

Energy in Egypt:

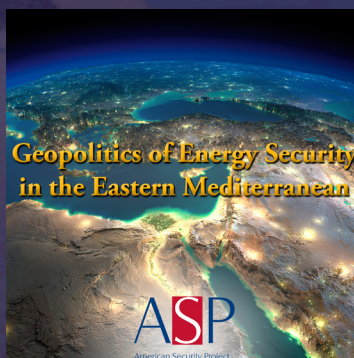
Background and Issues



American Security Project

Background Report

—
Sungtae Park
March 2015



BOARD OF DIRECTORS



The Honorable Gary Hart, Chairman

Senator Hart served the State of Colorado in the U.S. Senate and was a member of the Committee on Armed Services during his tenure.



Norman R. Augustine

Mr. Augustine was Chairman and Principal Officer of the American Red Cross for nine years and Chairman of the Council of the National Academy of Engineering.



The Hon. Donald Beyer

The Hon. Donald Beyer is the former United States Ambassador to to Switzerland and Liechtenstein, as well as a former Lieutenant Governor and President of the Senate of Virginia.



The Hon. Jeffery Bleich

The Hon. Jeffery Bleich heads the Global Practice for Munger, Tolles & Olson. He served as the U.S. Ambassador to Australia from 2009 to 2013. He previously served in the Clinton Administration.



Lieutenant General John Castellaw, USMC (Ret.)

John Castellaw is President of the Crockett Policy Institute (CPI), a non-partisan policy and research organization headquartered in Tennessee.



Brigadier General Stephen A. Cheney, USMC (Ret.)

Brigadier General Cheney is the Chief Executive Officer of ASP.



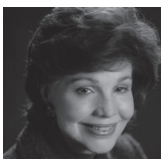
Lieutenant General Daniel Christman, USA (Ret.)

Lieutenant General Christman is Senior Vice President for International Affairs at the United States Chamber of Commerce.



Robert B. Crowe

Robert B. Crowe is a Partner of Nelson Mullins Riley & Scarborough in its Boston and Washington, DC offices. He is co-chair of the firm's Government Relations practice.



Lee Cullum

Lee Cullum, at one time a commentator on the PBS NewsHour and "All Things Considered" on NPR, currently contributes to the Dallas Morning News and hosts "CEO."



Nelson W. Cunningham

Nelson Cunningham is President of McLarty Associates.



Admiral William Fallon, USN (Ret.)

Admiral Fallon has led U.S. and Allied forces and played a leadership role in military and diplomatic matters at the highest levels of the U.S. government.



Raj Fernando

Raj Fernando is CEO and founder of Chopper Trading, a technology based trading firm headquartered in Chicago.



Vice Admiral Lee Gunn, USN (Ret.)

Vice Admiral Gunn is the President of the Institute of Public Research at the CNA Corporation, a non-profit corporation in Virginia.



Lieutenant General Claudia Kennedy, USA (Ret.)

Lieutenant General Kennedy was the first woman to achieve the rank of three-star general in the United States Army.



General Lester L. Lyles, USAF (Ret.)

General Lyles retired from the United States Air Force after a distinguished 35 year career. He is presently Chairman of USAA, a member of the Defense Science Board, and a member of the President's Intelligence Advisory Board.



Dennis Mehiel

Dennis Mehiel is the Principal Shareholder and Chairman of U.S. Corrugated, Inc.



Stuart Piltch

Stuart Piltch is the Co-Founder and Managing Director of Cambridge Advisory Group, an actuarial and benefits consulting firm based in Philadelphia.



Ed Reilly

Edward Reilly is CEO of Americas of FD International Limited, a leading global communications consultancy that is part of FTI Consulting, Inc.



Governor Christine Todd Whitman

Christine Todd Whitman is the President of the Whitman Strategy Group, a consulting firm that specializes in energy and environmental issues.

In this Report:

While Egypt produces its own oil and gas, the country is a net importer of both products and faces many other social and economic challenges, including potential electricity and water shortages. To address such problems, the Egyptian government under President Abdel Fattah el-Sisi is making serious efforts to bring more investment into its oil and gas sector while seeking to diversify Egypt's sources of energy. Given the country's political, economic, and social challenges, whether the Egyptian government will be able to achieve its objectives remains to be seen.

Interact:

Join our discussion on Twitter with the hashtag #ASPEnergy
Learn more about ASP at @amsecproject

IN BRIEF

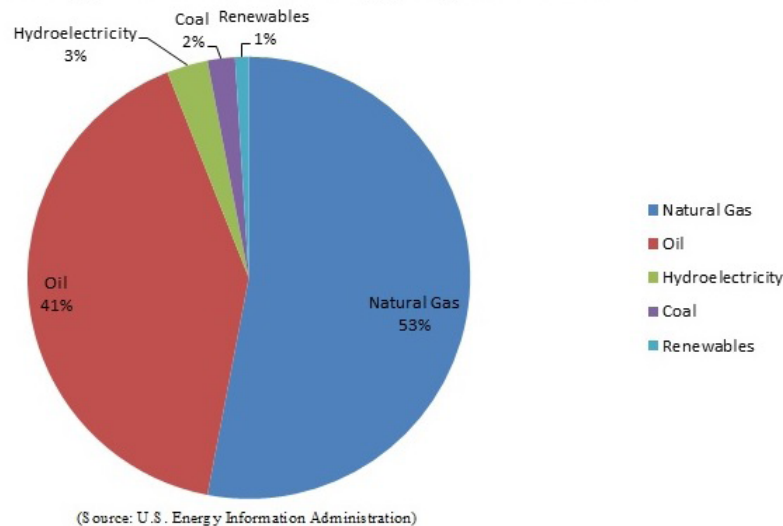
- Egypt is a producer of oil and gas. The country had once exported both products but is now a net importer of hydrocarbon resources, as rising demand and falling or stagnating production have altered the balance.
- The government's inability to provide adequate electricity to Egyptians has become a serious source of political and social instability. Observers expect that blackouts this summer could create problems for the el-Sisi government.
- The falling price of oil has been helping the Egyptian government in its efforts to reduce its budget deficit and energy subsidies but will likely not affect the energy shortages that ordinary Egyptians might face in the upcoming summer. Moreover, low prices mean Persian Gulf states might have less ability to support Egypt financially.
- The el-Sisi government is making serious efforts to bring more investment into its oil and gas sector while seeking to diversify Egypt's sources of energy. Egypt is using more coal, developing solar and wind energy, is exploring shale gas, and has plans to pursue nuclear power. Given the country's political, economic, and social challenges, whether the Egyptian government will be able to achieve its objectives remains to be seen.
- Egypt is vulnerable to environmental stress. While Egypt is a large country, most of its population lives along the Nile River, meaning that any change in the sea level or the flow of the river could cause displacement of millions of Egyptians, less fresh water supply, and harmful effects on the overall economy. Such a development could result in significant political and social instability.

About the Author

Sungtae "Jacky" Park is a Middle East and Nuclear Security Analyst at the American Security Project. He is currently pursuing a master's degree in Security Policy Studies at the George Washington University

Energy in Egypt: Background and Issues

Energy Consumption in Egypt by Sources 2013



Oil

Total Production (January 2015): 680,000 bbl/day¹

Global Share – Production (January 2015): 0.72%²

Proven Reserves (End of 2013): 3,900,000,000 bbl³

Global Share – Proven Reserves (End of 2013): 0.2%⁴

% of Total Domestic Consumption (2013): 41%⁵

Imports (Late 2013): 80,000 bbl/day⁶

Exports (2013): 189,000 bbl/day⁷

Export Destinations (2013): EU (56%), India (28%), China (13%), Others (3%)⁸

Egypt is the largest non-OPEC (Organization of the Petroleum Exporting Countries) oil producer in Africa and is the largest consumer of oil on the continent. The country's use of oil accounts for 20 percent of Africa's total consumption.⁹ Moreover, Egypt has Africa's largest oil refinery capacity.¹⁰ The country's Suez Canal is also a critical maritime chokepoint for oil originating from the Persian Gulf destined for Europe and North America.

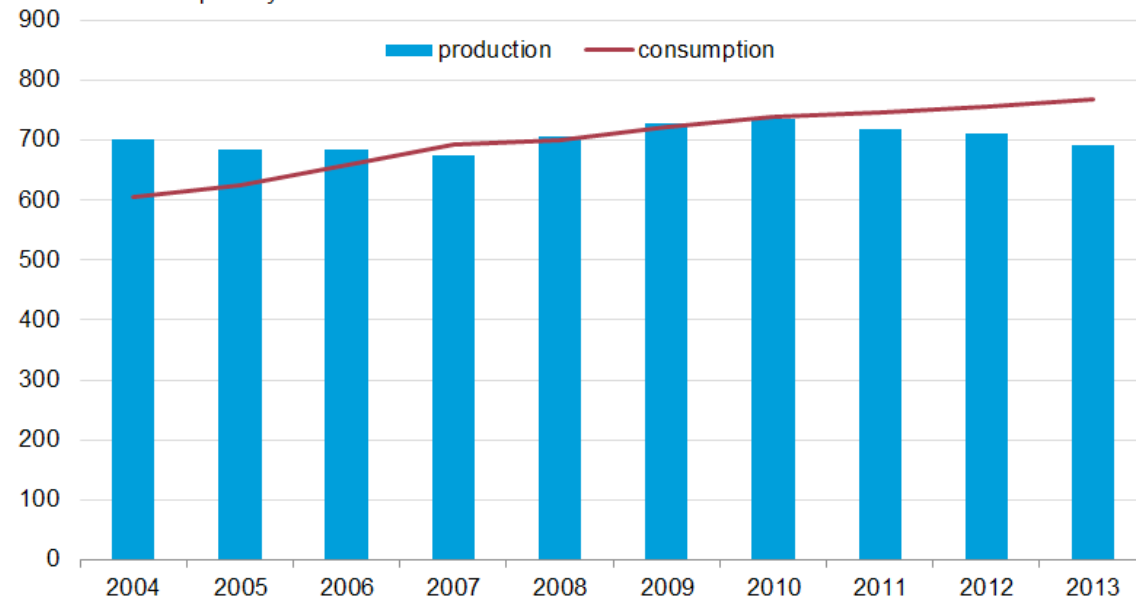
While a major producer, Egypt is an importer of oil because the country's consumption of oil has been increasing by approximately 3 percent per year over the past decade due to economic and population growth. While production has been unable to meet the demand, consumption has outpaced production in 2010.¹¹ Egypt's production of oil peaked during the 1990s at over 900,000 bbl/day.¹² The country's refinery output has been dropping significantly since 2009, although it is expected to increase this year.¹³ Dealing with the growing demand and falling production is Egypt's main challenge in the oil sector.

The recent drop in the global price of oil has been beneficial for Egypt. The falling price has helped Cairo reduce its budget deficit, as energy subsidy programs shrink. Petroleum products were subsidized by 100 billion Egyptian pounds (\$14 billion) in the 2014-2015 fiscal year.¹⁴ The falling price helps Cairo's on-going attempt to reduce fuel subsidies, which will fall by approximately 30 percent - 30 billion Egyptian pounds (\$4.2 billion).¹⁵ Furthermore, average Egyptians will benefit from lower inflation, adding to Egypt's social and political stability.¹⁶

Cutting subsidies, however, might not prevent fuel shortages during the upcoming summer season which could potentially see severe political and social unrest.¹⁷ The falling price of oil also means that the major Persian Gulf states will have less ability to financially prop up the Egyptian state. Indeed, Kuwait and UAE in February announced that their aid to Egypt will soon be cut, although investment remains possible.¹⁸ The amount of remittance from Egyptians working in the Gulf states and the number of tourists from the Persian Gulf region are also expected to decrease.¹⁹

Petroleum and other liquids production and consumption in Egypt

thousand barrels per day



Source: U.S. Energy Information Administration

Natural Gas

Total Production: 2 trillion cubic feet per year (2013)²⁰

Global Share - Production: 1.7% (2013)²¹

Proven Reserves: 65.3 trillion cubic feet (2013)²²

Global Share – Proven Reserves: 1% (2013)²³

% of Total Domestic Consumption: 53% (2013)²⁴

Imports: The first shipments of liquefied natural gas imports will arrive in March 2015.²⁵

Exports: 0.1 trillion cubic feet per year (2013)²⁶

Export Destinations (2013): Asia (82%), Europe (7%), South America (6%), Middle East (5%)²⁷

Egypt is the second largest producer of natural gas in Africa after Algeria, yet Egypt's production has decreased by approximately 3 percent every year between 2009 and 2013.²⁸ The country does have multiple areas of undeveloped reserves, but Cairo had not been able to afford their development, as the Egyptian government had not offered high enough prices to foreign firms capable of developing the reserves.²⁹ As with oil, Egyptian consumption of natural gas has been increasing by approximately 7 percent per year over the past decade.³⁰ The increasing level of consumption combined with the decreasing level of production meant that Egypt was only able to export 5 percent of its total natural gas production in 2013.³¹

In 2015, Egypt will begin to import liquefied natural gas (LNG).³² Cairo signed an agreement with Algeria in December 2014 to import six shipments of LNG between April and September 2015. Egypt signed a contract with Noble Energy in February 2015 to import natural gas from an Israeli offshore gas field in the future. Cairo also signed an agreement with Gazprom to import LNG from Russia.³³



Then-Egyptian Minister of Defense Abdel Fattah el-Sisi walking with U.S. Secretary of State John Kerry
Source: US Department of State

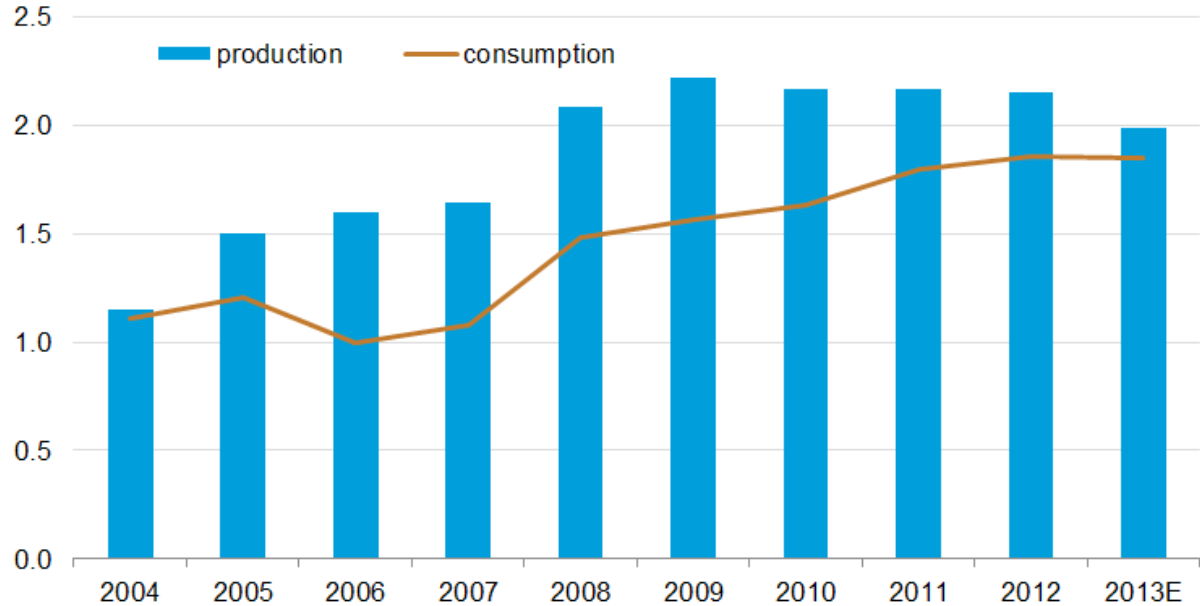
At the same time, Cairo is attempting to reform its energy sector to lure in more foreign investment with higher energy prices in order to develop Egypt's undeveloped gas fields. By doing so, Cairo hopes to stop importing gas by 2020, although the goal is unlikely to be achieved.³⁴ In January 2015, the Egyptian government signed fifteen new deals to explore and develop the country's gas fields.³⁵ In March 2015, Cairo reached an agreement with BP to explore Egypt's offshore natural gas reserves.³⁶ While the Egyptian government seems determined to reform its energy sector and develop its undeveloped reserves, Cairo faces real hurdles. The poor business environment in the country means that businessmen are reluctant to invest. The el-Sisi government also faces short term political risks, as the summer approaches and the possibilities of energy shortage loom large.

Shale Gas

Egypt has 100 trillion cubic feet of technically recoverable shale gas in unproven reserves.³⁷ In December 2014, Cairo signed its first contract to explore and drill shale gas wells with Apache and Shell; the project will take place in the desert region of western Egypt.³⁸

Dry natural gas production and consumption in Egypt

trillion cubic feet



Note: 2013 is an estimate.

Source: U.S. Energy Information Administration and BP 2014 Statistical Review

Hydroelectricity

Hydroelectricity makes up about **3 percent** of Egypt's energy consumption.³⁹ In 2012, the country produced approximately 13.2 billion kilowatt-hours of electricity from hydropower, mostly from the Aswan High Dam and the Aswan Reservoir Dams, using the water from the Nile River.⁴⁰ According to a report by the U.S. Energy Administration, much of the Nile River's hydropower potential in Egypt has already been exploited.⁴¹ In January 2015, the Egyptian government announced that it plans to construct additional hydroelectric power stations with the aid of China, although the new stations are not likely to contribute much to Egypt's hydroelectric capacity.⁴²



Egypt does not control the entire Nile River. Significant portions of the river are located in Ethiopia, South Sudan, and Sudan. Currently, Ethiopia is in the process of constructing a major power dam, the Grand Ethiopian Renaissance Dam. The project could temporarily affect the operation of Egypt's hydroelectric power plants, in addition to affecting the country's overall water supply for the duration of the dam's construction.⁴³ Given that hydropower comprises only 3 percent of Egypt's energy consumption, the negative effect on the overall power supply is unlikely to be devastating, but any resulting water shortages could be highly detrimental for Egypt's restive population. The dam, expected to be completed in September 2015, has been about half way finished as of late 2014 and is a major source of contention between Cairo and Addis Ababa, particularly as Egypt is currently in a state of great political, economic, and social uncertainty.⁴⁴

Once the project is completed, however, it could produce approximately 6,000 megawatts of energy and bring benefits to both Egypt and Ethiopia, as well as other East African countries that might be able to draw electricity from the dam.⁴⁵ According to an expert, "[t]he Renaissance Dam covers the electricity shortage in Egypt during rush hours, while Ethiopia regains electricity during the dam's pause and during drought periods when there is no water to activate the dam."⁴⁶ In March 2015, Egypt, Ethiopia, and Sudan came to an agreement on the basic principles on the use of the Nile River.⁴⁷ The agreement signals greater cooperation on the usage of the river.

Coal

Coal is also not a major source of energy in Egypt and makes up only about **2 percent** of its energy consumption.⁴⁸ Due to the increasing consumption and falling productivity of the country's oil and gas sector, however, the use of cheap imported coal is projected to increase in Egypt. Coal is approximately 30 percent cheaper than imported natural gas.⁴⁹ In April 2014, the Egyptian government approved the use of coal for industrial purposes for the first time, and companies are beginning to use coal for their factories.⁵⁰ In September of the same year, Egypt's state-owned power company, EEHC, signed a deal with an Abu Dhabi-based company to build the country's first coal-fired power plant.⁵¹ There are concerns that using coal would lead to serious environmental problems for Egypt which already has a high level of air and water pollution.⁵² In particular, Egypt's tourism sector, particularly in the Red Sea area, is concerned that the use of coal might cause significant damages to the industry.⁵³

Renewable Energy

Non-hydro renewable energy makes up only **1 percent** of the total energy consumption in Egypt.⁵⁴ Since 2014, Cairo has redoubled its efforts to develop and use more renewable energy to address growing energy challenges with the goal of producing 20 percent of the country's energy supply from renewable sources.⁵⁵ In January 2015, Egypt declared its objective of producing approximately 4,300 megawatts of energy from solar and wind power within three years.⁵⁶ Access Power, a UAE company, is heading a consortium to lead the project.⁵⁷

Solar energy has much potential in Egypt, with has approximately 325 days of sun in a year and approximately 2,400 hours annually for potential solar operations, compared to Spain and Greece, the next sunniest countries, which have 1,900 hours annually.⁵⁸ Back in 1913, Egypt was selected to host the world's first solar power station, although the plan was scrapped with the outbreak of World War I.⁵⁹ The country's first solar-thermal power plant was connected to the national electricity grid only in June 2011, producing approximately 160 megawatts of solar energy.⁶⁰ Cairo currently has a plan to develop solar energy to address the country's growing energy shortages with approximately \$1 billion slated for the project in the coming years.⁶¹ A number of Egyptian banks have also expressed interest in developing solar energy.⁶² Despite Egypt's potential, however, investors and entrepreneurs face significant regulatory hurdles in pursuing renewable projects in Egypt, particularly with the current political, social, and economic problems that the country is dealing with.⁶³



Egypt is also seeking to boost its wind power capacity. Currently, most of the country's wind power comes from the Zafarana and Hurghada wind farms.⁶⁴ In January 2015, the Egyptian government announced a plan to bring up the use of wind energy up to 2,000 megawatts within three years.⁶⁵ Cairo plans to increase its wind power capacity up to 7.2 gigawatts (7200 megawatts) by 2020.⁶⁶

Nuclear Energy

Egypt's work toward nuclear energy has been an on-and-off process, ever since the country's first president, Gamal Abdel Nasser, signed its first nuclear agreement with the Soviet Union in 1954. The work on the nuclear sector was halted after the war of 1967 and then restarted under Anwar Sadat after 1973. In 1986, Hosni Mubarak halted Egypt's work in the nuclear sector again after the Chernobyl disaster. Cairo began discussing nuclear power again in 2006.⁶⁷ Egypt currently has two small research reactors, but no large commercial reactor yet.⁶⁸ In February 2015, Egyptian President Abdel Fattah el-Sisi signed an agreement with Russian President Vladimir Putin on building a commercial nuclear reactor.⁶⁹

Energy Development Versus Climate Change

While Egypt seeks to produce more oil and gas and diversify the country's sources of energy, Cairo also has to consider the consequences that such developments might have on the environment and climate change. While Egypt is a large country, most of its population lives near the Nile River Delta and Valley, making the country one of the world's most vulnerable to climate change. Any change in sea levels or the flow of the river would be very detrimental to those relying on the river.⁷⁰ According to the Climate Institute, a 0.5 meter rise in sea level could result in the displacement of 2 to 4 million Egyptians. A warmer climate could also mean less fresh water supplies, with harmful effects on the overall economy.⁷¹ Such a change could result in a great amount of political and social instability.



Source: NASA

Conclusion

The problems Egypt faces in its energy sector come at a time of great uncertainty. In order to stabilize the country in the long run, the el-Sisi government will need to combine measures to provide security for ordinary Egyptians while diversifying its sources of energy and liberalizing the economy to bring in more foreign investment. The el-Sisi government will face significant challenges in doing so, however. The upcoming summer season during which energy shortages are expected will be the first hurdle that Cairo will have to overcome. Hence, whether or not the el-Sisi government will be able to achieve all of its objectives remains to be seen.

Find out more on the [U.S. -Egypt Strategic Partnership](#)

Endnotes

1. Oil Market Report, The International Energy Agency, 10 Feb. 2015, web, 6, accessed 24 Feb. 2015, 19, <https://www.iea.org/media/omrreports/fullissues/2015-02-10.pdf>
2. Ibid
3. BP Statistical Review of World Energy June 2014, BP, June 2014, web, 6, accessed 3 Feb. 2015, <http://www.bp.com/content/dam/bp/pdf/Energy-economics/statistical-review-2014/BP-statistical-review-of-world-energy-2014-full-report.pdf>
4. Ibid
5. Country Analysis Brief: Egypt, issue brief, U.S. Energy Information Administration, 14 Aug. 2014, web, 3, accessed 3 Feb. 2015, <http://www.eia.gov/countries/analysisbriefs/Egypt/egypt.pdf>
6. Country Analysis Brief: Egypt, 7
7. Country Analysis Brief: Egypt, 5
8. Country Analysis Brief: Egypt, 6
9. Country Analysis Brief: Egypt, 1-2
10. Murat Temizer, "Egypt to Import LNG from Algeria," Anadolu Agency, 5 Dec. 2014, web, accessed 2 Mar. 2015, <http://www.aa.com.tr/en/economy/431130--egypt-to-import-lng-from-algeria>
11. Temizer, "Egypt to Import LNG from Algeria."
12. David E. Brown, *Africa's Booming Oil and Natural Gas Exploration and Production: National Security Implications* (S.I.: Military hop, 2013), 140
13. Country Analysis Brief: Egypt, 6
14. Rami Galal, "Falling Oil Prices Both Blessing, Curse for Egypt," Al-Monitor, 6 Jan. 2015, web, accessed 2 Mar. 2015, <http://www.al-monitor.com/pulse/originals/2015/01/oil-prices-effects-on-egypt.html#>
15. Shadi Bushra, "Lower Oil Price "double-edged Sword" for Energy-hungry Egypt," Reuters, Thomson Reuters, 23 Dec. 2014, web, accessed 2 Mar. 2015, <http://www.reuters.com/article/2014/12/23/egypt-oil-economy-idUSL6N0U62O820141223>
16. "Who Gains and Who Loses from Plunging Oil Prices in the Middle East and North Africa Region?" The World Bank, The World Bank Group, 29 Jan. 2015, web, accessed 2 Mar. 2015, <http://www.worldbank.org/en/news/feature/2015/01/29/who-gains-and-who-loses-from-plunging-oil-prices-in-the-middle-east-and-north-africa-region>
17. Michele Dunne, "Egypt's Economy and Stability in 2015," Carnegie Endowment for International Peace, 29 Dec. 2014, web, accessed 2 Mar. 2015, <http://carnegieendowment.org/syriaincrisis/?fa=57610>
18. Ayah Aman, "Gulf States to Cut Aid to Egypt," trans. Joelle El-Khoury, Al-Monitor, 17 Feb. 2015, web, accessed 2 Mar. 2015, <http://www.al-monitor.com/pulse/originals/2015/02/egypt-gulf-aid-economy-conference.html>
19. "Who Gains and Who Loses from Plunging Oil Prices in the Middle East and North Africa Region?"
20. Country Analysis Brief: Egypt, 8
21. BP Statistical Review of World Energy June 2014, 22
22. BP Statistical Review of World Energy June 2014, 20
23. Ibid
24. Country Analysis Brief: Egypt, 3
25. Maher Chmaytelli, "Egypt to Get First LNG Cargo in March Amid Plans to Sell Gas," Bloomberg Business, Bloomberg L.P., 23 Feb. 2015, web, accessed 24 Feb. 2015, <http://www.bloomberg.com/news/articles/2015-02-23/egypt-to-get-first-lng-cargo-next-month-amid-plans-to-export-gas>
26. Country Analysis Brief: Egypt, 8
27. Country Analysis Brief: Egypt, 11
28. Country Analysis Brief: Egypt, 1, 7
29. Country Analysis Brief: Egypt, 7
30. Country Analysis Brief: Egypt, 8
31. Ibid
32. Chmaytelli, "Egypt to Get First LNG Cargo in March Amid Plans to Sell Gas."

33. Khalid Al-Masri, "Egypt Buys Israel's Gas and Raises Electricity Prices," Middle East Monitor, 18 Feb. 2015, web, 2 Mar. 2015, <https://www.middleeastmonitor.com/articles/africa/17034-egypt-buys-israels-gas-and-raises-electricity-prices>
34. Ehab Farouk, "Egypt Aims to Halt Gas Imports in 2020 – Minister," Reuters, Thomson Reuters, 6 Feb. 2015, web, 2 Mar. 2015, <http://in.reuters.com/article/2015/02/23/egypt-gas-idINL5N0VX2P020150223>.
35. Oleg Vukmanovic and Shadi Bushra, "Egypt's Energy Reforms Spark Rush of Oil and Gas Deals," Reuters, Thomson Reuters, 6 Feb. 2015, web, accessed 2 Mar. 2015, <http://www.reuters.com/article/2015/02/06/egypt-energy-investment-idUSL6N0VF26G20150206>
36. Stanley Reed, "BP Signs \$12 Billion Deal to Develop Natural Gas in Egypt," The New York Times, 6 Mar. 2015, web, accessed 9 Mar. 2015, <http://www.nytimes.com/2015/03/07/business/international/bp-signs-12-billion-deal-to-develop-natural-gas-in-egypt.html>
37. Technically Recoverable Shale Oil and Shale Gas Resources: An Assessment of 137 Shale Formations in 41 Countries Outside the United States, U.S. Energy Information Administration, June 2013, web, accessed 3 Mar. 2015, <http://www.eia.gov/analysis/studies/worldshalegas/pdf/fullreport.pdf>
38. "Egypt Signs First Fracking Shale Gas Deal with U.S. Firm," World Tribune, East West Services Inc., 18 Dec. 2014, web, accessed 3 Mar. 2015, <http://www.worldtribune.com/2014/12/18/egypt-signs-first-fracking-shale-gas-deal-u-s-firm/>
39. Country Analysis Brief: Egypt, 3
40. Country Analysis Brief: Egypt, 15
41. Ibid
42. "Egypt Plans New Hydroelectric Power Stations in Cooperation with China," Egypt Independent, Al-Masry Al-Youm, 5 Jan. 2015, web, accessed 4 Mar. 2015, <http://www.egyptindependent.com/news/egypt-plans-new-hydroelectric-power-stations-cooperation-china>
43. Walaa Hussein, "Egypt Faces Power Cuts, Potential Drought," Al-Monitor, 9 Sept. 2014, web, accessed 4 Mar. 2015, <http://www.al-monitor.com/pulse/originals/2014/09/egypt-water-nile-shortage-power-cuts.html#>
44. Tinishu Solomon, "Ethiopia, Egypt Seek Closer Ties as Nile Hydroelectric Dam Advances," The Africa Report, 6 Nov. 2014, web, accessed 4 Mar. 2015, <http://www.theafricareport.com/North-Africa/ethiopia-egypt-seek-closer-ties-as-nile-hydroelectric-dam-advances.html>
45. "Ethiopia, Egypt, Sudan Advance Water, Impact Studies of 6,000-MW Grand Renaissance Hydro Project," Hydro Review, Hydro World, 3 Sept. 2014, web, accessed 11 Mar. 2015, <http://www.hydroworld.com/articles/2014/09/ethiopia-egypt-sudan-advance-water-impact-studies-of-6-000-mw-grand-renaissance-hydro-project.html>
46. Quoted in Hussein, "Egypt Faces Power Cuts, Potential Drought."
47. "Sudan, Egypt, and Ethiopia Agree Basis of Nile Deal," Al Arabiya News, 6 Mar. 2015, web, accessed 9 Mar. 2015, <http://english.alarabiya.net/en/News/africa/2015/03/08/Islamist-group-claims-responsibility-for-Mali-attack-that-killed-5.html>
48. Country Analysis Brief: Egypt, 3
49. Susanna Twidale and Shadi Bushra, "Egypt's Cement Firms Overcome Gas Shortages by Importing Coal," Reuters, Thomson Reuters, 5 Nov. 2014, web, accessed 4 Mar. 2015, <http://www.reuters.com/article/2014/11/05/egypt-cement-coal-idUSL6N0SU2YB20141105>
50. Stephen Kalin, "Egypt's Suez Cement to Convert Two Factories to Run on Coal," Reuters, Thomson Reuters, 16 Dec. 2014, web, accessed 4 Mar. 2015, <http://af.reuters.com/article/egyptNews/idAFL6N0U027C20141216>
51. Stanley Carvalho, "UAE Firm Signs Deal to Build Egypt's First Coal-fired Power Plant," Reuters, Thomson Reuters, 30 Sept. 2014, web, accessed 4 Mar. 2015, <http://af.reuters.com/article/commoditiesNews/idAFL6N0RV3FI20140930>
52. Maggie Fick, "Egypt's Cabinet Approves Use of Coal for Power Generation," Reuters, Thomson Reuters, 2 Apr. 2014, web, accessed 4 Mar. 2015, <http://www.reuters.com/article/2014/04/02/us-egypt-energy-coal-idUSBREA3117Y20140402>
53. "Red Sea Tourism Group Protests Egypt's Coal Plans," San Diego Jewish World, 13 Apr. 2014, web, accessed 4 Mar. 2015, <http://www.sdjewishworld.com/2014/04/13/red-sea-tourism-group-protests-egypts-coal-plans/>
54. Country Analysis Brief: Egypt, 3

55. Ayah Aman, "Egypt Aims to Produce 20% of Power from Renewables by 2020," trans. Pascale El-Khoury, Al-Monitor, 9 Oct. 2014, web, accessed 9 Mar. 2015, <http://www.al-monitor.com/pulse/originals/2014/10/egypt-energy-crisis-resort-solar-power-plants.html#>
56. "Egypt to Build 4,300 MW Solar, Wind Plants in 3 Years –Sisi," Reuters. Thomson Reuters, 19 Jan. 2015, web, accessed 9 Mar. 2015, <http://af.reuters.com/article/egyptNews/idAFL6N0UY2T720150119>
57. Ibid
58. "Solar Energy In Egypt," Sun Vision Solar Energy Systems, web, accessed 9 Mar. 2015, <http://sun-vision.com/en/solar-energy-in-egypt/>
59. David Thorpe, "How Solar Energy Can Solve Egypt's Electricity Crisis," Sustainable Cities Collective, Social Media Today LLC, 8 Sept. 2014, web, accessed 9 Mar. 2015, <http://sustainablecitiescollective.com/david-thorpe/337996/sisi-cant-see-how-solar-energy-can-solve-egypts-electricity-crisis>
60. Country Analysis Brief: Egypt, 15
61. "Project for Producing Solar Energy in Egypt to Be Established," Egypt State Information Service, 27 Apr. 2014, web, accessed 9 Mar. 2015, <http://www.sis.gov.eg/En/Templates/Articles/tmpArticleNews.aspx?ArtID=77422#VP3I5uH2Rpk>
62. Ahmed Abu Shady, "Egypt's Banks Express Willingness to Fund Solar Energy Projects," The Cairo Post, 30 Apr. 2014, web, accessed 9 Mar. 2015, <http://www.thecairopost.com/news/108637/business/egypts-banks-express-willingness-to-fund-solar-energy-projects>
63. Aman, "Egypt Aims to Produce 20% of Power from Renewables by 2020," trans. Pascale El-Khoury
64. Country Analysis Brief: Egypt, 15
65. LeAnne Graves, "Egypt Prepares Tender for 250-Megawatt Wind Energy Project," The National, Abu Dhabi Media, 20 Jan. 2015, web, accessed 9 Mar. 2015, <http://www.thenational.ae/business/energy/egypt-prepares-tender-for-250-megawatt-wind-energy-project>
66. Country Analysis Brief: Egypt, 15
67. "Country Profile: Egypt," The James Martin Center for Nonproliferation Studies, Nuclear Threat Initiative, July 2014, web, accessed 4 Mar. 2015, <http://www.nti.org/country-profiles/egypt/nuclear/>
68. Country Analysis Brief: Egypt, 15
69. Sarah Sirgany, "Russia's Putin, Egypt's El-Sisi Agree on Preliminary Nuclear Power Deal," CNN, Turner Broadcasting System, Inc., 10 Feb. 2015, web, accessed 4 Mar. 2015, <http://www.cnn.com/2015/02/10/middleeast/egypt-russia-talks/>
70. David Sterman, "Climate Change in Egypt: Rising Sea Level, Dwindling Water Supplies," Climate Institute, July 2009, web, accessed 11 Mar. 2015, <http://www.climate.org/topics/international-action/egypt.html>
71. Sterman, "Climate Change in Egypt: Rising Sea Level, Dwindling Water Supplies."

The American Security Project (ASP) is a nonpartisan organization created to educate the American public and the world about the changing nature of national security in the 21st Century.

Gone are the days when a nation's security could be measured by bombers and battleships. Security in this new era requires harnessing all of America's strengths: the force of our diplomacy; the might of our military; the vigor and competitiveness of our economy; and the power of our ideals.

We believe that America must lead in the pursuit of our common goals and shared security. We must confront international challenges with our partners and with all the tools at our disposal and address emerging problems before they become security crises. And to do this we must forge a bipartisan consensus here at home.

ASP brings together prominent American business leaders, former members of Congress, retired military flag officers, and prominent former government officials. ASP conducts research on a broad range of issues and engages and empowers the American public by taking its findings directly to them via events, traditional & new media, meetings, and publications.

We live in a time when the threats to our security are as complex and diverse as terrorism, nuclear proliferation, climate change, energy challenges, and our economic wellbeing. Partisan bickering and age old solutions simply won't solve our problems. America – and the world - needs an honest dialogue about security that is as robust as it is realistic.

ASP exists to promote that dialogue, to forge that consensus, and to spur constructive action so that America meets the challenges to its security while seizing the opportunities that abound.



American Security Project

www.americansecurityproject.org