

## **Questions about the EIA tight oil and shale gas forecasts**

### ***General Question on Tight Oil and Shale Gas Forecasts***

#### ***The Facts:***

Here is what the EIA says about uncertainty regarding its own tight oil and shale gas forecasts in its “Oil and Gas Supply Module” document (pages 125-126):

Estimates of technically recoverable tight/shale crude oil and natural gas resources are particularly uncertain and change over time as new information is gained through drilling, production, and technology experimentation. Over the last decade, as more tight/shale formations have gone into production, the estimate of technically recoverable tight oil and shale gas resources has increased. However, these increases in technically recoverable resources embody many assumptions that might not prove to be true over the long term and over the entire tight/shale formation. For example, these resource estimates assume that crude oil and natural gas production rates achieved in a limited portion of the formation are representative of the entire formation, even though neighboring well production rates can vary by as much as a factor of three within the same play. Moreover, the tight/shale formation can vary significantly across the petroleum basin with respect to depth, thickness, porosity, carbon content, pore pressure, clay content, thermal maturity, and water content. Additionally, technological improvements and innovations may allow development of crude oil and natural gas resources that have not been identified yet, and thus are not included in the Reference case.

#### ***The Question:***

Given the high degree of uncertainty over future U.S. oil and natural gas production, is it possible that other substantially lower estimates are correct?

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## ***Tight Oil Forecast Questions***

### **Question #1**

***The Facts:***

It's clear by looking at drilling locations that oil producers have concentrated on the most productive and profitable areas in both the Bakken and Eagle Ford—in so-called "sweet spots." If the entire area designated by the EIA for these plays were productive and profitable, the dispersion of wells would be much greater. In fact, given actual drilling results, the prospective play areas are considerably smaller than estimated by the EIA; and even within the prospective area there is a large variation in well quality. If the total play area designated by the EIA were actually productive, there would certainly be wells drilled there. A reduced play area limits the number of locations available to be drilled and hence the ultimately recoverable resource.

***The Question:***

Can the EIA explain why drillers have chosen to ignore much of the supposed prospective areas in tight oil formations that it deems productive? Without those areas, is it possible to reach the production levels forecast by the EIA for tight oil?

### **Question #2**

***The Facts:***

The oil industry is basing ultimate recoveries for tight oil wells on the longevity of conventional oil, wells which can produce for 30 or more years. But we have less than a decade of experience with widespread tight oil development using high-volume slickwater hydraulic fracturing. And, tight oil wells exhibit behavior which is not at all like that of conventional wells. The average annual worldwide oil production decline rate is thought to be around 4 to 5 percent—which would imply a three-year decline rate of between 11.5 and 14.3 percent. Horizontal wells in the following plays have much higher three-year well production decline rates:

Bakken	85%	Wolfcamp	81%
Eagle Ford	79%	Austin Chalk	85%
Spraberry	60%	Niobrara-Codell	90%
Bone Spring	91%		

***The Question:***

Does the EIA accept the longevity estimates of the industry for tight oil wells? If so, why does it accept such estimates even though tight oil wells exhibit rapid early production declines compared to conventional wells?

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Questions about EIA forecasts

## ***Shale Gas Forecast Questions***

### **Question #1**

#### ***The Facts:***

Four of the top seven shale gas plays are past their production peaks, and in all of those four plays drilling is not sufficient even to maintain current production.

#### ***The Question:***

How does this square with an EIA forecast that in these four plays, production rates in 2040 will *exceed* today's rate, and in three cases will be significantly higher than the plays' recent production peaks—even as the agency is predicting only modest price increases for U.S. natural gas?

### **Question #2**

#### ***The Facts:***

Data from actual production from the first 12 months of new shale gas wells indicates that well productivity has stalled in most of the top shale gas plays. Increases in well productivity will be difficult to achieve as drillers move from the “sweet spots” they are currently drilling to lower quality parts of plays.

#### ***The Question:***

What specific technological improvements—beyond those already deployed and thus reflected in the data—does the EIA believe will change the flattening of shale gas well productivity even as drillers move toward more and more challenging deposits?

### **Question #3**

#### ***The Facts:***

Based on actual well data, the three-year production decline rates for shale gas wells in the top shale plays are between 71 and 88 percent. Most wells drilled using high-volume slickwater hydraulic fracturing and horizontal drilling are less than 10 years old.

#### ***The Question:***

Does the EIA accept industry claims that shale gas wells will have lifespans of 30 years or longer even though they are not behaving like conventional gas wells?

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