Enbridge Ex. 3

ENBRIDGE PIPELINES (FSP) L.L.C.

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ILLINOIS COMMERCE COMMISSION

DOCKET NO. 12-0347

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TESTIMONY OF

CHARLES J. CICCHETTI, Ph. D.

PACIFIC ECONOMICS GROUP

July 3, 2012

Qualifications and Organization

Q. Please state your name, business and address.

A. My name is Charles J. Cicchetti. My address is Pacific Economics Group, 1341 Hillcrest Avenue, Pasadena, California 91106.

Q. What is your position with Pacific Economics Group?

A. I am a Co-Founding Member of and Senior Advisor to Pacific Economics Group. I am also a Senior Advisor to Rothstein Kass & Company, and CEO of Cicchetti Associates, Inc.

Q. What are your current professional duties?

A. I actively consult with clients on price, costs, environmental, oil, natural gas and electricity market issues, as well as competition and antitrust policies, particularly as those policies relate to regulated industries.

Q. What is your educational background?

A. I attended the United States Air Force Academy, and I received a B.A. degree in Economics from Colorado College in 1965 and a Ph.D. degree in Economics from Rutgers University in 1969. From 1969 to 1972, I engaged in post-doctoral research on energy and environmental matters at Resources for the Future (RFF), a Washington, D.C. think tank.

Q. Please summarize your professional experience.

A. I was the first economist of the Environmental Defense Fund from 1972 to 1975, and was a faculty member at the University of Wisconsin from 1972 to 1985, ultimately earning the title of Professor of Economics and Environmental Studies.

From 1975 through 1976, I served as the Director of the Wisconsin Energy Office and as Special Energy Counselor for the Governor. In 1977, I was appointed by the Governor as Chairman of the Public Service Commission of Wisconsin and held that position until 1979, and served as a Commissioner until 1980. In 1980, I co-founded the Madison Consulting Group, which was sold to Marsh & McLennan Companies in 1984. In 1984, I was named Senior Vice President of National Economic Research Associates and held that position until 1987. From 1987 until 1990, I served as Deputy Director of the Energy and Environmental Policy Center at the John F. Kennedy School of Government at Harvard University, and from 1988 to 1992, I was a Managing Director and ultimately Co-Chairman of the economic and management consulting firm, Putnam, Hayes & Bartlett, Inc. In 1992, I formed Arthur Andersen Economic Consulting, a division of Arthur Andersen, LLP. In late 1996, I left Arthur Andersen to co-found Pacific Economics Group, L.L.C. and form Cicchetti Associates, Inc. I have taught at the University of Southern California (USC) and held the Miller Chair in Government, Business and the Economy at USC. I became Senior Advisor to Navigant Consulting in 2009 and to Rothstein Kass & Company in 2011. A copy of my resume is appended hereto as Attachment A.

Q. Have you published any papers or articles?

A. Yes. I have published articles on energy and environmental issues, public utility regulation, competition and antitrust. A complete listing of my publications is included in Attachment B, which is appended.

Q. Have you ever given expert testimony in a court or administrative

proceeding?

A. Yes. A list of the proceedings in which I have provided expert testimony is included in Attachment C, which is appended.

Q. Have you ever given expert testimony before the Illinois Commerce Commission (ICC)?

A. In addition to appearing before the ICC on behalf of Enbridge in other pipeline proceedings, I have appeared before the ICC on behalf of Commonwealth Edison in 1986, 1987, and 1990.

Q. Who retained you for this testimony?

A. I have been retained by Enbridge Pipelines (FSP) L.L.C. (hereinafter referred to as “Enbridge”) to provide testimony explaining the benefits to Illinois and the Midwest region of the United States known as PADD 2 if the Commission approves Enbridge’s Application for a Certificate in Good Standing and Other Relief with respect to its Request to construct, operate and maintain the Flanagan South Pipeline, a 600-mile long 36-inch pipeline running from Flanagan, Illinois to Cushing, Oklahoma. The pipeline will essentially parallel the existing Spearhead Pipeline and will be built largely within the existing right-of-way of that pipeline.

Q. What is your understanding of the various Enbridge undertakings on which you have appeared as an expert witness?

A. The Southern Access Expansion project involved construction of two new liquids pipelines in Illinois, located in Boone, DeKalb, LaSalle, Livingston, Grundy, and

Will Counties. The majority of the portion of the route for the pipelines located in Illinois was located within the same right-of-way. The Southern Access Expansion begins at Enbridge Energy's storage terminal in Superior, Wisconsin and carries crude oil through Wisconsin to a point south of Chicago at an existing Enbridge storage facility located near Flanagan, Illinois. This 42-inch pipeline is known as the "Stage 2" segment of the Southern Access Expansion Program. "Stage 1" consisted of constructing a new line through much of Wisconsin to provide some additional capacity, with Stage 2 extending the line to Flanagan, Illinois about one year later, adding additional capacity to what is referred to as the integrated Enbridge pipeline network in the Midwest known as the Lakehead System. The second pipeline was built concurrently with the Southern Access Expansion. It transports light liquid hydrocarbons (called diluents) from Illinois-area refineries and other sources through new and existing pipelines in the United States and Canada for delivery in northern Alberta. There, the liquid hydrocarbons are used to facilitate transporting the oil from Alberta's oil sands. This is the Southern Lights Project. It is a 20-inch diameter pipeline and originates near Manhattan in Will County and crosses Grundy County before joining the right-of-way for the new 42-inch crude line in LaSalle County and continuing north through Illinois, Wisconsin, Minnesota at which point an existing pipeline was reversed and re-purposed to allow continued transportation of these diluents to Alberta, Canada. The Southern Access Expansion Program and the Southern Lights Project are jointly known as the "Expansion Projects."

The Extension Project was a planned extension of the Southern Access Expansion Program ("Southern Access Expansion"). The Extension Project, when built, will extend shipments from the Flanagan terminal near Pontiac to a crude oil hub near Patoka, Illinois in Marion Country. Enbridge also owns storage facilities in Marion County. At the Extension Project's terminus in Patoka, Enbridge and other companies have approximately 13 million barrels of crude petroleum storage and breakout tankage. Upon completion, the Extension Project will provide U.S. refiners an initial capacity of 400,000 bpd into Patoka, Illinois. Patoka, Illinois is a pipeline hub with connections that will allow the crude to flow south, east, and west.

Q. What are the reasons that Flanagan South will yield benefits to Illinois and the nation, particularly the central region?

A. It takes time for interstate pipeline transportation projects to be planned and developed with customers, permitted, and constructed before coming on line and each year of delay in bringing a new pipeline on line would increase the likelihood of consumers paying more for the petroleum products they use. These Projects will increase the likelihood of consumers paying less for the petroleum products they use because they add to existing capacity of the crude oil pipeline and storage capacity in North America. Thus, this access to North American crude capacity will reduce U.S. dependence on oil imported via ocean-going tankers from other continents, including some often less stable, sometimes unfriendly, and typically without the progressive environmental protection laws in North America. In addition, there would be other benefits, such as:

1. The new pipeline capacity will deliver crude oil from the Bakken and Three Forks oil shale formations largely within North Dakota and Montana and from western Canada including oil sands production in Alberta.
2. The national balance-of-payment and regional economies gain when Bakken and western Canadian crude supplies displaces crude imported from South America and the Middle East.
3. Crude oil from Canada and the U.S. will provide global markets with a larger cushion of spare capacity from very secure sources.
4. Storage matters for security and Enbridge has committed to expand its crude oil storage to increase reliability to meet refinery runs requirements and expand infrastructure and benefits to Illinois.
5. Additional jobs in Illinois and the region would likely be created.
6. Expanding and extending pipeline capacity to access growing supplies of crude oil from secure North American energy development increases National Security as crude oil from the Bakken Formation and western Canada displaces supplies currently imported from South America and the Middle East.

Q. How is your evidence organized?

A. I have eight additional sections in my testimony. These are:

In Section 1, I introduce the issues and explain how this proposal would improve North American petroleum markets and efficiency, while reducing dependence on imports from outside North America, often from unstable or unfriendly nations.

In Section 2, I discuss other pipelines and other proposals to bring Canadian crude oil supplies to the United States.

In Section 3, I discuss Illinois petroleum facts.

In Section 4, I discuss my interpretation of the Public Utilities Act Section 15-401 and its requirement for applicants seeking a Certificate of Good Standing to demonstrate substantial societal benefits.

In Section 5, I quantify the consumer benefits and update previous benefits analyses.

In Section 6, I discuss related national security, balance of trade, jobs, and Green House Gas matters.

In Section 7, I summarize my evidence and conclusions.

SECTION 1: INTRODUCTION AND OVERVIEW

Q. Would you please summarize the need for additional oil supplies and pipeline capacity to move these supplies to consumers?

A. Yes. Much has been written and said lately about petroleum given the price run-up in gasoline. Since the middle 1980's crude oil has mostly been traded in a global commodities market. The price of particular crudes varies depending on its chemical composition and the costs needed to refine the particular crude into useful petroleum products that fuel modern economies worldwide. Crude is primarily exchanged using U.S. Dollars. Prices can vary and the world has come to understand that there is a world spot price of crude that changes throughout the trading day and over time. The fundamental movements in the price of crude are tied to the balance between demand and supply of oil in a global marketplace. Major supply disruptions or even the prospect of them can and often has increased the price of crude. The industry roughly produces what it needs and holds relatively little inventory. The balance between production and use is achieved through spare capacity. The ability to bring on line spare capacity is a very important determinant of the extent of the upward price pressures related to unexpected supply interruptions. Table 1 shows that Saudi Arabia holds most of the spare capacity in the world.

TABLE 1
Excess OPEC Capacity by Country
(Million Barrels/Day)[1]

Country	Production	Capacity	Spare	Spare Capacity %	% of Spare Capacity
Algeria	1.27	1.27	0.00	0.0%	0.0%
Angola	1.90	1.90	0.00	0.0%	0.0%
Ecuador	0.49	0.49	0.00	0.0%	0.0%
Iran	3.55	3.55	0.00	0.0%	0.0%
Iraq	2.70	2.70	0.00	0.0%	0.0%
Kuwait	2.55	2.55	0.00	0.0%	0.0%
Libya	0.70	0.70	0.00	0.0%	0.0%
Nigeria	2.20	2.20	0.00	0.0%	0.0%
Qatar	0.85	0.85	0.00	0.0%	0.0%
Saudi Arabia	10.00	12.25	2.25	18.4%	97.4%
U.A.E.	2.60	2.66	0.06	2.3%	2.6%
Venezuela	2.20	2.20	0.00	0.0%	0.0%
OPEC Total	31.01	33.32	2.31	6.9%	100.0%

[1] As of December 2011.
Source: Energy Economist: OPEC - January 26, 2012

Q. How does the spare capacity of crude oil production affect national security?

A. Spare capacity is similar to electric utility "reserves". It is a form of stand-by or effective capacity. These potential incremental supplies are typically used when uncertain events threaten system reliability and upset normal or expected market supply and demand conditions. Spare capacity historically was shut-in production. For example, in the 1950s and 1960s, the U.S. retained a portion of productive wells effectively in a stand-by mode. More recently, OPEC nations have used agreements across countries to restrict output in order to protect or maintain higher crude oil prices. There have been numerous instances of such market power in the crude oil industry, which have very often been government sanctioned and orchestrated.

As the world demand for crude has increased with China, India, and other regions growing significantly, the volume of shut-in or spare capacity worldwide has generally fallen within OPEC. Each minor jolt or expected disruption in the worldwide crude oil supply chain causes price jumps for crude oil. Financial instruments have increasingly been used to hedge against uncertainty in both supply and price. These futures contracts have also caused speculators to become more important players in what determines crude oil prices. Higher and more volatile crude prices have become the norm.

Taken together, the evidence, regardless of the theoretical language used, in unassailable. As world crude demand grows and shut-in or spare capacity declines, world crude prices soar and price volatility increases. There are two ways to think about the proposed addition of 585,000 bpd that would flow from the Bakken region of North Dakota and western Canada to the U.S., if the Flanagan South Pipeline were built.

Compared to world use of nearly 85 million bpd, the additional supplies are a rather insignificant increase of about 0.69 percent. However, other things equal, the same 585,000 bpd is quite significant when compared to spare capacity, which has generally fallen from almost 7 million bpd in late 2002 to be about 2.25 million bpd before factoring in the loss of Iranian oil currently under an embargo, losses that likely will increase. As supplies are reduced and demand remains steady, spare or effective capacity will fall to within a 1 million to 2 million bpd range. From this very important perspective of spare capacity, an additional 585,000 bpd would be a major incremental insurance cushion that would help to curtail price volatility and levels.

The Flanagan South segment is also capable of being expanded to over 800,000 bpd. This would be added to the Spearhead system that has optimized capacity at approximately 193,000 bpd to Cushing, Oklahoma, bringing total capacity close to 1 million bpd. Enbridge has storage about 14.8 million barrels of storage capacity in the Cushing area. Enbridge has also entered into a joint venture investment with Enterprise Products Partners (Enterprise). Enterprise is also planning to expand the Seaway Pipeline from Cushing to the Gulf region with a capacity of 850,000 bpd, with much of the crude oil on the expanded Seaway line expected to be delivered into Cushing.

Enbridge is not focusing solely on Canadian supplies of crude oil. Enbridge has recently tripled its capacity of its pipeline system that interconnects to the Lakehead System and has proposed further expansions of its North Dakota System to allow increased transportation from newly accessible domestic oil shale supplies from the Bakken and Three Forks formations in Montana and North

Dakota, which may have reserves totaling as much as 24 billion barrels.[1] The North Dakota System interconnects with the Enbridge System in Clearbrook, Minnesota and Cromer, Manitoba. The expansions of Enbridge's North Dakota System will allow these domestic sources to reach refineries in the Rockies, the mid-west and the Mid-Continent, all of which will curtail price volatility and price levels, and improve national and regional security.

This will mean that the Enbridge system will move to U.S. refineries both the expanding domestic oil production in the Bakken fields in the U.S. and growing production from western Canada, largely driven by growth in Alberta's oil sands region. Both the North Dakota System expansions and the Flanagan South Pipeline would help back out imports into the U.S. Gulf Coast now received from countries outside North America that are often less secure and less friendly nations.

Q. What else affects crude oil prices?

A. The price of crude varies with location and the quality of the oil traded. Quality depends upon the chemistry of a barrel of crude. For example, "light" crudes yield more highly valued products such as jet fuels, gasoline and light distillates. Therefore, "light" crudes typically fetch a higher crude price than "heavier" crudes based on their specific gravity. Another factor is the presence of impurities particularly sulfur. Generally low sulfur, or "sweet", crudes trade at higher prices.

[1] Moore, Stephen, "How North Dakota became Saudi Arabia." Wall Street Journal. October 1, 2011. "Continental: Bakken's Giant Scope Underappreciated." Oil and Gas Journal, February 16, 2011.

The location of crudes also matters because crude mostly needs to move from where it is produced to where it is consumed in a refinery process that converts crude to the myriad array of products consumers directly use. Most of the world's crude prices are tied to two important and widely traded benchmark prices. These are West Texas Intermediate (WTI) traded at Cushing, Oklahoma and the London Brent Indexed (Brent) sourced from a blend of crudes in the North Sea. Adjusting for quality differences and transportation to these locations can determine the trading price for crude virtually anywhere in the world.

Both the WTI and Brent indices are based on relatively light crudes with relatively low sulfur content. The use of these types of crude is particularly useful because they are easily converted to gasoline and distillate prices because these are the typical products that would be produced using these crudes. Seasonal price movements are also built into the information in these two indices because distillates are used for heating oil in colder months and gasoline prices and demand typically increase in the warmer months.

The WTI and Brent products are also the two primary products used to trade crude oil future contracts. The WTI is the reference price for futures' contracts at the Chicago Mercantile Exchange's NYMEX. Brent is the reference price for futures' contracts at the Intercontinental Exchange (ICE). The world's energy markets react to news related to world events, financial and economic conditions in both the spot market movement in the WTI and Brent Prices and the longer-term futures' prices, which build in a modicum of insurance hedging and speculation.

Q. Would you describe global oil markets and their recent history?

A. Yes. The first quarter of 2012 ushered in a resurgence of crude oil prices. Average U.S. gasoline prices hit new highs for the winter months. The three primary causes are:

1. Demand increased in both the U.S. and worldwide due to sustained economic recovery, particularly outside of Europe.
2. Spare crude oil production capacity has fallen to below 2.4 million bpd. This was the amount of worldwide spare capacity that existed prior to the world economic recession when the effective capacity equaled about 1 to 1.5 million bpd. At this time of economic expansion in July 2008, crude prices approached record levels of $150 per barrel.
3. There is great supply uncertainty and rising price expectations.

Currently, political crises exist in the Middle East and particularly Iran. These have added significant uncertainty related to future supplies. The reduction in Iran's output due to sanctions also reduced spare capacity. This self-imposed sales embargo has reduced world supply. There also is the potential for a deeper shut in of all Iran's production. This would reduce crude oil supplies by about 4 million bpd, which is much greater than Saudi Arabia's current spare capacity. In addition, the crisis between Iran and other countries poses a major threat to the 20 percent of the world's crude oil that flows through the Strait of Hormuz.

There is a "perfect storm" of tightening supply, increasing demand, declining spare capacity, and increased supply uncertainty related to world crises. These have caused a sharp increase in hedging and speculation as businesses seek to protect themselves from the prospect of higher future prices and shortages. Seasonal increases in demand later during the spring and summer of 2012 will add additional pressures to increase petroleum prices in the late spring. Additional supply and price risks fester in Iraq, Libya, Venezuela, and Nigeria. The upward move in crude oil prices has caused petroleum product prices to increase. The parallel price increases threaten economic recovery and stall growth. The economic effects vary across countries with consumers bearing much of the direct burden.

Q. What is happening closer to home in North America?

A. The prices for crude oil and petroleum products in North America reflect global market supply and demand conditions. There are also regional and even intra-regional factors that affect prices. In North America, a lack of pipeline transportation in the center of the U.S. to move crude to refinery hubs such as those along the U.S. Gulf of Mexico is a major bottleneck. This has caused two important anomalies.

First, the world's two primary crude oil price indices, West Texas Intermediate (WTI) and Brent, are trading at unusually large differentials ($15 to $20 per barrel since May of 2011). This is a major indication that upstream pipeline delivery is not sufficient to transport available and increasingly scarce crude to the major refinery hubs in the U.S., and thus constrains overall capacity in world markets. Put totally bluntly, there are bottlenecks in the transportation system that restrict the movement of crude oil to the Gulf region's refineries. While rail and other modes can make small dents in this bottleneck, only pipelines can transport the volumes needed round-the-clock to provide full relief. This has caused something of an unusual oversupply of crude oil in certain hubs in the center of the nation, while consumers in more populated refining areas such as Houston, Chicago, Los Angeles, New York, and the surrounding markets are facing higher benchmark prices, making those refineries much less competitive, prompting closure or sell-off of refineries in those regions.

Second, the early 2012 run-up in gasoline prices has been accompanied by unusually large state-by-state price differences. Some Rocky Mountain States have had relatively small increases, while consumers in the Midwest and on both the Atlantic and Pacific coasts have been severely hit. In fact, the populous coastal and midwestern states have prices more closely tied to the higher-priced Brent crude index. This is due to the bottleneck that restricts oil movement from Cushing, Oklahoma to the Gulf. Bringing more crude online with increased delivery capability and would slow and perhaps reduce the run-up in petroleum prices. All consumers in the U.S. would benefit from greater security and less price volatility tied to the need for hedging and speculation.

Q. Please explain this bottleneck further.

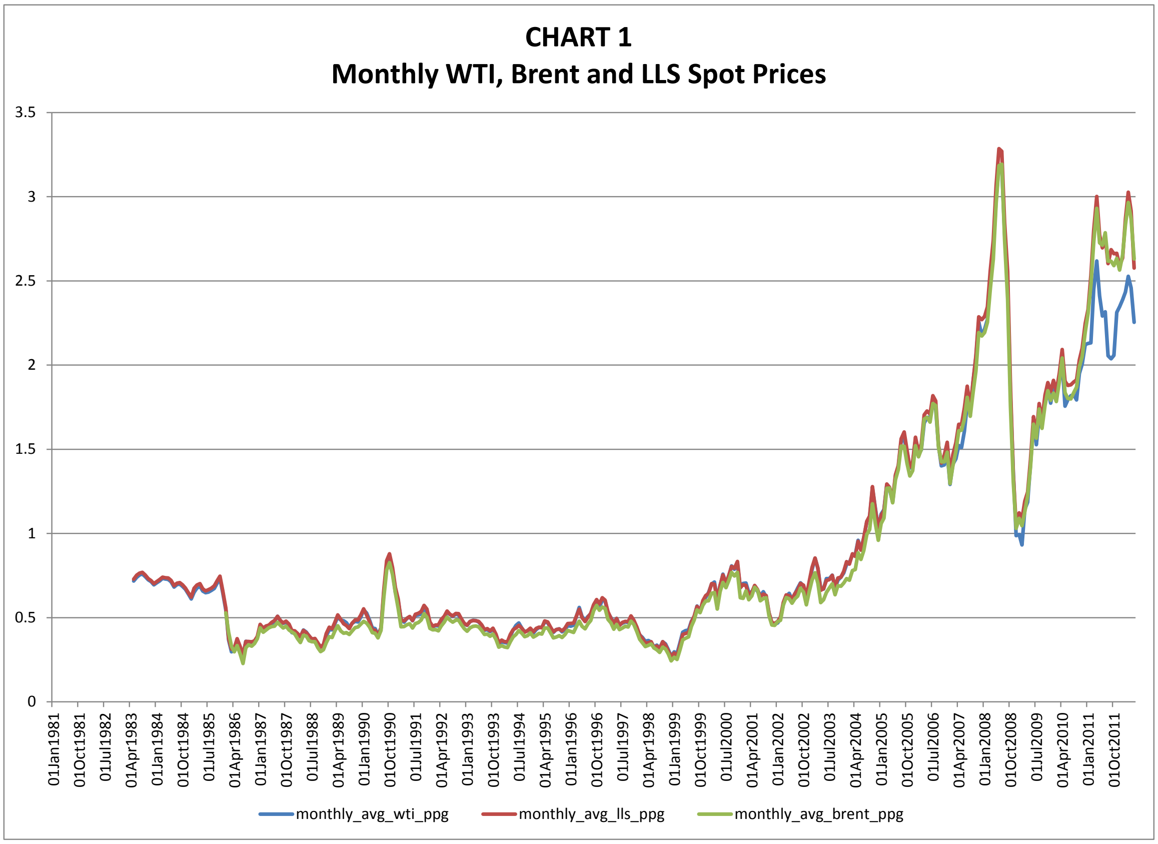
A. The lack of pipeline capacity for overland delivery into the refineries on the Gulf Coast ties back to the anomalous price disparities between WTI and Brent, as well as the regional differences in gasoline prices. Most important, these outcomes point to a need to add pipeline capacity that will deliver additional Canadian crude to the Midwest and on to the Gulf refineries. This requires two steps: (1) more capacity to bring Canadian oil to the U.S.; and (2) more capacity from

Cushing, Oklahoma to the Gulf. The nation, the PADD 2 region, and the State of Illinois will benefit. This would back out imports from Venezuela and Saudi Arabia. Worldwide spare or effective capacity would increase if we reduce imports from outside North America, which would then be diverted to supply the growing demand in other counties. The many international crises in producing nations in OPEC with relatively low spare capacity are triggering fears related to the prospect of higher future petroleum prices and the need to hedge and secure price and supply certainty.

Things can get worse for consumers. First, oil dependent industries are locking in higher priced contracts to reduce the risk of even higher future prices. Second, demand will increase during the summer months. This normally as much as 2 million bpd compared to the usually lower February to May slack period. The economic recovery in North America will add more demand as well.

Q. What would likely happen after removing the transportation bottleneck at Cushing, Oklahoma?

A. The first likely effect if the bottleneck is relieved at Cushing would be for the prices of Brent and WTI to return to a normally tight trading relationship. Chart 1 shows this relationship on a monthly basis from May 1982 to April 2012. The source is the World Bank. From January 2011 through the present, the so-called bottleneck has caused WTI crude prices to average about 15% less than both Brent and Louisiana Light Sweet (LLS) Crude prices. This is very unusual because WTI prices typically about equal or even a bit higher than Brent prices. Chart 1 shows that historically Brent, LLS, and WTI closely track one another and then WTI diverges from the Brent and LLS in 2011.



The second likely effect was explained above. In volumetric terms if more crude deliveries were moved to the Gulf Region (PADD 3), this extra volume would be added to world supply and the level of spare capacity, which I discuss in more detail below. The world's consumers would, other things equal, pay less for crude and likely find less price volatility.

Q. In the near term, would adjusting the WTI crude price to its rough equivalence with Brent raise petroleum product prices such as gasoline and diesel in Illinois and/or PADD 2?

A. Likely, the gap between the WTI price and Brent prices will end when the existing Cushing to Gulf bottleneck is eliminated. In relative terms, the WTI crude price would likely then increase. There is also no question that crude oil and petroleum product prices are highly correlated. The core question is: "Do Illinois product prices track world crude prices or regional crude prices?" When WTI and Brent are statistically equal, there is no issue to resolve.

The current bottleneck is causing WTI prices to be significantly less than Brent prices. If product prices track global crude prices such as Brent rather than the suppressed WTI price, the removal of the bottleneck would not cause gasoline or diesel prices to increase in Illinois or the PADD 2 region. This could be happening if PADD 2 and Illinois import petroleum products from refiners that run crudes tied to world oil markets rather than the WTI Cushing crude prices that are currently trading at prices that are abnormally below world crude prices.

Q. Can the relationship between Midwest petroleum product and crude prices be statistically tested?

A. Yes. Professors Borenstein and Kellogg from the University of California (Berkeley) and University of Michigan, respectively, have performed such structural analyses and tests in a recent publication.[2] They first formulate the economic theory that if a region imports petroleum products, the marginal or market clearing product price would track world crude prices, not constrained regional crude prices. This would, in effect, make any crude acquired for PADD 2 refinery runs at prices less than prevailing world prices an infra-marginal source of supply. If this hypothesis holds, regional petroleum product prices would

[2] Borenstein, Severin and Ryan Kellogg. "The Incidence of an Oil Glut: Who Benefits From Cheap Crude Oil in the Midwest?" Working Paper Series, Energy Institute of Haas School of Business, UC Berkeley, May 2012.

simply reflect world crude prices, and would not be based on any regional crude price differentials compared to world crude prices, if and when such differentials might occur. The refiners would earn economic rent until the bottleneck is removed and consumer product prices would not be less than other regions that are tied primarily to world crude supplies and prices.

Q. Please explain the statistical tests that Professors Borenstein and Kellogg performed.

A. They used a regression analysis for both gasoline and diesel prices in the Midwest as a function of global crude prices in Louisiana and the differential between crude prices in the Midwest (WTI at Cushing, Oklahoma) and Louisiana crude prices. They used Louisiana crude prices that are similar to Brent crude prices for their global crude price. Professors Borenstein and Kellogg analyzed monthly data for 6 years, beginning in 2006, and a panel of 15 states in PADD 2.

They tested various hypotheses and concluded that while petroleum product prices track world crude prices, any differential between Midwest crude and world crude prices was statistically insignificant. Therefore, if the current gap between WTI and Brent dissipates with the removal of the current Cushing, Oklahoma to Gulf bottleneck, there would not be any statistically likelihood that gasoline or diesel prices would increase in PADD 2.

Q. Have you independently verified their results?

A. Yes. I was able independently to replicate all their statistical results In addition, I extended the time period to begin in 1986 and end in the spring of 2012. I also added some additional hypotheses related to the existence of the current bottleneck and inventories or stocks. In my independent analyses, I used the same statistical methods and tests to adjust the reliability tests used to reflect the error structures in the data. These include so-called "White" standard errors and a number of other econometric techniques to investigate and test various hypotheses using different procedures.[3]

Q. What was the crude price data used in the analyses?

A. Drs. Borenstein and Kellogg used monthly averages of daily spot prices for crude oil at Cushing, Oklahoma for WTI crude, North Sea for Brent, and St. James Louisiana for LLS, which they sourced from *Bloomberg*. They used data from January 1, 2006 through January 1, 2012.

In addition I extended the time period analyzed to use monthly averages of daily spot prices from *Bloomberg* for WTI, Brent, and LLS, which I extended backward for the period of analysis to January 1, 1986. *Bloomberg* could provide daily spot prices for Brent only from June 1988 forward. For the earlier period, January 1986 through May 1988, I used monthly World Bank prices from *IndexMundi* for monthly spot Brent crude oil prices. Prior to using the *IndexMundi* data for the earlier period, I compared the average prices for these two sources. They were $39.16 and $39.53 for Brent and *IndexMundi*, respectively. These are statistically equivalent. I also ran a correlation analysis of the reported *IndexMundi* and *Bloomberg* spot prices for Brent for the period June 1988 through March 2012. I found a correlation of 0.99820364. Thus, I am

[3] I also confirmed these results using Newey-West procedures, which are a specific type of "White" standard errors.

confident in using the *IndexMundi* data for Brent spot crude oil prices from January 1986 through May 1988.

Q. What data did Drs. Borenstein and Kellogg use for gasoline and diesel fuel prices?

A. They used Energy Information Administration (EIA) state level data for gasoline and diesel fuel prices. I did also. For gasoline, I used the EIA's Sales-for Resales of Motor Gasoline from its tables entitled Total Gasoline Wholesale/Resale Price by Refiners (Dollars per Gallon). I used the same source for diesel prices, using Sales-for-Resales of Distillate No. 2 Wholesale/Resale Price by Refiners. I used these two data sources for monthly prices from January 1986 through March 2012.

Q. Please explain how your analysis differed from Drs. Borenstein and Kellogg.

A. I began with their analyses and results. I independently replicated and confirmed all the statistical results in their paper.

In my analyses, I concentrate on Illinois and treat all the PADD 2 states together, rather than as a panel of 15 individual states. I do this because when I tested the underlying panel data; I found no statistically significant differences in product prices across the 15 states that comprise PADD 2. This also focuses my analysis on the statutory standard in Illinois and simplifies the discussion.

Table 2 and Table 3 show my results for PADD 2 and Illinois, respectively. The t-statistics are shown in parentheses below each estimated coefficient in Tables 2 and 3.

Q. Did you do anything else?

A. Yes. I tested the alternative hypotheses that WTI prices plus the difference between Brent and WTI would determine petroleum product prices in Illinois and PADD 2. I performed this to determine the most important change in a crude oil price index for estimating monthly changes in petroleum products in Illinois and the aggregate PADD 2. These additional results confirm that monthly changes in Brent (world), not WTI, would be the better crude price to use for determining changes in monthly petroleum product prices in Illinois and PADD 2.

Q. Did you also analyze jet fuel?

A. Yes. I tested the same hypotheses for jet fuel that I performed for gasoline and diesel because I consider jet fuel, along with gasoline and diesel, later in my testimony. I reach the same conclusions concerning the importance of changes in global unconstrained crude prices such as Brent, rather than WTI crude prices, for estimating monthly changes in jet fuel prices in Illinois and PADD 2.

TABLE 2
PADD 2
Product Prices as Functions of World Crude (Brent) Prices and the Differential Between WTI and Brent

	First Difference	
Coefficient	**Gasoline**	**Diesel**
First Difference Brent	1.1293	1.0505
	(10.89)	(21.09)
First Difference (WTI-Brent)	0.1929	0.2714
	(0.87)	(1.55)
Bottleneck (Starting 1/1/11)	-0.0140	0.00216
	(-0.42)	(0.11)
First Difference Crude Inventory	0.00000171	-5.3178E-07
	(1.03)	(-0.44)
First Difference Gasoline Inventory	-3.1778E-7	N/A
	(-0.20)	N/A
First Difference Diesel Inventory	N/A	-0.00000965
	N/A	(-5.38)
R^2 (adj)	0.64	0.74
N	313	313
Durbin Watson	1.74	2.2

TABLE 3
ILLINOIS
Product Prices as Functions of World Crude (Brent) Prices and the Differential Between WTI and Brent

	First Difference	
Coefficient	**Gasoline**	**Diesel**
First Difference Brent	1.1241	1.0450
	(9.95)	(20.15)
First Difference (WTI-Brent)	0.2451	0.3072
	(1.16)	(1.55)
Bottleneck (Starting 1/1/11)	-0.0161	-0.00161
	(-0.45)	(-0.07)
First Difference Crude Inventory	0.00000217	-8.3730E-7
	(1.18)	(-0.65)
First Difference Gasoline Inventory	9.5385E-9	N/A
	(0.01)	N/A
First Difference Diesel Inventory	N/A	-0.00000962
	N/A	(-5.00)
R^2 (adj)	0.59	0.73
N	313	313
Durbin Watson	1.66	2.22

Q. What do you conclude from this analysis of PADD 2 and Illinois petroleum product prices over the extended time period?

A. Like Professors Borenstein and Kellogg, I do not find any statistically significant effect related to the monthly change in the differential between WTI and world crude prices on the monthly change in the price of either gasoline or diesel oil in either PADD 2 or in Illinois over the period from January 1986 to March 2012. I do find these same monthly price changes are highly dependent on the monthly change in the unconstrained world price levels measured using the Brent Index price. (I reach the same conclusion if I use the Louisiana Light Sweet price that Professors Borenstein and Kellogg used.)

In addition I tested and rejected the hypothesis that these conclusions might be affected differently by events occurring during the current bottleneck period starting in January 2011. I also tested in this regression analysis the hypothesis that regional inventories or storage of crude and the specific petroleum product would affect petroleum product prices in both PADD 2 and Illinois. I found that crude oil inventories in the region had no effect on either gasoline or diesel price movements. This is consistent with the notion that PADD 2 and Illinois are petroleum product price takers because: (1) they import petroleum products; and (2) levels of crude oil inventories on hand in PADD 2 have no significant effect on monthly gasoline or diesel price movements. I rejected the hypothesis that inventories of gasoline mattered in either PADD 2 or Illinois. I do find that increases in inventories of diesel were associated with reduced diesel price movements, and *vice versa*.

In conclusion as I explain below I find benefits for Illinois and the region if additional crude is shipped on the Flanagan South Pipeline. Furthermore, the statistical analysis of monthly price movements leads to the conclusion that removing the current bottleneck at Cushing, Oklahoma is not likely to have any adverse effect on petroleum product prices in Illinois or the PADD 2 region. In fact, the benefits related to building the pipeline are that world supply would expand. This will mean expected lower future petroleum prices and less price volatility, all else the same, compared to a future in which oil sands remain untapped or at least not produced to their full economic potential.

SECTION 2: PIPELINE PROPOSALS

Q. What is being proposed?

A. Enbridge, TransCanada, and Kinder Morgan have proposed or are planning to expand pipeline transportation capacity to the Gulf of Mexico. This includes: (1) constructing new pipeline capacity to move oil into key refinery hubs, including the Gulf of Mexico refineries[4], and (2) reversing existing pipeline flows to bring more crude oil from the Bakken region and western Canadian oil into the U.S. These actions will deliver more crude oil and add to the world's markets as whole. If successful, these pipeline expansions will reduce the volatility and pressure on world oil prices by expanding spare and effective capacity along with added supplies to meet growing demand.

The primary benefit of increased supplies is to ease the strong upward pressure on petroleum prices. There are also some important secondary benefits. These include using Canadian oil to back off less dependable imports to the Gulf, primarily from Venezuela and the Persian Gulf. In addition, both increased U.S. production from the Plains States and Alberta mean that the dollars spent on crude oil mostly remain in the United States. This increases economic activity in both the U.S. and Canada and expands employment.

Q. What does Enbridge propose to do to bring more North American oil to the Gulf?

A. Table 4 summarizes the existing Enbridge pipelines and permits that move liquid petroleum from Alberta to the Gulf coast refineries. These also bring a significant portion of the petroleum to Illinois refineries. This has made it possible to reverse

[4] TransCanada recently announced that it would proceed with its plans to move forward with the portion of its Keystone XL oil pipeline that will run from Cushing, Oklahoma to Houston and Port Arthur, Texas. Wall Street Journal, "Pipeline Gets Jump With Gulf Route." Section B1, page 1, February 28, 2012.

the flow of oil from Cushing to Illinois, making it possible to move increased amounts of Canadian petroleum to the U.S. and the need to expand capacity from Cushing to the Gulf. In addition, Enbridge plans new pipeline capacity to tie the Bakken crude oil production into its system to move this growing U.S. production into and across Illinois. (Table 4 on next page)

TABLE 4
Enbridge Pipelines from the Alberta Crude Oil and Oil Sands Production to the Gulf Coast

Pipeline	***Description***
Athabasca	335 mile pipeline from Fort McMurray, Alberta to Hardistay, Alberta. It has a capacity of 345,000 bpd. It connects with the Enbridge Mainline at Hardisty.
Waupisoo	236 mile pipeline from Cheechum, Alberta (near Fort McMurray). It has a capacity of 350,000 bpd. It connects with the Enbridge Mainline at Edmonton.
Enbridge Mainline	1,400 mile long pipeline from Edmonton, Alberta to Superior Wisconsin. In conjunction with Lakehead, it has a capacity of 2,500,000 bpd. The Enbridge Mainline consists of the Canadian pipelines originating in Edmonton, Alberta Canada to Gretna, Alberta and includes the U.S. portion of the system called the Lakehead System and the Canadian portion of the line spanning from Sarnia, Ontario to Quebec and across the border to Buffalo, New York
Spearhead	22-inch and 24-inch pipeline running from the Flanagan Terminal in Pontiac Illinois to Cushing, Oklahoma. It has a capacity of 193,300 bpd (the original 125,000 bpd capacity was expanded by 68,300 bpd in 2009). Spearhead is reportedly massively oversubscribed, attracting 737,500 bpd in nominations for February 2012.
Lakehead System	1,900 mile long pipeline that in the U.S. runs from near Gretna, Manitoba crossing the border near Neche, North Dakota and includes lines spanning across the Upper Peninsula of Michigan to Ontario and lines to Chicago and through Indiana and Michigan to Sarnia, Ontario and also including the U.S. portion of the line near Buffalo, New York. The Lakehead System includes the Southern Access Expansion pipeline.
Southern Access Extension (Certificated but not yet built)	170 mile pipeline from the Flanagan Terminal in Pontiac, Illinois to Patocka, Illinois. It is planned as a 36-inch pipeline with a 400,000 bpd capacity.
Mustang (Joint Venture)	215 mile pipeline that runs from Chicago to Patoka, Illinois. Enbridge has a 30% interest. The pipeline has a 100,000 bpd capacity.
Seaway (Joint Venture)	30-inch, 500 mile long, 150,000 bpd pipeline that is scheduled to be reversed in June 2012. It is a joint venture between Enbridge and Enterprise Products Partners. It runs for 500 miles and has an expected capacity (with pump station additions) of 400,000 bpd. It runs from Cushing, Oklahoma to Houston, Texas. A planned 85 mile extension would run from Houston to Port Arthur/Beaumont.

Q. What are the other pipelines that bring Canadian crude to consumers in the U.S?

A. Kinder Morgan brings petroleum from Alberta to Wyoming and Illinois. These are described in Table 5.

TABLE 5
Kinder Morgan Pipelines from Alberta
To the U.S.

The Express System	785 mile long 24 inch that begins in Hardisty, Alberta and then interconnects with the Platte Pipeline System in Casper Wyoming. It has a capacity of 280,000 bpd
The Platte Pipeline	932 mile 20-inch pipeline that runs from Casper, Wyoming to Wood River, Illinois. It has a capacity of 164,000 bpd.

Q. What is the third principal pipeline option for Alberta petroleum imports into the U.S?

A. TransCanada proposes to complete four phases of the Keystone Pipeline. Table 6 describes each phase.

TABLE 6
TransCanada Pipeline's Proposal to Move
Alberta Petroleum to the Gulf Coast

Phase 1 Keystone (completed)	1,853 mile long 30-inch pipeline running from Hardisty through Saskatchewan and Manitoba, then south through North Dakota, South Dakota and Nebraska to Steele, City Nebraska. From there, Phase 1 runs to Wood River and Patoka, Illinois. It has a capacity of 435,000 bpd.
Phase 2 Keystone (completed)	298 mile long 36-inch pipeline that runs from Steele City, Nebraska to Cushing Illinois. It increases the capacity of Keystone to 591,000 bpd.
Phase 3 Keystone XL (proposed)	Proposed 435 mile long 36-inch pipeline running from Cushing to Houston and Port Arthur, Texas. When completed, it will, in conjunction with Phase 4, increase the capacity of Keystone to 1.3 million bpd.
Phase 4 Keystone XL	Proposed 1,179 mile long 36 inch pipeline running from Hardisty, Alberta through Montana, South Dakota and Nebraska, terminating in Steele City, Nebraska. When completed, it will in conjunction with ***Phase 3***, increase the capacity of Keystone to 1.3 million bpd.

Q. Where does this current Enbridge application fall in this pipeline market?

A. Enbridge proposes to build the Flanagan South Pipeline, which will be a 600 mile long 36-inch pipeline running from Pontiac, Illinois to Cushing, Oklahoma. The pipeline will roughly parallel the existing Spearhead Pipeline and will be built largely within the existing right-of-way of that pipeline.

At Cushing, the petroleum will be transported on the Seaway Pipeline System that currently consists of a 30-inch, 500 mile long, 150,000 bpd pipeline that was reversed in May 2012 and is currently undergoing expansion to 400,000 bpd by early 2013. A parallel second pipeline has been proposed, which would be completed in 2014. Together the two Seaway pipelines will have a capacity of 850,000 bpd.[5] Seaway is a joint venture between Enbridge and Enterprise Products Partners. The Seaway Pipeline runs from Cushing, Oklahoma to Houston, Texas and will connect with refineries located in the western Gulf and Houston area.

Q. Do both the Enbridge and TransCanada Pipelines need to be built?

A. The answer has both regulatory and competitive market components. In some jurisdictions, petroleum pipelines must seek regulatory approval that gives them the right but not the obligation to construct a new oil pipeline. In addition, pipelines often compete against each other and other modes of transportation. Pipelines are built with the private risk that they may not keep shippers indefinitely and may not be guaranteed competitive market success.

Accordingly, Enbridge seeks ICC approval but assumes the risks related to competition. The Enbridge proposal for Flanagan South Pipeline would compete

[5] Seaway Crude Pipeline Company, LLC. "About Seaway." www.seawaypipeline.com.

with the Keystone XL proposal. I suspect both can succeed given predicted continued growth in crude oil production from the Bakken region and western Canada. Time and the market will ultimately be the arbiter of any success. Regulated entry across international borders and other approvals set the stage for private investors to compete.

At a high level, the dual applications to move petroleum from Canada to the U.S. gulf refineries serve as a competitive incentive for the pipelines to propose the most efficient transport option economically feasible to respective customers, regardless if both are built.

Q. How are oil pipelines regulated in the U.S.?

A. Oil pipelines compete against other means of transportation, such as trains, trucks, barges, and tankers. They also compete against each other. At the federal and interstate level, the competitive choices have caused the Federal Energy Regulatory Commission (FERC) to adopt a very light-handed form of market-access regulation. However, FERC has regulatory oversight over the rates and terms of service for common carrier petroleum pipelines.

In Illinois, a new oil pipeline must obtain regulatory approval from the Illinois Commerce Commission (ICC) based on a “public interest” test if it wants to have the right to exercise eminent domain powers in assembling a right-of-way (ROW) for the pipeline.

Oil pipelines, particularly in Illinois, must pass both the “market” and “public interest” tests to support requested approval for a grant of eminent domain power, should such rights be necessary. The market test is equivalent to an assurance that the proposed project would be capable of attracting sufficient shippers to justify the investment. The corresponding public interest test is equivalent to a societal benefits-to-cost test.

The regulatory public interest test is a necessary condition. In effect, achieving a "Certificate of Good Standing" from the ICC is a "necessary" condition to obtain a Certificate of Eminent Domain.

SECTION 3: ILLINOIS PETROLEUM

Q. Please describe the Illinois Market for crude oil and petroleum products.

A. The population of Illinois is growing and is projected to keep growing. From 2010 to 2011, Illinois added about 40,000 new residents.[6] From 2000, Illinois' population has grown by 3.3%. The U.S. Census Bureau projects that by July 1, 2030, Illinois' population will increase from an estimated 12,916,894 in July 2010 to 13,432,892 in 2020, an increase of about 4%.[7] With an increased number of people living in Illinois, there comes a corresponding increase in the demand for refined petroleum products. Taken together, the strong population and growth projections portend likely strong growth in the demand for refined petroleum products in Illinois, as well as for the nation. In order to meet this increased demand, there is a corresponding increased demand for additional supply sources of crude oil.

For the nation, the U.S. Census Bureau projects an increase in population from 310.2 million in 2010 to 373.5 million in 2030, an increase of 63.3 million

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[6] See Illinois Quick Facts from the U.S. Census Bureau, State and County Quick Facts; U.S. Census, Table 1. Annual Estimates of the Population of the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2011 (Release date December 2011).

[7] U.S. Census. Interim Projections of the Total Population for the United States and States: April 1, 2004 to July 1, 2030 (Release date April 21, 2005).

people, or more than 20%.[8] By 2050, the U.S. census projects a U.S. population of 439 million, an increase of 128.8 million over 2010 population estimates, an increase of almost 42%.[9]

Similarly, Illinois is also one of the leading petroleum consuming states in the country, consuming 3.6% of the gasoline and 2.7% of the liquefied petroleum gas (propane) consumed in the U.S. Gasoline is sold in about 4,400 service station outlets, comprising about 2.7% of the total gasoline service stations in the nation.[10]

Illinois has four major refineries, two located near Chicago, one in an Illinois suburb outside of St. Louis, Missouri, and one in Robinson, near the Indiana border. The refineries have a combined distillation capacity of 974,000 bpd, which is an increase from the 896,000 bpd capacity the refineries had in 2006.[11] The four refineries are Wood River (jointly owned by ConocoPhillips and Cenovus with a capacity of 356,000 bpd),[12] Joliet (owned by ExxonMobil with a capacity of 250,000 bpd),[13] Robinson (owned by Marathon Oil Corp. with a capacity of 206,000 bpd),[14] and the CITGO refinery at Lemont with a capacity of 167,000 bpd.[15] Further, BP's Whiting, Indiana refinery is located in relatively

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[8] U.S. Census. Table 1. Projections of the Population and Components of Change for the United States: 2010 to 2050 (release date August 14, 2008).
[9] U.S. Census. Table 1. Projections of the Population and Components of Change for the United States: 2010 to 2050 (release date August 14, 2008).
[10] Illinois Energy Fact Sheet, U.S. Energy Information Administration; www.eia/gov/state/state-energy-profiles. Last updated February 12, 2012.
[11] Illinois Energy Fact Sheet, U.S. Energy Information Administration; www.eia/gov/state/state-energy-profiles. Last updated February 12, 2012.
[12] "Wood River Refinery Expansion Nearly Complete," Oil and Gas Journal, October 2011.
[13] http://www.exxonmobil.com/Corporate/Files/joliet_brochure.pdf
[14] www.marathonpetroleum.com/Operations/Refining_and_Marketing/Refining/Robinson.html
[15] www.citgorefining.com/Lemont_About Us.html

close proximity to and supplies refined products to Illinois consumers. It has a capacity of 405,000 bpd.[16]

These refineries are supplied with crude oil from several pipelines, including ones owned by BP, ExxonMobil, Kinder Morgan, ChiCap, Capline, TransCanada (Keystone Pipeline), and Enbridge. Additional refined petroleum product (*e.g*. various gasoline grades, jet fuel, heating fuels, diesels, etc.) pipelines delivering from refineries outside the state also serve Illinois. These include pipelines owned by BP, Sunoco, ExxonMobil, Shell, Marathon, Buckeye Pipelines, TEPPCO, and ConocoPhillips. The pipelines include the Explorer Pipeline, Centennial Pipeline, Magellan Pipeline, Buckeye Pipeline, Wolverine Pipeline, and West Shore Pipeline.

Illinois has some indigenous crude oil production, although relatively small compared to its consumption. The state has proven reserves of 66 million bpd.[17]

Q. Describe the broader region of the U.S. that surrounds Chicago and Illinois?

A. The surrounding area is called PADD[18] II for petroleum products. It is composed of the following 15 states, including Illinois: Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, and Wisconsin.[19]

SECTION 4: PUBLIC UTILITY ACT, SECTION 15-401

[16] www.bp.com/liveassets/bp.../bp.../abp_refineries_what_we_produce.pdf
[17] Illinois Energy Fact Sheet, U.S. Energy Information Administration; www.eia/gov/state/state-energy-profiles. Last updated February 12, 2012.
[18] PADD is an acronym for Petroleum Administration for Defense Districts and were established during World War II to facilitate allocating oil. http://205.254.135.7/pub/oil_gas/petroleum/analysis_publications/oil_market_basics/paddmap.htm
[19] See EIA Data, http://205.254.135.7/oog/info/twip/padddef.html

Q. Is Enbridge seeking authorization to use the power of eminent domain to secure ROWs?

A. Yes. Enbridge seeks a right-of-way (ROW) easement for some portion of the 600-mile pipeline called Flanagan South. This Flanagan South Pipeline route would span from the Flanagan Terminal in Pontiac, Illinois to Cushing, Oklahoma. Much of the ROW is either adjacent to or collocated with the existing ROW of the Spearhead Pipeline.

In addition, Enbridge will also build pumping facilities for the new line within or adjacent to existing pump stations for the Spearhead line, in some cases acquiring adjoining property for 7 new pumping stations. Putting aside the relatively small amount of land required for the additional property needed for the pumping stations, and the temporary work-place easements, the remaining permanent easements do not require current or future landowners to sell their property outright or give up most current uses of their property as most of the route spans through agricultural or rural regions.

Q. Has the ICC previously awarded eminent domain rights in other pipeline proceedings before the ICC?

A. Yes. The ICC approved a request by TransCanada for the Keystone Pipeline and the St. Louis Pipeline Corporation for authorization to use eminent domain in conjunction with authorizing the pipeline to construct and operate a petroleum pipeline.[20] The ICC also granted Enbridge eminent domain authority in the

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[20] See *St Louis Pipeline Corporation Petition Pursuant to Section 8-503, 8-509, 15-101 and 15-401 of the Public Utilities Act for a Certificate Authorizing Operation as a Common Carrier by Pipeline;* 006 ILL. PUC LEXIS 14 (May 17, 2006).

Southern Access Expansion Project.

Q. What section of the Public Utilities Act authorizes eminent domain for pipelines?

A. Section 8-509 of the Public Utilities Act provides in relevant part that: "When necessary for the construction of any alterations, additions, extensions or improvements ordered or authorized under Section 8-503 or 12-218 of this Act, any public utility may enter upon, take or damage private property in the manner provided for by the law of eminent domain."

Q. Please describe the Public Utility Act, Section 15-401 requirements.

A. Public Utilities Act, Section 15-401 requires the Illinois Commerce Commission to grant an application for a certificate authorizing operations a common carrier by pipeline if the applicant can show a public need for the service.

Q. What does an applicant need to prove to the ICC in order to get the right to use eminent domain to secure needed ROWs?

A. Under Section 15-401, the ICC is required to grant an application for a certificate authorizing operations as a common carrier by pipeline if it finds that "a public need for the service exists; the applicant is fit, willing, and able to provide the service in compliance with this Act, Commission regulations, and orders; and the public convenience and necessity requires issuance of the certificate."[21]

Q. What evidence does the ICC consider when making its determination?

A. For my testimony, the most important is "any evidence …as to how the proposed

[21] Section 15-401(b).

pipeline or facility will affect the security, stability, and reliability of energy in the State or in the region."[22]

Q. Is this the same criteria the ICC used when it awarded Enbridge the right of eminent domain in the Southern Access Expansion case?

A. Not exactly. The statute has been amended to allow an applicant to show benefits to the region, not just the State of Illinois. This amendment recognizes that a parochial view considering Illinois only was not necessarily a broad enough perspective. Consequently, the legislature amended the statute allowing the ICC to consider a broader perspective than just Illinois. In my testimony, I have shown the benefits that Illinois and the entire midwestern region (encompassed by the states that make up PADD II) will enjoy if the Flanagan South Pipeline is built.

Q. What exactly is an easement of the type that Enbridge is seeking?

A. An easement or right-of-way involves a partial taking of rights and in most cases involves only a portion of the total property. The easement holder does not acquire fee simple title in the underlying property, or in legal parlance the estate. In valuing the easement, the measure of value is "always the loss in the value of the burdened property, not the value of the easement to the taker."[23] It is the highest and best use to the property owner that determines the value, not the benefits that the condemnor might receive. Thus, the property is appraised in its before acquisition situation and the portion of the property subject to the easement

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[22] Section 15-401(b)(9).
[23] Allen, Albert N., "The Appraisal of Easements", www.associated legal.com/AllenArticleTest.html (December 2001) reprinted from *right of way* Magazine.

will be valued in the same per unit value as the entire property before imposing the easement. Utility easements can sometimes have an established going rate per mile.[24] An alternate manner to calculate the value of the easement is to value the property in its before condition, and then value it at its highest and best use in the after easement condition. The difference between the two is the value of the easement.[25]

However, each easement is unique and may burden the underlying property in different ways. For example, a one-mile easement on one property may be located next to a highway while a one-mile easement on the adjacent property might cut diagonally across the property. The first would not affect the owner's ability to construct a building on the burdened site, while the latter might effectively put restrictions on some construction. Thus, each easement can have a different effect on the burdened property's value, and in the latter case, the easement might be valued in excess of the "going rate per foot."[26]

A "rule of thumb" for underground utility easements for a single utility line or pipeline is 50 percent of the "before" unit land value (e.g. value per square foot of land). This is typical where erecting a building is prohibited, but farming, roads, and parking are permitted.[27] In the present case, I am informed that Enbridge is offering 100 percent of the before unit land value for the easements it seeks, although in many cases the existing easement for the Spearhead Pipeline would allow a second pipeline at much less payment. This is equivalent to the

[24] Ibid. at p 6.
[25] University of California Easement Practice Guidelines, p 7.
[26] Ibid p 4.
[27] Ibid p 8.

full "fee simple" value of the property subject to the easement. Since the pipeline would be underground and the landowner (the easement grantor) retains significant use rights (especially as in this case the majority of the land is agriculture), Enbridge's offer to pay "100 percent" of the land's value is generous.

Accordingly, on a very basic level, Enbridge would pay 100 percent of "fee simple" value for an easement to place an underground pipeline three or more feet below the surface. This is by reasonable accounts about twice the expected reference price.

Q. As an economist, what specific easement restrictions would be placed on the owners' use of their property under Enbridge's proposed easement?

A. Because the majority of this land is agricultural or rural, the owners would have very few restrictions. First, there are no adverse major aesthetic results when an underground pipeline is put in place and operates. This pipeline is not intrusive, like a new road, or even an above-ground power line or pipeline. An underground crude oil pipeline is also the safest mode of petroleum transportation. There is a comprehensive set of federal regulations and national consensus codes on design, construction, maintenance, and inspection of pipelines to enhance safety.[28] Using the economists' externality concept, the proposed underground pipeline would not have any significant negative externalities.

Additionally, unlike fee simple property sales, the owners can still use the land within the ROW and above the underground pipeline, with appropriate restrictions on structures and trees that would affect continued pipeline safety or

[28] See Application, Page 26.

access. Enbridge is seeking the right to clear away trees, undergrowth, and other potential obstructions that could adversely affect the pipeline. However, the landowners would retain the right to engage in all activities that do not threaten the safety, integrity, and operation of the pipeline.[29] For example, the landowners may not, without first consulting with Enbridge and agreeing on the details: (1) excavate within the ROW; (2) erect permanent structures with foundations on the ROW that cannot be readily removed to permit access to the pipeline, and (3) materially alter the grade of the ROW, all of which are related to maintaining the pipeline's safe operation.[30]

Q. What are the economic implications of these various easement conditions?

A. I suspect that virtually all economists recognize the difference between selling all the rights to property (real estate law calls this a fee simple exchange) and the transfer of some limited set of rights to another entity to use property that the grantor of these rights continues to own.

This important distinction has often been ignored. However, Enbridge (except for the minor amount of land required for the greenfield pumping stations) is not proposing an offer or seeking eminent domain authority that would require any landowner to sell any of their land to Enbridge. The primary economic questions become: public use benefits and just compensation in the form of the "price" paid for this specific partial taking of rights to place a pipeline

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[29] Fourth Covenant of Right-of-Way and Easement Grant (attached as Enbridge Ex. J to the Application filed May 15, 2012).

[30] Fourth Covenant of Right-of-Way and Easement Grant (See Enbridge Ex. J, page 2 to the Application filed May 15, 2012).

underground and to retain permanent access rights to insure safety, integrity, and proper pipeline operations.

Q. Is Enbridge seeking rate base treatment for the Expansion Projects?

A. No it is simply seeking a Certificate of Good Standing. The rates and terms of service for interstate liquid petroleum pipelines are established by the FERC.

Q. How is such certification different from rate base of cost-of-service treatment?

A. Service certification for an oil pipeline is different from rate base/cost of service regulation for several reasons. First, there is no presumption of prudent-investment cost recovery if the Commission simply grants a certificate as opposed to granting cost-of-service recovery. Second, by simply granting a certificate, there are no captive customers or ratepayers. And finally, by granting only the certificate, Enbridge must pay fair market value to secure the necessary rights of way.

Q. Are there other regulatory perspectives associated with this Application?

A. The Flanagan South Pipeline is important for the State of Illinois and its citizens. It is important that the Commission be cognizant of land owners that might seek to inappropriately delay or derail the Expansion Project in order to recover economic rent. I am not implying that land owners and farmers should not receive full payment for the use of their land, but they should not be permitted to receive excessive payments by threatening to deny use of their land unless they receive payments that exceed the fair market value of the use of their land. As well, the values of efficient routing and minimization of environmental impacts and protection of agricultural production must be mitigated, as described in the Application and testimony of Enbridge management.

Q. If condemnation authority were granted, would the land owners or farmers suffer a complete loss of their land?

A. No. As I discussed above, my understanding is that the rights-of-ways would involve only a minimum taking of the land; no buildings or residences are likely to be affected and the landowners can continue to use the easements for agricultural, open spaces, and other purposes. As such, the appropriate standard for payment is the "avoided cost." Thus, landowners are entitled to receive the fair-market value for the use easement for underground pipeline.

Q. Why isn't the value that "at-risk" investors receive relevant to the appropriate compensation to pay to land-owners or farmers whose land is used for the Expansion Projects?

A. "At risk" investors have no guarantees. There is absolutely no guarantee that these investors will receive any particular return. As I discussed above, this is a crucial difference between the request for a certificate and a request to place the expansion into cost-of-service rate base, where the opportunity to earn a reasonable return on investment is theoretically assured to investors. My point is that there are extraordinary social benefits to be reaped for the State of Illinois and its citizens from approving the Flanagan South Pipeline. Further, investors are at risk for the recovery of the cost of the expansion. Regulation should not provide leverage to those that would seek to block social benefits and to reap extraordinary rents.

Q. Is not Enbridge also seeking the right to use the power of eminent domain?

A. Yes. In the interests of economy and efficiency in the Commission proceedings, Enbridge filed an Application for a Certificate in Good Standing whereby it seeks the right to invoke the power of eminent domain if necessary. However, Enbridge also stated that its preferred method of acquiring the easement interests necessary for the Flanagan South Pipeline is through negotiated agreements with property owners.

Q. Do you have an opinion as to whether granting the certification that Enbridge seeks should include the requested authorization to use the power of eminent domain if necessary?

A. Yes. As I have stated, this pipeline is extremely important to Illinois, the Midwest, and consumers located in those areas. In addition to providing access to a secure source of petroleum for many years to come, the Flanagan South Pipeline will likely provide Illinois consumers with substantial savings in the event of any crisis that occurs in the future, especially if the tight spare capacity that exists today continues, as is likely, in the future. Thus, I conclude that it is appropriate for this Commission to authorize Enbridge to use the power of eminent domain if necessary to secure the route for Enbridge to build and operate the Flanagan South Pipeline.

SECTION 5: QUANTIFYING BENEFITS

Q. How do you quantify the benefits for Illinois and the region if the Flanagan South Pipeline is granted a Certificate of Good Standing?

A. I have described the various categories of benefits for Illinois, the region, and North America in some detail above. Here, I explain how I quantify the expected present value of benefits based on the additional production of liquid petroleum. I concentrate, as I did in my evidence in the prior Enbridge proceedings (Docket Nos. 06-0479 and 07-0446) on the expected value of the direct benefits related to increased spare capacity in global markets. I also discuss related benefits and costs below.

I start with forecasts of world demand, supply, and prices with and without the 585,000 barrels of incremental additional spare capacity and production that the Flanagan South's pipeline would make available as a major transportation option. I also recognize that other pipeline expansions might emerge as competitive alternatives to carry this additional production to world markets.

These competitive alternatives do not affect the estimated benefits because, regardless of which lines are built, the benefits come from the additional Canadian production. The at least temporary denial of the Keystone pipeline leg across western Canada, Montana, and Nebraska to Oklahoma is a case in point. The benefits start with the additional production in Alberta. How the oil ultimately gets to market does not matter in terms of quantifying the benefits of the additional spare capacity added to reduce future petroleum price volatility. This means that societal benefits are based on private investments that would move Alberta oil to the U.S. and who bears private competitive risk does not affect the estimated societal benefits based on the additional oil production. Therefore, any risks related to which line is built or succeeds in capturing throughput are strictly private investor risks. These do not affect the societal benefits. In fact, multiple competitive options might increase societal benefits if shippers have choices.

Q. What steps do you take in quantifying societal benefits?

A. I approach the quantification of benefits in four steps, just as I did previously. These are:

Step 1: Use a regression analysis to test the hypothesis that more crude oil supply would reduce the risk and consequences of future events that would cause a loss of petroleum production.

Step 2: Analyze the Illinois petroleum market to determine the future need for crude oil and petroleum products in Illinois.

Step 3: Use the Regression Analyses to quantify the effect on relative future price jumps during crises "with and "without" the Expansion Projects.

Step 4: Estimate the present value of benefits for Illinois using the differences in future prices and the amount of future petroleum sales.

A. Step 1: Regression Analysis Shows That More Supply Would Likely Reduce the Risk and Consequence of Future Events That Would Cause a Loss of Petroleum Production

Q. Have you updated the data, regressions, and assumptions you used previously in the prior Enbridge Dockets?

A. Yes.

Q. What data and methods did you use in the regression analyses of crude

prices?

A. I used monthly price data, which is available for West Texas Intermediate (WTI) crude since the mid-1980s. I begin the analysis in January 1986 to reflect the prevailing market structure in which crude oil is primarily traded as a commodity in world markets.

In this analysis, I test various hypotheses related to prevailing trends and interruptions in supply related to price jumps.

In this analysis, I tested for two specific hypotheses. These are that the Mean Reversion for oil markets is like a stair-step function that tends to trend up regardless of the existence of a crisis. Second, I also test for the existence of "jumps" about the petroleum markets' Mean Reversion trend function. These hypotheses follow the work of others conceptually and empirically.[31]

Q. How do you include supply-disrupting events in your regression analyses?

A. The data show past events, most of which lasted less than a year. In the monthly regression analysis, I can more precisely identify when an event begins and ends, as well as the prevailing primarily Lost Production from a supply disruption, and Spare Capacity conditions. Increasingly, petroleum analysts recognize that demand growth, particularly in China, affects world oil markets. Therefore, I add Chinese demand as a confounding factor in my regression analysis. The EIA forecasts also consider different Chinese growth scenarios.[32]

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[31] See Dixit, A.K. and R.S. Pindyck, Investments Under Uncertainty, Princeton University Press, 1994, Princeton, New Jersey; and "Monte Carlo Simulation of Stochastic Processes", June 10, 2004; http//www.puc-rio.br/marco.ind/sim_stoc_proc.html. Especially see "Mean Reversion With Jump Models", section 4, as applied to crude oil markets

[32] See EIA International Energy Outlook 2011, page 29.

Chart 2 shows, on a monthly basis, the dramatic swings and increased volatility in crude oil prices from 1986 through 2011 in both nominal and 2010 dollars. Many of the sharp price-increasing events shown in Chart 2 coincided with Lost Production and Insufficient Spare Capacity.

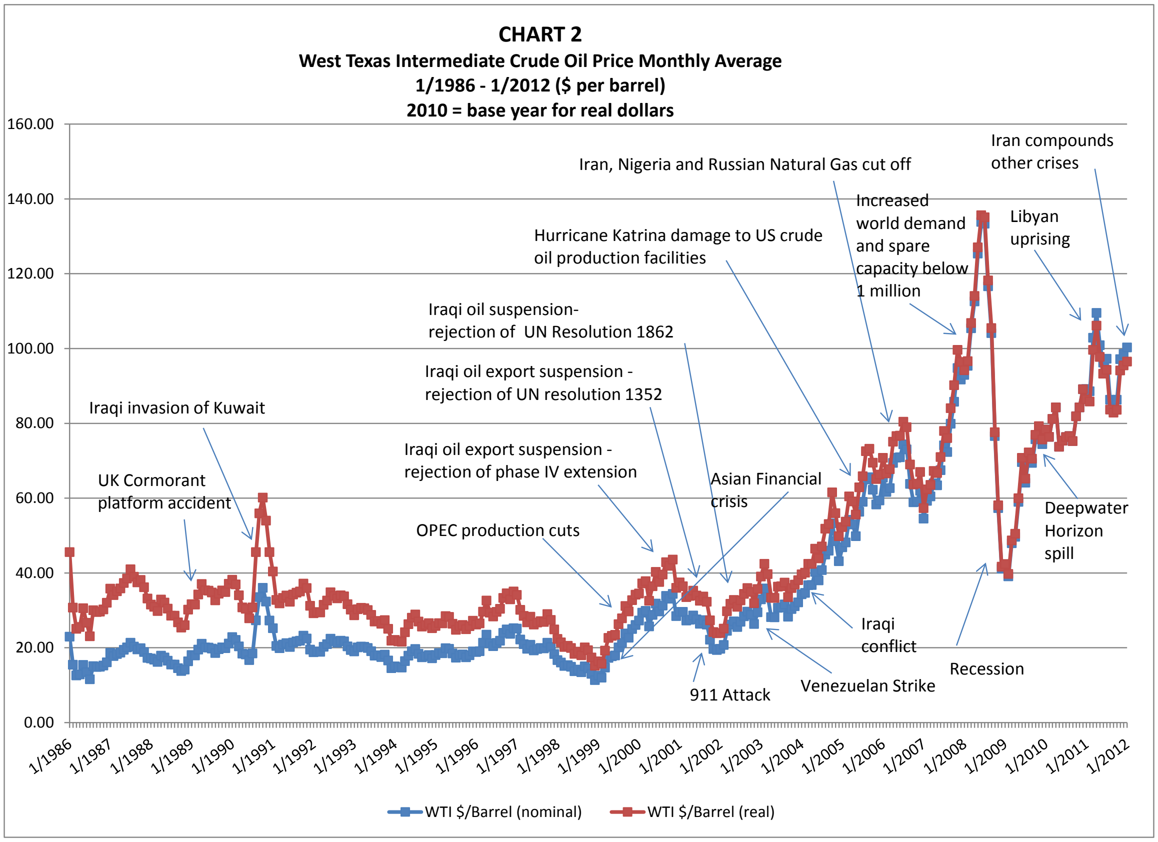

Chart 2 also shows the effect of tightening world oil supplies effectively coinciding with the economic recovery post "9/11", or about mid-year 2002. Since then, relatively small and short-lived events that reduced supply have pushed crude oil prices to higher levels. The dramatic effects of the recession that began in 2008 are also evident in the slackening demand and corresponding drop in crude oil prices. The rises in prices following the Deepwater Horizon event, the Libyan revolution, and continuing instability in the Middle East, particularly Iran, are shown in Chart 2. Since 2000, Chinese demand has increased more than

7 percent per year, starting from a very small base and now exceeding ten percent of worldwide consumption.

Q. Can you say anything about relative volatility in these monthly petroleum prices?

A. Yes. Table 7 shows the standard deviation, mean values, and coefficients of variation (100*standard deviation/mean) by decade in both nominal and real dollars. This demonstrates that as world oil prices have increased over time, so has the variability in world crude prices as measured both in terms of standard deviation and relative variability using the coefficient of variation.

TABLE 7 *

Standard Deviation

	WTI Monthly Spot Prices Nominal	WTI Monthly Spot Prices Real Using Monthly CPI
1986-1989	2.621294	2.078743
1990-1999	3.893975	3.254834
2000-2010	14.996402	7.177784

Mean

	WTI Monthly Spot Prices Nominal	WTI Monthly Spot Prices Real Using Monthly CPI
1986-1989	17.457292	14.988515
1990-1999	19.704167	13.292378
2000-2010	38.568500	20.396364

Coefficient of Variation (StdDev/Mean)*100

	WTI Monthly Spot Prices Nominal	WTI Monthly Spot Prices Real Using Monthly CPI
1986-1989	15.015467	13.868903
1990-1999	19.762191	24.486470
2000-2010	38.882512	35.191487

* EIA data is not available for earlier years on a monthly or daily spot basis. Annual variation was its greatest in the 1970s as a result of that decade's two enormous oil shocks in 1973-74 and 1979-80.

Q. How did you test the specific hypotheses using multiple variable regression analyses to determine what factors affected world crude prices?

A. As stated, I updated the regression analysis I first used in 2006. I use the consistently reported EIA monthly price data for WTI spot prices shown in Chart 2 above. I analyzed and tested various functional forms using monthly price data, crises prevalence, Lost Production, world supply of crude, lagged historic price trends (or stair-step movement), spare capacity, nominal/real versions, and more. After detailed investigation and analyses, I find the two regressions shown in

Table 8 are the best combination of statistical significance, functional form based upon the Mean Reversion Trend with Jumps theory, and for use in simulating "with" and "without" scenarios to quantify the expected benefits for Illinois if the Expansion Projects are built.

TABLE 8
Monthly Regression of WTI Prices Using Mean Reversion Trend with Jumps[1]

Dependent Variable	L_N (WTI)(Monthly)	
	With Trend	**With China**
Independent Variables		
Constant	-54.31724	+2.16328
	(11.37)	(83.37)
Trend	+.02847	n/a
	(11.83)	n/a
China	n/a	+0.00013186
	n/a	(13.31)
Five-Year Moving Average Annual Price	+.01807	+.001169
	(19.05)	(9.30)
Inverse of the Percent of Spare Capacity Relative to World Use	+.66089	+.58636
	(10.78)	(9.66)
Lost Volume During a Crisis Relative to Volume of Spare Capacity	+.12684	+.12435
	(6.65)	(6.78)
R^2	0.90	0.91
Mean nof Dependent Variable	$3.40	$3.40

[1] T-statistics are shown in parenthesis

This regression explains about 90 percent of the monthly variation in world crude prices measured using West Texas Intermediate (WTI) as the world reference crude, which is a common practice. I structured this equation taking the natural logarithm of monthly WTI prices to comport with the Mean Reversion approach. I obtained WTI monthly spot prices at Cushing, Oklahoma from the EIA.[33] Each variable is highly statistically different from zero, which means I cannot reject any of the hypotheses that I have explained previously. The nominal

[33] http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=M.

threshold test of statistical significance is a t-statistic of 1.96, which implies an "acceptance" of a hypothesis at a 95 percent level. The Equation shown in Table 8 has statistical tests of hypotheses that are well in excess of 95 percent.

The first three variables are relative individually and in conjunction with each other. The first variable, "Constant", is the equation's "intercept." It is negative because the second variable, "Trend", measures how world oil prices have tended to track up in percentage change terms over time. Trend varies linearly from month to month. For example, January 1986 is quantified as 1986.0; February 1985 is quantifies as 1986.0833; and each month thereafter adds .0833 to the previous month's value, making January 1987 equal to 1987.0, and so on up to the end of the data in February 2012, where trend would equal 2012.0833. The arithmetic size of trend as defined here is the only reason why the "Constant" term in the regression is negative.

The third variable is the Five-Year Moving Average of Annual WTI prices. This variable measures the broad shifts in crude markets over time. In effect, it represents "stair steps." Along with Trend, this variable represents the historic trend to which monthly WTI crude prices would be expected to track and to revert if there are "jumps" or other price shifts due to shortages of surpluses.

The fourth variable measures the effect that declining amounts of the volume of spare production capacity relative to the then current world supply has had on the trends, or reversion stair steps, in monthly crude oil price movements over time. I obtained monthly spare production capacity for the period January 1994 through February 2012 from the EIA's Short Term Energy Outlook that I compiled using EIA's custom table builder.[34] For the period January 1986 through December 1993, I calculated monthly spare capacity by multiplying the percent of annual spare capacity[35] times the EIA's Total World Supply, which I sourced from the EIA's International Petroleum Statistics [36] This variable is expressed as the inverse in the relative percent of available capacity. This means declines in the percent of spare capacity would, other things equal, be expected to increase the trend line, or stair step function, to which crude prices would revert when spare capacity is growing short, and *vice versa* if spare capacity grows relative to world production.

The fifth variable is zero if there is no crisis affecting world petroleum markets. When there were crises in the past, this variable is set equal to the ratio of "Lost Production relative to the Volume of Spare Capacity Available" at that time. Again, I updated the previous data I had collected on crises[37] with updated information detailing the crises that have occurred since the end of 2005. This variable tests the hypothesis that "jumps" matter. With a t-statistic of 10.78, it is an extremely statistically significant result. It "confirms" the notion that crises affecting world oil supplies would cause prices to jump relative to their current trends. It also confirms the hypothesis that after the crisis is either ended or additional supply and demand forces come into the market; crude prices would revert to their contemporaneous trend levels.

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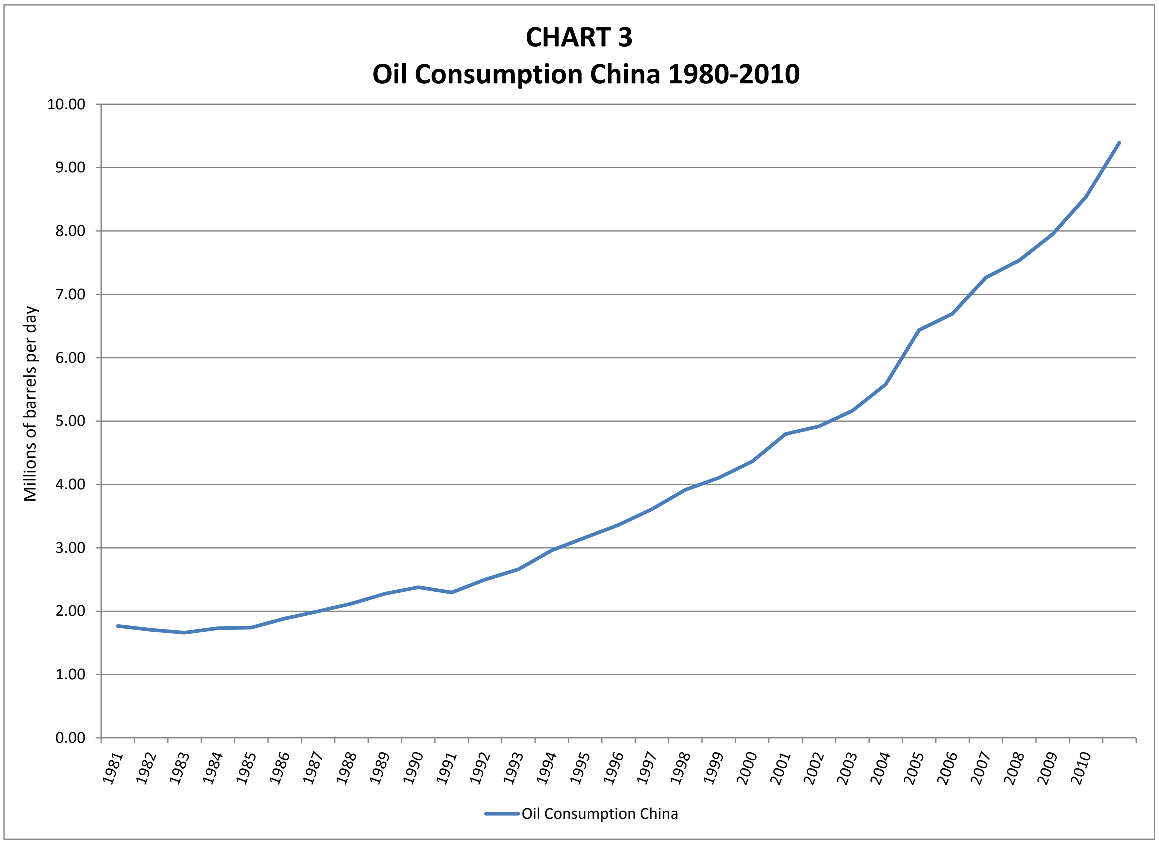
[34] http://www.eia.gov/forecasts/steo/query/
[35] Source: "Nervous Energy", The Economist, Table 2, January 5, 2006.
[36] Source: http//205.254.135.7/cfapps/ipdbproject/IEDIndex3.cfm.
[37] See Muse Stancil, Economic Study for Public Need, Convenience, and Necessity, Global Oil Supply and Demand Perspective, Table 1, page, for crisis between January 1986 and December 2005. See also Table 14 *infra* at page 68.

Q. How did you add China to the regression equation?

A. I replaced the trend variable I used previously with a variable that equal Chinese consumption of Crude Oil. Chart 3 shows the growth pattern for Chinese consumption from 1980 to 2010.



The Chinese consumption variable shows that as China consumer more, world oil prices increase. This is a very statistically significant result. The other variables all remain statistically significant.

B. Step 2: Future Price Jumps Hurt Consumers

Q. How did you assess future societal benefits using the regression analysis?

A. It is likely that the consuming public would use and spend more money on petroleum products such as gasoline, distillate (fuel oil), and jet fuel in the next twenty-five years than it spends today. However, as we incorporate higher petroleum prices, associated national security risks, and other factors into our personal, business, and agricultural decisions, we can expect people in Illinois and elsewhere will become smarter and more efficient.

In the subsequent "benefits assessment," I make a relatively conservative assumption; to wit: the amount consumers would spend on petroleum products would grow nominally each year, but remain constant in real terms relative to current spending levels.

This risk assessment is predicated on a core assumption that failing to add pipeline expansions to bring additional Alberta petroleum to PADD II markets would diminish the amount of spare capacity otherwise available to mitigate a future crude oil crisis. This risk assessment analysis is based on an expansion of 585,000 bpd. In the "with" case, this additional capacity would be added to Spare Capacity and world production, and for the "without" case, this additional 585,000 bpd of supply would not be available. If there are future crises that cause Lost Production and Spare Capacity is also short, the expected price jumps would be greater "without" the additional 585,000 bpd in new crude supplies than "with" them.

Q. How did you determine the differences in the relative size of future crude oil price jumps?

A. First, I need to assess the future trend in crude prices.

Q. How did you determine future values for variables that would affect the "reference trend" function for future crude oil prices?

A. I selected the EIA reference case, which was published in 2011.[38] I use this reference case to determine two important "reference trend" variables. These are shown in Table 9 in columns (B) and (C) for "world production" and the "rolling five-year average annual prices," respectively. These forecasts include a moderate trend in the growth of China's consumption. If China's demand increased more rapidly this would increase future crude prices and most importantly shave the spare or effective crude capacity that would be available to offset any future oil market supply shocks.

[38] Energy Information Administration, Department of Energy, "International Energy Outlook 2011 (With Projections to 2035. (2012).

TABLE 9
Projections of Relevant "Trend" Variables

A	B	C
Year	**Reference Case World Production 000s bpd**	**World Oil Prices per EIA IEO 2011 (2009 Dollars)**
2012	$ 89,900	$ 85
2013	$ 91,100	$ 88
2014	$ 92,200	$ 91
2015	$ 93,300	$ 95
2016	$ 94,500	$ 98
2017	$ 95,500	$ 100
2018	$ 96,400	$ 103
2019	$ 97,100	$ 106
2020	$ 97,600	$ 108
2021	$ 98,200	$ 110
2022	$ 99,100	$ 112
2023	$ 100,300	$ 114
2024	$ 101,700	$ 116
2025	$ 103,200	$ 118
2026	$ 104,600	$ 119
2027	$ 105,700	$ 120
2028	$ 106,700	$ 121
2029	$ 107,400	$ 122
2030	$ 108,000	$ 123
2031	$ 108,600	$ 124
2032	$ 109,400	$ 124
2033	$ 110,200	$ 125
2034	$ 111,200	$ 125
2035	$ 112,200	$ 125

Q. How did you estimate the probability of different losses of production during any future crises, as well as the potential availability of spare capacity?

A. Basically, no one knows with any certainty either how much oil could be lost during any future supply disruptions or crises. It is also not easy to determine how much spare capacity might be available in the future to help offset or mitigate the possible future "price jumps" if and when a future crisis occurs.

My approach is to perform a Monte Carlo scenario analysis that simulates 8,000 annual future Lost Production and Spare Capacity conditions for each of the next twenty-five years. This means I consider 200,000 (25 x 8,000) different potential future pairs of Lost Production and Spare Capacity "with" and "without" the proposed Flanagan South Projects.

I start with the values shown in Table 10.

TABLE 10
Scenarios

	Low	Medium	High	Weighted Average
I. Lost Production During Crises	200,000 bpd	500,000 bpd	800,000 bpd	410,000 bpd
Assumed Relative Probability	50%	30%	20%	n/a
II. Future Levels of Spare Capacity	1,000,000 bpd	2,000,000 bpd	4,000,000 bpd	2,150,000 bpd
Assumed Relative Probability	35%	40%	25%	n/a

These establish ranges of potential values and what I consider to be reasonable estimates of probability for both Lost Production and Spare Capacity. I next convert these values to logarithmic form because this will assure that the values in the Monte Carlo simulation will not be negative. In addition, the historic data appears to have a Log-Normal underlying distribution, or shape.

I estimate the means and standard deviation in logarithmic form using the values shown in Table 10. These are: (1) Lost Production has a mean of 5.85 and a standard deviation of .57 in logarithmic forms; and (2) Spare Capacity has a mean of 7.53 and a standard deviation of .42.

In each year, I used 8,000 random numbers ranging from a very low negative value to a very high positive value, with a mean of zero, to simulate 8,000 annual values for Lost Production. I do this by multiplying the specific random number generated times the standard deviation of Lost Production, which I then add to the mean value. I then take the exponential of this logarithmic calculation and estimate the corresponding value of Lost Production for each of the 8,000 specific simulations in a given year. Accordingly, I did this 8,000 times over 24 years and the mean value of all these 192,000 simulations for Lost Production is 408,271 bpd. This is about equal to the Expected Value of Lost Production of 410,000 bpd shown in Table 10.

I repeated this process independently, meaning the simulations of Lost Production and Spare Capacity are not connected to each other, to simulate a corresponding 192,000 possible future Values for Spare Capacity over the next 25 years. The average Value for Spare Capacity in this Monte Carlo simulation was 2,034,760 bpd, with a low of 318,540 bpd and a high of 12,220,060 bpd.

C. Step 3: Determination of Price Jumps "With" and "Without" the Flanagan South Pipeline

Q. How did you determine the relative size of future price jumps "with" and "without" the Flanagan South Pipeline?

A. The regression analysis contains two variables that depend upon an estimate of future Lost Production and the corresponding value of spare capacity. These variables affect estimated crude prices, as well as the relative size of a jump in price if and when there is an event causing a loss in petroleum production relative to Spare Capacity.

Therefore, I start with the 8,000 random simulation pairings of Lost Production and Spare Capacity for each of the next 25 years. Next, I add 585,000 bpd to Spare Capacity for the "With" case and nothing for the "Without" case. This is conservative because the Bakken, Three Forks, and Alberta fields are likely to continue to expand production and the existing Enbridge Mainline and Lakehead Systems can further expand to deliver more crude.[39]

I use the 8,000 annual "With" and "Without" pairings to estimate the price of crude oil using the regression equation shown in Table 8. I subtract the "Without" predicted prices from the "With" to estimate the annual average price difference for the 8,000 scenarios each year. These are shown in Table 11 in both nominal dollars and real dollars each year. I use a 2.9 percent annual rate of inflation to convert prices in 2012 and beyond because the EIA crude oil price projections are in 2009 dollars.

[39] See Stephen J. Wuori News Release; "Enbridge Announces Next Bakken Pipeline Expansion Program." August 24, 2010. www.enbridgeincomefund.com/investor/pdf/2010-08-24-news-release.pdf.

TABLE 11
Estimated Annual Crude Price Effects
Monte Carlo

Year	Estimated Jump Price Differences (Nominal)		In 2009 Dollars <1> Estimated Jump Price Differences (Real) <2>	
2012	$	14.49	$	13.30
2013		16.35		14.59
2014		17.77		15.41
2015		19.57		16.48
2016		21.95		17.97
2017		24.45		19.45
2018		26.77		20.70
2019		28.96		21.76
2020		31.09		22.70
2021		33.69		23.91
2022		35.97		24.81
2023		38.99		26.13
2024		43.07		28.05
2025		45.73		28.95
2026		49.76		30.61
2027		51.32		30.68
2028		56.18		32.64
2029		59.21		33.43
2030		63.32		34.74
2031		66.13		35.26
2032		67.85		35.16
2033		73.29		36.91
2034		74.78		36.59
2035	$	78.70	$	37.42

<1> Price projection data provided by EIA is expressed in 2009 dollars.
<2> Assuming 2.9% inflation rate.

Q7. What did you do next?

A. I converted the absolute expected value of the annual real jump price differences to percentage terms using the EIA reference case WTI crude price. Both series of price estimates were measured in constant or real 2009 dollars. This percentage price estimate is shown in Table 12.

TABLE 12
Expected Price Percent Price Jumps for Crude Oil "With" and "Without" Expansion Projects

A	B	C	D
Year	**EIA Reference Case Price of WTI**	**Expected Value of Price Jump Differences**	**Percent Price Jumps**
	2009 Dollars	**2009 Dollars**	**C / B**
2012	$ 84.50	$ 13.30	15.7%
2013	88.00	14.59	16.6%
2014	91.34	15.41	16.9%
2015	94.53	16.48	17.4%
2016	97.55	17.97	18.4%
2017	100.41	19.45	19.4%
2018	103.12	20.70	20.1%
2019	105.66	21.76	20.6%
2020	108.05	22.70	21.0%
2021	110.28	23.91	21.7%
2022	112.35	24.81	22.1%
2023	114.26	26.13	22.9%
2024	116.01	28.05	24.2%
2025	117.60	28.95	24.6%
2026	119.03	30.61	25.7%
2027	120.30	30.68	25.5%
2028	121.42	32.64	26.9%
2029	122.37	33.43	27.3%
2030	123.17	34.74	28.2%
2031	123.81	35.26	28.5%
2032	124.28	35.16	28.3%
2033	124.60	36.91	29.6%
2034	124.76	36.59	29.3%
2035	$ 125.00	$ 37.42	29.9%

Q. What did you do next?

A. I estimated a single regression in 2006 for each petroleum product using EIA forecasted reference prices to determine the relationship between percent changes in real crude prices and corresponding percent changes in real product prices. These results are shown in Table 13.[40]

Table 13
Coefficients for Percent Change in Forecasted Dollars Per Gallon For a Corresponding Percent Change in Crude Oil Prices[1]

Gasoline	Distillate	Jet Fuel
0.5301	0.5542	0.8868
(11.87)	(13.95)	(11.84)
R^2 = .86	R^2 = .89	R^2 = .86

[1] T-statistics shown in parenthesis

D. Step 4: Estimating the Present Value of Benefits for Illinois

Q. How frequently do world crises occur that increase crude oil prices?

A. Consider Table 14. This table compares "lost production" and "spare capacity." Prices can increase if lost production increases and/or spare capacity declines. In Table 14, I determined the percent of a year in which lost production exceeds spare capacity. Since 1986, this happened about 15.12% of the time. This increased from 8.74% shown in my 2006 analysis used in my testimony in the Expansion Docket No 06-0470.

[40] These statistical relationships assume the normal historical crude price differentials between WTI and Brent would occur after the removal of the current Cushing, Oklahoma bottleneck discussed at pages 15-26.

TABLE 14

Crisis Year	Months[1]	Lost Production 1,000 bpd[1]	Spare Capacity 1,000 bpd[2]	Worldwide Production 1,000 bpd[3]	Percent of Year With Lost Production	Percent of Year Where Lost Production Exceeded Spare Capacity
1986	n/a	0	9,203	61,354	0.0	0.0
1987	n/a	0	9,922	62,014	0.0	0.0
1988	n/a	0	10,293	64,333	0.0	0.0
1989	Apr-Jun	500	4,581	65,449	25.0	0.0
1990	Aug-Dec	4,300	1,327	66,340	41.7	41.7
1991	Jan	4,300	1,989	66,307	8.3	8.3
1992	n/a	0	2,655	66,375	0.0	0.0
1993	n/a	0	3,003	66,734	0.0	0.0
1994	n/a	0	3,050	68,634	0.0	0.0
1995	n/a	0	3,010	70,216	0.0	0.0
1996	n/a	0	2,810	71,985	0.0	0.0
1997	n/a	0	3,050	74,219	0.0	0.0
1998	n/a	0	3,300	75,690	0.0	0.0
1999	Apr-Dec	3,300	4,980	74,843	75.0	0.0
1999	Nov-Dec	1,100	4,980	74,843	75.0	0.0
2000	Jan-Mar	3,300	3,050	77,706	33.3	25.0
2000	Dec	1,600	3,050	77,706	33.3	25.0
2001	Jun-Jul	2,100	4,070	77,641	16.7	0.0
2002	Apr-May	1,800	5,540	77,040	25.0	0.0
2002	Dec	2,600	5,540	77,040	25.0	0.0
2003	Jan-Mar	2,600	1,920	79,493	100.0	100.0
2003	Mar-Dec	2,300	1,920	79,493	100.0	100.0
2004	n/a	0	1,270	82,980	0.0	0.0
2005	Aug-Dec	1,500	1,000	84,453	41.7	41.7
2006	Jan-Dec	2,000	1,420	84,511	100.0	100.0
2007	Oct-Nov	2,500	2,070	84,362	25.0	16.7
2007	Dec	2,000	2,070	84,362	25.0	16.7
2008	Jan-Sept	2,000	1,370	85,339	100.0	75.0
2008	Oct-Dec	500	1,370	85,339	100.0	75.0
2009	n/a	0.00	3,930	84,242	0.0	0.0
2010	Jan-Mar	1,300	3,510	86,643	100.0	0.0
2010	Apr-Dec	1,325	3,510	86,643	100.0	0.0
2011	Jan	1,325	3,000	86,954	100.0	0.0
2011	Feb-Dec	2,900	3,000	86,954	100.0	0.0
2012	Jan-Feb	1,300	3,290		100.0	0.0
			Average		33.02%	15.12%

[1] Source: Muse Stancil, "Economic Study for Public Need, Convenience, and Necessity, Table 1, page 6 (January 2006); Hirsch, Robert L, Roger Bezdek, and Robert Wendling, "Peaking of World Oil Production: Impacts, Mitigation, and Risk Management (February 2005); EIA, "Gloval Oil Market and Oil Price Chronologies: 1970-2003" (March 2004); EIA, "Global Oil SUpply Disruptions Since 1951 (2001); EIA "Annual Energy Review 2002"; and EIA, "International Petroleum Monthly" (April 2004).

[2] Source: "Nervous Energy", The Economist, Chart 2, page 63, January 7, 2006 for years 1986 through 1993. EIA Short Term Energy Outlook, OPEC Annual Surplus Production Capacity for years 1994-2012; www.eia.gov/forecasts/steo/query

[3] Source: EIA, February 2012 Monthly Energy Review, Table 11.1b - World Crude Oil Production: Persian Gulf Nations, Non-OPEC, and World

Q. How did you estimate the present value of benefits for Illinois?

A73. I begin with the amount the EIA estimated Illinois spent on gasoline in 2010, which is $13,403,800,000.[41] This is a conservative estimate for several reasons. First, the country was still struggling to come out of recession in 2010, and this likely means lower demand for gasoline than Illinois is experiencing in 2012. Second, the price for gasoline has been increasing dramatically over the last part of 2011 and the first part of 2012. This means Illinois consumers are paying more. Both increased demand as the country comes out of recession and higher prices means Illinois consumers are likely to spend more than the $13 billion they spent for gasoline in 2010.

Table 15 shows this sales amount for gasoline multiplied by the expected portion of a year that might experience a price jump. I use 15.12%, which is an estimate of the average[42] amount of time each year, since 1986, that lost crude production capacity exceeded the corresponding spare capacity. This amount of expected real sales subject to future jumps is $2,026,654,560 as shown in Column B of Table 15.

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[41] See EIA State Energy Data System (SEDS), Table F3: Motor Gasoline Consumption, Price, and Expenditure Estimates, 2010.

[42] I calculated this percentage in Table 1 after excluding the high and low values. *Supra* at 14,

TABLE 15
Gasoline Price Jump Effect for Illinois

A Year	B Reference Amount Illinois Spends	C Percent Price Jumps	D Coefficients for % Change	E Percent Product Price Jump	F Expected Annual Effect	G Present Value
				C * D	B * E	
2012	$ 2,026,654,560	15.7%	0.5301	8.3%	$ 169,074,465	$ 169,074,465
2013	2,026,654,560	16.6%	0.5301	8.8%	178,071,611	161,883,283
2014	2,026,654,560	16.9%	0.5301	8.9%	181,202,526	149,754,154
2015	2,026,654,560	17.4%	0.5301	9.2%	187,327,590	140,741,991
2016	2,026,654,560	18.4%	0.5301	9.8%	197,922,394	135,183,658
2017	2,026,654,560	19.4%	0.5301	10.3%	208,082,573	129,202,906
2018	2,026,654,560	20.1%	0.5301	10.6%	215,659,979	121,734,436
2019	2,026,654,560	20.6%	0.5301	10.9%	221,259,097	113,540,902
2020	2,026,654,560	21.0%	0.5301	11.1%	225,748,954	105,313,553
2021	2,026,654,560	21.7%	0.5301	11.5%	232,924,720	98,782,819
2022	2,026,654,560	22.1%	0.5301	11.7%	237,232,062	91,463,229
2023	2,026,654,560	22.9%	0.5301	12.1%	245,715,930	86,121,934
2024	2,026,654,560	24.2%	0.5301	12.8%	259,743,400	82,762,252
2025	2,026,654,560	24.6%	0.5301	13.0%	264,438,508	76,598,416
2026	2,026,654,560	25.7%	0.5301	13.6%	276,249,659	72,745,169
2027	2,026,654,560	25.5%	0.5301	13.5%	273,944,381	65,580,107
2028	2,026,654,560	26.9%	0.5301	14.2%	288,771,153	62,845,016
2029	2,026,654,560	27.3%	0.5301	14.5%	293,447,756	58,057,074
2030	2,026,654,560	28.2%	0.5301	15.0%	303,020,152	54,500,838
2031	2,026,654,560	28.5%	0.5301	15.1%	305,958,494	50,026,659
2032	2,026,654,560	28.3%	0.5301	15.0%	303,902,140	45,173,117
2033	2,026,654,560	29.6%	0.5301	15.7%	318,204,785	42,999,194
2034	2,026,654,560	29.3%	0.5301	15.5%	315,124,113	38,711,728
2035	$ 2,026,654,560	29.9%	0.5301	15.9%	$ 321,649,171	$ 35,921,187
					Net Present Value at 10% 2013 - 2035	$ 2,019,643,623

I multiply the expected annual percentage increase in crude oil prices (Column C) times the coefficient for gasoline products and crude prices in Table 15 (and shown in Column D) to estimate the annual percentage increase in gasoline prices shown in Column E. I multiply this amount times the Reference Amount shown in Column B to Calculate the Expected Annual Benefit amount shown in Column F.

The last step is to calculate the present value of the expected annual differences in prices multiplied by the amount spent each year. I use a 10 percent discount rate and eliminate 2012. Therefore, the estimated Net Present Value for Illinois based upon gasoline is about $2.02 billion, which is shown in Column G.

Q. Did you perform similar analyses for distillate and jet fuel?

A. Yes. These are shown in Tables 16 and 17, respectively. I use the same EIA expenditure sources for both distillate and jet fuel that I used for gasoline.[43] The respective annual expenditures are $5,360,700,000 for distillate and $2,341,100,000 for jet fuel. I multiply these annual amounts spent on distillate and on jet fuel of $1,489,200,000 by the same conservative annual estimate of future jumps occurring of 15.12%. This yields $810,537,840 of annual distillate spending in Illinois at risk of jumps and is shown in Column B of Table 16. The corresponding at-risk spending in Illinois for jet fuel is $353,974,320, and is shown in Column B of Table 17.

I use the same approach for distillate and jet fuel that I used for gasoline. The only difference in approach is that I used different coefficients to convert the percent change in real crude oil prices to the specific percent change in product prices using the corresponding product coefficient shown in Table 16 above.

Accordingly, the present value of the expected savings for distillate in 2013 is about $844 million and is shown in Column F of Table 16. The present value of the expected savings for jet fuel is in 2011 is about $590 million and is shown in Column F of Table 17.

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[43] EIA State Energy Data System (SEDS), Table F2: Jet Fuel Consumption, Price, and Expenditure Estimates, 2010: Table F8: Distillate Fuel Oil Price and Expenditure Estimates, 2010.

TABLE 16
Distillate Price Jump Effect for Illinois

A Year	B Reference Amount Illinois Spends	C Percent Price Jumps	D Coefficients for % Change	E Percent Product Price Jump C * D	F Expected Annual Effect B * E	G Present Value
2012	$ 810,537,840	15.7%	0.5542	8.7%	$ 70,693,633	$ 70,693,633
2013	810,537,840	16.6%	0.5542	9.2%	74,455,532	67,686,847
2014	810,537,840	16.9%	0.5542	9.3%	75,764,634	62,615,400
2015	810,537,840	17.4%	0.5542	9.7%	78,325,653	58,847,223
2016	810,537,840	18.4%	0.5542	10.2%	82,755,567	56,523,166
2017	810,537,840	19.4%	0.5542	10.7%	87,003,754	54,022,486
2018	810,537,840	20.1%	0.5542	11.1%	90,172,029	50,899,759
2019	810,537,840	20.6%	0.5542	11.4%	92,513,139	47,473,868
2020	810,537,840	21.0%	0.5542	11.6%	94,390,444	44,033,839
2021	810,537,840	21.7%	0.5542	12.0%	97,390,784	41,303,200
2022	810,537,840	22.1%	0.5542	12.2%	99,191,776	38,242,723
2023	810,537,840	22.9%	0.5542	12.7%	102,739,062	36,009,414
2024	810,537,840	24.2%	0.5542	13.4%	108,604,245	34,604,660
2025	810,537,840	24.6%	0.5542	13.6%	110,567,370	32,027,429
2026	810,537,840	25.7%	0.5542	14.3%	115,505,864	30,416,304
2027	810,537,840	25.5%	0.5542	14.1%	114,541,978	27,420,439
2028	810,537,840	26.9%	0.5542	14.9%	120,741,367	26,276,839
2029	810,537,840	27.3%	0.5542	15.1%	122,696,754	24,274,899
2030	810,537,840	28.2%	0.5542	15.6%	126,699,177	22,787,961
2031	810,537,840	28.5%	0.5542	15.8%	127,927,760	20,917,211
2032	810,537,840	28.3%	0.5542	15.7%	127,067,955	18,887,842
2033	810,537,840	29.6%	0.5542	16.4%	133,048,195	17,978,879
2034	810,537,840	29.3%	0.5542	16.3%	131,760,101	16,186,198
2035	$ 810,537,840	29.9%	0.5542	16.6%	$ 134,488,366	$ 15,019,413
					Net Present Value at 10% 2013 - 2035	$ 844,455,997

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TABLE 17
Jet Fuel Price Jump Effect for Illinois

A Year	B Reference Amount Illinois Spends	C Percent Price Jumps	D Coefficients for % Change	E Percent Product Price Jump C * D	F Expected Annual Effect B * E	G Present Value
2012	$ 353,974,320	15.7%	0.8868	14.0%	$ 49,401,249	$ 49,401,249
2013	353,974,320	16.6%	0.8868	14.7%	52,030,092	47,300,084
2014	353,974,320	16.9%	0.8868	15.0%	52,944,903	43,756,118
2015	353,974,320	17.4%	0.8868	15.5%	54,734,562	41,122,887
2016	353,974,320	18.4%	0.8868	16.3%	57,830,220	39,498,818
2017	353,974,320	19.4%	0.8868	17.2%	60,798,885	37,751,324
2018	353,974,320	20.1%	0.8868	17.8%	63,012,900	35,569,139
2019	353,974,320	20.6%	0.8868	18.3%	64,648,885	33,175,100
2020	353,974,320	21.0%	0.8868	18.6%	65,960,760	30,771,181
2021	353,974,320	21.7%	0.8868	19.2%	68,057,421	28,862,990
2022	353,974,320	22.1%	0.8868	19.6%	69,315,967	26,724,306
2023	353,974,320	22.9%	0.8868	20.3%	71,794,838	25,163,653
2024	353,974,320	24.2%	0.8868	21.4%	75,893,473	24,181,999
2025	353,974,320	24.6%	0.8868	21.8%	77,265,319	22,381,011
2026	353,974,320	25.7%	0.8868	22.8%	80,716,376	21,255,145
2027	353,974,320	25.5%	0.8868	22.6%	80,042,806	19,161,611
2028	353,974,320	26.9%	0.8868	23.8%	84,374,986	18,362,455
2029	353,974,320	27.3%	0.8868	24.2%	85,741,425	16,963,484
2030	353,974,320	28.2%	0.8868	25.0%	88,538,349	15,924,400
2031	353,974,320	28.5%	0.8868	25.3%	89,396,892	14,617,106
2032	353,974,320	28.3%	0.8868	25.1%	88,796,053	13,198,968
2033	353,974,320	29.6%	0.8868	26.3%	92,975,091	12,563,777
2034	353,974,320	29.3%	0.8868	26.0%	92,074,961	11,311,038
2035	$ 353,974,320	29.9%	0.8868	26.6%	$ 93,981,494	$ 10,495,680
					Net Present Value at 10% 2013 - 2035	$ 590,112,275

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Q. Will you summarize the expected present value of the benefits for Illinois?

A. Yes. Table 18 shows that an additonal 585,000 barrels of crude oil equivalents in the global market would be about $3.45 billion in 2009 dollars over the period through 2035.

TABLE 18 Summary of Benefits for Illinois Present Value 2009 Dollars in 2013 at 10%			
Gasoline	$	2,019.64	million
Distillate	$	844.46	million
Jet Fuel	$	590.11	million
TOTAL	**$**	**3,454.21**	**million**

Q. Did you perform a similar analysis for the PADD II Region?

A. Yes I did. I again utilized the EIA SEDS data on 2010 expenditures for gasoline, distillate, and jet fuel for the fifteen states that make up PADD II.[44] The EIA estimated that in 2010, consumers in the PADD II region spent $102,309,100,000 on gasoline. I again multiplied these total expenditures for gasoline by 15.12% to reflect the expected portion of a year that might experience a price jump. This yields $15,469,135,920 at risk of price jumps in the PADD II region. This is shown in Column B of Table 19.

Again, using the same approach I used for Illinois, I multiply the expected annual percentage increase in crude oil prices (Column C) times the coefficient for gasoline products and crude prices in Table 13 (and shown in Column D) to

[44] These states are Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, and Wisconsin.

estimate the annual percentage increase in gasoline prices shown in Column E. I multiply this percentage increase times the Reference Amount shown in Column B to calculate the Expected Annual Amount in Column F.

The last step is to calculate the present value of the expected annual differences in prices multiplied by the amount spent each year. I again use a 10 percent discount rate and eliminate 2012. Therefore, the estimated Net Present Value for the PAD IIs based upon gasoline is about $14.04 billion.

TABLE 19
Gasoline Price Jump Effect for PADD II States <1>

A Year	B Reference Amount PADD II Spends	C Percent Price Jumps	D Coefficients for % Change	E Percent Product Price Jump C * D	F Expected Annual Effect B * E	G Present Value
2012	$ 15,469,135,920	15.7%	0.5301	8.3%	$ 1,290,518,830	$ 1,290,518,830
2013	15,469,135,920	16.6%	0.5301	8.8%	1,359,192,638	1,235,629,671
2014	15,469,135,920	16.9%	0.5301	8.9%	1,383,090,422	1,143,049,935
2015	15,469,135,920	17.4%	0.5301	9.2%	1,429,842,067	1,074,261,508
2016	15,469,135,920	18.4%	0.5301	9.8%	1,510,710,545	1,031,835,630
2017	15,469,135,920	19.4%	0.5301	10.3%	1,588,261,592	986,185,489
2018	15,469,135,920	20.1%	0.5301	10.6%	1,646,098,746	929,179,829
2019	15,469,135,920	20.6%	0.5301	10.9%	1,688,835,932	866,639,869
2020	15,469,135,920	21.0%	0.5301	11.1%	1,723,106,304	803,841,808
2021	15,469,135,920	21.7%	0.5301	11.5%	1,777,877,798	753,993,740
2022	15,469,135,920	22.1%	0.5301	11.7%	1,810,755,064	698,124,464
2023	15,469,135,920	22.9%	0.5301	12.1%	1,875,511,097	657,355,198
2024	15,469,135,920	24.2%	0.5301	12.8%	1,982,580,572	631,711,269
2025	15,469,135,920	24.6%	0.5301	13.0%	2,018,417,592	584,663,680
2026	15,469,135,920	25.7%	0.5301	13.6%	2,108,570,256	555,252,450
2027	15,469,135,920	25.5%	0.5301	13.5%	2,090,974,433	500,562,655
2028	15,469,135,920	26.9%	0.5301	14.2%	2,204,144,850	479,686,139
2029	15,469,135,920	27.3%	0.5301	14.5%	2,239,840,629	443,140,528
2030	15,469,135,920	28.2%	0.5301	15.0%	2,312,905,220	415,996,334
2031	15,469,135,920	28.5%	0.5301	15.1%	2,335,333,130	381,845,628
2032	15,469,135,920	28.3%	0.5301	15.0%	2,319,637,298	344,799,304
2033	15,469,135,920	29.6%	0.5301	15.7%	2,428,807,139	328,206,095
2034	15,469,135,920	29.3%	0.5301	15.5%	2,405,292,858	295,480,543
2035	$ 15,469,135,920	29.9%	0.5301	15.9%	$ 2,455,097,600	$ 274,180,777
					Net Present Value at 10% 2013 - 2035	$ 15,415,622,541

Note:
<1> PADD II includes Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, and Wisconsin.

I followed the same approach to calculate the net present value of expected benefits based upon distillate and jet fuel for the PADD II region. These results are shown in Tables 20 and 21, respectively. I use the same EIA expenditure sources for both distillate and jet fuel that I used for gasoline.[45] The respective annual expenditures are $47,753,300,000 for distillate and $9,229,800,000 for jet fuel. I multiply these annual amounts spent on distillate and on jet fuel by the same conservative annual estimate of future jumps occurring of 15.12%. This yields $7,220,298,960 of annual distillate spending in PADD II at risk of jumps and is shown in Column B of Table 20. The corresponding at-risk spending in the PADD II regions for jet fuel is $1,395,545,760, and is shown in Column B of Table 21.

I use the same approach for PADD II distillate and jet fuel that I used for gasoline. The only difference in approach is that I again used different coefficients to convert the percent change in real crude oil prices to the specific percent change in product prices using the corresponding product coefficient shown in Table 13 above.

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[45] EIA State Energy Data System (SEDS), Table F2: Jet Fuel Consumption, Price, and Expenditure Estimates, 2010: Table F8: Distillate Fuel Oil Price and Expenditure Estimates, 2010.

TABLE 20
Distillate Price Jump Effect for PADD II States <1>

A Year	B Reference Amount PADD II Spends	C Percent Price Jumps	D Coefficients for % Change	E Percent Product Price Jump C * D	F Expected Annual Effect B * E	G Present Value
2012	$ 7,220,298,960	15.7%	0.5542	8.7%	$ 629,741,317	$ 629,741,317
2013	7,220,298,960	16.6%	0.5542	9.2%	663,252,439	602,956,763
2014	7,220,298,960	16.9%	0.5542	9.3%	674,913,967	557,780,138
2015	7,220,298,960	17.4%	0.5542	9.7%	697,727,615	524,213,084
2016	7,220,298,960	18.4%	0.5542	10.2%	737,189,435	503,510,303
2017	7,220,298,960	19.4%	0.5542	10.7%	775,032,431	481,234,162
2018	7,220,298,960	20.1%	0.5542	11.1%	803,255,534	453,416,808
2019	7,220,298,960	20.6%	0.5542	11.4%	824,110,225	422,898,852
2020	7,220,298,960	21.0%	0.5542	11.6%	840,833,320	392,254,949
2021	7,220,298,960	21.7%	0.5542	12.0%	867,560,456	367,930,323
2022	7,220,298,960	22.1%	0.5542	12.2%	883,603,750	340,667,496
2023	7,220,298,960	22.9%	0.5542	12.7%	915,203,095	320,773,101
2024	7,220,298,960	24.2%	0.5542	13.4%	967,450,354	308,259,497
2025	7,220,298,960	24.6%	0.5542	13.6%	984,937,935	285,301,436
2026	7,220,298,960	25.7%	0.5542	14.3%	1,028,930,209	270,949,482
2027	7,220,298,960	25.5%	0.5542	14.1%	1,020,343,881	244,262,213
2028	7,220,298,960	26.9%	0.5542	14.9%	1,075,568,250	234,074,989
2029	7,220,298,960	27.3%	0.5542	15.1%	1,092,986,908	216,241,633
2030	7,220,298,960	28.2%	0.5542	15.6%	1,128,640,624	202,995,937
2031	7,220,298,960	28.5%	0.5542	15.8%	1,139,584,890	186,331,236
2032	7,220,298,960	28.3%	0.5542	15.7%	1,131,925,712	168,253,544
2033	7,220,298,960	29.6%	0.5542	16.4%	1,185,197,898	160,156,469
2034	7,220,298,960	29.3%	0.5542	16.3%	1,173,723,510	144,187,207
2035	$ 7,220,298,960	29.9%	0.5542	16.6%	$ 1,198,026,994	$ 133,793,448
				Net Present Value at 10% 2013 - 2035		$ 7,522,443,072

Note:
<1> PADD II includes Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, and Wisconsin.

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TABLE 21
Jet Fuel Price Jump Effect for PADD II States <1>

A Year	B Reference Amount PADD II Spends	C Percent Price Jumps	D Coefficients for % Change	E Percent Product Price Jump	F Expected Annual Effect	G Present Value
				C * D	B * E	
2012	$ 1,395,545,760	15.7%	0.8868	14.0%	$ 194,764,703	$ 194,764,703
2013	1,395,545,760	16.6%	0.8868	14.7%	205,128,933	186,480,848
2014	1,395,545,760	16.9%	0.8868	15.0%	208,735,579	172,508,743
2015	1,395,545,760	17.4%	0.8868	15.5%	215,791,322	162,127,214
2016	1,395,545,760	18.4%	0.8868	16.3%	227,995,968	155,724,314
2017	1,395,545,760	19.4%	0.8868	17.2%	239,699,948	148,834,809
2018	1,395,545,760	20.1%	0.8868	17.8%	248,428,714	140,231,532
2019	1,395,545,760	20.6%	0.8868	18.3%	254,878,596	130,793,021
2020	1,395,545,760	21.0%	0.8868	18.6%	260,050,670	121,315,557
2021	1,395,545,760	21.7%	0.8868	19.2%	268,316,767	113,792,502
2022	1,395,545,760	22.1%	0.8868	19.6%	273,278,594	105,360,728
2023	1,395,545,760	22.9%	0.8868	20.3%	283,051,555	99,207,843
2024	1,395,545,760	24.2%	0.8868	21.4%	299,210,447	95,337,669
2025	1,395,545,760	24.6%	0.8868	21.8%	304,618,959	88,237,262
2026	1,395,545,760	25.7%	0.8868	22.8%	318,224,771	83,798,528
2027	1,395,545,760	25.5%	0.8868	22.6%	315,569,215	75,544,761
2028	1,395,545,760	26.9%	0.8868	23.8%	332,648,859	72,394,084
2029	1,395,545,760	27.3%	0.8868	24.2%	338,036,055	66,878,631
2030	1,395,545,760	28.2%	0.8868	25.0%	349,062,940	62,782,038
2031	1,395,545,760	28.5%	0.8868	25.3%	352,447,754	57,628,024
2032	1,395,545,760	28.3%	0.8868	25.1%	350,078,943	52,037,004
2033	1,395,545,760	29.6%	0.8868	26.3%	366,554,822	49,532,762
2034	1,395,545,760	29.3%	0.8868	26.0%	363,006,054	44,593,832
2035	$ 1,395,545,760	29.9%	0.8868	26.6%	$ 370,522,570	$ 41,379,278
					Net Present Value at 10% 2013 - 2035	$ 2,326,520,985

Note:
<1> PADD II includes Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, and Wisconsin.

Accordingly, the present value of the expected savings for distillate in 2013 is about $7.52 billion. The present value of the expected savings for jet fuel is in 2013 is about $2.33 billion.

Q. Will you summarize the expected present value of benefits for petroleum consumers in PADD II?

A. Yes. Table 22 shows the present value of PADD II benefits would be about $25.26 billion if an additional 585,000 bpd were added to spare capacity and future supplies.

TABLE 22
Summary of Benefits for PADD II States
Present Value 2009 Dollars in 2013 at 10%

Gasoline	$	15,415.62	million
Distillate	$	7,522.44	million
Jet Fuel	$	2,326.52	million
TOTAL	**$**	**25,264.59**	**million**

SECTION 6: ADDITIONAL BENEFITS

Q. What are the additional factors that you consider to be relevant for determining the public benefits of the Flanagan South Pipeline?

A. In addition to the expected present value of consumers' savings overtime, I think national security, balance of payment and job benefits are also important.

National and Economic Security

Q. Is national security an issue that the ICC should be concerned about?

A. Yes. National security and economic security are important public policy matters. Bad things happen partly because the U.S. imports about half of the oil it consumes and despite our best efforts and conservation, alternative energy sources will not put enough of a dent in petroleum use in the near term for this to change. With crude oil prices hovering above the $100 per barrel range, the U.S. economy must pay out about $400 billion in petroleum-related balance of payments each year, causing a weaker dollar with pressure to raise interest rates. Spending more to import crude oil is also similar to raising taxes, unless the exporting country trades extensively with the U.S., such as our Canadian neighbors. The production from the Bakken and Three Forks fields is largely a U.S. play because these oil resources are in North Dakota and Montana. The current level of imports, if unchecked, would likely mean that the economy would slow or even decline.

Whether we like it or not, the U.S. has national security reasons to guarantee the flow of crude to world markets, not just the U.S. These oil flows often begin in unfriendly places and insecure regions of the world and move to the U.S. and our friendly allies. Expanding domestic and North American production is more secure and beneficial to the U.S. and Illinois.

When more oil flows into the U.S. from Canada, there are benefits. The crude flow is more secure and comes from a stable, environmentally progressive, and friendly neighbor that is an ally in world conflicts. In addition, Canada's increased petroleum dollars are more likely to be spent on U.S. goods and services than when the U.S. purchases oil from other nations.[46]

Again, I do not think that the 585,000 bpd that the Flanagan South Pipeline would carry is sufficient to make the U.S. completely secure in either the economic or national security sense. That said, each such transportation expansion to connect U.S. refineries to production helps. Small gains and benefits are not the same as "zero." When more crude hits the world market, the U.S. benefits.

Q. Can national security benefits be quantified?

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[46] For example, in 2011, Canada imported $25.3 billion (Canadian dollars) in goods from Illinois, and $50.6 billion in goods from the Great Lakes region (Michigan, Ohio, Illinois, Indiana, and Wisconsin). http://www.ic.gc.ca/sc_mrkti/tdst/tdo/tdo.php.

A. To some extent, yes. We are in the midst of another oil crisis. There is some debate whether this is a demand or supply induced crisis. Both seem to be present and the risks particularly related to Iran may swamp all else. If this happens when demand is increasing and spare capacity is falling, this would likely cause the worse oil crisis since the early 1970s. Even if thus far this crisis is demand driven, the current high prices for crude oil are also attributable to heightened international problems in the Middle East that cause both macroeconomic and national security problems for the United States.

Some attempts to quantify the effect of high oil prices for the United States use a per barrel premium for imported oil of about $20 per barrel.[47] The Oak Ridge National Labs (ORNL) report quantified the extent of market power that OPEC exhibits and estimates the corresponding security premium that is attached to each barrel of oil. ORNL estimated the energy security premium to be about 30 percent of the prevailing price.[48] This would be about $30 per barrel when world crude trades at $100 per barrel.

Some researchers have recently estimated that reduced spare capacity currently results in a risk premium of between $10-$38 per barrel, and with global

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[47] See Leiby, Paul N. "Estimating The Energy Security Benefits of Reduced U.S. Oil Imports", Oak Ridge National Laboratory, February 28, 2007; Leiby, Paul N., Donald W. Jones, T. Randall Curlee, and Russell Lee, *Oil Imports: An Assessment of Benefits and Costs*, ORNL-6851, Oak Ridge National Laboratory, November 1, 1997; US DOT, NHTSA 2006. "Final Regulatory Impact Analysis: Corporate Average Fuel Economy and CAFÉ Reform for MY 2008-2011 Light Trucks," Office of Regulatory Analysis and Evaluation, National Center for Statistics and Analysis, March; National Academy of Sciences 2002. *Effectiveness and Impact of Corporate Average Fuel Economy (CAFÉ) Standards*, Committee on the Effectiveness and Impact of Corporate Average Fuel Economy (CAFÉ) Standards, National Research Council (Washington, D.C.: National Academy Press).

[48] ORNL used an outdated price of oil of $45 per barrel and reported a national security premium of $13.58 per barrel. Leiby, Paul N., "Estimating the Energy Security Benefits of Reduced U.S. Oil Imports" (February 28, 2007).

economic recovery could go as high as $58 per barrel.[49] In the past, estimates of a risk premium during times of spare production company have been as high as $50 per barrel.[50]

I conclude that $20 to $30 per barrel premiums are very conservative estimates because the premium reflects just two aspects of the adverse consequence of America's oil import dependence: (1) lost efficiency due to seller market power[51]; and (2) the strategic storage costs that reduce potential losses during supply disruptions. A more accurate estimate of the per unit benefit of reduced oil dependence should also include:

- Higher defense budgets and the consequence of national security on troops and their families.
- The danger and consequences when higher oil revenue finances terrorists and anti-American hatred.
- The adverse macro-economic effects of increased imports, a weakened dollar, higher inflation, and higher interest rates and their corresponding effect on the U.S. economy, businesses, and families.

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[49] See, for example, "Nervous Energy", The Economist, ("'fear premium' of $10-$15 a barrel reflecting the threat of lost supply"), January 7, 2006; Williams, James L.,, Energy Economist, September 8 2006 ($20-$25/bbl supply interruption premium); Deutzia, Tony and Elizabeth Millington, and Rob Sergeant, "Making Sense of America's Oil Needs". National Association of State PIRGs, August 2005, ($4-$13/bbl security risk premium); and Kathuria, Vinish, "Factors Behind the Wild Oil Price Swings", The Hindu, December 27, 2004 ($10/bbl risk premium). "Oil Market Must Endure Risk Premium for At Least Rest of the Year" Ghana Oil Watch, April 7, 2011 (implied risk premium, for Brent crude around $15-$20 per barrel); "Crude Oil at $200 a Barrel? Oil Output at Risk." Seeking Alpha, March 2, 2011 (if spare oil production capacity is reduced to 2.4 million bpd, "it may be fair to expect a risk premium of $38 per barrel." "If the global economic recovery keeps on track, around $20 a barrel will be tacked on top of the crude oil price by the end of 2011.) "Geopolitics heat up; oil price premium settles in." Market Watch, January 13, 2012. (threat added around $10-$15 to the price of oil).

[50] "Crude Oil at $200 a Barrel? Oil Output at Risk." Seeking Alpha, March 2, 2011. (Risk premium in 2008 was estimated at $50 per barrel).

[51] On an energy equivalent basis, natural gas prices average $40 per barrel less than crude oil. This suggests a much greater efficiency loss for OPEC's monopoly power.

- The effect of the above on our friends and allies throughout the world.

Q. Does anything else matter for national and economic security?

A. The full adverse effect of America's oil import dependency needs to be focused through the lens of a world oil market that has virtually shrinking amounts of spare capacity. World oil consumption exceeds 85 million bpd. Spare capacity has also been falling as I explained above. As recently as the 1990s, the world's spare capacity reserve cushion was closer to about ten percent of world production. The precipitous decline in spare crude oil production capacity and the growth in demand in China and India are relatively new phenomena, which cause much greater energy prices, unprecedented volatility in prices, and international tensions. The future seems likely to be worse, not better, in terms of rising oil prices and America's given America's continued oil import dependency.

Accordingly, a reasonable range for the estimated benefits of reducing oil dependence would be $20 per barrel for the low case and the $40 per barrel or more for the high case. Reducing a barrel of oil dependence would likely reduce the nation's import dependence and yield benefits to the nation in line with the $20 to $40 per barrel premiums. Regardless of their specific quantification, I view at least some of the loss associated with high crude oil prices to be a loss of economic efficiency due to the cartel-related monopoly rents of the OPEC nations. There are also economic losses related to the macroeconomic consequences of balance of payment deficits and a weak dollar. Additional economic losses are due to increased money spent on national security and related national budget deficits.

Q. Is there a simple way to think about the Illinois or regional security benefits from importing oil from Canada as opposed to from Venezuela and Saudi Arabia?

A. Yes. Since President Nixon's time, the nation has stressed the importance of an oil independence goal for the US and North America. I have often heard my friend and former colleague, Professor Hogan of Harvard University eloquently dumb-down America's energy policy as being equivalent to adding more aircraft carriers and battleships. The national dividend from a secure land-based North American petroleum resource base would likely be huge in terms of saved blood and treasure.

I think a conservative estimate of national and economic security would be to, take the mid-point of the $20-$30 per barrel premium I discussed above, or $25 per barrel, and multiply this barrel premium times the annual consumption of imported oil that is not delivered overland from friendly nations in North America that trade primarily with the U.S. In 2011, the U.S. imported about 1.53 billion (or 4.195 million bpd) barrels of crude oil from OPEC member countries.[52] The U.S. total consumption was about 6.88 billion barrels of petroleum liquids. Therefore, the U.S. secured about 22.24% of its petroleum liquids from OPEC. Multiplying OPEC supplied consumption by the $25 per barrel, the national security risk premium would be about $38.3 billion dollars annually based solely upon crude oil imported from OPEC.

[52] See EIA, Petroleum and Other Liquids, U.S. Imports by Country of Origin; http://www.eia.gov/dnav/pet/pet_move_impus_a2_nus_epc0_mbbpld_a.htm. In 2011, the U.S. imported 4,195,000 from OPEC nations.

Illinois consumed 239.6 million barrels of petroleum liquids in 2009[53]. Assigning Illinois the same share of imports from OPEC this would be about 53.29 million barrels. Multiplying times $25 per barrel the national security premium Illinois pays would be about a $1.33 billion annually. Similarly, the 15-state PADD II region consumed 1,727.8 million barrels of petroleum liquids in 2009.[54] The proportionate share of petroleum from OPEC is about 384.26 million barrels. Multiplied times $25 per barrel equal a $9.61 billion in added annual security premium for just the oil imported from OPEC.

Q. But aren't we still importing oil from a foreign country?

A. Yes, but the difference is that the U.S. and Canada have enjoyed a long and strategically beneficial diplomatic and trading relationship. In fact, President Eisenhower issued an Executive Order establishing the Mandatory Oil Import Quota (MOIQ) program, in 1959 that was designed to limit U.S. dependence on foreign oil. Under this program imports from Canada, deemed overland, were explicitly excluded from the MOIQ.[55]

Today, excluding oil imported to the U.S. from Canada and Mexico, the top three countries from which the U.S. imported oil in 2011 were three OPEC countries, Saudi Arabia, Nigeria, and Venezuela. These crude oil imports are, in part, destined for Gulf Coast refineries via sea-going tankers and represented

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[53] Source: U.S. Energy Information Administration, Illinois Energy Fact Sheet; http://www/eai/gov/state/state-energy profiles.
[54] Source: U.S. Energy Information Administration, Illinois et al Energy Fact Sheet; http://www/eai/gov/state/state-energy profiles
[55] See Cicchetti, C.J. and W. Gillen, "The Mandatory Oil Import Quote: A Consideration of Economic Efficiency and Equity." Natural Resources Journal. Vol. 13, No. 3, July 1973.

about 32% of the total crude oil imported to the U.S. in 2011.[56] The U.S. has a significant negative balance of trade deficit with these countries due to the amount the US spends to purchase crude oil from them.

Canadian Balance of Payments

Q. How does "Trade" affect public use benefits in Illinois and PADD II?

A. Canadian and U.S. economies are intertwined. A recent United States Department of State company profile[57] concludes:

> The relationship between the United States and Canada is among the closest and most extensive in the world. It is reflected in the staggering volume of bilateral trade—the equivalent of $1.4 billion a day in goods—as well as in people-to-people contact. About 400,000 people cross the border every day by all modes of transport.
> The United States and Canada share the world's largest and most comprehensive trading relationship, which supports millions of jobs in each country. Canada is the leading export market for 36 of the 50 U.S. states and is a larger market for U.S. goods than all 27 countries of the European Union.

In 2011, the annual-trade between the two nations was in excess of $597 billion.[58] Additionally, in 2010, Canada was Illinois' main foreign trading partner. In 2010, Illinois exported $19.17 billion worth of goods and products to Canada, representing about 30% of all Illinois exports, and imported from Canada $36.07 billion in goods and products, primarily crude oil and natural

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[56] See EIA, Petroleum and Other Liquids, U.S. Imports by Country of Origin; http://www.eia.gov/dnav/pet/pet_move_impus_a2_nus_epc0_mbbpld_a.htm. In 2011, the U.S. imported 1,186,000 bpd from Saudi Arabia, 868,000 bpd from Venezuela, and 657 bpd from Nigeria. About 47% of U.S. crude oil imports came from OPEC countries in 2011.

[57] U.S. Department of State, Background Note: Canada, Bureau of Western Hemisphere Affairs, December 22, 2011.

[58] U.S. Census Bureau, U.S. Trade in Goods with Canada. http://www/census.gov/foreign-trade/balance/c1220.html.

gas.[59] This trade is important for Chicago, which is a major hub for activities related to and affected by the high degree of integration between the U.S. and Canadian economies. The same State Department report also concluded the U.S. and Canada have the largest energy trading relationship in the world and that Canada provides 20 percent of U.S. oil imports and 18 percent of all natural gas consumed in the U.S.[60] Both countries invest heavily in each other's economy. Both nations have integrated vast portions of their agriculture and other essential industries.

When Canada's economy grows, so does its consumption of goods and services imported from the U.S. Further, as Canada's economy grows, its investments in the U.S. also grow. The Midwest and Illinois share in these gains from trade and economic interdependence. If the Illinois economy should slow, increased Canadian business and economic investments would not and should not be underestimated. Using Canadian exports likely contributes to Canadian personal incomes and makes them want to import goods and services from their southern neighbors. This is a public use benefit for Illinois whether all of the imports remain in Illinois or the increased imports are used (which the Flanagan South Pipeline facilitates) throughout refinery hubs in Illinois, the Midwest, and the U.S. Gulf. Finally, oil produced in North Dakota and Montana directly yield economic benefits for the U.S.

Jobs Tied to Flanagan South Investments

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[59] Illinois-Canada: Business Strength in Numbers; www2.Illinois.gov/gov/exports/Documents/Canada/BizStats.pdf.
[60] U.S. Department of State, Background Note: Canada, Bureau of Western Hemisphere Affairs, December 22, 2011.

Q. Should the ICC attach public use benefits to jobs, trade, and local economic benefits?

A. Yes. Let me explain, however, that the claimed benefits to local economies can sometimes be overstated in terms of the very narrow and precise confines of economic theory. Nevertheless, jobs are the central focus today of most public policy decisions. Given the slow and uncertain economic recovery, I think the Commission should be cognizant of the jobs that Flanagan South would cause and induce.

I use the U.S. Bureau of Labor Statistics Regional Input-Output Modeling System, known as RIMS II (2002/2008) to estimate the jobs that can be expected from a pipeline construction project that costs $2.9 billion to build in 2012. I convert the costs of the investment to 2008 U.S. dollars in order to use the RIMS II model results. The investment in the Flanagan South Pipeline would be equivalent to about $2.74 Billion in 2008 USD.

New investments add to final demand and increase both direct jobs for the firm that invests and indirect jobs for all other industries in the state that supply materials and services. The combination of direct and indirect jobs is called a Type I effect. These job estimates do not distinguish between Illinois and out of state jobs.

For each $1 million invested in Pipeline Transportation in Illinois, there would be 7.9613 new direct and indirect jobs. With an investment of $2.74 billion in 2008 USD, there would be 21,834 jobs spread over several years. The direct jobs would include construction jobs that would peak at about 3,000 jobs.

The indirect jobs reflect jobs related to material inputs and services supplied from the state and region. Some may be outside Illinois.

There would also be induced employment benefits because the much of the new earnings from the direct and indirect will be spent. This will add induced jobs to the direct and indirect effects and the combination is designated a RIMS II, Type II multiplier effect. Using the Illinois multiplier (12.5142 jobs per $1 million invested, the combined direct, indirect, and induced job increase would be about 34,289 across the state, region and nation.

In 2012 we are still mired in what some believe seems like a recession. Others might more accurately think of it as a jobless or at the very least a weak recovery in terms of employment. When an economy experiences unemployment or under-utilization of people/assets, the differences between economic theory and parochial concerns are far less important. Drs. Robert H. Haveman and John V. Krutilla wrote what I consider to be the seminal work that shows how local unemployment affects this relationship between local benefits and economic efficiency gains.[61]

In their analyses, Haveman and Krutilla discuss the "opportunity cost" of unemployed factors of production. They conclude that economic efficiency would count the gains from using unemployed resources. This is hardly ground-breaking for public officials concerned with economic slowdowns and unemployed voters. This economic insight means that Enbridge would be correct to claim incidental employment and other local economic benefits particularly in

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[61] Haveman, Robert H. and John V. Krutila, with the assistance of Robert M. Steinberg, Unemployment, Idle Capacity and the Evaluation of Public Expenditures: Natural and Regional Analyses. Baltimore, Maryland: John Hopkins Press for Resources of the Future, 1968.

a slow or stagnant economy. This would always be the case in terms of public perception. Regardless, economic theory, even when narrowly focused, would attach benefits to jobs and economic stimulus when there is an economic slowdown that causes people and assets to be taken out of production.

Green House Gases and Other Environmental Issues

Q. Should the ICC consider environmental damages that may result from greenhouse gases from operating the pipeline?

A. No. The air emissions association with constructing and operating the pipeline will be considered as required for the environmental permits for facilities. Furthermore, Enbridge is not proposing activities involved in the production or refining of crude oil, and such activities by other entities within the U.S. and Canada are subjected to a broad regime of federal, provincial, state, and local permits under legislation such as the Clean Air Act. In fact, Alberta has one of the strictest forms of limiting greenhouse gases, unlike many other countries outside North America that the U.S. currently relies on for energy imports.

A number of critics aver there is a stigma attached to oil-sands production and have pointed out that production requires energy and water inputs and disturbs the land, although the extent of those incremental impacts have often been challenged by Canadian and Albertan regulatory agencies. It is also important to consider the fact that if the oil is produced it will be transported somewhere in the world, even if the Flanagan South Pipeline does not proceed. In other words, oil production in Canada and the construction of the proposed pipeline are not interdependent actions. Therefore, the environmental issues associated with green house gasses arising from pipeline operations would simply be beyond the issues the Commission should consider as relevant. Similarly, issues related to the actual extraction and processing of the oil sands in Alberta is an issue that is properly and best left to the Canadian regulators.

The oil sands in Alberta have a petroleum reserve potential that some consider matches the reserve levels in the Persian Gulf. The Energy Information Administration reports that Canada has 175 billion barrels in oil sands reserves, which places it second to Saudi Arabia with its estimated 260 billion barrels of reserves.[62]

The world's appetite for crude oil seemingly exceeds the ability of traditional crude oil reserves to keep up. Both conventional and non-conventional[63] sources of liquid petroleum are needed for the foreseeable future. To think otherwise puts too much emphasis on alternatives that consumers seem neither to want nor are many willing to pay to use. Nevertheless, Enbridge is investing in green and renewable energy.

Consumers and the U.S. economy depend upon petroleum and no realistic substitutes exist either physically or economically. Increasingly, the world is turning to various forms of unconventional petroleum production. These are increasing in both absolute and relative terms.

SECTION 7: SUMMARY AND CONCLUSIONS

Q. What do you conclude with respect to the Flanagan South project?

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[62] EIA, "Canadian Oil Sands Outlook" Annual Energy Outlook page 4, (March 2007). See also Central Intelligence Agency, "The World Factbook" – Country Comparison: Oil – Proved Reserves (1/1/2011); https://www.cia.gov/library/publications/the-world-factbook/rankorder/2178rank.html.

[63] The primary other forms of unconventional petroleum currently are: (1) Enhanced Oil Recovery from shale oil; (2) ultra-deepwater reserves such as the ones currently under development off the coast of Brazil buried under 5,000 feet of salt deposits; (3) and the Arctic including Beaufort and Chukchi Sea reserves off the Alaskan coast. Walsh, Bryan, "The Future of Oil" Time Magazine. April 9, 2012.

A. The Flanagan South Pipeline will help to curb future price jumps. This would save money for Illinois and regional petroleum users. It will add needed jobs and improve national and economic security and, for many decades, oil from western Canada, including Alberta's oil sands region and the Bakken formation have contributed to Illinois refinery economic viability and regional refined petroleum supplies. No energy alternative would come without any environmental side effects.

The Commission should weigh the public benefits for Illinois and the region and grant approval of a Certificate in Good Standing and Eminent Domain authority to the Flanagan South Pipeline. The Flanagan South Pipeline is a necessary link in a very important project to deliver petroleum from America's oil shale formations and Alberta's oil sands to the Midwest and Gulf regions to back out oil imports from less secure places.

ATTACHMENT A

Resume of Charles J. Cicchetti, Ph.D.

CHARLES J. CICCHETTI

PROFESSIONAL EXPERIENCE

2008-present	Senior Advisor to Navigant Consulting, Inc.;
1996-present	Co-Founder, Pacific Economics Group, a California LLC;
1998-2006	Jeffrey J. Miller Professor in Government, Business, and the Economy, University of Southern California;
1992-1996	Managing Director, Arthur Andersen Economic Consulting;
1991-2008	Adjunct Professor, University of Southern California
1991-1992	Co-Chairman, Putnam, Hayes & Bartlett, Inc.;
1988-1991	Managing Director, Putnam, Hayes & Bartlett, Inc.;
1987-1990	Deputy Director, Energy and Environmental Policy Center, John F. Kennedy School of Government, Harvard University;
1984-1987	Senior Vice President, National Economic Research Associates;
1980-1984	Co-Founder and Partner, Madison Consulting Group;
1979-1986	Professor of Economics and Environmental Studies, University of Wisconsin-Madison;
1977-1979	Chairman, Public Service Commission of Wisconsin, Appointed by Governor Patrick J. Lucey (member until 1980);
1975-1976	Director, Wisconsin Energy Office and Special Energy Counselor for Governor Patrick J. Lucey, State of Wisconsin;
1974-1979	Associate Professor, Economics and Environmental Studies, University of Wisconsin-Madison;
1972-1974	Visiting Associate Professor, Economics and Environmental Studies, University of Wisconsin-Madison;
1972	Associate Lecturer, School of Natural Resources of the University of Michigan;
1969-1972	Resources for the Future, Washington, D.C.;
1969	Post Doctoral Research: Ph.D., Economics, Rutgers University;
1968-1969	Instructor, Rutgers University;
1965	B.A., Economics, Colorado College;
1961-1964	Attended United States Air Force Academy.

ADVISORY BOARDS

Faculty Advisor to Campus Republicans at USC, 2002 to 2005

Alliance for Energy Security; Former Member;

Association of Environmental and Resource Economics, Former Executive Committee, Former Member;

California ISO Market Advisory Group –Former Member appointed by Governor Gray Davis;
Center for Public Policy Advisory Committee, Former Member;
Department of Energy, Fuel Oil Marketing Advisory Committee, Former Member;
Graduate School of Public Policy at the University of California, Berkeley; Former Board Member;
National Association of Regulatory Utility Commissioners, Executive Committee and Chairman of the Ad Hoc Committee on the National Energy Act, Former Member;
Public Interest Economics Center, Board of Directors, Former Member;
Rutgers University, Energy Research Advisory Board;
U.S. Chamber of Commerce Energy and Natural Resources Committee, Former Member.

EDITORIAL BOARDS

Journal of Environmental Economics and Management, Former Member
Energy Systems and Policy, Former Member;
Land Economics, Former Editor.

PUBLICATIONS

Books and Monographs

Going Green and Getting Regulation Right: "A Primer for Energy Efficiency", PUR Publishers, March 2009.

Natural Gas: the Other California Energy Crisis, Pacific Economics Group Working Paper with Colin M. Long, November 2006.

The California Electricity Crisis: What, Why, and What's Next, with Jeffrey A. Dubin and Colin M. Long, Kluwer Academic Publishers, July 2004

A Tarnished Golden State: Why California Needs a Public/Private Partnership for its Electricity Supply System, with Colin M. Long, August 2003.

Restructuring Electricity Markets: A World Perspective Post-California and Enron, with Colin M. Long and Kristina M. Sepetys, May 2003.

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A Neo Keynesian Equilibrium Analysis For an Open Economy, A.B. Thesis, Colorado College, Colorado, Springs, Colorado, May, 1965.

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Journal Articles

"Duke's Fifth Fuel", Public Utilities Fortnightly, January 2008.

"Public Service Commission of Wisconsin, 1977-1980" Charles J. Cicchetti, The NRRI Journal of Applied Regulation, Volume 4, December 2006

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