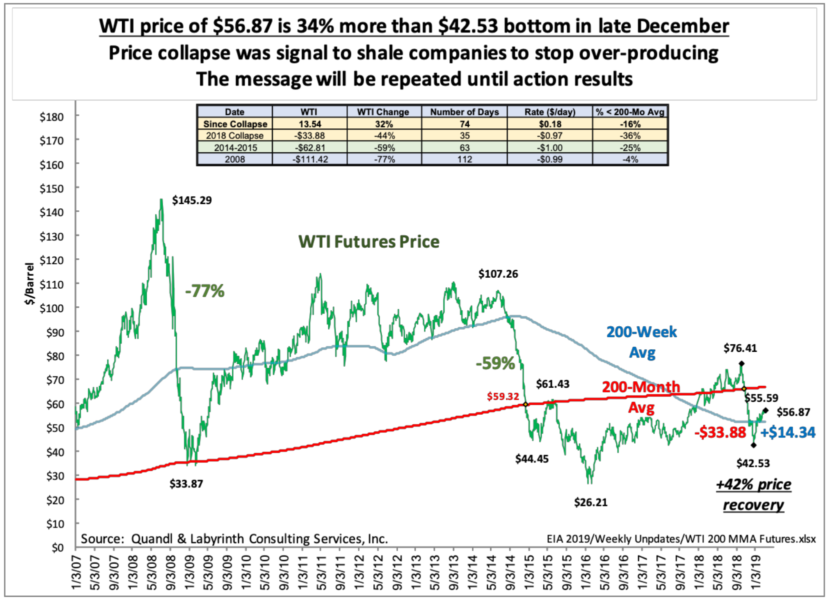
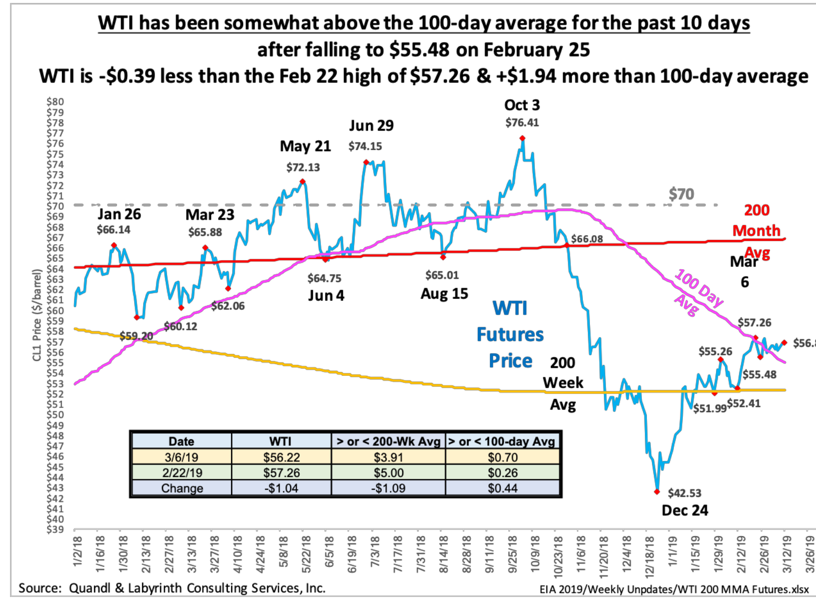
MacroVoices
March 13, 2019

Art Berman
Labyrinth Consulting Services, Inc.

Oil prices collapsed in early October but Have Recovered to Mid-$50 Range



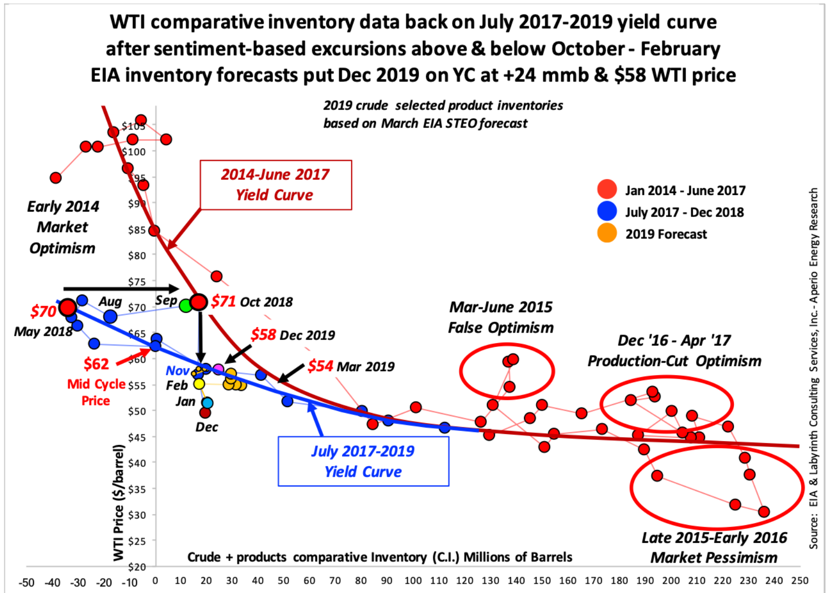
Date	WTI	WTI Change	Number of Days	Rate ($/day)	% < 200-Mo Avg
Since Collapse	**13.54**	**32%**	**74**	**$0.18**	**-16%**
2018 Collapse	-$33.88	-44%	35	-$0.97	-36%
2014-2015	-$62.81	-59%	63	-$1.00	-25%
2008	-$111.42	-77%	112	-$0.99	-4%

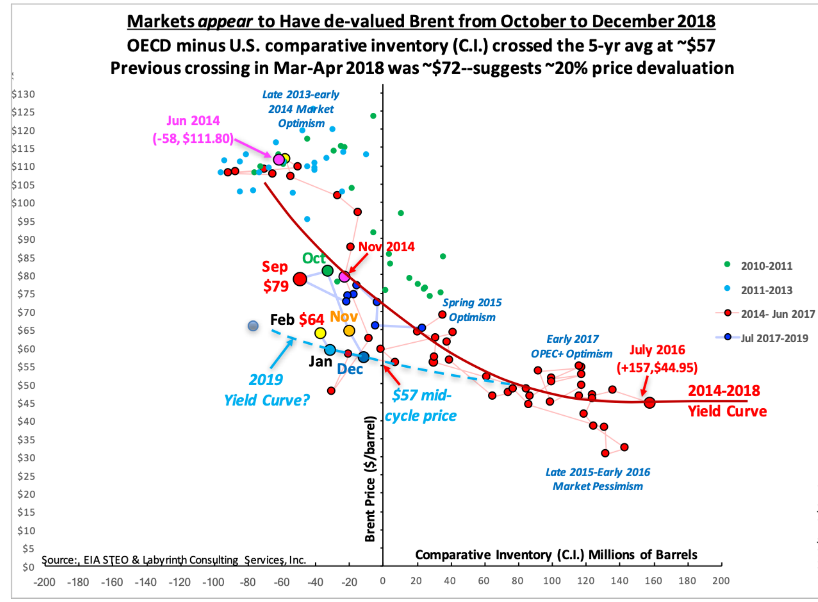


Date	WTI	> or < 200-Wk Avg	> or < 100-day Avg
3/6/19	$56.22	$3.91	$0.70
2/22/19	$57.26	$5.00	$0.26
Change	-$1.04	-$1.09	$0.44

- WTI has recovered 42% of the price decline from the 2018 oil-price collapse.
- $56.87 is 34% more than $42.53 bottom in late December.
- Price collapse was signal to shale companies to stop over-producing.
- The message will be repeated until action results.
- WTI has been somewhat above the 100-day average for the past week after falling to $55.48 on February 25.
- WTI is -$0.39 less than the Feb 22 high of $57.26 & +$1.94 more than 100-day average.

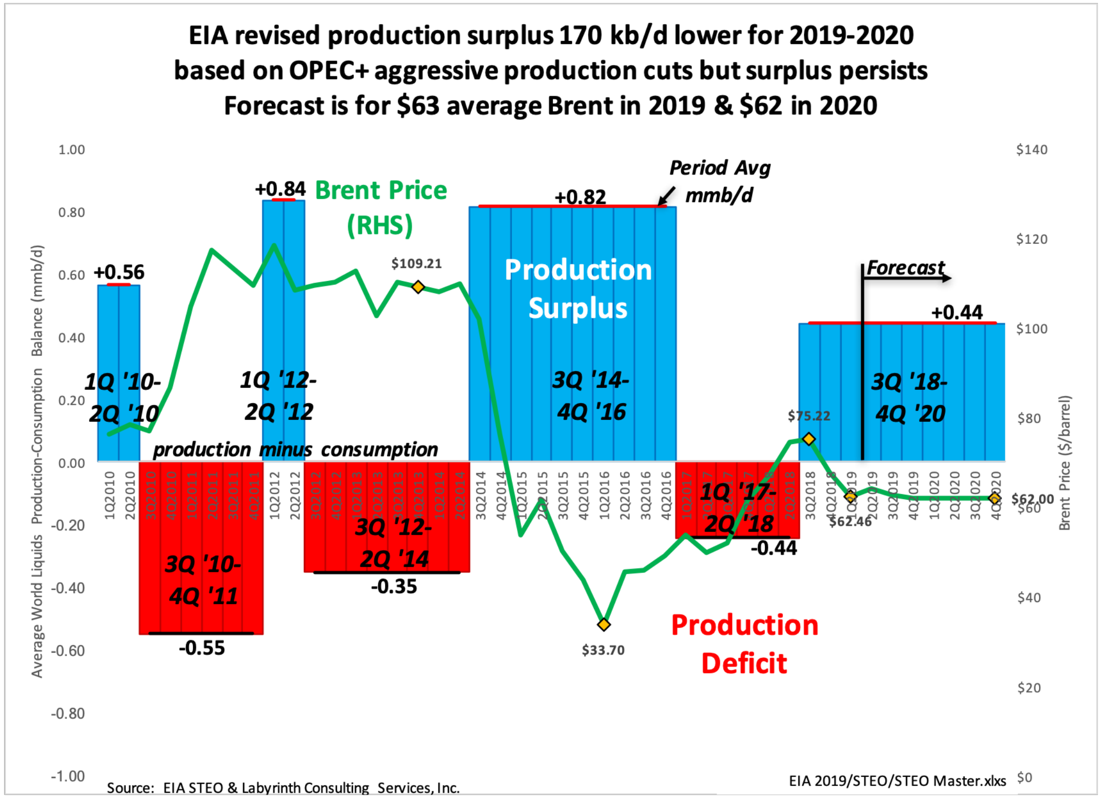
2018 Oil-Price Collapse Was More Than a Correction: Markets Devalued Brent





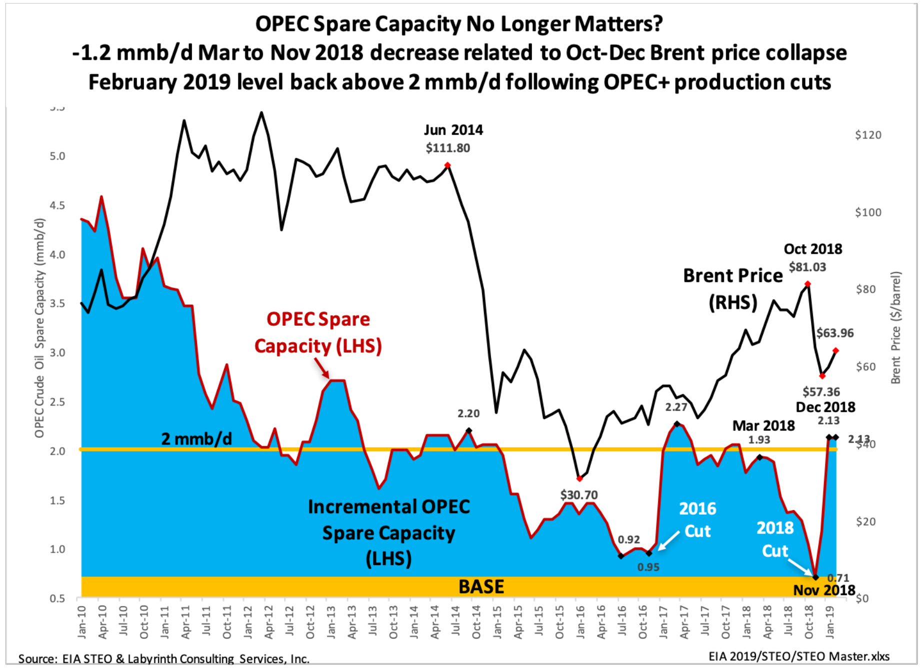
- The price collapse was in reaction to global over-supply and was not merely a correction.
- Some analysts mistakenly think that everything is back-to-normal now that prices have stabilized—comparative inventory yield curves suggest that they are wrong.
- Markets appear to have de-valued Brent from October to December 2018.
- OECD minus U.S. comparative inventory (C.I.) crossed the 5-yr avg at ~$57.
- Previous crossing in Mar-Apr 2018 was ~$72--suggests ~20% price devaluation.
- WTI comparative inventory data back on July 2017-2019 yield curve after sentiment-based excursions above & below October – February.
- EIA inventory forecasts put Dec 2019 on YC at +24 mmb & $58 WTI price.

World Production Surplus for 2019-2020



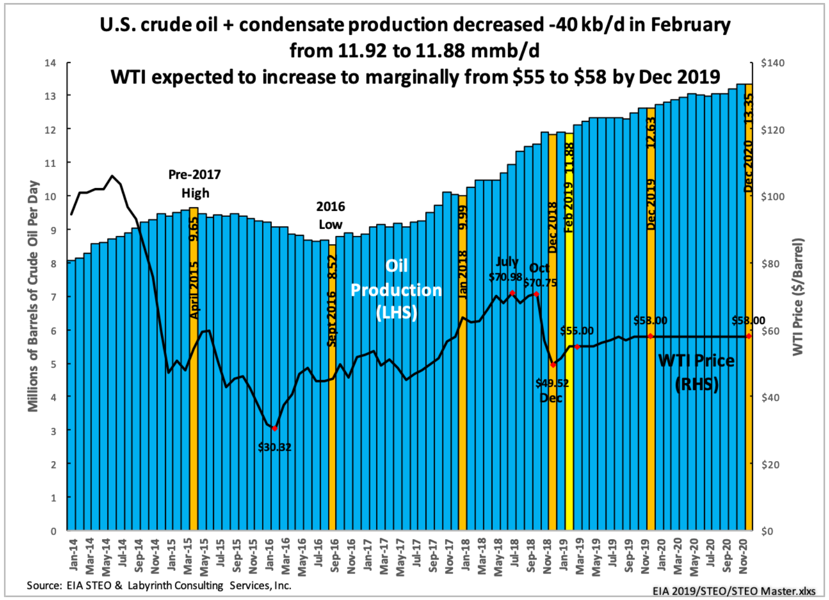
- EIA revised production surplus 170 kb/d lower for 2019-2020 based on OPEC+ aggressive production cuts but surplus persists
- Previous estimate was +610 kb/d, now at +440 kb/d.
- Forecast is for $63 average Brent in 2019 & $62 in 2020.

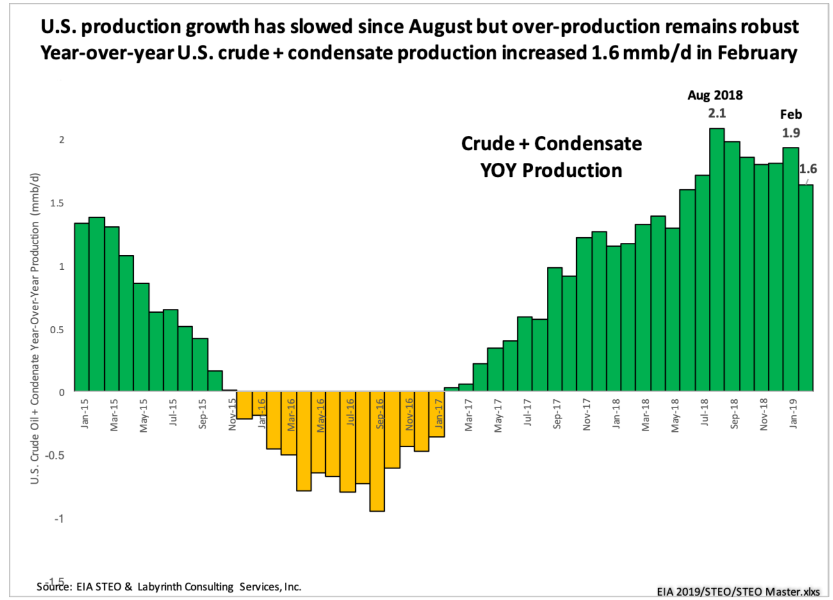
OPEC No Longer Matters?



- Many believe that OPEC no longer matters & cannot move oil prices.
- March through November increased production resulted in a -1.2 mmb/d decrease in OPEC spare capacity.
- This was clearly related to the October-December Brent price collapse
- February 2019 spare capacity is back above 2 mmb/d following OPEC+ production cuts.

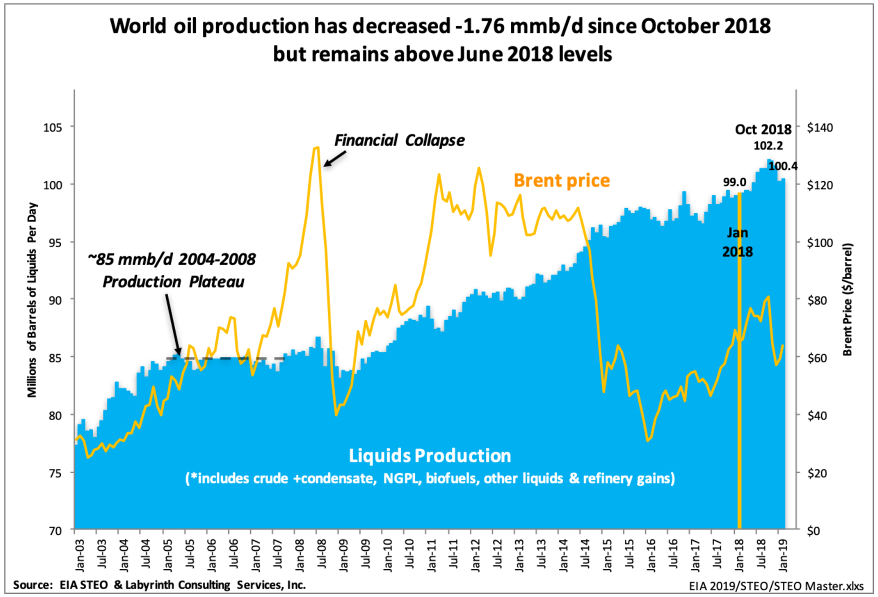
U.S. Oil Output Remains Strong

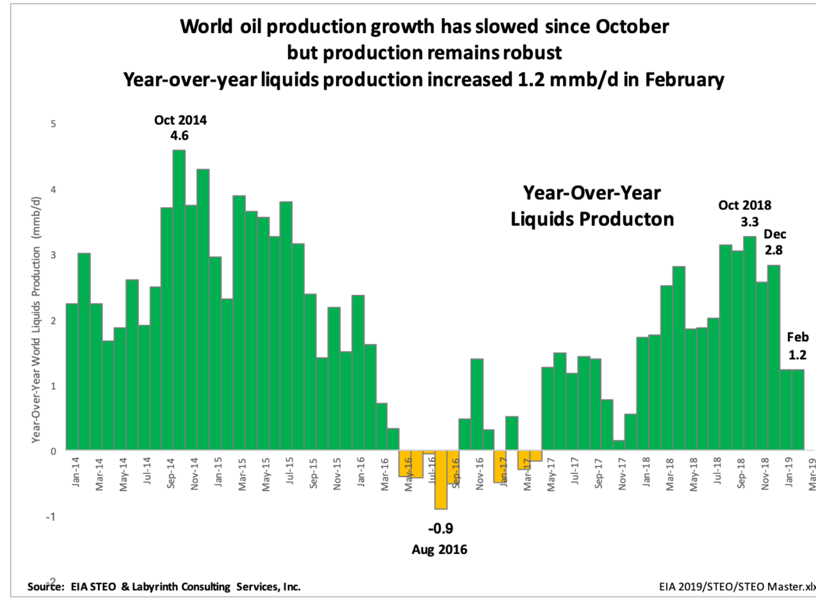




- U.S. crude oil + condensate production decreased -40 kb/d in February from 11.92 to 11.88 mmb/d.
- Output is expected to increase to 12.13 mmb/d in March.
- WTI price forexast is to increase to marginally from $55 to $58 by Dec 2019.
- U.S. production growth has slowed since August but over-production remains robust.
- Year-over-year U.S. crude + condensate production was 1.6 mmb/d in February.

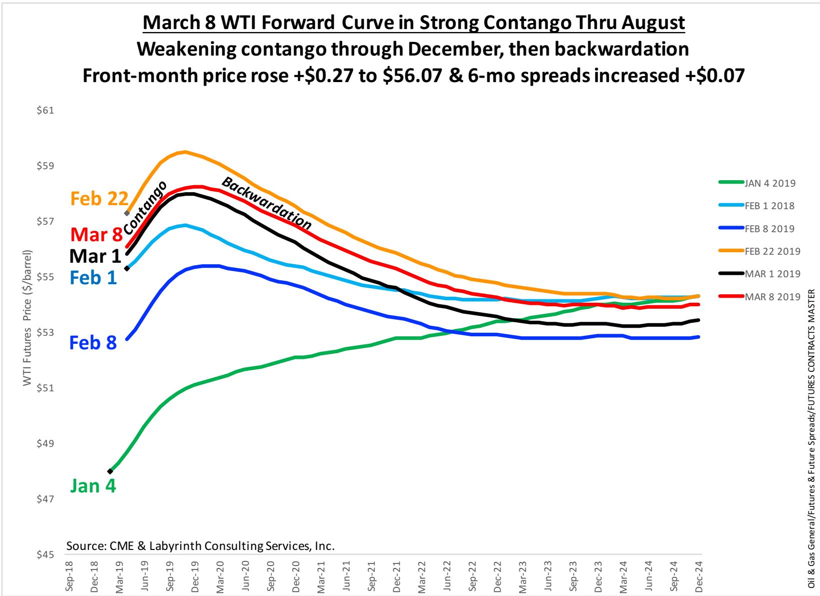
World Liquids Production is Falling But Growth is Still Strong

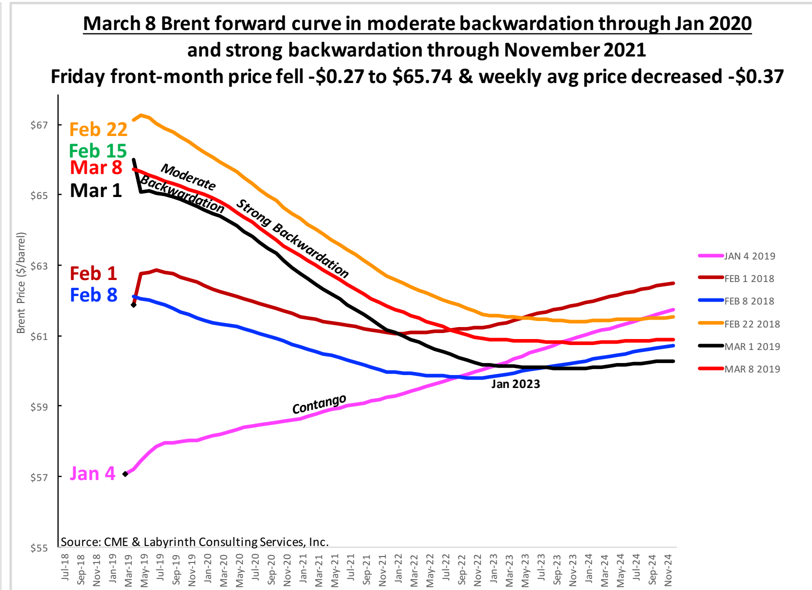




- World oil production has decreased -1.76 mmb/d since October 2018 but remains above June 2018 levels.
- Growth has slowed since October but production remains robust.
- Year-over-year liquids production was 1.2 mmb/d in February, approximately the same as in January.

WTI and Brent Forward Curves Going in Different Directions

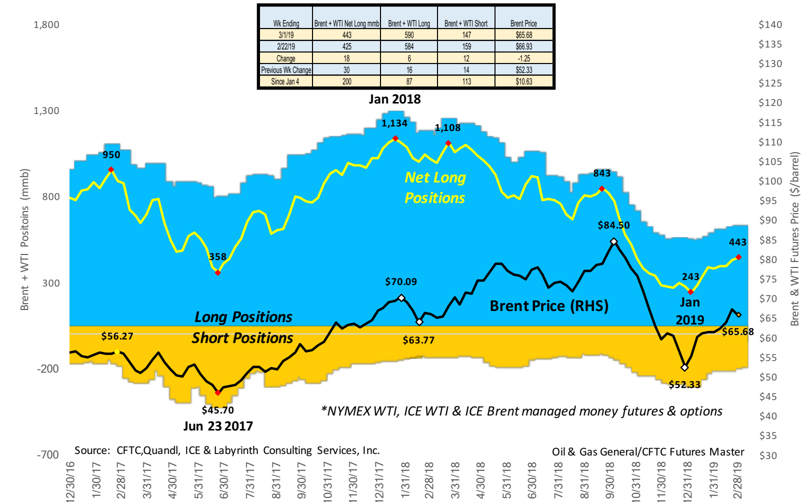




- WTI is in near-month contango while Brent is in backwardation.
- Forward curves reflect stronger demand for Brent than for WTI probably reflecting oil-quality more than supply concerns.
- March 8 WTI forward curve in strong contango thru August.
- Weakening contango through December, then backwardation.
- March 8 Brent forward curve in moderate backwardation through Jan 2020 and strong backwardation through November 2021.

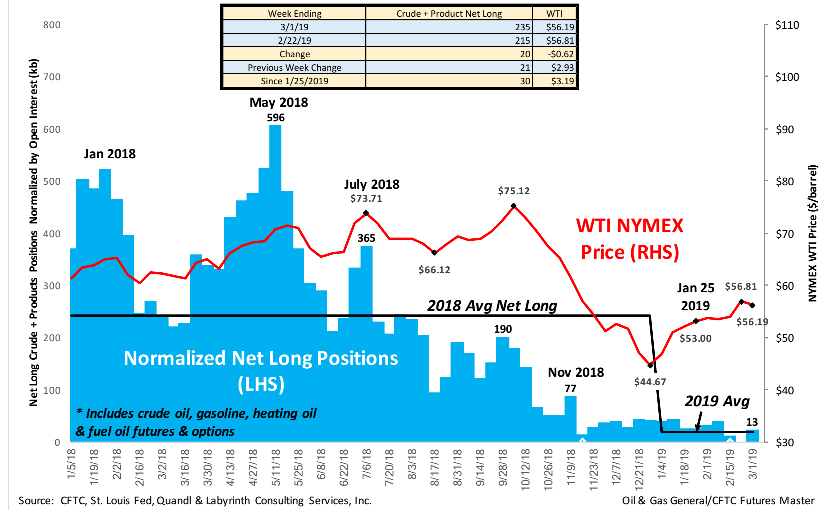
Oil Price Optimism Colored by Increased Short Bets

Brent + WTI net long positions increased a *deceptively* optimistic +18 mmb
Shorts increased +12 mmb after increasing +14 mmb the previous week
All of the long increase was WTI but 85% of the short increase was also WTI



Wk Ending	Brent + WTI Net Long mmb	Brent + WTI Long	Brent + WTI Short	Brent Price
3/1/19	443	590	147	$65.68
2/22/19	425	584	159	$66.93
Change	18	6	12	-1.25
Previous Wk Change	30	16	14	$52.33
Since Jan 4	200	87	113	$10.63

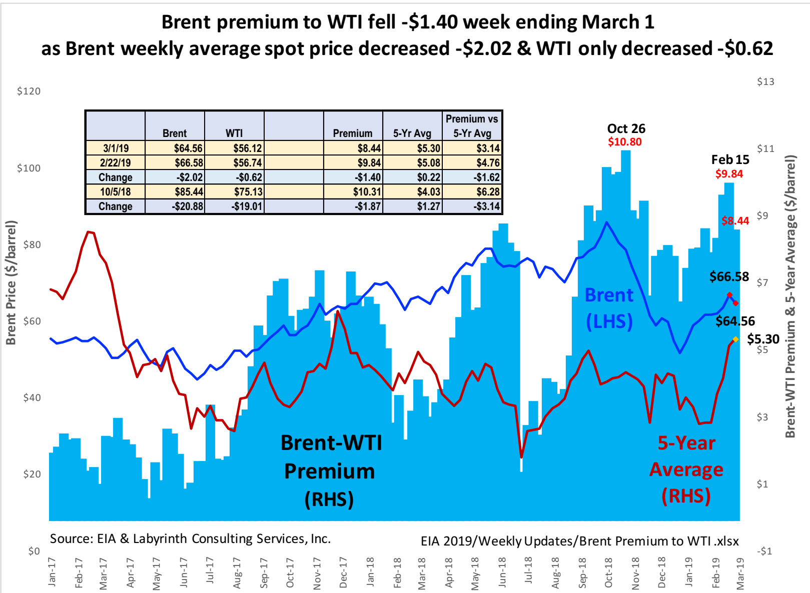
Higher 2019 WTI prices inconsistent with lowest WTI net long positions in 15 months
2019 year-to-date average net long positions -93% less than 2018 level
Net long positions increased +20 mmb & WTI fell -$0.62 week ending March 1



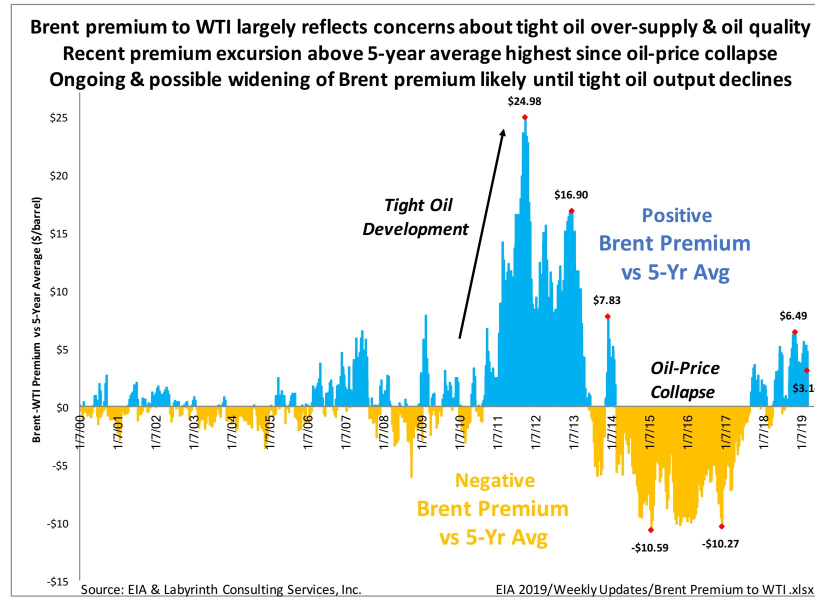
Week Ending	Crude + Product Net Long	WTI
3/1/19	235	$56.19
2/22/19	215	$56.81
Change	20	-$0.62
Previous Week Change	21	$2.93
Since 1/25/2019	30	$3.19

- Brent & WTI price optimism offset by increasing short bets.
- Brent + WTI net long positions increased a deceptively optimistic +18 mmb week ending March 1.
- Shorts increased +12 mmb after increasing +14 mmb the previous week.
- All of the long increase was WTI but 85% of the short increase was also WTI.
- Higher 2019 WTI prices inconsistent with lowest WTI net long positions in 15 months.
- 2019 year-to-date average net long positions -93% less than 2018 level.
- Net long positions increased +20 mmb & WTI fell -$0.62 week ending March 1.

Brent Premium to WTI Reflects Concerns About Tight Oil

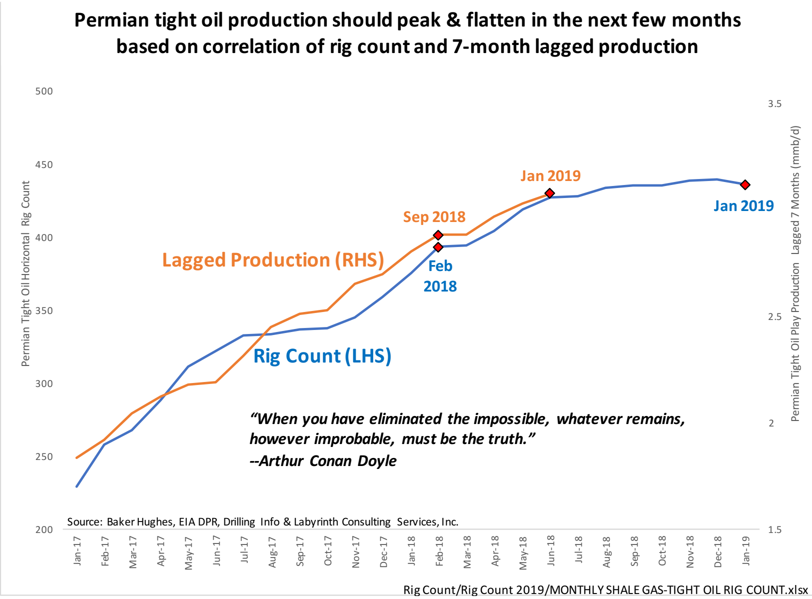


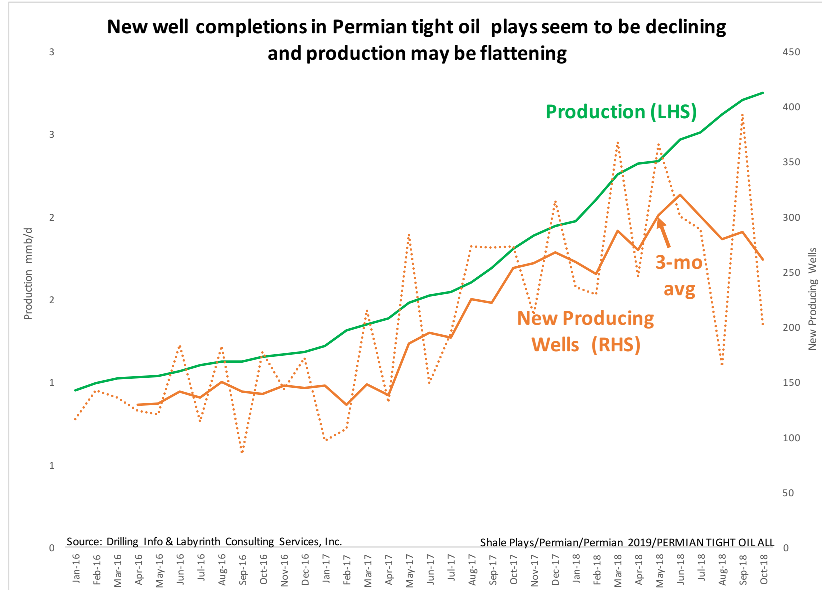
	Brent	WTI		Premium	5-Yr Avg	Premium vs 5-Yr Avg
3/1/19	$64.56	$56.12		$8.44	$5.30	$3.14
2/22/19	$66.58	$56.74		$9.84	$5.08	$4.76
Change	-$2.02	-$0.62		-$1.40	$0.22	-$1.62
10/5/18	$85.44	$75.13		$10.31	$4.03	$6.28
Change	-$20.88	-$19.01		-$1.87	$1.27	-$3.14



- Brent premium to WTI fell -$1.40 week ending March 1 as Brent weekly average spot price decreased -$2.02 & WTI only decreased -$0.62.
- Brent premium to WTI largely reflects concerns about tight oil over-supply & oil quality.
- Recent premium excursion above 5-year average highest since oil-price collapse.
- Ongoing & possible widening of Brent premium likely until tight oil output declines.

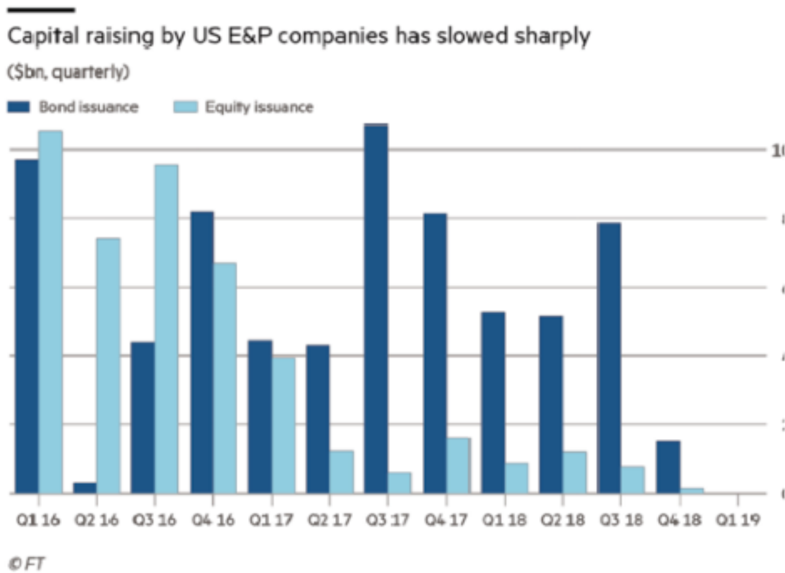
Permian Tight Oil Production May Decline in Coming Months

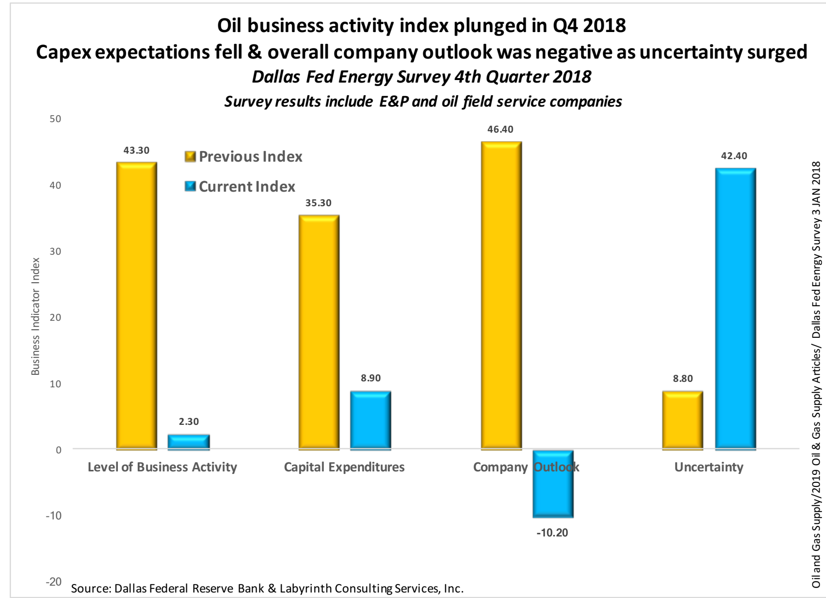




- Permian tight oil production should peak & flatten in the next few months based on correlation of rig count and 7-month lagged production.
- "When you have eliminated the impossible, whatever remains, however improbable, must be the truth." --Arthur Conan Doyle
- New well completions in Permian tight oil plays seem to be declining and production may be flattening.

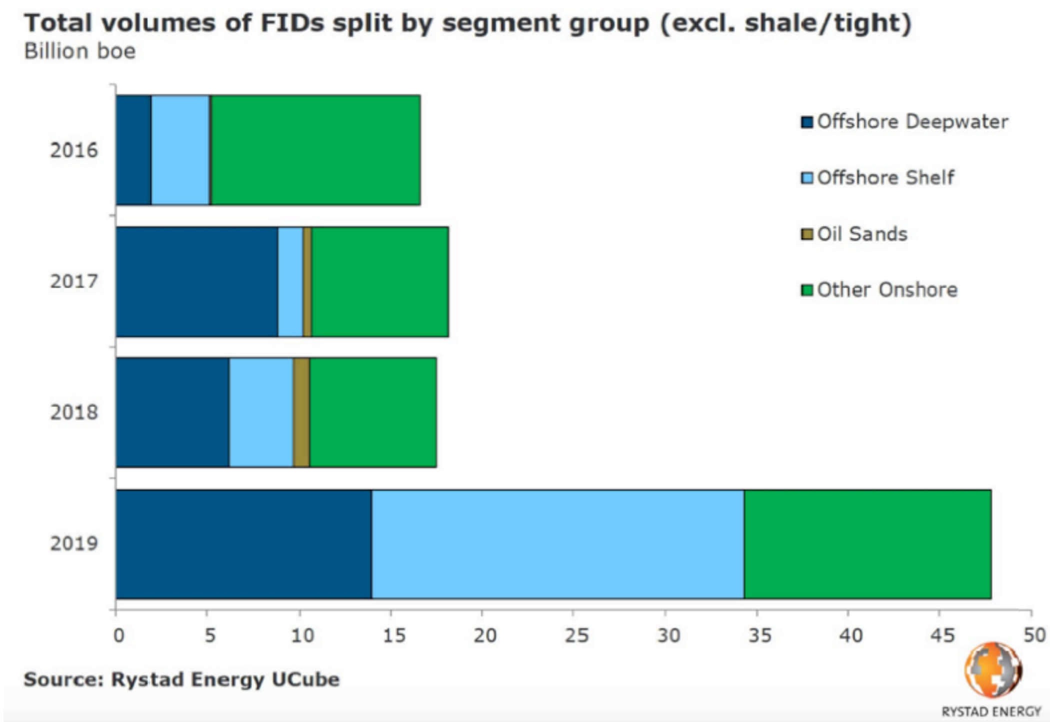
Will Capital Discipline Finally be Imposed on U.S. E&P Companies?





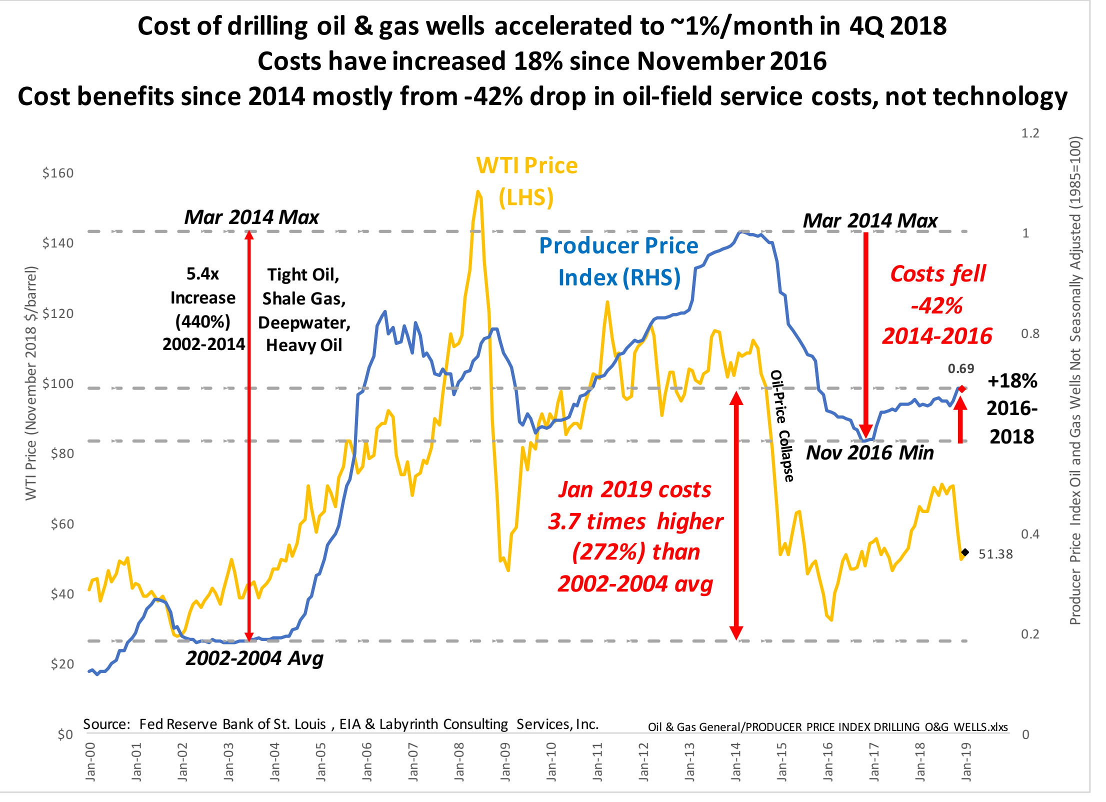
- No oil & gas bond sales since early November and only $157m raised from equity sales in the past four months.
- S&P oil and gas sector index has fallen 29% since October.
- US shale oil companies were being forced to react to an investor push for more spending discipline—Vicki Hollub, OXY CEO.
- “There is a general recognition that the industry needs to consolidate.” –Credit Suisse
- Dallas Federal Reserve oil business activity index plunged in Q4 2018.
- Capex expectations fell & overall company outlook was negative as uncertainty surged.

Growth for Sanctioned Offshore & Conventional Development in 2019



- Sanctioned volumes of oil and gas – excluding shale and tight oil and gas prospects – may nearly triple compared to last year's tally.
- 46 billion barrels of oil equivalent.
- Only oil sands are likely to shrink: deepwater, offshore shelf and other conventional onshore developments are all poised to show substantial growth.

Cost of Drilling Wells Has Increased With Higher Oil Prices



- Producer price index for drilling oil and gas wells has increased 18% since November 2016.
- Cost of drilling accelerated to ~1%/month in 4Q 2018.
- Cost benefits since 2014 mostly from -42% drop in oil-field service costs, not technology.
- Jan 2019 real cost of drilling oil & gas wells is 3.7 times higher than 2002-2004 average.