Energy Intelligence

New York Energy Forum

2015 World Oil Price Outlook: Some Insights into Oil Market Adjustment Processes

David Knapp, Chief Energy Economist, Energy Intelligence

January 2015

Powerful Thinking
for the global energy industry

OUTLINE

- How did this happen?
- Changing roles for key players
- Where are we in the process?
- While the direction of adjustment is clear, the pace is anything but
- The problem is that besides supply, demand and stock levels interacting with prices, they also interact with each other and with outside influences all with varying degrees of intensity
- Processing and interpreting the flow of adjustment events including outside influences and intervening events -- geopolitics continue
- A quick note of the vagaries of “breakeven” prices
- Where are we at the end of the year and what about 2016 oil markets?

How Did This 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" that changed the rules oil market has lived by for decades.**

- **The Shale Era is more about how geologists think about their job than the tools and information they have due to technological improvements.**

- **Source rock as a target rather than an afterthought caused the US supply surge, not horizontal drilling, multilateral wells or hydraulic fracturing.**

- **The oil world has been confronted with a new, huge producible resource base and has begun to produce it economically.**

- **Saudi Arabia can't change the resource base so they are changing the economics.**

Changing Roles for Key Players

- Saudi Arabia convinced Opec to hold production and allow prices to drop because cutting to make room for more non-Opec supply didn't make 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 now involuntarily takes the dreaded role of the "swing producer." Saudi Arabia has been there, and doesn't want to go back.
- Opec and specifically Saudi Arabia takes the role of chief "sitter and watcher" for signs that what some Opec delegates dubbed "the experiment" has succeeded.
- The price decline will continue until it works -- by shutting in a significant amount of non-Opec supply, preferably in US shale areas that were the prime source of the glut.
- The answer to an increasing number of queries asking "Are we there yet?" I -- as is usually the case -- is "No."
- The to the similarly cliched question "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 carrying an entire industry and fortunes to be made and lost 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 afterword.

– 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 Phase 1 works, forward price curves flatten and speculative stocks to come back on the market blunting price recovery.

– If Phase 1 works slowly, and Phase 2 goes on for quite a while, there may be another phase to consider:
  - Phase 2A will occur if and when the world “runs out” of storage, a moving target as onland tanks can be built relatively quickly and there are always more boats.
  - But Phase 2A would accelerate the Phase 1 process, as distressed cargoes begin to show up on tanker markets and force shut-ins at the wellhead.

We are likely in mid-Phase 1/early Phase 2

The Direction of Adjustment is Clear, the Pace and Shape Isn't

- 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 a short term (utilization) component and an equipment choice component.

For both supply and demand the long term adjustment components are generally larger than the short term adjustments -- except for the effect of price expectations.

In the "alphabet soup" of oil price recovery trajectories, the basic choices are V (snapback), U (extended trough) or W (volatility/aborted recovery).

For now what is looking at appears to be a long U that could turn into warped W if Phase 2A plats out erratically

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	**92.81**	**92.72**	**94.32**	**95.12**	**93.75**	***+0.80***
OECD	45.43	44.92	45.93	46.13	45.61	*-0.06*
Non-OECD	47.37	47.80	48.39	48.99	48.14	*+0.86*
Supply	**95.41**	**94.94**	**95.15**	**96.93**	**95.35**	***+1.40***
Non-Opec	58.63	58.27	58.21	59.93	58.67	*+1.16*
Opec NGLs & Other	6.57	6.44	6.67	6.84	6.65	*+0.14*
Call on Opec Crude	**27.60**	**28.01**	**29.44**	**28.35**	**28.36**	***-0.54***
Opec Crude	30.20	30.22	30.26	30.16	30.04	*+0.10*
Implied Stock Chg.	**+2.60**	**+2.21**	**+0.83**	**+1.81**	**+1.60**	
Source: Based on EI, Oil Market Intelligence, *January 2014*						

- **Absent significant economic events demand is expected to grow by 800,000 b/d this year and non-Opec supply increases by 1.16 million b/d assuming delayed price responses. Inventories continue to build and prices continue to decline.**
- **Opec NGL and other production will see a modest 140,000 b/d rise again assuming no extraordinary events and Opec crude adds about 100,000 b/d.**
- **These Opec additions assume the financial pressure of the lower oil price on balance of payments and government budgets don't spawn local 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 against the dollar, the evolution of subsidies and supply will vary with fiscal policy changes.**

Processing and Interpreting the Flow of Adjustment Events

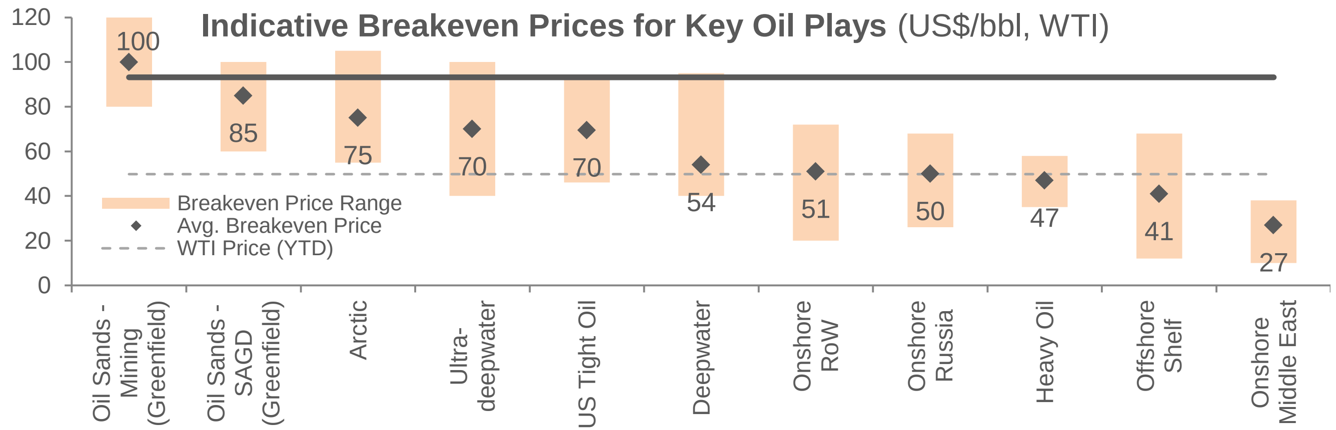
- How much oil supply responds will be the main criteria in evaluating the success of the Opec/Saudi strategy;
  - slowing growth in the US, Canada, Brazil and the few other "grower" countries,
  - accelerating declines in the North Sea, Russia and several other mature areas, and
  - switches from "grower" to "decliner" for places like heavy oil laden Colombia
- Demand growth will play a lesser role this year but might factor significantly into any re-balancing that takes place in 2016 and beyond;
  - watch the US and China in particular and any possible help from lower oil prices for fragile European finances or Japan's struggling economy, or
  - any inter-fuel events that limit supplies or raise prices of competing fuels like coal, nuclear or LNG.
- Inventory levels and the adequacy of storage capacity and particularly the onset of distressed cargoes would be major signals.
- Fiscal policy changes being 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….

The Vagaries of "Breakeven Prices"

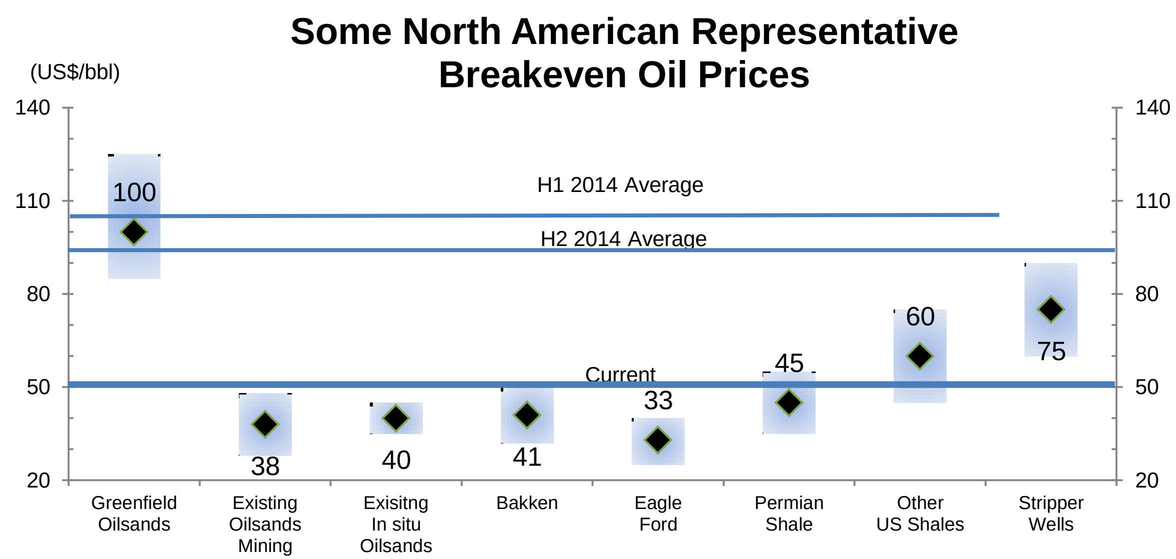
- One of the most visible metrics that has emerged as a prime driver in evaluating supply responses is the somewhat flawed concept of "breakeven price."
- Unfortunately upstream decisions are based on widely varying conditions and individual circumstances and don't conform nicely to such a metric.
- Even though the ranges in the growing number of breakeven graphics tend to be reasonable wide it is unlikely they capture the real decision points.
- Also the "average" tends to sit in the middle while the distribution is skewed.
- In addition, the short-term and long-term aspects of these graphs do not reflect the differences between operating costs and finding and development cost.
- The breakeven categories do not reflect the impact of the maturity of individual projects and the sunk cost nature of earlier expenditures.
- "Breakeven" actual depends realized price, including the varying costs of production and development, which are expected to fall, lowering breakeven.
- Lastly, the relationship between the current price and breakeven ignores both price and cost expectations.

The Vagaries of "Breakeven Prices" (a couple of examples)

Global



Regional



Source: EI, Oil Market Intelligence based on various company, and financial institution sources.

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

- One man's judgment: price will be lower than they are today, forward curves will still be in contango, inventories will still be building; Saudi Arabia sits tight; why?
  - because there will still be too much oil as supply and demand responses are slow to materialize and have an unexpected composition;
  - and as supply reductions come not in US shale, but from closure of stripper well and California Central Valley steam flood operations about twice as much of the effect comes from non-US increases in decline rates, then from US supply growth reductions;
  - storage capacity will be added fast enough to avoid distressed cargoes and 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 it has 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 prices

- Oil market landscape for 2016 will see:
  - much larger downward supply adjustments in and upward demand increases;
  - flattening forward curves will cause the emergence of large volumes of stored crude;
  - the beginnings of a slow, wide-bottom U price recovery, but that could bring a quick upturn in US shale growth with the right side of the U on a slant

Today's Price Outlook for 2015 (subject to large revision without notice)

- Since the fundamentals and the geopolitics are expected to be choppy so will the downward price trajectory
- Most of the work has already been done on prices, it is now for the fundamentals to catch up
- Brent will be more volatile than WTI, since geopolitics have a much bigger Brent effect and US supply changes less than expected
- an interim low in Q2, based on financial side history and expectations, will be overtaken late in the year,
- Geopolitical events would appear to be relevant earlier rather than later for Nigeria, Venezuela, Iraq, but financial pressure s will be cumulative

2015 Oil Price Outlook			
Month	Brent	WTI	WTI-Brent Spread
Jan	$50.02	$48.19	-$1.83
Feb	$54.50	$50.25	-$4.25
Mar	$51.50	$47.00	-$4.50
Apr	$47.00	$40.00	-$7.00
May	$53.00	$44.00	-$9.00
Jun	$53.00	$45.00	-$8.00
Jul	$51.00	$47.00	-$4.00
Aug	$52.00	$45.00	-$7.00
Sep	$55.00	$47.00	-$8.00
Oct	$46.75	$41.00	-$5.75
Nov	$41.00	$38.00	-$3.00
Dec	$39.00	$35.00	-$4.00
Avg	**$49.48**	**$43.95**	**-$5.53**
vs. 2014	*-$45.85*	*-$45.60*	*$0.25*

Energy Intelligence

The Americas

5 East 37th Street, 5th Floor
New York, NY 10016-2807
Tel: 1 212 532 1112
Fax: 1 212 532 4479

1401 K Street, NW, Suite 1000
Washington DC 20005
Tel: 1 202 662 0700
Fax: 1 202 783 8230

808 Travis Street, Suite 1014
Houston, TX 77002
Tel: 1 713 222 9700
Fax: 1 713 222 2948

Europe & Africa

7 Down Street, 3rd Floor
London W1J 7AJ, UK
Tel: 44 (0)20 7518 2200
Fax: 44 (0)20 7518 2201

72/4 Leningradsky Pspt, #407
125315, Moscow, Russia
Tel: 7 495 721 1611
Fax: 7 495 721 1614

Chaussee de la Hulpe 120
1000 Brussels
Belgium
Tel: 32 (0)2 663 18 00

Middle East & Asia-Pacific

15 A Temple Street, #02-01
Singapore 058562
Tel: 65 6538 0363
Fax: 65 6538 0368

Dubai Media City
Al Thuraya Tower 2 - 1907
P.O Box 71338
Dubai - UAE
Tel: 97 14 364 2607
Fax: 97 14 369 7500

1st Floor, Building DeFreij,
Sodeco, Beirut, Lebanon
Tel: 9611614282
Fax: 9611614284