

Geology Might Reshape Economic Landscape Afghan Study Boosts Resource View

By Pat Blake, Explorer Correspondent

A March announcement that the U.S. Geological Survey had identified undiscovered oil reserves 18 times the amount originally thought in a certain location and three times the amount of natural gas there likely caused many a Pavlovian response.

Whetted appetites may have dried a bit with the realization of the potentially lucrative site's location: northern Afghanistan.

While such a knee-jerk reaction may be inaccurate, this battle of perception is central to the Afghan struggle for reconstruction. The newly formed government is banking on the work of USGS geologists as a pivotal leg in its strategy to reshape its image, attract investors and thereby resuscitate its economy.

Geology takes center stage in the northern reaches of the Islamic Republic of Afghanistan where risk, reward and the creation of a new marketplace all hang in the balance.

Getting Started

In the fall of 2001 -- after the United States entered Afghanistan and the sting of 9/11 was still new -- the U.S. State Department approached the USGS, asking for ideas to revitalize the Afghan economy. The response would yield one of the most concentrated efforts of USGS expertise.

"We proposed the oil and gas assessment of the north -- knowing that there was potential there -- a water project, a coal assessment and a hazards project, including landslides and earthquakes," recalls Craig Wandrey, USGS project chief. "Because of the last 20-plus years of war, the Afghans don't have a lot of developed industry of any kind. They have no real energy infrastructure. They have a lot of mining operations that have been going on for hundreds of years, but they are on a very small scale.

"The idea of doing this assessment was to help the Afghans define their resource base," he said, "and determine what they had that we could help them develop into industries."

Teaming with Afghan's Ministry of Mines and Industry, the crew recruited Afghanis who were adept in oil and gas assessment, including geologists, geophysicists, geochemists and petroleum engineers. Although skilled with a

solid foundation in the geosciences, the mostly Russian-schooled scientists had suffered a long break in training during more than two decades of war.

The assessment process itself would go a long way in advancing the Afghan knowledge of contemporary geological practices.

First Findings

This new look at undiscovered oil reserves began with a base of seismic data and detailed geologic information gathered by the Afghanis during Russian occupation. The Afghan-USGS team took the exploration two steps further by surveying the sub-basin of the Amu Darya Basin and the Afghan-Tajik Basin, areas that had never before been assessed.

Samples of oil and core from northern neighbor Tajikistan broaden the geological scope.

The geologic elements amassed, according to the USGS assessment report, include “source-rock presence, maturation, petroleum generation and migration; distribution and quality of reservoir rocks; and character of traps and time of formation with respect to petroleum migration.”

A greatly improved ability to analyze source rock gave the team a more accurate picture of the petroleum system than what was imagined a generation ago.

“Though the Russians and Afghans recognized source rocks, there was very little work done with the source rocks in the ‘70s and ‘80s in that part of the world,” Wandrey explained. “We collected a lot of oil and gas samples and source rock samples and were able to analyze them here at our labs using the latest techniques. That gave us a better handle on what the rocks were, particularly in the Afghan-Tajik Basin.”

Using data collected over a two-year period, the assessment team identified four petroleum systems:

- Accumulations of undiscovered natural gas were pinpointed in Upper Jurassic carbonate and reef reservoirs.
- Potential crude oil in Cretaceous to Paleogene carbonate reservoir rocks was estimated in the Afghan-Tajik Basin.
- Undiscovered petroleum in the region was estimated at 1.6 billion barrels; approximately 15.6 trillion cubic feet of natural gas; and 562 million barrels of natural gas liquids.

These levels may pale in comparison to Saudi Arabia’s quarter of a trillion barrels of oil reserves and the Russian swells of proven natural gas. But for

Afghanistan, which trucks in diesel from Pakistan to fuel generators that deliver part-time electricity to only 6 percent of the population, the find is nothing short of a boon.

To Secure an Economy

A large donor community is aiding the Afghan government in taking giant steps forward in reconstruction.

In the petroleum sector, the Asian Development Bank is rehabilitating a few existing wells with the intent of drilling and increasing the current production levels. The potential identified by the Afghan/USGS team may come online within two to five years for oil and twice as long for the natural gas.

“The oil play is relatively shallow and undeveloped in Afghanistan, (and) slightly developed in Tajikistan,” Wandrey said. “It is economically easier to develop that shallow oil resource because it requires less of an infrastructure. It still requires seismic and drilling to prove out the plays, but it is something that can develop in the nearer term, perhaps than gas.

“For deeper resources and the gas, it might extend out to 10 years,” he added. “They need new pipelines. They need a new gas plant. Presently the gas primarily supplies a 28-megawatt power plant near Mazar-i-Sharif, and a fertilizer plant. Their domestic supply is somewhat limited. But there is certainly an opportunity to provide power for other industry in much larger power plants.”

Although the brunt of fighting is confined to the southern part of the country, security remains a prime concern in the north as well. The country is still in the process of removing landmines at the same time it is striving to better its police force and its army.

“Many questions still arise regarding potential setbacks in the political development of Afghanistan, and business risk assessments still have to include major security issues,” according to the Afghanistan Investment Support Agency Web site.

“However, little doubt remains today that regional integration can be fully developed over the next 10 to 15 years,” it continues. “In fact, the dramatically rising international demand for natural resources and its expected benefits for the region’s economies are its main drivers.”

The need for improved security and lack of infrastructure has not held back the economy, which is growing by more than 100 percent per year.

“The first year I went there, the streets were pretty deserted,” recalled

Wandrey, who has made the trip to Afghanistan five times since 2002. “Our Afghan friends talked about how important security was for the people who had basically gone back to their villages.

“The security that was provided by the United States and other international security forces went a tremendous distance toward reinvigorating the economy,” he said. “Now when we go to Mazar, the streets are packed. There are shops everywhere. Business is booming for them and things are certainly improving.”

The transformation in the people of Afghanistan is a reminder that this is not only a project of economy but one for humanity as well.

“You see signs of change everywhere. Children are laughing and playing on the streets; men are playing sports. None of this was allowed under the Taliban,” Suleman Fatimie, vice-president of the Afghanistan Investment Support Agency, recently reported to fDi Magazine. “The fact that we have this working, functioning office, the fact that we’re talking about economic development rather than war -- that is enormous progress.”

Putting It Together

The economic promise for an Afghan future lies in hydrocarbon development, exports and investment from the foreign and private sectors, according to a development plan unveiled in London last year.

The environment for hydrocarbon exploration was greatly enhanced in December when a “hydrocarbons law” was approved by the Afghan cabinet. The World Bank helped draft the regulation that gives the Afghan government full ownership of oil and gas wells, but allows foreign investment in exploration through shared-production agreements. A similar “Minerals Law” was approved in July 2005.

The World Bank furthered the Afghan cause by commissioning a study by Gustavson & Associates to update the reserve estimates in the country’s major discovered fields in the north.

“There is a lot of potential in the deeper Jurassic reservoirs. These are carbonate reservoirs, and some of them are quite significant,” says Ed Moritz, executive vice president of Gustavson & Associates.

“The biggest hurdle is trying to find a market for the gas primarily,” he said. “We’re talking about a fairly impoverished country, and you’re going to have to have significant investments to bring this gas onstream.

“The key question is, ‘What are you going to do with the gas in terms of use?

Are you going to generate it for electricity, are you just going to use it for local energy consumption or for certain industrial purposes?’

“If you can come up with some good solutions for the use of the gas,” he said, “then I think everything else will fall into place.”

Putting all the pieces in place is the mission of the Afghanistan Investment Support Agency and its “one stop shop for investors.” The process to register a business to operate in Afghanistan is streamlined and straightforward via the online agency (www.aisa.org.af).

“We are inviting the private sector to join the government to explore and extract resources, both for domestic use as well as for international sale,” says Ashraf Haidari, first secretary for the Afghanistan Embassy in Washington, D.C. “We have a mineral’s law, an improved legal environment and a one-stop shop for investors. The environment is right and the government is very receptive.

“Without the private sector, we would be unable to exploit those resources. We neither have the human resources nor the technical capacity. All we know is that we have those resources and we need the private sector -- especially the energy sector -- to come and help us exploit it.”