

UNDISCOVERED OIL AND GAS RESOURCES OF U.S. ARCTIC ALASKA OUTER CONTINENTAL SHELVES

by

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An assessment of the undiscovered, conventionally recoverable oil and gas potential of the U.S. continental shelves of the Beaufort and Chukchi Seas using probabilistic computer models was conducted by the U.S. Minerals Management Service in Year 2000. Results indicate mean technically recoverable resource quantities of 22 Bbo (3,080 Mmto) and 96 Tcfg (2,718 Gcmg). At a 5 percent fractile (1-in-20 chance) in the range of possible outcomes, up to 33 billion barrels of recoverable oil (Bbo) (4,620 million metric tons of oil [Mmto]) and 198 trillion cubic feet of recoverable gas (Tcfg) (5,607 billion cubic meters [Gcmg]) may be present.

Despite the immense oil and gas endowment, only a subordinate fraction of the undiscovered resources may be profitable to develop in the present price-cost climate. At \$US30/barrel, a mean quantity of 9.4 Bbo (1,316 Mmto) is economically recoverable, with up to 16.6 Bbo (2,324 Mmto) for the high (5% fractile) resource case. Sixty-six percent of the economically recoverable oil resources of the U.S. Arctic shelves are allocated to the Chukchi shelf (including Hope basin).

At development costs of \$US3.52 per 1,000 cubic feet, a mean quantity of 5.7 Tcfg (161 Gcmg) of associated gas is deliverable to hypothetical future gas transportation systems, with economic potential rising to 21.6 Tcfg (617 Gcmg) for the high (5% fractile) resource case. Most (74%) of the economically recoverable gas resources occur in the Beaufort shelf in association with commercial-sized oil pools. Although Chukchi shelf is estimated to have 60 Tcfg (1,699 Gcmg) of technically recoverable gas, these gas resources were not tested for economic viability because the remote likelihood for economic development in the near-term.

In the Chukchi shelf north of Hope basin, 48 percent of the 6.1 Bbo (854 Mmto) economic oil resources occur in Rift sequence plays (Jurassic to Cretaceous), with 35 percent allocated to Ellesmerian plays (Devonian to Jurassic) and 17 percent to Brookian plays (Cretaceous to Tertiary). In the Beaufort shelf, 38 percent of the 3.8 Bbo (532 Mmto) of economic oil resources occur in Brookian plays, with 35 percent allocated to Rift sequence plays and 27 percent to Ellesmerian plays. Fifty-six percent of the 4.2 Tcfg (119 Gcmg) of economic (associated) gas in the Beaufort shelf occurs in Rift sequence plays, with 37 percent and 7 percent forecast for Ellesmerian and Rift sequence plays, respectively.

The Year 2000 assessment evaluated 43 exploration plays containing 1,246 mapped prospects. In Chukchi shelf, hypothetical oil pools range up to a mean size of 1.1 Bbo (154 Mmto) with up to 3.5 Bbo (490 Mmto) at the 5 percent fractile in the largest pool. Hypothetical gas pools range up to a mean size of 10.2 Tcfg (289 Gcmg), with the largest pool possibly containing 34 Tcfg (963 Gcmg). The largest oil pools occur in the Ellesmerian and Rift sequence plays, while the largest gas pools occur in the Brookian sequence. In the Beaufort shelf, hypothetical oil pools range up to a mean size of 1.0 Bbo (140 Mmto) with high-side potential

for 3.8 Bbo (532 Mmto) in the largest pool. Hypothetical gas pools range up to a mean size of 7 Tcfg (198 Gcmg), with up to 22 Tcfg (623 Gcmg) at the 5 percent fractile in the largest pool. The largest oil and gas pools in the Beaufort shelf both occur in the Rift and Brookian sequence plays.

Public Presentations of This Poster:

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