PROGRAM facts

U.S. DEPARTMENT OF ENERGY
OFFICE OF FOSSIL ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

Petroleum Systems Analysis and Planning

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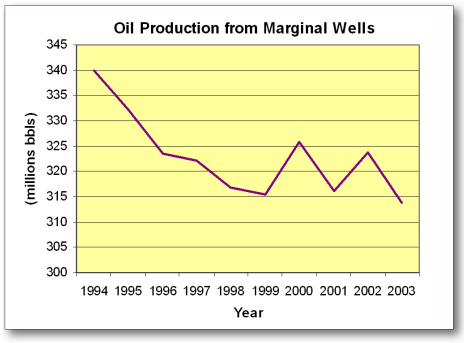
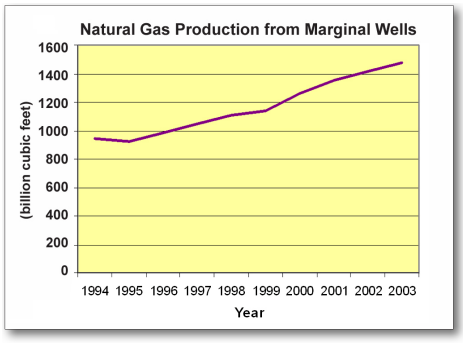
MARGINAL WELLS: CONTRIBUTIONS TO FUTURE SUPPLY

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 meanwhile, 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. Production volumes, as reported by the IOGCC, are shown in the following figures.





Data for Figures from IOGCC

Marginal oil wells are defined as wells which produce 10 barrels per day or less while 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 261,000 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 – producers 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.

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. Operators of these wells do not have the means to conduct their own research. Federal

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and state RD&D 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 reserves untapped [and inaccessible.]

Activity Description

Given the significance of marginal well production, as well as recent commodity prices, it is imperative that a critical assessment [of marginal wells] be undertaken. To that end, the U.S. Department of Energy's National Energy Technology Laboratory initiated an activity aimed at forecasting marginal well counts and associated production through 2025. This analysis will make use of multiple data sources including the IOGCC, Energy Information Administration, IHS Energy, and others.

The approach will employ a linear "trend analysis" on a state by state basis for both oil and natural gas. A series of regressions will be completed and include:

- determining the fraction of production from a supply region attributable to each state
- estimating the fraction of state-wide production that is "marginal", and
- predicting average production rates of marginal wells, by state.

Marginal well counts, by state, are then determined by dividing the estimated marginal production by the average marginal well rate. Other data, such as current total well counts and future drilling projections, which are being acquired as part of this study may be used to limit or modify the strictly linear regression fits. A "history match" is also being performed as part of the analytical process in order to assure valid projections. The forecasting activity was initiated during the winter 2005 and results are expected this summer.

Anticipated Results and Benefits

Upon completion of this activity, well counts and production, by state and supply region will be reported on an annual basis. These forecasts will directly tie to EIA's reference case forecast of U.S. oil and natural gas production, as reported in the Annual Energy Outlook 2005.

Though IOGCC's annual survey is invaluable, a "forward looking" view will provide key information and insights that will benefit myriad entities. For example and importantly, 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 the production performance of natural gas and petroleum stripper wells. Results of the forecast can be used to "focus" upcoming solicitations and cooperative agreements such that solutions can be developed now to address the most significant, anticipated issues associated with marginal wells.

Bibliography

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Energy Information Administration
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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
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