

WTI Crude \$US/B	Edmonton Light \$Cdn/B	Henry Hub Gas \$US/MMBtu	AECO Gas \$Cdn/GJ	AECO Basis \$US/MMBtu	Currency \$US/\$Cdn
96.56 ↑	93.64 ↑	3.56 ↓	2.86 ↓	0.69 ↑	0.9506 ↓

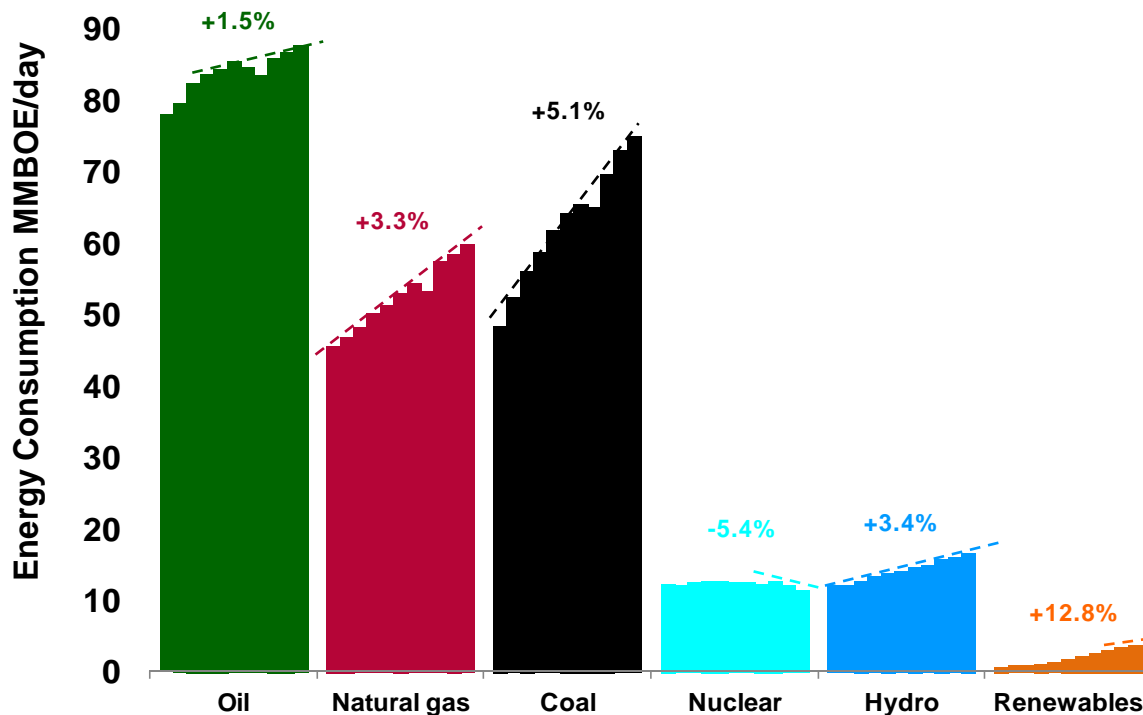
Chart Watch

- 6** Canadian dollar closed the week near a 2-year low
- 8** Brent-WTI differential narrowest since Jan 2011
- 33** AECO spot closed the week below \$C 3/GJ
- 34** US oil rig count fell to the lowest since April
- 56** Weak US coal prices deterring gas power demand

Forecast: More Energy, Rain or Shine

Our column was flooded out last week, due to the weather disaster in Calgary. Good humour amidst hardship was maintained with recollection of jokes that start out like, "Did you hear the one about the economist and the weatherman...?" Inevitably, the punch line

**Figure 1: World Energy Consumption by Source
Average 2002 to 2012, with Trending Growth Rates**



Sources: BP Statistical Review, ARC Financial Research

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Sources Bloomberg, CAODC, Baker Hughes, EIA, NOAA, CPC, IEA, Natural Resources Canada, Canadian Gas Association, ARC Financial Research

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portrays the economist as the dunce who has near-zero predictive capability, in lowly stature only one notch below a meteorologist.

Yet there is one thing an energy economist can say with confidence; that the world will continue to grow its energy needs every year, by about 2.5%, notwithstanding calamitous events like depressions, World Wars and the Financial Crisis of 2009. A couple of weeks ago, that ongoing forecast of unbounded energy consumption was validated yet again with the release of the *2012 BP Statistical Review*, the authoritative source of annual global energy data.

In Figure 1, we've compiled and displayed the world's consumption over the past 11 years, 2002 to 2012, grouped by each of the primary energy sources. Visually, the trends speak for themselves: The use of oil has moderated; natural gas has steady momentum; coal's resilience should never be underestimated; nuclear is down and out for now; hydro remains the quiet, inoffensive competitor; and renewables are showing good growth, but are still inconsequential to the big picture.

Oil – A laggard among the fossil fuels in terms of demand growth, oil's year-over-year pace has retreated to 1.5%, compared to 3.3% for natural gas and 5.1% for coal. Oil has been a bipolar story since 2008: for every new barrel purchased in an emerging economy, close to another barrel has been forfeited in either Europe, the US or Japan. That give and take is why global growth has been lackluster and choppy for the past few years. Mostly a transportation fuel, the inflation-adjusted price of oil is at its highest level in history, expensive to the point of moderating consumption habits and stimulating new sources of supply like light, tight oil (LTO) and oil sands. Over the past ten years China has been the place to watch, but the focus is now shifting back to western economies. Two dynamics are in play in North America: LTO production from resource plays, partially counterbalanced by a halt to domestic demand destruction. If the latter prevails in the United States, demand growth from places like China and the Middle East will be building their thirst for oil on a solid foundation of consumption, rather than one that has been sinking.

Natural gas – Data from BP shows that the use of gas

is growing in all parts of the world, especially in emerging markets. Asia-Pacific consumers are especially fond of gas, ratcheting up their use of the greenest of all fossil fuels by 7% per year. Japan wants to mothball its nukes and China wants to diversify its energy diet away from too much high-carb coal. Environmentalists call natural gas the "bridge fuel," because burning more gas at the expense of oil and coal is the best path for the world to transition to zero-carb renewable energy. Yet, surprisingly abrupt trends like shale gas suggest that natural gas is more likely to be a parking lot than a bridge to any other energy system. The scalability, widespread supply potential and consumer appeal of natural gas makes it the most exciting primary energy source to watch over the next decade.

Coal – In 13th century England, King Edward I banned the use of coal, because records showed that the emissions were, "corrupting the air with great stink and smoke, to the great prejudice and detriment of their health." Yet, this medieval energy policy was largely ignored; because even 700 years ago coal's compelling utility to consumers at a low price trumped its environmental detractions. BP's 2012 consumption data reinforces the notion that we should never rule out coal as a fierce competitor in any country's energy diet, regardless of domestic policies to mitigate its use. In emerging countries, coal remains the energy system of choice to bring impoverished citizens into the electrical world. Global growth is trending at 5.1%, supported by China's linear trajectory averaging 10% year-over-year. Competing energy systems have always sought to take away coal's market share, and western governments are implementing aggressive policies to diminish its share, but seven centuries of growth teach us to never underestimate the resilience of a longstanding incumbent.

Nuclear – Countless geeky magazines like *Popular Science* from the 1950s and 60s gushed about the promise of nuclear energy as the unlimited fuel of the future. But half-a-century later Fukushima reminded the world about the horrors of accidental radiation leaks. Nuclear energy consumption is down by 10.5% over the past two years, mostly, and not surprisingly, in Japan. The downward trend should level out in the next couple of years. Countries like China do have impressive plans for

more atomic reactors, but it's going to be hard to get a chain reaction going again in any western country.

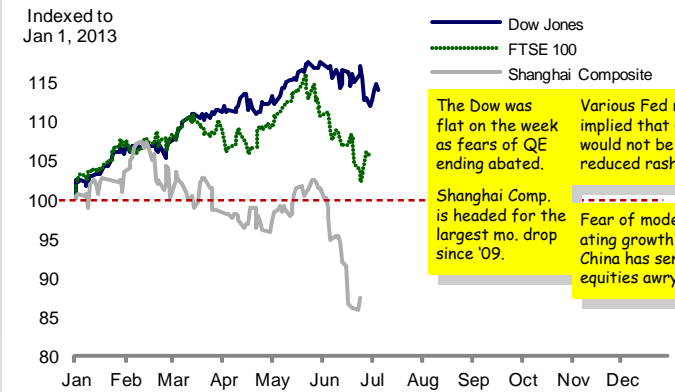
Hydroelectric – Most of the world's largest rivers have already been tamed to produce electrons, and those that haven't are subject to big, cross-border geopolitical issues surrounding water use. Nevertheless, hydroelectric power is still growing by over 3% worldwide, again mostly in emerging economies. Steady as she goes, hydro power is unlikely to grow faster, or conversely be watered down in future.

Renewables – On a percentage basis, renewables take the gold for growth with an impressive rate of 13% per year since 2010. But from an absolute perspective the news is more sobering: systems like wind, solar and biomass are not

taking market share away fast enough to make a difference to disconcerting metrics like carbon intensity. Because coal and natural gas are also growing at a good clip, on massively higher volumes, the share of renewables in the world's energy diet (currently 1.4%) is increasing by 0.1% per year. That means that unless something changes, under current conditions it's going to take 1,000 years to put the fossil fuel industry to bed! Yet we know that innovation that unleashes new energy technologies can occur suddenly, changing the world's proportion of primary fuels, but knowing when is about as difficult to predict as the weather.

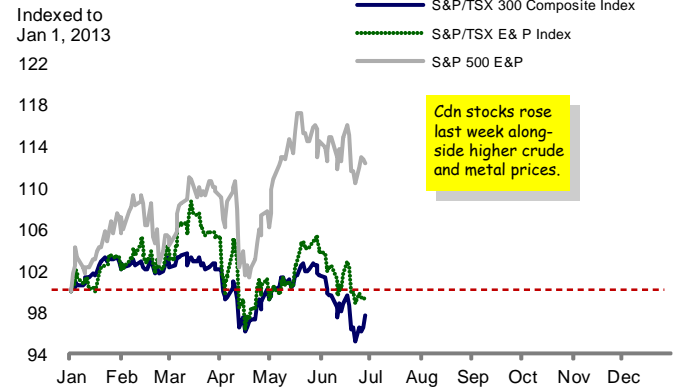
Market Indicators

1 Broad Equity Markets Year to Date
Daily Index Values; Indexed to January 1, 2013



Broad market indices are one of many vital signs measuring the health of the economy. Energy demand is a function of economic health.

2 Performance of Oil and Gas Equities Year to Date
Daily Index Values; Indexed to January 1, 2013



Performance of Canadian and US oil & gas equities are compared against the broader market.

3 ARC Canadian Oil & Gas Growth Equity Index
Daily Index Values; Rolling 24-Month History



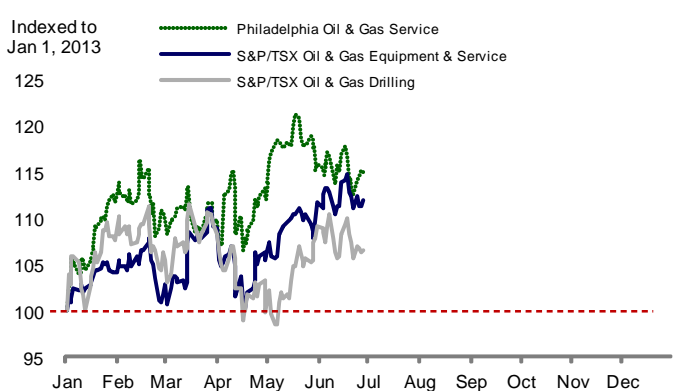
The ARC CDN Oil & Gas Growth Index measures the performance of over 100 oil and gas producers that are not included in larger exchange indices.

4 ARC Oil Sands Producers Equity Index
Daily Index Values; Rolling 24-Month History



The ARC Oil Sands Index measures the performance of six oil sand producers.

5 Oil & Gas Service Equities Year to Date
Daily Index Values; Indexed to January 1, 2013

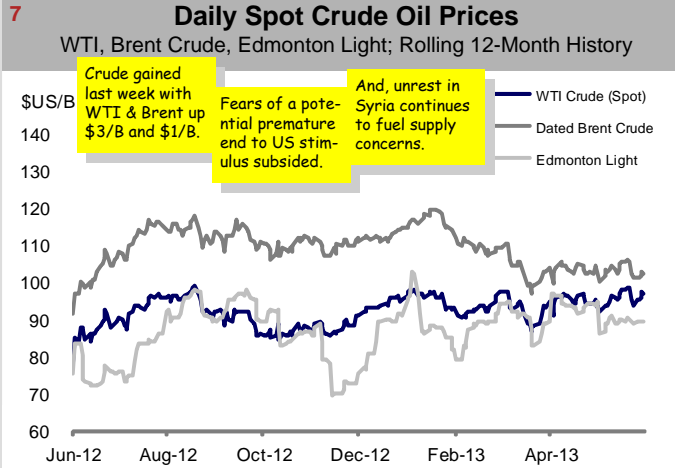


The performance of Canadian oil and gas service equities are plotted in tandem with the corresponding US company index.

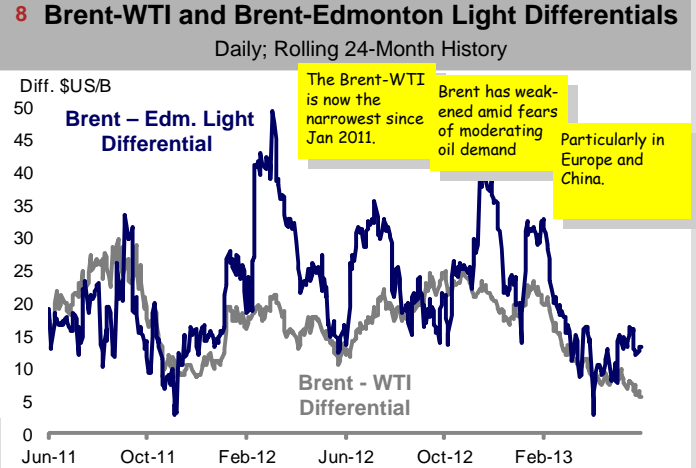
6 Canadian Currency Exchange
Daily Close Values; Rolling 24-Month History



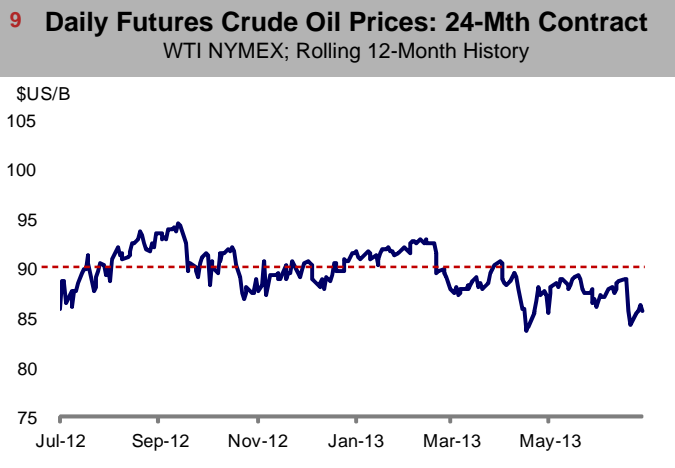
Much of Canada's oil and gas production is exported. As such, the value of the Canadian dollar has significant impact on corporate revenues.



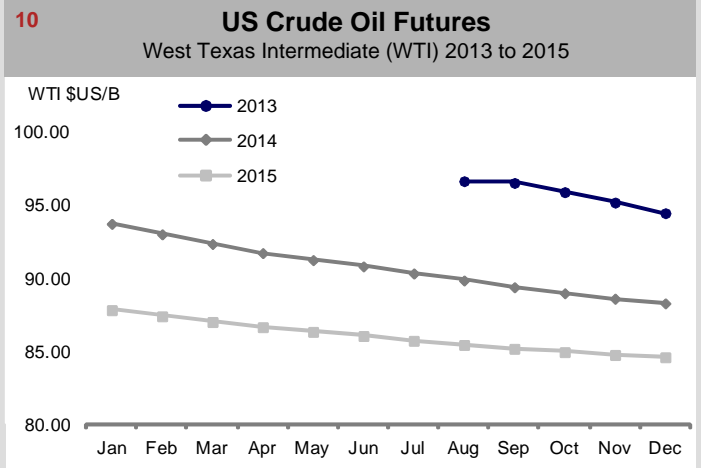
Spot crude oil prices are principally driven by stock levels, international supply/demand dynamics and related geopolitical influences.



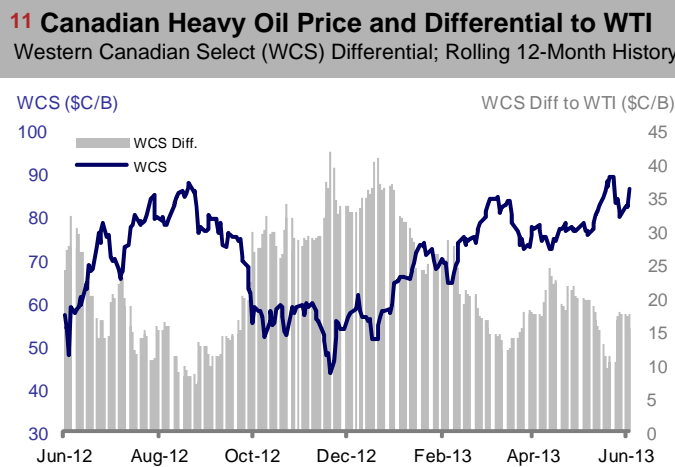
Crude oil price differentials are driven by domestic and international supply/demand dynamics including market accessibility and related geopolitics.



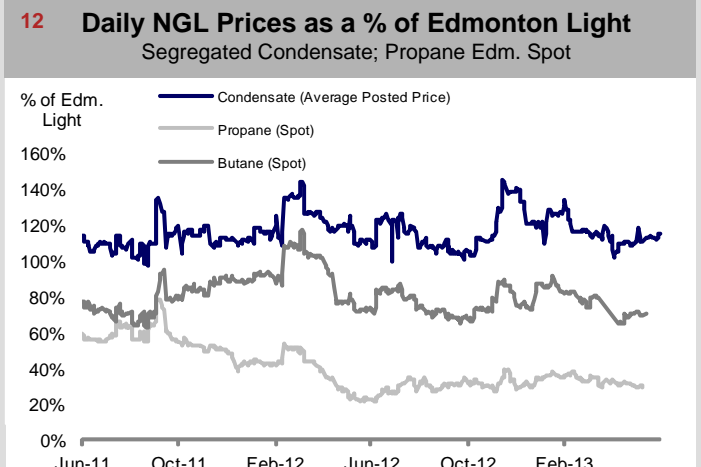
The daily close of the long end of the futures curve is important to watch for structural changes in the crude oil market.



Here forward contract prices for WTI are plotted against months in the calendar year. Years are distinguished by color and/or symbol coding.

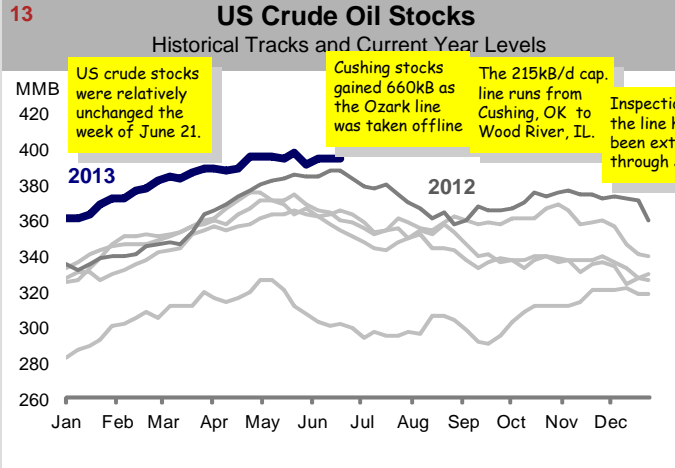


Canadian heavy differentials vary depending on barrel-to-barrel competition at a limited number of US refineries with specialized refining capacity.

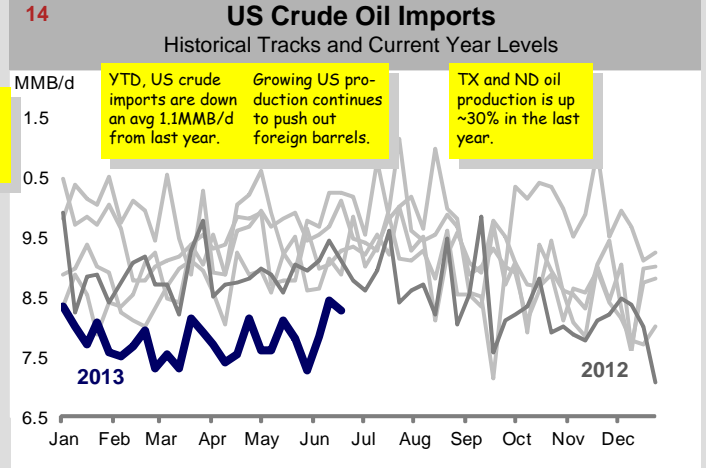


Natural gas liquids have become critical contributors to producers' cash flow. Prices are influenced by the price of oil.

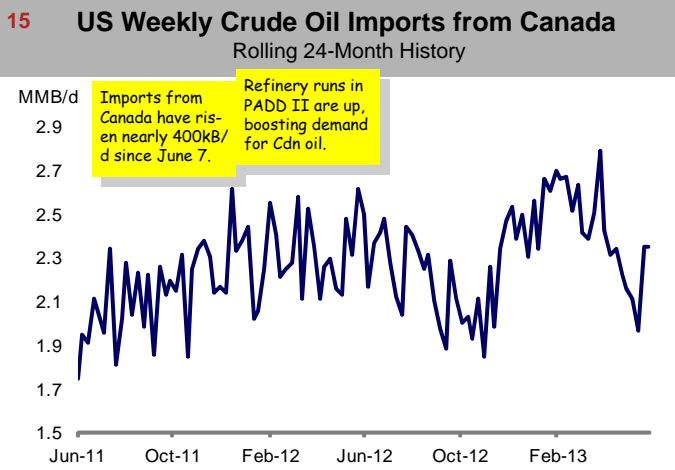
Crude Oil



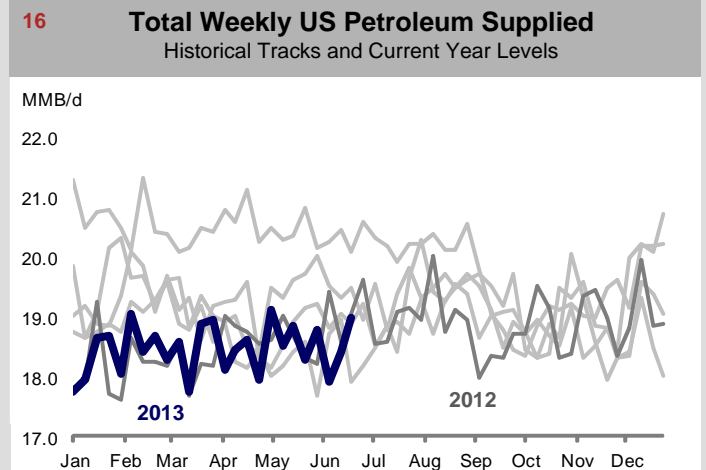
Weekly stock levels provide a snapshot of supply and demand. The grey lines span a historical range; the blue line plots current year levels.



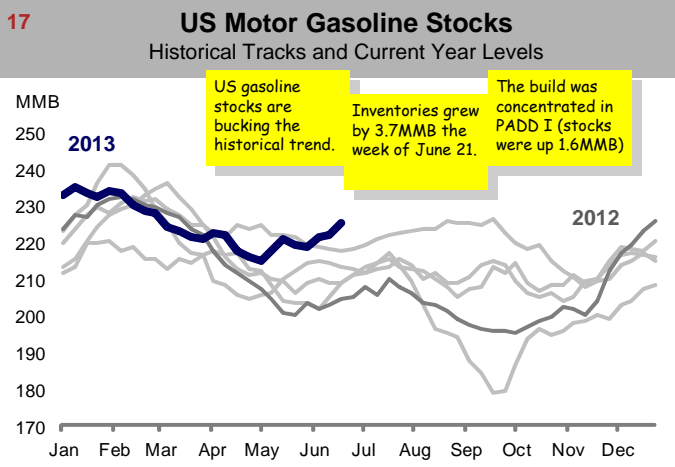
The US must import crude oil to augment its domestic supply. The grey lines span a historical range; the blue line plots current year values.



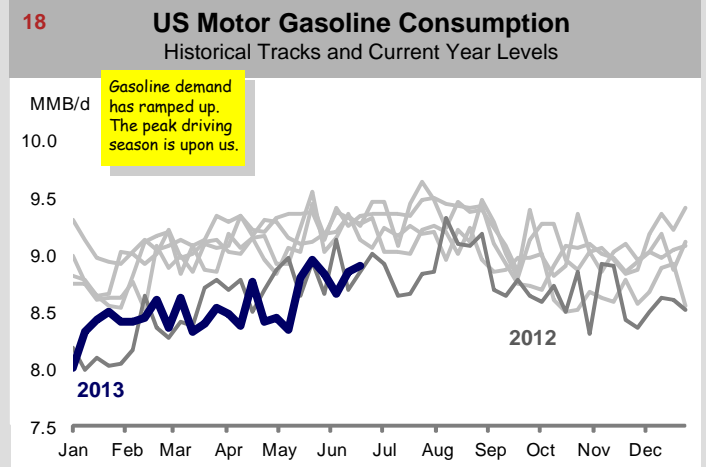
Total US crude imports are trending downward year-over-year. Canadian volumes are taking market share from overseas imports.



Petroleum supplied represents the total consumption of petroleum products in the U.S. Oil consumption for the current year is in blue.

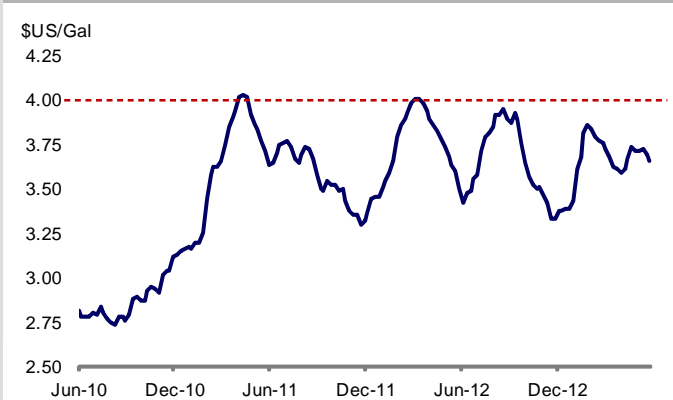


Gasoline stock levels can affect crude oil prices. Stock levels for the current year are represented by the blue line.



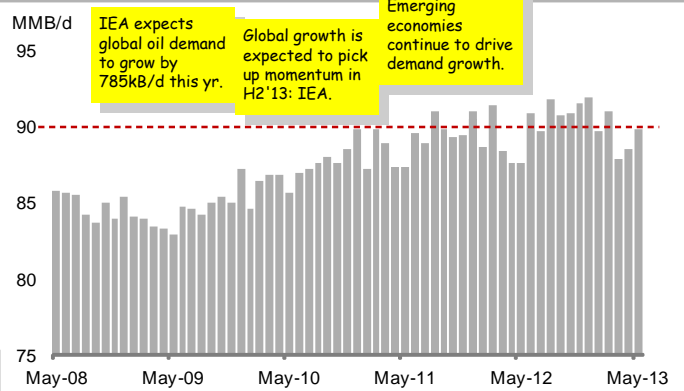
Gasoline consumption accounts for almost half of all oil use in the U.S. Gasoline consumption for the current year is in blue.

19 US Average Retail Gasoline (All Grades) Prices
Weekly Data; Rolling 3-Year History



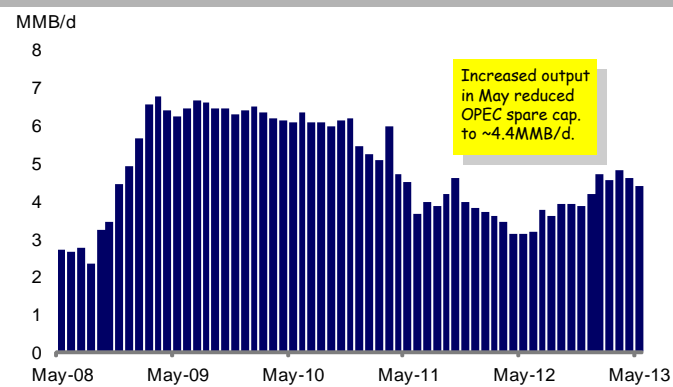
Gasoline is one of the main products refined from crude oil. Gasoline prices are influenced by crude oil prices, seasonality and retail competition.

20 Global Oil Demand
Monthly; Rolling 60-Month History



Global oil demand growth is largely driven by economic growth. The majority of new demand is coming from non-OECD countries.

21 OPEC Notional Spare Capacity
Monthly; Rolling 60-Month History



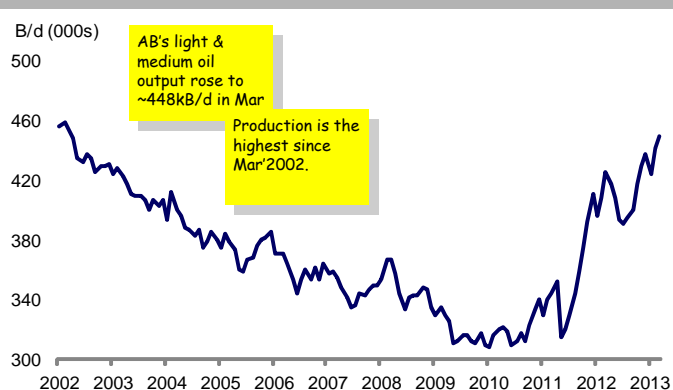
World oil spare capacity resides only in OPEC member countries. It is assumed that non-OPEC countries produce at full capacity.

22 OPEC Production Data Table
Recent Production Targets and Spare Capacity: MMB/Day

	Target Effective May-13	May-13 Prod'n	Sustainable Capacity	Spare Capacity
Algeria		1.15	1.19	0.04
Angola		1.78	1.82	0.04
Ecuador		0.50	0.51	0.01
Iran		2.68	2.98	0.30
Iraq		3.14	3.34	0.20
Kuwait		2.84	2.90	0.06
Libya		1.38	1.55	0.17
Nigeria		1.96	2.44	0.48
Qatar		0.73	0.77	0.04
Saudi Arabia		9.56	12.27	2.71
UAE		2.73	2.90	0.17
Venezuela		2.45	2.60	0.15
TOTAL OPEC	30.00	30.90	35.27	4.37

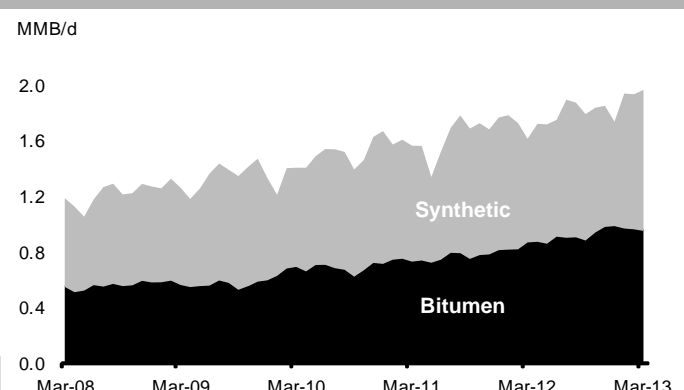
OPEC's production levels relative to its sustainable and spare capacity ties directly into near and long-term crude oil prices.

23 Alberta Oil Production
Monthly; Light & Medium Crude



Alberta is the largest producer of crude oil in Canada. Recent growth has come as a result of innovations in drilling and completions methods.

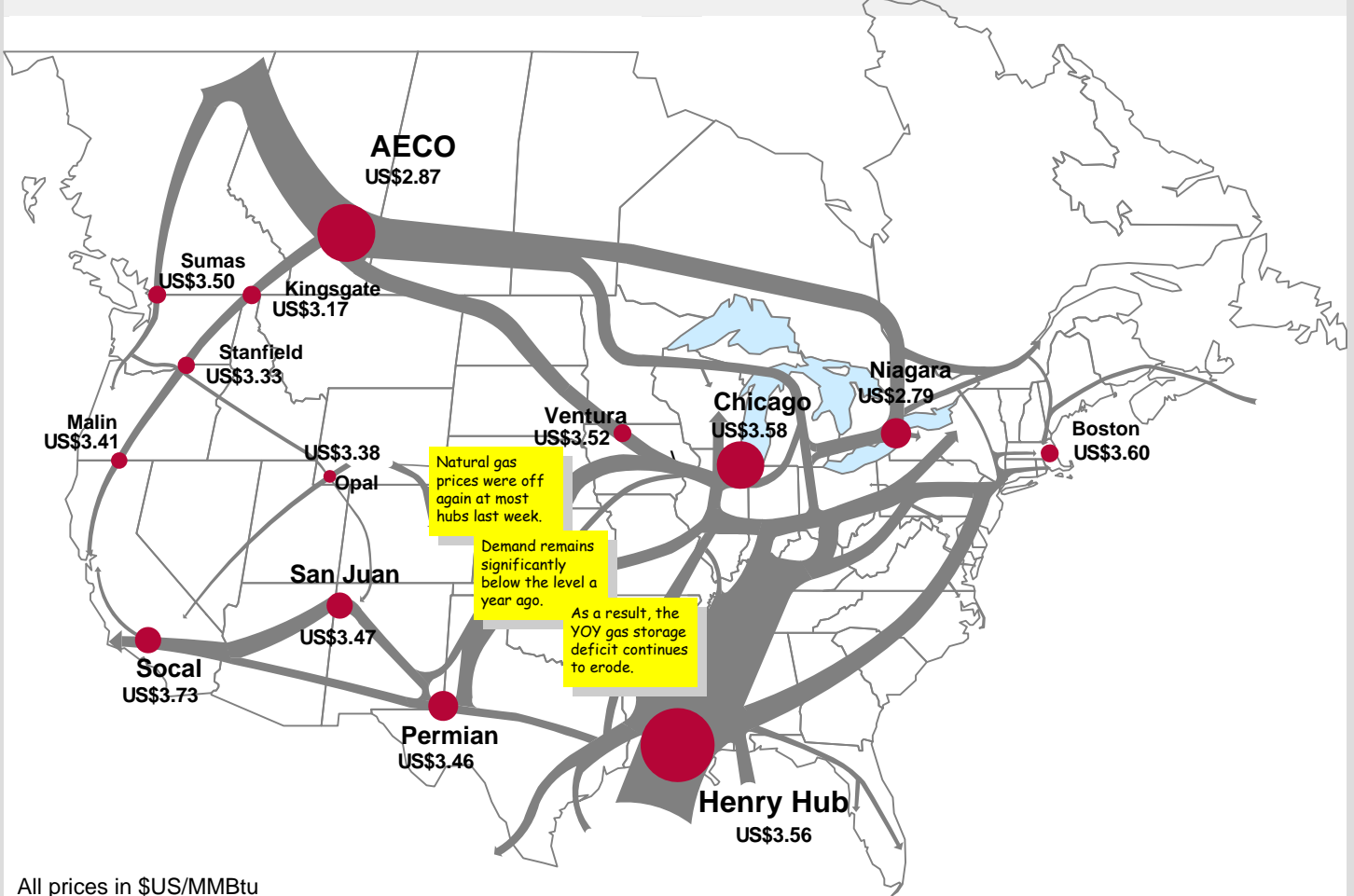
24 Canadian Oil Sands Production
Monthly; Rolling 60-Month History



Cdn oil sands is an important source of new supply to meet global oil demand growth. Production is projected to reach 2.1 MMBd by 2015.

25

Closing Spot Prices at North American Natural Gas Hubs
Superimposed on Relative Pipeline Flows



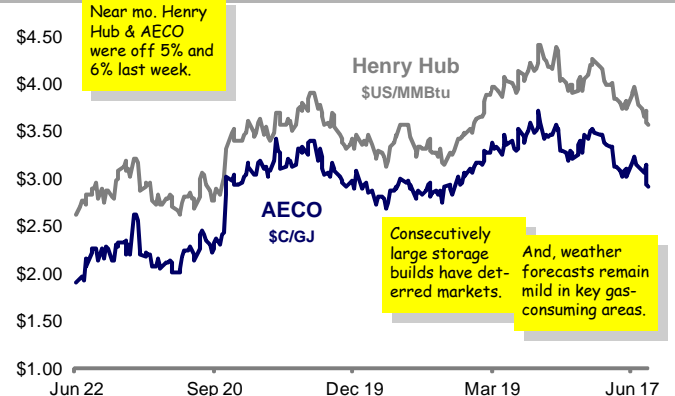
All prices in \$US/MMBtu

26 Henry Hub-AECO Near Month Price Differential
Daily; Rolling 12-Month History



Historically the AECO price has traded at approximately 85% of the Henry Hub price (in \$US/MMBtu).

27 Near-Month North American Natural Gas Prices
Daily Prices; Rolling 12-Month History



Near month prices at AECO mostly track Henry Hub prices, the exchange rate and the cost of transportation. Local factors can also affect price.

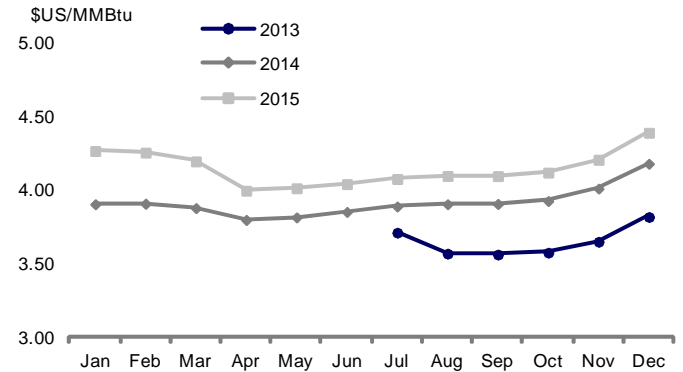
Natural Gas

28 Daily Natural Gas Prices Futures Average
Average of 25-to-36 month out contracts; Rolling 12-Month History



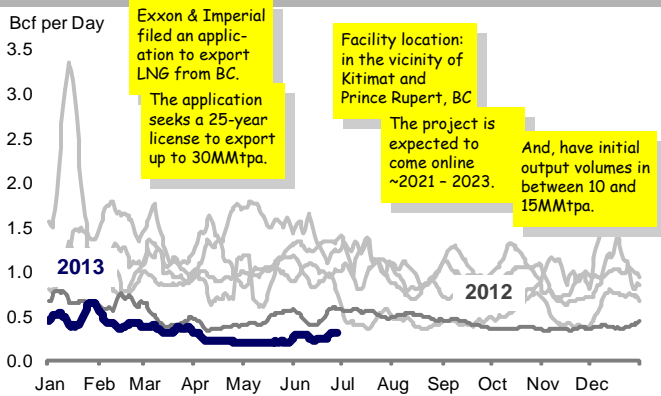
The daily close of the long end of the futures curve is important to watch for structural changes in the natural gas market.

29 US Natural Gas Futures
Nymex (Henry Hub) 2013 to 2015



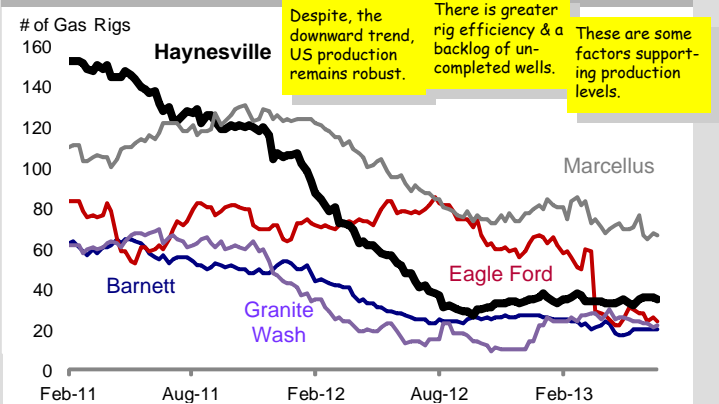
Here forward contract prices are plotted against months in the calendar year. Years are distinguished by color and/or symbol coding.

30 US LNG Import Volumes (Net)
Daily; Historical Tracks and Current Year Levels



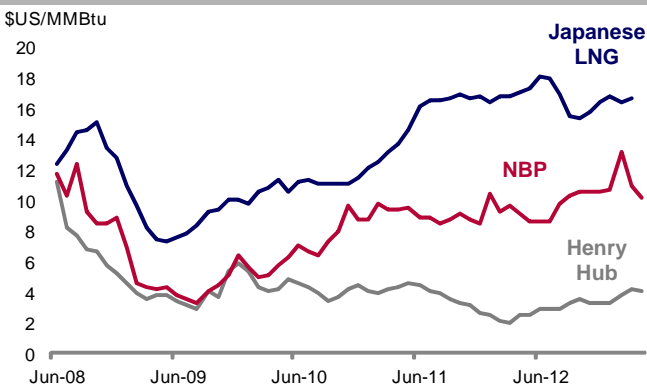
LNG Imports are an important component in meeting US natural gas demand. Source: Bentek

31 US Shale Gas Horizontal Drilling Activity
Baker Hughes Horizontal Shale Gas Rig Counts



Tracking US gas drilling by major shale gas play provides insight into the composition of US natural gas supply and productivity growth trends.

32 Global Natural Gas Prices
Japanese LNG, UK NBP, Henry Hub; Average Monthly Prices



Japan's LNG import price is inclusive of freight cost. NBP reflects the gas price at a notional delivery point in the UK National Transmission System.

33 Canadian Natural Gas Forward Prices
AECO Hub

AECO spot closed below \$3/GJ for the 1st time since Feb. AECO has suffered as robust US supply displaces Cdn exports

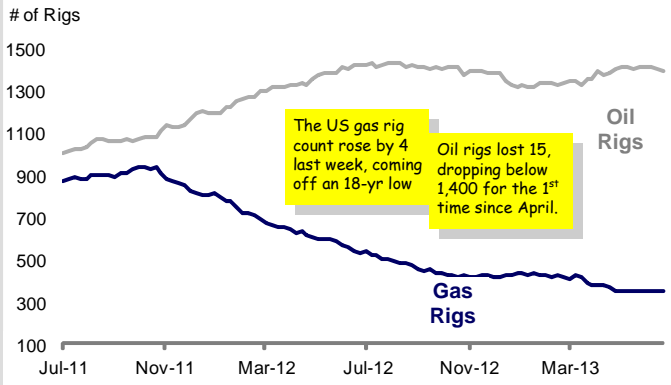
	\$C/GJ	\$C/Mcf	\$US/MMBtu
AECO Spot Price	2.86	3.02	2.87
1-Month Fwd	2.92	3.08	2.93
AECO Nov 1 Yr Out	3.26	3.44	3.27
Rest of Gas Year	2.94	3.10	2.95
Fwd Winter Strip	3.29	3.47	3.30

AECO forward prices mimic Henry Hub futures plus a differential. Due to less liquidity, forward AECO quotes do not extend out beyond one year.

Natural Gas

34 Weekly US Oil and Gas Drilling Activity

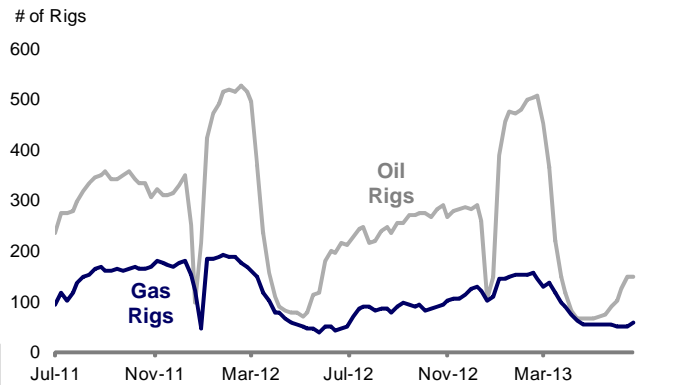
Baker Hughes Average Rig Counts; Rolling 24-Month History



US rig activity is a leading indicator of continental supply. Capital allocation by operators is driven by views of future oil and natural gas prices.

35 Weekly Canadian Oil and Gas Drilling Activity

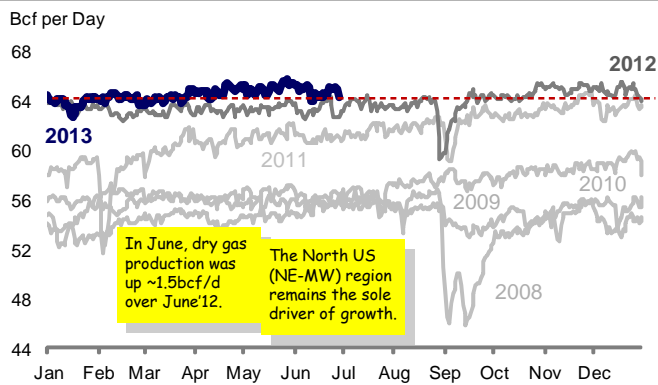
Baker Hughes Average Rig Counts; Rolling 24-Month History



Canadian rig activity is a leading indicator of continental supply. Unlike US drilling activity Canadian rigs are dispatched seasonally.

36 Total US Dry Natural Gas Production

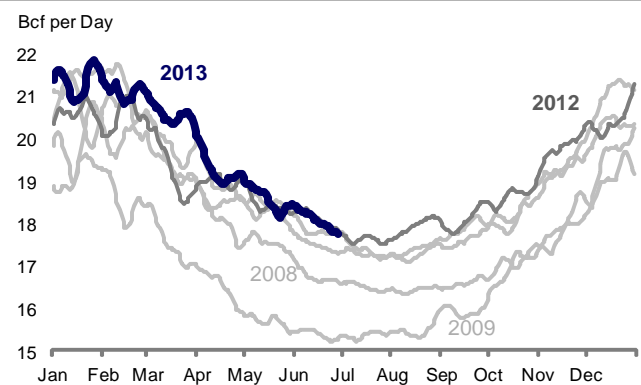
Historical Tracks and Current Year Levels



Tracking US natural gas supply helps monitor the growth in domestic production that started ramping up in late 2007.

37 US Total Natural Gas Industrial Demand

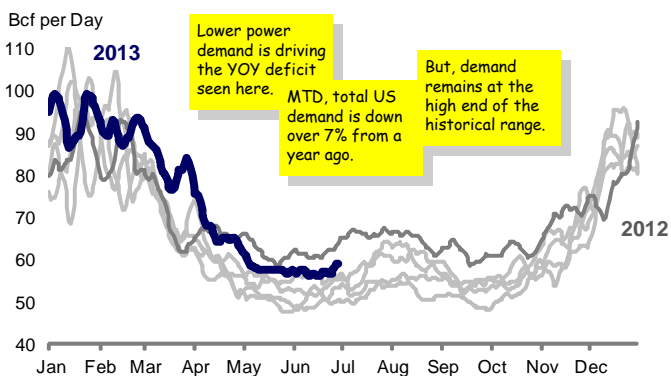
Daily; Historical Tracks and Current Year Levels



Industrial sector energy use is largely for process heating/ cooling and powering machinery. US gas demand in the sector is on the rise.

38 US Total Natural Gas Demand

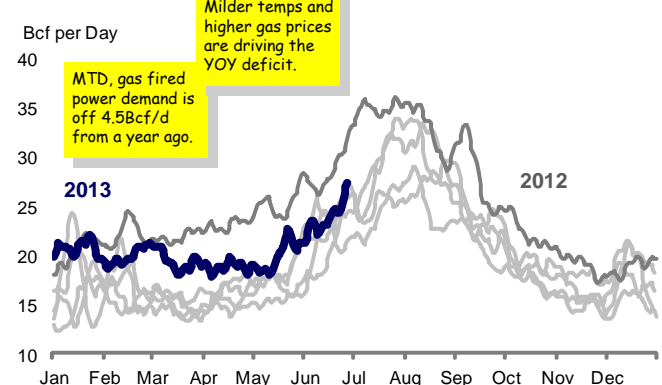
Daily; Historical Tracks and Current Year Levels



Total US demand fluctuates between 50 Bcf/d in summer and 100 Bcf/d in the winter. Weather is still the most influential factor driving consumption.

39 US Total Natural Gas Power Demand

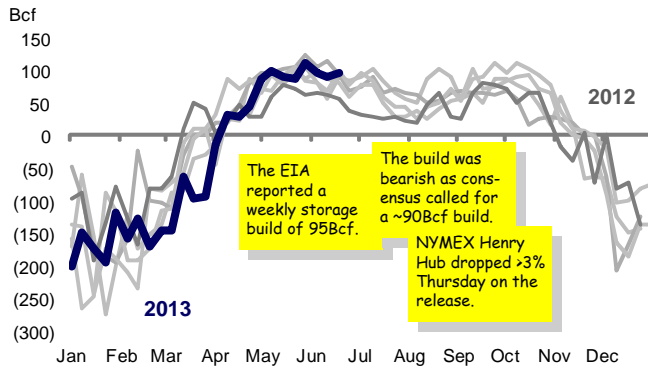
Daily; Historical Tracks and Current Year Levels



The electric power industry has become an important driver of total US natural gas demand. It is the largest component by far in the summer.

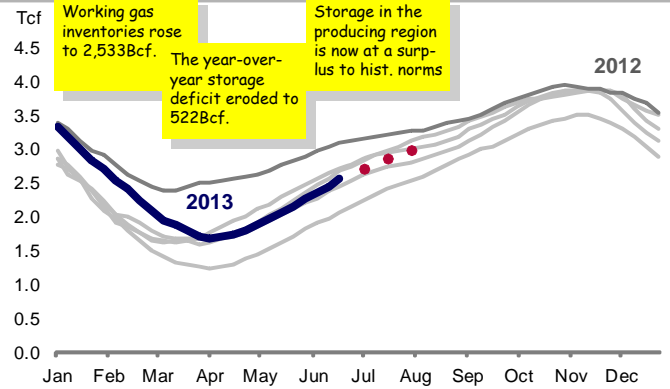
Natural Gas

40 Weekly US Natural Gas Storage Net Change
Weekly Injection or (Withdrawals); 2007 to Current



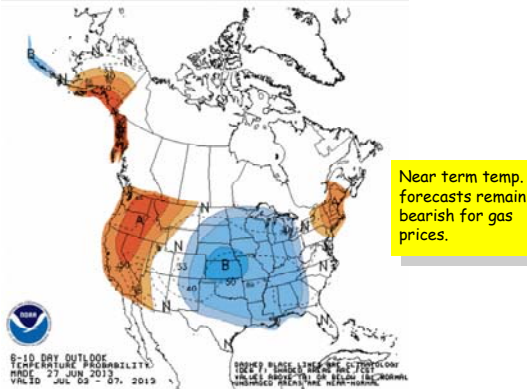
Weekly gas storage reports provide a snapshot of supply and demand. Previous years are in light grey; the blue line plots current year levels.

41 Total Working Natural Gas in US Storage
Historical Tracks and Current Year Levels



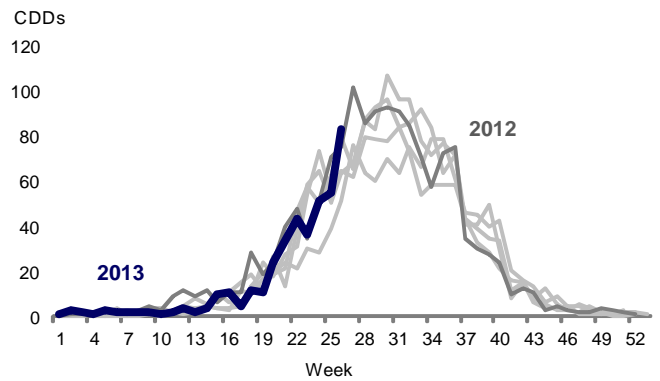
The EIA reports changes in US natural gas inventories held in underground storage facilities on weekly basis.

42 US Temperature Outlook: 6 to 10 Days
NOAA Temperature Probability Contours



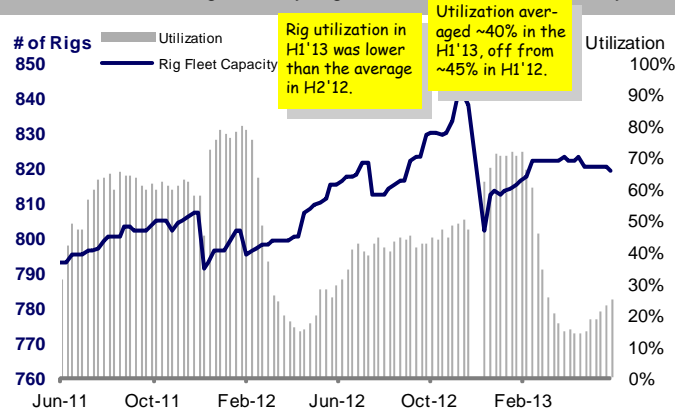
Probability contours show which regions are expected to be anomalously warmer or cooler. Deeper reds imply warmer-than-average; blueish cooler.

43 US Weekly Cooling Degree Days
Source: NOAA



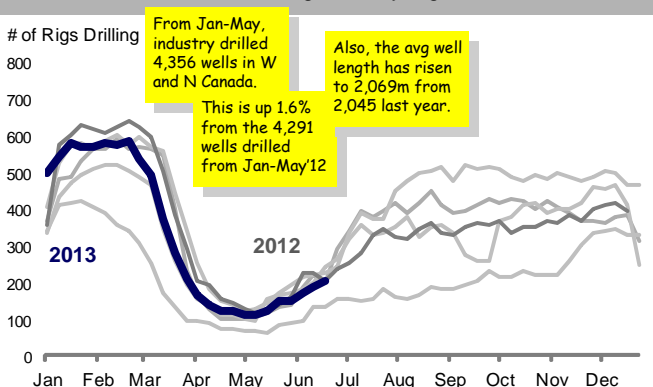
Weekly natural gas demand is directly tied to the weather. Current year is in dark blue; historical years are in grey.

44 Cdn Oil and Gas Rig Capacity and Utilization
CAODC Average Weekly Rig Count; Rolling 2-Year History



Rig utilization in Canada is a function of broad fundamentals and seasonality. Utilization always drops off during spring breakup.

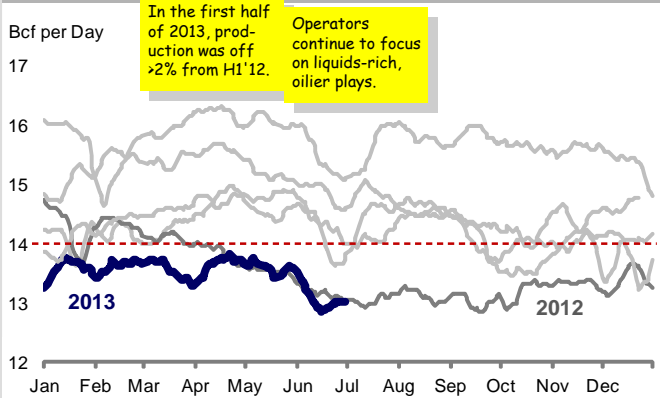
45 Weekly Canadian Oil and Gas Drilling Activity
CAODC Average Weekly Rig Count



Unlike US drilling activity Canadian rigs are dispatched seasonally. The active rig count for the current year is in blue.

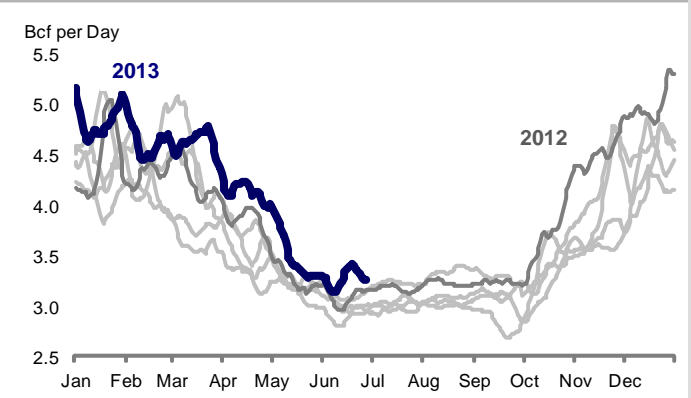
Natural Gas

46 Daily Western Canadian Pipeline Receipts
TransCanada (NOVA), Alliance, WestCoast & TransGas Pipelines



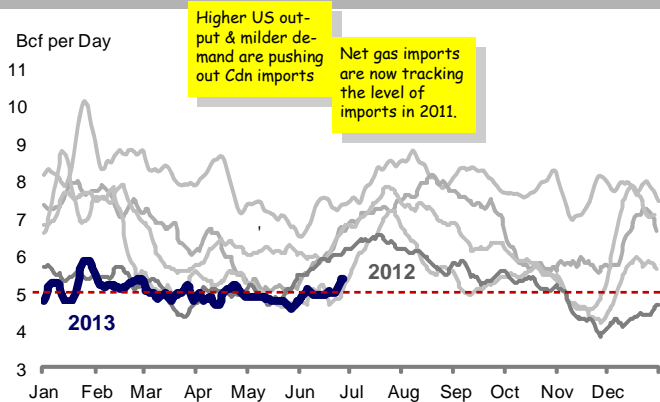
All combined, TCPL, Alliance, WestCoast and TransGas pipelines move over 13 Bcf/d of natural gas out of Western Canada.

47 Alberta Natural Gas Demand
TransCanada Intra-AB Deliveries; Current Year and Historical Tracks



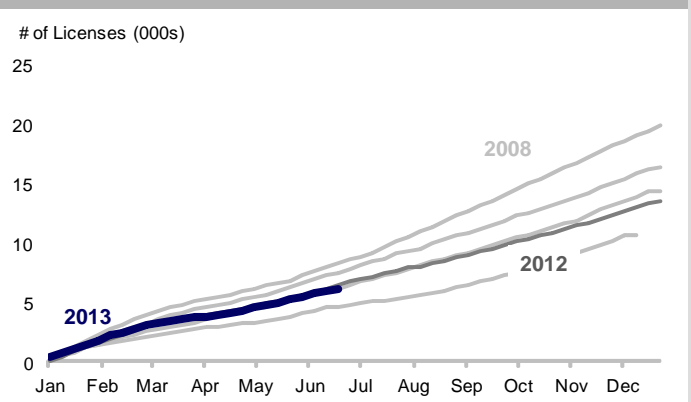
As Alberta's economy grows, and as more oil sands projects come on line, it will be increasingly important to monitor the Province's gas demand.

48 US Net Natural Gas Imports From Canada
Daily; Historical Tracks and Current Year Levels



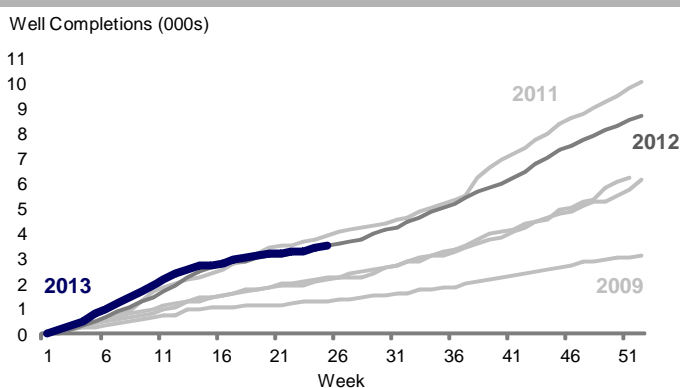
The US is a large consumer of Canadian gas. However, the dynamic is changing as US domestic production continues to grow.

49 Canadian Cumulative Well Licensing Activity
Current Year vs Years Prior



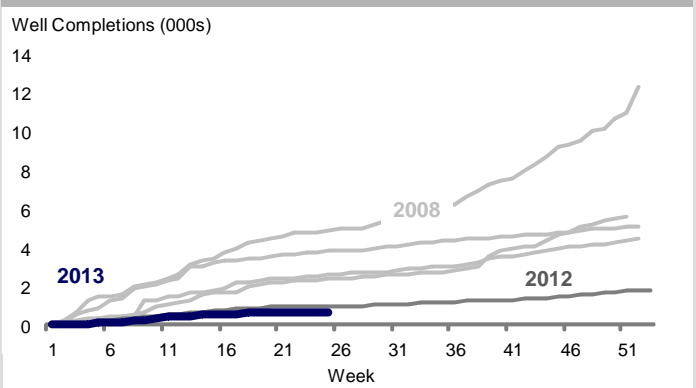
Canadian well licenses are a leading indicator of WCSB drilling activity. Cumulative well licenses for the current year are in blue.

50 Canadian Cumulative Oil Well Completions
Current Year vs Years Prior



Relative year-over-year drilling activity is highlighted in this chart. Cumulative oil well completions for the current year are shown in blue.

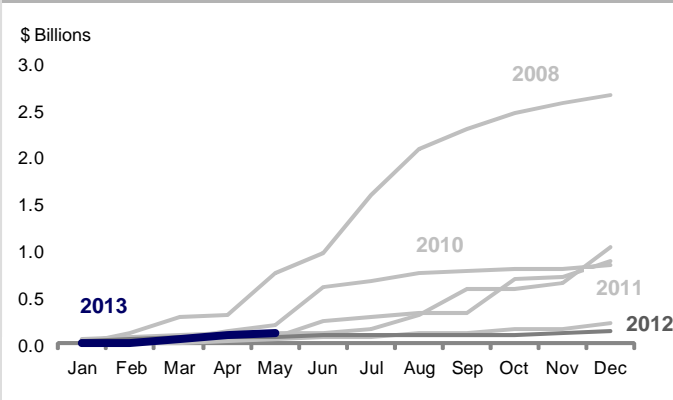
51 Canadian Cumulative Gas Well Completions
Current Year vs Years Prior



Relative year-over-year drilling activity is highlighted in this chart. Cumulative gas well completions for the current year are shown in blue.

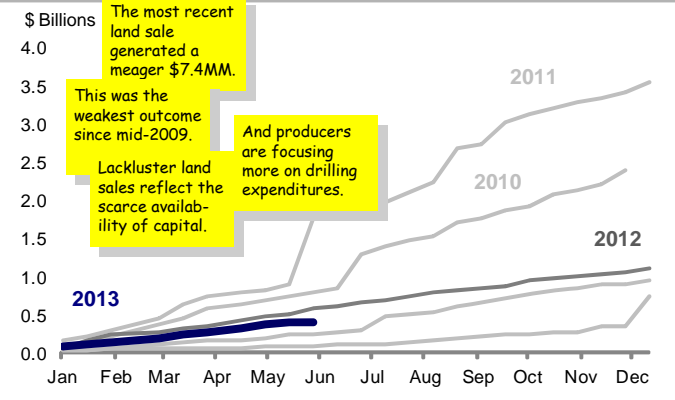
Other Indicators

52 British Columbia Crown Land Sales
Year-over-Year; Cumulative



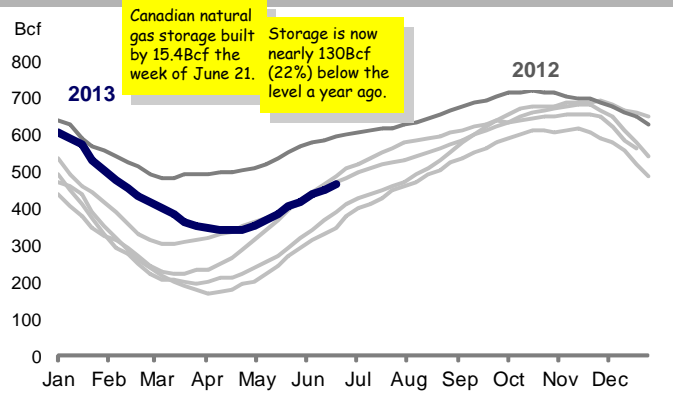
Land prices are an important component of F&D costs. In British Columbia, sales of petroleum and natural gas rights are held every month.

53 Alberta Crown Land Sales – Excluding Oil Sands
Year-over-Year; Cumulative



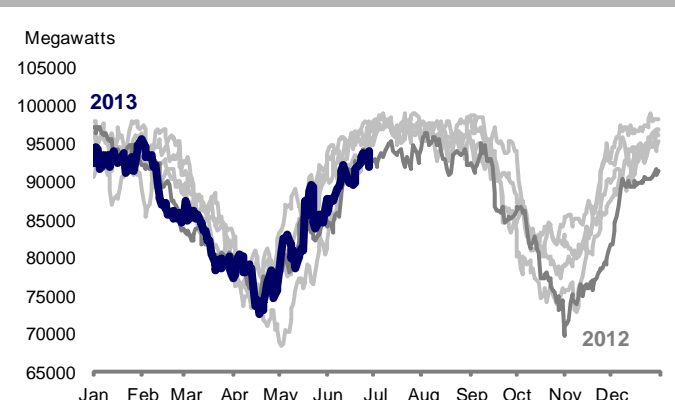
Land prices are an important component of F&D costs. In Alberta, sales of petroleum and natural gas rights are held every two weeks.

54 Canadian Natural Gas Storage Levels
Weekly; Current Year and Historic Tracks



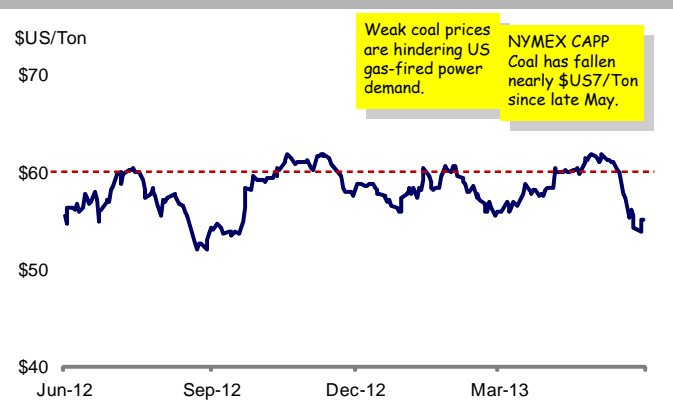
Canada's natural gas storage level provides a good metric if the country is well stocked. Abnormally high or low storage can affect the basis.

55 Weekly US Nuclear Electricity Generation
Current Year vs Years Prior



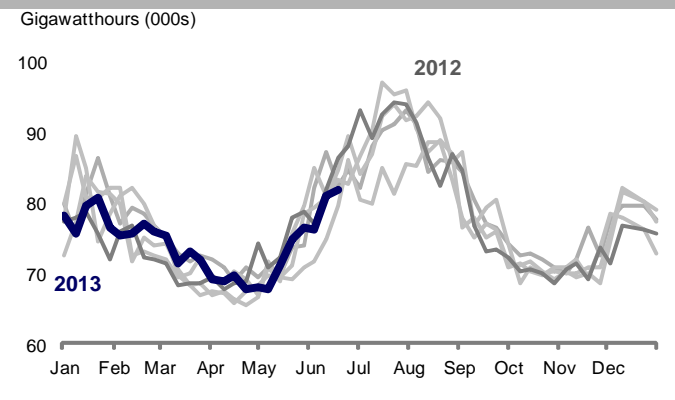
The capacity of electricity generated from US nuclear power plants is 99,910 megawatts. Source: Nuclear Regulatory Commission.

56 NYMEX CAPP Coal Prices – Near Month
Daily; Rolling 12-Month History



Nymex offers a liquid market to hedge physical coal contracts. In power markets, coal competes for market share against oil and gas.

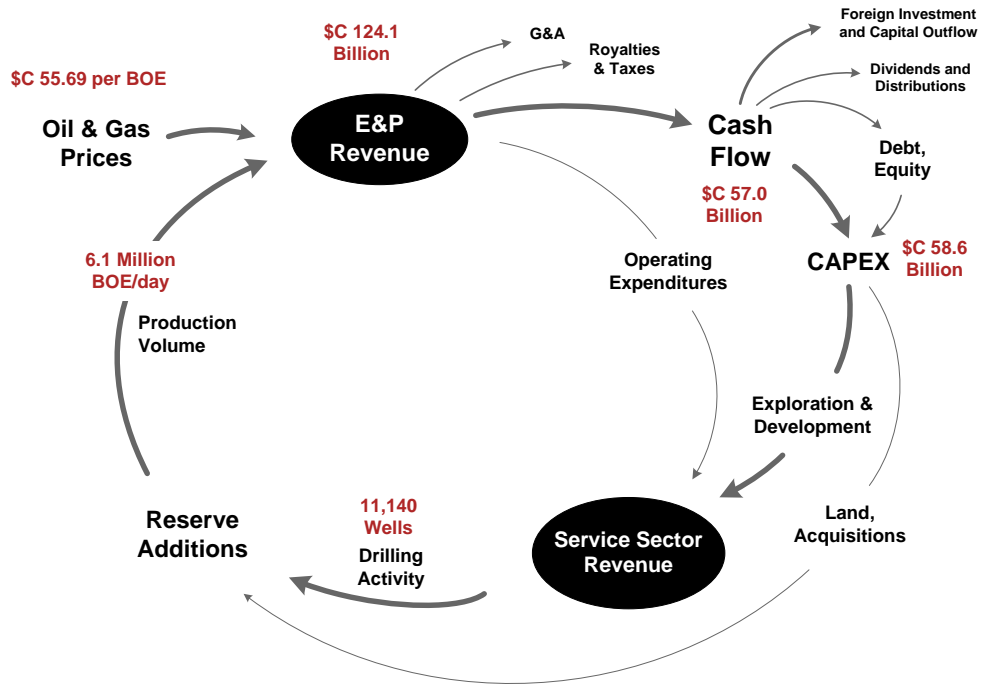
57 Weekly US Electrical Power Output
All Sources of Power Generation



Weekly US electrical power output can be compared against output at the same time for years prior. Current year is plotted in blue.

Canadian Industry Metrics

Estimated Capital Flow in the Canadian Oil and Gas Economy for 2013
Industry Revenue, Cash Flow, Reinvestment, Drilling Activity and Production



2013e metrics are based on YTD actuals & the FWD curve

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Canadian Industry Statistics: Historical Data and Forecast

Canadian Industry Metrics

	Price			Production Volume				Capital Inflow		Reinvestment			Drilling		Well Split	
	Average Price	Edmonton Par	AECO	Conv. Liquids	Bitumen+ Synthetic	Natural Gas	Total Volume	Total Revenue	After-tax Cash Flow	Conv. Oil and Gas	Oilsands	Reinvest Ratio	Wells Compl.	Avg Rig Utiliz.	Oil Wells	Gas Wells
	\$/BOE	\$/B	\$/GJ	Average MBOE/d	Average MBOE/d	MBOE/d (@ 6:1)	MBOE/d (@ 6:1)	\$/ millions	\$/ millions	\$/ millions	\$/ millions	x:1	#/ Year	%	%	%
1999	18.60	27.61	2.77	1,990	568	2,745	5,303	35,996	16,846	13,743	2,422	0.96	10,605	46%	26%	59%
2000	29.41	44.48	5.31	2,056	608	2,840	5,504	59,094	26,543	18,795	4,223	0.87	16,485	63%	33%	54%
2001	31.22	39.26	5.17	2,024	659	2,889	5,572	63,481	29,064	21,998	5,907	0.96	17,933	62%	26%	62%
2002	27.71	40.21	3.89	2,102	741	2,886	5,729	57,939	29,433	18,107	6,746	0.84	14,459	45%	27%	63%
2003	35.95	43.40	6.31	2,085	863	2,800	5,738	75,298	37,644	23,855	5,048	0.77	19,851	62%	23%	70%
2004	39.79	52.86	6.24	2,089	993	2,827	5,865	85,179	43,959	26,828	6,183	0.75	21,593	63%	21%	72%
2005	51.53	69.19	8.36	2,044	990	2,840	5,837	107,455	56,442	34,815	10,437	0.81	21,925	68%	22%	70%
2006	46.98	73.27	6.20	2,042	1,126	2,850	5,941	103,294	54,171	38,345	14,337	1.00	22,127	65%	22%	71%
2007	49.28	77.01	6.12	2,077	1,199	2,810	6,070	109,274	54,985	31,184	18,065	0.88	19,144	38%	28%	66%
2008	68.22	102.66	7.75	1,994	1,207	2,700	5,864	145,425	83,255	36,293	18,113	0.65	16,877	41%	36%	56%
2009	42.26	66.42	3.79	1,840	1,331	2,514	5,683	89,057	36,680	22,335	11,227	0.91	8,368	25%	41%	51%
2010	48.41	77.55	3.79	1,830	1,403	2,434	5,668	101,056	43,569	35,666	17,195	1.19	12,119	40%	56%	40%
2011	55.32	95.24	3.44	1,873	1,482	2,386	5,740	115,890	53,448	40,139	22,491	1.17	12,827	52%	65%	21%
2012e	50.64	86.38	2.27	1,894	1,776	2,275	5,945	109,883	48,697	32,802	22,991	1.15	11,067	53%	74%	17%
2013e	55.69	91.53	3.22	1,938	1,926	2,242	6,106	124,122	56,980	35,073	23,491	1.03	11,140	40%	74%	17%