

## *Shale Gas Exploration Goes Global with Drilling in Argentina*

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The shale gas industry started, of course, in Texas and spread across North America and from there to Australia. In the past 12 months shale gas exploration has accelerated in Asia (China with India following) and Europe (Poland has the lead but efforts are underway in several countries). In Africa, South Africa has the lead and now serious exploration has begun in Argentina. No energy discovery industry has globalized as rapidly as shale gas: indeed no substantial industry of any kind may have become global so swiftly. Where the Texas independent led, the world now wants to go.

The Argentine company YPF ([YPF](#)) (now owned by the large Spanish company, Respol) announced a 4,500 billion cubic feet (Bcf) shale gas discovery in Loma de La Lata conventional gas field in the well known and productive Neuquén Basin in Patagonia. The Vaca Muerta and Los Molles shales are the principal source rocks in this basin. YPF guesses that the shale gas resource base in the Neuquén is over 250 trillion cubic feet (Tcf). Argentina's annual gas consumption is 1.5 Tcf and its proven, documented, reserves are about 15 Tcf so the discovery is far more significant for Argentina than the Barnett was for the U.S.

YPF has entered into a \$140 million joint venture with the Brazilian iron ore and mining multinational, Vale ([VALE](#)), which will use the gas to develop a \$4.3 billion dollar potassium project in nearby Mendoza. Shale gas exploration has only now become attractive in Argentina with the revision of that country's gas pricing structure. The Neuquén Basin already has a gas transportation and field services infrastructure in place.

A small Canadian independent, American Petrogas Inc (BOE.V) is also enthusiastic about shale gas development in the Neuquén. The company has 16 exploration blocks, both for conventional and shale gas, in the eastern and western parts of the basin and thinks its western blocks have the greatest potential for shale gas. API believes that there is shale gas in nine of its blocks and the resource potential of these blocks is 100 Tcf. A strategic investor in API is the large fertilizer company called Indian Farmers Fertilizer Cooperative (IFFCO), which has a strategic alliance with API to explore for natural gas. IFFCO suggests that Indian companies should become involved in Argentina's shale exploration. API has invited two government owned Indian companies to invest in its shale prospects. These companies are Oil India and GAIL ([GAIL.PK](#)).

Apache Corporation ([APA](#)) is encouraged by the new pricing policy in Argentina which provides incentives to develop new supply. Apache expects to have 900,000 net acres in the shale gas prone part of the Neuquén. The company has a partnership with YPF to develop shale gas in several prospective blocks. It is currently drilling the first horizontal multi fracture well in Latin America specifically to develop shale gas.

Total SA ([TOT](#)), the third largest integrated oil company domiciled in Europe, has acquired an interest in four shale gas blocks in the Neuquén and will explore in partnership with YPF. This follows the acquisition of an 85% interest in two other Neuquén shale gas blocks recently. Total operates about a quarter of Argentina's natural gas production. It aspires to a significant portfolio of shale gas and oil assets worldwide, to which it can profitably apply what it has learned from its 25% interest in Chesapeake

Energy Corporation's (CHK) holdings in the Barnett shale (where the shale gas industry originated not very long ago). Total is already present in the Bakken like formation in the Paris Basin in Northern France and plans to develop shale assets in Denmark, Canada, Australia, Algeria and China.

ExxonMobil (XOM) may also become an important participant in Argentina's shale gas industry. In addition to its very large business position in "unconventional" oil and gas resources in North America, the company is also investing or plans to invest in such plays in Colombia, Germany, Poland, China and Indonesia. Poland is the leader in shale gas development in Europe and China in Asia and Argentina now in Latin America.

### Lessons From Around the World

There is accumulating evidence from onshore basins around the world that:

1. The term "mature" basin or province does not define a state of nature but a human state. The term "mature" is a description of the entrepreneurial imagination, technological capability, geologic knowledge and the matrix of laws and regulations that are imposed on oil and gas resources. Human choices, decisions and understanding are the constraint on oil and gas development, not the physical endowment. From the Permian Basin to the Paris Basin, from Pennsylvania to Poland it is now becoming clear that was "mature" according to yesterday's received wisdom is once again a frontier or emerging play today and will be a core asset tomorrow.
2. The shale gas and tight gas resources in "mature" provinces far exceed the "conventional" resource base, usually by multiples. Low permeability gas is far more abundant than medium permeability gas which, in turn, is more plentiful than high permeability gas. It is high permeability onshore gas that is "mature". What is rapidly emerging and will soon eclipse the contribution of high permeability onshore gas are shale and tight sands gas and offshore, especially deep and ultra-deepwater, gas.
3. Shale gas and tight sands gas are not only vastly more abundant than "conventional" gas but are found in scores of countries: indeed no large country is without these resources and many small countries have notable endowments. In the next 20 years the global natural gas E&P industry will not only be far bigger and more valuable than in 2011 but it will also be much more diversified. The age of Big Gas is now starting and Big Oil will be more accurately labeled Big Gas within a generation.