

The World Market for Natural Gas and Gas Flow Measurement

Module B: A Strategic Approach to Doing Business in Mideast/Africa

Flow Research, Inc.

Wakefield, Massachusetts

November 2011

Researched by:

**Flow Research, Inc.
27 Water Street – Suite B7
Wakefield, MA 01880
United States**

**+1 781-245-3200
+1 781-224-7552 (fax)
info@flowresearch.com
www.flowresearch.com
www.gasflows.com**

Project Team

**Jesse Yoder, PhD – Publisher and Executive Director
Belinda Burum
Norman Weeks
Leslie Buchanan
Christina Glaser
Nicole Riordan
Jessica Weldy**

Published by



November 2011

Copyright © 2011

Flow Research, Inc.

All data and information in this study is proprietary and copyrighted by Flow Research, Inc. No part of this study may be reproduced orally or in written form to anyone outside the internal organization of the client for five years from the date of this study without the prior written consent of Flow Research, Inc.

Disclaimer

While every effort has been made to insure that this study is accurate and complete, Flow Research, Inc. accepts no liability for consequences of any actions that are based on the findings in this study.

TABLE OF CONTENTS

One	Executive Summary	1-1
	Overview	1-1
	Selling into the Unique Mideast/Africa Business Climate	1-2
	Flowmeter Usage in Mideast/Africa	1-2
	Study Objectives	1-3
	Methodology	1-4
	Gas and Flowmeter Data.....	1-5
	How to Use the Information in this Study	1-5
	Shipments of New-Technology, Traditional Technology, and All Gas Flowmeters in Mideast/Africa: Figures 1-1 to 1-4	1-6
	Shipments of All Gas Flowmeters Worldwide by Type in Mideast/Africa: Figure 1-5 to 1-7	1-7
	Gross Natural Gas Production in Mideast/Africa: Figure 1-8	1-8
	Proved Reserves of Dry Natural Gas in Mideast/Africa: Figure 1-9	1-8
Two	Scope and Method	2-1
	Overview	2-1
	Study Objectives	2-2
	Methodology	2-2
	Geographic Regions of the World	2-9
	The Role of Viewpoint Pluralism	2-9
	Flowmeter Types	2-19
	Gas and Flowmeter Data.....	2-19
	Flow Research, Inc.....	2-21
	Flow Research Off-the-Shelf Market Research Studies	2-23
	Custom Reports.....	2-24
	Worldflow Monitoring Service.....	2-24
	Flow Research Instrumentation Articles.....	2-25
	Natural Gas Glossary	2-37

Three	Mideast/Africa Regional View	3-1
	I. Natural Gas Data: Mideast/Africa	3-4
	II. Gas Flowmeter Market in Mideast/Africa	3-11
	Growth Factors for Gas Flowmeters in Mideast/Africa	3-11
	Mideast/Africa is the second-largest producer of natural gas in the world	3-11
	Mideast/Africa is the leading region in the world in natural gas reserves	3-12
	Many natural gas companies are state-owned and operated, creating a different dynamic for natural gas distribution.....	3-13
	The Mideast is a major source of LNG.....	3-14
	Market Size and Forecasts for Flowmeters in Mideast/Africa	3-14
	Shipments of New-Technology Flowmeters by Type in Mideast/Africa: Figures 3-12 to 3-17	3-14
	Shipments of Traditional Technology Flowmeters by Type in Mideast/Africa: Figures 3-18 to 3-23	3-16
	Shipments of All Flowmeters by Type in Mideast/Africa: Figures 3-24 to 3-31	3-17
Four	Mideast	4-1
	I. Natural Gas Data: Mideast	4-4
	Production	4-4
	Reserves	4-4
	Imports	4-4
	Exports	4-4
	Consumption	4-4
	II. Gas Market in the Mideast.....	4-14
	Bahrain.....	4-14
	Overview	4-14
	Economy	4-14
	Reserves	4-15
	Leading companies	4-15
	Production and consumption.....	4-15
	Iran	4-17
	Overview	4-17
	Economy	4-17
	Reserves	4-18

Production and consumption.....	4-18
Leading companies	4-20
Liquefied natural gas.....	4-20
Pipelines.....	4-20
Iranian Natural Gas Data	4-22
Iranian Gas Producers	4-24
National Iranian Oil Company (NIOC)	4-24
Iraq	4-28
Overview	4-28
Politics.....	4-28
Leading companies	4-29
Reserves	4-29
Production.....	4-30
Export plans	4-31
Iraqi Natural Gas Data.....	4-33
Iraqi Gas Producers.....	4-35
North Oil Company (NOC)	4-35
North Gas Company	4-36
South Gas Company (SGC)	4-37
Basrah Gas Company Joint Venture.....	4-37
Kuwait.....	4-39
Overview	4-39
Economy	4-39
Reserves	4-40
Leading companies	4-40
Exploration and production.....	4-40
Consumption and imports	4-42
Kuwaiti Natural Gas Data.....	4-44
Kuwaiti Gas Producers.....	4-46
Kuwait Petroleum Corporation	4-46
Oman.....	4-50
Overview	4-50
Economy	4-50
Reserves	4-50
Leading companies	4-51
Production.....	4-52

Consumption	4-52
Pipelines	4-52
Exports	4-52
Imports	4-53
Omani Natural Gas Data.....	4-54
Omani Gas Producers.....	4-56
Oman Oil Company S.A.O.C. (OOC)	4-56
Oman Liquefied Natural Gas (Oman LNG)	4-59
Petroleum Development Oman L.L.C.	4-60
Qatar	4-63
Overview	4-63
Economy	4-63
Consumption	4-63
Reserves	4-64
Leading companies	4-65
Production.....	4-65
Exports	4-66
Liquefied natural gas.....	4-67
Gas-to-liquids.....	4-68
Qatari Natural Gas Data.....	4-70
Qatar Gas Producers.....	4-72
Qatar Petroleum	4-72
Qatargas Operating Company Limited	4-77
RasGas Company Limited	4-80
Saudi Arabia.....	4-84
Overview	4-84
Economy	4-85
Leading company.....	4-85
Reserves	4-86
Production and consumption.....	4-86
Exploration and development	4-87
Pipelines	4-89
Saudi Arabian Natural Gas Data	4-90
Saudi Arabian Gas Producers	4-92
Saudi Aramco.....	4-92
Saudi Basic Industries (SABIC)	4-97

S-Chem	4-102
Syria	4-103
Overview	4-103
Politics.....	4-103
Economics.....	4-104
Production.....	4-104
Imports	4-105
Pipelines	4-105
Syrian Natural Gas Data	4-107
Turkey.....	4-109
Overview	4-109
Reserves	4-109
Exploration and production.....	4-110
Consumption	4-110
Leading companies	4-110
Pipelines and imports.....	4-111
Liquefied natural gas.....	4-112
Turkish Natural Gas Data	4-113
United Arab Emirates (UAE)	4-115
Overview	4-115
Economy	4-115
Consumption	4-116
Reserves	4-117
Exploration and production.....	4-117
Exports and imports	4-118
Liquefied natural gas.....	4-119
United Arab Emirates Natural Gas Data	4-121
United Arab Emirates Gas Producers	4-123
Abu Dhabi National Oil Company	4-123
Abu Dhabi Gas Industries Ltd. (GASCO)	4-126
Dolphin Energy Limited	4-129
Yemen.....	4-133
Overview.....	4-133
Production.....	4-134
Liquefied natural gas.....	4-134
Yemeni Natural Gas Data	4-136

Yemeni Gas Producers.....	4-139
Yemen Gas Company	4-139
Yemen LNG Company Ltd.....	4-141
Five	
Africa	5-1
I. Natural Gas Data: Africa	5-3
Production	5-3
Reserves	5-3
Imports	5-3
Exports	5-3
Consumption.....	5-3
II. Gas Market in Africa.....	5-14
Algeria.....	5-14
Overview	5-14
Politics.....	5-14
Reserves	5-15
Production.....	5-16
Leading companies	5-17
Pipelines	5-17
Liquefied natural gas.....	5-18
Algerian Natural Gas Data	5-20
Algerian Gas Producers	5-21
Sonatrach.....	5-21
Angola	5-24
Overview.....	5-24
Economy	5-24
Production.....	5-25
Liquefied natural gas.....	5-25
Angolan Natural Gas Data	5-26
Egypt	5-28
Overview	5-28
Economy	5-28
Consumption	5-29
Leading companies	5-30
Production	5-31
Exports	5-32

Liquefied natural gas.....	5-32
Egyptian Natural Gas Data.....	5-35
Egyptian Gas Producers.....	5-37
Egyptian Natural Gas Holding Company (EGAS)	5-37
Libya.....	5-42
Overview	5-42
Production	5-43
Reserves	5-43
Consumption	5-44
Exports	5-45
Liquefied natural gas.....	5-45
Leading companies	5-46
Libyan Natural Gas Data	5-47
Libyan Gas Producers.....	5-49
National Oil Company (NOC)	5-49
Nigeria.....	5-52
Overview	5-52
Economy	5-52
Reserves and production	5-53
Consumption	5-54
Nigerian Natural Gas Data	5-55
Nigerian Gas Producers	5-56
Nigerian National Petroleum Corp. (NNPC)	5-56
Six Strategies for Doing Business in Mideast/Africa	6-1
Selling into the Unique Business Climate of Mideast/Africa	6-1
A preference for doing business face to face	6-2
The importance of the religious observance of Ramadan.....	6-4
Doing business when the government owns all or part of the companies.....	6-5
Dubai and Qatar stand out as centers of growth in the Mideast	6-7
Saudi Arabia steeped in tradition.....	6-9
Unfriendly business climates in some countries pose obstacles....	6-10
Not a single, monolithic region – approach the Mideast country by country	6-12
‘Arab Spring’ phenomenon is changing the face of the Mideast	6-13

Flowmeter Usage in Mideast/Africa.....	6-15
Large installed base of differential pressure (DP) flowmeters	6-15
Turbine and ultrasonic predominate for custody transfer of natural gas, with longterm trend away from turbine.....	6-16
Coriolis leads for custody transfer and other petroleum liquids applications	6-16
Flowmeter calibration an issue for oil and gas producers in Mideast/Africa	6-17
Mideast/Africa oil & gas producers would like a flowmeter manufacturing plant in their region.....	6-19

LIST OF FIGURES

Figure

1-1	Shipments of New-Technology Gas Flowmeters in Mideast/Africa	1-9
1-2	Shipments of Traditional Technology Gas Flowmeters in Mideast/Africa ...	1-10
1-3	Shipments of All Gas Flowmeters in Mideast/Africa.....	1-11
1-4	Shipments of All Gas Flowmeters in Mideast/Africa.....	1-12
1-5	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	1-13
1-6	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	1-14
1-7	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	1-15
1-8	Gross Natural Gas Production in Mideast/Africa	1-16
1-9	Proved Reserves of Dry Natural Gas in Mideast/Africa.....	1-16
2-1	New-Technology and Traditional Technology Flowmeters	2-33
2-2	Emerging Technology Flowmeters.....	2-33
2-3	New-Technology Flowmeters Approved by the Fieldbus Foundation.....	2-34
3-1	Total Energy Consumption by Fuel for Mideast/Africa	3-3
3-2	Gross Natural Gas Production in Mideast/Africa	3-6
3-3	Gross Natural Gas Production in Mideast/Africa	3-6
3-4	Proved Reserves of Dry Natural Gas in Mideast/Africa.....	3-7
3-5	Proved Reserves of Dry Natural Gas in Mideast/Africa.....	3-7
3-6	Imports of Dry Natural Gas in Mideast/Africa	3-8
3-7	Imports of Dry Natural Gas in Mideast/Africa	3-8
3-8	Exports of Dry Natural Gas in Mideast/Africa	3-9
3-9	Exports of Dry Natural Gas in Mideast/Africa	3-9
3-10	Dry Natural Gas Consumption in Mideast/Africa	3-10
3-11	Dry Natural Gas Consumption in Mideast/Africa	3-10
3-12	Shipments of New-Technology Gas Flowmeters in Mideast/Africa	3-18
3-13	Shipments of New-Technology Gas Flowmeters in Mideast/Africa	3-19
3-14	Shipments of New-Technology Gas Flowmeters by Type in Mideast/Africa	3-20
3-15	Shipments of New-Technology Gas Flowmeters by Type in Mideast/Africa	3-21

3-16	Shipments of New-Technology Gas Flowmeters by Type in Mideast/Africa	3-22
3-17	Average Selling Price of New-Technology Gas Flowmeters by Type in Mideast/Africa	3-23
3-18	Total Shipments of Traditional Technology Gas Flowmeters in Mideast/Africa	3-24
3-19	Total Shipments of Traditional Technology Gas Flowmeters in Mideast/Africa	3-25
3-20	Shipments of Traditional Technology Gas Flowmeters by Type in Mideast/Africa	3-26
3-21	Shipments of Traditional Technology Gas Flowmeters by Type in Mideast/Africa	3-27
3-22	Shipments of Traditional Technology Gas Flowmeters by Type in Mideast/Africa	3-28
3-23	Average Selling Price of Traditional Technology Gas Flowmeters by Type	3-29
3-24	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	3-30
3-25	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	3-31
3-26	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	3-32
3-27	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	3-33
3-28	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	3-34
3-29	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	3-35
3-30	Shipments of All Gas Flowmeters by Type in Mideast/Africa.....	3-36
3-31	Average Selling Price of All Gas Flowmeters by Type in Mideast/Africa ...	3-37
4-1	Gross Dry Natural Gas Production in the Mideast	4-5
4-2	Gross Dry Natural Gas Production in the Mideast	4-6
4-3	Proved Reserves of Dry Natural Gas in the Mideast	4-7
4-4	Proved Reserves of Dry Natural Gas in the Mideast	4-8
4-5	Imports of Dry Natural Gas in the Mideast	4-9
4-6	Imports of Dry Natural Gas in the Mideast	4-10
4-7	Exports of Dry Natural Gas in the Mideast 2009	4-11
4-8	Exports of Dry Natural Gas in the Mideast	4-11
4-9	Dry Natural Gas Consumption in the Mideast.....	4-12
4-10	Dry Natural Gas Consumption in the Mideast.....	4-13
4-11	Bahrain's Natural Gas Production and Consumption 2005-2009	4-16
4-12	Total Energy Consumption in Iran by Type 2007	4-18

4-13	Dry Natural Gas Market in Iran.....	4-22
4-14	Dry Natural Gas Market in Iran.....	4-22
4-15	Proved Reserves of Dry Natural Gas in Iran	4-23
4-16	Total Energy Consumption in Iraq by Type 2007	4-29
4-17	Dry Natural Gas Market in Iraq.....	4-33
4-18	Dry Natural Gas Market in Iraq.....	4-33
4-19	Proved Reserves of Dry Natural Gas in Iraq	4-34
4-20	Dry Natural Gas Market in Kuwait.....	4-44
4-21	Kuwaiti Dry Natural Gas Production and Consumption 2005-2009	4-44
4-22	Dry Natural Gas Market in Kuwait.....	4-45
4-23	Proved Reserves of Dry Natural Gas in Kuwait.....	4-45
4-24	Dry Natural Gas Market in Oman.....	4-54
4-25	Dry Natural Gas Market in Oman.....	4-54
4-26	Proved Reserves of Dry Natural Gas in Oman	4-55
4-27	Total Energy Consumption in Qatar by Type 2008.....	4-64
4-28	Qatar's LNG Exports, 1997-2009.....	4-66
4-29	Qatar's LNG Infrastructure, January 2011	4-68
4-30	Dry Natural Gas Market in Qatar	4-70
4-31	Dry Natural Gas Market in Qatar	4-70
4-32	Qatar's Natural Gas Production and Consumption 2005-2009	4-71
4-33	Proved Reserves of Dry Natural Gas in Qatar.....	4-71
4-34	Total Energy Consumption in Saudi Arabia by Type 2008.....	4-87
4-35	Dry Natural Gas Market in Saudi Arabia	4-90
4-36	Dry Natural Gas Market in Saudi Arabia	4-91
4-37	Proved Reserves of Dry Natural Gas in Saudi Arabia.....	4-91
4-38	Dry Natural Gas Market in Syria.....	4-107
4-39	Dry Natural Gas Market in Syria.....	4-107
4-40	Proved Reserves of Dry Natural Gas in Syria	4-108
4-41	Major Turkish Gas Pipelines	4-112
4-42	Dry Natural Gas Market in Turkey.....	4-113
4-43	Dry Natural Gas Market in Turkey.....	4-113
4-44	Proved Reserves of Dry Natural Gas in Turkey	4-114
4-45	Dry Natural Gas Market in United Arab Emirates	4-121
4-46	Dry Natural Gas Market in United Arab Emirates	4-121
4-47	Proved Reserves of Dry Natural Gas in United Arab Emirates.....	4-122
4-48	UAE Natural Gas Production and Consumption: 2005-2009.....	4-122

4-49	Dry Natural Gas Market in Yemen.....	4-136
4-50	Dry Natural Gas Market in Yemen.....	4-136
4-51	Proved Reserves of Dry Natural Gas in Yemen	4-137
4-52	Yemen's Natural Gas Production and Consumption 2005-2009.....	4-137
4-53	Yemen's Natural Gas Production and Consumption 1992-2009.....	4-138
5-1	Gross Dry Natural Gas Production in Africa.....	5-5
5-2	Gross Dry Natural Gas Production in Africa.....	5-6
5-3	Proved Reserves of Dry Natural Gas in Africa.....	5-7
5-4	Proved Reserves of Dry Natural Gas in Africa 2010.....	5-7
5-5	Top Sub-Saharan Africa Proven Natural Gas Reserve Holders 2011	5-8
5-6	Proved Reserves of Dry Natural Gas in Africa.....	5-9
5-7	Imports of Dry Natural Gas in Africa.....	5-10
5-8	Imports of Dry Natural Gas in Africa.....	5-10
5-9	Exports of Dry Natural Gas in Africa.....	5-11
5-10	Exports of Dry Natural Gas in Africa.....	5-11
5-11	Dry Natural Gas Consumption in Africa	5-12
5-12	Dry Natural Gas Consumption in Africa	5-13
5-13	Top Importers of Algerian LNG 2008	5-16
5-14	Dry Natural Gas Market in Algeria	5-20
5-15	Dry Natural Gas Market in Algeria	5-20
5-16	Proved Reserves of Dry Natural Gas in Algeria.....	5-21
5-17	Dry Natural Gas Market in Angola.....	5-26
5-18	Dry Natural Gas Market in Angola.....	5-26
5-19	Proved Reserves of Dry Natural Gas in Angola	5-27
5-20	Total Energy Consumption in Egypt by Type 2008	5-30
5-21	Dry Natural Gas Market in Egypt.....	5-35
5-22	Dry Natural Gas Market in Egypt.....	5-35
5-23	Egypt's Natural Gas Production and Consumption 2005-2009	5-36
5-24	Proved Reserves of Dry Natural Gas in Egypt	5-36
5-25	Total Energy Consumption in Libya by Type 2009	5-45
5-26	Dry Natural Gas Market in Libya	5-47
5-27	Dry Natural Gas Market in Libya	5-47
5-28	Libya's Production and Consumption of Natural Gas 2005-2009	5-48

5-29	Proved Reserves of Dry Natural Gas in Libya	5-48
5-30	Total Energy Consumption in Nigeria by Type 2008.....	5-54
5-31	Dry Natural Gas Market in Nigeria	5-55
5-32	Dry Natural Gas Market in Nigeria	5-55
5-33	Proved Reserves of Dry Natural Gas in Nigeria.....	5-56

LIST OF MAPS

Map

2-1	World	2-10
2-2	World by Region.....	2-11
2-3	Asia	2-11
2-4	Europe and Russia	2-12
2-5	The Russian Federation	2-12
2-6	China.....	2-13
2-7	Japan	2-13
2-8	India	2-14
2-9	Indonesia.....	2-14
2-10	Europe, Mideast, and Africa (EMEA).....	2-15
2-11	The Mideast	2-16
2-12	Commonwealth of Independent States and Asia	2-16
2-13	South America	2-17
2-14	Central America.....	2-17
2-15	North America (The United States and Canada)	2-18

Appendix A: Overview of *The World Market for Gas Flow Measurement, 2nd Edition: Modules A through E* A-1

