

# The Geopolitics of Natural Gas

The Changing Geopolitics of Natural Gas: The Case of Algeria

Harvard University's Belfer Center and  
Rice University's Baker Institute Center for Energy Studies

November 2013

*center for*  
**ENERGY  
STUDIES**

Rice University's Baker Institute



**HARVARD** Kennedy School

**BELFER CENTER**

**FOR SCIENCE AND INTERNATIONAL AFFAIRS**



JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY  
RICE UNIVERSITY

# THE CHANGING GEOPOLITICS OF NATURAL GAS: THE CASE OF ALGERIA

BY

AZZEDINE LAYACHI, PH.D.

PROFESSOR OF INTERNATIONAL AND MIDDLE EAST AFFAIRS  
ST. JOHN'S UNIVERSITY

NOVEMBER 1, 2013

## **The Changing Geopolitics of Natural Gas: The Case of Algeria**

THESE PAPERS WERE WRITTEN BY A RESEARCHER (OR RESEARCHERS) WHO PARTICIPATED IN A BAKER INSTITUTE RESEARCH PROJECT. WHEREVER FEASIBLE, THESE PAPERS ARE REVIEWED BY OUTSIDE EXPERTS BEFORE THEY ARE RELEASED. HOWEVER, THE RESEARCH AND VIEWS EXPRESSED IN THESE PAPERS ARE THOSE OF THE INDIVIDUAL RESEARCHER(S), AND DO NOT NECESSARILY REPRESENT THE VIEWS OF THE JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY.

© 2013 BY THE JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY OF RICE UNIVERSITY

THIS MATERIAL MAY BE QUOTED OR REPRODUCED WITHOUT PRIOR PERMISSION,  
PROVIDED APPROPRIATE CREDIT IS GIVEN TO THE AUTHOR AND  
THE JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY.

## ACKNOWLEDGMENTS

The Center for Energy Studies of Rice University's Baker Institute would like to thank ConocoPhillips and the sponsors of the Baker Institute Center for Energy Studies for their generous support of this program. The Center for Energy Studies further acknowledges the contributions by study researchers and writers.

## ENERGY FORUM MEMBERS

### ADVISORY BOARD

Accenture  
The Honorable & Mrs. Hushang Ansary  
Baker Botts L.L.P.  
Baker Hughes Incorporated  
BP  
California Energy Commission  
Cheniere Energy, Inc.  
Chevron Corporation  
ConocoPhillips  
Deloitte  
EDP Renewables North America, LLC  
Energy Future Holdings Corporation  
ExxonMobil Corporation  
The Institute of Energy Economics, Japan (IEEJ)  
Marathon Oil Corporation  
Saudi Aramco  
Schlumberger  
Shell Oil Company  
Shell Exploration & Production Co.  
Trinity Industries, Inc.  
Wallace S. Wilson

### ASSOCIATE MEMBERS

Direct Energy  
Hess Corporation  
Tudor, Pickering, Holt & Co. LLC

### MEMBERS

Afren Resources USA  
Air Products and Chemicals, Inc.  
American Air Liquide Holdings, Inc.  
Apache Corporation  
Aramco Services Company  
IPR - GDF SUEZ North America  
Pioneer Natural Resources USA Inc.  
Rockwater Energy Solutions, Inc.  
TOTAL E&P New Ventures, Inc.  
TOTAL E&P USA, Inc.  
VAALCO Energy

### SUPPORTING MEMBERS

Deloitte MarketPoint LLC  
Energy Intelligence

## ACKNOWLEDGMENTS

The Geopolitics of Energy Project at Harvard University's Kennedy School is grateful for the support it receives from BP, as well as the Belfer Center for Science and International Affairs. It also appreciates the work and contributions provided by the scholars who have participated in this program.

## ABOUT THE STUDY

Some of the most dramatic energy developments of recent years have been in the realm of natural gas. Huge quantities of unconventional U.S. shale gas are now commercially viable, changing the strategic picture for the United States by making it self-sufficient in natural gas for the foreseeable future. This development alone has reverberated throughout the globe, causing shifts in patterns of trade and leading other countries in Europe and Asia to explore their own shale gas potential. Such developments are putting pressure on longstanding arrangements, such as oil-linked gas contracts and the separate nature of North American, European, and Asian gas markets, and may lead to strategic shifts, such as the weakening of Russia's dominance in the European gas market.

Against this backdrop, the Center for Energy Studies of Rice University's Baker Institute and the Belfer Center for Science and International Affairs of Harvard University's Kennedy School launched a two-year study on the geopolitical implications of natural gas. The project brought together experts from academia and industry to explore the potential for new quantities of conventional and unconventional natural gas reaching global markets in the years ahead. The effort drew on more than 15 country experts of producer and consumer countries who assessed the prospects for gas consumption and production in the country in question, based on anticipated political, economic, and policy trends. Building on these case studies, the project formulated different scenarios and used the Rice World Gas Trade Model to assess the cumulative impact of country-specific changes on the global gas market and geopolitics more broadly.

## STUDY AUTHORS

Rawi Abdelal  
Luay Al Khatteeb  
Govinda Avasarala  
Beibei Bao  
Soner Cagaptay  
Charles Ebinger  
Jareer Elass  
Andreas Goldthau  
Peter Hartley

Simon Henderson  
Trevor Houser  
Amy Myers Jaffe  
Robert Johnston  
Ken Koyama  
Azzedine Layachi  
Michael Levi  
Steven Lewis  
Suzanne Maloney

David Mares  
Kenneth B. Medlock  
Keily Miller  
Tatiana Mitrova  
Isidro Morales  
Martha Brill Olcott  
Meghan O'Sullivan  
Ronald Ripple

## Introduction

Algeria, the largest country in Africa, is one of the three biggest producers of hydrocarbons on that continent, the other two being Libya and Nigeria. It produced hydrocarbons even before its independence from France in 1962. Its entire economy was built around such resources, and its exports are mainly oil and natural gas. After major capital investments in these industries in the 1960s and 1970s, it quickly grew into a major supplier of these energy products to Europe and other markets, including the United States. In the region of North Africa (also known as the Maghreb<sup>1</sup>), Libya is the only other major oil and gas producer whose key market is also primarily Europe, particularly Italy.<sup>2</sup>

Algeria is important in the global energy market due to several factors. It has the eighth largest natural gas reserves in the world with 159 trillion cubic feet (Tcf). With a production of 6.8 Tcf in 2010 (down from 6.9 Tcf in 2009),<sup>3</sup> Algeria is among the top 10 producers of natural gas in the world and is also the third largest of OPEC member countries after Iran and Qatar. It exports gas through pipelines to Europe and by tankers of liquefied natural gas (LNG) to many countries. In 1964 Algeria was the first producer of LNG in the world; today it is the fourth largest LNG exporter (behind Indonesia, Malaysia, and Qatar), exporting around 13% of the world's total LNG, which is roughly 35% (682 Bcf) of its total gas exports. LNG is exported by 28 tankers for crude and products. Sonatrach,<sup>4</sup> the national and sole hydrocarbon company, has commissioned 10 new tankers to be delivered in 2013.

The long-term trends of Algeria's gas industry rest on several factors, including the reserves, which have been dwindling due to maturing fields and slow discovery of new ones; the external demand, which recently has been affected negatively by the recession in Europe and the rising competition of other gas exporters, such as Qatar; domestic consumption of gas, which has been

---

<sup>1</sup> The Maghreb, as a unique cultural and political region, includes Algeria, Libya, Mauritania, Morocco, and Tunisia.

<sup>2</sup> Before the overthrow of Moammar Gadhafi in 2011, Libya provided Italy with 40% of its energy needs.

<sup>3</sup> U.S. Energy Information Administration, *Algeria Country Analysis Brief*, last modified May 20, 2013, <http://www.eia.gov/cabs/Algeria/Full.html>. Of the 6.8 Tcf produced in 2010, 3.5 Tcf was marketed (exports and domestic consumption), 3.2 Tcf was re-injected for oil recovery, and 0.2 Tcf was either vented or flared.

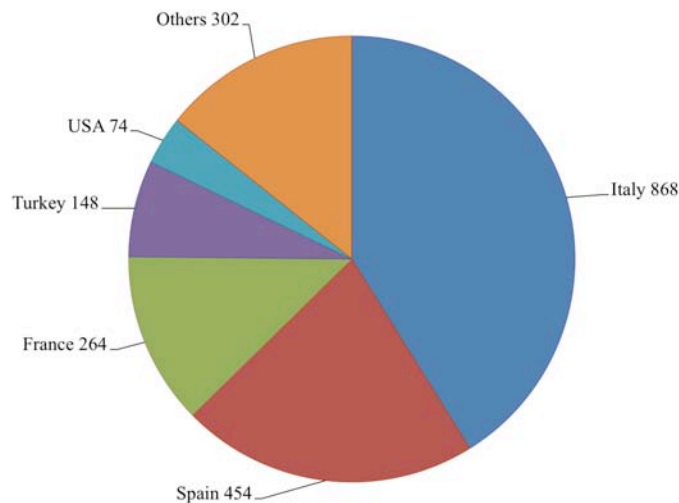
<sup>4</sup> Sonatrach is the acronym for the company's French name, Société Nationale pour la Recherche, la Production, le Transport, la Transformation, et la Commercialisation des Hydrocarbures.

rising by more than 6% a year; and internal political dynamics, which affect the country's hydrocarbon policy and foreign investment regulations. The prospect of shale gas development may offset a shortfall in conventional gas reserves, production, and exports, but that may take many years to materialize in spite of the government's firm commitment to this source, which is said to be very abundant.

Despite the challenges ahead for its gas industry, Algeria remains a significant player in the global gas market. It is the European Union's third most important source of natural gas after Russia and Norway,<sup>5</sup> and yet "[l]ittle is heard publicly or written about Europe's third largest supplier of gas, Algeria, which accounts for 20% of the continent's imports."<sup>6</sup> More than 97% of Algeria's natural gas exports—an average of 2.118 trillion cubic feet (Tcf)—go to Europe where, as indicated in Figure 1, the main clients are Spain and Italy, which are supplied mainly via pipelines across the Mediterranean Sea with long-term contracts with oil-indexed prices.

**Figure 1. Importers of Algerian Natural Gas in 2007**

(Billion cubic feet)



Source: International Energy Agency

<sup>5</sup> In 2012, Algeria was the second source of gas for the EU, providing 30% of its needs, while Russia and Norway provided respectively 40% and 25%. See "Geopolitics of EU Energy Supply," EurActiv, last modified May 28, 2012, <http://www.euractiv.com/energy/geopolitics-eu-energy-supply-links dossier-188354>.

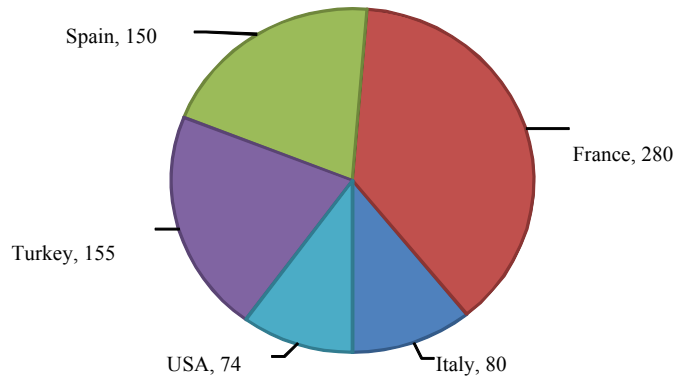
<sup>6</sup> Francis Ghilès, "Algeria: A Strategic Gas Partner for Europe," *Journal of Energy Security*, February 2009. Among the EU members, France, the former colonial power, is the largest source of Algeria's imports (19.7%) and hosts close to 2 million Algerian expatriates.



Most of Algeria's LNG exports also go to Western Europe (see Figure 2), especially France, Spain, and Turkey. Other European clients include Portugal, England, Greece, and Slovenia.

**Figure 2. Top 5 Importers of Algerian LNG in 2007**

(Billion cubic feet)



Source: U.S. Energy Information Administration, multiple databases.

Algerian gas reaches Europe mostly through three pipeline connections (see Table 1); the construction of a fourth pipeline linking Algeria to Italy's mainland is planned for 2014.

**Table 1. Pipelines Linking Algeria to Its European Customers**

Pipeline	Length (miles)	From	To	Capacity (Bcf/y)
Trans-Mediterranean (TransMed, Enrico Mattei)	1,370	Hassi R'mel	Mainland Italy (via Tunisia and Sicily)	1,059
Maghreb-Europe Gas (MEG or Pedro Duran Farrel)	1,000	Hassi R'mel	Cordoba, Spain (via Morocco)	426
MEDGAS	130	Beni Saf	Almeria, Spain	403
GALSI (Gasdotto Algeria Sardegna Italia). <sup>7</sup> <u>Not built yet.</u>	937	Hassi R'mel	Piombino, Italy	282

Note: MEG ties into the Spanish and Portuguese natural gas transmission networks. MEDGAS is planned to have an extension to France by 2015 to sell Spain's surplus gas to France and other European states. GALSI is just a project at this time.

<sup>7</sup> In 2012, the Galsi pipeline project was further delayed by both parties. One of the reasons invoked by observers the possible consideration by Italy of investing in the Trans-Adriatic or the South Stream pipeline projects.

In recent years, Algeria and Nigeria agreed to build a trans-Sahara gas pipeline (NIGAL pipeline and Trans-African Gas Pipeline) to supply Europe with Nigerian natural gas through a 2,800-mile pipeline that will connect to the TransMed, MEG, Medgaz, and Galsi pipelines using the Algerian gas transmission hubs at El Kala and Beni Saf. This pipeline, planned for completion in 2015, will have a capacity of up to 30 billion cubic meters. This project, which is delayed by costs (\$20 billion), logistical challenges, and instability in the Sahel region, could turn Algeria into a major export hub for African natural gas.

## **Background**

It is important to note that, beyond its natural gas resources, Algeria is among the world's top 15 oil exporters, with a production of approximately 1.3 Mb per day. Its proven oil reserves were estimated in January 2007 to be 12.3 billion barrels,<sup>8</sup> making them the third largest in Africa after Libya and Nigeria, and the oil produced there is said to be of the highest quality in the world. Its key oil markets are Europe and the United States. In 2011, Algeria's estimated crude oil exports were 750,000 barrels per day (Bbl/d), the largest portion of which—around 40%—went to North America, mainly the United States.<sup>9</sup> The Organization for Economic Cooperation and Development (OECD) countries import around 30% of Algeria's oil exports.<sup>10</sup>

Hydrocarbons are the mainstay of Algeria's economy. In the mid-1960s, Algeria opted for a strategy of economic and social development guided by the belief that a strong heavy oil industry would fuel and support a manufacturing industry; this would then generate an extensive manufacturing capacity that would substitute domestic products for expensive imports. The strategy, known as import-substitution, was undergirded by a socialist ideology that guided the setup of an economic system whose main engine was the state. The principal financing source for this plan was hydrocarbon exports, supplemented by external borrowing. In the end, the economic strategy and socialism failed and were abandoned. By 2013, Algeria was still without

---

<sup>8</sup> *Oil and Gas Journal*, online at <http://www.ogj.com/index.html>. OR "International Energy Statistics," U.S. Energy Information Administration, <http://www.eia.gov/cfapps/ipdbproject/iedindex3.cfm>.

<sup>9</sup> According to the US Energy Information Administration, the United States imported an average of 510,000 bbl/d from Algeria in 2010, of which 328,000 bbl/d was crude oil. These imports represented 4% of the U.S. total oil imports in 2008 (547,000 bbl/d), which constituted 28% of Algeria's oil exports.

<sup>10</sup> U.S. Energy Information Administration, *Algeria Country Analysis Brief*.

significant heavy and light industries, depended heavily on imports (industrial and food items), and had a high rate of youth unemployment (22%).

Most of Algeria's proven oil and gas reserves are located in the eastern part of the Sahara. Around 67% of reserves are in the provinces of Oued Mya and Hassi Messaoud, with two giant fields: Hassi R'mel (gas) and Hassi Messaoud (oil); the basin of Illizi comes in third position with 14% of the reserves, followed by the basins of Rhourde Nouss (9%), Ahnet Timimoun (4%), and Berkine.<sup>11</sup>

The province of Hassi Messaoud-Dahar alone has 71% of Algeria's oil reserves, while the province of Oued Mya has 50% of the gas reserves and only 6% of the oil reserves. The basin of Illizi has 15% of oil and 14% of gas; the provinces of Rhourde Nouss and Berkine have 19% of gas, mostly in Rhourde Nouss, and 8% of oil. Finally, the basin of Ahnet-Timimoun is suspected of containing gas only (13%).<sup>12</sup>

In terms of production, 75% of Algeria's hydrocarbon output comes from the fields of Hassi Messaoud and the Hassi R'Mel. Sixty-four percent of the total primary production volume is natural gas, 26% oil, 6% condensates and 4% liquefied petroleum gas (LPG). In 2010, 72% of the output volume was produced by Sonatrach and the rest by foreign companies.<sup>13</sup>

LNG is produced by the two old plants of Arzew and Skikda; two new ones are being built now. The Arzew plant in the northwest of Algeria, which had three trains and a production capacity of around 53 Bcf/y of LNG, was the first of its kind in the world when it opened in 1964. It was closed in February 2011 after becoming too dilapidated and dangerous to operate. It is now being replaced by a new LNG plant with a mega-capacity of 218 Bcf/y; it will be supplied by gas from the Gassi Touil fields and is due to open in 2013. The LNG plant and export terminal of Skikda

---

<sup>11</sup> Sonatrach, "Nos Activités," <http://www.sonatrach.com/nos-activites.html>.

<sup>12</sup> Ibid.

<sup>13</sup> Sonatrach, *Annual Report 2010*, accessed July 19, 2012, [http://www.sonatrach.com/en/rapport2010/Rapport%20annuel\\_uk\\_2010.pdf](http://www.sonatrach.com/en/rapport2010/Rapport%20annuel_uk_2010.pdf). Foreign companies operating in Algeria under production-sharing agreements include Anadarko Petroleum Corp., ConocoPhillips Co. of the United States, BP Algeria of the United Kingdom, Eni Algeria Production BV of Italy, Gas De France (GDF) Suez and Total Algeria S.p.A. of France, Maersk A/S of Denmark, and Talisman Energy Inc. of Canada.

in the northeast of Algeria, which has been operating since 1972, also encountered problems when on January 19, 2004, an accidental explosion destroyed three of its trains and damaged three others. The accident temporarily reduced LNG production by more than 70%. The damaged trains were repaired in less than a year, but the destroyed three will be replaced by a single, large-capacity train (250 Bcf/y) by 2013.<sup>14</sup>

### *Domestic Gas Consumption and Distribution System*

The domestic consumption of natural gas has been increasing by 6% a year, and most energy needs are met mostly by natural gas (over 90% of electricity is produced with gas). By 2020, the country expects to produce 1.58 Tcf of gas for domestic consumption alone, and 1.94 Tcf by 2030.<sup>15</sup> The government expects the consumption of gas to increase by 13% by 2017.<sup>16</sup>

The domestic energy distribution uses an extensive system of pipelines of 4,000 miles that sends around 10 Bcf/d of gas to all regions of the country, including the points of export to Europe.<sup>17</sup> Sonatrach pipelines distribute gas to Algeria's four regions. The Hassi R'mel gas field is at the center of this pipeline distribution system (see Maps in the Appendix). From there is connected the largest pipeline systems that send gas to export terminals of liquefied natural gas (LNG) along the Mediterranean coast.

The transportation and distribution of natural gas in the domestic market are done by the public company Société Nationale de l'Electricité et du Gaz (National Company of Electricity and Gas, Sonelgaz), which is also responsible for the production and distribution of electricity. It is part of 36 subsidiary companies headed by Sonelgaz Holding, which owns the company.<sup>18</sup> It is distinct from Sonatrach, which, with 25 subsidiaries, controls the exploration, production, and

---

<sup>14</sup> U.S. Energy Information Administration, *Algeria Country Analysis Brief*.

<sup>15</sup> *Renewable Energy and Energy Efficiency Program*, Algerian Ministry of Energy and Mines (March 2011), 5. Online at [http://www.mem-algeria.org/francais/uploads/enr/Programme\\_ENR\\_et\\_efficacite\\_energetique\\_en.pdf](http://www.mem-algeria.org/francais/uploads/enr/Programme_ENR_et_efficacite_energetique_en.pdf).

<sup>16</sup> *Programme indicatif d'approvisionnement du marché national en gaz 2008-2017*, Electricity and Gas Regulation Commission (CREG), [http://www.mem-algeria.org/fr/statistiques/Programme\\_indicatif\\_Gaz\\_2008-2017.pdf](http://www.mem-algeria.org/fr/statistiques/Programme_indicatif_Gaz_2008-2017.pdf).

<sup>17</sup> See map of existing and planned hydrocarbon fields and domestic pipelines at <http://www.mem-algeria.org/fr/hydrocarbures/pipe&gis.pdf>.

<sup>18</sup> Sonelgas lost its electricity and gas monopoly when its activities were unbundled in 2002. Besides an independent regulatory agency (Algerian Electricity and Gas Regulation Commission, CREG, [www.creg.gov.dz](http://www.creg.gov.dz)), several electricity and gas subsidiaries were created for the production and distribution of the two commodities.

transportation pipelines of oil and gas, in addition to marketing hydrocarbons and their byproducts.<sup>19</sup>

Electric power plants account for around 42.7% of the total gas consumption, and 26.9% is consumed by clients supplied directly by Sonatrach. Close to 70% of the total natural gas consumption is drawn by clients in the western and eastern regions, where the main gas liquefaction plants and most electric power plants are located. The remaining 30% is drawn by the central and southern regions.<sup>20</sup>

### *Unconventional Gas*

Algeria announced in February 2012 that it has important shale gas reserves that could be equal to those of the United States.<sup>21</sup> Algeria is third (after China and Argentina) among the top 10 countries with technically recoverable shale gas resources. In May 2013, such potential was estimated to be 707 Tcf.<sup>22</sup> In June 2012, Sonatrach indicated that “studies conducted in May 2012 over an area of 180,000 square kilometers [69,500 square miles] show an enormous shale gas potential of more than 600 million cubic meters [2 Bcf] per square kilometer [0.386 square mile], which means that more than 2 trillion cubic meters [70.629 Tcf] could be extracted.”<sup>23</sup>

Algeria plans to spend \$12 billion over the next five years to develop shale gas reserves in partnership agreements with several foreign companies.<sup>24</sup> In order to attract foreign partners, it decided that, instead of the usual bidding process, it will invite specific companies to negotiate investment contracts.

---

<sup>19</sup> Mowafa Taib, “The Mineral Industry of Algeria” *U.S. Geological Survey 2010 Minerals Yearbook*, June 2012, 2, <http://minerals.usgs.gov/minerals/pubs/country/2010/myb3-2010-ag.pdf>.

<sup>20</sup> *Programme indicatif*, CREG, 10-11.

<sup>21</sup> “Algerian shale gas potential equal to that of U.S.” *World Oil*, February 28, 2012, [http://www.worldoil.com/Algerian\\_shale\\_gas\\_potential\\_equal\\_to\\_that\\_of\\_US.html](http://www.worldoil.com/Algerian_shale_gas_potential_equal_to_that_of_US.html).

<sup>22</sup> U.S. Energy Information Administration, *Technically Recoverable Shale Oil and Shale Gas Resources: An Assessment of 137 Shale Formations in 41 Countries Outside the United States*, June 2013, 10, <http://www.eia.gov/analysis/studies/worldshalegas/pdf/fullreport.pdf>.

<sup>23</sup> Liès Sahar, “Bassin d’Ahnet (Aïn Salah): Forage du premier puits de gaz de schiste par Sonatrach,” *El Watan*, June 7, 2012. According to Abdelhamid Zerguine, the CEO of Sonatrach, this estimate is based on a 20% extraction rate.

<sup>24</sup> Summer Said, “Algeria to Ink Shale-gas Partnerships With Shell, Exxon,” *World Oil*, July 15, 2012, [http://www.worldoil.com/Algeria\\_to\\_ink\\_shale\\_gas\\_partnerships\\_with\\_Shell\\_Exxon.html](http://www.worldoil.com/Algeria_to_ink_shale_gas_partnerships_with_Shell_Exxon.html).

As of now, there is almost no serious domestic opposition to the development of shale gas, and environment protection associations are few and too weak to affect public policy on this issue.

### *Renewable and Clean Energy*

Algeria has recently started an ambitious program aiming to use extensively renewable sources, mainly solar power and photovoltaic systems and, to a lesser extent, wind power. In spite of a large electric energy supply system, the national needs are still not fully met. Algeria seeks “the installation of power capacity from renewable sources of nearly 22,000 MW between 2011 and 2030, including 12,000 MW dedicated to the national demand and 10,000 MW for export...”<sup>25</sup> By 2030, renewable sources are expected to cover 40% of domestic consumption. The country started in the 1990s the conversion of vehicles using diesel fuel to natural gas fuel. A great number of long-distance taxis already run on gas fuel, and in the coming years, several buses in the capital will be using gas.

### *Environmental Challenges*

Algeria contends with several environmental problems in the areas of air quality, water resources, waste management, coastal and marine pollution, and desertification. The government’s responses to these challenges include developing renewable energy sources and making businesses comply with environmental laws.<sup>26</sup>

To lower the CO<sub>2</sub> pollution from gas production, Algeria developed a stringent program that brought down flaring of associated gas from 33% in 1995 to less than 4% today and promised to eliminate it altogether by 2012 by way of re-injection. The country also started the largest storage operation of excess carbon dioxide in the world (800,000 tons per year, 1.2 miles below ground). The CO<sub>2</sub> removed during gas extraction is pumped into an aquifer below the gas reservoir.<sup>27</sup> Algeria also plans to build by 2025 its first green city, Boughzoul, some 100 miles south of Algiers, with 400,000 residents. It is expected to save 3.4 million tons of CO<sub>2</sub> emissions,

---

<sup>25</sup> Ibid. In December 2011, Algeria joined the European Desertec Industrial Initiative, which aims to supply 15% of Europe’s electricity needs by 2050 to use solar and wind power.

<sup>26</sup> “Algeria’s Environmental Control Laws,” *International Business Wiki*, accessed August 3, 2012, [http://internationalbusiness.wikia.com/wiki/Algeria's\\_Environmental\\_Control](http://internationalbusiness.wikia.com/wiki/Algeria's_Environmental_Control).

<sup>27</sup> Peter Fairley, “Algerian Carbon Capture Success,” *Technology Review*, MIT, December 19, 2008, <http://www.technologyreview.com/view/411417/algerian-carbon-capture-success/>.

the equivalent of about 600,000 tons of oil. This green strategy appears to aim to increase the availability of exportable hydrocarbons, prepare for the post-hydrocarbon era, and lessen domestic dependency on hydrocarbons as a source of energy. This policy is not expected to affect gas development in general and shale gas in particular, since there is today an important commitment to developing gas production to the maximum.

### **Political Trends**

Algerian politics and public policy are known for being among the least transparent in the world. Quite often, it is a guessing game when trying to figure out who decides “who gets what, when, and how” from a given public policy. Since its independence from France in 1962, Algeria has been under the control (direct at times and indirect at others) of the military. After Abdelaziz Bouteflika, a civilian, became president in 1999, some complex efforts were made to push the men in uniform out of politics. The results are mixed today.

The governing system is officially semi-presidential (a remote emulation of the current French system of the Fifth Republic) with the president as the key institution, followed by parliament. Among the civilians, power is heavily concentrated in the presidency, but the president, in order to act, needs to establish around him a circle of supporters who expect a reward of some sort for helping him implement his policies. A prime minister is appointed and removed by the president at will. Both parliament and the prime minister have generally been subservient to the president, whose authority is limited by the power of non-elected forces, such as the military and especially its powerful intelligence services known as the DRS (Département des Renseignement et Sécurité, or Directorate of Intelligence and Security). The country is divided into 48 administrative units (*wilayat*), each comprising subdivisions (*dairat*) with cities and towns. In this unitary state, most decision-making power resides in the central government. The administrative divisions and subdivision have little power of their own and are fully subservient to the central government. In this context, all energy policies, initiatives, and implementation stem from the country’s government.

Algerian politics is often described as “clannish,” i.e., evolving around political clans, some of which are regional (e.g., Bouteflika tends to surround himself with people from his region), while others are religious (Islamic conservatives), nationalist, or liberal-secular. For the Algerian layman, those ruling the country are simply referred to as *Le Pouvoir* (the powers that be), referring to the entire ruling system, which includes powerful military and civilians in the state apparatus, as well as those among them with de facto monopolies in the private business sector.

This complex institutional environment often makes it difficult to know who is behind a given policy or policy reversal. Also, shifting configurations of power among various elements of *Le Pouvoir* can, at times, explain major policy changes, as has happened in the case of foreign investment laws, which started out somewhat liberal in the late 1990s and then reverted in 2006 to being restrictive and imbued with a heavy dose of “economic nationalism.”

The Algerian political dynamics are today at a major crossroads characterized by the looming biological end of the generation of leaders that has controlled the state since independence and claims legitimacy from the war of independence. An important generational shift is expected in the coming years. The current president, Abdelaziz Bouteflika, is one of the few remaining in power, and he is in poor health. In April 2013, he was victim of a stroke that left him partially paralyzed and totally absent for more than two months while being treated in France. Following his return to Algeria on July 18 in a wheelchair, there were serious doubts about his capacity to govern.

Another characteristic of the crossroads is the fact that Algeria, which escaped the winds of change of the Arab Spring, is under strong domestic and regional pressure to enact enough political and economic changes in order to avoid being thrown into yet another era of conflict and instability, worse than the armed Islamist rebellion of the 1990s.

During the 2011 upheavals in the Arab countries, Algeria stood almost alone in North Africa as an exceptional case, unshaken by the events around it. While Tunisia and Libya experienced a change of rulers following societal upheavals in 2011, Algeria’s neighbor to the west, Morocco, enacted in July a major constitutional reform, and its monarch promised more changes. These



regional developments prompted the Algerian government to preempt a popular upheaval at home by injecting substantial cash into the economy (around \$280 billion) and by promising political reforms. This tactic is not new: “The government regularly buys off social discontent by providing relative social welfare on the back of windfall gains from hydrocarbon exports. Whereas this approach provides the government political leeway in the short term, it sidesteps the need to seriously tackle a number of weaknesses in Algeria’s economy and political system.”<sup>28</sup> The question now is whether this approach will succeed in getting the country out of “the classic rentier economy trap: Enormous petrochemical reserves have enabled the state to buy a kind of grudging acceptance from the populace, but the bounty has not been invested in the future, or in the kind of development that would lift all boats.”<sup>29</sup>

Algeria’s rentier state seems strong when oil revenue are high, but weakens suddenly when such income declines drastically and the government can no longer finance the long-established and growing social entitlements. The state’s legitimacy, which became tied to these entitlements, suffers automatically when hydrocarbon income declines and no sound economic reform is undertaken in order to tackle economic challenges.<sup>30</sup> This scenario was experienced at the end of the 1980s and throughout the 1990s, and yet Algeria remains hostage to the oil rent conundrum and seems unable to enact a viable long-term strategy of economic development. Today there are serious concerns over the shortfalls in gas reserves, production, and exports that necessitate a serious rethinking of the hydrocarbon policy. As will be discussed later, these tendencies are the result of both structural factors and policy.

The current regulations and practices discourage necessary reforms and private investment and block the growth of a formal, productive, private sector; instead, they encourage predatory private business behavior that continues to extract benefits from the rent-based and subsidized formal system. In recent years, corruption at high levels of public institutions, companies, and the bureaucracy became a major problem that hurt not only the end-goal of public investments but also the legitimacy of the state. Two recent big corruption cases involved the construction of

---

<sup>28</sup> Bertelsmann Stiftung, *BTI 2012 — Algeria Country Report* (Gütersloh: Bertelsmann Stiftung, 2012), 64.

<sup>29</sup> Jack Brown, “Algeria’s Midwinter Uproar,” *Middle East Report and Information Project* (MERIP), January 20, 2011, [http://www.merip.org/mero/mero012011#\\_4](http://www.merip.org/mero/mero012011#_4).

<sup>30</sup> Richard M. Auty, “Third time lucky for Algeria? Integrating an industrializing oil-rich country into the global economy,” *Resources Policy* 29 (2003): 38. doi: 10.1016/j.resourpol.2004.02.001.

the East-West highway and the national hydrocarbon company, Sonatrach. High-level managers and even the Minister of Energy and Mines were brought down by these corruption scandals.

In 2011, the government promised constitutional reforms in the electoral system, gender balance in political institutions, and media laws.<sup>31</sup> The elements of pending constitutional changes were still unknown by July 2013.<sup>32</sup> The few reforms enacted so far and those yet to be adopted “constitute no real breakthrough and are unlikely to change the fundamental nature of the political system put in place 50 years ago. The regime seems to be reproducing the scheme it devised following the riots of October 1988.”<sup>33</sup>

Parliamentary elections on May 10, 2012, took place in a very tense socio-economic climate compounded by a serious political malaise. The vote was boycotted by the vast majority of eligible voters (43% participation rate). Most people did not find it useful to vote for a parliament that is generally unresponsive to their concerns, powerless, and full of individuals driven more by their own interests than by the desire to serve the public good.

Campaigning on a platform that warned against the pitfalls of the Arab Spring, which was presented as being merely a foreign conspiracy against the Arab states, the National Liberation Front (FLN, which was the sole legal party from 1962 to 1989) and the National Democratic Rally (RND, another nationalist, pro-government party created in 1995) won together the majority of seats.<sup>34</sup> The Islamist parties, which had hoped for a victory similar to that of Islamists in Tunisia, Egypt, and Morocco, did poorly.

With the state coffers awash with substantial hydrocarbon income, Algeria's leaders opted for the status quo as a guarantor of stability and a defense against the tidal wave of Islamist electoral

---

<sup>31</sup> “Bouteflika annonce des réformes politiques en Algérie,” *L'Express.fr*, April 15, 2011, [http://www.lexpress.fr/actualite/monde/algerie-bouteflika-annonce-des-reformes-politiques\\_983535.html?xtmc=](http://www.lexpress.fr/actualite/monde/algerie-bouteflika-annonce-des-reformes-politiques_983535.html?xtmc=).

<sup>32</sup> A 2009 constitutional amendment did away with the limit of two 5-year terms for the presidency in order to accommodate President Bouteflika's wish to serve a third term. He was reelected for the third term that year.

<sup>33</sup> Yahia H. Zoubir and Ahmed Aghrout, “Algeria's Path to Reform: Authentic Change?” *Middle East Policy* 19, no. 2 (Summer 2012): 66.

<sup>34</sup> Christian Lowe and Lamine Chikhi, “Algeria Ruling Party Snubs Arab Spring To Win Election,” *Reuters*, May 11, 2012.

victories in the region. To deflect opposition and criticism, they are likely to continue the policies of both repression and co-optation of opponents, which have been largely successful so far.

The real political opposition that could create instability and strife is not in the institutional setting but rather in the street, where there are daily challenges to the status quo via protests, strikes, and localized riots. These collective actions are usually driven by demands for water services, low-income housing, jobs, new labor contracts, and similar matters. The number and intensity of these protests is increasing every day, but the government continues to respond with ad hoc localized solutions rather than a comprehensive political and economic approach. As a result, the social, economic, and political conditions seem ripe for a popular upheaval, even though a decade ago the state survived a ten-year bloody warfare aimed at bringing about a regime change. The violent rebellion of the 1990s, spearheaded by armed Islamist groups, did not succeed, and most of its causes still exist today. While the reasons for yet another violent upheaval are present, the popular inclination for it may rest on a future trigger event, which might be any outrageous action the state or its agents take against an average person or people of a region or town, or a drastic decline of the oil and gas revenues.

Among the Algerian elite, reformist and conservative tendencies confront each other often; at certain times one tendency seems to dominate, and at others the rival tendency controls policymaking. Nowadays, the conservative tendency is in control, as confirmed by the 2010 ousting or marginalization of some of the most liberal, reform-minded officials (e.g., the former privatization minister Abdelhamid Temmar and the minister of energy and mines Chakib Khelil, who is today under investigation for corruption),<sup>35</sup> and by the skewed result of the 2012 parliamentary elections. This explains partly the regression in economic liberalization since the mid-2000s. Other reasons for the lack of serious economic reforms and the worsening of the foreign investment climate include the high oil and gas income (why reform when income is high?), the fear that stringent liberal economic reforms could undermine further the legitimacy of

---

<sup>35</sup> For more on the political intrigues over the succession to Bouteflika, see Liamine Chikhi, "Algeria's elite at loggerheads over next president," *Reuters*, June 20, 2012, <http://www.reuters.com/article/2012/06/20/us-algeria-government-idUSBRE85J12E20120620>.

the state and its leadership, and the belief that the government can pacify society with occasional ad hoc public spending on housing and infrastructure, which also generates some new jobs.

Today, there is much uncertainty as to what political developments will take place in Algeria in the short term, i.e., when President Bouteflika's third term in office ends in April 2014. This uncertainty is due to Bouteflika's deteriorating health; the impending constitutional reform, which might reinstate term limits; the absence of a clear and legitimate mechanism of succession (the constitutional arrangement does not usually indicate what actually happens); and the persistent social, economic, and political malaise in the country at a time when major changes and security threats developed in the region. In the scenarios section at the end of this chapter are some possible political and economic developments that could affect hydrocarbon policy, investments, production, and exports.

### **Effect of Political Trends on Future Development**

#### *The Regional Environment*

Algeria's natural region is the Maghreb (Libya, Morocco, Tunisia, and Mauritania), but this does not preclude its historical, cultural, and political connection with the Middle East region, southwestern Europe, and sub-Saharan Africa. Algeria's interactions with the African countries of the Sahel region—especially Mali and Niger—have increased in recent years mostly out of concern for insecurity created by roaming armed Islamist groups and smugglers of weapons, drugs, and illegal migrants. These challenges can have a direct effect on Algeria's hydrocarbon industry because it is mostly located in the south of the country.

In the Maghreb, the most difficult relationship has been with Morocco due to competition for regional hegemony, old border issues, and the fate of Western Sahara, which Morocco annexed in the 1970s in spite of the United Nations' call for self-determination for the local population. Algeria rejects the annexation and supports the Sahrawi population's desire for an independent state in that territory. The animosity between the two countries has prevented the implementation of a 1989 regional integration plan. Paradoxically, the first Algerian gas pipeline (MEG) to deliver gas to Spain went through Morocco. Such transit—for a transit fee—has not been affected, so far, by the poor quality of relations between the two countries. The second pipeline

to Spain (Medgas), which opened in 2011, bypasses Morocco and links Algeria directly to Spain via a Mediterranean Sea pipeline of 120 miles. Morocco does not export hydrocarbons. An armed conflict with Morocco—unlikely, but possible—may affect mainly the MEG pipeline gas delivery to Spain because most of the hydrocarbon industry is far from the common borders, unless Moroccan aerial bombardments incapacitated the refinery and export facilities in Arzew.

To the east, relations with Tunisia have been the most cordial in the region, but not close. Squeezed between two giants—Algeria and Libya—Tunisia has done its best to maintain peace and stability in a region often frequented by political plots, threats, and instability. It is a small oil and natural gas producer whose gas production stood in 2010 at 72 Bcf, which is much less than what it consumes.<sup>36</sup> The current transition period in that country has brought about concerns about internal security and also possible infiltration of armed groups into Algeria. If the Tunisian political transition fails and turns into a full-fledged internal war, there is risk that such evolution may affect Algeria's own security and stability by way of the infiltration of weapons and armed radical groups. This may have a disruptive effect on the gas industry if it becomes the target of combined offences involving Algerian and foreign radicals.

Relations with Libya, the other eastern neighbor, have always been distant, with occasional tensions due to one issue or another (e.g., Libyan territorial claims and Qadhafi's support for Tuareg rebels in the Sahel and for Algerian Islamist rebels in the early 1990s). Libya is well endowed with oil and a good gas potential. Its gas production and exports, which have always been weak, picked up considerably after 2003 with the exploitation of offshore fields and the opening of the Green Stream gas pipeline linking Libya to Italy. All hydrocarbon production and exports were halted during the 2011 unrest, but they quickly recovered afterward. Overall, Libya remains a small gas producer, but this may change in the near future. In March 2012, its proven reserves stood at 52.8 Tcft.<sup>37</sup> Libya's gross natural gas production (1.07 Tcf in 2010) is exported almost entirely to Italy via pipeline (150 million Cf/day).<sup>38</sup>

---

<sup>36</sup> U.S. Energy Information Administration, "Overview data for Tunisia," last modified May 30, 2013, <http://www.eia.gov/countries/country-data.cfm?fips=TS>.

<sup>37</sup> U.S. Energy Information Administration, *Libya Country Analysis Brief*, June 2012, <http://www.eia.gov/countries/analysisbriefs/cabs/Libya/pdf.pdf>.

<sup>38</sup> Ibid.

In the wake of the armed rebellion that overthrew Gadhafi in 2011, Algeria became concerned about the possibility of the rise of armed radical movements in Libya associated with the al-Qaeda in the Islamic Maghreb (AQIM), which may trickle into Algeria and cause serious security challenges. In fact, such a possibility materialized in 2012 in Mali when an old Tuareg rebel movement, helped by Libyan weapons, went on the offensive. Following the overthrow of the Malian government, a group linked to the AQIM, the Movement for Unity and Jihad in West Africa, gained control of northern Mali. Very worried that this conflict could affect its southern region—where most hydrocarbon production is located—Algeria tried hard to help find a peaceful solution to the problem. It was very apprehensive about the international armed intervention called for by a UN resolution passed in October 2012. However, a French military intervention against the Islamists in early January 2013 put Algeria's worst fears in motion. Within days, an armed group attacked natural gas installations in Ain Amenas and took a large number of Algerian and foreign workers hostage. The armed group apparently entered Algeria through Libyan territory. A swift Algerian military intervention against the group freed most hostages (over 600), but 32 foreigners died during the ordeal, along with scores of Algerian workers. This event, which may not be the last of its kind, highlighted the vulnerability of the hydrocarbon installations that were thought to be highly secure. This vulnerability is likely to remain and may affect the hydrocarbon industry if more attacks of this nature happen in the near future.

#### *Policy Constraints and Impact on Foreign Investment*

The state, through its public companies, garners and allocates funds for the development of gas and all related transportation, distribution, and storage infrastructures. The financial resources in these areas have traditionally come from both the state and foreign investors through cost-sharing arrangements. The government has access to international finance but is reluctant to borrow for fear of falling in the dreadful debt trap of the 1970s and 1980s, which caused a serious debt crisis.

The power to affect economic reforms and enact development projects resides mainly in the hands of the state's elite, which in turn is influenced by private business interests that benefit directly and indirectly from the status quo undergirded by oil and gas rent. In this sense, the more

hydrocarbon income, the more power to the high state bureaucrats and the more gain for a few large private businesses—the majority of which are importers of consumer goods rather than manufacturers.

As illustrated by recent laws and events, the governing institutions have heeded the interests of the de facto informal import monopolies at the expense of the development of the non-hydrocarbon production capacity of the economy. These interests, along with conservative elements in the dominant parties (FLN and RND), as well the biggest labor union, the General Union of Algerian Workers (UGTA), still adamantly oppose the liberalization of the hydrocarbon sector.

Over 50 years of independence, the policy of heavy reliance on hydrocarbons has created powerful interests vested in the rentier model of management of the economy. Policies that aim to increase the rent intake are thus favored over those that might decrease it, such as contract-sharing above the 49%–51% scheme. This attitude could change, however, if hydrocarbon prices fall drastically, if the external demand for Algerian gas diminishes substantially, and if the level of foreign investment in this sector continues to stagnate.

### *Decision-making Structures*

The Algerian state has total control over the energy sector and policies. It decides on oil and gas prospection, transportation, marketing, and investment rules. The energy policy has traditionally been strongly influenced by the military, which considers the hydrocarbon resources to be elements of national sovereignty and independence; these resources have also been the key source of income for their institution.

The Algerian energy policy is decided at the top of the state hierarchy, with little input from society. The key players have generally been the president himself, the energy minister, and the head of Sonatrach. However, it is not always clear where decisions emanate from. Whatever is decided nowadays often results from pulling and hauling between various influential groups and individuals at the top. Major shifts are usually the result of one clan or faction winning over the others. Between 2010 and 2012, it appeared, through some reshuffling of key players in the

economic decision-making structures, that those in favor of economic liberalization were pushed aside in favor of those favoring the status quo in the name of economic nationalism.

The corruption probe of Sonatrach by the mighty DRS in 2010, which led to the arrest of Sonatrach's CEO and the resignation of energy minister Chakib Khelil, was interpreted as a direct objection by the military to the economic liberalization plans. Khelil supported the liberalization of the energy sector and suggested, among other things, the separation of Sonatrach, the company, from the policymaker, i.e., the state. As noted above, Khelil himself is currently the object of a major corruption investigation linked to related ones of the Italian company Saipem and the Canadian SNC-Lavalin.<sup>39</sup>

### External Commitments and Challenges

Between 2006 and 2010, Algeria's gas production decreased by more than 6%, going from 3.113 Tcf to 2.978 Tcf, while domestic consumption increased from 811 Bcf to 994 Bcf. Also, Algeria's share in global gas export (both LNG and pipeline gas) has been declining since the early 2000s and, according to the Australian mining group BHP Billiton, gas production has declined recently by 8.7%.<sup>40</sup> A study done by consulting firm Wood Mackenzie indicated that Algeria is struggling to maintain its gas exports at 2.130 Tcf annually (in 2010, it exported 1.951 Tcf). Despite efforts to replace the declining gas reserves, exports have been falling steadily since 2006.

The decline is caused by diminishing demand, diminishing production of maturing reserves, and a shortfall in new foreign exploration investments. To remedy this situation, Algeria was pressed to revise its restrictive investment laws, find new reserves,<sup>41</sup> and hasten the exploitation of its shale gas potential. Sonatrach has already earmarked an \$80 billion investment over 5 years for

---

<sup>39</sup> Lies Sahar, "Chakib Khelil, Sonatrach et Saipem: Aux origines des scandales," *El Watan*, April 3, 2013.

<sup>40</sup> Melissa Roumadi, "La surproduction de gaz s'achèverait en 2013" [Overproduction of gas would end in 2013], *El Watan*, August 11, 2011, <http://ericpichet.fr/assets/docs/Les-consequences-de-la-degradation-de-la-note-americaaine.pdf>.

<sup>41</sup> To increase production and export capacity, Algeria recently started developing a southwest gas project in Reggane Nord fields (102 billion Bcf/y). Two other projects in southwestern gas fields will be in Timimoun (56 Bcf/y) and Touat (159 Bcf/y). Menzel Ledjmet East (MLE) is another important project that was planned to start producing 116 Bcf/y in 2012. US Energy Information Administration, *Algeria Country Analysis Brief*.



the exploration, production, and development of shale gas. The country is under pressure to increase its reserves volume,<sup>42</sup> production and delivery capacities, and international market share. It also has to tackle adequately the rising domestic gas consumption.

Algeria's export challenges also include the emergence of new gas producers, such as Qatar. Furthermore, the 2009 recession in Europe decreased the "European gas demand to the 2004 levels, which constituted the largest decline since 1970. In 2010, Italy and Spain, Algeria's key importers of Algerian gas, found themselves over-contracted in volume."<sup>43</sup>

A further challenge is the future pricing of long-term contracts. In the current era of a global abundance of gas supply, Algeria's oil-indexed prices of natural gas contracts have been under pressure from lower spot market prices. There is a concern that European customers may seek a lower contract price for gas that is either not indexed to oil or is somewhere between spot price and oil-indexed price. Algeria is likely to fight hard to keep the existing contract pricing formula.

Algeria's liquefied natural gas sales to the United States and Belgium—representing 10% of Algeria's exports—ceased in 2010. "Although long-term contracts and pipelines ensure stable export markets, Algerian gas exports are dependent on cyclical conditions in its gas buyers"<sup>44</sup> The vulnerability of Algerian gas exports is also highlighted by the possibility of the development of shale gas in Europe, which would undermine all non-EU gas imports."<sup>45</sup>

In spite of the important domestic, regional, and international challenges noted above, Algeria will remain a strategic energy partner for Europe. The stability and reliability of supply have made its partners confident enough to invest billions of dollars in the prospection, production, and export of gas through long-term contracts. The Algerian authorities have also invested large sums of money in this industry on which they staked the country's future. They managed to

---

<sup>42</sup> A high-resolution map of mining territory perimeters and exploration blocks in 2005 can be viewed at [http://www.mem-algeria.org/fr/hydrocarbures/perimetr03\\_05.pdf](http://www.mem-algeria.org/fr/hydrocarbures/perimetr03_05.pdf).

<sup>43</sup> Sabine Schels et al., "High Oil Prices Squeezing European Gas Buyers," *Global Energy Weekly*, October 8, 2010.

<sup>44</sup> Reinout De Bock and José Gijón, "Will Natural Gas Prices Decouple from Oil Prices Across the Pond," IMF Working Paper WP/11/143, International Monetary Fund, June 2011.

<sup>45</sup> International Energy Agency, "Presentation to the CSIS Medium Term Oil And Gas Markets 2010" (presentation, Center for Strategic and International Studies, Washington, DC, July 7, 2010), <http://csis.org/event/medium-term-oil-and-natural-gas-market-review>.

make Algeria's gas industry intimately tied to the European market, and a disruption of Algeria's gas industry or exports would create serious problems for Algeria and for Italy, Spain, and France, its key European partners.

The key drivers of Algerian gas production, consumption, and exports include the availability of funds (national and international through foreign investment), the rising domestic demand for gas, and the nature of the demand and its price elasticity among foreign buyers, mainly Western Europe. Foreign policy has negatively affected the development of regional markets for Algeria's gas, as explained above, but this is largely compensated for by the traditional export destinations.

### **Economic and Legal Factors**

In recent years, Algeria's GDP growth rate was around 5% before declining to 2.4% in 2009 for two reasons: a decrease in the oil prices from the high levels of summer 2008 and a dismal growth rate of non-hydrocarbon industrial activity (-3.1% in 2011). These factors, along with a 27% annual increase in public spending in the last five years, led to the first fiscal deficit in a decade. Growth may recover if oil prices remain at around \$90 a barrel at least, industrial output increases, agriculture's contribution to GDP improves, and external demand for oil and gas does not fall substantially. The economy remains very vulnerable because its hydrocarbon trade accounts for 96.6% of all exports earnings, 40% of GDP, and 60% of budget revenues. While oil and gas generate 49% of export income, the non-hydrocarbon sector of the economy brings in only 3%.

In 2010, the government announced an investment program worth \$280 billion for the period 2010–2014 that aims to reinvigorate non-hydrocarbon economic activities and employment generation, geared mostly toward infrastructure development. However, this program may have failed to integrate the 300,000 new job seekers a year and contributed to inflationary pressures. The substantial infusion of public money into the economy has not accomplished its stated goals due to the absence of a comprehensive and coherent development strategy. These investments are understood by many people as populist actions aimed mostly at calming social discontent.

In its 2011 assessment, the IMF warned that Algeria's economic conditions can be adversely and substantially affected by a sustained degradation of the international economic situation and by a lasting downward trend in oil prices. According to the IMF, the high level of youth unemployment (22%), inadequate private investment climate, and lack of diversification of the economy are the biggest challenges the country faces. "Today, Algeria's exports are among the least diversified in the world, even compared to other oil producers. The economy's long-term prospects will depend on the government's ability to improve the business climate to allow new enterprises to emerge, to grow, and benefit from these massive infrastructure and social investments."<sup>46</sup>

### *Legal and Political Constraints*

Sonatrach, Algeria's key energy agent, handles most oil and gas prospection, transportation, and marketing. Several of its subsidiaries handle all refining, domestic distribution, and the production of natural gas by-products. The government encourages the use of natural gas by domestic consumers (households and businesses). Close to 60% of domestic energy consumption comes from natural gas. The biggest incentives for using gas as a source of energy are its low cost and the easy and clean access to it. Moreover, the government's big renewable energy projects (solar and wind) aim to keep the domestic consumption of hydrocarbons down while increasing their export.

### Domestic Gas Pricing

Algeria's relatively low domestic prices of natural gas have been the source of serious tensions with economic partners and became an issue in Algeria's potential accession to the World Trade Organization (WTO). The government is pressured to raise them because they are deemed too low and contrary to the rules of fair trade and competition. In May 2008, it responded that Algeria would not raise the domestic prices of gas and fertilizers to international levels,<sup>47</sup> and that they were not subsidized and included all production and marketing costs. It also indicated

---

<sup>46</sup> Joël Toujas-Bernaté, interview, "Algeria Should Reduce Reliance on Oil, Create More Jobs, Says IMF," *IMF Survey Online*, January 26, 2011, <http://www.imf.org/external/pubs/ft/survey/so/2011/int012611a.htm>.

<sup>47</sup> Liamine Chikhi, "Algeria says won't raise domestic gas prices," Reuters, May 3 2008, <http://uk.reuters.com/article/2008/05/03/algeria-gas-idUKCHI32626520080503>.

that Algeria was merely using the gas reserves as a comparative advantage, with the same right wealthy countries had used their natural resources in the past.<sup>48</sup> Energy minister Chakib Khelil indicated: “This is not new. Before us, Europe, particularly the United Kingdom, used coal as a comparative advantage to boost its industry.”<sup>49</sup> He argued that low gas prices offer foreign investors a rightful comparative advantage, since the low energy cost of their operations is a big incentive for doing business in Algeria. The International Energy Agency’s data on consumption subsidy rates for fossil fuels found that Algeria had no subsidies from 2008 to 2010.<sup>50</sup> However, according to some other sources, “[t]he government spends an estimated \$7 billion per year on subsidizing gas and electricity for all end-users.”<sup>51</sup> In any case, a substantial increase in the domestic price of gas could cause social unrest, as most households use natural gas, and could bring about serious resistance from both average consumers and big gas users in the business sector; it could also increase substantially the costs of foreign investment in Algeria. It must be expected that the government will not alter its pricing policy, at least for the time being.

#### Financing and the Investment Climate and Laws

The country’s current financial and fiscal positions are excellent, mostly due to high hydrocarbon revenues, a conservative fiscal policy, and healthy foreign exchange reserves worth \$200 billion in December 2012 (60% of GDP). Algeria has also paid off almost all its foreign debt (currently at less than 2% of GDP).

Under the pressure of a serious economic crisis, Algeria started in the 1980s to shed the socialist system and timidly inched toward a market economy, which enticed some foreign direct investment (FDI) in non-hydrocarbon sectors. However, political instability and an inadequate institutional setting (in banking and finance, information, and justice), discouraged the already little FDI interest there was. The political stability that returned after the 1990s Islamist rebellion,

---

<sup>48</sup> Ibid.

<sup>49</sup> Chakib Khelil, quoted in Liamine Chikhi, “Algeria says won’t raise domestic gas prices.”

<sup>50</sup> The International Energy Agency’s subsidy data for all countries can be found at <http://www.iea.org/subsidy/index.html>.

<sup>51</sup> “Sonatrach investira 60 milliards de dollars entre 2011 et 2015,” *El Moudjahid*, January 17, 2011, cited in Hakim Darbouch, “Algeria’s Shifting Gas Export Strategy: Between Policy and Market Constraints” (Oxford Institute for Energy Studies, 2011), 14. See also Hakim Darbouch, “Algeria’s Natural Gas Market: Origins and Constraints of Export Strategy,” in *Natural Gas Markets in the Middle East and North Africa*, ed. Bassam Fattouh and Jonathan Stern (Oxford University Press, 2011), <http://www.oxfordenergy.org/wpcms/wpcontent/uploads/2011/03/NG48.pdf>.

the implementation of a structural adjustment program, and hints at economic liberalization stimulated a renewed interest of foreign investors.

In the hydrocarbon sector, liberalization was seriously discussed in the early 2000s. Proposed changes included revamping the role of Sonatrach, which would give up its function as policymaker and act solely as a public business company that is partially privatized. The liberalization plan was enounced in the 2005 Hydrocarbons Law, but was quickly rescinded in the amended law passed in 2006 due to strong resistance from political and military elites. The reversal was officially justified as a measure to protect the country's resources from depletion with less than maximum return. The reform efforts were replaced by "nationalist" regulations that imposed tough fiscal terms on new foreign investment contracts and reinforced the role of Sonatrach as both state entity and co-investor.<sup>52</sup> Furthermore, it became a practice since the late 1990s and more so after the enactment of the 2005 Hydrocarbons Law to share most investment costs with foreign partners. This is done with Sonatrach as an investment partner and not the state, as used to be the case.

The 2009 Supplementary Budget Law (SBL) imposed new conditions on investment, which proved to be an additional hurdle in the way of using FDI as a means to bring in investment capital, develop the economy, increase employment, and create new export outlets for local products and services—all this while generating new tax revenues for the state. The new financial rules included, among other things, "more stringent controls on external trade operations and a ban on consumer credit (excluding mortgages)."<sup>53</sup> The key aim of the 2009 SBL was to promote national production and investment. Foreign businesses that purchased domestically produced goods would benefit from tax exoneration. However, the law imposed new limitations on foreign investment, such as the 49% maximum share for foreign stakeholders. Foreign investors were also required to do projects with one or more domestic partners, and a substantial part of their profits had to be invested locally.<sup>54</sup> In 2009, FDI fell by 60%

---

<sup>52</sup> Darbouch, "Algeria's Shifting Gas Export Strategy," 3.

<sup>53</sup> Reinout De Bock and José Gijón, "Algeria: Selected Issues Paper," IMF Country Report No. 11/41, February 2011, <http://www.imf.org/external/pubs/ft/scr/2011/cr1141.pdf>.

<sup>54</sup> Foreign investors are now required to reinvest within four years a value equal to any tax benefits received; also, a new 15% tax is now collected on the transfer of profits out of Algeria by foreign companies.

(excluding the hydrocarbon and financial sectors). The World Bank's 2011 *Doing Business* ranked Algeria 136th out of 183 countries across all categories.

The 2009 SBL also stifled foreign investment in the hydrocarbon industry. Two important elements of the law were the mandatory 51% minimum control by Sonatrach of any new business with foreign companies, and the imposition of a windfall tax on surplus profits when crude oil prices exceed \$30 a barrel. These new rules resulted from the steady rise of oil prices, the constant increase in international demand for hydrocarbons and their products, the ascendancy of nationalist political elites (including President Bouteflika himself), the need for cash to finance the multibillion investment programs for economic revival, the low prospects for a substantial increase in revenues from the country's non-hydrocarbon production, and the dominant role in parliament of the National Liberation Front, which opposes the breakup of Sonatrach and the deregulation of the hydrocarbon sector.

#### The 2013 Revision of Hydrocarbon Law

Algeria needs substantial cash to finance its huge social and economic investment plans, which are partly meant to prevent a major social upheaval in the country. This, in combination with insignificant exploration bidding rounds since 2008<sup>55</sup> and recent changes in the structure and dynamics of the international gas market, made Algeria eager to revise its foreign investment laws in order to attract much-needed FDI and increase its natural gas reserves, production, and exports.

In fall 2012, the government decided on a revision of the 2005 Hydrocarbons Law, and the parliament approved it in early 2013. The new Law 13-01 aims at encouraging foreign investments in exploration and production by way of new tax incentives. It also provides general guidelines on exploration and exploitation of unconventional resources, mainly shale gas. Law 13-01 revises how the tax rate on oil income (Taxe sur le Revenu Pétrolier or TRP) is calculated, now on the profitability of a project rather than the turnover of the company. The revised law establishes a system of skimming superprofits applicable to beneficiaries of a new reduced

---

<sup>55</sup> Samuel Ciszuk, "Abysmal Licensing Rounds Result in Algeria Confirms Energy Sector Malaise," *IHS Global Insight*, March 18, 2011; "Oil Companies Steer Clear of Algeria Due to Windfall Tax, Few Bid for Licenses," *Africa Energy Intelligence*, March 23, 2011.

complementary tax rate on income (Impôt complémentaire sur le résultat or ICR). This new tax formula will replace the controversial windfall tax. It aims also to encourage activities related to unconventional hydrocarbons, small deposits, and those located in the very weakly explored areas, including offshore deposits, areas with complex geology, and those lacking infrastructure.

This needed amendment of foreign investment laws aims to help fulfill Algeria's gas production goals, domestic consumption needs, and export commitments. It is a part of recent efforts to improve the overall economic and financial environment. However, the amendments to the investment laws did not change Sonatrach's majority stake requirement (51% minimum) and its hold on roughly 80% of total hydrocarbon production in Algeria; they seem to focus mainly on new fiscal incentives to foreign investments in offshore exploration and unconventional resources only. As a result, the investment climate remains relatively tight in conventional gas, and foreign investors are not likely to rush in as a result of these amendments alone.

### **Political Scenario Analysis and Impact on Gas**

Based on the above assessment of the Algeria's hydrocarbon industry, policy, and position in the global market, this section examines possible political scenarios and their potential impact on Algeria's gas policy and position in the international market. However, for the future political evolution of the country, and given the lack of political transparency in Algeria, one can only offer a set of approximate scenarios based on the scant information available to even some of the key political players themselves. Below are four possible scenarios and their impact on Algeria's gas development; they overlap at times.

It should be said from the outset that possible future political scenarios can have a direct bearing on Algeria's position in global gas market and on the outlook of the country's gas industry, but objective factors such as gas reserves, production capacity, export outlets and demand, structure of the domestic market, and foreign investment environment may hinder political choices that do not take them into account and work on overcoming the inherent challenges.

*Scenario 1*

In spite of his illness (physical and mental incapacity due to a stroke suffered in April 2013), President Bouteflika will either maintain office for a fourth term starting in 2014 or be replaced (due to health problems or reinstatement of term limit by the planned constitutional amendment) by a close associate.<sup>56</sup> Under either one, not much will change in general policies, especially those related to natural resources (economic/resource nationalism continues) and economic reforms (no full liberalization). In the natural gas sector, the government will continue to focus on maintaining and increasing current gas export prices and market share; this may be done within the prevailing limitations on foreign investment, even with the amended investment law of 2013. On prices, Algeria will continue to work with the Gas Exporting Countries Forum (GECF),<sup>57</sup> in which it is an active member. On market share, it will try to maintain and improve its current position in the European market while facing the challenge of competing LNG exports from countries like Qatar. It will also aim at increasing its market share in Asia and Southeast Asia. However, this conservative trend will not help overcome the structural challenges noted above (e.g., declining reserves, low FDI, rising domestic demand, and increasing international competition in the gas market). Thus, in this scenario, Algeria's importance in the global gas market is likely to decline markedly, and the country's revenues and export commitments will suffer.

*Scenario 2*

President Bouteflika, incapacitated by health problems, does not seek a fourth term, and is replaced by a reform-minded president, with the acquiescence of the military. The new leader opts for substantial economic liberalization that includes major changes to the foreign investment rules. Three possible contenders for this are Ahmed Benbitour, Ali Benflis, and Mouloud Hamrouche, all former prime ministers who were previously pushed out of office. The first two

---

<sup>56</sup> At the time of this writing, several leadership positions below the president were being reshuffled, making it hard to know exactly who was left in the presidential circle and who was not. Two close associates, the former prime minister and contested leader of the FLN party Abdelaziz Belkhadem and the four-time prime minister and leader of the RND party Ahmed Ouyahia, are facing tremendous challenges that put their political viability in doubt.

<sup>57</sup> The GECF is an organization of 11 of the world's leading natural gas producers that control over 70% of the world's natural gas reserves, 38% of the pipeline trade, and 85% of the LNG production. It seeks to protect the interests of its members via coordinated actions aiming to maintain or improve gas export prices. For more see Marcel Dietsch, "The Next Global Energy Cartel," *Forbes*, December 10, 2009, <http://www.forbes.com/2009/12/10/natural-gas-exporting-trade-opinions-contributors-marcel-dietsch.html?sp=true>.



fell out of grace with Bouteflika, and Hamrouche was pushed out in 1991 by President Bendjedid. Benbitour called for a liberalization of the economy that would allow the use of hydrocarbon revenue and relaxed investment rules to generate economic development. Benflis tried to take over the FLN and move it away from its sterile conservatism and nationalism. In a sense, he attempted, without success, to wrestle the control of the FLN away from the president. Hamrouche acquired the reputation of being the most serious reformer of all.

No matter who is picked, the power to enact genuine and lasting reforms does not rest on the president alone. Other players have to be brought in line with a liberal reform agenda, especially the unelected power holders and brokers, both civilian and military.

The accession to power of any of these three potential contenders is likely to bring about some liberalization in FDI rules but not the privatization of Sonatrach. The pricing of domestic gas consumption is not likely to change for reasons indicated above. Algeria will try to increase its international gas market share and prices. To that effect, the country will work with the GECF and will continue to seek a larger share of the gas market in southeast Asia. However, it would also have to find a way to increase the gas reserves and production and to deal adequately with rising domestic consumption.

In the case of a takeover by a reformist, the foreign investment laws will be substantially amended in order to attract more businesses. In the best possible version of this scenario, a post-Bouteflika leader would be one who is young and not too embedded in the current system, a technocrat in essence who will be free of the political influence of the military and security services. With the support of a group of reform-minded elites, such technocrat would use economic rationality, rather than ideology and inter-clan competition, to bring about changes that will make Algeria use its natural gas resources to the fullest extent for the purpose of both improving the country's place in the global energy market and developing its non-hydrocarbon economy. This would make foreign investment in conventional and unconventional gas more attractive. To do this, the new reformist leader must build a substantial constituency and power base; his impact on gas policy will also depend on the approval of the military and security

services. One such technocrat—not linked to any political party—on the political stage today is the current prime minister, Abdelmalek Sellal.

### *Scenario 3*

A negative evolution of the social and economic conditions (sharp and persistent fall of hydrocarbon export income due to price decline, production and export shortfall, loss of market shares, or all combined) causes major social upheaval and precipitates the departure of President Bouteflika, who might be used as a scapegoat by the military establishment. In case of a wide-scale protest movement, the Algerian military, particularly its powerful Department of Intelligence and Security, might be tempted to emulate their Tunisian and Egyptian counterparts and pose as the saviors of the people by ousting the aging and ailing leader. In taking such action, the military would preserve its interests under a smokescreen of seemingly revived political liberalization and ad hoc economic fixes.

At this moment, there does not appear to be a favored candidate to replace President Bouteflika. Under the future leadership of any of the regime's holdovers such as Ouhayia, Benflis, or Benbitour, not much change is expected in the energy policy. The restrictions on foreign investment in the gas sector, beyond the few alterations made in 2013 to the tax code, will generally remain unchanged. The pricing of domestic gas consumption will remain unchanged while the country struggles vigorously to increase its international gas market share. To reach these goals, the country will seek market shares in southeast Asia and will work with the GECF to affect pricing.

Just like the previous scenarios, the impact of the above political developments and the gas policy pursued are likely to be offset by the structural limitations of Algeria's gas industry and the changing reality of the global gas market. In other words, the pursuit of increased market shares and higher prices will be fairly limited by the shortcomings noted above if they themselves are not tackled.

*Possible Corollary to Scenario 3*

Social discontent can turn into a country-wide rebellion inspired by what happened in Libya in 2011 and what is happening now in Syria, and will be aided by armed Islamist groups currently roaming the Maghreb and Sahel regions with large amounts of weapons. In this case, it is not just the Algerian civilian leadership that may be overthrown, but also the entire regime. The hydrocarbon industry may not be as shielded as it was during the bloody Islamist rebellion of the 1990s. It will be a key target of an armed rebellion because it is the backbone and lifeline of the current regime and a symbol of despised Western interests. Production and exports will be interrupted, and new foreign investments will come to a halt. It would take a year or more after that to bring the hydrocarbon industry back in full operation. The new regime will exhibit a high level of resource nationalism while being cognizant of the fact that a healthy hydrocarbon industry is necessary for the country to stay afloat. There will thus be a minimal change to the current conservative gas policy.

*Scenario 4*

In light of the Islamist attack and hostage-taking operation that took place in January 2013 in the gas field of Ain Amenas in southwest Algeria, it is possible that the current conflict in Mali and the intervention of foreign forces (mainly French and African) against the al-Qaeda and other Islamist groups will create general instability in the entire region. Ensuing developments would bring more attacks against Algerian economic infrastructure, mainly oil and gas fields. In spite of Algeria's preparation for such eventuality, the industry could be either damaged or unable to function. If there is a large-scale assault that targets several industrial installations, there could be a major disruption of the gas industry with dire consequences for Algeria's clients, especially Western Europe. This in turn might affect the price of gas in that market and make current and prospective foreign gas operators uneasy about doing business in Algeria under those conditions. The impact on Algeria will be tremendous due to the fact that 96.6% of Algeria's export earnings come from hydrocarbon. This development will worsen the conditions of falling reserves and exports noted above. It will also lower the hydrocarbon income and the ability of the government to support its social and economic development commitments. This in turn would lead to social and political instability and major disruptions in the gas industry.

## Conclusion

Algeria is the case of a country that is relatively well endowed in energy resources but without a comprehensive, integrated, and sustained strategy for development. It is also the case of a country that has managed to create for itself a niche primarily in the European gas market, while actively trying to obtain the highest price possible for its product in exchange for security of supply via pipelines and LNG delivery. In recent years, however, its international energy strategy started to unravel due to decisions that affected negatively foreign investment in its hydrocarbon industry and major changes in the global gas market and prices (e.g., the development of US unconventional gas production, the rise of new LNG exporters, and the decreasing demand for Algerian gas in Europe). Furthermore, “the threat of lower gas prices is coupled with declining export volumes and growing domestic demand, making the issue all the more pressing for the Algerian authorities.”<sup>58</sup>

The Algerian case points to the possible effect of three factors in the global gas market: 1) the changing relationship between spot pricing and long-term contract prices, 2) the effect of unconventional gas development (in the United States and eventually in Europe and Asia) on the supply and price of natural gas, and 3) the apparent movement from regional gas markets and dynamics to global interconnectedness of gas supply and prices.

On the first issue (spot versus contract prices), oil-indexed gas prices are under pressure due to the changing nature of the gas market. This tends to happen when spot market LNG fetches substantially lower prices than those of long-term contracts, and when price indexation fails to benefit the seller due to lower spot oil prices. However, a lower demand for gas can also add to the challenges that sellers like Algeria face: “The link between the price for Algerian gas and spot oil remains strong even after the global crisis of 2008 and the increase in production of nonconventional gas in North America.”<sup>59</sup> Under the previous energy minister Chakb Khelil, Algeria welcomed short-term deals at a time when spot market prices soared. However, this was

---

<sup>58</sup> De Bock and Gijón, “Algeria: Selected Issues Paper,” 12.

<sup>59</sup> Ibid, 12.

done at the expense of long-term contracts, which Algeria started seeking in 2010 for its new LNG trains (one at Gassi Touil in Arzew and another in Skikda).<sup>60</sup>

When the contractual prices and the spot prices of gas were close, long-term contracts made sense for Algeria's clients, especially those in Europe. However, in the wake of the 2008 economic crisis, there developed a marked difference between the two prices, and the financial attractiveness of the long-term contracts started to be questioned. As a consequence, the seller's position weakened. In future negotiations for the renewal of long-term gas contracts, the spread between spot prices and long-term contract prices is likely to be an important factor. However, the security of supply, which long-term contracts generally guarantee, may somewhat offset a price spread, but the contracted minimum take may be reduced. This would allow the buyer to take advantage of lower prices in an oversupplied gas market.<sup>61</sup>

Algeria's strategy of focusing on obtaining the highest price possible may not serve it well at a time when European demand is low, additional supply from Qatar is increasing, and domestic demand is booming. In order to deal with these challenges, the country must increase its reserves and produce and export more gas with an eye on Asian markets, where demand and prices remain high. To accomplish this, Algeria would have to commit more money to exploration and production and, more importantly, find ways to entice more foreign investment (and cost-sharing) in the gas industry.

On the second issue (unconventional gas and its effect on supply and price), the development of unconventional gas in Asia, and eventually in Europe, will pressure current gas producers such as Algeria to increase their own exports even at lower prices (this option is shunned by some Algerian decision-makers who would prefer to keep the gas underground until the right price is attained). The advantage may be in increased market shares and volume sales. Furthermore, current producers of conventional gas with declining reserves may look into shale gas

---

<sup>60</sup> "Algeria favors long-term deals and oil price indexation for LNG," *Energy Intelligence*, October 7, 2010.

<sup>61</sup> Kjersti Hegde and Eirik Fjeldstad, "The future of European long-term natural gas contracts," Consultancy Project Report sponsored by TOTAL E&P NORGE AS, September 1, 2010, 51, <http://www.bergen-energi.com/arch/img/9548380.pdf>.

production.<sup>62</sup> Algeria, for example, has recently decided to invest heavily in this area and seek out potential foreign investors, bypassing thereby the bidding process altogether.

On the third issue (the move from regional to global gas markets), it appears, from the Algerian case and others, that gas markets may no longer be confined to regional arrangements and are likely to take on a global dimension in the areas of sales and prices. Natural gas demand is expected to grow and overtake coal worldwide by 2030, with an increasing share of unconventional sources such as shale.<sup>63</sup> According to the ExxonMobile 2012 Energy Outlook, between 2010 and 2040, gas will be the fastest-growing major fuel and demand is expected to rise by more than 60% in non-OECD countries, especially in Africa, China, India, and Latin America.<sup>64</sup> LNG is expected to fill 25% of the global demand by 2030 and will grow at a faster rate than inter-regional pipeline trade.

These predictions illustrate well the point made above on the third issue—gas trade, through substantial LNG development, is likely to become less confined to regional markets. In other words, the dynamics and factors of gas trade might approximate those of crude oil today. If this trend is confirmed, Algeria might find it less and less attractive to remain essentially tied to a single market, western Europe, and would have to develop a substantial capacity to export gas worldwide. Along with this trend, it is very likely that the decoupling of gas prices from oil prices will increase,<sup>65</sup> allowing natural gas to fetch a price on its own market, a market that will see an abundance of supply—especially if the United States decides to export LNG<sup>66</sup>—at lower prices.

---

<sup>62</sup> International Energy Agency, “Golden Rules for a Golden Age of Gas: World Energy Outlook,” Special Report on Unconventional Gas by the International Energy Agency, 2012.

<sup>63</sup> The International Energy Agency’s 2012 World Energy Outlook predicts that by 2035, unconventional gas will constitute 35% of all gas supply (currently 14%) and that its production will spread around the world.

<sup>64</sup> “2012 The Outlook for Energy: A View to 2040,” ExxonMobile, [www.exxonmobil.com/Corporate/files/news\\_pub\\_eo.pdf](http://www.exxonmobil.com/Corporate/files/news_pub_eo.pdf).

<sup>65</sup> Reinout De Bock and José Gijón, “Will Natural Gas Prices Decouple from Oil Prices across the Pond?” IMF Working Paper on the Middle East and Central Asia, June 2011, <http://www.imf.org/external/pubs/ft/wp/2011/wp11143.pdf>.

<sup>66</sup> On the debate in the United States about this possibility, see Michael A. Levi, “The Case for Natural Gas Exports,” *New York Times*, August 15, 2012.

In the future environment presented above, Algeria may face serious difficulties as an exporter whose economic and political stability are entirely dependent on hydrocarbon income. With a curtailed export capacity, a highly competitive gas export market, and growing domestic consumption, Algeria may no longer be able to maintain a decent part of the global market, and its export revenues may decline substantially. This pessimistic scenario may somewhat improve if Algeria quickly develops renewable energy sources to meet domestic demand, improves its gas reserves and exports, and develops a non-hydrocarbon economy that would employ more people and bring in enough income so as to lessen substantially the effects of the “resource curse.”<sup>67</sup> Algeria can do this by transforming from a rentier state into a state that guides development using, in conjunction with foreign investment, all its resources (human resources, geographical proximity to Europe, and solar and wind energy); it can promote new industrial and service activities that could easily find a niche in the Western Mediterranean economic space and beyond.

Of course, none of this may be possible without necessary political reforms. Only with sound political reforms can Algeria tackle the necessity “to radically change the prevailing incentive structures, including wages, taxes, and access to credit in order to discourage rent-seeking behavior, unlock the latent economic potential of the country, and stimulate productive investment and greater non-hydrocarbon output.”<sup>68</sup> Short of these reforms, Algeria may miss the last opportunity to extricate itself from the economic and political problems associated with a heavy dependency on hydrocarbon income, and make its oil and gas income a source of development rather than an impediment.

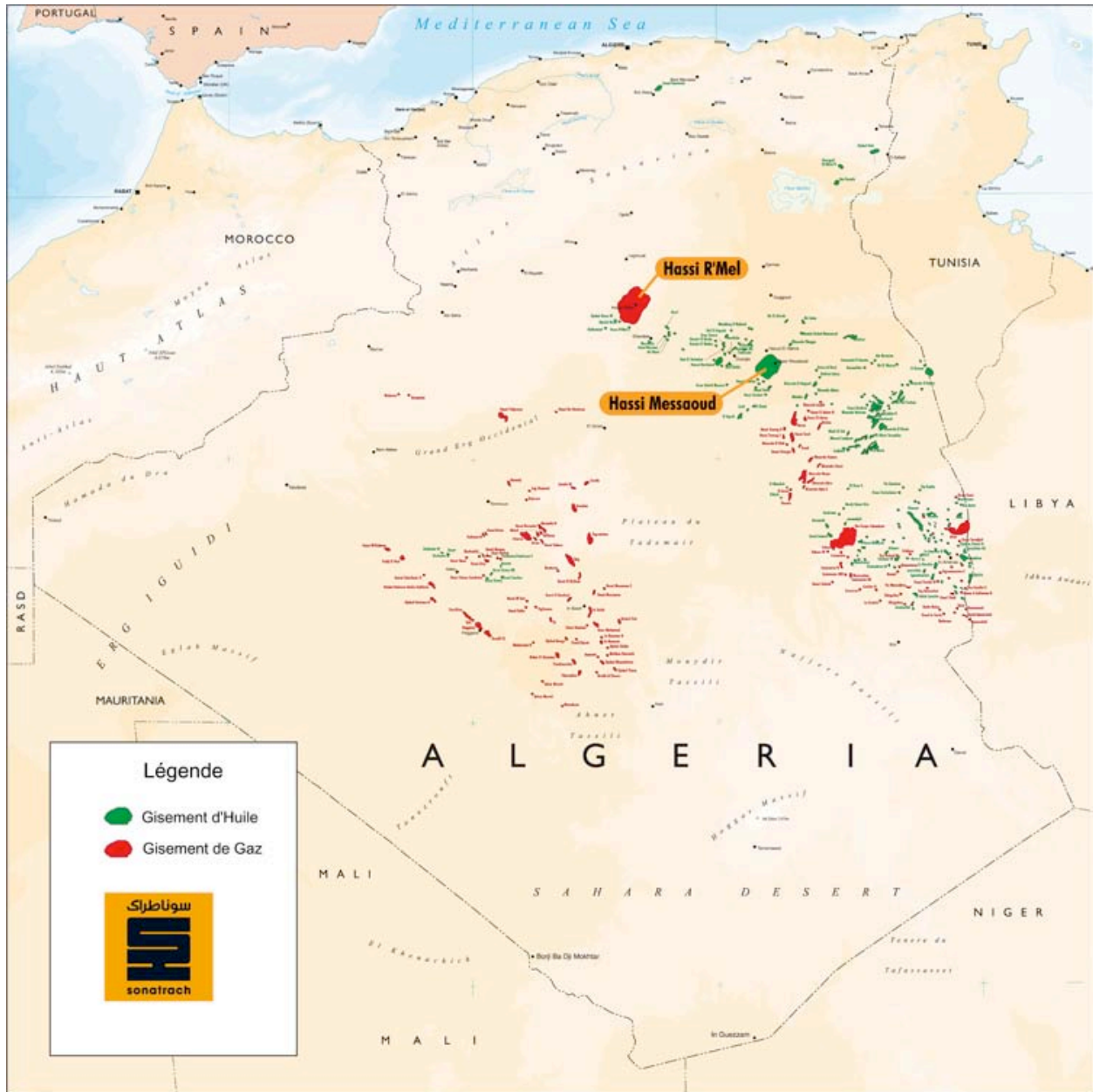
---

<sup>67</sup> According to the resource curse theory, “countries heavily dependent on exports of natural resources are exceptionally prone to slow economic growth, high rates of poverty, authoritarian rule, corruption and violent conflict. The easy money from natural resources ... weakened civil institutions by enabling repressive governments to buy off opponents and stay in power despite policies that stifled the rest of the economy.” John Tierney, “Rethinking the Oil Curse,” *New York Times*, May 5, 2008.

<sup>68</sup> Ali Aissaoui, *The Political Economy of Oil and Gas* (Oxford University Press, 2001).

## APPENDIX

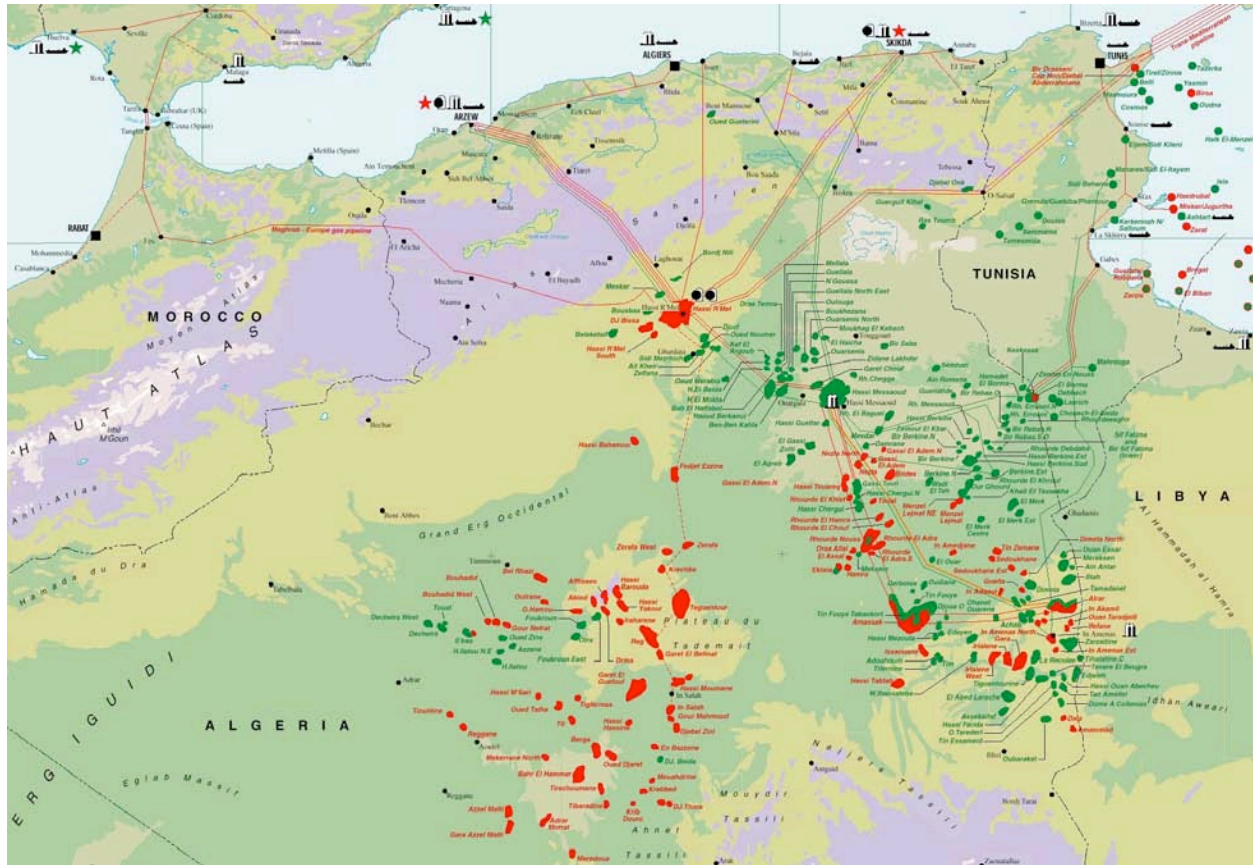
Map 1. Hydrocarbon Fields in Algeria



Source: Sonatrach, “Réseau de transport par canalisations,” [http://www.sonatrach-dz.com/PDF/transport\\_par\\_canalisation.pdf](http://www.sonatrach-dz.com/PDF/transport_par_canalisation.pdf).



Map 2. Algerian Hydrocarbon Fields and Pipelines



Source: Algeria Ministry of Energy and Mines, [http://www.mem-algeria.org/fr/hydrocarbures/gisements\\_hydroc.htm](http://www.mem-algeria.org/fr/hydrocarbures/gisements_hydroc.htm).

Map 3. Algerian Gas Export Routes



Source: Sonatrach, <http://www.sonatrach-dz.com/commercialisation.html>.

**Table 1a. Domestic Gas Pipeline Work Projects in Algeria**

<b>Pipeline Work Projects</b>	<b>Length (km)</b>	<b>Diameter (inches)</b>	<b>Date of Planned Completion</b>
Looping GEM Phase I	293	48	2/2007
Compression Station SC3 Moudjebara-GG1	-	-	12/2007
Pipeline Sougueur – Hadjret Ennous	273	42	4/2008
Renovation GK1 Hassi R'Mel – Skikda	150	40	5/2008
Renovation GZ1 Hassi R'Mel – Medarreg	228	40	7/2009
Looping GEM Phase II	256	48	10/2008
Pipeline GZ4 phase I Hassi R'Mel – Sougueur	300	48	6/2008
Pipeline GZ4 phase II Sougueur – Arzew	218	48	12/2008
Pipeline GZ4 phase III Moctaa douz – Béni Saf	122	48	10/2008
Pipeline GZ5 Hassi R'Mel – Sougueur	300	48	1/2012
Pipeline GK3 Hassi R'Mel – Skikda – El Kala	604	48	9/2011
Pipeline GK4 Hassi R'Mel – Mechtatine	574	48	1/2012
Pipeline PC5 (GK3) – El Kala	261	48	6/2011
Pipeline GG2 phase I Hassi R'mel – PC5	175	42	12/2010
Rocade Khenchela (East region) – Saida (West region)	509	28	2009
Oued Djer – Gué de Constantine	84	28	2008
Zahana – Oran	28	20	2008

Source: “Programme indicatif d’approvisionnement du marché national en gaz, 2008-2017,” Commission de Régulation de l’ Électricité et du Gaz, 2008, 30, [http://www.mem-algeria.org/fr/statistiques/Programme\\_indicatif\\_Gaz\\_2008-2017.pdf](http://www.mem-algeria.org/fr/statistiques/Programme_indicatif_Gaz_2008-2017.pdf).

**Table 2. MENA Gas Data**<sup>69</sup>

2009 figures in billion cubic feet (bcf) per year of % of global totals

Consumption		Production	% of World Production	Exports	% of World Natural Gas Trade
Qatar	745	3,154	3.0%	2,408	7.7%
<b>Algeria</b>	<b>1,016</b>	<b>2,876</b>	<b>2.7%</b>	<b>1,860</b>	<b>6.0%</b>
Egypt	1,567	2,214	2.1%	647	2.1%
Oman	520	875	0.8%	408	1.3%
Libya	212	562	0.5%	349	1.1%
UAE	2,086	1,725	1.6%	248	0.8%
Iran	4,649	4,632	4.4%	200	0.6%
Yemen	4	18	<0.5%	15	<0.5%
Other MENA	4,359	4,072	3.8%	0	0%
<b>MENA Total</b>	<b>15,158</b>	<b>20,127</b>	<b>18.9%</b>	<b>6,135</b>	<b>19.7%</b>
<b>World Total</b>	<b>106,764</b>	<b>106,471</b>	<b>100.0%</b>	<b>31,184</b>	<b>100.0%</b>

Source: U.S. Energy Information Administration, multiple databases. Oman and the UAE import natural gas in addition to exporting it.

<sup>69</sup> Michael Ratner and Neelesh Nerurkar, “Middle East and North Africa Unrest: Implications for Oil and Natural Gas Markets,” CRS Report for Congress, March 10, 2011, <http://www.fas.org/sgp/crs/mideast/R41683.pdf>.