

New Reports Highlight the Need for Realistic and Transparent Oil & Gas Analysis in Light of Pro-Fracking Trump Administration

Santa Rosa, CA (12. December): Post Carbon Institute has released two reports authored by earth scientist J. David Hughes assessing the U.S. Energy Information Administration's most recent projections for domestic tight ("shale") oil and shale gas production. The reports ([2016 Tight Oil Reality Check](#) and [2016 Shale Gas Reality Check](#)) evaluate the EIA's increasingly optimistic projections in light of actual production data (through June 2016) and the agency's own previous estimates. The reports raise critical questions about the veracity and volatility of the EIA's estimates, questions that are especially important as the Trump Administration sets its domestic energy policy.

"The EIA kindly provided the play level projections that make up its Annual Energy Outlook reference case forecasts," said earth scientist and the reports' author J. David Hughes. "This allowed a comparison to the Administration's previous projections and my own forecasts, which were based on an analysis of well productivity by subarea within each play and other fundamentals such as the number of available drilling locations and decline rates. I was also able to assess the EIA's most recent projections in light of actual production data from the field. Simply put, when looked at on a play-level, the EIA's forecasts are highly unlikely to be realized."

The Annual Energy Outlook (AEO) published yearly by the U.S. Energy Information Administration (EIA) is taken by media, policymakers, investors, and general public at face value. Yet the EIA's projections for future energy prices and production are very often wrong (like when it revised its own estimate for the Monterey shale downward by 96% after just three years) and tend to show a consistent optimism bias.

For example, AEO2016 has increased estimates of tight oil production through 2040 by 19% over AEO2015 and 31% over AEO2014, while its estimates for shale gas production have been increased by 31% over AEO2015 and 43% over AEO2014. This despite the fact that U.S. tight oil production is already down 13% (as of June 2016) from its peak in March 2015 and shale gas production has declined 5% from its peak in early 2016. The EIA does not provide an explanation for why it is so optimistic about future production, especially considering that AEO2016 anticipates lower drilling rates than in 2014 through 2040, when it projects 31% higher oil and gas production, and only modest increases in prices. It also does not account for the year-over-year volatility in its estimates of various plays. For example, Marcellus shale gas production estimates through 2040 are now 76% higher than they were in 2014 (accounting for 147% of the unproved, technically recoverable resource in the play), while Eagle Ford production has been reduced by 36% in that same period of time.

"Forty years ago, the EIA was uniquely granted independence from the rest of the federal government in order to ensure that its data collection and analysis would not be politicized. But with that independence comes great responsibility," said Asher Miller, Executive Director of Post Carbon Institute. "Particularly with an incoming Presidential Administration that is, by all signs, strongly in favor of expanding fossil fuel production, the American people need to be certain that

U.S. energy policy is based on realistic, independently-sourced and transparent analysis rather than wishful thinking.”

Key Takeaway/Conclusions

- The EIA has raised its estimates in 2016 for how much tight oil and shale gas will be produced through 2040 by 19% and 31%, respectively, over the previous year’s projections, despite the fact that production of both has declined by 13% and 5%, respectively, from peak production levels.
- The EIA projects tight oil and shale gas production will grow 88% from 2014 levels to all-time highs by 2040, while drilling rates remain below 2014 levels through 2040, with only a modest increase in oil price.
- The AEO forecasts continue to be volatile and trend toward very high, unsubstantiated optimism bias. Tight oil AEO projections of recovery by 2040 in certain plays have been adjusted significantly between AEO2016 and AEO2014 — ranging from +414% (Bone Spring) and +137% (Bakken) to -42% (Austin Chalk), while shale gas forecasts range between +237% (Bakken) to -36% (Eagle Ford). The EIA offers no explanation for this volatility.
- The EIA assumes that tight oil and shale gas production will grow strongly beginning in 2017, that U.S. oil and gas production will reach 2015 highs by 2019, and that production will grow a further 31% by 2040—all while also assuming that drilling rates (which are currently 37% below peak levels of 2014) will remain below 2014 levels through 2040. This seems highly improbable, considering that all major tight oil plays have peaked except in the Permian Basin, and that all major shale gas plays have peaked.
- The EIA assumes that the major shale gas plays (which account for 75% of total projected 2013-2040 production) will recover 132% of their “unproved technically recoverable resources” by 2040 but provide no explanation as to why or how they believe this to be possible.

Play	Peak date	% below peak as of June 2016	Unproved technically recoverable resources as of January 1, 2013	Recovery 2013-2040	% recovered by 2040	2040 recovery % change from AEO2015	2040 recovery % change from AEO2014	EIA optimism bias
Tight Oil Plays								
Bakken	Dec-14	18%	22.7 Bbbl	18.96 Bbbl	84%	28%	137%	Extremely High
Eagle Ford	Mar-15	31%	10.3 Bbbl	9.02 Bbbl	88%	-11%	-15%	Moderate
Wolfcamp	-	-	6.1 Bbbl	6.02 Bbbl	99%	23%	136%	Extremely High
Spraberry	-	-	10.6 Bbbl	2.87 Bbbl	52%	21%	-13%	Moderate
Bone Spring	May-15	13%	2.9 Bbbl	3.3 Bbbl	114%	45%	414%	Very High
Niobrara	Feb-15	36%	0.4 Bbbl	2.94 Bbbl	735%	-11%	71%	Extremely High
Austin Chalk	Dec-15	21%	5.5 Bbbl	2.87 Bbbl	52%	169%	-42%	Very High
"Other"	Mar-14	36%	19.7 Bbbl	8.55 Bbbl	43%	22%	23%	High
Total	Mar-15	13%	78.2 Bbbl	58.1 Bbbl	74%	19%	37%	Very High
Sources:	Drillinginfo	Drillinginfo	EIA Oil & Gas Supply Module	EIA AEO2016	EIA AEO2016	EIA AEO2016	EIA AEO2016	J. David Hughes
Notes:	<p>- Peak dates and % below peak may differ slightly from the commonly referenced EIA Drilling Productivity Report, which uses estimates for recent months.</p> <p>- "Other" plays include the Woodford and Monterey, which have relatively minor tight oil production</p>							
Shale Gas Plays								
Marcellus	Feb-16	4%	148.7 tcf	218.42 tcf	147%	47%	76%	Extremely High
Haynesville	Jan-12	52%	73.3 tcf	93.55 tcf	128%	16%	-1%	Extremely High
Eagle Ford	Sep-15	17%	55.4 tcf	36.25 tcf	65%	-33%	-36%	Moderate
Barnett	Nov-11	38%	17.5 tcf	42.81 tcf	245%	9%	8%	Extremely High
Fayetteville	Nov-12	33%	20.4 tcf	26.55 tcf	130%	<-1%	-31%	High
Woodford	Aug-14	13%	20.5 tcf	24.9 tcf	122%	39%	11%	High
Bakken	Mar-16	7%	12.1 tcf	15.32 tcf	127%	87%	237%	Extremely High
Utica	Feb-16	4%	54.6 tcf	84.3 tcf	154%	Collectively "Other": +69%	Collectively "Other": +200%	Very High
Antrim	Mar-00	53%	12.7 tcf	2.57 tcf	20%			Very High
Rest of US	Apr-16	2%	534.1 tcf	69.14 tcf	13%			Very High
Total	Feb-16	5%	949.3 tcf	613.81 tcf	65%	31%	43%	Very High
Sources:	EIA Nat. Gas Weekly	EIA Nat. Gas Weekly	EIA Oil & Gas Supply Module	EIA AEO2016	EIA AEO2016	EIA AEO2016	EIA AEO2016	J. David Hughes

Questions for the EIA:

- AEO2016 projects tight oil and shale gas production to grow 88% from 2014 levels to all-time highs by 2040. Given that drilling rates are projected to remain below 2014 levels through 2040, with only a modest increase in oil price, what justifies the unprecedented growth?
- Considering that AEO2015 and AEO2016 are just 12 months apart, there is a lot of change in projected production profiles for individual plays and total production between the two. What is the reason for the substantial variation in these projections?

- The EIA published a more in-depth assessment of the Eagle Ford shale play in 2014 and has subsequently downgraded its projection for tight oil and shale gas production through 2040 by 15% and 36%, respectively. Has the EIA conducted similar assessments of other plays?
- Is the EIA's optimism based on the assumption of ever increasing technological improvements, considering that they will not necessarily increase the ultimate recovery of a play? At a constant drilling rate, better technology will allow each well to tap more of the reservoir while reducing the number of drilling locations, and exhaust a play more quickly at a lower cost.
- If NEMS is truly a robust system for forecasting, why is there so much difference at the play level between AEO2015 and AEO2016 when play fundamentals have changed little?
- How can overall tight oil production increase by 19% in AEO2016 compared to AEO2015 while assuming oil prices are the same or lower over the 2015-2040 period?
- How can overall shale gas production increase by 31% in AEO2016 compared to AEO2015 while assuming gas prices are 20% lower over the 2015-2040 period?

Tight oil play-specific questions:

- Why does Bakken production rise 128% from current levels, recover more than twice as much oil by 2040 as the latest USGS mean estimate of technically recoverable resources, and exit 2040 at production levels more than double current levels?
- How can a decades old play like the Austin Chalk increase production 21-fold over current levels, compared to the modest forecast in AEO2015, and recover twice as much oil by 2040 as it has recovered since the 1940s?

Shale gas play-specific questions:

- Why does Marcellus shale gas production rise 48% from current levels, recover 47% more gas than the EIA's estimate of "unproved technically recoverable resources", and exit 2040 at near all-time high production levels?
- How can the Haynesville grow 223% from current levels and exit 2040 at all-time high production levels after recovering 28% more gas than the EIA's estimate of unproved resources?
- How can an old play like the Barnett be resurrected and exit 2040 at near all-time high production levels after recovering 145% more unproved resources than the EIA estimates exist?

POST CARBON INSTITUTE

Tel: +1.707.823.8700 • Fax: +1.866.797.5820

<http://www.postcarbon.org> • media@postcarbon.org