A New Phase of Exploration in Yemen

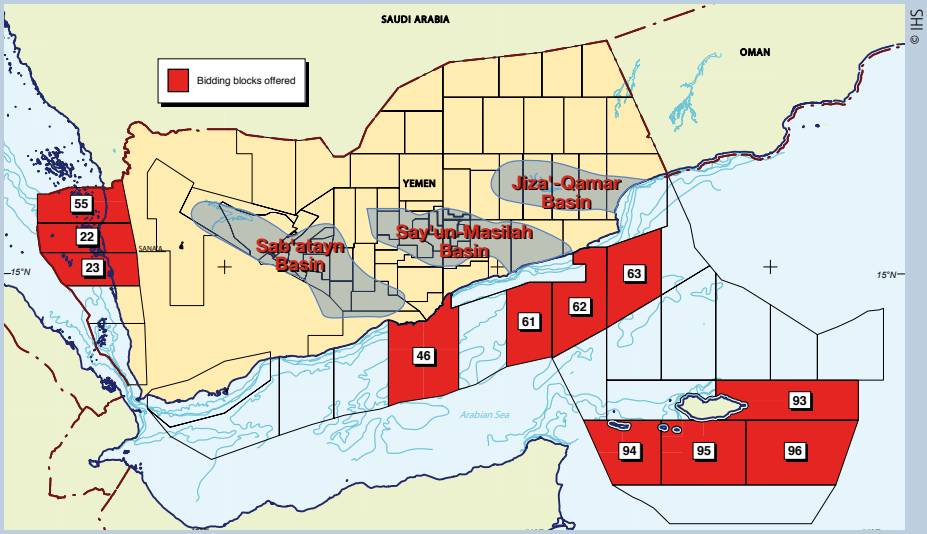
Bid Round offers 11 offshore blocks in underexplored areas.

Unlike many countries in the Middle East, Yemen, lying on the southern tip of the Arabian Peninsula, has a number of offshore exploration blocks on offer to the hydrocarbon industry. A total of eleven blocks are now available, three of which are in the Red Sea, four in the Mukalla Sayhut area off the south-east coast and four more in the vicinity of Socotra Island.

The first commercial discovery of oil in Yemen was made in 1984 in the **Alif Field** in central Yemen, which came under production only two years later. Further significant hydrocarbon discoveries followed, although the relatively unstable political situation in the country at the time meant that not all companies were interested in following up these opportunities. As a result of this much of the country, particularly offshore, is relatively unexplored in comparison to most of the Middle East. A total of 421 exploration wells have been drilled in Yemen, resulting in the discovery of 55 producing fields. In all, 34 out of a possible 87 blocks are unlicensed.

The three blocks in the Red Sea Basin lie in an immature frontier basin which extends into neighbouring Saudi Arabia, Sudan and Eritrea, where a number of discoveries have been made, but which has not yet been drilled in Yemen. Two petroleum systems are believed to be active, one in the Lower – Middle Miocene and the other with Late Miocene intra-evaporitic shales as source, with reservoirs and seals of the same age.

The Mukalla-Sayhut Basin off the south-east coast is also comparatively unexplored, and although exploration began here in the late 1970's, only ten exploration wells have been drilled. There was one sub-commercial discovery, in 1982, but exploration in this basin may be about to begin a new phase, as two new field wildcats have been drilled this year, the first for 11 years. Lower Eocene shales are thought to be the main, fully mature source rock in this area, migrating into primarily Upper Cretaceous and Paleogene carbonates and clastics. Potential traps consist of extensional features such as fault blocks and other fault related structures. An additional untested petroleum system may also exist in this area, with Oligocene shales as source and a number of potential Tertiary reservoirs.



12 frontier area blocks are available in offshore Yemen.

Three further blocks are available south of Socotra Island, which lies about 300km south-east of the mainland. This is also a frontier area, where only three wells have been drilled, one with shows, suggesting the existence of a working petroleum system. Further details of all these blocks are available from the website of the Yemeni Petroleum Exploration and Production Authority.

Production for 2006 was about 390,000 barrels of oil per day, while proven recoverable reserves were estimated to roughly 3 billion barrels of oil.

Yemen boasts twelve sedimentary basins, but oil production has come from only two of these, both lying in the centre of the country, indicating that there is promising potential for further exploration both on and offshore Yemen.

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Heavy Oil - ever more important

Heavy oil is considered an important source of energy in the future, as explained in our column "Global Resource Management" on page 76. The BP Statistical Review of World Energy 2007 lists "proved oil reserves" at 1,208 billion barrels while estimates of heavy oil in place are five to ten times greater – ranging between 6,000 and 13,000 billion barrels. Yet of this amount, somewhere between 500 billion to 1000 billion barrels are considered recoverable with today's technology and economic constraints, according to the website heavyoil-info.com.

Despite these reserves figures, actual current production of heavy oil is only about 8 million barrels per day (approximately 10% of world total output) , coming from sources ranging from the 20 API crudes of Mexico to the < 10 API tar sands of Canada.

It is quite clear therefore that with world energy needs continuing to grow, heavy oil will become an increasingly more important resource where recovery will be the key issue.

According to IEA, the Canadian oil sands will help non-OPEC countries to continue a modest increase in production during the next 20-25 years.

Photo: H. Carstens