

**Written Testimony in Support of the Oral Testimony of Professor Paul Sullivan, National Defense University and Georgetown University for the Western Hemisphere Subcommittee of the Foreign Affairs Committee, US House of Representatives Regarding the Need for Canadian Oil As We Face Increasing Turmoil in the Middle East, Increasing Competition for Energy Resources, Peak Conventional Oil, and an Increasingly Complex Geostrategic Environment<sup>1</sup>.**

*Before the Western Hemisphere Subcommittee of the Foreign Affairs Committee, U.S. House of Representatives, March 31, 2011, Room 2172, Rayburn House Office Building, beginning at 200 pm.*

**This is not the perfect answer, but a step toward better energy security for the country:**

Canadian tar sands and this pipeline system are not comprehensive and perfect answers to some of our energy security needs. However, sometimes the perfect is the enemy of the good especially when we face increasing competition for resources, have to deal with oil exporting countries which don't like us, have to prop up some regimes we would rather not in order to get their oil, and have to face the whims of oil prices and their effects on our people without doing much about it. We are facing increasing turmoil in the Middle East, where most of the conventional oil reserves are found<sup>2</sup>. We are

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<sup>1</sup> All opinions expressed are Dr. Sullivan's alone and do not represent those of the National Defense University, Georgetown University or any other entity he may be associated with. Professor Sullivan reserves the right to update this testimony prior to the hearing and for 5 days after the hearing as he understands the window of testimony submission to be given changing circumstances and events.

<sup>2</sup> <http://www.eia.doe.gov/international/reserves.html>,  
[http://www.opec.org/opec\\_web/en/data\\_graphs/330.htm](http://www.opec.org/opec_web/en/data_graphs/330.htm),

facing down the peaking of *conventional* oil resources. We are potentially facing increasing economic turmoil and energy market turmoil globally.

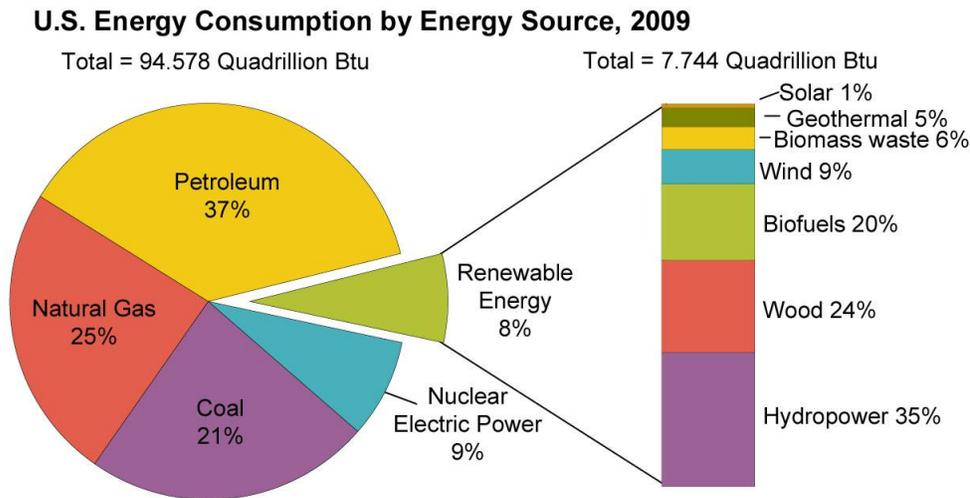
One thing to understand right off is that oil markets are global markets and events that occur in even what seem to be remote corners of the world can affect oil prices and even oil supply and transport. Also, non-oil energy, minerals and other markets outside of oil are intertwined with oil markets in many ways as both substitutes and complements to oil use. Furthermore, energy systems are really systems within systems, not just one energy source after another. Oil systems are connected with electricity systems that can be connected with gas, nuclear, renewable energy and other systems. And these energy systems are in turn connected with transportation, water, industrial, residential, commercial, and other systems. We really cannot look at one energy source independently of the others. We cannot fully understand the effects of energy market and energy policy changes without looking at the totality of the systems within systems connected to energy systems.

It would be best to have a full, comprehensive energy security policy, but this is unlikely to happen any time soon, so it seems we will need to settle for ad hoc improvements in the diversification of supplies and other ad hoc policy measures until the real shocks hit us in waves upon waves upon waves of economic and energy security woe --- and we finally wake up to the severity of the situations we might be facing. We need to be far more diversified in our energy sources and our means and ways of using those energy sources, but all of that will take considerable time to accomplish. Anyone who thinks that we can move away from oil any time soon does not understand the complexity of the intertwined nature of energy systems within systems, and also the energy compactness that will be needed to

replace oil. We would also have to change our transportation and industrial systems simultaneously with the change in the energy systems.

**Our major energy security threat is from imported oil:**

But let's cut right to the matters of today. Our major energy security threat is from imported oil. 37 percent of our energy consumption is oil. The major use for oil in the US is for transport. Over 91 percent of our transport fuels are oil based. Some of the rest of the fuels used for transport, like biofuels and "other", rely on oil for their production and other aspects of their logistical networks. Our sea, rail, and air transport systems are also very much dependent on oil. Our agricultural systems are based on oil. Some of our industries are oil-intensive. About 8% of our households still heat with oil. Oil represents 37% of our energy needs and it is the largest source of energy, yet we import most of it. Please see the following charts<sup>3</sup>:

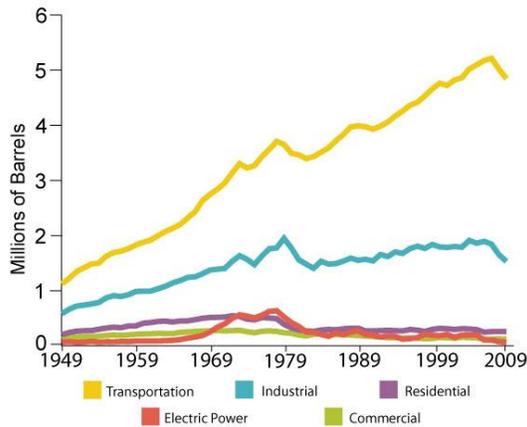


Note: Sum of components may not equal 100% due to independent rounding.  
 Source: U.S. Energy Information Administration, *Annual Energy Review 2009*, Table 1.3, Primary Energy Consumption by Energy Source, 1949-2009 (August 2010).

<sup>3</sup> See also: [http://www.eia.doe.gov/cneaf/alternate/page/renew\\_energy\\_consump/table1.html](http://www.eia.doe.gov/cneaf/alternate/page/renew_energy_consump/table1.html) and <http://www.eia.doe.gov/aer/txt/ptb0103.html> for an historical perspective. The sources for the following charts are: [http://www.eia.doe.gov/energy\\_in\\_brief/major\\_energy\\_sources\\_and\\_users.cfm](http://www.eia.doe.gov/energy_in_brief/major_energy_sources_and_users.cfm) . [http://www.eia.gov/forecasts/aeo/early\\_fuel.cfm](http://www.eia.gov/forecasts/aeo/early_fuel.cfm), [http://www.eia.gov/energyexplained/index.cfm?page=us\\_energy\\_transportation#tab2](http://www.eia.gov/energyexplained/index.cfm?page=us_energy_transportation#tab2),

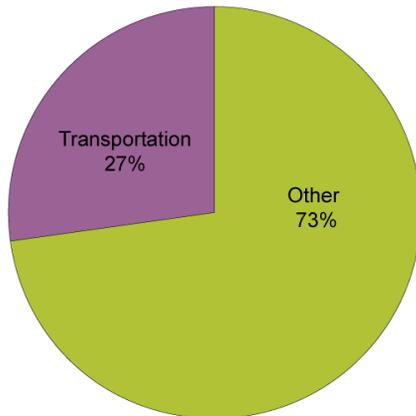
Please note the fastest overall growth in petroleum use since 1949 has been by far in transport.

### Petroleum Consumption by Sector, 1949-2009



Source: U.S. Energy Information Administration, *Annual Energy Review 2009*, Tables 5.13a, 5.13b, 5.13c, and 5.13d (August 2010).

### Share of Total U.S. Energy Used for Transportation, 2009



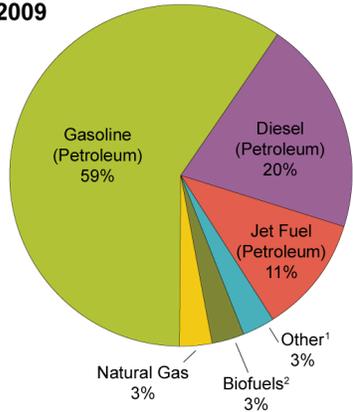
Source: U.S. Energy Information Administration, *Annual Energy Review 2009* (August 2010).

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[http://www.eia.gov/energyexplained/index.cfm?page=us\\_energy\\_homes#tab1](http://www.eia.gov/energyexplained/index.cfm?page=us_energy_homes#tab1),  
[http://www.eia.gov/energyexplained/index.cfm?page=us\\_energy\\_industry#tab2](http://www.eia.gov/energyexplained/index.cfm?page=us_energy_industry#tab2),  
[http://www.eia.gov/energyexplained/index.cfm?page=us\\_energy\\_commercial#tab2](http://www.eia.gov/energyexplained/index.cfm?page=us_energy_commercial#tab2),  
[http://www.eia.doe.gov/energyexplained/index.cfm?page=oil\\_imports](http://www.eia.doe.gov/energyexplained/index.cfm?page=oil_imports),  
[http://www.eia.doe.gov/pub/oil\\_gas/petroleum/data\\_publications/company\\_level\\_imports/current/import.html](http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/company_level_imports/current/import.html),  
[http://www.eia.doe.gov/energy\\_in\\_brief/world\\_oil\\_market.cfm](http://www.eia.doe.gov/energy_in_brief/world_oil_market.cfm),  
[http://www.eia.doe.gov/energy\\_in\\_brief/foreign\\_oil\\_dependence.cfm](http://www.eia.doe.gov/energy_in_brief/foreign_oil_dependence.cfm),

As we can see from these charts transportation is 27 percent of our energy use, and over 91 percent of that is from refined oil products. Some of the "other" fuels here are the results of oil refining.

**Fuel Used for U.S. Transportation, 2009**



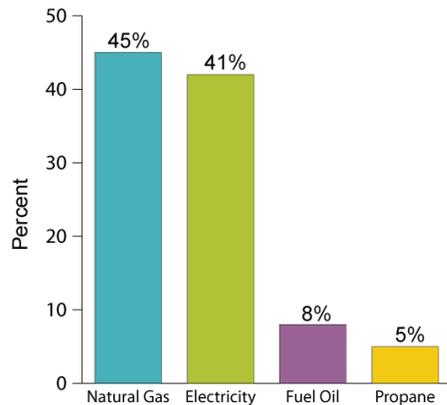
<sup>1</sup> Electricity, LPG, Lubricants, Residual Fuel Oil  
<sup>2</sup> Ethanol added to gasoline and biodiesel

Note: Due to rounding, data may not sum to exactly 100%.

Source: U.S. Energy Information Administration, *Monthly Energy Review*, Tables 2.5 and 3.7c (September 2010).

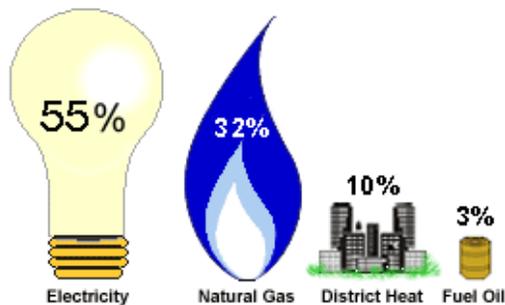
Residential use of oil has declined since the earlier days when a much higher percentage of homes were heated with oil. There has been a vast supplanting of oil heating systems with natural gas heating systems, especially since the oil shocks of the 1970s. .

### Types of Energy Consumed in Homes, 2005



Source: U.S. Energy Information Administration, 2005 Residential Energy Consumption Survey.

Commercial buildings have also moved away from the use of oil and have moved into the much greater use of natural gas. Electricity generation in this country relies very little on oil.<sup>4</sup> This is partly a result of the oil shocks of the 1970s and the policies that went after them.

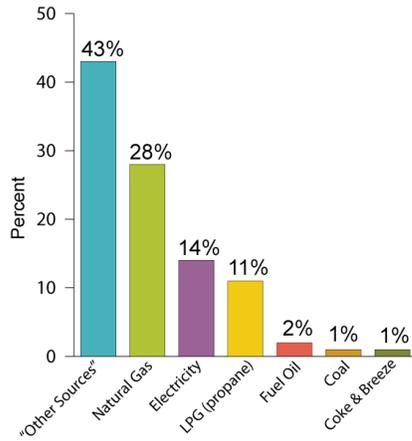


Industry also has successfully moved from oil and relies little on oil for most of its sectors. Transport remains the outlier in all of this. As our industries

<sup>4</sup> [http://www.eia.doe.gov/cneaf/electricity/epa/epa\\_sum.html](http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html)

have grown in output their use of oil per unit of output has dropped considerably.

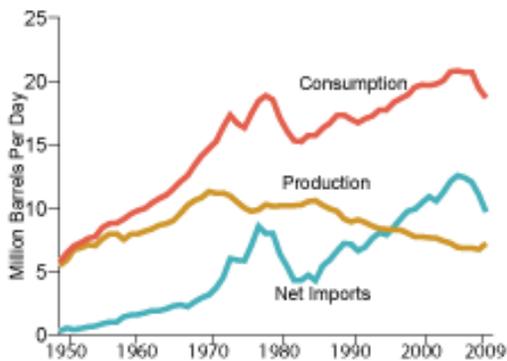
### Sources of Energy Used for Industry and Manufacturing



Source: Energy Information Administration, *Manufacturing Energy Consumption Survey*, Table 3.2 (July 2009).

One of the key graphs is that showing how our *conventional* oil production has declined since the 1970s on average.

### Consumption, Production, and Import Trends (1949-2009)



Source: U.S. Energy Information Administration, *Annual Energy Review 2009*, Table 5.1 (August 2010).

Unconventional oil resources, such as out of the Bakken and other oil shale resources, could be significant potential energy sources of the future and

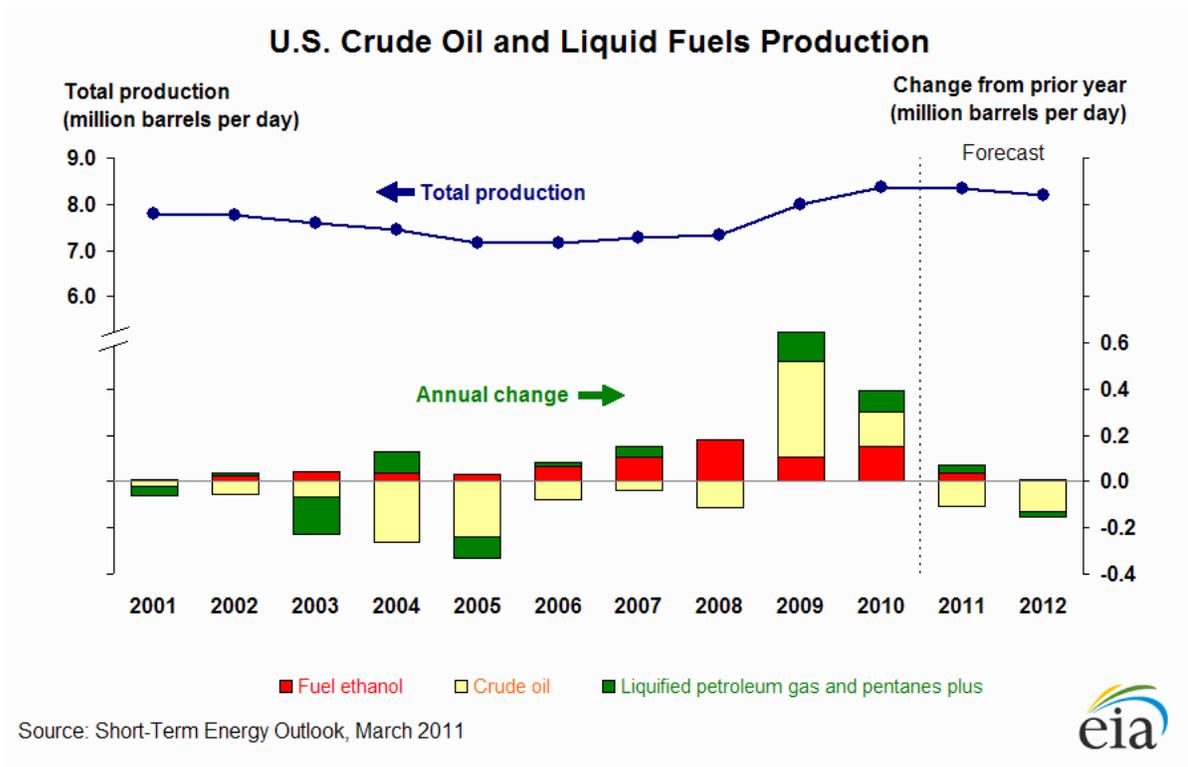
considerable investments are pouring into these areas.<sup>5</sup> These unconventional resources have added some to the increase in oil production of oil in 2009 to date<sup>6</sup>. However, oil leases that were allowed in the past also have come to fruition recently. Greater restrictions on oil production and leasing will likely lead to a decline in oil production in the future. The development of oil field leases often take many years and huge investments to make them work properly. Increasing restrictions on offshore drilling may lead to an even greater need for Canadian oil<sup>7</sup>.

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<sup>5</sup> <http://www.ft.com/cms/s/0/8698ae80-4503-11e0-80e7-00144feab49a.html#axzz1I01IVhds>,  
[http://www.eia.doe.gov/oil\\_gas/petroleum/data\\_publications/petroleum\\_supply\\_monthly/psm.html](http://www.eia.doe.gov/oil_gas/petroleum/data_publications/petroleum_supply_monthly/psm.html),  
[http://www.eia.gov/oil\\_gas/petroleum/data\\_publications/weekly\\_petroleum\\_status\\_report/wpsr.html](http://www.eia.gov/oil_gas/petroleum/data_publications/weekly_petroleum_status_report/wpsr.html),  
[http://www.eia.doe.gov/steo/#Global\\_Crude\\_Oil\\_And\\_Liquid\\_Fuels](http://www.eia.doe.gov/steo/#Global_Crude_Oil_And_Liquid_Fuels),

<sup>6</sup> <http://www.eia.doe.gov/steo/gifs/Fig13.gif>, <http://www.eia.doe.gov/state/state-energy-profiles-analysis.cfm?sid=MT>, <http://www.eia.doe.gov/state/state-energy-profiles-analysis.cfm?sid=ND>,  
<http://www.eia.doe.gov/state/state-energy-profiles-analysis.cfm?sid=WY>, <http://coalgeology.com/2010-domestic-oil-production-up-20-year-over-year-newfield-exploration-company-nyse-nfx/13928/>,  
[http://money.cnn.com/2011/03/04/news/economy/oil\\_shale\\_bakken/](http://money.cnn.com/2011/03/04/news/economy/oil_shale_bakken/),  
[http://www.api.org/aboutoilgas/oilshale/upload/Oil\\_Shale\\_Factsheet\\_1.pdf](http://www.api.org/aboutoilgas/oilshale/upload/Oil_Shale_Factsheet_1.pdf),  
<http://www.kiplinger.com/businessresource/forecast/archive/gulf-cuts-bring-us-oil-output-down.html>

<sup>7</sup> <http://www.api.org/Newsroom/offshore-approvals.cfm>,  
<http://www.instituteforenergyresearch.org/2010/06/25/in-2009-u-s-led-the-rest-of-the-world-in-increases-of-oil-and-natural-gas-production-china-recorded-the-greatest-increase-in-energy-consumption-and-emissions/#>,

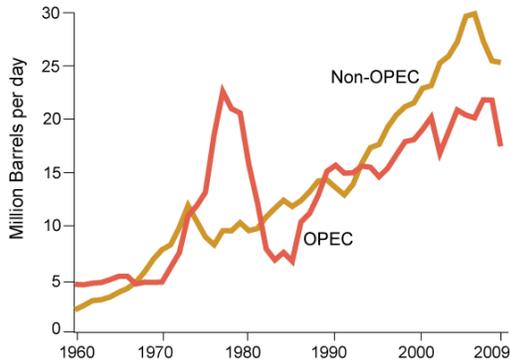


Except a few years of recession and the reactions to the oil shocks in the 1970s aside, our imports and consumption have been, on average, increasing. We have also been paying out hundreds of billions of dollars each year to import this oil<sup>8</sup>.

The following chart is a very interesting one pointing out the importance of our imports from non-OPEC countries, such as Canada, Mexico, and Brazil.

<sup>8</sup> [http://assets.opencrs.com/rpts/RL34686\\_20100212.pdf](http://assets.opencrs.com/rpts/RL34686_20100212.pdf),  
[http://assets.opencrs.com/rpts/RS22204\\_20100914.pdf](http://assets.opencrs.com/rpts/RS22204_20100914.pdf),

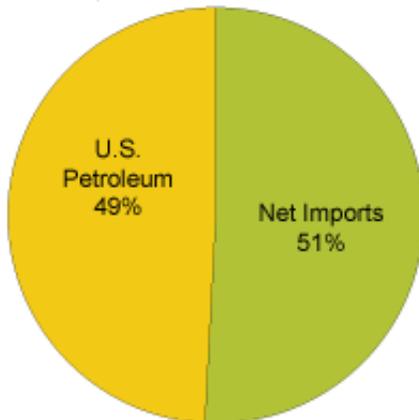
### Petroleum Imports from OPEC Are Less than Imports from Non-OPEC Countries



Source: U.S. Energy Information Administration, *Annual Energy Review 2009* (August 2010).

Yet will still have to contend with very large imports of oil at very high price tags.

### Net Imports and Domestic Petroleum as Shares of U.S. Demand, 2009

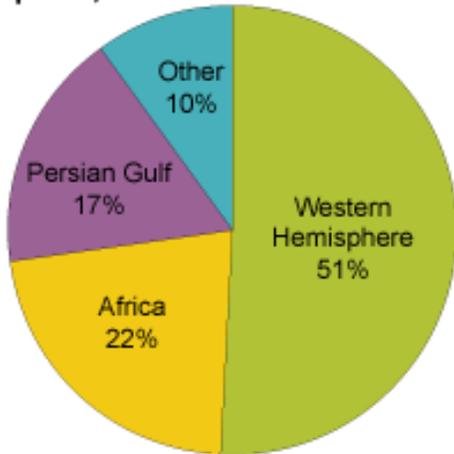


Source: U.S. Energy Information Administration, *Petroleum Supply Annual 2009* (July 2010).

Importantly, most of our oil imports are from the Western Hemisphere with Canada being the most important source at 23% of our imports. Venezuela is

about 10.7% of our imports. Saudi Arabia is about 10.4%. Mexico is about 9.2%. Nigeria is about 8.3%.

**Sources of U.S. Net Petroleum Imports, 2009**



Source: U.S. Energy Information Administration, *Petroleum Supply Annual 2009*.

The following charts show where we have recently been getting our oil from<sup>9</sup>:

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[http://www.eia.doe.gov/pub/oil\\_gas/petroleum/data\\_publications/company\\_level\\_imports/current/import.html](http://www.eia.doe.gov/pub/oil_gas/petroleum/data_publications/company_level_imports/current/import.html). See also <http://www.capp.ca/GetDoc.aspx?dt=PDF&docID=186104>

Crude Oil Imports (Top 15 Countries)  
(Thousand Barrels per Day)

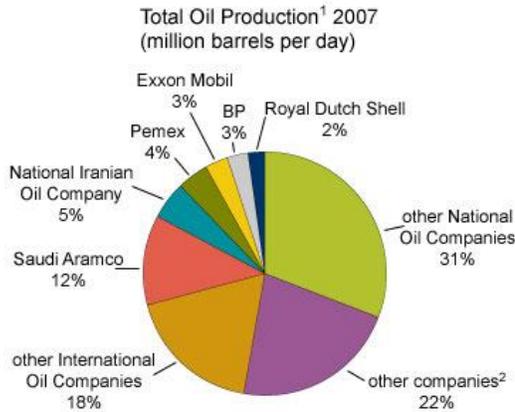
Country	Dec-10	Nov-10	YTD 2010	Dec-09	YTD 2009
CANADA	2,064	1,975	1,972	2,104	1,943
MEXICO	1,223	1,229	1,140	1,063	1,092
SAUDI ARABIA	1,076	1,119	1,080	870	980
NIGERIA	1,024	806	986	1,020	776
VENEZUELA	825	884	912	772	951
IRAQ	336	340	414	325	449
ANGOLA	307	263	380	266	448
BRAZIL	271	188	254	181	295
ALGERIA	262	379	325	336	281
COLOMBIA	220	489	338	179	251
ECUADOR	192	188	195	86	181
RUSSIA	158	85	252	168	230
KUWAIT	125	170	195	160	180
UNITED KINGDOM	124	80	120	67	103
ARGENTINA	85	35	29	33	53

Total Imports of Petroleum (Top 15 Countries)  
(Thousand Barrels per Day)

Country	Dec-10	Nov-10	YTD 2010	Dec-09	YTD 2009
CANADA	2,713	2,510	2,532	2,710	2,479
MEXICO	1,365	1,363	1,280	1,204	1,210
SAUDI ARABIA	1,087	1,141	1,094	877	1,004
NIGERIA	1,070	860	1,025	1,029	809
VENEZUELA	917	942	987	849	1,063
RUSSIA	514	553	611	385	563
ALGERIA	484	572	507	544	493
IRAQ	336	340	414	325	450
ANGOLA	319	276	390	278	460
BRAZIL	295	198	271	184	309
UNITED KINGDOM	236	187	256	199	245
COLOMBIA	231	492	365	231	276
ECUADOR	192	194	197	86	185
VIRGIN ISLANDS	191	234	255	289	277
KUWAIT	125	170	197	160	182

It is also important to note that most of our oil imports from outside of Canada come *from national oil companies*, which may have their own specific policy and other goals in mind beyond simple market interests<sup>10</sup>.

*In 2007, roughly 78% of total world oil was produced by 50 companies, and of that production, about 70% was produced by national oil companies.*



Source: Petroleum Intelligence Weekly, (Vol XLVII, No. 48). December 1, 2008.

<sup>1</sup> Total oil production includes crude oil, natural gas liquids, and condensates.

<sup>2</sup> Includes smaller companies outside of the top 50 producers.

The national oil companies dominate not only the reserves of oil, but the production of it. Big oil is not Exxon. Big oil is Saudi Aramco. And of the *accessible reserves not controlled by the national oil companies 52 percent is to be found in Canada*<sup>11</sup>.

We can see where our oil is coming from and where our demand for oil has been growing and it is mostly in transport.

It would be great if we could lightweight our cars, make them more efficient in their drive trains and more, and convert most if not all of our cars to

<sup>10</sup> <http://www.capp.ca/GetDoc.aspx?dt=PDF&docID=186104>, [http://www.eia.doe.gov/energy\\_in\\_brief/world\\_oil\\_market.cfm](http://www.eia.doe.gov/energy_in_brief/world_oil_market.cfm), and <http://www.rice.edu/energy/research/nationaloil/index.html>.

<sup>11</sup> <http://www.capp.ca/GetDoc.aspx?dt=PDF&docID=186104>,

electric plug-ins, hybrid plug ins, CNG<sup>12</sup>, hydrogen, methanol, and the like but that could take many years, if not decades. Another good idea, of course, is to have more of our transportation vehicles, aircraft, ships, etc. converted to flexible fuel engines in order to allow transport, other companies, the government, military, and consumers, to adjust their costs as different energy resources become more or less expensive or reliable than others. The simple mathematics of automobile vintages could indicate how long these changes could take. If we wanted to get around that then would also need to refit our transport vehicles as well as our transport infrastructure to these alternative fuels. Such things do not happen overnight. If these changes are pushed too fast and too hard then we could have significant economic and other disruptions in the US. There could also be vastly increased risk of severe instability in the oil producing nations that might dwarf even what is going on now. So we need to phase into the new energy futures over proper time periods and in proper, thoughtful and strategic manners. However, *we also need answers to our present and near term oil security issues now*. In the longer runs we need to change the way we do things, but these changes need to be done in a reasonable and reasoned fashion.

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<sup>12</sup> Compressed Natural Gas

**Instability in the Middle East, North Africa and other areas are driving a new calculation of our energy security situations:**

As the Middle East and North Africa are in turmoil, and with greater turmoil possible, it behooves us to focus on more diversified energy sources, and especially oil sources, closer to home or at the very least from places that are facing less instability and civil strife. *Canada is one of the most stable countries on the planet and will likely be so well into the future.*

The present and future instabilities in the Middle East and North Africa are not just a problem for oil production, but also of oil transport, such as around the Bab Al Mandab near Yemen, which carries about 3 million barrels of oil a day, the Suez Canal and Sumed pipeline, which carry 3-3.5 million barrels a day<sup>13</sup>, The Straits of Hormuz, which carries between 12 and 15 million barrels a day, and more<sup>14</sup>.



<sup>13</sup> As the Egyptian situation may get more complex see:

<http://www.eia.doe.gov/countries/cab.cfm?fips=EG>

<sup>14</sup> [http://www.eia.gov/cabs/world\\_oil\\_transit\\_chokepoints/background.html](http://www.eia.gov/cabs/world_oil_transit_chokepoints/background.html)



There are various pipelines and oil ports and offloading zones, such as the Al Basra Oil Terminal (ABOT) and Khor Al-Amaya Oil Terminal (KABOT) in Iraq, which send out about 1.5 million barrels a day on a good day, the Ab Qaiq Processing Facility in Saudi Arabia, and others that could be at extreme risk given certain circumstances<sup>15</sup>. Al Qaeda got very close to damaging Ab Qaiq in 2006, and this facility handles 6-7 million barrels of oil from various oil fields in the country<sup>16</sup>. That is 6-7 million barrels out of 82 million barrels a day that are used worldwide. There are numerous other

<sup>15</sup> See the Country Analysis Briefs on the countries in the region via: <http://www.eia.doe.gov/cabs/>

<sup>16</sup> <http://www.washingtoninstitute.org/templateC05.php?CID=2446>

facilities and pipelines that could be at risk given various scenarios that could face these countries in the future.

The situation in Libya is just one indication of the possibly bigger threats that are looming as the contagion of rebellion possibly spreads in the region and maybe even beyond<sup>17</sup>. The situation in Bahrain as its spread into Qatif, Saudi Arabia recently is also far from comforting<sup>18</sup>.



There have been demonstrations in Iraq. Iran could be facing down increased instability. Oman has seen demonstrations. Algeria is a country that needs to be watched. Yemen is heading toward possible failed state status, or even been broken into many failed states. Jordan has had demonstrations, but I don't see that heading south as some other places have. Syria has had increasing violent reactions to demonstrations, especially in Dara'a in the south<sup>19</sup>. These demonstrations have recently spread to many

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<sup>17</sup> [http://www.iea.org/files/facts\\_libya.pdf](http://www.iea.org/files/facts_libya.pdf), <http://www.ogj.com/index/article-display/1323636114/articles/oil-gas-journal/general-interest-2/20100/march-2011/iea-sees-lengthy-reduction.html>, <http://online.wsj.com/article/SB10001424052748703300904576178151215604240.html>, and [http://www.iea.org/files/oil\\_market\\_libyan\\_supply\\_2mar11.pdfm](http://www.iea.org/files/oil_market_libyan_supply_2mar11.pdfm).

<sup>18</sup> <http://www.bbc.co.uk/news/world-middle-east-12708401>

<sup>19</sup> <http://www.nytimes.com/2011/03/26/world/middleeast/26syria.html> and <http://www.crisisgroup.org/en/publication-type/media-releases/2011/conflict-risk-alert-syria.aspx>

areas in the country and have turned quite violent<sup>20</sup>. Syria is not a major oil producer, but its importance in the peace process, its relations with Iran, Lebanon, and other states in the region could make instability and change in this country more important to the overall situation in the region well beyond things weighted by oil production and population.

Then there is the constant, nagging conundrum of the Palestinian issue, which still reverberates in the region. Things have been heating up there as well. Kuwait has had demonstrations. The only two countries that have not seen any sense of instability or vocal discontent have been the UAE and Qatar, thankfully. They are also contributors to the efforts towards the no-fly zone in Libya<sup>21</sup>.

However, if the Saudi situation gets more complex then even these lucky two may be facing significant stress. They share borders with Saudi Arabia<sup>22</sup>. So far there are no indications of troubles ahead for these two small nations in the midst of such actual and potential turmoil. Saudi Arabia also seems to have the situation in control. But the leadership of Saudi Arabia clearly sees the problems at hand and is trying to respond<sup>23</sup>. However, there are indications that Iran is trying to stir up trouble in the Shia communities in the region<sup>24</sup>, including, possibly, the large Shia population that lives atop many of the major oil fields of Saudi Arabia. The problem is not just from Shia and Sunni political differences. The problem is also from Iran stirring up trouble and from political, economic and other tensions that have been translated into confessional stresses and resentments. Iran is trying to use the grievances of some of the Shia in the region for its own benefit.

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<sup>20</sup> [http://www.rferl.org/content/feature\\_on\\_syria\\_changes/3540869.html](http://www.rferl.org/content/feature_on_syria_changes/3540869.html),

<http://www.guardian.co.uk/world/2011/mar/29/syria-bashir-al-assad-protest>,

<sup>21</sup> <http://www.nytimes.com/2011/03/26/world/africa/26libya.html?partner=rss&emc=rss> and <http://www.bloomberg.com/news/2011-03-25/qaddafi-unites-arab-league-in-campaign-to-oust-libya-s-mad-dog-dictator.html>

<sup>22</sup> <http://www.eia.doe.gov/countries/cab.cfm?fips=TC>

<sup>23</sup> <http://www.eurasiareview.com/challenges-for-saudi-arabia-amidst-protests-in-the-gulf-analysis-25032011/>, and <http://online.wsj.com/article/SB10001424052748704608504576208764057863034.html>,

<sup>24</sup> <http://www.bloomberg.com/news/2011-03-25/qaddafi-unites-arab-league-in-campaign-to-oust-libya-s-mad-dog-dictator.html>



To see the importance of these many Middle East and North African countries in the overall oil export picture please look at this chart from the EIA of the top 15 oil exporters in the world<sup>25</sup>:

**“Country**

**Exports**

**1 Saudi Arabia**

7,322

**2 Russia**

7,194

**3 Iran**

2,486

**4 United Arab Emirates**

2,303

**5 Norway**

2,132

**6 Kuwait**

2,124

**7 Nigeria**

1,939

**8 Angola**

1,878

**9 Algeria**

1,807

<sup>25</sup> <http://www.eia.doe.gov/countries/>

**10 Iraq**

1,764

**11 Venezuela**

1,748

**12 Libya**

1,525

**13 Kazakhstan**

1,299

**14 Canada**

1,144

**15 Qatar**

1,066”

But that is really not enough to explain how important these countries are. Most of the excess capacity in the oil markets can be found in the Arabian Gulf region, and 80 percent of that is found in Saudi Arabia. Spare capacity is the buffer against any oil shocks in the future. If something goes wrong outside of the region then that excess capacity can be used. If it happens in the region where the excess capacity is found then we have real problems<sup>26</sup>.

**Sometimes it is not that we import oil, but from whom we import the oil:**

As we saw above, the US's largest trading partner, tightest foreign relations, and strongest energy relations are with our neighbors to the north, Canada. They are also our largest source of imported oil.

Our friends to the South, Mexico, are our second largest source of imports recently, but they are having extreme problems with declining oil production and have problematic management issues of their state oil company, PEMEX. There is also considerable underinvestment in PEMEX.

Next is Saudi Arabia, a country in an unstable area that may soon have some problems of its own. Hopefully, Saudi Arabia will remain the stable ally that it is today, but given the situation in the region and the fact that most of the people living near their largest oil fields are Shia, who have grievances and

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<sup>26</sup> <http://ftalphaville.ft.com/blog/2011/03/08/507161/>, <http://www.ft.com/cms/s/0/bb49dab2-4690-11e0-967a-00144feab49a.html#axzz1GsPpr9jt>, and <http://www.ft.com/cms/s/0/b56c7898-2331-11e0-b6a3-00144feab49a.html>

may be stirred up by Iran, then we can't be sure of the future of even this stalwart source of oil. Saudi Arabia also has significant unemployment and underemployment problems.

King Abdullah has been sending tens of billions into the system lately to help alleviate some of the economic and other stresses in his country. He has also started the building of economic cities and education cities to help develop Saudi Arabia in a different and more sustainable way. One would hope that these efforts will move Saudi Arabia to a new future, but this is not fully certain.

Also, Chinese demands for Saudi oil have increased considerably over the last few years. The Chinese take more Saudi oil than we do<sup>28</sup>.

Next down the list of our sources of imported oil is Nigeria, which is having severe internal problems with the MEND (The Movement to Emancipate the Niger Delta) and other groups. It also has had a very difficult past with regard to interethnic strife and other issues that could become even bigger in the future. Internal strife has led to declines in the production of oil in the country on many occasions<sup>29</sup>.

Our next most important source of imported oil is Venezuela. Hugo Chavez is hardly an ally of the US. He publicly supports Mahmoud Ahmedinijad of Iran, Mouammar Ghaddafi of Libya, and other problematic figures and regimes on the world stage. Venezuela may also prove to be unstable in the near future. There seems to be a building resentment given unemployment, underemployment, corruption, oppression and more of the same factors that have led to uprisings and revolutions in the Middle East. China is also planning to take more oil from Venezuela in the future.<sup>30</sup> The widening and deepening of the Panama Canal could also have great effects on oil trade from Latin America to Asia.<sup>31</sup>

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<sup>28</sup> <http://www.nytimes.com/2010/03/20/business/energy-environment/20saudi.html> and [http://www.upi.com/Science\\_News/Resource-Wars/2011/03/24/China-taking-on-more-Saudi-crude/UPI-70551300969850/](http://www.upi.com/Science_News/Resource-Wars/2011/03/24/China-taking-on-more-Saudi-crude/UPI-70551300969850/)

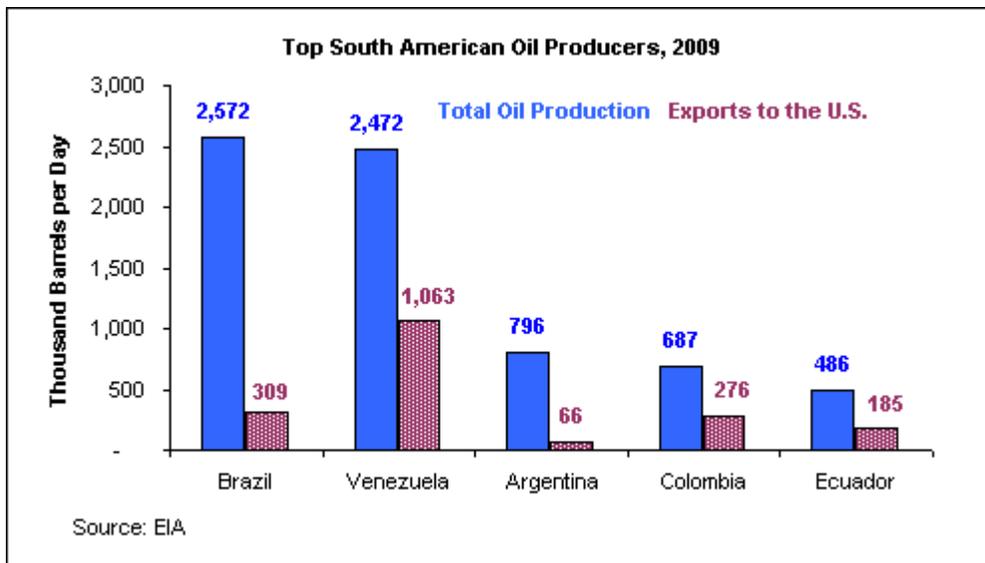
<sup>29</sup> [http://www.ogj.com/index/article-display/5872317024/articles/oil-gas-journal/drilling-production-2/2010/11/exxonmobil-rig\\_attacked.html](http://www.ogj.com/index/article-display/5872317024/articles/oil-gas-journal/drilling-production-2/2010/11/exxonmobil-rig_attacked.html), <http://www.bbc.co.uk/news/world-africa-11467394>,

<sup>30</sup> <http://www.businessweek.com/news/2010-04-18/china-lends-venezuela-20-billion-secures-oil-supply-update1-.html> and <http://online.wsj.com/article/SB10001424052748703512404576208642116371086.html>

<sup>31</sup> <http://www.theaustralian.com.au/business/news/china-eyes-panama-canal-expansion/story-e6frg90o-1225827691243>, <http://www.cosco.com/en/pic/forum/17622626373948636.pdf>,

Then we have considerable imports from Iraq, not the sort of country that gives one a sense of long term stability, especially given the recent demonstrations and other actions on the ground. Also, almost all of its oil goes through one fairly small geographic speck, the Al Basra Oil Terminal, or ABOT and its sister oil port facility, Khor Al –Amaya Oil Terminal, or KABOT<sup>32</sup>. 95 percent of all Iraq’s export revenues is from the oil exporting out of ABOT and KABOT<sup>33</sup>. The entire economy of Iraq relies on these set of wharves and pipelines at sea not far from Iran. We have our Operation Sea Dragon<sup>34</sup> protecting these facilities, but it may be only a matter of time before something happens there.

We do import oil from Brazil, Colombia, Ecuador, Trinidad and Tobago and oil refined products from many places in the Caribbean. Those are close by, and less problematic states than some of the others mentioned<sup>35</sup>. Our relations are not perfect and we have our differences, but these countries might be relied on more in the future for their oil as well, especially Brazil given their significant finds in subsalt regions offshore<sup>36</sup>. But these countries do not have the massive reserves that Canada has.



<sup>32</sup> <http://www.eia.doe.gov/cabs/iraq/pdf.pdf>

<sup>33</sup> <http://www.iraq-businessnews.com/tag/al-basra-oil-terminal/>, <http://www.maritime-database.com/port.php?pid=1776>, <http://www.iraqoilreport.com/oil/production-exports/tour-of-a-lifeline-3973/>, and <http://www.eia.doe.gov/cabs/iraq/pdf.pdf>

<sup>34</sup> <http://military.discovery.com/videos/operation-sea-dragon-abot-part-1.html>

<sup>35</sup> <http://www.eia.gov/countries/cab.cfm?fips=EC>, <http://www.eia.doe.gov/cabs/Colombia/pdf.pdf>,

<sup>36</sup> <http://www.eia.doe.gov/cabs/brazil/pdf.pdf>

When we consider our imports of refined products the important countries change, but not that much, and also they often remain in the potentially unstable areas and some are run by regimes that we could not exactly want to have a cup of tea with without gritting our teeth, such as that of Hugo Chavez of Venezuela.

**We need to reasonably consider our oil and energy futures, including the environmental and other tradeoffs involved:**

When we look at our top sources of imported oil one thing is clear-- we need to move closer to more stable areas and closer to our friends. Sure we can move from source to source as instabilities arise, but we also need to take care *to not get caught out and face energy shortages and economic problems when we have not properly prepared for our future.* We could also develop our own offshore and onshore conventional and unconventional resources. Our onshore unconventional resources, such as shale oil, could be massive, but this will take time and will require a careful phasing in of production. Until these sources are up to speed we need a stabilizing influence.

***The XL pipeline should be allowed to go forward for energy security, economic security, and national security reasons. Energy security is a vital part of national security, and it is a requirement for economic security.***

There are environmental issues that need to be dealt with, and they can be and they must be, but there are vital national energy security interests involved. This is not to dismiss the environmental issues. But these are all issues that are controllable and the technologies and management practices are already available to deal with them *with the proper regulations and oversight.*

There is a \$12 billion cost to consider in the building of the Keystone XL. That is about the cost of two medium sized nuclear power plants.

However, if the oil can get to Houston and our refineries in the south from Canada this may supplant many hundreds of thousands of barrels of imported crude from elsewhere, such as Venezuela. Or, when the need arises, this oil could replace oil from any other country on the lists where the types of oil in our refineries are close to those flowing in the XL pipeline. It could also be a way to stabilize our SPR over time in new ways.

Having such a pipeline may also make some oil countries pause the next time they would want to try to jack up the prices of oil, or try to follow through with oil boycott or slowdown threats for whatever reasons. The higher the price for conventional oils the more profitable it is to produce unconventional oils, and the more likely there will be more upstream and transportation investment in such unconventional oils.

Canada has about 175 billion barrels in proved reserves. Most of that is found in the tar sands of Alberta. This is oil in a neighboring and friendly state that does not go through dicey oil transport choke points<sup>37</sup>. The expectation is that oil sands will become an increasingly important part of oil production in Canada over the coming years<sup>38</sup>.

The Chinese are also interested in obtaining these tar sands oils via a pipeline that might be built to the west coast of Canada. If this pipeline is built and the oil flows to the western ports of Canada and on to China before we can increase our capacity to import Canadian tar sands oil then we may lose out on a great opportunity to lock in future flows of Canadian oil to us, rather than to the Chinese<sup>39</sup>.

Tar sands add just 5-15% over normal oil in CO<sub>2</sub><sup>40</sup>. Most CO<sub>2</sub> production for all oil types happens with the oil is burned in the autos, planes, ships, factories, etc. It is very important to look at the life-cycle CO<sub>2</sub> emissions and not just at the increase in emissions from producing tar sands, other heavy oils and the lighter oils, many of these lighter oils already heading toward peak<sup>41</sup>. Also, the Province of Alberta has increasingly strict environmental, safety and other regulations being imposed on the tar sands industry<sup>42</sup>. There

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<sup>37</sup> <http://www.eia.gov/todayinenergy/detail.cfm?id=330>

<sup>38</sup> <http://www.capp.ca/GetDoc.aspx?DocId=173003>

<sup>39</sup> <http://www.guardian.co.uk/business/2010/feb/14/canada-china-investment-oil-sands>, [http://www.upi.com/Business\\_News/Security-Industry/2010/01/05/China-buys-into-Canadian-tar-sands-exploitation-project/UPI-22041262732184/](http://www.upi.com/Business_News/Security-Industry/2010/01/05/China-buys-into-Canadian-tar-sands-exploitation-project/UPI-22041262732184/), <http://www.bloomberg.com/news/2011-03-08/sinopec-paying-attention-to-proposed-canada-west-pipeline-1-.html>

<sup>40</sup> International Energy Agency, *World Energy Outlook 2010*, p. 156, IEA, Paris, 2010 and <http://www.capp.ca/oilsands/Pages/default.aspx#CcTLw23HdNiq>

<sup>41</sup>

<http://www.capp.ca/library/publications/crudeOilAndOilSands/pages/pubInfo.aspx?DocId=135721#G1eNc2Na14b3>, [www.cfr.org/content/publications/.../Oil\\_Sands\\_CSR47.pdf](http://www.cfr.org/content/publications/.../Oil_Sands_CSR47.pdf), and

[http://www2.ihsdera.com/docs/Oil\\_Sands\\_Energy\\_Dialogue\\_0810.pdf](http://www2.ihsdera.com/docs/Oil_Sands_Energy_Dialogue_0810.pdf)

<sup>42</sup> [http://www.environment.alberta.ca/documents/oil\\_sands\\_opportunity\\_balance.pdf](http://www.environment.alberta.ca/documents/oil_sands_opportunity_balance.pdf),

[http://www.environment.alberta.ca/documents/CCC\\_Calgary\\_report.pdf](http://www.environment.alberta.ca/documents/CCC_Calgary_report.pdf),

will likely be increasing efforts by the industry to capture and sequester more CO2 in the future.

Again, the most production of CO2 by any oils is in the combustion of those oils in transport vehicles, electricity production, industry and any other activity that combusts the oils and then send the once stored CO2 into the atmosphere as part of that combustion.

Again, what we need to do is focus on more efficient cars, light weighting of cars, alternative fuels cars, the development of flexible fuel options for many, if not all uses of fuels in transport and more, etc. But this will take time.

***In the meanwhile we need energy security that will support the transportation and other systems we have now, while at the same time focusing on changing those systems for even greater energy security.***

Tar sands oil is more expensive to make than conventional oils and there are more steps to making it useable in refineries. However, as we explore in deeper water and in harsher climates and more difficult places to find conventional oil then the costs for extracting the conventional oil will most likely continue to rise. They have been rising for many years. The era of cheap to find and produce conventional oil is over. However, given the potential increases in costs of production of conventional oil globally, the potential increases in riskiness of that production and in the transport of that oil through dicey chokepoints, the extra costs for tar sands are outweighed by the energy security benefits this pipeline could bring us.

We also need to consider how important transport costs variability is to the overall cost of getting the oil. Oil tanker costs have had a very wild ride over the last few years. Oil tanker leasing costs are mostly found by the equilibrium of the markets and when there is surging demand for oil then the prices for the tankers spike as well. The lease rates for the very large tankers that normally bring crude over long distances spiked to close to \$90,000 a day in 2008 from around \$50,000 a day in 2006-2007. Now they are down to about \$20,000 a day or so, but as the demand rises this will likely spike again as it also did from 2001 to 2004<sup>43</sup>. The price of transporting the oil

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<http://www.energy.alberta.ca/OilSands/583.asp>, and  
<http://www.capp.ca/oilsands/Pages/OilSandsEnvironment.aspx#TxltknkUyGGs>

<sup>43</sup> <http://www.intertanko.com/templates/Page.aspx?id=18>

from Canada would be set by FERC in the U.S. and would **not** have the same supply/demand features that cause these transport costs spikes for tankers<sup>44</sup>. The variability of transport costs for the pipeline would be kept in check by FERC and Canadian regulators.

The costs of sending oil by ship also increases for certain areas as political risk and physical and pirate risk to the shipping goes up, such as around the Bab Al Mandab in Yemen and the waters off Somalia, Yemen, Kenya, Oman, Tanzania, Nigeria, and other countries where some of the largest oil cargos transport. The examples of the hijacking of the 2 million barrel Sirius Star a couple of years ago, and the recent hijacking of a Greek supertanker should give us pause once again<sup>45</sup>. A Kuwaiti tanker headed to Singapore was hijacked very recently off of Oman.<sup>46</sup>

It will be a lot cheaper to send the oil by pipe from Canada than by ship from Saudi Arabia and Nigeria, especially during times of very high demand for shipping. As the demand for shipping drops during deep recessions then the prices of transport by ship decline and begin to approach those of the pipeline costs. However, for long distance oil journeys by sea there are other risks and cost vulnerabilities that pipelines do not have.

### **Peak conventional oil and the promise of unconventional oil:**

*Conventional oil* already peaked worldwide according to the IEA<sup>47</sup>. It peaked in the US in 1973. It has been peaking and will peak in many non-OPEC countries over the years. Clearly, the world will be pushed to rely more and more on unconventional oil as time progresses and the conventional oil gets harder and more expensive to find.

Two of the biggest sources of available, in the shorter term, unconventional oil are the tar sands of Canada and the heavy oils of Venezuela. I would rather the US relies on our friends the Canadians -- and our own internal

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<sup>44</sup> <http://www.intertanko.com/templates/Page.aspx?id=18831>, <http://www.ferc.gov/industries/oil.asp>, <http://www.ferc.gov/industries/oil/gen-info/pipeline-index.asp>, <http://www.transcanada.com/5232.html>, <http://www.ferc.gov/docs-filing/etariff.asp>, and <http://www.ferc.gov/docs-filing/etariff.asp>.

<sup>45</sup> <http://www.guardian.co.uk/world/2008/nov/18/somalia-oil> and <http://www.reuters.com/article/2011/02/09/us-oman-supertanker-idUSTRE7182Q220110209>

<sup>46</sup> <http://af.reuters.com/article/topNews/idAFJOE72S01J20110329>

<sup>47</sup> <http://www.energybulletin.net/stories/2010-11-11/iea-acknowledges-peak-oil>, [http://www.worldenergyoutlook.org/docs/weo2009/WEO2009\\_es\\_english.pdf](http://www.worldenergyoutlook.org/docs/weo2009/WEO2009_es_english.pdf)

sources of unconventional oil, such as shale oil—than on a possibly unreliable source of oil from what could prove to be a declining regime of Hugo Chavez. If the country changes its type of leadership and behavior toward the US then we could revisit this, but for now we get what we see – and it is not calming. We have potentially massive reserves of unconventional oil in our own country, but that could take some time to develop, and actually some of these places could be helped in their development with this pipeline system as a connector to other pipeline systems. The Bakken Formation comes to mind on this.

### **We also need to focus inward as we consider our energy futures:**

There is also a need for us to also focus more on our own oil resources, including the huge offshore fields that are now so hard to get at off of the West and East Coasts and in Alaska. With the proper regulations and oversight this could go very well for us and help protect us from further shocks in a much more important way than our SPR does. The SPR is just 700 million barrels. We could have over 7 times our presently published proved reserves of 19.1 billion barrels, and our unconventional oil reserves could be just massive<sup>48</sup>.

We also need to focus on new production technologies, including enhanced oil recovery techniques.

The average output of the average US well is just 10 b/d. 79 percent of our wells are stripper wells with less than 10 b/d. 86 percent are marginal wells at less than 15 b/d<sup>49</sup>.

With developments of offshore fields, shale oil, and the like we could go a long way toward this medium term diversification that is required. Pushing more application of enhanced oil recovery techniques could also help our energy security situation<sup>50</sup>.

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<sup>48</sup> [http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore\\_id=04212e22-c1b3-41f2-b0ba-0da5eaead952](http://epw.senate.gov/public/index.cfm?FuseAction=Files.View&FileStore_id=04212e22-c1b3-41f2-b0ba-0da5eaead952) and

[http://fossil.energy.gov/programs/reserves/npr/publications/Unconventional\\_Oil.pdf](http://fossil.energy.gov/programs/reserves/npr/publications/Unconventional_Oil.pdf)

<sup>49</sup> <http://www.eia.doe.gov/aer/txt/ptb0502.html>, <http://www.nswa.us/dyn/showpage.php?id=25>, <http://iogcc.myshopify.com/collections/frontpage/products/2009-marginal-well-report>

<sup>50</sup> Alvarado, Vladimir, and Menrique, Eduardo, 'Enhanced Oil Recovery: An Update Review', *Energies*, Volume 3, 2020, pp. 1529-1575, <http://www.mdpi.com/1996-1073/3/9/1529/pdf>, Falcone, Gioia, et al, 'Can We Be More Efficient in Oil and Gas Exploitation?', *Journal of Physics and Natural Sciences*, Volume 1, Issue 2,

**It would be a moment of energy security folly to not allow this project to go forward:**

Putting all of this together we can see it would be a moment of energy security and national security folly to stop this pipeline from being built and operated<sup>51</sup>. *The Canadians are the most important and most reliable source of imported oil we have.* They supply large quantities of electricity to us and import electricity from us as well. They are the largest source of our imported natural gas, *and this is by pipeline.* We also have significant cross-border energy investments with the Canadians on hydrocarbon sources and technologies as well as in alternative energies. Our energy relations with the Canadians are very important<sup>52</sup>. The U.S. and Canada have an important clean energy dialogue as well<sup>53</sup>.

Both countries realize the importance of efficiency gains, smart grids, alternative energy futures, flexible fuel use, new forms of transport and more. Some of our strongest intellectual cooperative efforts on energy futures can also be found with the Canadians. The US, along with partnerships and collaborations with Canada and others can move forward to the new energy future. But that future is **not** just around the corner.

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<http://www.scientificjournals.org/journals2007/articles/1319.pdf>, Maugeri, Leonardo, 'Squeezing More Oil from the Ground', *Scientific American*, October 2010, <http://www.scientificamerican.com/article.cfm?id=squeezing-more-oil-edit-this>, Sandra, Ivan and Sandra, Rafael, 'Recovery Factors Leave EOR Plenty of Room for Growth', *Oil and Gas Journal*, 12 November 2007, Volume 105, no. 42.

<sup>51</sup> <http://energy.nationaljournal.com/2010/08/should-obama-approve-oil-pipel.php#1614290>

<sup>52</sup> <http://www.eia.doe.gov/cabs/Canada/pdf.pdf>

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[http://events.energetics.com/USCanadaCleanEnergy2010/pdfs/US\\_Canada\\_Clean\\_Energy\\_Dialogue\\_2010\\_Conference\\_Summary\\_Report.pdf](http://events.energetics.com/USCanadaCleanEnergy2010/pdfs/US_Canada_Clean_Energy_Dialogue_2010_Conference_Summary_Report.pdf)

The strongest and most reliable economic relations we have are with the Canadians. We have huge amounts of people, goods, services, electronic information, funds and energy sources flowing between our countries each day<sup>54</sup>. The deepest and most important defense relationship the US has is with Canada<sup>55</sup>.

Our many important relations with Canada also link with our relations with other important allies, trading partners and others. The Canadians are our closest friends in the world on many issues.

We will be in need of oil from the Canadians for some time to come. Our oil, gas and electricity trade with the Canadians could prove to be one of the most important linkages for both of our countries as we both face new energy challenges. The US transition from oil and gas to a new energy future for the US will likely also include Canada in many ways.

It is important to see the problems with our dependence on oil. It is even more important to see the importance of reason and strategic planning to make sure that our energy supplies remain secure in the coming difficult transitions that we will face to a new energy and geopolitical future.

We need to be reasonable and think of the need for Canada's oil in the short to medium runs, ***but also we need to think down the line in the longer runs when both of our countries will need to find an energy future that could be very different from today.***

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<sup>54</sup> Please see <http://www.buyusa.gov/canada/en/traderelationsusacanada.html> for even more indications of how important Canada is to the US economically and otherwise.

<sup>55</sup> Please see: <http://www.forces.gc.ca/site/focus/canada-us-canada-eu/index-eng.asp>.  
One might also look at: <http://www.state.gov/r/pa/ei/bgn/2089.htm>

**We need to be reasonable in our tradeoffs with a clear view of the problems we face ahead:**

This pipeline is a step forward in the direction of better energy, economic and national security for the U.S. in the medium run. It is not the giant step toward a new energy future than some would like, but it could be part of reasoned and reasonable set of steps that could be used as a bridge to our new energy future. These steps could help secure our energy needs for today and for the medium term as the US and others begin the very complex quest to find sustainable and attainable energy security in the long run.

Respectfully Submitted,

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**United States House of Representatives  
Committee on Foreign Affairs**

**"TRUTH IN TESTIMONY" DISCLOSURE FORM**

Clause 2(g) of rule XI of the Rules of the House of Representatives and the Rules of the Committee require the disclosure of the following information. A copy of this form should be attached to your written testimony:

<b>1. Name:</b>  Professor Paul J. Sullivan	<b>2. Organization or organizations you are representing:</b>  National Defense U./ Georgetown U.
<b>3. Date of Committee hearing:</b>  March 31, 2011	
<b>4. Have you received any Federal grants or contracts (including any subgrants and subcontracts) since October 1, 2008 related to the subject on which you have been invited to testify?</b>	<b>5. Have any of the organizations you are representing received any Federal grants or contracts (including any subgrants and subcontracts) since October 1, 2008 related to the subject on which you have been invited to testify?</b>
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<b>6. If you answered yes to either item 4 or 5, please list the source and amount of each grant or contract, and indicate whether the recipient of such grant was you or the organization(s) you are representing. You may list additional grants or contracts on additional sheets.</b>	
<p align="center"><i>According to Legal Affairs, NDY and Sponsored Programs office, Georgetown there are no such grants</i></p>	
<b>7. Signature:</b>  	

*Please attach a copy of this form to your written testimony.*