



MARGINAL WELLS: CONTRIBUTIONS TO FUTURE SUPPLY

Background

The contributions of marginal or “stripper” wells in meeting U.S. crude oil and natural gas demand are becoming ever more important. Data released by the Interstate Oil and Gas Compact Commission (IOGCC) show that marginal oil wells produced about 29% of Lower-48, onshore production during 2003. Marginal wells accounted for about 11% of natural gas production in the contiguous states (onshore) during this same period. These volumes are up significantly from the 24% (oil) and 8% (natural gas) reported just five years earlier.

Marginal oil wells are defined as wells that produce 10 barrels per day or less. Marginal natural gas wells produce 60 thousand cubic feet per day (Mcf/d) or less. The IOGCC reports the operation of more than 390,000 marginal oil wells and over 260,000 stripper gas wells during 2003. Overall, stripper oil well production averaged slightly more than 2 barrels of oil per day (bbl/d) while natural gas wells averaged just over 15 Mcf/d.

Generally, marginal oil and natural gas wells are owned, produced, and maintained by independent operators with limited resources, and not the integrated E&P firms that operate globally. These operations create jobs and support economic growth that, while small on an individual basis, are collectively significant.

Activity Description

In general, federal and state funding is required to develop and demonstrate new technologies/ strategies that will allow these low-rate wells to remain online. For the most part, once marginal wells are shut-in, they are plugged and abandoned, leaving much needed [remaining] reserves untapped (and inaccessible).

Given the significance of marginal well production, as well as rising commodity prices, it was imperative that a critical assessment of marginal wells be undertaken. The U.S. Department of Energy’s National Energy Technology Laboratory initiated an activity to forecast marginal well counts and associated production through 2025. This analysis made use of multiple data sources including the IOGCC, Energy Information Administration, IHS Energy, and others.

The approach employed a linear “trend analysis” for both marginal oil and natural gas production, and well counts. A series of regressions were completed and include:

- estimation of each states’ overall fraction of production per region – including the Northeast, Gulf Coast, Mid-Continent, Southwest, Rocky Mountain, West Coast;
- estimation of the fraction of state-wide production that is “marginal;” and
- estimation of the average state-wide marginal well production rates.

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RELATED LINKS

Energy Information Administration

www.eia.doe.gov

Independent Petroleum Association of America

<http://www.ipaa.org>

Interstate Oil and Gas Compact Commission

<http://www.ioGCC.oklaosf.state.ok.us/>

Oklahoma Commission on Marginally Producing Oil and Gas Wells

www.marginalwells.com

Stripper Well Consortium

<http://www.energy.psu.edu/swc/>

Marginal well counts were determined by dividing the estimated overall marginal production by the average state-wide marginal well production rate. Other data, such as current total well counts and future drilling projections, were used to limit or modify the linear regression fits. A “history match” was also performed as part of the analytical process in order to assure valid projections.

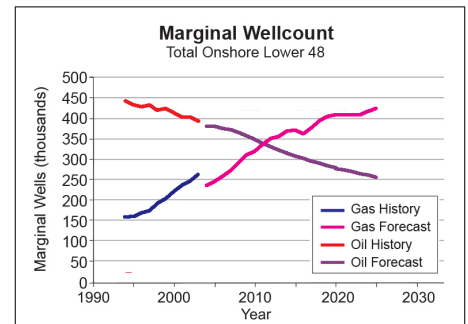
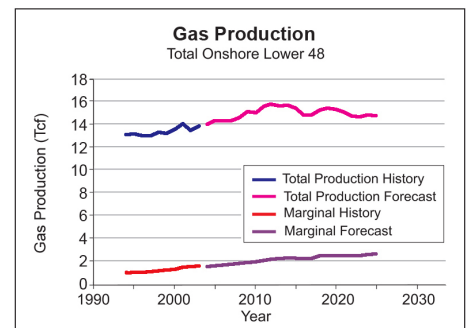
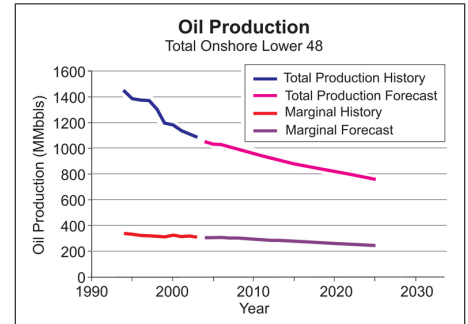
Results and Benefits

Mid-term forecasts of marginal well counts and production, by supply region and nationally, may be reported on an annual basis using this method. The forecasts tie directly to EIA’s reference case forecast of U.S. oil and natural gas production, as reported in the Annual Energy Outlook 2005. Forecast production volumes and well counts determined in this analysis are summarized in the graphs at right.

Results from the recent analysis reveal that:

- natural gas marginal well counts will increase over time while oil well counts will decrease, assuming no significant technological breakthroughs;
- the fraction of marginal production compared to total onshore production will continue to increase for oil and natural gas;
- a significant increase in marginal natural gas wells is expected in the Rocky Mountain region.
- overall, volumes of crude oil and natural gas from marginal wells are estimated to be approximately 4 Tcf_e in 2025, an increase of nearly 20 percent compared to 2003 volumes.

Though IOGCC’s annual survey is invaluable, the “forward looking” view of this analysis provides key information and insights that benefit a myriad of entities. For example, NETL sponsors the “stripper well consortium” - an industry-driven consortium that is focused on the development, demonstration, and deployment of new technologies needed to improve marginal natural gas and oil well production. Results of this forecast can be used to “focus” upcoming technology oriented solicitations and cooperative agreements toward developing technological solutions for the most significant anticipated issues associated with marginal wells. The key to continued operation of these marginal oil and gas wells has been and will remain incentive programs and the application of new, cost-effective technologies.



Bibliography

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- Interstate Oil and Gas Compact Commission. Marginal Oil and Gas, fuel for economic growth (2004 edition).
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