Energy Intelligence

The Current and Future State of World Oil Markets

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Powerful Thinking
for the global energy industry

Agenda

- Why did the 2014-15 oil price decline happen?
- How have the roles of key players changed?
- Where are we in the adjustment process?
  - The direction of market-based adjustments are clear, the pace is not.
- Where will we be at the end of 2015 and what about 2016 and beyond?
- What is going on in the main US shale areas?
- Which outside and inside factors now have the most influence on oil markets?

Dr. David Knapp Biography

- Dr. David Knapp is Chief Energy Economist and Senior Editor for Global Oil Market Analysis at Energy Intelligence. He also contributes regularly to several Energy Intelligence publications including *Petroleum Intelligence Weekly*, *Energy Compass*, *Oil Daily, Energy Intelligence Finance* and *International Oil Daily*.

- Before joining Energy Intelligence in late 2000, Dr. Knapp was a senior official with the International Energy Agency in Paris and Editor of the IEA's *Monthly Oil Market Report* through much of the 1990s. He has analyzed energy markets for more than 45 years in the international, government, business and financial sectors as Energy Economist and Energy Team Leader for the Wall Street banking and investment firm of Brown Brothers Harriman & Co. throughout the 1980s, after starting his career at the Federal Energy Administration/Department of Energy and then Chase Manhattan Bank's Energy Economics Division in the 1970s.

- Dr. Knapp holds a Ph.D. in Economics from the University of California at Santa Barbara and is a member of numerous professional organizations in the energy area. He was a founder and currently serves as President of the Board of the New York Energy Forum. He is also a Senior Fellow of the US Association for Energy Economics and is the incoming VP for Business. He has served on various USAEE committees, as well as being an appointed Advisor to five recent USAEE Presidents. He is a Charter Member and former council member of the parent IAEE and is a reviewer for the organization's *Energy Journal*. Dr. Knapp holds the IAEE 2007 Award for Excellence in Written Journalism.

How and Why Did The Price Collapse Happen?

- The prime cause of the oil price collapse was **not Opec's Nov. 27 decision**, Opec's decision was a reaction to something else.
- The price collapse was the consequence of the **birth of the "Shale Era"**; changing the rules oil markets have lived by for decades.
- The Shale Era is more about **how geologists think about their job** than about the tools and information they have. Technology affected the growth, not the event.
- **Source rock** as a target, rather than an afterthought, caused the US supply surge, not oil prices, horizontal drilling, multilateral wells or hydraulic fracturing.
- The oil world has been confronted with a **new, huge, producible resource base** and was able to produce it economically at prevailing prices.
- Saudi Arabia couldn't change the resource base, so they have chosen to **change the economics.**.

Changing Roles for Key Players: Who is Doing What?

- **Saudi Arabia convinced Opec to hold production and allow prices to drop: the alternative of cutting to make room for more non-Opec supply made no sense.**
- **The rest of Opec went along, because they had to. Without the leverage of Saudi spare capacity Opec isn't much of a cartel -- to the extent it ever was.**
- **Non-Opec has now involuntarily assumed the dreaded "swing producer" role. Saudi Arabia has been there, and doesn't want to go back.**
  - Opec and specifically Saudi Arabia's new role is chief "sitter and watcher" -- for signs that the "experiment", as some Opec delegates dubbed it back in November, has succeeded. What those signs are neither we, nor probably they, know.
  - And the US shale industry does not come close to meeting the criteria for swing producer
- **The price decline will continue "until it works" shutting in significant/sufficient amounts of non-Opec supply, from Opec's standpoint preferably from US shale areas -- the prime source of the glut – but a barrel gone is a barrel gone.**
  - The answer to an increasing number of queries asking "Are we there yet?" -- as is usually the case -- is "No."
  - The similarly cliched response to "When will we get there?" is "When we get there."
  - But this is far from a car ride with small children, it is a roller coaster ride carrying an entire industry with it along with fortunes to be made and lost by countries, companies and investors by coming up with more creative answers.

Where Are We in the Process?

- **Phase 1 of the "experiment " was to drive down prices, a process that was well underway by the time of the Nov. 27 Opec meeting, but intensified thereafter.**
- **Phase 2 is the effect of the ongoing surplus on inventories both inadvertent -- there is too much oil -- and intentional as contango makes holding oil profitable.**
- **Phase 3 is occurs when Phase1 works, forward price curves flatten and speculative stocks reenter the market *en masse* blunting price recovery.**
- **If Phase 1 works slowly, and Phase 2 continues for quite a while, there may be another phase to consider:**
  - Phase 2A would occur if and when the world "runs out" of storage. But capacity is a moving target as onland tanks can be built relatively quickly and there are always more boats, at a price.
  - In any case Phase 2A would accelerate the Phase 1 price decline process, as distressed cargoes begin to show up on tanker markets and force shut-ins at the wellhead.
- **Phase now are overlapping with Phase 1 and 2 both ongoing. Phase 2A hasn't happened and Phase 3 lies ahead affecting the shape of any price recovery.**

Direction of Adjustments is Clear, the Pace and Shape are Not

- **It is clear, for oil supply, lower oil prices mean lower supply; for oil demand, lower prices mean higher demand.**
- **But there are a number of reason why the process could be quite slow;**
  - forward momentum for US shale projects is first and foremost, especially in key shale areas like Eagle Ford and Bakken,
  - supply decision have short run and long run components put in other terms operating costs are much lower than all-in finding and development costs,
  - high sunk cost of major high cost projects like deepwater in Angola, the US Gulf, Brazil suggest those near completion will be finished despite the price level,
  - demand effects are asymmetric ("you don't rip out insulation at lower prices"), and like supply have short term (utilization) and longer-term (equipment choice) components.
- **For both supply and demand the long term adjustment components are generally larger than the short term adjustments – but can be brought forward by altering near-term effects on price expectations.**
- **In the "alphabet soup" of oil price recovery trajectories, the basic choices are V (snapback), U (extended trough) or W (maybe a sequence of Ws with volatility aborting attempted price recoveries).**
- **For now what is looking most likely is a long lumpy-bottom U with a weak right leg, that could turn into an ascending warped-W with a sporadic Phase 3.**

Supply-Demand Price Responses are Not the Whole Story

2015 Quarterly Oil Market Balances						
(million b/d)	Q1	Q2	Q3	Q4	2015	Chg. vs. 2014
Demand	**94.44**	**94.78**	**95.79**	**96.39**	**95.36**	***+2.12***
OECD	46.46	45.30	46.43	46.85	46.26	*+0.59*
Non-OECD	47.98	49.49	49.36	49.54	49.10	*+1.53*
Supply	**95.37**	**96.17**	**97.45**	**98.29**	**96.82**	***+3.51***
Non-Opec	58.16	58.20	58.76	59.68	58.70	*+1.81*
Opec NGLs & Other	6.72	6.72	6.79	6.89	6.78	*+0.20*
Call on Opec Crude	**29.56**	**29.86**	**30.23**	**29.82**	**29.87**	***+0.16***
Opec Crude	30.48	31.25	31.89	31.72	31.34	*+1.49*
Implied Stock Chg.	**+0.92**	**+1.39**	**+1.66**	**+1.90**	**+1.46**	
Source: Based on EI, Oil Market Intelligence, *November, 2015*						

- Absent significant economic events **demand is expected to grow by 2.12 million b/d** this year and **non-Opec supply increases by 1.81 million b/d** assuming delayed price responses. Inventories continuing to build and prices continuing to decline.
- **Opec NGL and other** production will see a moderate **200,000 b/d** rise again assuming no extraordinary events and **Opec crude** adds about **1.5 million b/d**.
- These Opec additions assume the **financial pressure** of the lower oil price on balance of payments, government budgets **don't spawn production-inhibiting upheavals**.
- **Iraqi growth** especially in KRG, sputtering **Libyan recovery** and more creative **Iranian sanctions busting** are responsible for most of the crude increase.
- Demand responses will be depressed by currency movements in favor of the dollar, the evolution of **subsidies,** while supply will vary with **fiscal policy** changes and the most importantly financial health or lack thereof among producing companies.

US Shale is Not the Only, or even the Major, Supply in Play

Current Oil Supply Outlook for Top Non-Opec Producers 2014-16							
					Changes		
'000 b/d	2013	2014	2015	2016	2014	2015	2016
US	11,381	13,024	14,293	14,903	1,643	1,269	611
Russia	11,276	11,362	11,362	11,098	87	0	-263
China	4,214	4,206	4,185	3,865	-8	-21	-320
Canada	3,990	4,237	4,431	4,441	247	194	10
Brazil	2,663	2,901	3,142	3,223	237	242	81
Mexico	2,892	2,801	2,611	2,431	-91	-190	-180
Norway	1,838	1,863	1,937	2,002	26	74	64
Kazakhstan	1,641	1,623	1,622	1,620	-18	-1	-2
Oman	957	959	1,011	1,024	2	53	13
Colombia	995	989	1,009	1,040	-6	20	30
Azerbaijan	885	875	837	798	-10	-38	-39
Indonesia	922	879	849	833	-43	-30	-16
Malaysia	837	851	937	967	15	85	30
Egypt	716	717	733	730	1	16	-3
Argentina	591	568	578	556	-23	10	-22
Australia	446	460	447	488	14	-13	41
Other	7,123	7,133	7,144	7,165	10	11	20
Total RPG	2,304	2,329	2,217	2,309	25	-112	92
Total Non-Opec	**55,671**	**57,778**	**59,347**	**59,495**	**2,106**	**1,569**	**148**
Top 16 non-Opec share	*83.1%*	*83.6%*	*84.2%*	*84.1%*			
Source: Based on EI, Oil Market Intelligence, September 2015.							

- **Russia's** flat 2015 and 2016 decline has as much to do with effects of sanction as prices, while **China's** is more about aging, likely over-produced fields, mainly Daqing.
- Five **other** top 16 non-Opec producers are seen declining this year -- as well as refinery processing gains -- many unrelated to price, one more than in 2014.
- **Growth** has been **dominated by the US;** but **2016 declines elsewhere** are **much bigger** than US slowing growth, **2015** US slowing nearly matched non-US declines.

What to Watch for – The Adjustment Process

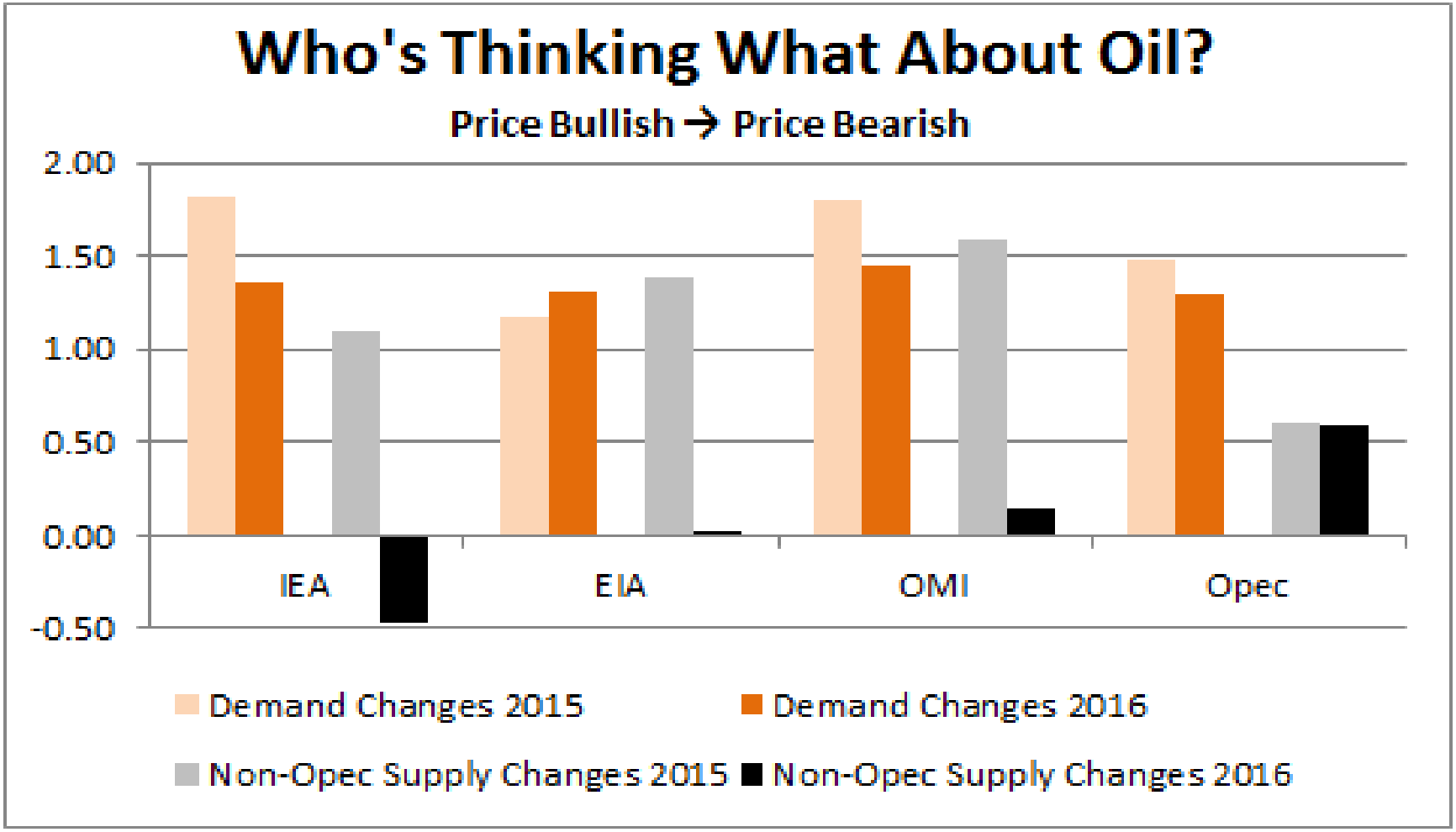
- **How much oil supply responds will be the main criteria in evaluating the success of the Opec/Saudi strategy; the strategy is <u>not</u> about a price level;**
  - slowing growth in the US, Canada, Brazil and the few other "grower" countries,
  - accelerating declines in the China, Russia and several other mature areas, and
  - possible switches from "grower" to "decliner" for places like heavy oil laden Colombia
- **Demand growth will play a lesser role next year after a surprisingly good 2015 validating earlier Opec rhetoric and will be in play over the medium term;**
  - watch the US, China and India, in particular, and any possible help from lower oil prices for fragile European finances or Japan's struggling economy, as well as
  - any inter-fuel events that limit supplies or raise prices of competing fuels like coal, nuclear , LNG or renewables.
- **Inventory levels and the adequacy of storage capacity and particularly the onset of any distressed cargoes would be major signals.**
- **Fiscal policy changes being adopted (UK) or considered in a number of place could prolong the adjustment by improving upstream economics so as to lower decline rates and maybe justify completion of new projects.**
- **On the other side of the spectrum geopolitics have not disappeared for oil markets, watch in particular, IS in Iraq and Syria (and Libya and maybe elsewhere). Yemen, the Sudans, Nigeria, Venezuela, Ukraine/Russia….**

Where Will We Be at Yearend and What's In Store for 2016?

- **"One man's judgment": prices will be lower than they are today, forward curves will still be in contango, inventories will still be building; Saudi Arabia sits tight (King Abdullah's death and adventures in Yemen notwithstanding) -- why?**
  - Because there will still be too much oil – supply, demand responses are slow to materialize and have an unexpected composition -- less early US shale cuts, more cuts almost everywhere else.
  - Supply reductions likely come from non-shale US closures of stripper wells and California Central Valley steam flood operations. Non-US accelerating decline rates account for slightly more than the net supply growth reduction in the US.
  - Storage capacity will be added fast enough to avoid distressed cargoes, while non-OECD infrastructure expansion will continue to provide a home for some 400,000-700,000 b/d in pipes, terminal and intermediate tanks, as has been the case for the last few years.
  - Strategic reserves will be built further in China and India and perhaps elsewhere in Asia to take advantage of the progressively lower oil prices.

- **Oil market landscape for 2016:**
  - Will see much larger downward supply adjustments, but maybe a bit less demand increase after a surprising 2015 response led by US;
  - a flattening forward curves causing the emergence of large volumes of stored crude;
  - a slow, wide-bottom U price recovery, bringing back more US shale tilting the right side of the U.

There are an Interesting Range of Supply-Demand Opinions



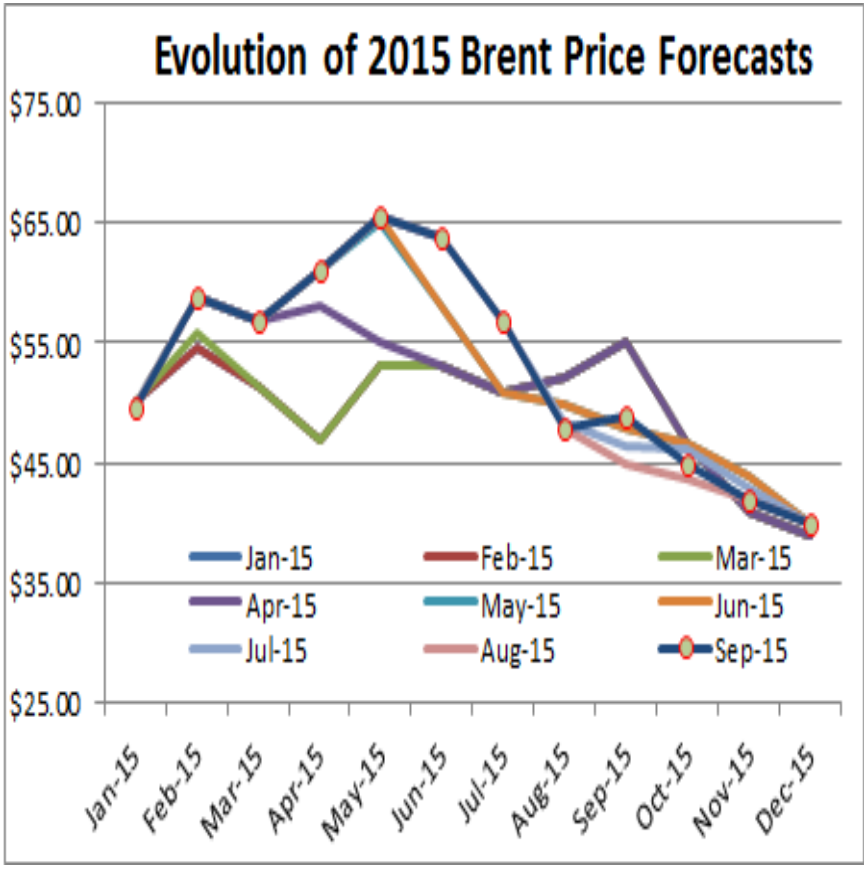
Sources: Energy Intelligence, Oil Market Intelligence*, Sep.15'15; International Energy Agency,* Oil Market Report*, Sep.11'15; Opec* Monthly Oil Market Report*, Sep.14'15; US Energy Information Administration,* Short Term Energy Outlook*, Sep.9'15.*

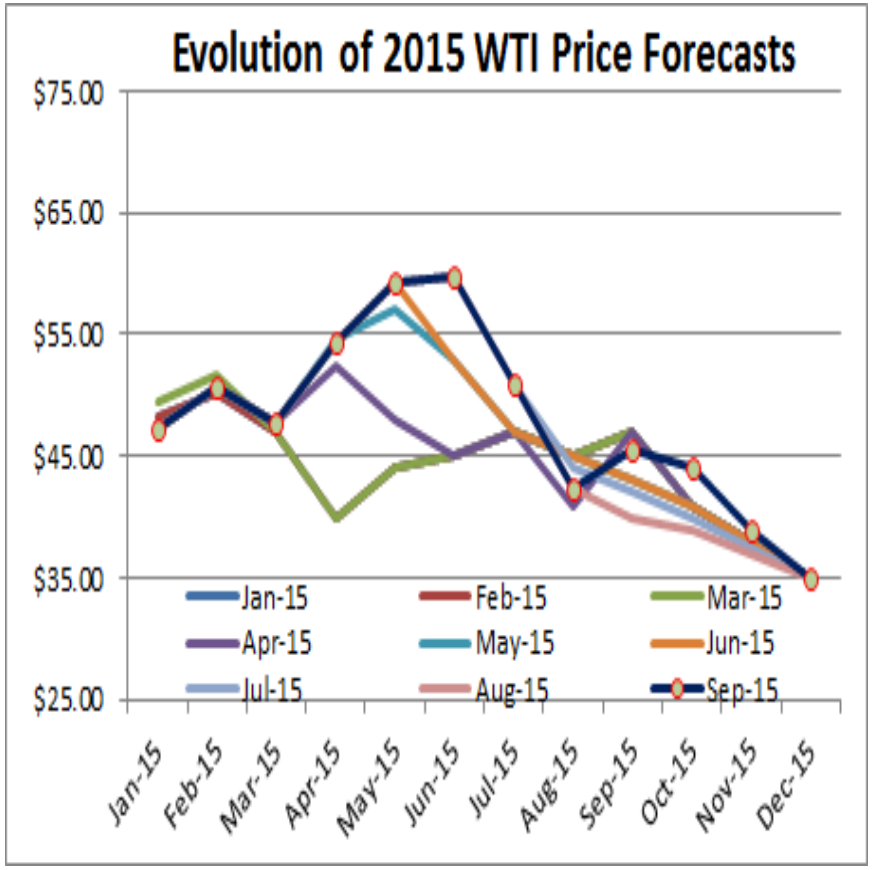
Price Outlook for 2015 -- One Man's View (subject to major changes without notice)

- **Since the fundamentals and the geopolitics** are expected to be choppy, so will the downward price trajectory
- **Much of the work was already done on prices in 2014**, it is now for the fundamentals to catch up
- **Brent should be more volatile than WTI,** since geopolitics have a much bigger Brent effect and US shale supply changes are seen being less than expected
- **Jan-Feb and Q2 prices bumps, based on financial side positioning** and expectations, delayed the process but could be **overtaken in the second half.**
- **Geopolitical events would appear to be more relevant earlier** rather than later for Nigeria, Venezuela, Iraq, but financial pressures are cumulative

A 2015 Oil Price Outlook			
Month	Brent	WTI	WTI-Brent Spread
Jan	$49.76	$47.33	-$2.43
Feb	$58.80	$50.72	-$8.07
Mar	$56.94	$47.85	-$9.08
Apr	$61.14	$54.38	-$6.76
May	$65.61	$59.37	-$6.24
Jun	$63.75	$59.83	-$3.92
Jul	$56.76	$50.93	-$5.83
Aug	$47.80	$42.43	-$5.36
Sep	$48.66	$45.47	-$3.20
Oct	$49.38	$46.29	-$3.09
Nov	$48.93	$45.97	-$2.96
Dec	$41.00	$38.00	-$3.00
Avg	**$54.04**	**$49.05**	**-$5.00**
vs. 2014	*-$41.26*	*-$40.44*	*$0.82*

The Evolution of 2015 Prices Has Been Anything But Smooth





Source: January - New York Energy Forum, "2015 Oil Market Outlook"; February - CSIS, "Energy Market Impacts of Low Oil Prices"; March Saudi Aramco Energy Week, "Global Oil Markets in a New Lower Oil Price 'Shale Era'"; April - CERI World Oil Conference, "Energy Market Impacts of Low Oil Prices"; May - client presentation in London, Paris and Madrid, "Energy Market Impacts of Low Oil Prices"; June - client presentations in Houston, "Shale Era Challenges Oil Market Traditional Structures"; July-August - internal estimates. September - client presentations in Europe. All by David Knapp.

Current Supply-Demand Response Only Half the Story

Medium-Term Oil Market Balances								
(million b/d)	2014	2015	2016	2017	2018	2019	2020	Yrly Chg.
Demand	93.24	95.36	96.78	97.70	98.64	99.29	99.92	*+0.91*
OECD	45.67	46.26	46.50	46.25	46.03	45.52	44.99	*-0.25*
Non-OECD	47.57	49.10	50.28	51.45	52.61	53.77	54.93	*+1.17*
Supply	93.31	96.82	98.45	98.13	98.62	98.86	99.30	*+0.50*
Non-Opec	56.88	58.70	59.49	58.51	57.85	56.99	55.99	*-0.54*
Opec Non-Crude	6.58	6.78	6.89	7.28	7.53	7.79	8.05	*+0.25*
Opec Crude	29.85	31.34	32.07	32.34	33.24	34.09	35.25	*+0.78*
Implied Stock Chg.	0.07	1.46	1.67	0.43	-0.02	-0.43	-0.63	
Source: Based on EI, Oil Market Intelligence, November 2015								

- Some believe Saudi/Opec's strategy has always had a longer-term component: to assure oil's role into the next decade, maybe with it being produced sooner rather than later.
- Arguably the bigger "success" for the strategy is delays and cancellations of the next tranche of competing non-Opec oil from deepwater and to a lesser extent the Arctic rather than the immediate reversal of US shale area growth..
- The small surplus from 2014 is expected reach 1.5 million b/d this year and further in 2016. It begins to come down in 2017 and turns modestly negative in 2018. Given the current trends of non-Opec project cancellations, and lack of Opec capacity additions outside of Iraq, Iran and a couple of Gulf members, the deficits look serious by 2020.
- Accumulated inventories and growing non-OECD Asian SPR give some protection, but higher price toward the end of the decade are quite likely.

- **Focus on US Shale Areas**
- US oil shale area production is reversing a multi-decade decline
- Eagle Ford and Bakken core areas dominate
- More diverse Permian and Niobrara contributing but most vulnerable
- High-grading is keeping up momentum in sweet spots, at expense of future performance of marginal areas and secondary shales

A Reconfigured US Oil Production Landscape

The US was an aging oil province, now reinvigorated by oil shale

- **North Dakota** has moved into the #2 position behind Texas, surging ahead of declining Alaska and California.
- **Alaska** has dropped behind **California** and is at barely more than a quarter of its peak.
- The country as a whole is not much more than half its 1971 peak, while **Texas** is fast closing on a new state record..
- But besides **North Dakota**, **New Mexico** and **Colorado** are making new peaks and are expected to do so for several more years.
- Some small producer states are also at or close to records; **South Dakota**, **Missouri** and **Utah.**
- Many states are at less than 10% of their peaks, but a few of them have some shale exposure. For all states, declines in the very mature conventional areas are being accelerated by low prices.

US 31 Oil Producing States Ranked by Volume

'000 b/d	2014	First Oil	Peak Year	Peak Yrs. Ago	Peak Vol.	2014 % of Peak
Texas	**3,163.9**	**1889**	**1972**	**42**	**3,452**	**91.7%**
North Dakota	**1,087.5**	**1951**	**2014**	**0**	**1,087**	**100.0%**
California	612.1	1861	1985	29	1,161	52.7%
Alaska	531.6	1958	1988	26	2,028	26.2%
Oklahoma	350.0	1891	1927	87	761	46.0%
New Mexico	**338.9**	**1911**	**2014**	**0**	**339**	**100.0%**
Colorado	**258.6**	**1887**	**2014**	**0**	**259**	**100.0%**
Wyoming	208.4	1894	1970	44	425	49.1%
Louisiana	187.8	1902	1996	18	367	51.2%
Kansas	135.6	1889	1956	58	254	53.3%
Utah	112.0	1907	1985	29	113	**99.2%**
Montana	81.8	1916	1968	46	133	61.6%
Mississippi	67.0	1889	1998	16	178	37.6%
Ohio	40.9	1860	1896	118	66	62.3%
Alabama	26.9	1944	1985	29	58	46.4%
Illinois	26.2	1889	1940	74	401	6.5%
West Virginia	27.1	1860	1900	114	44	61.9%
Michigan	19.9	1900	1979	35	105	18.8%
Arkansas	18.7	1921	1977	37	55	34.2%
Pennsylvania	18.3	1859	1891	123	81	22.6%
Kentucky	9.2	1860	1959	55	75	12.4%
Nebraska	8.3	1939	1962	52	68	12.2%
Indiana	6.9	1889	1956	58	35	19.8%
Florida	6.1	1943	1978	36	129	4.7%
South Dakota	4.9	1954	2014	0	4.9	**100.0%**
New York	0.9	1865	1882	132	18.4	5.0%
Tennessee	0.9	1860	1982	32	3.1	29.1%
Nevada	0.9	1954	1990	24	11	7.8%
Missouri	0.5	1889	2014	0	0.5	**100.0%**
Arizona	0.2	1958	1968	46	9.2	1.7%
Virginia	0.04	1943	1983	31	0.2	19.7%
United States*	**7,352**	**1859**	**1971**	**46.5**	**9,637**	**76.3%**

** Excluding US Federal GOM production. Major shale states in bold.*
Source. Oil Market Intelligence *generally based on state level data.*

The US Light, Tight Oil Surge Has Changed the Global Oil Market

The US shale liquids are dominated by North Dakota and Texas

- More than half of expected 2015 **crude oil** growth comes from **North Dakota** and **onshore Texas** which are also major contributors to another 242,000 b/d of growth in US natural gas liquids.
- Shale-based increases in crude oil, condensates and NGLs is even larger as some of the increases go to offsetting declines in **conventional oil** and **NGL output** from other parts of Texas and North Dakota.
- Nationally, several states without significant shale development continue to decline, noticeably **Alaska**, **California** and **Louisiana** and **shallow water Gulf of Mexico**.
- But **New Mexico's Permian Basin** exposure and **Colorado's** Denver-Julesburg Basin **Niobrara** sand have made significant contributions to rising US supplies. **Montana Bakken** not so much

2015 Quarterly US Oil Supply Details

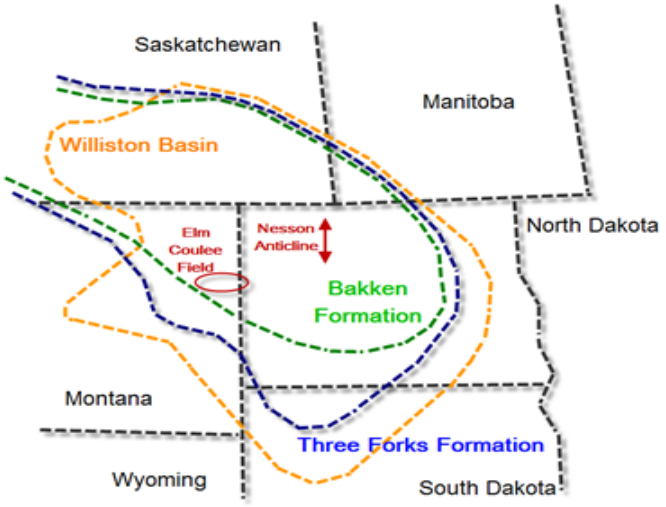
'000 b/d	Q1	Q2	Q3	Q4	2015	Chg. vs. 2014
Texas	3,487	3,518	3,429	3,443	3,469	+305
North Dakota	1,175	1,186	1,192	1,216	1,192	+105
Gulf of Mexico	1,319	1,361	1,463	1,644	1,448	+124
Colorado	313	325	333	334	326	+66
New Mexico	398	430	449	455	433	+94
Other PADD 2	629	624	632	662	637	+34
Other PADD 4	440	444	430	432	437	+34
Other PADD 3	120	118	111	115	116	+4
PADD 1	34	31	29	30	31	+3
Other PADD 5	1	1	1	1	1	-0
Louisiana	180	175	166	164	171	-17
California	615	602	594	588	600	-11
Alaska	547	523	480	532	520	-11
Total US Crude	**9,258**	**9,339**	**9,307**	**9,616**	**9,381**	**+729**
Total US NGLs	3,087	3,274	3,314	3,364	3,261	+246
New OMI US Other	0	0	0	0	0	0
Total US Oil Productio	**12,345**	**12,612**	**12,621**	**12,980**	**12,641**	**+975**

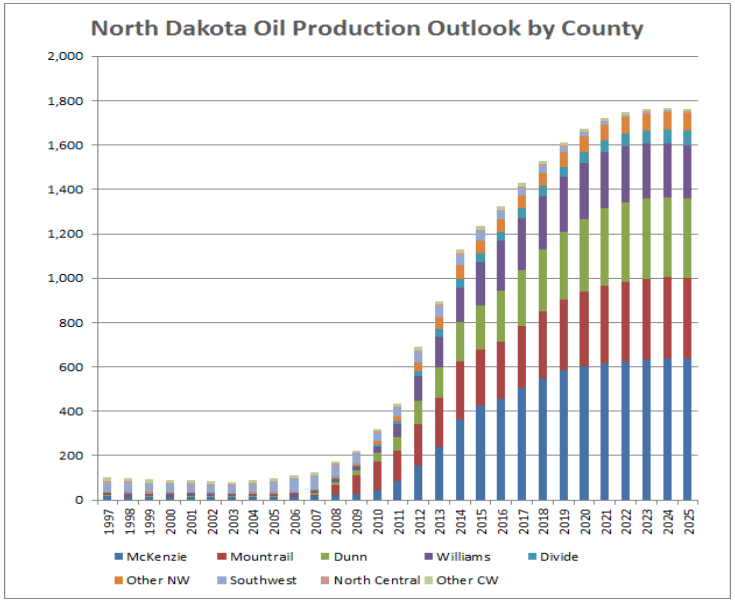
Source: Based on EI, Oil Market Intelligence, November, 2015

Understanding the Bakken "Shale" Oil Area

Key US growth area

- Geographically, the Bakken area is a part of the larger Williston Basin that contains a number of other productive sands but nothing close to the productivity of the Bakken/Three Forks.
- Bakken output, primarily using the same method as shale areas, now represents over 98% of state output.
- With Bakken's remote location/short pipeline capacity., rail costs have become more important than production costs. Harsh climate and small population are additional disadvantages putting the Bakken on the front lines of price-induced production cuts..
- Reliance on rail transport comes with difficult crude oil quality standards and shut in of some oil as have flaring restriction and lacking gas off-take capacity.
- Producers are cutting spending but continue to exercise drilling options to hold leases but not completing some wells . Some already-completed wells are not hooked up yet for lack offtake space.





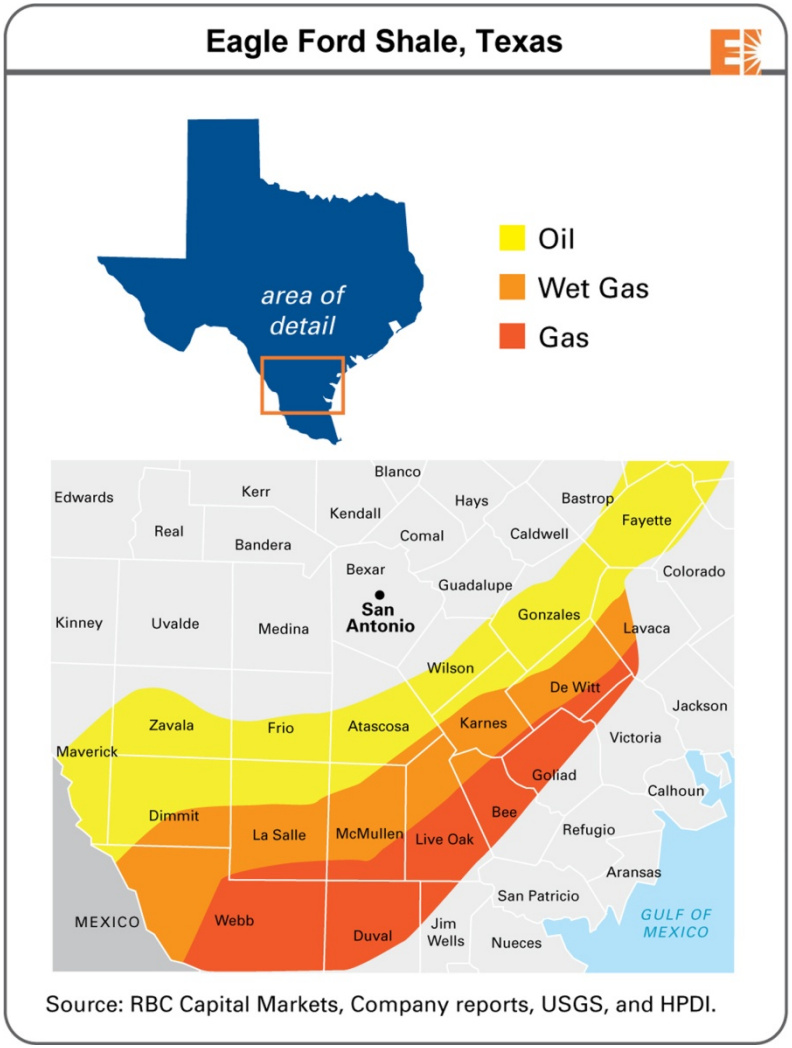
North Dakota Crude Oil Production Growth									
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Bakken Area	223.0%	265.2%	83.0%	72.6%	49.7%	70.0%	32.6%	28.7%	14.8%
Non-Bakken	0.1%	-6.1%	-15.4%	-9.5%	-10.4%	-1.7%	-0.5%	-0.6%	-7.4%

**Jan-Sep year-on-year. Source ND Department of Mineral Resources. EI calculations.*

The Texas Eagle Ford the "True Shale Play"

Location and developed infrastructure give it an advantage over the Bakken

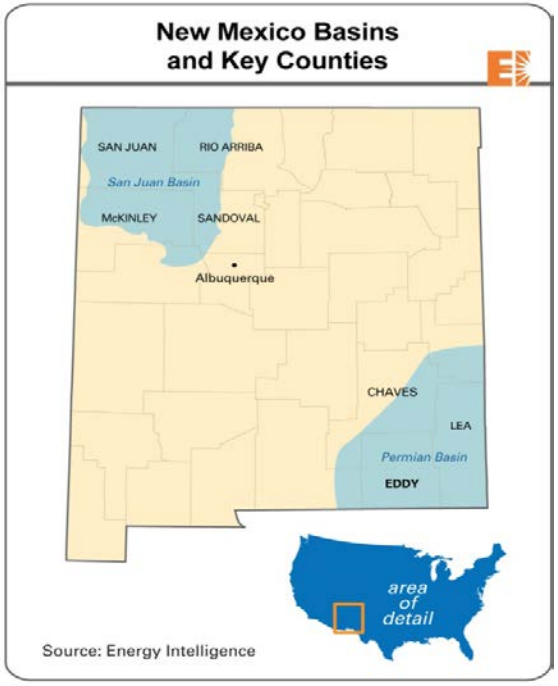
- Bakken is conventional oil in a shale environment, Permian is a mixed shale/non-shale play with the non-shale portion dominant.
- Shale zones account for most of the Eagle Ford area liquids under 23 counties in eastern and southern Texas, 12 fields currently produce liquids often from under multiple countries. Output now exceeds 1.5 million. Infrastructure is highly developed, political environment is strongly positive
- The Eagleville field is by far the most productive responsible for more than 75% of the liquids output of the Eagle Ford, other fields include Briscoe Ranch, DeWitt, Sugarkane.
- Supply logistics are highly developed skilled labor is of the highest order and the local communities are exceedingly receptive. Nearby refineries are ready customers and exports are even possible.

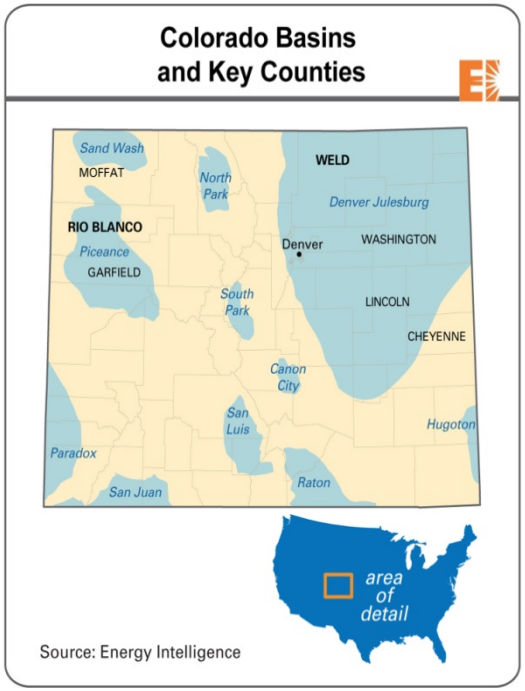


Two Other States Are Contributing to the Shale Revolution

New Mexico and Colorado have seen localized but significant gains

- Virtually all of New Mexico's oil output comes from two counties, Lea and Eddy, with only small amounts from Chavez county all n the southeast corner of the state**.** Northeast corner is a gas area.
- Five of Texas' Delaware Basin Permian sands cross the border into New Mexico and are being exploited by a number of small and medium sized companies.
- Water resources are an issue but the state is generally seen, like Texas and North Dakota remains "development friendly." Shale growth dominates declines from non-shale areas.





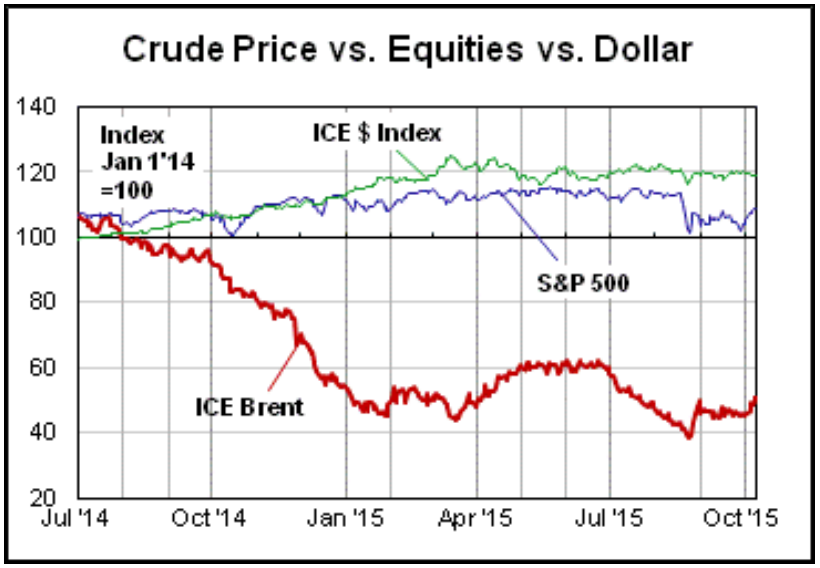
- Colorado has a much larger number of basins, but only the Denver-Julesburg (DJ) in the northeast part of the state is a significant shale liquids area, primarily Niobrara shale in the Wattenberg field ..
- Colorado's other large conventional field Rangely in the Piceance Basin has been in decline for a number of years. The state is decidedly split and is a battleground on hydraulic fracturing.
- A number of D-J fields have potential to contribute and there are a couple of other untapped Niobrara basins like the North Park Basin in the north central part of the state and some of the western basins.

- **No Oil Market is an Island**
- The advent of paper markets brings with it asset allocation influences
- Physical market interactions have also become more intense
- Oil also lives in a world of inter-fuel and inter-factor competition
- Headline driven oil price movements are increasingly financial
- But classic geopolitics still can paly a supporting (or depressing) role
- One great irony of the current oil market is Middle East geopolitics being more threatening than ever while oil production makes records

"Outside" Influences on Oil Markets and Prices

Financial drivers, geopolitics, domestic policies and regulation all play a role

- Physical balances and supply logistics, are not only affected by the physical market but interact in a dynamic way with financial drivers.
- Correlations between factors that affect oil prices are very sporadic flipping from very tight to virtually zero from year to year or month to month, tightening and loosening. But in general physical market factors currently dominate the trend.
- But financial factors and the market sentiment they reflect still matter in variations around the trend; i.e. the recent "dead cat bounce"



- Oil pricing in dollars enters currency a into oil prices with a physical market as products and labor costs relate to local currencies, as seen in the regular monthly *Oil Market Intelligence* chart above.
- For a net oil importing economy like the US, stock prices (the S&P) should be negatively affected by higher prices, but to the extent economic optimism or pessimism drive prices of both share and oil, a counterintuitive positive correlation can result.
- Even if oil-dollar or S&P-oil correlations are flawed, if trading strategies are based on the perceived correlation, the relationship becomes a self-fulfilling prophesy—until it doesn't.
- Public policy similarly will push prices around, with economic stimulus, variations in price subsidies common examples. US state and local hydraulic fracturing rules are another.

- **Physical Markets Have Become More Complex, Higher Velocity**
- Inside the physical oil market interactions between the Atlantic Basin and East of Suez markets interaction is complex, with gluts in both.
- Light-sweet & heavy-sour differentials are swinging cross-regional flows.
- Linkages between crude markets and product markets are dynamic as pricing power ebbs and flows.
- Refiners sit in the middle with their own external influences including transport logistic for crude and product and continuing environmental.
- Oil is also only one fuel choice in energy markets and energy is only one factor of production.

- **Financial Market Drivers Dominate Physical Drivers More Often**
- The advent of paper markets brings with it asset allocation influences
- Events in stock markets, currencies, bond markets now can affect oil
- Interactions are complex -- what affects banks, affects oil lending
- China's stock market crash, strong dollar, QE2; "the new geopolitics"
- But old style geopolitics is "alive and unwell"

Geopolitical Hotspots Support For Oil Prices Has Waned

And cooling tensions could soften prices where additional oil is forthcoming

- **Focus has shifted** from geopolitical supply interruptions to market surpluses
- But there remains a **long list of hotspots** including Iranian nuclear deal as well as Ukraine-Russia and related sanctions.
- The most visible concerns surround **Islamic State in Iraq, Syria** and its a growing presence in **Libya** joining supply crippling internal factional conflicts.
- **Yemen and Sudan** are currently "hot" but like Syria and, to a lesser extent, even Iraq have more upside than downside for supply prospects. But **Nigeria** still has more to lose than gain.
- Low oil prices are exacerbating **Venezuela**'s already disabling economic and oil production problem with social unrest appearing to be growing. **Ecuador** faces similar difficulties despite improved performance and prospects.
- **Colombia** faces some internal political problems, but its oil production problems are more market related due to the preponderance of heavy oil facing stern competition in the key US market from Canadian oil sands supplies. Brazilian scandals look more relevant beyond the near term.
- The **effects of low oil prices** on the geopolitics of the **Mideast Gulf** are **very different**, but **Iran**'s internal and external political context will have a material role in oil market developments beyond direct market developments.
- Similarly **Iraq** represents both the largest potential upside production potential and the largest potential losses from internal conflict between the **Federal and KRG** governments and the external threats not only from ISIL but also complicated interrelationships involving Iran and Turkey. .

Energy Intelligence

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