

Chapter Two

The African Hydrocarbons Boom: Its Impact on Atlantic Basin Energy and Energy Relations with the Non-Atlantic World¹

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Over the past decades the oil sector has changed drastically, thanks to geologists who placed their trust in the potential of new zones that had long remained underexplored. The increase in the price of Brent crude after 2003 (rising from \$28/bbl to \$94/bbl by 2008, and then climbing to \$110/bbl in 2012) helped oil firms raise funds to explore new regions and allowed them to take more risks. This relatively high price level resulted from several geopolitical disruptions which continue to have global repercussions. These have included: (1) the Iraq war; (2) rising tensions with Iran over its nuclear program; (3) Venezuela's massive strike in 2006 and its long-term effects; (4) the wave of violence since 2006 in Nigeria's Niger Delta; (5) recurring terrorist attacks in Saudi Arabia; and (5) Hurricane Katrina in 2005, among others. In any case, the seemingly-secular rise in the price of oil in the past decade reflects, to a large degree, a thirst for oil in emerging countries, particularly in China and India. By 2012, the worldwide market was demanding 10 million more barrels per day of oil (mbd) than it had a decade earlier, bringing total global oil demand to its current level of 90 mbd.

Editor's note: this chapter was written when oil prices were around \$100/bbl—before their recent decline. Although a long period with prices at their current levels— \$50-\$60/bbl—would price out of the market much of Africa's new potential supply—the central subject of this chapter—it is likely that prices will actually stabilize within a higher range, somewhere between \$70 and \$80/bbl. This level would be high enough to support most of Africa's recently discovered potential. The remainder of this chapter should be read taking this into account.

1. This chapter is the product of several field trips in Africa since 2007 on which the author conducted hundreds of interviews with different types of actors: oil executives, ministers, NGO's, political party members in power or from the opposition, journalists, academics, ministers, advisers, etc. The limited bibliography, apart from the Energy Information Administration and European Commission figures, can be explained by the forward-looking issues explored. Geologists are pioneers, and academic researchers have no other choice than to follow them.

Not only did the higher barrel price provide new funds to the majors who have operated in Africa since before the independence era of the 1950s-70s, but it also paved the way for the entry of new kinds of companies, a trend which has significantly accelerated African hydrocarbons exploration since 2003. The first new type of actor is the so-called junior—a small or medium sized company, often founded by ex-major executives or geologists with a pioneering mindset. Another driving force behind African exploration has been the state-owned firms (and in some cases even private companies) coming from countries that have traditionally not invested significantly in Africa—Brazil, Russia, China, India, Malaysia, South Korea, Indonesia, Thailand, and Japan. While the goal might be the same for all such actors (majors, juniors, local, and foreign state firms)—that is, finding, producing and selling the precious crude—their strategies remain quite different.

- Oil majors—the one-time sisters: ExxonMobil, Royal Dutch Shell, Chevron, BP, and, by some counts, Total—have invested billions of dollars in countries with which they are familiar (Nigeria, Angola, Gabon, Congo, Equatorial Guinea, Chad, etc.) without taking on too much new additional African risk.
- On the contrary, the juniors—small and often midsized firms, like Tullow Oil and Marathon, among others—have pioneered and unlocked new and previously unknown or shunned terrains: in Mauritania and Namibia, at the margins of Atlantic Africa's rich oil littoral; in Sierra Leone, Liberia, Ghana, and other small countries along the West Africa Transform Margin; and in East Africa (Uganda, Tanzania, and Mozambique), a region once forgotten by the hydrocarbons industry.
- Other outside oil companies—particularly (but not exclusively) state-owned firms from Asia—have merely developed basins that had already been discovered but which had not yet been deemed politically safe or economically profitable, at least not when the barrel price was too low to justify investment in landlocked fields in places like Sudan and Niger.

In this regard, Tullow Oil represents a unique case. Formed in 1985 by Irish accountants and geologists, this company has subsequently taken great risks, allowing it to discover the first-ever commercial oil in Ghana, Uganda, and Kenya. State firms and majors rushed in to

purchase equity at high prices on the same blocks where this junior (now considered a mid-cap) had made the discoveries. Indeed, a whole class juniors like Tullow are now assuming the first risk by digging underexplored areas. When they make successful discoveries they call upon the majors to gain access to the larger financial resources needed to develop the reserves.

For their part, the majors have increasingly acted like banks and developers whereas juniors have behaved as pioneers and the principal explorers in Africa and in certain areas of Latin America—trends which I discuss in this chapter. In the end, all of the actors mentioned above—majors, juniors and other state-owned firms from Asia—tend to work together. An emblematic example can be found in Uganda, where in 2010 Tullow selected the French major, Total, and the state-owned Chinese firm, the China National Oil Offshore Corporation (CNOOC), to develop a 1.7 billion barrel project in the Lake Albert area. Today, more than 40 countries in Africa (out of a total 54) are currently in exploration, thanks to hundreds of firms eager to find new oil.

Oil discovery has always had immense local and national consequences, but it can also significantly influence the international crude oil market. Discoveries can depress the oil price, but then can also help a country to become energy independent. This may not be a major concern for countries that have only a limited demand for oil; however, when the state in question is the biggest oil and gas consumer on the planet, the implications can be numerous. The gigantic shale oil and gas discoveries in the United States helped the country—which consumes 18.5 mbd—to increase its oil production by 2 mbd between 2005 and 2012 and simultaneously boost its gas output by 170 billion cubic meters.²

As the U.S. gradually depleted its conventional oil and gas reserves at the end of the last century, the country engineered a complex strategy to guarantee that its enormous energy demands could be secured. One part of this strategy, particularly after September 11th, was to increasingly rely on the supplier countries of Atlantic Africa's Gulf of Guinea. This chapter examines the direct implications of America's unconventional discoveries of oil and gas on Africa, in both economic

2. *BP Statistical Review of World Energy 2013*.

and diplomatic terms, and attempts to forecast where these spare hydrocarbons might go in the future.

Oil discoveries on the American side of the Atlantic Basin can have direct implications for Africa or Europe—the old world littoral of the Atlantic Basin—in terms of crude supply; but there is also an Atlantic rationale that has recently come to increasingly drive oil exploration. A million years ago, Africa and Latin America used to belong to one single continent; only recently did geologists start to explore this historical fact. Now that oil companies found oil on one side of the Atlantic basin, they are keener to explore the other side as well. This phenomenon—the mirror image theory—will also be analyzed in this chapter. The two shores of the Atlantic Basin are becoming increasingly interconnected, and the relevant actors are gradually coming to understand the need to work together in light of the mutual benefits that such deepening energy cooperation would bring. This development has so far been driven primarily by private entities, but it might be time for political bodies to consider designing a coherent strategy that would benefit all parties involved in the energy space of the Atlantic Basin.

The Impact of U.S. Shale Gas and Oil on Hydrocarbon Exports from the Gulf of Guinea

The United States has always been particularly preoccupied its energy security. Following the first petroleum shock of October–December 1973, Henry Kissinger, as President Richard Nixon’s Secretary of State, became the driving force behind the creation of the International Energy Agency (IEA). Based in Paris as part of the Organization for Economic Cooperation and Development (OECD), the IEA has been—and continues to be—shaped to represent the oil importing nations as a self-conscious counterbalance to the weight of the Organization of Petroleum Exporting Countries (OPEC), created by the Persian Gulf, the Maghreb and Venezuela in 1960. In 1971, the United States had reached its then-historical peak in oil production, and Kissinger was well aware that his country would be in need of crude from the Persian Gulf, Canada, Mexico, and Venezuela. Controlling the oil output in most OPEC states was impossible due to the nationalizations of the 1970s (and of 1938 in Mexico), but the IEA was

tasked with avoiding market shortages that would automatically increase the price of the crude and directly impact American and other IEA member economies.

Forty years after Kissinger's move, the United States faces a very different situation as it suddenly finds itself on the way to possibly becoming energy independent in the future and almost certainly a net exporter of gas. Shale gas has allowed the U.S. to produce roughly 40 additional billion cubic meters per year since 2010 and to double its reserves from 4.7 trillion cubic meters in 1992 to 8.8 trillion cubic meters in 2012. On the oil side of the equation, the increase of reserves and production has been less spectacular, but significant in any case: extending from 30 to 35 billion barrels from 2002 to 2011, with a daily production increase from 6.9 million barrels in 2005 to 10 million barrels in 2013.³ All these figures will surely rise in the coming years, but the long-term pace of the increase in oil and gas production capabilities in the United States still remains unclear. (Much will depend, however, on how high or low global oil prices finally settle.) Nonetheless, shale oil and gas have already had a significant impact on the other side of the Atlantic Basin in Africa.

The Consequences of U.S. Shale Gas for Africa

One project in particular to suffer a major setback due to recent hydrocarbon exploration by the United States has been Angola Liquefied Natural Gas (LNG). Angola is the second largest producer of oil in Africa (1.8 mbd), but in terms of gas the country also lags behind Nigeria, which has exported gas as a commodity on the international market since 1999. For a number of years after the conclusion of the civil war in Angola in 2002, no company wanted to take on the additional risk to invest in a significant onshore plant to liquefy the associated gas of the offshore oil blocks. But in 2008, Chevron created the Angola LNG Company with the help of Sonangol (Angola), ENI (Italy), BP (United Kingdom), and Total (France). The plant, located in Soyo (Zaire Province in the north) was commissioned in 2013, with its first shipment sold to Brazil. However, the output of Angola LNG was initially intended to be sold entirely to the Mississippi Pascagoula terminal in the U.S.—at least until the shale gas boom occurred.

3. *BP Statistical Review of World Energy 2014.*

Sonangol U.S., the affiliate of Angola's national utility, had purchased 20% of the Pascagoula terminal to secure its position, but in 2011 the decision was taken to sell its shares to its partners El Paso and GE Energy Financial Services.⁴ The difficulty for Angola LNG since then has been to find long-term customers willing to accept a contract similar to the one the consortium had secured with Pascagoula terminal. This has not yet happened (as of the fall of 2014) and Angola LNG is selling its cargos one by one under spot contracts. Such contracts are profitable in terms of price because Asian buyers are willing to pay a higher price per British Thermal Unit (BTU) than U.S. customers, but there is no certainty with respect to volume. So far, Angola LNG has only managed to sell a couple of cargos to China, Malaysia, India, and Latin America (Uruguay and Brazil). Given that North America might become an energy exporter, all of the new regasification terminals are currently requesting permission from the U.S. government to convert into liquefaction plants (as in the case of Pascagoula) for the export of LNG.

One other consequence of these additional capacities in the United States has been the delay of greenfield LNG projects. Two cases from Nigeria—Brass LNG and OK LNG—are emblematic. Backed by Total, ConocoPhillips, and the Italian ENI, together with NNPC, the Nigerian national oil company, Brass LNG in Bayelsa state, has been plagued with political problems in the Niger Delta—where militants have been putting the sector at risk since the mid-1990s and where the Movement of the Emancipation of the Niger Delta (MEND) has been on the rise since 2006. MEND's campaign managed to shrink the production of the country by a third in 2009, before an amnesty helped the area return to normal production—even though none of the militant demands were met.

This decade-long atmosphere of physical insecurity and uncertainty in the legal regime—combined with the new additional supply capacities coming out of North America—are not conducive to large-scale investments in Nigeria. After the withdrawal of Chevron from Brass LNG in 2006, ConocoPhillips decided to sell all of its Nigerian interests in 2012, including its 17% share in Brass LNG. Although this project was launched under the Olusegun Obasanjo presidency in the 1990s, it is unlikely to reach a final investment decision in the near

4. *Africa Energy Intelligence*, no. 663, 11/16/2011.

future. The same is true for OK LNG. Even if global demand for LNG is growing, further gas development in Nigeria—with gas reserves of 182 trillion cubic feet, the largest in Africa— could be delayed as long as the Maghreb, Russia, and the internal market are able to supply European needs.

The only other gas exporter in Western Africa (apart from Nigeria and Angola) is Equatorial Guinea. Nevertheless, that country is now experiencing difficulties in finding enough gas for a second liquefaction train. Only one train of 5.2 million tons of LNG per year has been operational since 2007. The shale revolution is now endangering the project, at least in the short term.

Consequences of U.S. Shale Oil for Africa

With regards to African crude exports to the United States, there have been major changes since the exploitation of unconventional shale oil reserves on American soil, particularly the so-called light tight oil (LTO) of the now famous Bakken Shale in North Dakota. For several decades the main African exporters of oil have been Nigeria and Angola. Based on figures from the U.S. Energy Information Administration (EIA), Angola sold to the United States an average of 397,000 b/d from 1993 until 2010. Between 2010 and 2013, however, this figure fell to 326,000 b/d and for the year of 2013, it was only 233,794 b/d, the lowest volume in 20 years. Between 1993 and 2010 Nigeria exported 850,000 b/d to the United States. But from 2010 to 2013, this average volume fell to 761,000 (again a level not registered in more than 20 years) and then even more precipitously in 2013 to only 441,000 b/d. The same declining trajectory can be found in other African suppliers of crude (Algeria, Libya, Republic of Congo, Gabon, and Equatorial Guinea). In 2013, there were roughly one million barrels per day of African crude available on the international market that a decade ago would have been sold in the United States. This one million barrels per day of Africa oil that was once bound for the U.S. but is now heading out to other destinations might soon become 2mbd if the trend continues at this pace and the United States stops buying crude from Africa altogether. Less than a decade ago, in 2007, before the gas and oil shale boom, the United States imported 2.66 mbd from 14 African states.⁵

5. Calculations obtained based on figures given by the U.S. Energy Information Administration.

This significant shift in the structure of supply and demand in the international oil market has two main consequences for Africa. First, some African countries, particularly Nigeria, have grown afraid that the end of Washington's energy dependency will reshape its relationship with former economic partners. U.S. involvement in Africa intensified as a result of energy security concerns, and particularly after 9-11, when a more diversified range of suppliers was actively pursued in order to reduce its dependency on Persian Gulf states. Political leaders and government officials in Nigeria are worried that American companies—Exxon and Chevron, in particular—might not invest as much as they had previously planned before the shale revolution.

These worries are understandable. Some American majors have effectively begun to divest from Nigeria—not because of shale or other unconventional opportunities in the United States, but rather because of the country's weak security and decrepit rule of law. To illustrate this point, the two majors, as well as other private companies (including Cobalt, Anadarko, Conoco, and Marathon) have drastically increased their investments in other African countries and are all active in the Gulf of Mexico and in America's onshore.

The State Department might see the political situation in African oil producer states somewhat differently, however, and perhaps will begin to feel less of a geopolitical imperative to be as diplomatic as it has in the past regarding democracy and freedom of speech in certain African countries. Nigeria could still remain a special case, given its weight in the African economy (some 25% of Africa GDP with 170 million inhabitants, one quarter of the continental population) and its ongoing political fragility, still more than evident in the simmering situation in the Niger Delta and the increasingly explosive activities of Boko Haram in the North. Both situations will continue to demand cautious handling. But Angola, Algeria, Equatorial Guinea, Congo, and Gabon—none of which, as yet, are exemplary democratic states—could face a less flexible relationship with the United States in the near future.

The second main consequence of shale oil development in the United States regards the resulting spare capacities of oil and gas in Africa. Who will now buy these new volumes no longer consumed in the North American market? Asian economies—China and India, in

particular—have increased their demand by 8mbd since 2002⁶ and are already importing most of the new cargo available from the Gulf of Guinea, together with other Atlantic countries like Brazil (which is nevertheless reducing its imports from Atlantic Africa as its own domestic production from the Santos and Campos basins expand).

But what about European countries that are closer to African producers and that have refineries capable of treating light oil produced in the Gulf of Guinea? Figures from the European Commission's Energy Directorate can give an idea: the percentage of African imports of total crude exports to the 27 members of the European Union was 20.7% (2009), 20.1% (2010), 17.3% (2011) and 24% (2012). In 2013, this percentage may have declined for one reason: Libya's output contracted by a factor of five within a year. However, while traders in both Geneva and London see a clear tendency for European refineries to increase their crude purchases from Africa, Asia might remain the main buyer of the extra capacities. Nevertheless, traders claim that they face difficulties in selling their crude cargos that went to the United States for the last two years. Consequently, their margins have decreased drastically. It is difficult to predict whether or not this problem will continue over the longer run to impact the level of production in Africa. All such trends remain to be confirmed.

As for gas, new available capacities in Africa might be negligible in comparison with crude oil. Algeria and Libya have always sold most of their output to the European Union through pipelines. Algeria had been selling relatively small quantities of liquefied gas to the United States since the 1960s thanks to the Arzew and Skikda plants (commissioned in 1964), but nothing has been traded since 2007 due to local production weaknesses and a significant rise in local consumption. For Nigeria, which began its operation in 1999 with NLNG (six trains), most of its gas is already going to Europe and Asia, and so is the only liquefaction train in Equatorial Guinea.

The U.S. oil and gas shale boom will clearly reshape relationships with African hydrocarbon producing countries, but it is highly improbable that American firms will divest from this continent. African energy can be very profitable and still has an enormous unex-

6. *BP Statistical Review of World Energy 2013*.

ploited potential. Asia seems to be occupying the space increasingly vacated by the United States.

The “Mirror Image Theory:” Links Between Oil Discoveries in Africa and Latin America

Because Africa and Latin America once belonged to the same geographic landmass, a number of countries on opposite side of the Atlantic Basin—particularly in the south—have similar geologies, despite the fact that they are separated by thousands of miles today. This has recently led oil firms to buy blocks on the opposite side of Atlantic when they make discoveries on one side of the basin or the other. This strategy—known the “Mirror image theory”—is a quite recent development, but examples are beginning to mount.

Namibian-Brazilian Offshore Links

The first occurrence of mirror image exploration on the other side of the Atlantic Basin took place in Brazil. Since 2006, the large discoveries in the Lula field—along with the other huge discoveries (Libra, Carioca) in the pre-salt Santos and Campos basins, off the coast of Rio de Janeiro, Sao Paulo, and Vitoria) have been driving exploration efforts in Namibia. The similarities between the Orange, Walvis, Namibe, and Lüderitz fields in Namibia and Brazil’s offshore pushed junior firms to enter the southern African country and to boost their interests in countries that are currently opening up the deep offshore like Gabon and the Republic of Congo.

Prior to that discovery, Namibia had not been completely terra incognita for oil and gas exploration. Chevron discovered the Kudu gas field in 1974, but its size (1.4 trillion cubic feet) was not significant enough to incentivize commercialization at a time when gas was not considered to be an asset. After Namibia’s independence from South Africa in 1990, the country tried to promote its offshore capacity, and new oil companies bought licenses through several bid rounds since 1991. But even when a major like Shell entered the country no significant reserves were discovered over the next two decades, as Namibia suffered from the weak price of oil in the late 1990s.

A new impetus for exploration came after the findings in Brazil that pushed former Petrobras executives to secure—in 2008—ten blocks in Namibia through their entity HRT Oil&Gas. The enthusiasm for pre-salt exploration in Namibia has recently driven majors to re-enter the offshore. Petrobras was the first one to enter Namibia in 2009, followed by BP on the same block (2714A) in 2011. In 2012, the British firm increased its exposure in the country by accumulating shares in four more blocks: 2512A, 2513A, 2513B and 2612A. The last major to give another chance to Namibian geology was Shell, which secured equities in blocks 2913A and 2914B in February 2014.

A petroleum system has been proven to exist in Namibia, but that does not mean that oil companies are necessarily going to find oil in commercial quantities. Apart from Kudu, which has enough gas to empower an electricity plant of 800 MW in Walvis Bay, the existence of viable Namibian basins still remains uncertain. The three wells drilled in the Walvis and Orange basins by HRT in 2013 have disappointed, but that does not mean the exploration will stop. Shell's 2014 move and Chevron's involvement demonstrate this country might remain a hot spot for oil and gas exploration for the next couple of years. Brazil has an undeniable role in this new opportunity provided to Namibia.

Jubilee Discovery Fosters Positive Developments in Latin America

Another recent example in support of the mirror image theory occurred in Ghana, in the offshore of the West Africa Transform Margin). The discovery of the Jubilee field in 2007 by the British company Tullow Oil and the American juniors, Kosmos Energy and Anadarko, unlocked this country which had previously produced only a very small quantity of crude. The reserves found at Jubilee—around one billion barrels of recoverable oil—are among the largest that have been discovered in the region for years. The field was put in production in December 2010 and has produced roughly 100,000bd since then. Other significant finds discovered after Jubilee have included Tweneboa, Ntomme, and Enyenra which will produce 80,000bd by 2015–2016.

In Sierra Leone, the continuation of the petroleum trends of Ghana in the east helped Anadarko and Tullow to discover the Venus, Mer-

cury, and Jupiter fields in 2009, 2010 and 2011. This petroleum system, called the Liberian basin, has also caught the attention of larger companies. Chevron took three blocks in Liberia in 2010 (where Italian behemoth ENI joined in 2012) and two more blocks in Sierra Leone. In 2013, Exxon managed to take the lead on block 13 in Liberia.

Called by geologists the “transform margin,” these new discoveries—running from Ghana to Sierra Leone and perhaps in future all the way to Guinea—have stimulated exploration on the other side of the Atlantic Basin in Latin America. Indeed, a new impetus has been given to explorations in Guyana, French Guiana, and Suriname—taking place in geological locations exactly analogous to those in offshore Ghana, Liberia, and Sierra Leone—only they are on the other side of the Atlantic Basin. These two regions, which geologists have called the Equatorial Atlantic Basin, were once joined hundreds of millions of years ago, much as were Namibia and southern offshore Brazil.

After its discoveries in Ghana—once Tullow Oil could secure additional funds based on its new reserves—this junior decided to invest more money in the offshore acreages of French Guiana, which the company had acquired in 2006 (as part of the purchase of the Australian company, Hardman Resources). Enthused by the Ghana finds, majors like Total and Shell have farmed into Tullow’s block at Guyane Maritime, leading to the *Zaedyus* discovery in September 2011.

These new successes (along with the African offshore discoveries previously mentioned) pushed Tullow to purchase stakes in neighboring countries in Latin America. After having taken up the operatorship in Suriname’s block 47, in 2013, the British junior took two new blocks in offshore Suriname with Japanese Inpex (license 31) and Norwegian major Statoil (license 54). Tullow was also joined by Kosmos Energy (the other firm active in Jubilee finds) and in 2011 secured the blocks 42 and 45, managing to attract Chevron as co-investor in 2012. Other American firms like Murphy and Apache did the same and won bids in Suriname. In the north, Tullow also acquired the Kanuku offshore block in Guyana (a former Dutch and then a British colony) in July 2013, alongside the Spanish company, Repsol.

They are not alone, as Anadarko (another stakeholder in the Jubilee field) was already present in this area with Exxon. The African findings also provoked Brazil to license blocks in its northern off-

shore, in the Foz de Amazonas Basin, which borders French Guiana and its Zaedyus find. Brazil has been the last country to offer licenses in this region because it has taken time to gather data to promote new blocks, and because Brazilian authorities were busy with all the other discoveries in the Santos and Compos basins in the southern part of its offshore. In the Foz de Amazonas basin, the French major Total won five blocks alongside BP in May 2013. In contrast to the previous experience in all other states in Brazil, the two companies had to pay a high signature bonus (\$270 million) to authorities in order to secure the blocks.⁷

These two shores of the Atlantic basin are still relatively underexplored. Many drilling campaigns will take place in Ghana, Liberia, Sierra Leone, and Guinea in the upcoming years; the same goes for French Guiana, Suriname, Guyana, and north Brazil. Those regions, which share the same geographical lineage, remain underexplored. Nevertheless, their oil exploration fate has taken on a common trajectory in the last ten years.

The Falkland Effect on South Africa

Last but not least, another example of the mirror image theory is coming from the petroleum system discovered recently in the Falkland/Malvinas Islands near the southern Argentine shore. The recent discoveries in the Malvinas/Falklands offshore has had major consequences for the eastern offshore area of South Africa because the two zones used to be joined in the past. The offshore of this archipelago under the sovereignty of United Kingdom has been under exploration (seismic and well drillings) since the end of the 1990s by majors such as Shell or Hamerada Hess.

However, discoveries were far too miniscule to develop the reservoirs at a time when the price of oil was barely \$10/bbl. The new era of oil exploration began in 2003 and was associated with a far more robust crude price in New York and London, which helped some new companies—particularly British juniors such as Falkland Oil and Gas Limited, Desire Petroleum, and Rockhopper Exploration—to reprocess data from the past and to acquire new data in Falklands off-

7. *Africa Energy Intelligence*, no. 717, February 25, 2014.

shore. This led to the discovery of Sea Lion by Rockhopper in 2010 (293 million barrels oil equivalent) and other successful drilling campaigns, which attracted bigger companies such as Noble Energy, Edison, and Premier Oil that farmed in several blocks in 2012.

To develop the Sea Lion prospect in the northern basin, Premier Oil has been in competition with well-known mid-cap companies such as Anadarko⁸ and other American firms like Murphy Oil or Hess. The winner, Premier Oil, accepted to pay \$722 million to develop the field and give \$231 million to Rockhopper.⁹ The final investment decision will be taken in early 2015. In July 2012, Noble Energy assumed control (alongside Edison, owned by the French major power firm EDF) of the blocks in the Falklands southern offshore, owned by junior Falkland Oil & Gas. Several seismic and well drillings are planned for 2014 and 2015, and are expected to amount to a total profit of \$420 million.

This exploratory success in the Falkland/Malvinas Islands has driven some companies to take a corresponding interest—following the mirror image theory—in the eastern part of the South African offshore. Two geological events have put the South African offshore in the spotlight in the last five years. The first one is Anadarko and ENI's enormous Mozambique gas discovery (almost equivalent to Nigeria's reserves) in the northern offshore in 2010. This discovery unlocked the offshore of South Africa, which had been relatively underexplored compared to many other African countries. The second determining geological aspect comes from the Falkland/Malvinas Islands, where the Sea Leon field was discovered and attracted a number of mid-sized companies.

As in other part of the Atlantic Basin offshore, junior companies have typically been the ones to make the first moves and to bid for exploratory rights from the South African authorities.¹⁰ Impact Oil & Gas (a firm based in London and headed by the British geologists who followed the oil history of the Falkland Islands) managed to obtain a formal agreement in March 2012 for the Tugela blocks in South Africa (close to Durban city). Less than a year later, ExxonMobil took 75%

8. Also active in Ghana, Sierra Leone, Liberia and Guyana.

9. <http://www.rockhopperexploration.co.uk/rockhopper/about.html>.

10. <https://www.impactoilandgas.co.uk/NewsDetails.aspx?id=5>.

of the Tugela blocks and became its operator. Additionally, in 2013 the French major, Total, took the operatorship of the block 11B/12B (across from Port Elizabeth).

Once again, the Falkland Island discoveries played a role in the rationale for the investment. According to the company's Senior Vice President of Exploration, Marc Blaizot, the "acquisition in this extensive frontier exploration asset demonstrates our determination to establish ourselves in new plays. South Africa's deep offshore, in particular the Outeniqua Basin, is one of the few remaining under-explored offshore regions in Africa. Recent discoveries in the Falkland Islands (Malvinas Islands) together with prospects identified on the block offer us very promising opportunities."¹¹

Petroleum Actors of the Equatorial Atlantic Margin Play and the Southern Atlantic Basin

In terms of actors in the oil sector, the mirror image geology has clearly paved the way for Atlantic Basin firms. Brazilian companies like Petrobras and HRT have quickly caught on to the potential of Namibia as a result of the previous discoveries in the Santos and Campos basins. Petrobras also took up several blocks in northern Angola and Gabon, given that the geology of the Lula field, unveiled in 2006, is similar in its pre-salt characteristics to the offshore zones of those countries. Furthermore, North American investors in Africa's southern offshore have been very proactive in securing blocks. Exxon and Chevron have operated in Angola for decades, long before the mirror image theory became popular. But they have invested in new areas since this concept has taken root (in Liberia, Sierra Leone, and Guyana). Some mid-cap companies from the United States have been pioneers in this quest. Anadarko and Kosmos Energy, for example, discovered Jubilee in Ghana in 2007, and at the same time entered the new oil plays of Latin American nations such as Suriname and Guyana.

But the real driving force has been Tullow Oil. This British junior took the chance very early on to unlock the two sides of the Atlantic Basin by securing blocks without delay. The story of this small company—the first to understand the geological implications of the

11. <http://total.com/en/media/news/press-releases/20130930-Total-Acquires-Offshore-Exploration-Interests-in-South-Africa>.

mirror image theory—is also wrapped up with that of the South African offshore and Impact Oil & Gas. Thanks to its rapid decision-making practices, Tullow rushed into South Africa after the findings in the Falklands, and the major Exxon profited from the licenses of Impact Oil and Gas a year later. This trend has also been observed in Namibia by HRT Oil & Gas from Brazil, another driving force, in this regard. The company has been joined by the majors, shortly after its initial moves in Namibia.

The African actors seem relatively quiet in this new Equatorial Atlantic Margin play (Ghana, Sierra Leone, Liberia-North Brazil, French Guiana, Suriname, and Guyana). The Angolan state company Sonangol is the sole African actor to have taken blocks in Brazil based on an agreement with Petrobras (which has explored in Angola since 1979).

In summary, the Atlantic Basin remains the sphere of Western or Atlantic companies, with juniors acting as mavericks, later to be joined by majors when successful. At least as far as these new offshore opportunities and basins are concerned, where the mirror image theory has played a catalytic role, no companies from Asia have entered Namibia, Ghana, Liberia, Sierra Leone, South Africa, or in the other mirror image play, countries on the Latin American side of the Atlantic.

Conclusion

The energy market has long been globalized, but increasingly one can see consequences of significant oil and gas discoveries in diverse and disparate locations. This chapter has sought to explain why the Atlantic Basin is an appropriate framework for thinking about hydrocarbons among the Atlantic continents of North America, South America, Africa, and Europe. These regions are already interconnected via private and state firms' visions of geological similarities. But up until now, however no political vision has been developed to help the nations of these continents to work together so that they might profit from each other's experience and common geological ancestry. The same companies are taking blocks on both sides, but states may be missing out on an opportunity to learn from more experienced countries. Some African and Latin American regions have no track

record in hydrocarbon discoveries and are struggling to propose balanced guidelines and contracts that both attract firms and are profitable for the state.

The examples presented and analyzed in this chapter—the Southern Atlantic sub-basin between Brazil and Namibia and the Falklands/Malvinas and South Africa, and the Equatorial Atlantic Margin sub-basin between Ghana, Liberia, Sierra Leone, French Guiana, Suriname, Guyana, and North Brazil—are the first in what could be, no doubt, a very long list. We can easily foresee many other discoveries in these regions that will help to unlock the other side of the Atlantic Basin. It has become necessary to foster a wide regional political debate on these matters, especially after the U.S. oil and gas shale boom, an unexpected development that could drastically change U.S. relationships with African states in the short term. U.S. energy independence might not be achieved for many years, but the country's declining external energy dependency on the countries of the Gulf of Guinea (Nigeria, Angola, Equatorial Guinea, Congo, and Gabon) and the Maghreb is already visible. The necessary political relationships between consumers and producers must be buttressed by another type of political dialogue based on a new Atlantic Basin partnership, one that cannot lead to a political vacuum. The Atlantic Basin is now the location of a significant percentage of global oil and gas production, but it also remains an important place of consumption. The need for dialogue is urgent.

