
The Future of the Global Oil Industry: Resources, Challenges, and the Geoscience Workforce

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ABSTRACT

The past 18 months have been a time of unprecedented energy commodity price volatility. Historic highs in mid-2008 were followed by a precipitous crash in late 2008. Volatility continues as the global economies struggle to recover from a deep recession. Investment and drilling rig counts have plummeted. Nevertheless, as this paper will discuss, there is a bright future for the domestic and international petroleum industry in terms of supply, demand and the geoscience workforce. Oil and natural gas are and will continue to be the energy fuels of choice.

Global oil consumption has declined from a peak of nearly 86 million barrels per day. When consumer demand returns, and it will, to what level will it climb? Are there sufficient resources available to meet international demand? What role will alternate energy fuels play? Production in the mature sedimentary basins of North America, Europe, and Southeast Asia is declining. The United States, with less than 5% of the world's population, consumes 25% of the world's oil and natural gas. Can this continue? Global peak hydrocarbon production is likely to occur between 2025-2040. Then what?

The world has significant remaining conventional and unconventional oil and gas resources with some estimates exceeding 4 trillion barrels. Where are these resources located, and who controls them? Unconventional hydrocarbon resources are adding significant new reserves. Improved recovery technologies and conservation will extend the life of known reserves in mature conventional oil and gas fields. Despite the current North American focus on continuous reservoir resource plays, there are still significant new exploratory plays, as demonstrated by the multi-billion barrel ultra-deep Lower Tertiary play in the deepwater Gulf of Mexico. Internationally, deepwater delta systems, subsalt plays, and the Arctic margins offer significant exploration potential.

A vibrant future global economy will require access to petroleum resources and major capital investment in exploration, development, and infrastructure. There are many technical, geopolitical, infrastructure, economic, environmental, capital, and workforce challenges to meeting near-term and future global oil demand. How can we deal with these? Where will capital be deployed? Graduates entering the petroleum workforce must have appropriate geoscience and business skills. What are they? Where will the industry find its future geotechnical employees? The public must have a better understanding of energy and the geosciences so realistic energy policies can be implemented. Finally, a serious commitment to developing affordable alternate energy technologies is essential, as by 2100, alternate energy sources are projected to supply fully 40% of global energy demand.