

[U.S. TIGHT OIL PRODUCTION TENDENCY ANALYSIS]

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Overview

According to the newest data released by EIA, the U.S. tight oil production is 6.75 million barrels per day in September of 2018, which accounts for 59 percent of total U.S. crude oil production. Tight oil production has gradually grown into the main driving force of crude oil production growth in the U.S. as well as an important contributor to the global crude oil supply. Many agencies tend to forecast U.S. tight oil production tendency based on different resource and technology conditions. However, tight oil production is not only affected by the technical factors but also economical ones such as the well costs and the oil prices. To solve this problem, the exploration and development statuses of important tight oil reservoirs in the U.S. are investigated from both the technical and economical aspects. Production tendencies of plays that contribute the majority of U.S. tight oil production are analysed based on the investigation results above. The forecasting result of total U.S. tight oil production from the year 2018 to 2035 has been achieved.

Methods

The current exploration and development statuses of plays that contribute about 90 percent of U.S. tight oil production are investigated and analysed from the following aspects: 1) the status of remaining reserves; 2) the current production level of each oilfield, 3) the estimated drilling plans of operation companies, 4) the distribution of “sweet spot” in each play, 5) the well cost status of each oilfield. The well cost tendencies of tight oil plays are analysed. The remaining reserves of tight oil in each play are been divided by different breakeven prices and oil prices. The typical well curves of 47 sub-plays are been drawn. The depletion rates and EUR of these wells are calculated by utilizing these curves to set up the regression equations. With the investigation and calculation results above, the tight oil production trends of six plays including Bakken, Eagle Ford, Bone Spring, Wolfcamp and Niobrara are been achieved according to the oil&gas production composition method.

Results

The current proven reserves of U.S. tight oil is 19974 million barrels, among which, about 42 percent of reserves buried in Permian basin who also owns the largest production growth rate. Besides, the production rates of Bakken, Eagle Ford and Niobrara are more sensible to the oil prices compared with Permian. The tight oil production rates of the first three zones in 2016 were significantly lower than those of 2015, and with the increase of oil prices, the tight oil production of these zones gradually recovered since 2017. The well costs in major tight oil plays in the U.S. range from 4.5 to 6.5 million USD in 2017, and the costs have slightly increased in 2018. In recent years, the break-even oil prices of major tight oil production areas in the United States has generally shown a downward trend. The break-even point of tight oil has decreased by \$30/bbl. The remaining recoverable tight oil reserves in the U.S. with a break-even oil price under \$50 accounts for 65.1% of the total remaining recoverable tight oil reserves, while the remaining recoverable tight oil reserves with a break-even oil price under \$60 accounts for 87.7%. The tight oil production in the U.S. will reach the peak level at about 8.3 million barrels per day in the year 2025.

Conclusions

Tight oil production in the United States is the main driving force of crude oil production growth in the United States, which has an important impact on the supply and demand relationship of the global crude oil market and future oil price trends. Permian basin is the core area of tight oil production in the United States, especially the Wolfcamp-Midland sub-play. The Wolfcamp sub-play is far ahead of other tight oil production areas in terms of reserve size, sweet spot size and production level, and will be the biggest driver of tight oil production in the United States in the future.