



Organization of Arab Petroleum Exporting Countries
(OAPEC)

The Secretary General's Annual Report

40

2013



Organization of Arab Petroleum Exporting Countries
(OAPEC)



The Secretary General's
40th Annual Report
2013



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ORGANIZATION OF ARAB PETROLEUM
EXPORTING COUNTRIES (OAPEC)



OAPEC Ministerial Council (2013)

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HE Sheikh Ahmed bin Mohammed Al Khalifa	Kingdom of Bahrain
HE Engineer Sherif Ismail ⁽¹⁾	Arab Republic of Egypt
HE Mr Abdul Karim Luaibi Bahedh	Republic of Iraq
HE Dr Ali Saleh Al Omair ⁽²⁾	State of Kuwait
HE Mr Omar Ali El Shakmak ⁽³⁾	State of Libya
HE Dr Mohammed bin Saleh Al Sada	State of Qatar
HE Engineer Ali bin Ibrahim Al Naimi	Kingdom of Saudi Arabia
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HE Engineer Suhail bin Mohammed Faraj Al Mazroui ⁽⁵⁾	United Arab Emirates

(1) Succeeded HE Engineer Osama Mohammed Kamal as of July 2013

(2) Succeeded HE Mr Mustafa Al Shamali as of January 2014. Also, HE Hani Hussein was appointed as Minister of Oil from February 2012 till July 2013

(3) Succeeded HE Engineer Abdulbari Al Arosi as of February 2014

(4) Succeeded HE Engineer Saeed Heneidy as of February 2013

(5) Succeeded HE Mohammed Bin Dhaen Al Hamli as of March 2013





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Engineer Amro Abdul Halim	Arab Republic of Egypt
Mr Hassan Mohammed Al Rufai'e ⁽¹⁾	Republic of Iraq
Sheikh Talal Nasser Al Athbi Al Sabah ⁽²⁾	State of Kuwait
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Engineer Nasser bin Ibrahim Al Fuzan	Kingdom of Saudi Arabia
Dr Engineer Hassan Zainub	Syrian Arab Republic
Dr Matar Hamad Al Neyadi	United Arab Emirates

(1) Succeeded HE Mr Hameed Abdul Razaaq Al Saiidi as of 31/12/2012

(2) Succeeded HE Engineer Adel Abdul Aziz Al Jasim as of 24/9/2013





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EXPORTING COUNTRIES (OAPEC)



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Mr. Sheikh Abdul Rahman bin Jaber Al Khalifa	Vice-President
Mr. Jawad Omar Al-Sakka	Member
Dr. Nabil Abdullah El Araby	Member
Mr. Khalifa Daalouj Al Kobaissi	Member





ORGANIZATION OF ARAB PETROLEUM
EXPORTING COUNTRIES (OAPEC)



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H.E. Abbas Ali Al Naqi

Secretary General

The Arab Center for
Energy Studies

Dr. Samir M. El Kareish

Director of the Technical Affairs
Department

Mr. Abdul Fattah Dandi

Director of the Economics
Department



Mr. Abdul Kareem Ayed

Director of the Information and
Library Department

Director of the Finance and
Administrative Affairs
Department*

* The Finance and Administrative Affairs Department is currently under the supervision of the Secretary General





CONTENTS



CONTENTS

PREFACE	23
PART ONE	

INTERNATIONAL DEVELOPMENTS IN OIL AND ENERGY

CHAPTER ONE: DEVELOPMENTS IN GLOBAL MARKETS AND THEIR IMPACT ON OAPEC MEMBER COUNTRIES

Foreword	37
1 THE MAJOR DEVELOPMENTS IN THE GLOBAL OIL MARKET IN 2013 AND THE FACTORS INFLUENCING THEM:	31
1. Supplies	32
1-1 OPEC Supplies	33
1-2 Non-OPEC Supplies	34
2. World Oil Demand	35
2-1 OECD Countries	40
2-2 Developing Countries	41
2-3 Countries in Transition	43
3. Price Trends	43
3-1 Crude Oil Prices	43
3-2 Spot Prices of Oil Products	48
3-3 Oil Freight Rates	51
4. World Oil Inventories	52
4.1 OECD Commercial Stocks	53
4.2 US Strategic Petroleum Reserve	53
2 OIL EXPORTS VALUE OF OAPEC MEMBER COUNTRIES	54
3 DEVELOPMENTS IN OIL AND ENERGY CONSUMPTION IN THE ARAB COUNTRIES	55
1. Arab Countries	55
1-1 Total and Per Capita Energy Consumption by Source	55
1-2 Energy Consumption by Source	55
2. Total Energy Consumption in OAPEC Member Countries	67
2-1 Total and Per Capita Energy Consumption	67
2-2 Energy Consumption by Source	69
3. Local Prices	74

CHAPTER TWO:

ARAB AND WORLD DEVELOPMENTS IN THE EXPLORATION, RESERVES AND PRODUCTION OF ENERGY RESOURCES

I.	Oil and Gas	103
	1. Exploration and Production: An Overview	103
	1-1 Seismic Surveys	128
	1-2 Exploratory and Developmental Drilling	128
	2. Oil and Natural Gas Reserves	150
	2-1 Oil Reserves	150
	2-2 Natural Gas Reserves	152
	3. Hydrocarbon Liquids and Natural Gas Production	154
	3-1 Hydrocarbon Liquid Production	154
	3-2 Marketed Natural Gas	157
II.	Coal	158
III.	Nuclear Energy	160
IV.	Renewable Energy Sources	162
	1. Hydropower	162
	1-1 Hydropower in the World	162
	1-2 Hydropower in the Arab Countries	162
	2. Wind Energy	163
	2-1 Wind Energy in the World	163
	3. Solar Energy	163
	A- Solar Energy in the World	164
	B- Solar Energy in the Arab Countries	164
	4. Geothermal Energy	165
	A- Geothermal Energy in the World	166
	5. Solid Biomass Energy	166
	B. Solid Biomass Energy in the Arab Countries	166
	6. Ocean and Tidal Power	167

CHAPTER THREE:

ARAB AND WORLD DEVELOPMENTS IN PETROLEUM DOWNSTREAM INDUSTRIES

I.	Refining Industry	193
	1. World Developments	193
	2. Developments in Arab Countries	205
II.	Petrochemical Industries	214
	1. World Developments	214
	2. Arab Developments	219
III.	Natural Gas Consumption, Trade and Processing	226
	1. Global Developments	226

1-1 Natural Gas Consumption	226
1-2 Natural Gas Trade	230
1-3 World Natural Gas Prices	235
1-4 World's Most Important Gas Activities	236
2. Arab Developments	242

PART TWO OAPEC ACTIVITIES IN 2012

CHAPTER ONE:	
THE MINISTERIAL COUNCIL AND THE EXECUTIVE BUREAU	281
1 THE MINISTERIAL COUNCIL	281
2 THE EXECUTIVE BUREAU	281
First: Studies, Papers and Reports	282
1-1 A Study on "Oil Refining Industry in the Arab Countries: Present and Future"	281
1-2 Offshore Exploration & Production and their Role in Developing Oil and Gas Reserves	283
1-3 Study: Nuclear Energy and Future Outlook: In the Aftermath of Fukushima Accident – Japan	283
1-4 Study: Growing Role of National Petroleum Companies: Implications for Petroleum Industry in Member Countries	284
1-5 Study: Oil and Natural Gas Exports from Member Countries: World Waterways for Petroleum Shipments	286
1-6 Paper entitled "Heavy Crude Oil Perspective in the World and Arab Countries"	288
1-7 Paper Entitled "Overview of heavy Crude Oil in the Arab Countries: Challenges and Opportunities"	290
1-8 Paper entitled "Global Prospects of Gas Industry: Challenges and Opportunities"	291
Second: Conferences and Seminars Organized by the Secretariat General	294
2-1 Options for Heavy Crude Oil Refining in Arab Countries Conference Enhancing Cooperation between OAPEC and JCCP	294
2-2 22 nd Forum on the Fundamentals of the Oil and Gas Industry	297
2-3 13 th Experts Meeting on Potential Cooperation in Natural Gas Investment	298
2-4 Prospects of Natural Gas Industry Development: Reality, Challenges, and Opportunities	300
2-5 OAPEC's Member Countries Second Coordination Meeting Liaison Officers of Data Bank Information	301
Third: Conferences and Seminars Attended by the Secretariat General	302
3-1 4 th Meeting of the Electricity Experts Committee in Arab Countries, and 28 th Meeting of the Executive Bureau of the Council of Arab Electricity Ministers	302

3-2 1 st Meeting of Energy Ministers from Arab and South American Countries (ASPA)	303
3-3 14 th Kuwait-Japan Joint Symposium	304
3-4 3 rd Meeting for Monitoring Work in 1 st and 2 nd Parts of Arab Electricity Interconnection Study, and Evaluation of Natural Gas Utilization for Electricity Export	305
3-5 3 rd Meeting of the Arab Negotiating Group on Climate Change	306
3-6 GCC Petroleum Media Forum - Realities and Aspirations	307
3-7 Petroleum Downstream Industries Week	308
3-8 Lecture by His Excellency Mr. Abbas Ali Al-Naqi at the Japan Cooperation Centre, Petroleum (JCCP)	310
3-9 3 rd IEF NOC-IOC Forum: Challenges, Investment and Cooperation	311
3-10 4 th Meeting for Monitoring Work on Arab Electricity Interconnection Feasibility Study, and Evaluation of Natural Gas Utilization for Electricity Export	312
3-11 1 st GCC-Swiss Forum	313
3-12 92 nd Ordinary Session of the Economic and Social Council	314
3-13 Africa Oil and Gas Finance and Investment Forum (AOGFI)	315
3-14 Afro-Arab Economic Forum	316
3-15 Conference on Refining and Petrochemicals Technology in the GCC	316
3-16 Preparatory Meeting for the 4 th Session on China-Arab Energy Cooperation Conference	318
3-17 Arab Investment Forum: Investment Attractiveness Gap	317
3-18 The Joint Arab Economic Report, 2012	319
Fourth: Environment, Climate Change, and Sustainable Development: OAPEC Role	321
4-1 The Thirty-Eighth Session of the Subsidiary Body for Implementation (SBI 38), (ABATA 38) and the Second Part of the Second Session of the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP 2-2)	322
4-2 19 th Meeting of Sub-Committee on Climate and Climate Change	322
4-3 20 th Coordinating Meeting of Environmental Experts in the Arab Countries	322
4-4 5 th Meeting of the Arab Negotiating Group on Climate Change:	323
4-5 Workshop on Developing the Abilities of Arab Negotiators on the Topics Laid on the Negotiation Table on Climate Change	323
4-6 OPEC Member Countries Coordinating Meeting to Prepare for the next Conference of the Parties (COP 19)	324

4-7 COP19/CMP9 UNITED NATIONS CLIMATE CHANGE CONFERENCE - Warsaw, Poland, 11-23 November 2013	325
Fifth: MEDIA ACTIVITY	328
5-1 Editing, Printing, Publishing and Distribution	328
5-2 Press and Media Activity	328
5-3 Website	328
5-4 38 th Arab Book Fair	329
5-5 Information and Library Services	329
Sixth: DATABANK	331
6-1 Monitoring Developments of Database	331
6-2 Reports and Papers	331
6-3 Other Activities	332
6-4 Strengthening Cooperation between OAPEC Secretariat General and its Member Countries	332
Seventh: Encouraging Scientific Research	334
7-1 OAPEC Scientific Award 2012	334
7-2 OAPEC Scientific Award 2014	334
Eighth: ADMINISTRATIVE AND FINANCIAL ACTIVITIES	335
8-1 Evolution of the Administrative Structure	335
8-2 Evolution of Expenditure	335
OAPEC Joint Ventures	336
ARAB MARITIME PETROLEUM TRANSPORT COMPANY (AMPTC)	337
THE ARAB SHIPBUILDING AND REPAIR YARD COMPANY (ASRY)	339
THE ARAB PETROLEUM INVESTMENTS CORPORATION (APICORP)	342
THE ARAB PETROLEUM SERVICES COMPANY (APSCO)	345
THE ARAB DRILLING AND WORKOVER COMPANY (ADWOC)	346
THE ARAB WELL LOGGING COMPANY (AWLCO)	348
THE ARAB GEOPHYSICAL EXPLORATION SERVICES COMPANY (AGESCO)	350
THE ARAB DETERGENT CHEMICALS COMPANY (ARADET)	351
PRESS RELEASES OF OAPEC MINISTERIAL COUNCIL MEETINGS IN 2013	355
Ninetieth Meeting of OAPEC'S Ministerial Council	355
<i>(At the level of the Executive Bureau Members)</i>	
91st OAPEC Council of Ministers Meeting	357

TABLES

PART ONE

CHAPTER ONE

1-1	Total & Annual Changes in World Oil and NGLs Supply, 2009 - 2013	76
1-2	Growth in the World Economy and Oil Demand by Region, 2009-2013	77
1-3	World Economic Growth, 2009-2013	78
1-4	Total & Annual Change in World Oil Demand, 2009-2013	79
1-5	World Oil Demand by Region, 2009-2013	80
1-6	Total & Annual Change in Oil Demand in OECD Countries, 2009-2013	81
1-7	Total & Annual Change in Rest of the World Oil Demand (Excluding Countries that joined the OECD), 2009-2013	82
1-8	Spot Price of OPEC Basket of Crudes, 2009-2013	83
1-9	Average Spot Prices of the OPEC Basket, Brent, WTI and Selected Arab Crudes, 2009-2013	84
1-10	Nominal and Real Prices of Crude Oil, 2000-2013	85
1-11	Average Monthly Market Spot Prices of Petroleum Products, 2011-2012	86
1-12	Share of Tax in Gasoline Prices in some OECD countries, 2012-2013	87
1-13	Spot Tanker Freight Rates, 2012 - 2013	88
1-14	OECD Oil Inventories at Quarter End, 2012 & 2013	89
1-15	Value of Oil Exports in OAPEC Member Countries, 2009-2013	90
1-16	Value of OAPEC Oil Exports in Current and Real Prices, 2000-2013	91
1-17	Energy Consumption in the Arab Countries, 2010-2013	92
1-18	Per Capita Energy Consumption in the Arab Countries, 2010 and 2013	93
1-19	Energy Consumption in OAPEC Member Countries, 2010-2013	94
1-20	Energy Consumption in OAPEC Member Countries by Source, 2010-2013	95
1-21	Natural Gas Consumption in OAPEC Member Countries, 2010-2013	96
1-22	Petroleum Products Consumption in OAPEC Member Countries, 2010-2013	97
1-23	Hydroelectricity Consumption in OAPEC Member Countries, 2010-2013	98
1-24	Coal Consumption in OAPEC Member Countries, 2010-2013	99
1-25	Domestic Prices of Petroleum Products in OAPEC Member Countries, 2013	100

CHAPTER TWO

2-1	Seismic Surveys Worldwide, 2009- 2013	196
2-2	Average Number of Active Rigs Worldwide, 2009-2013	197
2-3	Petroleum Discoveries in OAPEC Members and Other Arab Countries, 2009-2013	198
2-4	Arab and World Oil Reserves, 2009- 2013	199
2-5	Arab and World Natural Gas Reserves, 2009- 2013	201

2-6	Arab and World Hydrocarbon Liquids Production, 2009-2013	203
2-7	NGL Production in OAPC Members and Other Arab Countries, 2008-2012	205
2-8	Arab and World Marketed Natural Gas, 2008 - 2012	206
2-9	World Coal Reserves, 2008 - 2012	208
2-10	World Coal Production, 2008 - 2012	209
2-11	Nuclear Power Reactors in Operation and Under Construction Worldwide	210
2-12	Installed Hydro Power Capacities in some Countries, 2011	212
2-13	Installed Wind Power Capacities in some Countries, 2009-2012	213
2-14	Cumulative Installed Photovoltaic Power Capacities in Some Countries, 2009-2012	214
2-15	Installed Geothermal Capacities in Some Countries, 2011 and 2012	215
2-16	Installed Solid Biomass Capacities in some Countries, 2010 and 2011	216

CHAPTER THREE

3-1	World Existing Topping Distillation Capacity by Region, 2012 and 2013	256
3-2	World Catalytic Conversion Capacity by Region, 2012 and 2013	257
3-3	Regional Catalytic Conversion Capacity by Process, 2012 and 2013	258
3-4	World Coke Production Capacity from Thermal Conversion Process by Region, 2012 and 2013	259
3-5	World Hydrotreating Capacity by Region, 2012 and 2013	260
3-6	World's Top 25 Largest Refining Companies, Jan, (2013 - 2014)	261
3-7	Ranking of World's Top Largest Oil Refineries, January 2014	262
3-8	Installed Refining Capacity in the Arab Countries, 2009-2013	263
3-9	New Refinery Construction Projects in OAPC Member Countries	264
3-10	New Refinery Construction Projects in Other Arab Countries	265
3-11	World Top 10 Ethylene Complexes, January 2013	266
3-12	World Ethylene Capacity by Region, 2011 and 2012	267
3-13	World Ethylene Production Capacity by Country, 2005 and 2006	268
3-14	Top 10 Ethylene Producers Jan 2013	270
3-15	Ethylene Production Capacity in the Arab Countries, 2008-2012	271
3-16	Natural Gas Consumption by Region, 2011 and 2012	272
3-17	Evolution of Natural Gas Share of Total Commercial Energy Consumption by region, 2009-2012	273
3-18	Natural Gas Exports by Region, 2011 and 2012	274
3-19	World Natural Gas Exports by Region, 2011 and 2012	275
3-20	Evolution of World Natural Gas Prices*, 2008 - 2012	276
3-21	Distribution of LNG Nameplate Production Capacity in the world, 2012	277
	Distribution of LNG Nameplate Production Capacity in the Arab Countries, 2012	

FIGURES PART ONE

CHAPTER ONE

1-1	World Supply of Oil and NGLs , 2009-2013	32
1-2	Annual Change in World Supplies of Crude Oil and NGLs, (2009-2013)	35
1-3	World Economic and Oil Demand Growth, 2009-2013	36
1-4	World Economic Growth in 2012 and 2013	37
1-5	World Oil Demand, 2009-2013	38
1-6	Distribution of World Oil Demand by Region, 2009-2013	39
1-7	OECD Demand for Oil by Region, 2009-2013	40
1-8	Weekly Movement of OPEC Basket of Crudes, 2013	44
1-9	Annual Average Prices of OPEC Basket, U.S Crude, Brent, and Dubai For The Period 2009 - 2013	47
1-10	Premium Gasoline Prices, 2012-2013	49
1-11	Gasoline Prices in some OECD Countries, October 2013	50
1-12	Monthly Oil Prices and Value of OAPEC Oil Exports, January-December 2013	54
1-13	GPD at Current Prices in Arab Countries, 2010-2012	57
1-14	Average GDP Per Capita of Arab Countries, 2010-2012	58
1-15	Energy Consumption Structure in the Arab Countries, 2010-2013	61
1-16	Per Capita Energy Consumption in the Arab Countries, 2010 and 2013	62
1-17	Energy Consumption in Arab Countries and the World, 2012	63
1-18	Natural Gas Consumption in the Arab Countries and the World, 2012	64
1-19	The Relative Distribution of Petroleum Product Consumption in the Arab Countries, 2013	66
1-20	Oil Consumption in the Arab Countries and the World, 2012	66
1-21	Energy Consumption in OAPEC Member Countries, 2010 and 2013	68
1-22	Per Capita Energy Consumption in OAPEC Member Countries, 2013	69
1-23	Energy Consumption in OAPEC Member Countries by Source, 2013	70
1-24	Natural Gas Consumption in OAPEC Member Countries, 2010 and 2013	71
1-25	Natural Gas Consumption as a Percentage of Total Energy Consumption in OAPEC Member Countries, 2013	73

CHAPTER TWO

2-1	Seismic Surveying Activity in Different Parts of the World, 2009-2013	128
2-2	Average Number of Operating Rigs Worldwide 2009-2013	129
2-3	Rigs Distribution Worldwide 2013	129
2-4	The Number of Oil Discoveries in OAPEC Members and Other Arab Countries	149
2-5	The Number of Gas Discoveries in OAPEC Members and Other Arab Countries	149
2-6	World Oil Reserves by the End of 2013	151
2-7	The Evolution of Oil Reserves in OAPEC and OPEC Member Countries, 2009- 2013	151
2-8	World Natural Gas Reserves, by end of 2013	152

2-9	The Evolution of Natural Gas Reserves in OAPEC and OPEC Member Countries, 2009-2013	153
2-10	World Oil Production Distribution in 2013	155
2-11	Oil Production Rates in OAPEC and OPEC Member Countries, 2009- 2013	156
2-12	World Marketed Natural Gas Distribution in 2012	157
2-13	The Evolution of Marketed Natural Gas in OAPEC and OPEC Member Countries, 2009-2012	158
2-14	World Coal Reserves, by the end of 2012	159
2-15	Distribution of World Production of Coal by the end of 2012	159

CHAPTER THREE

3-1	Development of World Refining Capacity and the Number of Refineries (2005-2013)	193
3-2	Distribution of World Primary Distillation Capacity by Region, End of 2013	194
3-3	Distribution of World Catalytic Conversion Capacity by Region, End of 2013	195
3-4	Comparison of World Catalytic Reforming Capacity by Region, End of 2012 and 2013	196
3-5	Comparison of World Fluid Catalytic Cracking Capacity by Region, End of 2012 and 2013	197
3-6	Comparison of World Hydrocracking Capacity by Region, End of 2012 and 2013	198
3-7	World Capacity for Producing Coke from Thermal Conversion Processes by Region, End of 2013	199
3-8	Distribution of Total Hydrotreating Capacity by Region, End, 2013	200
3-9	Evolution of Primary Distillation Capacity in the Arab Countries, 2009-2013	206
3-10	Increases in World Existing Ethylene Production Capacity	214
3-11	Distribution of Total Existing Ethylene Capacities at the end of 2012	215
3-12	Distribution of Total Ethylene Capacities in Arab Countries, 2012	220
3-13	Development of world natural gas consumption between 2008 and 2012	226
3-14	Distribution of natural gas consumption worldwide in 2012	228
3-15	Distribution of natural gas production by Region in 2012	229
3-16	Evolution of the share of natural gas in total commercial energy consumption worldwide in 2009-2012	230
3-17	Distribution of Global Demand for Natural Gas during 2012	231
3-18	Natural Gas Exports Worldwide, 2012	232
3-19	Evolution of Natural Gas Exports Worldwide, 2008-2012	233
3-20	Distribution of Natural Gas Exports Worldwide, 2011 and 2012	233
3-21	Distribution of Natural Gas Exports Worldwide, 2012	234
3-22	Natural Gas Exports from Arab Countries, 2012	235
3-23	World Prices of Natural Gas, 2008-2012	236
3-24	Distribution of the world's nominal LNG production capacity by region	237
3-25	Distribution of Arab countries' nominal LNG production capacity by the end of 2012	238
3-26	Distribution of LNG regasification capacity by region at the end of 2012	240







PREFACE



PREFACE

It is my pleasure to present the 40th annual report of the Secretary General for the year 2013. The report thoroughly analyzes the recent Arab and international developments in the oil, gas and energy industry during year 2013, to address the strategic importance of the petroleum industry to the global economy on one hand, and the pivotal role of the Arab petroleum exporting countries on the other hand.

The global oil market has witnessed a remarkable improvement in 2013, reflecting the recovery of the global economy which has been growing at slow but consistent rates. This has contributed to more stability in the global energy market.

Concerning the OAPEC member countries, the year 2013 has witnessed positive growth in various aspects of petroleum industry — related fields, starting with exploration and production and ending with downstream industries (refining and petrochemicals), which will be tackled in detail in this report. The year 2013 has also witnessed relentless efforts by the OAPEC member countries towards implementing petroleum projects to increase crude oil and natural gas production, upgrade infrastructure, while paying more attention to health, safety, and environmental projects.

The release of this report coincides with the Secretariat General's preparations to organize the 10th Arab Energy Conference under the title "Energy and Arab Cooperation", which will be held in Abu Dhabi, UAE during the period 21-23 December 2014. The conference is co-sponsored by OAPEC, the Arab Fund for Economic and Social Development (AFESD), the Arab League, and the Arab Industrial Development and Mining Organization (AIDMO), with the participation of official delegations from all Arab countries, international energy

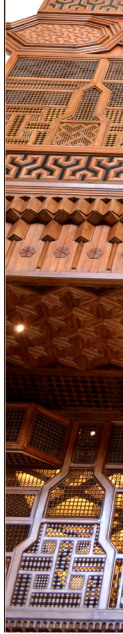
organizations, and Arab and foreign experts. The conference will discuss the developments in the industry and markets of the oil, natural gas and energy, together with environment and sustainable development issues, in addition to reviewing the aspects of cooperation between the Arab countries in the field of energy.

The report is released concurrently with the 45th anniversary of the foundation of OAPEC on 9 January 1968, which has witnessed the beginning of an important era in the joint Arab energy cooperation. During this period, OAPEC represented by the Secretariat General, has been defending the interests and gains of its member countries in various international events, in addition to encouraging the cooperation among member countries in different economic aspects of the oil industry. Moreover, it has contributed effectively in all the activities held by the specialized Arabic organizations, especially those aiming at strengthening the cooperation of Arab countries in the economic field.

The Report consists of two parts:

Part one introduces the main features of the global oil market and the main factors influencing it and their reflections on the value of OAPEC member countries oil exports. It also presents the developments of oil and energy consumption in Arab countries in general, and the OAPEC member countries in particular. This part includes also an extensive presentation of the Arab and international developments in exploration, production, reserves of energy resources, downstream industries (refining/transport/petrochemicals), and natural gas consumption and trade.

The second part covers conferences and seminars either organized or attended by OAPEC during 2013. Of the most important events were the Ministerial Council and Executive Bureau meetings, the 22nd Forum of the Fundamentals of Oil and Gas Industry, and the meetings organized by the Secretariat General at the level of the gas industry experts, and other fields. This part also reviews the economic and technical studies and reports prepared or co-authored by the organization.



The report also details the financial and administrative status of the OAPEC joint ventures which are the Arab Maritime Petroleum Transport Company (AMPTC), Arab Shipbuilding and Repair Yard Company (ASRY), Arab Petroleum Investments Corporation (APICORP), Arab Petroleum Services Company (APSCO); in addition to the Arab Petroleum Training Institute (APTI).

Finally, we hope that by releasing the new edition of the Secretary General's Annual Report, the Secretariat General would have managed to achieve its goal of providing researchers and those interested in the oil industry with a book containing a comprehensive overview of the oil developments within a whole year.

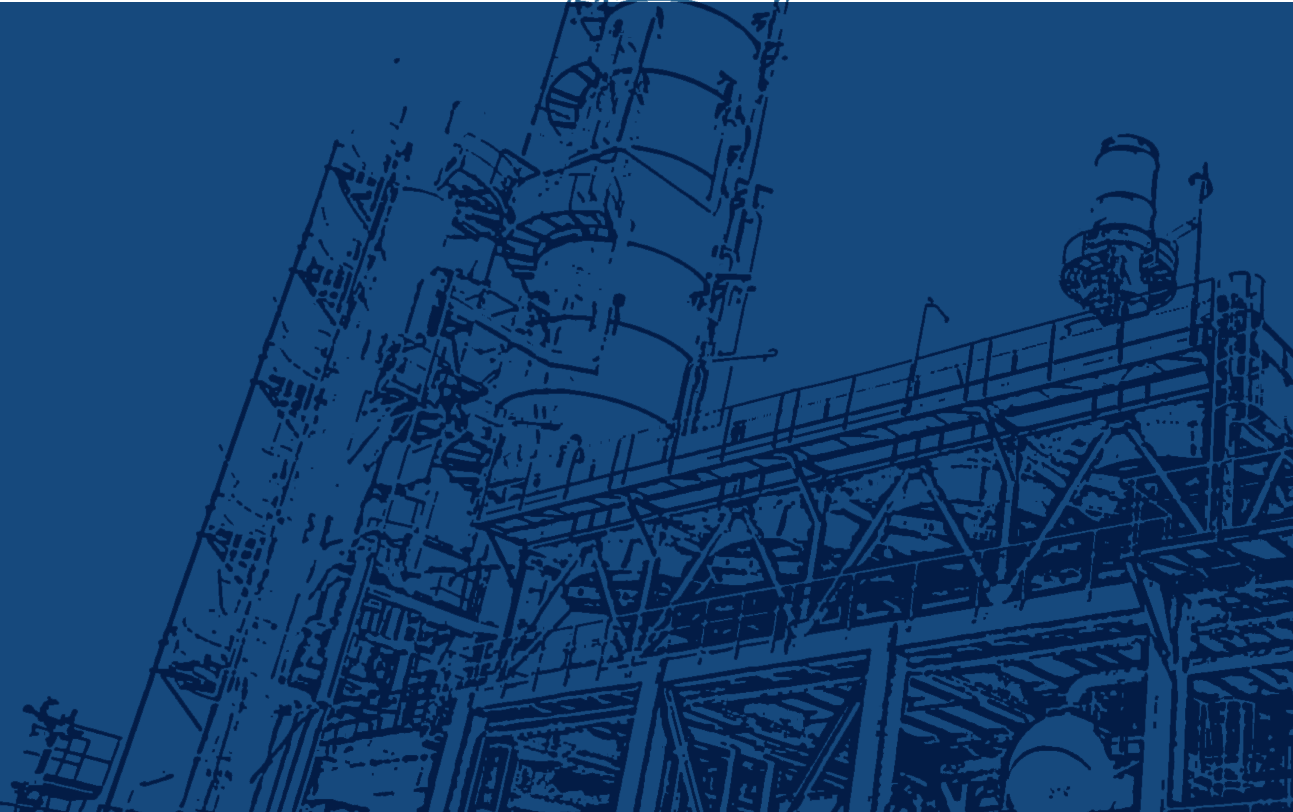
Abbas Ali Al Naqi

Secretary General



PART ONE

INTERNATIONAL DEVELOPMENTS IN OIL AND ENERGY





CHAPTER ONE



DEVELOPMENTS IN GLOBAL MARKETS AND THEIR IMPACT ON OAPEC MEMBER COUNTRIES



CHAPTER ONE

DEVELOPMENTS IN GLOBAL MARKETS AND THEIR IMPACT ON OAPEC MEMBER COUNTRIES

FOREWORD

During 2013, the international oil market has witnessed an increasing stability as a reflection of the global economic recovery which continued to grow on moderate but consistent rates. Although emerging economies experienced a slowdown, the economy of the United States was the main driver in global recovery.

High records have been noted during the year with regard to the global oil demand which reached 89.9 million b/d and supplies which reached 90.1 million b/d. In spite of the increased demand which was slightly higher than 2012, international oil prices experienced for the first time since 2009, a moderate drop with an average oil price of \$105.9 /b for OPEC crude basket, in light of the abundant supplies resulting from a rise in non-OPEC supply, mainly from North America (1.3 million b/d), simultaneously with the drop in OPEC supply to 36 million b/d for the first time since 2009.

The first chapter introduces the main features of the oil market and the main factors influencing it and their reflections on the value of the OAPEC member countries oil exports. It also presents the developments of oil and energy consumption in Arab countries in general, and the OAPEC member countries in particular.

1- THE MAJOR DEVELOPMENTS IN THE GLOBAL OIL MARKET IN 2013 AND THE FACTORS INFLUENCING THEM:

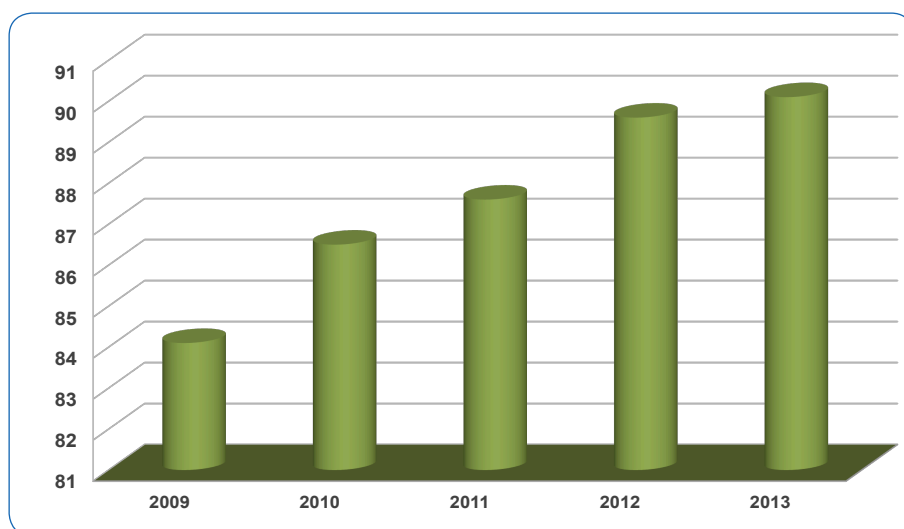
In order to shed more light on the main developments witnessed in the global oil market in 2013, the following paragraphs review in details some aspects related to the oil market. In particular the

oil supplies, the world oil demand, price trends, and fluctuations in international oil inventories, and their impact on the value of the OAPEC members' oil exports.

1. Supplies

The world oil supply (crude oil and NGLs) has witnessed in 2013 a slight increase of about 500 thousand b/d (0.6%) compared with the previous year reaching 90.1 million b/d as shown in Table (1-1) and Figure (1-1).

Figure (1-1)
World Supply of Oil and NGLs , 2009-2013
(Million b/d)



Concerning the supply development on quarterly basis, the first quarter of 2013, has witnessed a decline in world oil supply by about 200 thousand b/d compared to the last quarter of 2012, reaching about 89.9 million b/d and followed by an increase of 200 thousand b/d in the second quarter compared to the first quarter. This was followed by another increase of about 300 thousand b/d in the third quarter compared to the second quarter. Oil supplies then remained stable reaching about 90.3 million b/d during the fourth quarter.

1-1 OPEC Supplies

The rate of the OPEC countries oil supplies (crude oil and NGLs) reached nearly 36 million b/d in 2013, representing a drop of 700 thousand b/d (1.9% drop compared to 2012). This caused a drop of the OPEC share of the total global oil supplies from 41% in 2012 to about 40% in 2013 as shown in [Table \(1-1\)](#).

The OPEC oil supplies have dropped by almost 200 thousand b/d during the first quarter of the year compared to the fourth quarter of the previous year. It increased in the second quarter by 400 thousand b/d compared to the first quarter. This was followed by a drop of about 200 thousand b/d in the third quarter compared to the second quarter then by an even larger drop (of 700 thousand b/d) to reach 35.5 million b/d in the fourth quarter.

At the same time when OPEC oil supplies have dropped from about 30.2 million b/d in the first quarter of 2013 to reach about 29.6 million b/d in its fourth quarter, the OPEC's NGLs and nonconventional oil supplies have risen from 5.8 million b/d in the first quarter to 5.9 million b/d in the fourth quarter.

In light of the abundant global oil supplies, the OPEC continued to closely monitor the global oil market to produce the market needs, as part of its responsibility towards the petroleum market. This has helped to keep the market and prices stable throughout the year.

During 2013, the OPEC held two ordinary ministerial meetings to take further measures that would help stabilize the market. Following are some of the details discussed:

- The first ordinary meeting was held on 31 May 2013 at the OPEC headquarter in Vienna. The meeting discussed the oil market stances and the supply and demand projections, noting the relative steadiness of price during the first half of 2013 which indicated the adequacy of oil supply. Concerning the periodic price fluctuations they reflected the geopolitical



tensions. Accordingly, the conference decided that member countries should keep the Organization's production ceiling at current rates of 30 million b/d.

- The second ordinary meeting was held on 4 December 2013 at the OPEC headquarter in Vienna. The meeting discussed the international oil market outlook, especially the demand and supply projections for 2014. It has also studied the global economic outlook noticing the high sovereign debt in the Euro-zone, high unemployment rates in the developed countries, especially in the Euro-zone and the slow growth together with the risks of inflation in the emerging economies. However, in spite of the abundant supply, the conference decided to maintain the current production level of 30 million b/d for six months until the next meeting in June 2014 in order to maintain the equilibrium in oil market.

1-2 Non-OPEC Supplies

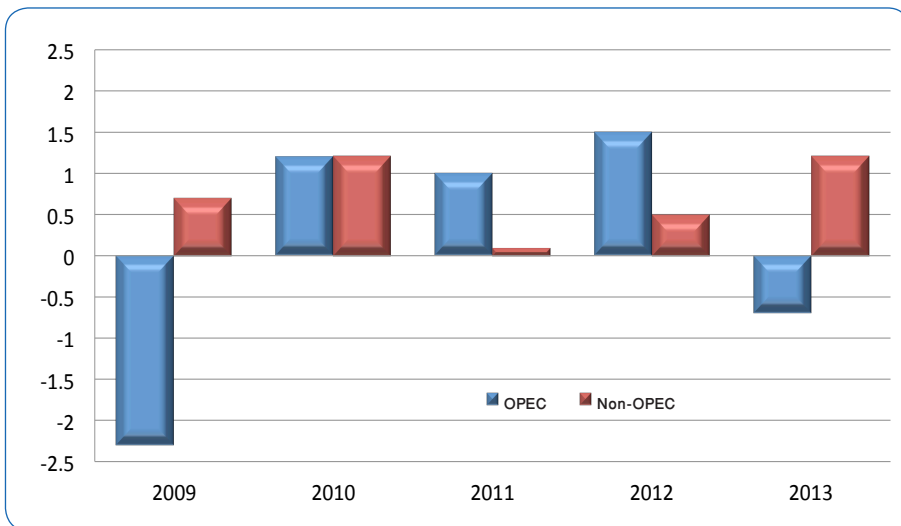
The total oil supply of Non-OPEC oil producing countries in 2013 has reached about 54.1 million b/d with an increase of 1.2m b/d, or 2.3% compared to 2012. As shown in [table \(1-1\)](#).

Moreover, in spite of the drop in production suffered by many non-OPEC countries, they have been able to achieve a net increase in production significantly countering predictions that their oil production has reached its peak.

of the greatest portion of this increase in supply the US has been the source production went up by 1.1 million b/d during 2013 compared to 2012. This has been in addition to other countries although on a lower scale, especially Canada (200 thousand b/d) and the former Soviet Union countries (140 thousand b/d). As a result, OECD countries have been able to increase their supplies significantly to exceed 22 million b/d throughout the year. As for the supply of the Developing countries, it has witnessed a drop of about 30 thousand b/d during the year.

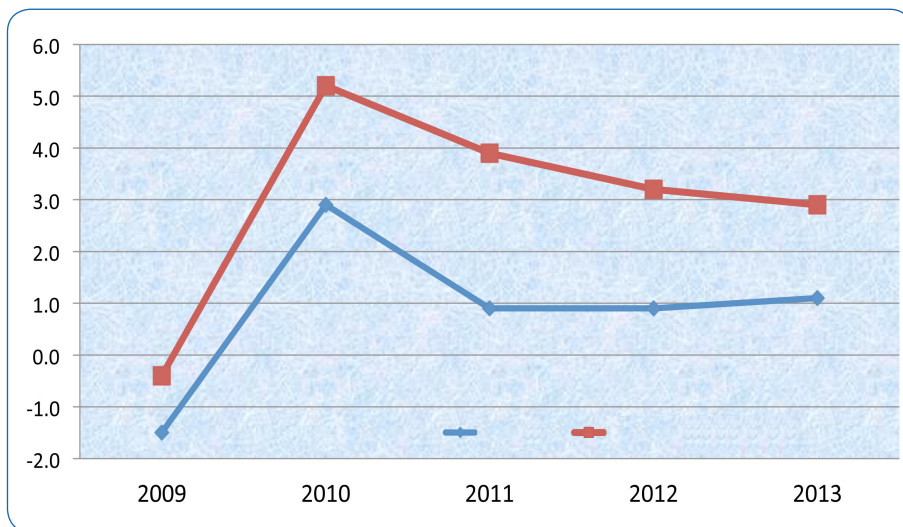
Figure (1-2) shows the rates of annual change of OPEC oil supply in addition to the Non-OPEC oil producing countries during the period 2009 to 2013.

Figure (1-2)
Annual Change in World Supplies of Crude Oil and NGLs, (2009-2013)
(Million b/d)



2. World Oil Demand

The absolute Global oil demand has increased in 2013 with 1 million b/d and with growth rates that slightly exceed the previous year influenced by the continuation of the slowdown of global economic growth. The Global economy status is an important factor affecting the global demand for oil. The relationship between economic growth and the increase in demand for oil has been represented by the impact of the persisting economic growth slowdown on demand growth rates in recent years. Figure (1-3) and table (1-2) show the annual rates of growth in world oil demand compared with world economic growth rates between 2009 and 2013.

Figure (1-3)**World Economic and Oil Demand Growth, 2009-2013****(%)**

The year 2013 has witnessed a continued slowdown in global economic growth rates and modest economic recovery owing to the high level of sovereign debt in the Euro-zone, the rise in unemployment rates in developed countries, and the risk of inflation in emerging economies. In light of this, the global economic growth in 2013 has been reconsidered to be reduced during the year by specialized international institutes especially the International Monetary Fund (IMF).

Concerning the different International groupings, the OECD countries, which account for 51% of the global oil consumption, have witnessed a decline in economic growth rates from 1.5% in 2012 to 1.2% in 2013.

Further, amongst the OECD countries, the US economy has witnessed a drop in annual growth rates from 2.8% in 2012 to 1.6% in 2013. While Japan has maintained the previous year economic

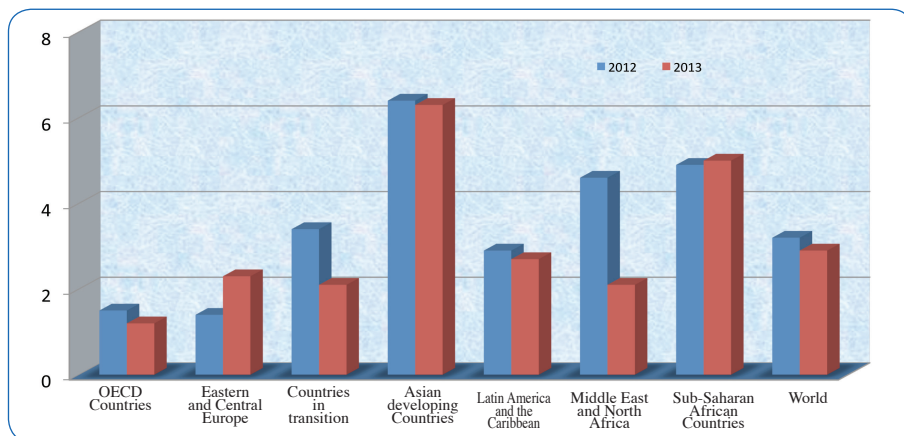
growth of 2%. On the other side the Euro zone has witnessed a relative improvement in the economic growth rates from (-0.6%) in 2012 to (-0.4%) in 2013.

Moreover, the World economic growth rate has fell slightly to reach 4.5% compared to the previous year growth rate of 4.9%. For instance, the commonwealth of Independent States (CIS) growth rate has dropped from 3.4% in 2012 to 2.1% in 2013.

With respect to the Asian developing countries, their growth rates have witnessed a slight drop throughout the year to reach 6.3% compared to 6.4% in the previous year including China which has witnessed a relative slowdown in its economic growth to reach 7.6% in 2013 compared to 7.7% in 2012.

Besides, the economic growth rates of Latin America and the Caribbean have also dropped from 2.9% in 2012 to 2.7% in 2013. Similarly, the economic growth rates in the Middle East and North Africa region (MENA) have dropped from 4.6% in 2012 to 2.1% in 2013. On the contrary, Sub-Saharan African countries have recorded a slight increase in their economic growth to reach 5% during the year compared to 4.9% in 2012 as shown in **figure (1-4)** and **table (1-3)**.

Figure (1-4)
World Economic Growth in 2012 and 2013
(%)

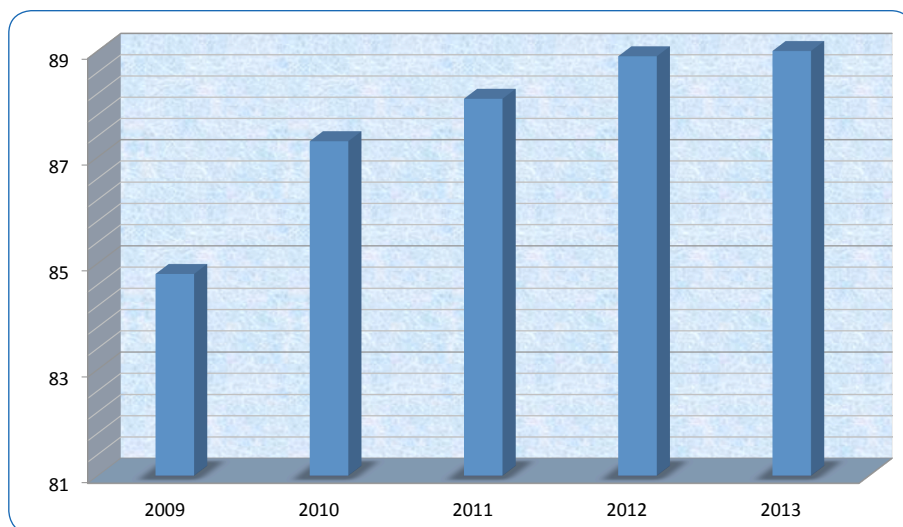


It can be noticed that the global economic slowdown in 2013 has affected oil demand growth rates. While global economic outlook has witnessed a relative improvement by the end of 2013, the total global oil demand in the fourth quarter has reached 90.9 million b/d up by 1.0 million b/d compared to the first quarter of the year and 800 thousand b/d compared to the same quarter of the previous year.

This has affected the projections of global oil demand in 2013 which were issued on a monthly basis by major international institutes, including OPEC, whose January 2013 report predicted an increase of about 0.8 million b/d in global demand for oil. However, it reviewed its projections later and increased them to 0.9 million b/d in November of the same year.

Generally, the economic growth rates, which are still relatively low, have affected the global oil demand that went up by 1 million b/d throughout the year, that's 1.1% compared to last year, as global demand has reached 89.9 million b/d in 2013, as shown in [figure \(1-5\)](#) and [table \(1-4\)](#).

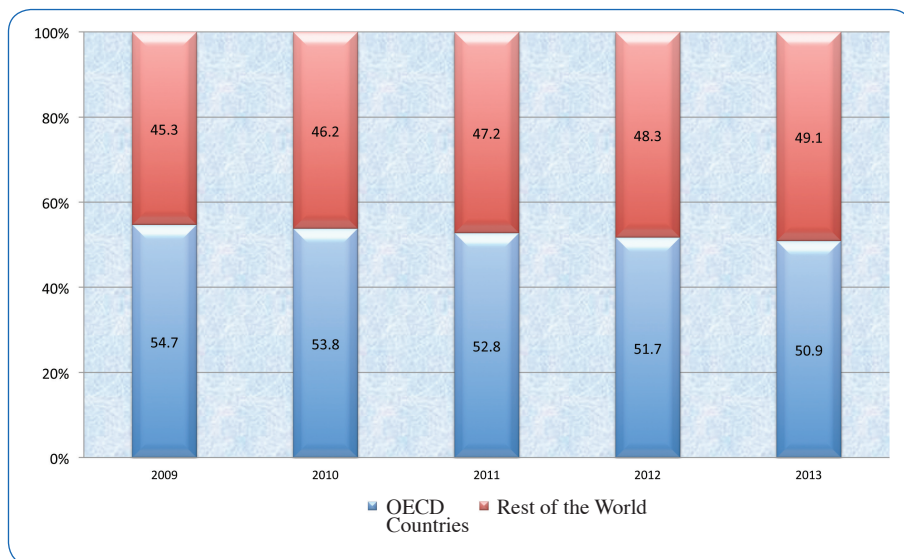
Figure (1-5)
World Oil Demand, 2009-2013
(million b/d)



Additionally, the oil demand levels have varied from one international grouping to the other. While OECD countries demand rates have dropped in 2013 by about 200 thousand b/d to reach 45.8 million b/d, they went up in other countries in the world by 1.2 million b/d compared to 2012 rates.

The change in the demand rate of every group has led to a change in their share of the global demand in 2013. The share of the OECD countries had dropped from 51.7% in 2012 to 50.9% in 2013, while the share of other countries in the world had risen from 48.3% to 49.1% as shown in **Figure (1-6)** and **Table (1-5)**:

Figure (1-6)
Distribution of World Oil Demand by Region, 2009-2013
(%)

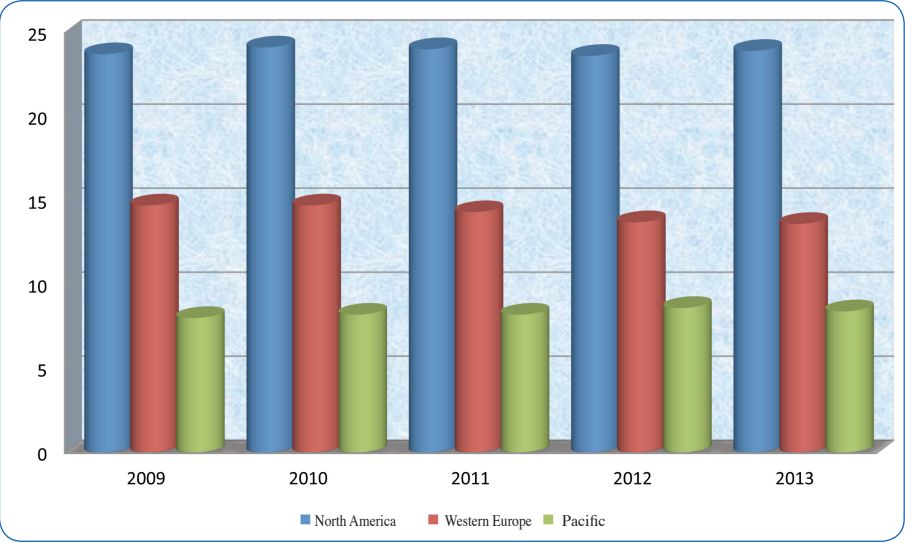


The developments in world oil demand witnessed by each of the International groups is illustrated below:

2-1 OECD Countries

The OECD countries demand for oil declined by 200 thousand b/d or (0.4%) compared to 2012 to reach 45.8 million b/d. In Western European countries demand fell by 100 thousand b/d to 13.6 million b/d throughout the year. The demand of the Asian industrial countries also fell by 200 thousand b/d to reach 8.4 million b/d. in contrast, North America demand for oil has risen by 300 thousand b/d to 23.9 million b/d, as shown in **Figure (1-7)** and **Table (1-6)**:

Figure (1-7)
OECD Demand for Oil by Region, 2009-2013
(million b/d)



The developments in the US economy are considered of the most important factors influencing the global oil consumption. Oil consumption in the USA that has reached nearly 21% of the total world consumption has become the significant and the unpredictable factor of the world oil consumption for the past few years. The US demand for oil has followed an upward trend since the beginning of 2013, especially in industrial and transport sectors. As a result of a moderate increase in the US demand for oil during the second



quarter, the demand has noticeably risen throughout the third and fourth quarters of the year because of the escalating US economic growth, the improvement in the labor market, and the high consumer confidence in the US during the second half of the year.

Concerning European industrial countries, the low oil consumption observed in the past years have prevailed. This was a result of the continuation of the sovereign debt crisis in the Euro zone that started in 2009 and aggravated in early 2011 and greatly affected the industrial European economies. In the second quarter, Europe has witnessed, for the first time since the end of 2010, a positive growth in demand for oil which resulted in reducing the drop in oil demand in addition to the stability in industrial and transport sectors in the region during the year.

As for Japan, explosion crisis of the Fukushima nuclear center in 2011 and closing down its nuclear plants has continued to influence oil demand and all aspects of the Japanese economy. However, Japan's local need for crude oil in generating power has dropped slightly during the year in light of the increasing natural gas and coal shares.

With respect to OECD countries demand for oil on a quarterly basis during 2013, OPEC projections indicate that following a drop in demand of about 400 thousand b/d during the first quarter of 2013 compared to the fourth quarter of the previous year, the second quarter has witnessed a drop of about 600 thousand b/d compared to the first quarter. this was followed by an increase of about 700 thousand b/d during the third quarter compared to the second quarter. Finally, the demand level has stabilized in the fourth quarter of the year.

2-2 Developing Countries

The Developing countries demand for oil (including China) in 2013 increased by more than 1 million b/d during 2013 compared to the previous year, reaching an unprecedented level of 39 million b/d with a growth rate of 2.9% compared to the previous year. It is

worth mentioning that developing countries demand is considered the main drive for global oil demand. Oil demand in these countries has witnessed an increase of 5.2 million b/d in 2013 compared to its level in 2009.

In the MENA region, oil demand has increased by 300 thousand b/d reaching 11.3 million b/d. The demand of Arab countries amounted to 6.5 million b/d (a share of 67% of the region's demand and 18% of the total increase in developing countries oil demand). This increase is largely attributed to the increase in OAPEC member countries consumption. As for other MENA region countries, the demand has risen by 100 thousand b/d to reach 4.8 million b/d throughout the year.

In 2013, OAPEC member countries demand for oil has risen to 5.6 million b/d compared to the previous year, with a growth rate of 3.7%. Diesel was the highest consumed product in these countries due to the increasing use in transport and industrial sectors. Demand in other Arab countries remained unchanged since the previous year level of 0.9 million b/d.

The demand of the Asian developing countries has risen by 600 thousand b/d to reach 21.2 million b/d in 2013. In spite of the slowdown of the Chinese economic growth, China accounted for 67% of the increase in Asian countries demand and 36% of the total demand of all developing countries, with an increase of 400 thousand b/d to reach 10.1 million b/d in 2013. China is the main drive for the Asian economic growth. Chinese demand accounted for more than 47% of the total Asian demand. It is worth mentioning, following its drop in the first quarter of 2013 compared to the fourth quarter of the previous year, Chinese demand for oil has increased in the second quarter but then fell in the third quarter followed by an increase in the fourth quarter. The Chinese demand for oil has been affected by a number of factors, including: the increase in the usage of LNG in petrochemicals and gasoline in the transport sector due to the rise in car sales. On the other side, the increase in demand for LNG and coal has led to a relatively low demand for diesel and fuel oil in China during the year.



As for the Indian economy, the other engine for Asian economic growth, it has experienced a rise in demand by 100 thousand b/d to reach 3.4 million b/d in 2013.

Moreover, the demand in Latin American has increased by 200 thousand b/d to reach 6.5 million b/d. This owed the increase in demand for oil in Brazil (100 thousand b/d) followed by the rest of the region with an increase of 100 thousand b/d , as shown in [Table \(1-7\)](#).

2-3 Countries in Transition*

The Oil demand in the countries in transition has maintained the previous year levels of 5.1 million b/d as shown in [Table \(1-7\)](#).

3- Price Trends

3-1 Crude oil prices

In 2013, global oil prices maintained a relatively stable level in spite of a slight drop for the first time since 2009. The monthly OPEC basket rates varied between \$101 and \$109 per barrel throughout most of the year. The average annual OPEC basket rate reached \$105.9, less by about \$3.6 per barrel (equivalent to a drop of 3% compared to 2012).

The first half of the year has witnessed a relative higher degree of price fluctuations ranging between \$101 and \$113 per barrel compared to about \$105 and \$109 per barrel in the second half of the year. As for the Quarterly oil prices, the OPEC basket price rate reached \$109.5 per barrel in the first quarter of the year up by \$2.2 per barrel (about 2%) compared to the fourth quarter of the previous year. It then dropped to \$100.9 per barrel (7.9%) in the second quarter compared to the first quarter of the year. The price then rose in the third quarter reaching \$106.9 per barrel then dropped slightly to \$106.5 per barrel in the fourth quarter.

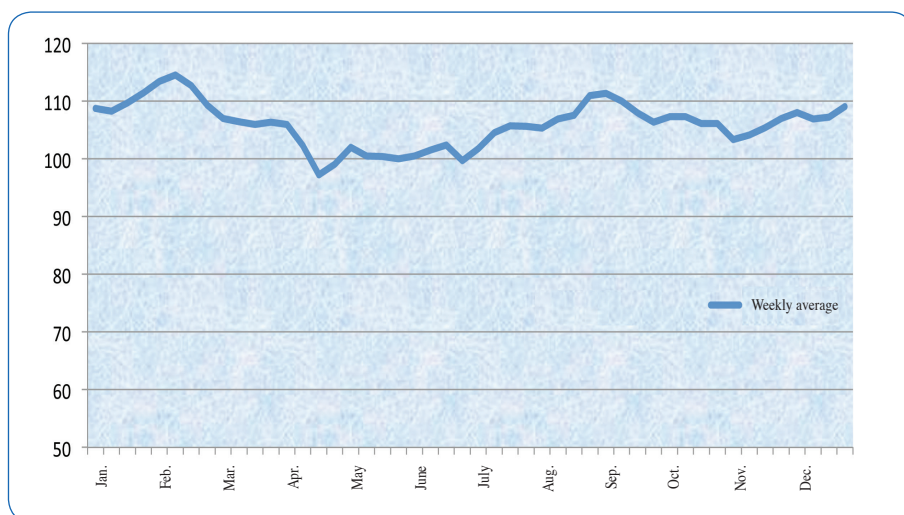
* Including the former Soviet Union and Eastern European countries that did not join the OECD .

Concerning the Monthly price rate of the OPEC basket, it reached over \$100 per barrel during 2013.

It is worth mentioning that the monthly OPEC basket rates have started the year by an increase that reached their highest level of \$113 per barrel in February after which they started falling until they reached their lowest at \$101 per barrel during the second quarter. Following that, prices started to go up until September then dropped slightly in October and November. In December, prices went up slightly again to reach \$107.7 per barrel.

As a result, 2013 witnessed a lower gap between the highest and lowest OPEC basket prices throughout the year reaching about \$12 per barrel compared to \$29 per barrel (as a difference between the highest and lowest monthly averages in 2012). **Figure (1-8)** shows the weekly chart of OPEC basket during the year.

Figure (1-8)
Weekly Movement of OPEC Basket of Crudes, 2013
(\$/ barrel)



The Global oil prices are determined usually as a result of the impact of various and intertwined factors. Some of these factors could push prices up, others might drive them down. Market fundamentals like demand and supply acquired a more significant role in 2013 compared to the past few years. The main factors that affected the oil price movement throughout the year can be listed as follows:

- The success of exploiting the non conventional oil and natural gas in the US, the resulting increase in oil production, and the increase in net oil supplies from the non OPEC group (exceeding one million barrels per day in 2013) were considered of the most important factors that resulted in abundant global oil supplies, expanding global energy production capacity, and accordingly prevented price hikes during the year.
- OPEC efforts and decisions on sustaining its production rates have had an important role in stabilizing the oil market. Some OPEC members have worked individually to compensate for the reduction observed in some other producing countries to avoid shortage in market supplies. As a result, the OPEC countries have contributed to meeting the global demand for oil and providing the global market with abundant supplies throughout the year. This has been a critical factor behind the relative stability that characterized the market during the year.
- The geopolitical developments had caused a significant reduction in production in some Arab countries in the region and some other petroleum exporting countries. However, the other producing countries that have extra production capacity have contributed to the global petroleum market stability and maintained acceptable price rates.
- The Global economic recovery, although moderate throughout the year, had a positive impact on global oil demand and a supporting factor for prices.
- The US dollar exchange rates (the currency used for oil pricing in global markets) against major currencies. For example, the



relative weakness of the dollar exchange rate against the Euro has been one of the factors behind the oil price hikes early in the year.

- Brokerages have had a relatively limited role, especially in the second half of the year, in light of the prevailing geopolitical factors and the sufficiency of global oil supplies during the year.
- Seasonal factors related to the weather. The year started relatively cold in most northern countries which affected the prices. There is a consensus that the second half of the year had witnessed a recovery in oil demand on seasonal basis too.

The year 2013 had also witnessed developments in price differences pattern. The pattern was characterized by relatively moderate expanding differences between the prices of light low sulfur oils and heavy high sulfur oils throughout the year compared to the previous year. For example, the price difference between Brent crude oil (highest quality of light oils) and Dubai oil (heavy oil) has reached \$3.1 per barrel in 2013 compared to \$2.5 per barrel last year. This applies to OPEC basket that was lower than Brent by \$2.7 per barrel during the year compared to \$2.1 per barrel the previous year.

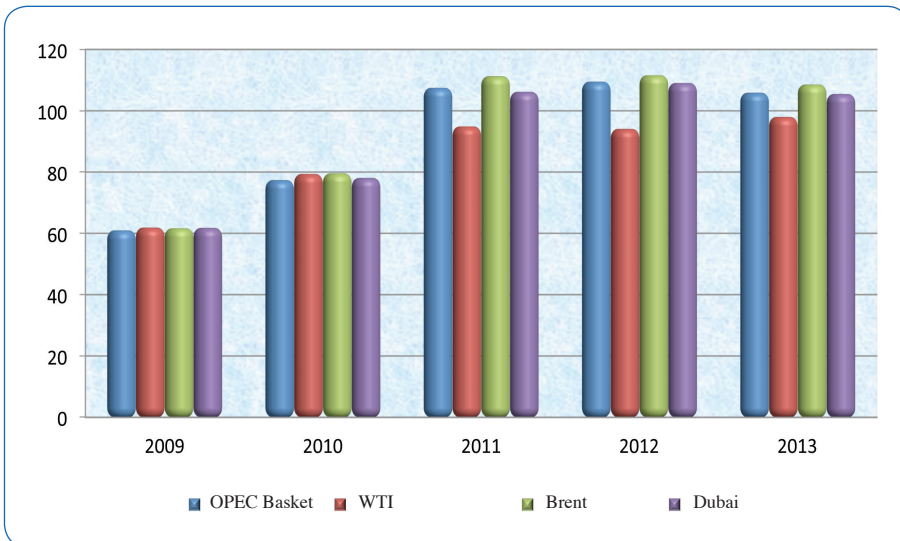
These price difference developments could be attributed greatly to the shortage in oil supplies in the global market, especially from Libya during the year, and its direct impact on Brent oil prices. In contrast to the decline in Crude oil prices around the world, West Texas crude oil price had risen up by \$4 per barrel during the year due to linking more refineries pipelines in the Gulf of Mexico and reducing the accumulation of local US oil supplies.

It is worth mentioning that West Texas crude oil, one of the main global indices of light nature and low sulfur content, has been negatively affected by logistic limitations, since 2007, especially that it is closed and isolated from other global markets. Its prices have moved in a way that was not related to the global market fundamentals. Traditionally, the price differences between West

Texas and Brent oil, similar in quality, favored West Texas. However, in 2013 these differences had reached \$10.6 per barrel compared to \$17.5 per barrel in the previous year in favor of Brent. Moreover, the high quality West Texas oil prices had been lower than other less quality oils by almost \$7.5 per barrel compared to Dubai oil and \$7.9 per barrel compared to the average OPEC basket price during the year.

Price differences can be figured out from [table \(1-9\)](#) and [figure \(1-9\)](#) showing the annual OPEC basket price rate and the main oil indices in the world (light US crude, Brent, and Dubai) from 2009 till 2013.

Figure (1-9)
Annual Average Prices of OPEC Basket, U.S Crude, Brent, and Dubai For The Period 2009 - 2013
(\$/barrel)



The evolution of prices and their pattern of differences during the year have been reflected on spot prices of all Arab crudes in general, that have followed the same course, as they fell during the year compared to the previous year and by different degrees.

The Algerian crude has fell by \$2.1 per barrel to reach \$109.4 per barrel during the year (a drop of 1.9% compared to last year). The Kuwaiti export crude has fallen by \$3.9 per barrel reaching \$105 per barrel (a drop of 3.6% compared to 2012). This has led to widening the difference between the Algerian and Kuwaiti crudes to up to \$4.4 per barrel during the year compared to \$2.6 per barrel in the previous year.

With regards to other Arab crudes, Arab light crude of Saudi Arabia has fallen by (3.4%) to reach \$106.5 per barrel, UAE Murban crude by (3.2%) reaching \$108.2 per barrel, Libyan Sidra (3.3%) reaching \$108.5 per barrel, Qatar marine crude and Iraqi Basra by (3.7%) and (4.1%) reaching \$105.3 and \$103.6 per barrel respectively during the year. As shown on table (1-9).

It is clear that the fall of nominal crude oil price, which reached \$3.6 per barrel, has been slightly lower than the fall in its real price calculated using the year 2000 as a base year after amending it according to the index number that represents the Gross Domestic Product deflator in industrial countries, as it fell by \$4 per barrel (less than 4.4%) reaching an average of \$86 per barrel in 2013 as shown in table (1-10).

3-2 Spot Prices for Oil Products

In 2013, there has been a decline in the annual average price of various oil products in all major markets around the world and by different percentages according to the market and product type.

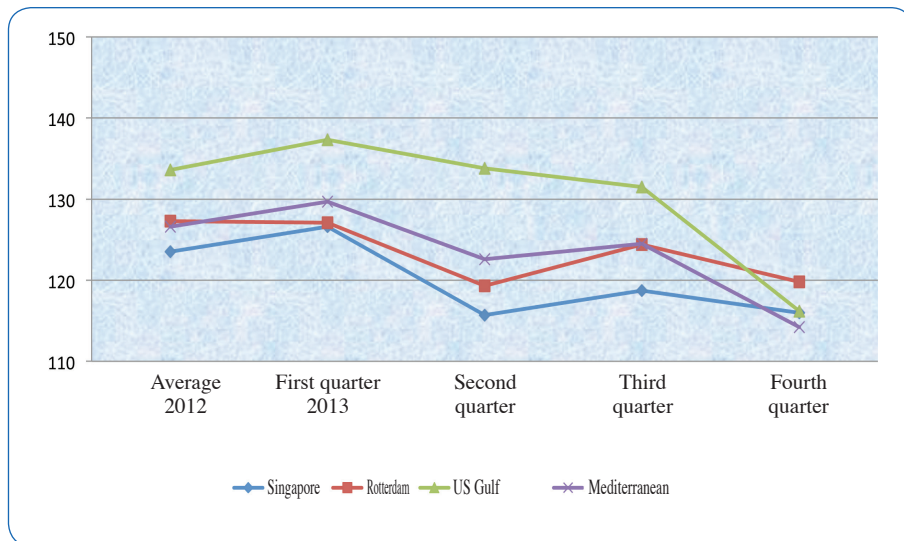
3-2-1 The prices of premium gasoline

In 2013, the price rate of gasoline in the US Gulf has reached \$129.7 per barrel, that is, \$3.9 lower representing 2.9% compared to the 2012 price rates. In the Mediterranean market, the price rate has reached \$122.8 per barrel during the year with a drop of \$3.8 per barrel. representing a drop of 3% compared to the previous year. The price rate in Rotterdam market has reached \$122.7 per barrel during the year with a drop of \$4.6 per barrel (3.6% when compared to 2012). As for the Singapore market, the price rate has reached \$119.3

per barrel in 2013, with a drop of \$4.2 per barrel (3.4% drop when compared to 2012 prices).

The US market has achieved the highest prices among the four markets in 2013, followed by the Mediterranean, then Rotterdam, and finally Singapore that recorded the lowest prices as shown in [table \(1-11\)](#) and [figure \(1-10\)](#).

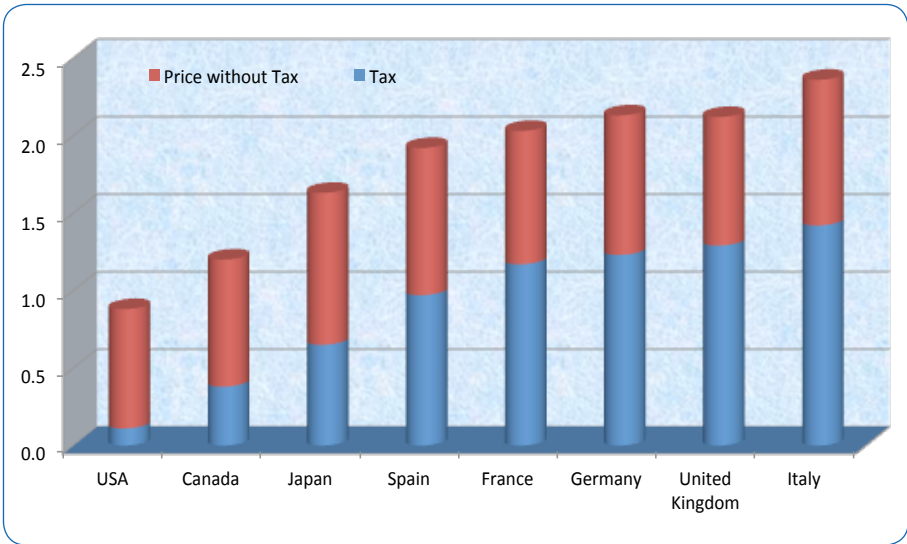
Figure (1-10)
Premium Gasoline Prices, 2012-2013
(\$/barrel)



When comparing the final price in some major industrial countries, it can be noted that it is lowest in the US market due to the low taxation in that market. Such taxes represented about 12.5% of the gasoline net price in October 2013 compared to 31.8% in Canada, 39.7% in Japan, 50.3% in Spain, and more than 57% in some other European countries (France 57.6%, Germany 57.8%, Italy 60.2%, UK 60.7%) during the same period as shown in [table \(1-12\)](#) and [figure \(1-11\)](#).

Figure (1-11)

Gasoline Prices in some OECD Countries, October 2013
(\$/Liter)



3-2-2 Gasoil/ Diesel prices

The absolute price levels of the Gasoil price in 2013, whether in Rotterdam or Singapore, had surpassed gasoline and fuel oil due to the continuous demand for the product in summer as well as winter, especially in transport, heating, cooling and power generating sectors in some countries like China. The Singapore market had claimed the highest prices reaching \$124.8 per barrel in 2013, with a drop of 3.2% compared to 2012, followed by Rotterdam with a price rate of \$124 per barrel with a drop of 5.1%, then the US Gulf market with a price rate of \$121.8 per barrel, with a drop of 3.3%. Finally, the Mediterranean market followed with the lowest price of \$113.1 per barrel in 2013, with a drop of 0.1% compared to the previous year.

3-2-3 Fuel Oil Prices

The Fuel oil prices have dropped in all markets in 2013. In Singapore, the fuel oil price rate has reached \$97.6 per barrel with a



drop of 7.4% compared to 2012. In the US, the price rate has reached \$99.7 per barrel with a drop of 5.3% compared to the previous year. In Rotterdam, it has reached \$95.9 per barrel with a drop of 8.7% compared to 2012. In the Mediterranean market, the price has reached \$97.2 per barrel with a drop of 6.4% compared to the year before.

3-3 Oil Freight Rates

Crude oil freight rates had witnessed a sharp decline in 2013 compared with their 2012 levels. This was mainly attributed to the global economic growth slowdown. In addition, some of the non-OPEC countries, especially the United States, and to a lesser degree Canada, experienced an increase in domestic oil production which resulted in lower US oil imports and thus a decrease in the demand for tankers simultaneously with an increase in tankers fleet capacity around the world of 25% between 2008 and 2012. This resulted in a disequilibrium between demand and supply for tankers, which pushed freight prices down.

In 2013, the freight price rate for oil shipments from Arabian Gulf ports to the East using big size tankers -VLCCs (230 -280 thousand deadweight tons (dwt)) was 41 points on the World Scale (WS)¹. This was 7 points, or 15%, lower than in 2012.

As for the freight price rates for shipments from Arabian Gulf ports to the West, with a capacity of 270 -285 thousand dwt, averaged 26 points on the WS in 2013 which was 7 points, or about 21% lower than in 2012, as shown in [Table \(1-13\)](#).

In the Mediterranean region there was a similar decrease in freight rates for small and medium-sized tankers (80 -85 thousand dwt). The average freight rate in 2013 was 80 WS points, which was 8 points, or about 9%, lower than in 2012.

¹ World Scale is a method for calculating freight prices. One point on the WS means 1% of the freight price index for the direction in the WS book, which is published annually by the World Scale Association, and contains a list of prices in the form of dollars per ton, representing "World Scale 100" for all the major routes in the world.

It is worth mentioning that the freight rates from the middle East to all directions had started the year 2013 with a decline compared with the end of 2012. This owed to the increase in the rates of world scale reference for freight rates which were effective for the year 2013 as a result of the higher tanker fuel prices. Other reasons included the oversupply of tankers, improved weather conditions, and weak demand for transportation.

In February 2013, crude oil freight rates using big size tankers from the Arabian Gulf ports to the East and West recorded the lowest level, averaging 33 WS points and 20 WS points, respectively. This was followed by ups and downs during the rest of the year.

As for the East direction, crude oil freight rates have slightly risen to reach 35 WS points in March then dropped again to their lowest February rates mentioned above. This trend was repeated in the second half of the year, as freight prices hit the lowest level of 33 WS points in August due to low demand for tankers following a rise in freight prices three months prior to that. This was followed by an increase in freight price to the mentioned destination reaching their highest level of 63 WS points in December due to the high demand in winter and the increasing demand from Asian countries.

Crude oil freight rates from the Arabian Gulf ports to the West destination were fixed at their lowest level for three months till April, because of the decline in oil demand due to the season of annual refinery maintenance work in Europe and the US. They then started to go up and down reaching their highest level at the end of the year of 39 WS points.

As for the Mediterranean destination, the freight rates started the year 2013 with a decline compared with 2012. After that they rose to reach 88 WS points in March and then they began to fluctuate up and down till reaching their lowest level of 70 WS points in October and their highest level of 107 WS points in December.

4. Global Oil Inventories

The year 2013 witnessed an increase in total world oil inventories (commercial and strategic) by the end of the fourth quarter of 2013,

reaching 7822 million barrels, representing an increase of 796 million barrels, or 11% compared with the similar quarter of previous year. Moreover, the crude oil stocks at sea totaled 990 million barrels by the end of 2013 with an increase of 28 million barrel compared with 2012.

4-1 OECD Commercial Inventories

After the commercial inventories in OECD countries reached 2663 million barrels in the first quarter of 2013, it declined by 13 million barrels by the end of the second quarter of the year to reach 2650 million barrels. It then decline even further in the third quarter by 6 million barrels. This was followed by another larger decline of 41 million barrels amounting to 2603 million barrels in the fourth quarter.

It is worth noting that OECD commercial inventories level of forward consumption has reached a level of 55 days, which is slightly lower than previous year level but still higher than the usual average.

4-2 US Strategic Petroleum Reserve

The US Strategic Petroleum Reserve has exceed the 700 million barrel level for the first time in 2008, then it started to decline below that level since the third quarter of 2011 to reach 696 million barrels and till the fourth quarter of 2013. The decline in the U.S. strategic reserve was due to the decision taken by International Energy Agency in June 2011 to allow countries withdraw 60 million barrels from the strategic reserves of members.

Since 2004, the US Administration has adopted a more flexible attitude toward releasing quantities of the strategic reserve to compensate for any shortage of supply. This gave a commercial aspect to the strategic reserve than the previous policies, which regarded the strategic reserve as a last resort to be used only at times of major crises.

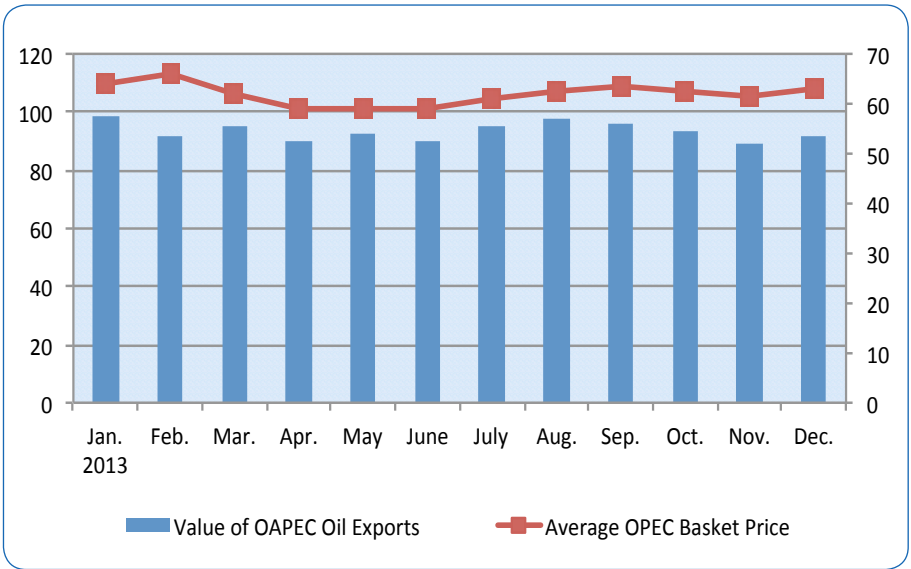


2- OIL EXPORTS VALUE OF OAPEC MEMBER COUNTRIES

The oil price rates in 2013 were reflected on the value of oil exports, that are the main engine of social and economic development in the oil producing Arab Countries, the mainstay of their central bank reserves of foreign currency, and the main source of their budget surpluses.

The monthly data on the movement of oil prices and the estimated monthly value of OAPEC member countries oil exports can give a clearer picture of the positive effects of the price movement during the year, as shown in **Figure (1-12)**.

Figure 1-12
Monthly Oil Prices and Value of OAPEC Oil Exports,
January-December 2013
(\$/b)



A year-on-year comparison shows that the value of the OAPEC members' oil exports went down from \$702.6 billion in 2012 to \$654.3 billion in 2013 due to a drop in price and production levels during the year. This represents a decline of \$48.3 billion or 6.9%. An



analysis of individual member countries shows that, apart from the United Arab Emirates whose revenues went up slightly by 1%, other countries' revenues values have dropped during the year. The decline varied from one country to another; Libya achieved the lowest level of revenues due to the huge decline in its production of about 34% compared with the previous year as a result of its security situation. The People's Democratic Republic of Algeria and the State of Qatar came next with a decline of 14% each, Saudi Arabia 7.2%, Arab Republic of Egypt 3.8%, the State of Kuwait 2.7%, the Republic of Iraq 2.4, and the Kingdom of Bahrain with a drop of less than 1%.

The value of crude oil exports for member countries measured by real prices for the year 2000, and after being adjusted according to the GDP deflator in OECD countries, has decreased from \$579.5 billion in 2012 to \$533.2 billion in 2013, representing a decline of 8%, as shown in [table \(1-16\)](#).

3- DEVELOPMENTS IN OIL AND ENERGY CONSUMPTION IN THE ARAB COUNTRIES

This section highlights energy consumption in the Arab countries during the period 2010-2013. It reviews the energy consumption of the Arab countries as in general and the OAPEC member countries in particular, depending on the data available for each.

1. Arab Countries

1-1 Total and Per Capita Energy Consumption

1-2 Energy Consumption by Source

During the past two years, Arab countries have witnessed relatively high levels of growth in energy consumption. It reached 4.3% in 2012 and 4.9% in 2013 compared to 0.4% in 2011. The energy consumption in the Arab countries has increased annually by 3.2% during the period from 2010 to 2013. It rose from 12.8 million barrels of oil equivalent per day in 2010 to 14.1 million barrels of oil equivalent per day in 2013.

There are three basic variables that affect energy consumption in the Arab countries: GDP, population, and energy prices. However, the main factor, if not the only one, that has been behind the increase in energy consumption in the past three years was the increase in the GDP. Population increase comes second with regards to its impact on Arab energy consumption. As for energy prices in local markets, Arab countries have avoided raising energy prices in the past years. The following sections highlight the development of the three variables.

1- GDP: The data published in the Joint Arab Economic Report for 2013 indicated that the GDP at current prices in Arab countries has tangibly risen significantly during the period 2010 to 2012 (from 17.1% in 2010 to 18% in 2011 and declined in 2012 reaching 9.4%).

Arab countries vary widely when looking at the GDP growth rates. OAPEC GDP at current prices has risen averaging 18.4% in 2010, 20.1% in 2011, and has fallen to 10.1% in 2012. Other Arab countries witnessed a rise in their GDP of 10.2% in 2010 but fell to 6.2% in 2011, and then 5.3% in 2012.

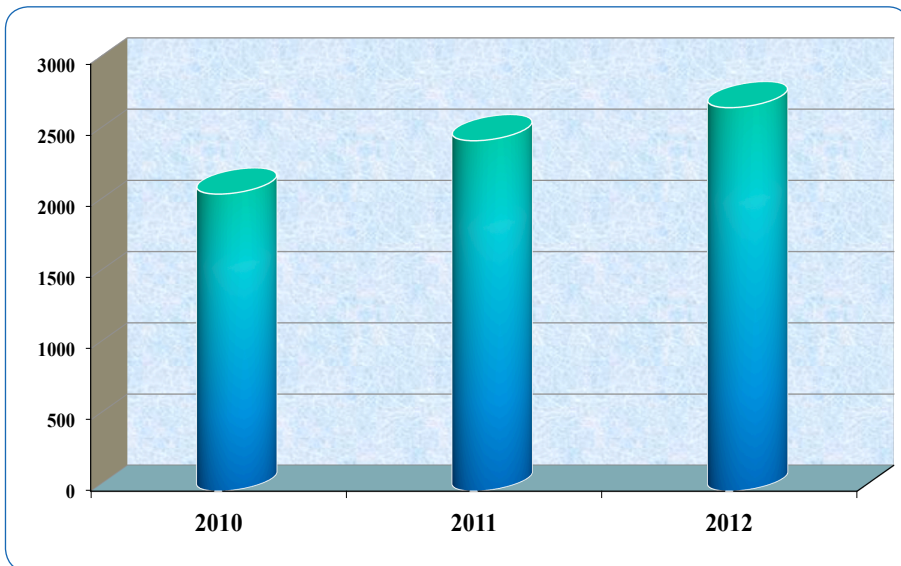
The GDP at current prices in all Arab countries has risen from \$2.1 trillion in 2010 to about \$2.7 trillion in 2012. OAPEC member countries' GDP has risen from \$1765 billion in 2010 to about \$2334 billion in 2012. In the other Arab countries, GDP has risen from \$320 to about \$358 billion during the same period. These discrepancies in GDP growth levels and their values are directly correlated with the developments in petroleum revenues and growth rates that are in turn affected by changes in the international petroleum market due to the international economic and geopolitical developments.

The data published in the Joint Arab Economic Report for 2013 showed that the Libyan economy started to recover as GDP has doubled at constant prices in Libya in 2012. Besides, Iraq, Kuwait, Saudi Arabia, and Qatar have had moderate GDP growth rates at constant prices in 2012 reaching 8.3% in Iraq, 7.9% in Kuwait, 6.8% in KSA, and 6.2% in Qatar. As for the other OAPEC member countries, the GDP growth rates at constant prices in 2012 have reached 2.2%

in Egypt, 2.4% in Algeria, and 3.4% in UAE. However, the Syrian GDP has dramatically deteriorated and shrank by 18.8% in 2012.

Figure 1-13 shows the development of the GDP at current prices in the Arab countries, 2010-2012.

Figure 1-13
GPD at Current Prices in Arab Countries, 2010-2012
(\$ billion)



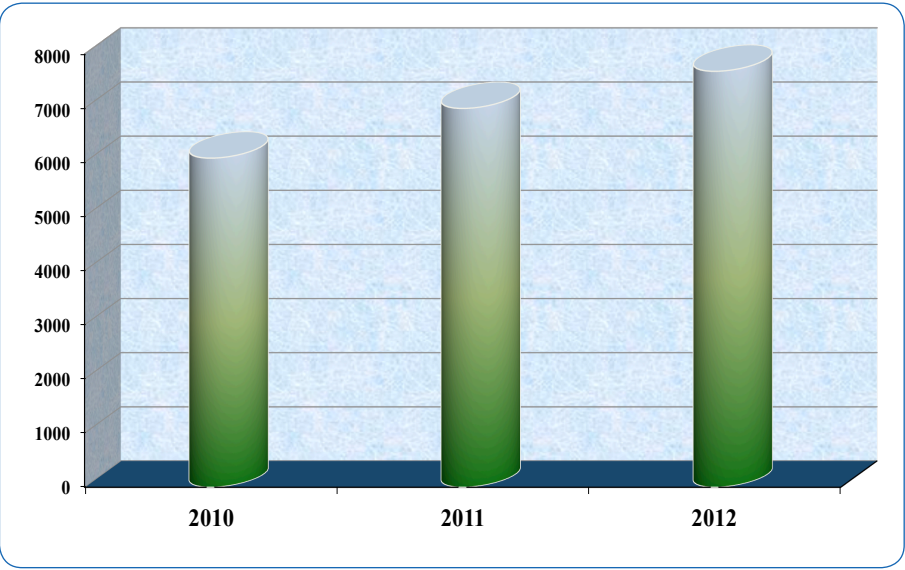
As for the average per capita GDP at current prices in Arab countries, it has risen by 9.8% in 2012 to reach \$7682 compared to \$6996 in 2011. There were eight countries where the per capita GDP had exceeded the overall average for the Arab countries, namely, Qatar (\$107427), Kuwait (\$47930), the United Arab Emirates (\$45461), Saudi Arabia (\$24912), Bahrain (\$24705), Oman (\$21560), Lebanon (\$10541), and Libya (\$10041).

The Arab countries whose per capita GDP did not exceed the average of the Arab countries fall into two groups. The first group comprises countries with a per capita GDP more than \$30000 but below the Arab countries' average. They were six countries: Iraq

(\$5545), Algeria (\$5509), Jordan (\$4850), Tunisia (\$4238), Egypt (\$3119), and Morocco (\$3030).

The second group includes countries whose per capita GDP fell below \$3000. They were six countries: Syria (\$2390), Sudan (\$1943), Djibouti (\$1382), Yemen (\$1382), Mauritania (\$1189), and Comoros (\$788). **Figure (1-14).**

Figure 1-14
Average GDP Per Capita of Arab Countries, 2010-2012
(\$)



2- Population: The Number of population in the Arab countries during 2010-2013 has increased by the rate of 1.5% during the period 2010 - 2013, where it increased from 352.1 million in 2010 to about 360.5 million in 2013.

3- Prices: The available data the prices of petroleum products in the domestic markets of the OAPEC member countries in 2013 showed that these prices remained at their 2012 level, except for Egypt that raised gasoline, kerosene, gasoil/diesel and LNG prices. As for the other Arab countries, the Jordan's Energy and Mineral

Resources Ministry has announced recently new prices for petroleum products effective in the domestic market as of February 2014. As shown in the following table:

the price list for petroleum products in the Jordan domestic market as of 1 February 2014

Product	Unit	Price
gasoline 90	Fils/Liter	820
gasoline 95	Fils/Liter	1000
(Gasoil (solar	Fils/Liter	670
Gas	Fils/Liter	670
(LNG (12.5kg cylinder (Domestic and restaurants use)	Dinar/Cylinder	10
(LNG (50kg cylinder	Dinar/Cylinder	52.36
(Bulk LNG (for central distribution		1006.29
(Bulk LNG (by tanks	Dinar/Ton	1047.29
Fuel Oil for Industry	Dinar/Ton	475.24
Jet Fuel –Local Companies	Fils/Liter	608
Jet Fuel – Foreign Companies	Fils/Liter	613
Jet Fuel – for emergency flights	Fils/Liter	628
Fuel oil for ships	Dinar/Ton	475.24
Gasoil (solar) for ships	Fils/Liter	670
Asphalt	Dinar/Ton	509.1

Arab countries depend, almost entirely, on their petroleum resources (oil and natural gas) to meet local energy demands. These resources contributed by about 98.5% of the total energy consumption of Arab countries in 2013. This was almost the same share of 2010, with a slight change; as the share of natural gas has rose from 50.7% in 2010 to 52.2% in 2013, while the oil share declined from 47.8% in 2010 to 46.3% primarily due to the substitution policy at the electricity power generating plants. Hydroelectric and coal energies together

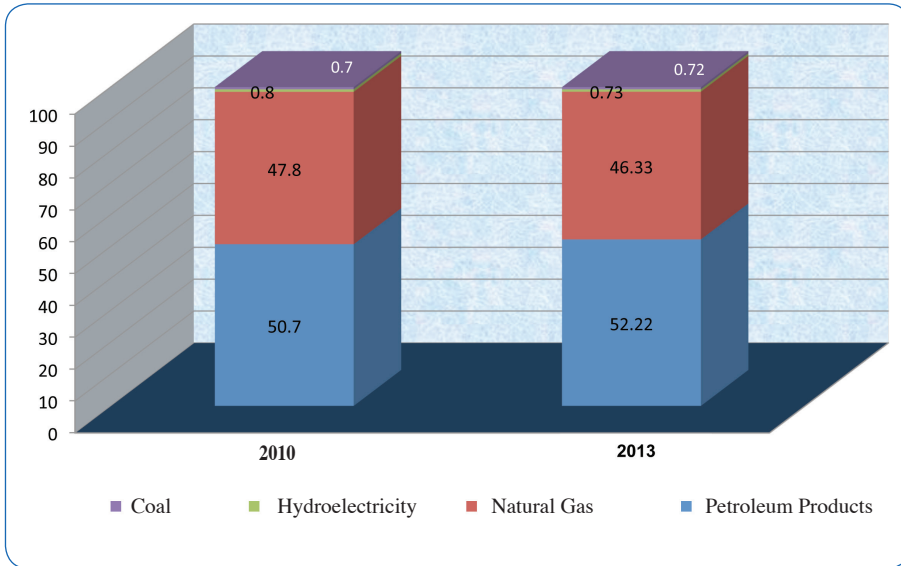
constitute no more than 1.5% of the total energy consumption in the Arab countries in 2013.

It is observed that the energy consumption in Arab countries has resumed increasing significantly since 2012. The consumption rates have increased by 4.3% reaching about 13.4 boe/d. Preliminary estimates indicated that energy consumption in Arab countries has gone up again in 2013 at a rate of 4.9% as total energy consumption reached 14.1 million oil boe/d.

The energy consumption growth rates in 2013 in the OAPEC member countries were close to other Arab countries. The energy consumption has increased by 5% in the OAPEC countries compared to 4.9% in other Arab countries. The overall energy consumption has reached about 12.7 million boe/d in member countries and 1.4 boe/d in the rest of the Arab countries.

The Arab countries vary in their use of primary energy sources to meet their energy needs. For instance, the natural gas has played a major role in OAPEC member countries, where its share reached 55.2% of the total energy consumption in 2013. This share was only 25.6% in the other Arab countries. The case is different regarding the share of oil in meeting energy needs. In the non-OAPEC Arab countries, oil constituted nearly two thirds (66.2%) of the total energy consumption in these countries, compared to 44.1% in member countries in 2013. Hydroelectricity and coal together play a secondary role in the non-OAPEC Arab countries. Together, they met about 8.1% of the total energy consumption in these countries and only a meager share of 0.7% in member countries in 2013. **Figure (1-15)** and **table (1-17)**.

Figure 1-15
Energy Consumption Structure in the Arab Countries, 2010-2013
(%)



The share of the OAPEC Member countries reached 90% of total energy consumption in Arab countries compared to 10% for other Arab countries in 2013. The disparity in energy consumption could be attributed to three main variables: differences in available petroleum reserves, disparity in the size and composition of GDP, and the number of population.

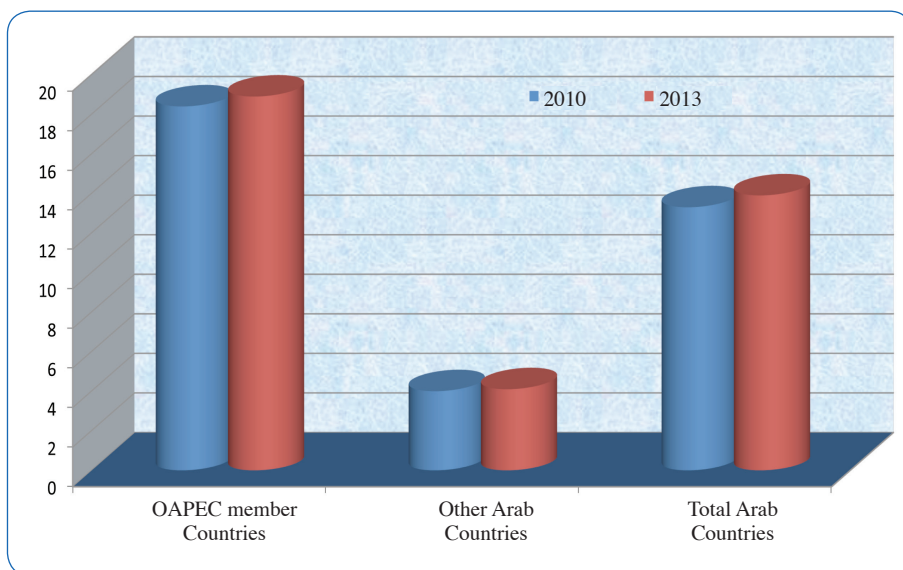
- **Oil and natural gas reserves:** The OAPEC member countries alone have possessed about 98.6% of total proven crude oil reserves and 97.2% of total proven natural gas reserves in 2013.
- **GDP:** The GDP of the OAPEC member countries accounted for about 86.7% of the total Arab countries GDP in 2012.
- **Total population:** The OAPEC member countries embrace about two thirds (66.3%) of the total population in the Arab World, while the Other Arab countries embraced the remaining one third (33.7%) in 2013.

This difference in the three major variables was the case of disparity of the average per capita energy consumption rates in the Arab countries, whether when comparing the OAPEC member countries or the other Arab countries, or within the member countries themselves. The per capita energy consumption average has increased as a whole by 1.5% per year for the period 2010 - 2013 from 13.3 boe/d in 2010 to 13.9 boe/d in 2013. The average per capita consumption rates for the OAPEC member countries have increased from 18.4 boe/d in 2010 to 18.9 boe/d in 2013. This average has increased in the rest of the Arab countries from 4 boe/d to 4.1 boe/d for the same period.

Figure (1-16) and Table (1-18) show the per capita energy consumption of the Arab countries in 2010 and 2013.

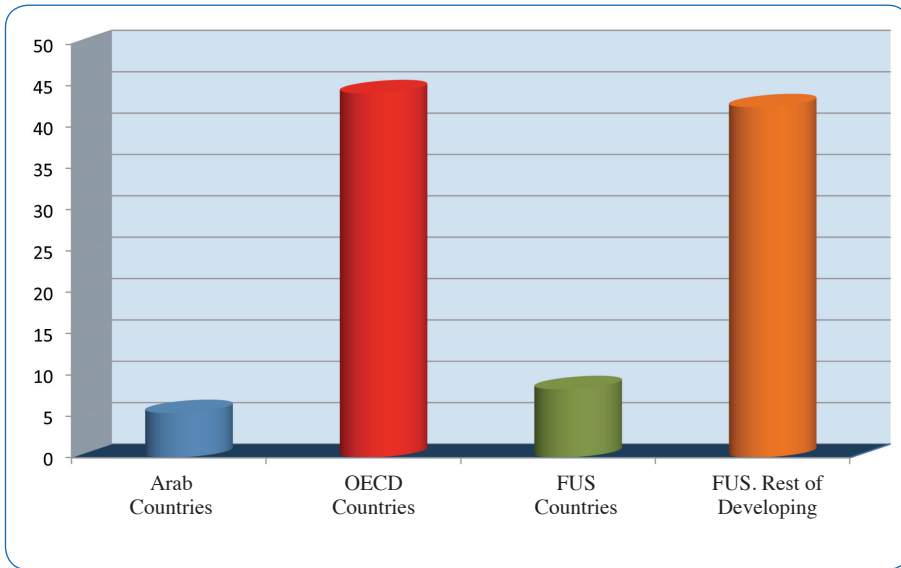
Figure 1-16

**Per Capita Energy Consumption in the Arab Countries, 2010 and 2013
(boe/year)**



The Arab countries share of the world total energy consumption in 2012 was 5.4%, while that of the OECD countries was 44%, the developing countries 42.3%, and the FSU countries 8.3%, as shown in Figure (1-17).

Figure 1-17
Energy Consumption in Arab Countries and the World, 2012
(%)



1-2-1 Natural Gas

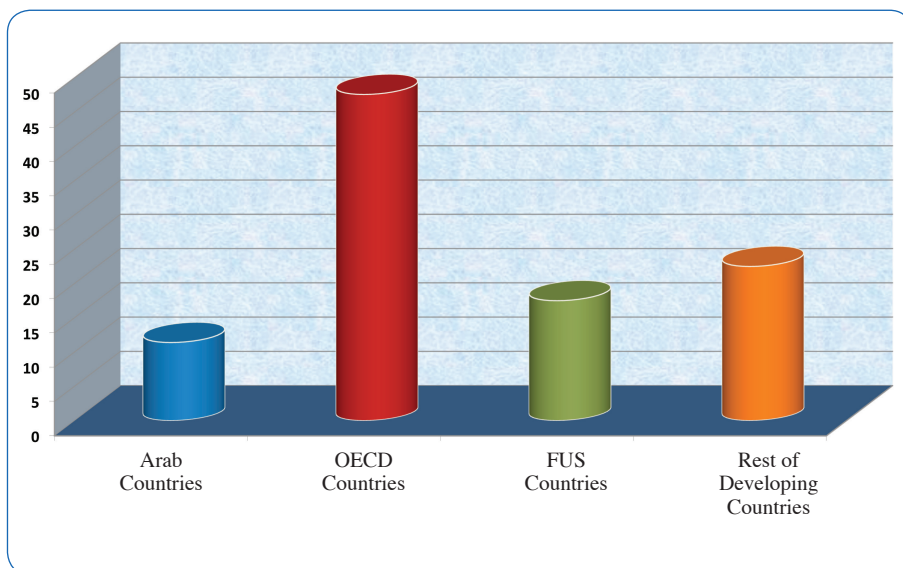
Many Arab countries, with high energy consumption, have increased their dependence on natural gas in fulfilling their growing energy needs. This has boosted the relative importance of natural gas in Arab countries during the period 2010-2013. Natural gas consumption has risen by 4.2% per year from 2010 to 2013, accounting for 7.4 million boe/d in 2013 compared to 6.5 boe/d in 2010. Due to the rise in natural gas consumption rates which exceeded energy consumption rates for the same period, the relative importance of natural gas in the total energy consumption in Arab countries has increased from 50.7% in 2010 to 52.2% in 2013.

The OAPEEC member countries accounted for 95.1% of the total consumption of natural gas in Arab countries in 2013. By classifying them according to the degree of reliance on natural gas to fulfill their energy needs, there will be two categories. The first depended heavily on natural gas in meeting over 50% of their energy requirements

in 2013; including: Qatar, Bahrain, the UAE, Algeria, Egypt and Libya. The second included countries that depend on natural gas to meet less than 50% of their energy needs; including: Kuwait, Saudi Arabia, Tunisia, Syria, and Iraq.

The Arab countries accounted for 11.4% of the total world consumption of natural gas in 2012, the OECD countries accounted for 47.6%, the developing countries 22.5%, and the FSU countries 17.5%, as shown in Figure (1-18).

Figure 1-18
Natural Gas Consumption in the Arab Countries and the World, 2012
(%)



1-2-2 Petroleum Products

Following the decline in the consumption of petroleum products in the Arab countries to 0.8% in 2011, consumption grew again rapidly as of 2012. This rate has reached 2.5% in 2012 and 3.1% in 2013. Petroleum products annual growth rate in Arab countries reached 2.1% during the period from 2010 to 2013. Therefore, petroleum products consumption in the Arab countries has increased from 6.1 million boe/d in 2010 to 6.5 million boe/d in 2013.

The relative importance of the Petroleum products in the energy balance has retreated gradually in Arab countries during the period from 2010 to 2013, as their share shrank from 47.8% in 2010 to 46.3% in 2013. The OAPEC member countries have consumed 85.5% of the total consumption of petroleum products in Arab countries in 2013 compared to 14.2% in other Arab countries whose annual consumption rose by no more than 1.2% (from 898 thousand boe/d in 2010 to 930 thousand boe/d to in 2013).

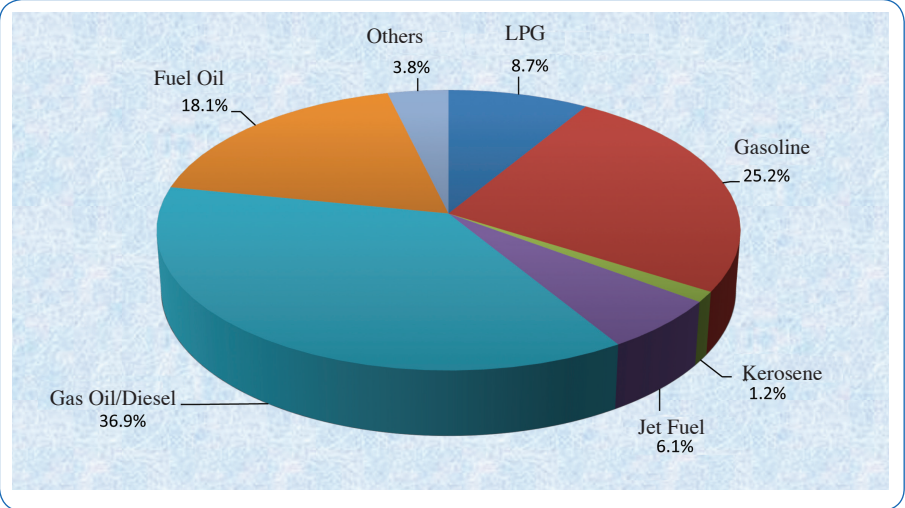
The consumption of petroleum products in the Arab countries in 2013 was distributed as follows:

- Gasoil/diesel: 36.9%
- Gasoline: 25.2%
- Fuel oil: 18.1%
- LPG: 8.7%
- Jet fuel: 6.1%
- Kerosene: 1.2%
- Other products: 3.8%

Figure (1-19) shows the relative distribution of petroleum products consumption in the Arab countries.

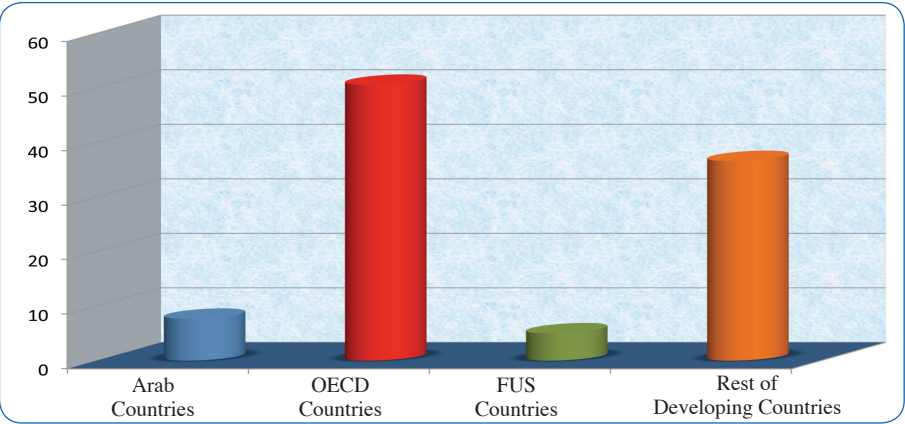


Figure 1-19
The Relative Distribution of Petroleum Product Consumption
in the Arab Countries, 2013
(%)



The Arab countries accounted for 7.7% of world oil consumption in 2012, while the OECD countries acquired 50.6%, the developing countries 36.6%, and FSU countries 5%, as shown in **Figure (1-20)**.

Figure 1-20
Oil Consumption in the Arab Countries and the World, 2012
(%)





1-2-3 Hydroelectricity

Because Arab countries suffer from scarcity of waterfalls, so the hydroelectric power accounted for only 0.7% of the total Arab countries energy consumption in 2013. Egypt is the only country with slight consumption of the hydroelectric power, reaching 60 thousand boe/d in 2013 or 87.5% of the total Arab countries consumption and was estimated to reach 68,600 boe/d in 2013. Very insignificant amounts are consumed in Syria, Tunisia, and Algeria.

The Arab countries consumed 0.6% of the total world consumption of hydroelectricity in 2012; 54.8% in the developing countries, 38% in the OECD countries and 6.6% in the FSU countries.

1-2-4 Coal

Coal consumption can be found on a very small scale in a few Arab countries, namely Egypt and Algeria, in addition to insignificant amounts in Syria. Total coal consumption in 2013 was estimated at 15 thousand boe/d in Egypt, and 7 thousand boe/d in Algeria.

The Arab countries accounted for less than 0.2% of the total world coal consumption in 2012, while developing countries accounted for 66.8%, the OECD countries for 28.2%, and the FSU countries for 4.8%.

2- Total Energy Consumption in OAPEC Member Countries

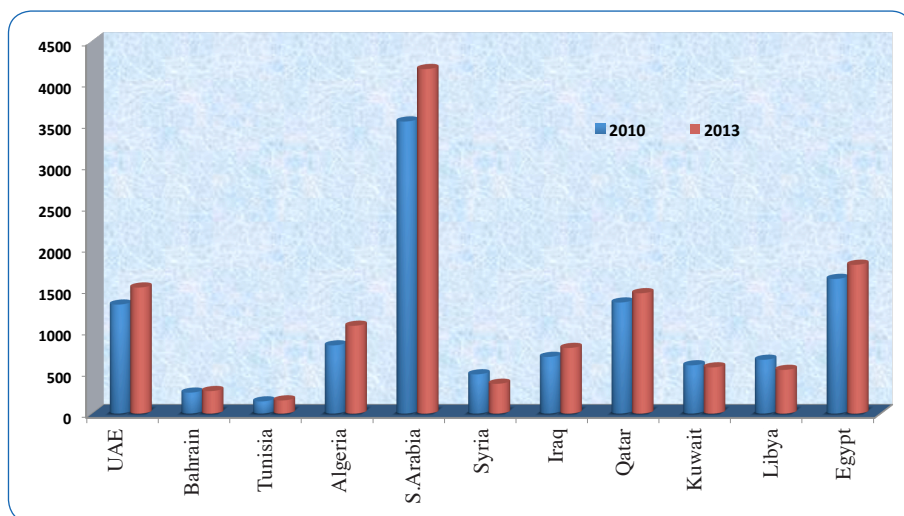
2-1 Total and Per Capita Energy Consumption

It is estimated that energy consumption in the OAPEC member countries will rise at a rate of 5% in 2013 compared to 0.3% in 2011 and 5.3% in 2012. The consumption is estimated to reach 12.7 million boe/d compared to about 11.5 boe/d in 2010 and 2011, and 12.1 million boe/d in 2012. There is a disparity with regard to the growth rates in energy consumption among member countries during the period from 2010 to 2013. Three categories may be identified as follows:

- 1- countries with an annual growth rate exceeding 5%:** includes, Algeria (8.8%) and Saudi Arabia (5.7%).
- 2- countries with an annual growth rate that did not exceed 5%:** includes 6 countries, Iraq and UAE (5%), Egypt (3.4%), Qatar (2.7%), Tunisia (2.6%), and Bahrain (2.5%).
- 3- countries whose energy consumption shrank by more than 6%:** energy consumption has dropped in the period 2010 - 2013 in two countries, Syria (-8.7%) and Libya (- 6.7%).

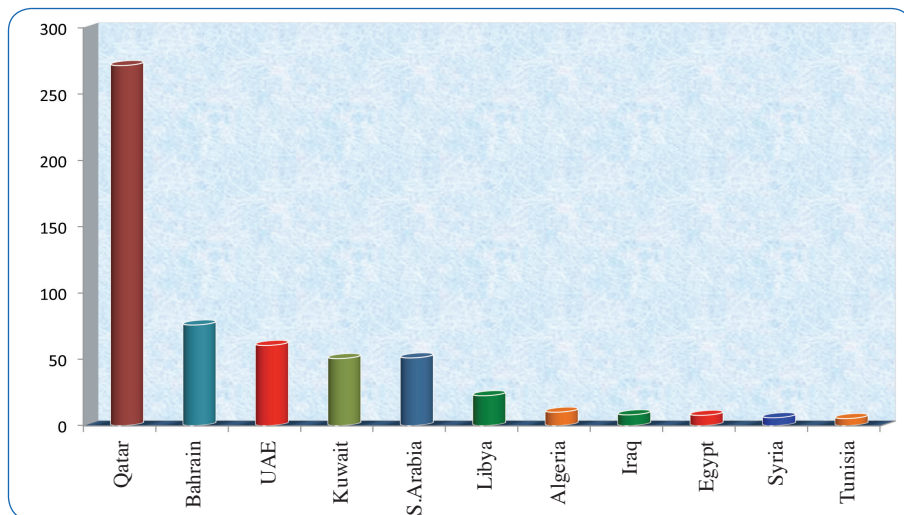
The rise in energy consumption in the OAPC member countries in 2013 is estimated at 601 thousand boe/d, where 226 thousand boe/d from Saudi Arabia, 111 thousand boe/d from UAE, 74 thousand boe/d from Algeria, 70 thousand boe/d from Libya and 65 thousand boe/d from Qatar. The increase in energy consumption in the other member countries varies between 2000 boe/d in Tunisia and 22 thousand boe in Kuwait. However, Energy consumption shrank by about 31 thousand boe/d in Syria. **Figure (1-21)** and Table (1-19) compare OAPC members energy consumption in 2010 with 2013.

Figure 1-21
Energy Consumption in OAPC Member Countries, 2010 and 2013
(Thousand boe/d)



The average per capita energy consumption in the OAPEC member countries rose by 0.9% per annum in the period 2010-2013, from 18.4 boe in 2010 to 18.9 boe in 2013. This average varies between 5.4 boe in Tunisia and 271.4 boe in Qatar. **Figure (1-22)** shows the average per capita energy consumption in the OAPEC member countries.

Figure 1-22
Per Capita Energy Consumption in OAPEC Member Countries, 2013
(boe)



2-2 Energy Consumption by Source

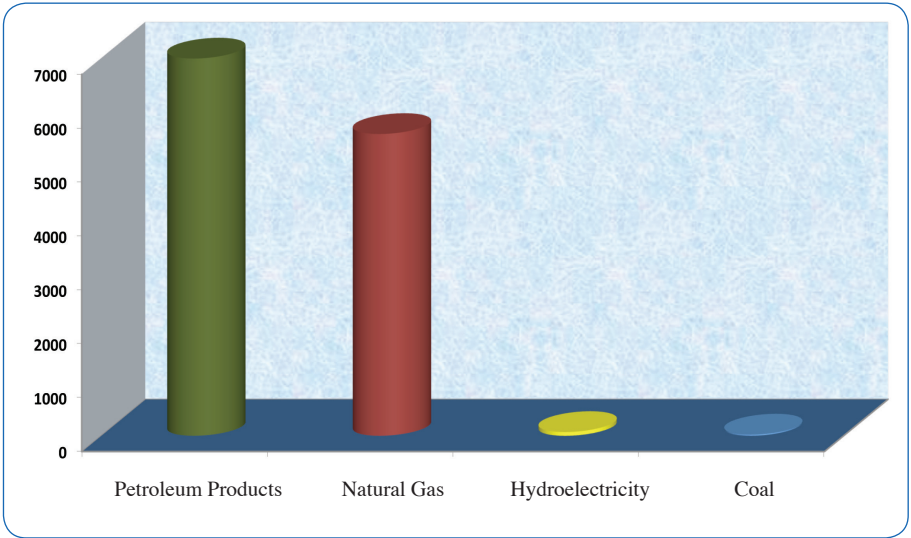
As mentioned earlier, energy consumption in OAPEC member countries is expected to increase by 5% in 2013 to reach about 12.7 million boe/d compared to 12 million boe/d in 2012. It is noted that the highest increase has happened in Libya due to the onset of the economic recovery following the crisis which the country went through in the last few years. It is estimated that energy consumption in Libya has gone up by 15.2% to reach 530 thousand boe/d in 2013 compared to 460 thousand boe/d in 2012. There are three other Arab countries whose energy consumption growth has exceeded the energy consumption average in OAPEC member countries in 2013, namely, the UAE, Algeria, and KSA. The energy consumption in

these countries reached 7.9% in the UAE, 7.5% in Algeria, and 5.7% in KSA. As for the other OAPEC member countries, the energy consumption growth average, in 2013, varied between 1.3% in Tunisia and 4.7% in Qatar, but shrank in Syria by 7.9%.

The Energy consumption in four member countries was about 70.5% of the total energy consumption in the OAPEC member countries in 2013. These countries are KSA, Egypt, UAE, and Qatar. Energy consumption in these countries was estimated at 4.2 million boe/d in KSA, 1.8 million boe/d in Egypt, and 1.5 million boe/d in UAE and Qatar.

Member countries depend on natural gas to meet their energy needs. The share of natural gas in the total energy consumption in these countries, in 2013, was estimated at 55.2% compared to 44.1% for oil. On the other side, the Hydroelectricity meets only 0.5% of the total energy consumption, while coal meets only 0.2%. **Figure (1-23)** and **Table (1-20)** show energy consumption in OAPEC member countries in 2013 by source.

Figure 1-23
Energy Consumption in OAPEC Member Countries by Source, 2013
(Thousand boe/d)

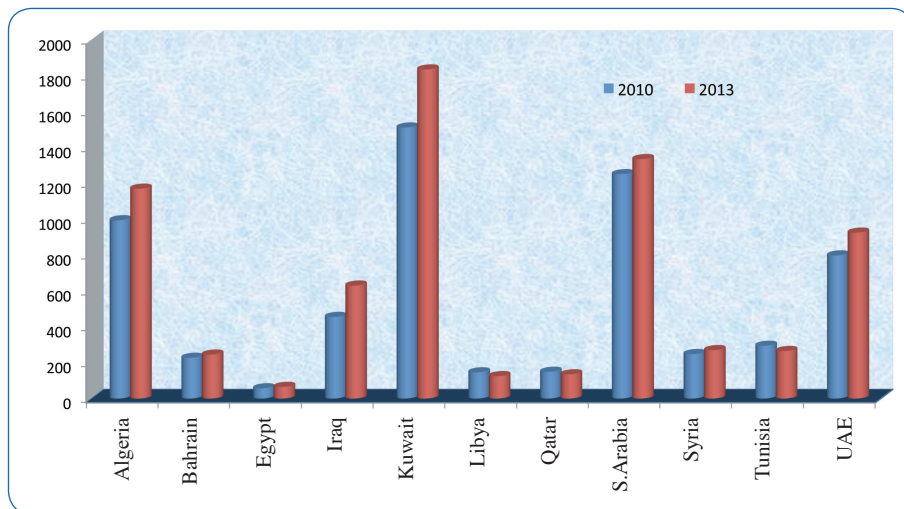


2-2-1 Natural Gas

Natural gas consumption has increased steadily during the period 2010-2013 in the member countries, where it increased by an annual rate of 4.5% compared to the increase in the total energy consumption in these countries of 3.5% per year. This has given more relative importance to natural gas in the energy balance from 53.5% in 2010 to 55.2% in 2013. The total natural gas consumption in the OAPPEC member countries is estimated to reach 7 million boe/d in 2013 compared to 6.1 million boe/d in 2010.

There are five countries with significant consumption of Natural gas: KSA, Qatar, UAE, Egypt, and Algeria. Their share of the total OAPPEC consumption of natural gas was 84.2%. Saudi Arabia is considered the biggest consumer among them as its natural gas consumption exceeded one fourth (26.2%) of the total members consumption, followed by Qatar with a share of almost one fifth (19.1%) of the total members consumption, then the UAE with a share of 16.7%, Egypt with a share of 13.2%, and finally Algeria 9%, as shown in **Figure (1-24)** and **Table (1-21)**.

Figure 1-24
Natural Gas Consumption in OAPPEC Member Countries, 2010 and 2013
(Thousand boe/d)

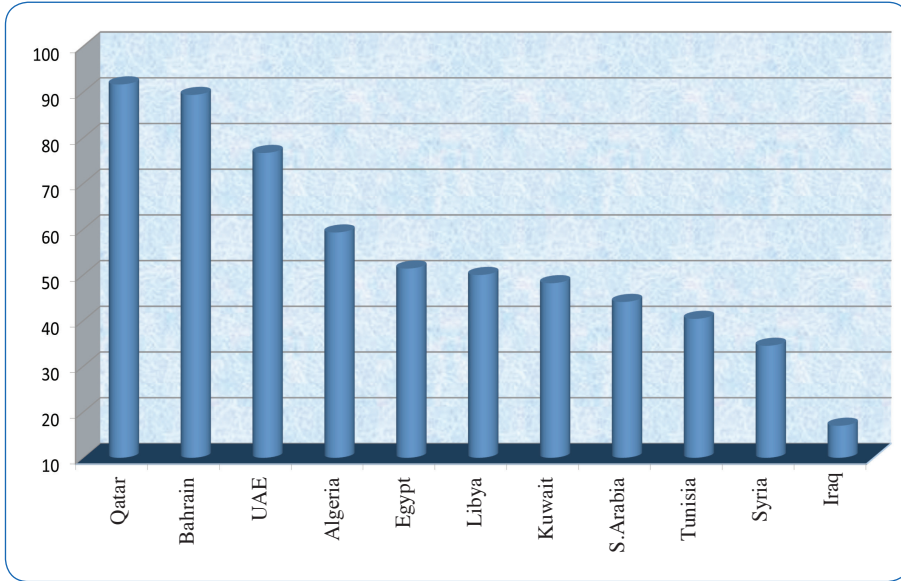


There is a noticeable disparity among member countries in terms of their reliance on natural gas to meet their energy needs. They can be classified into three categories depending on the relative importance of natural gas in their total energy consumption. These categories are:

- Countries that depend primarily on natural gas to meet their energy requirements. These are the countries where the share of natural gas exceeds 50% of energy use. Six countries fall into this category: Qatar, Bahrain, the United Arab Emirates, Algeria, Egypt and Libya. The share of natural gas in total energy consumption in 2013 in these countries was 91.7% in Qatar, 89.9% in Bahrain, 76.7% in the United Arab Emirates, 59.3% in Algeria, 51.4% in Egypt and 50% in Libya. It is worth noting that the number of countries relying on natural gas during the period 2010- 2013 has increased. from four countries in 2010 to six countries in 2013.
- Countries that depend mainly on natural gas to meet 33% to 50% of their energy needs. There are four member countries in this category, Kuwait, KSA, Tunisia, and Syria. The share of natural gas in the total energy consumption in these countries in 2013 was 48.2% in Kuwait, 44.1% in Saudi Arabia, 40.4% in Tunisia, and 34.5% in Syria.
- Countries that rely moderately on natural gas to meet their energy requirements. This category includes only Iraq whose natural gas consumption is 17% of the country's total energy consumption.

Figure (1-25) shows the degree to which OAPEC member countries depend on natural gas to meet their energy requirements.

Figure 1-25
Natural Gas Consumption as a Percentage of Total Energy Consumption in OAPEC Member Countries, 2013 (%)



2-2-2 Petroleum Products

Consumption of petroleum products in the OAPEC member countries has increased by a rate that did not exceed 2.3% per annum during the period 2010-2013. This consumption rose from 5.2 million boe/d in 2010 to 5.6 million boe/d in 2013. As this rate is less than the rate of increase in the total energy consumption in the member countries for the same period, which is 3.5%, the share of petroleum products in the total energy consumption has decreased from 45.7% in 2010 to 44.1% in 2013.

When looking at the rising petroleum products consumption rates in the member countries individually, it is noted that there is a category where consumption has dramatically increased, which includes, Qatar (9.6%), Iraq (7%), Algeria (5.3%), and KSA (4.9%).

It is estimated that the increase in Petroleum products consumption in member countries, in 2013, will reach about 164 thousand boe/d as follows; KSA (103 thousand boe/d), Iraq (21 thousand boe/d), Algeria (16 thousand boe/d), UAE (14 thousand boe/d), and Kuwait and Libya (11 thousand boe/d each). Increase in other member countries is expected to vary between one thousand boe/d in Bahrain and 8 thousand boe/d in Qatar and Egypt, while oil products consumption has shrank by about 32 thousand boe/d in Syria. Table (1-22).

Petroleum products still play an important role in meeting energy consumption requirements in many member countries. Their share in the total energy consumption is estimated to have reached the following percentages in 2013: Iraq (83%), Syria (63.5%), Tunisia (59%), KSA (55.9%), Kuwait (51.8%), and Libya (50%).

As for the other member countries, petroleum products share has reached the following: Egypt (44.4%), Algeria (40%), UAE (23.3%), Bahrain (10.6%), and Qatar (8.3%).

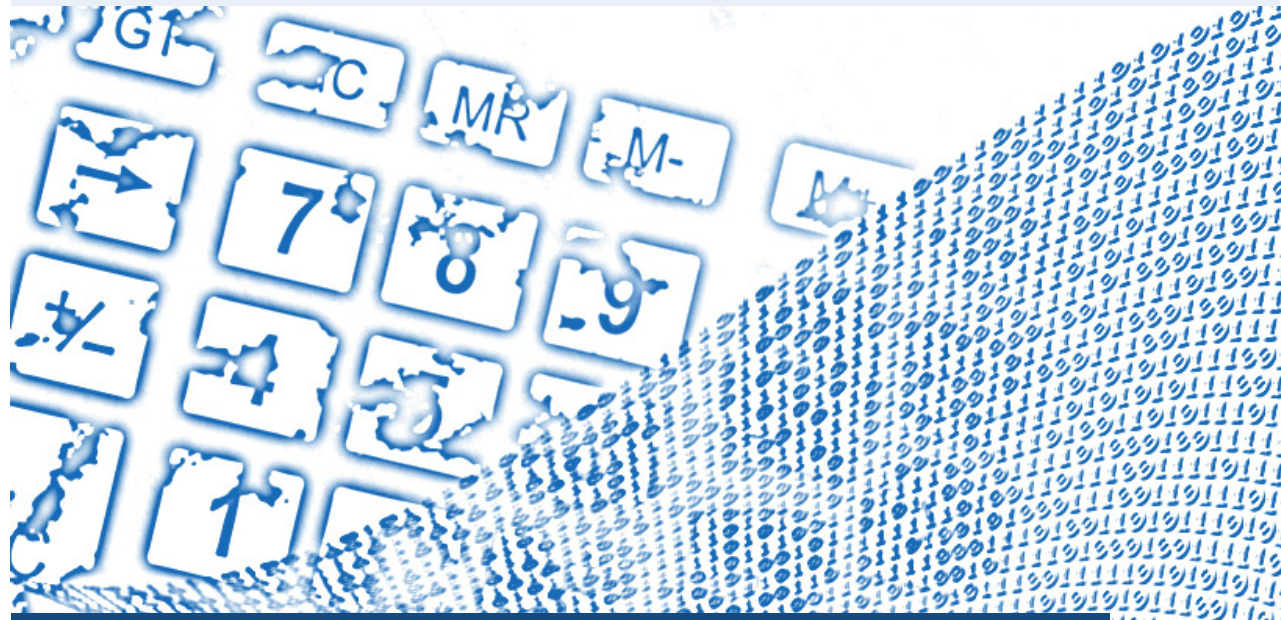
2-2-3 Hydroelectricity and Coal

The Hydroelectric power and coal play a marginal and decreasing role in meeting energy requirements in member countries. The consolidated share of both resources did not exceed 0.7% of the total energy consumption in 2013 compared to 0.8% in 2010.

As for the Hydroelectric consumption in member countries, it has increased from 68 thousand boe/d in 2010 to 69 thousand boe/d in 2013. Table (1-23). A small amount of coal is consumed that has not exceeded 22 thousand boe/d. Table (1-24).

3- Domestic Prices

As mentioned earlier, the available data show that in 2013, member countries have maintained the same 2012 prices for petroleum products in the domestic market, with the exception of Egypt, which raised some petroleum products prices including gasoline, gasoil/ diesel, and LPG. Table (1-25) shows the current domestic prices in the OAPEC member countries in local currencies in 2013.



TABLES

CHAPTER ONE

Table 1-1

Total & Annual Changes in World Oil and NGLs Supply, 2009 - 2013 (Million b/d)

	2009	2010	2011	2012	2013*
Total Supply					
OPEC	33.0	34.2	35.2	36.7	36.0
Rest of the World	51.1	52.3	52.4	52.9	54.1
World total	84.1	86.5	87.6	89.6	90.1
Annual Change					
OPEC	(2.3)	1.2	1.0	1.5	(0.7)
Rest of the World	0.7	1.2	0.1	0.5	1.2
World total	(1.6)	2.4	1.1	2.0	0.5
Percentage Change (%)					
OPEC	(6.5)	3.6	2.9	5.1	(1.9)
Rest of the World	1.4	2.3	0.2	1.1	2.3
World total	(1.9)	2.8	1.3	2.7	0.6

* Estimated data.

Notes:

- Parentheses denote negative figures.
- OPEC's supply includes data from both Angola and Ecuador, which were admitted to OPEC as a full member at the beginning and the end of year 2007 respectively.

Sources:

- IEA, Oil Market Report (various issues).
- OAPC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-2

**Growth in the World Economy and Oil Demand by Region,
2009-2013**
(%)

	2009	2010	2011	2012	2013*
OECD countries **					
GDP	(3.4)	3.0	1.7	1.5	1.2
Oil demand	(4.1)	1.3	(1.1)	(1.1)	(0.4)
Rest of the World					
GDP	3.1	7.5	6.2	4.9	4.5
Oil demand	1.9	4.9	3.2	3.1	2.8
World total					
GDP	(0.4)	5.2	3.9	3.2	2.9
Oil demand	(1.5)	2.9	0.9	0.9	1.1

* Estimated data.

** Include the newly industrialized Asian countries are Hong Kong, South Korea, Singapore,

Note:

Parentheses denote negative figures.

Sources:

- IEA, Oil Market Report (various issues).
- IMF, World Economic Outlook (various issues) .
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-3

World Economic Growth, 2009-2013 (%)

	2009	2010	2011	2012	2013*
OECD	(3.4)	3.0	1.7	1.5	1.2
Of which: Euro Area	(4.4)	2.0	1.5	(0.6)	(0.4)
Japan	(5.5)	4.7	(0.6)	2.0	2.0
USA	(2.8)	2.5	1.8	2.8	1.6
Eastern and Central Europe	(3.6)	4.6	5.4	1.4	2.3
Countries in transition (CIS)	(6.4)	4.9	4.8	3.4	2.1
Of which: Russia	(7.8)	4.5	4.3	3.4	1.5
Asian developing countries**	7.7	9.8	7.8	6.4	6.3
Of which: China	9.2	10.4	9.3	7.7	7.6
India	8.5	10.5	6.3	3.2	3.8
Latin America and the Caribbean	(1.2)	6.0	4.6	2.9	2.7
Of which: Brazil	(0.3)	7.5	2.7	0.9	2.5
Mexico	(4.5)	5.1	4.0	3.6	1.2
Middle East and North Africa	3.0	5.5	3.9	4.6	2.1
Sub-Saharan African countries	2.6	5.6	5.5	4.9	5.0
Rest of the World :	3.1	7.5	6.2	4.9	4.5
World	(0.4)	5.2	3.9	3.2	2.9

* Estimated data.

** Excludes Pakistan and Afghanistan.

Note:

Parentheses denote negative figures.

Source:

- IMF, World Economic Outlook, October 2013.

Table 1-4

**Total & Annual Change in World Oil Demand,
2009-2013
(Million b/d)**

	2009	2010	2011	2012	2013*
World total demand	84.8	87.3	88.1	88.9	89.9
Annual Change in World Oil Demand (Million b/d)	(1.3)	2.5	0.8	0.8	1.0
Change (%)	(1.5)	2.9	0.9	0.9	1.1

* Preliminary data.

Note:

Parentheses denote negative figures.

Sources:

- IEA, Oil Market Report (various issues).
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-5

World Oil Demand by Region, 2009-2013
(Million b/d)

	2009	2010	2011	2012	2013*
OECD countries	46.4	47.0	46.5	46.0	45.8
Rest of the World**	38.4	40.3	41.6	42.9	44.1
World total	84.8	87.3	88.1	88.9	89.9

* Estimated data.

** Includes all of the developing countries and transition countries.

Sources:

- IEA, Oil Market Report (various issues).
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-6

**Total & Annual Change in Oil Demand in
OECD Countries, 2009-2013
(Million b/d)**

	2009	2010	2011	2012	2013*
North America	23.7	24.1	24.0	23.6	23.9
Western Europe	14.7	14.7	14.3	13.7	13.6
Pacific	8.0	8.2	8.2	8.6	8.4
Total OECD	46.4	47.0	46.5	46.0	45.8
Annual Change in demand	(2.0)	0.6	(0.5)	(0.5)	(0.2)
Change (%)	(4.1)	1.3	(1.1)	(1.1)	(0.4)

* Estimated data.

Note:

Parentheses denote negative figures.

Sources:

- IEA, Oil Market Report (various issues).
- OAPC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-7

**Total & Annual Change in Rest of the World Oil Demand
(Excluding Countries that joined the OECD), 2009-2013
(Million b/d)**

	2009	2010	2011	2012	2013*
Developing countries	33.8	35.5	36.7	37.9	39
Arab countries	6.2	6.1	6.2	6.3	6.5
Of which: Member countries	5.4	5.2	5.2	5.4	5.6
Other Arab countries	0.8	0.9	0.9	0.9	0.9
Other countries in the Middle East and Africa	4.1	4.5	4.5	4.7	4.8
Total Middle East and Africa	10.3	10.6	10.7	11.0	11.3
Asian developing countries	17.9	19.0	19.8	20.6	21.2
Of which: China	8.2	8.8	9.4	9.7	10.1
India	3.2	3.4	3.2	3.3	3.4
Other countries	6.6	6.8	7.2	7.5	7.7
Latin America	5.7	6.0	6.3	6.3	6.5
Of which: Brazil	2.5	2.8	2.9	3.0	3.1
Other countries	3.2	3.2	3.4	3.3	3.4
Countries in transition (CIS)	4.7	4.8	4.9	5.1	5.1
Of which: Russia	4.0	4.2	4.3	4.4	4.5
Total Rest of the World	38.4	40.3	41.6	42.9	44.1
Annual Change in demand of Rest of the World	0.7	1.9	1.3	1.3	1.2
Change (%)	1.9	4.9	3.2	3.1	2.8

* Estimated data.

Sources:

- IEA, Oil Market Report (various issues).
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-8

**Spot Price of OPEC Basket of Crudes,
2009-2013
(\$/barrel)**

	2009	2010	2011	2012	2013
January	41.5	76.0	92.8	111.8	109.3
February	41.4	73.0	100.3	117.5	112.8
March	45.8	77.2	109.8	123.0	106.4
April	50.2	82.3	118.1	118.2	101.1
May	57.0	74.5	109.9	108.1	100.7
June	68.4	73.0	109.0	94.0	101.0
July	64.6	72.5	111.6	99.6	104.5
August	71.4	74.2	106.3	109.5	107.5
September	67.2	74.6	107.6	110.7	108.7
October	72.7	79.9	106.3	108.4	106.7
November	76.3	82.8	110.1	106.9	105.0
December	74.0	88.6	107.3	106.6	107.7
First quarter	42.9	75.4	101.0	117.4	109.5
Second quarter	58.5	76.6	112.3	106.8	100.9
Third quarter	67.7	73.8	108.5	106.6	106.9
Fourth quarter	74.3	83.8	107.9	107.3	106.5
Annual average	61.0	77.4	107.5	109.5	105.9

Sources:

- OAPC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-9

**Average Spot Prices of the OPEC Basket, Brent, WTI and
Selected Arab Crudes, 2009-2013
(\$/barrel)**

Crudes	2009	2010	2011	2012	2013	The increase in 2013
OPEC Basket Of which:	61.0	77.4	107.5	109.5	105.9	(3.6)
Algeria - Saharan Blend	62.4	80.4	112.9	111.5	109.4	(2.1)
Arabian Light	61.4	77.8	107.8	110.2	106.5	(3.7)
UAE - Murban	63.8	79.9	109.8	111.8	108.2	(3.6)
Kuwait - Export	60.7	76.3	105.6	108.9	105.0	(3.9)
Libya - Es Sider	61.5	79.1	111.9	112.2	108.5	(3.7)
Qatar-Marine	62.4	78.2	106.5	109.3	105.3	(4.0)
Iraq-Basrah	60.5	76.8	106.2	108.0	103.6	(4.4)
Other crudes						
Brent	61.7	79.6	111.3	111.6	108.6	(3.0)
UAE - Dubai	61.8	78.1	106.2	109.1	105.5	(3.6)
WTI	61.9	79.4	94.9	94.1	98.0	3.9

Note: Parentheses denote negative figures.

Sources:

- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-10

**Nominal and Real Prices of Crude Oil,
2000-2013
(\$/barrel)**

	Nominal Price	Index* 2000=100	Real 2000 Prices
2000	27.6	100.0	27.6
2001	23.1	101.8	22.7
2002	24.3	103.4	23.5
2003	28.2	105.1	26.8
2004	36.0	107.3	33.6
2005	50.6	109.5	46.2
2006	61.0	111.8	54.6
2007	69.1	114.3	60.5
2008	94.4	116.5	81.0
2009	61.0	117.0	52.1
2010	77.4	118.2	65.5
2011	107.5	120.8	89.7
2012	109.5	121.2	90.3
2013**	105.9	122.7	86.3

* The index represents the GDP Deflator of industrial countries as published by the IMF.

** Estimated data.

Sources:

- IMF, International Financial Statistics Yearbook , October 2013.
- OAPEC - Economics Department.
- OPEC, Monthly Oil Market Report (various issues).

Table 1-11

**Average Monthly Market Spot Prices of Petroleum
Products, 2011-2012
(\$/barrel)**

	Market	Unleaded Gasoline	Gasoil* (50 ppm Sulfur)	Fuel Oil** (1 % Sulfur)
Average 2012	Singapore	123.5	128.9	105.4
	Rotterdam	127.3	130.6	105.0
	Mediterranean	126.6	113.2	103.8
	US Gulf	133.6	126.0	105.3
Average 2013	Singapore	119.3	124.8	97.6
	Rotterdam	122.7	124.0	95.9
	Mediterranean	122.8	113.1	97.2
	US Gulf	129.7	121.8	99.7
First quarter 2013	Singapore	126.6	129.0	100.4
	Rotterdam	127.1	128.6	100.2
	Mediterranean	129.7	112.3	100.3
	US Gulf	137.3	127.2	103.6
Second quarter	Singapore	115.7	118.7	96.7
	Rotterdam	119.3	117.7	94.1
	Mediterranean	122.6	101.1	93.4
	US Gulf	133.8	115.7	97.5
Third quarter	Singapore	118.7	125.3	96.4
	Rotterdam	124.4	125.3	95.3
	Mediterranean	124.5	114.2	97.7
	US Gulf	131.5	122.8	99.1
Fourth quarter	Singapore	116.0	126.0	96.7
	Rotterdam	119.8	124.3	94.1
	Mediterranean	114.2	124.9	97.2
	US Gulf	116.2	121.5	98.7

* Singapore gasoil contains 2.0 % sulfur.

** US Gulf fuel oil contains 0.05 % sulfur.

Source:

OPEC, Monthly Oil Market Report (various issues).

Table 1-12

**Share of Tax in Gasoline Prices in some OECD countries,
2012-2013
(\$/liter)**

	October 2012				October 2013			
	Price without Tax	Tax	End-User Price	Tax (%)	Price without Tax	Tax	End-User Price	Tax (%)
Canada	0.90	0.41	1.31	31.30	0.82	0.38	1.20	31.83
France	0.92	1.09	2.01	54.23	0.86	1.17	2.03	57.65
Germany	0.96	1.19	2.15	55.35	0.90	1.23	2.13	57.85
Italy	1.02	1.36	2.38	57.14	0.94	1.42	2.35	60.22
Japan	1.08	0.80	1.88	42.55	0.98	0.65	1.63	39.73
Spain	0.96	0.93	1.89	49.21	0.95	0.97	1.92	50.34
United Kingdom	0.92	1.30	2.22	58.56	0.83	1.29	2.12	60.74
USA	0.88	0.11	0.99	11.11	0.77	0.11	0.88	12.50

Source:

- IEA, Oil Market Report (various issues).

Table 1-13

Spot Tanker Freight Rates, 2012 - 2013 (World scale)

	Arabian Gulf - East *	Arabian Gulf -West **	Mediterranean - Medi- terranean ***
Average 2012	48	33	88
January 2012	56	37	96
February	51	35	84
March	60	38	106
April	65	43	93
May	57	41	87
June	44	33	101
July	36	26	92
August	36	25	80
September	39	28	77
October	36	25	77
November	47	30	78
December	48	30	85
Average 2013	41	26	80
January 2013	39	25	80
February	33	20	85
March	35	20	88
April	33	20	85
May	40	24	72
June	42	25	74
July	42	27	82
August	33	22	82
September	35	25	71
October	41	28	70
November	60	38	72
December	63	39	107

* Vessels of 230-280 dwt.

** Vessels of 270-285 dwt.

*** Vessels of 80-85 dwt.

Source:

- OPEC, Monthly Oil Market Report (various issues).

Table 1-14

**OECD Oil Inventories at Quarter End,
2012 & 2013
(Million barrel)**

	First quarter		Second quarter		Third quarter		Fourth quarter	
	2012	2013	2012	2013	2012	2013	2012	2013*
North America	1334	1328	1359	1344	1385	1367	1309	1339
Of which: USA	1083	1098	1113	1123	1126	1123	1113	1123
Europe	943	922	916	896	917	878	919	871
Pacific	378	413	413	410	428	399	382	393
Total OECD	2655	2663	2688	2650	2730	2644	2610	2603
Rest of the World	1641	1660	2212	2231	2232	2230	1602	2295
Other Inventories	944	1052	983	951	943	958	962	990
Total Commercial	5240	5375	5883	5832	5905	5832	5174	5888
Strategic :	1792	1895	1781	1894	1805	1918	1852	1934
US Strategic Petroleum Reserves	696	696	696	696	695	696	696	696
OECD Commercial (days supply)	58.3	59.0	58.2	57.8	60.6	57.8	56.6	55.4
Total Commercial (days supply)	54.0	55.1	54.1	53.2	55.3	53.7	53.6	53.7
OECD Strategic (days supply)	34.0	35.0	34.0	34.0	33.0	34.0	34.0	34.0

* Estimated data.

** Oil At Sea and Independent storage.

*** Stock holding over the above minimum operating needs (55 days).

Sources:

- OAPEC - Economics Department

- EIG Inc., Oil Market Intelligence (various issues).

Table 1-15

**Value of Oil Exports in OAPEC Member Countries,
2009-2013
(\$ Million)**

	2009	2010	2011	2012	2013*
Algeria	21497	28089	37289	34662	29807
Bahrain	3275	4664	6305	7269	7216
Egypt***	2166	2593	4689	4770	4590
Iraq	43895	54248	83768	92685	90411
Kuwait	41858	53029	79646	99735	97025
Libya	29446	38764	7391	41705	27659
Qatar	16172	20553	27328	21014	18162
Saudi Arabia	144249	184421	289518	307119	284906
Syria	5414	6689	2994	**	**
Tunisia	**	**	**	**	**
UAE	44785	57900	85900	93613	94495
Total	352757	450950	624828	702572	654271

* Estimated data.

** Preliminary data indicate that oil consumption exceeds oil production.

*** Official sources for 2008.

Sources:

- OAPEC - Economics Department.

- OPEC, Monthly Oil Market Report (various issues).

Table 1-16

**Value of OAPEC Oil Exports in Current and
Real Prices, 2000-2013
(\$ Billion)**

Year	At Current Prices	Expressed in Real 2000 Prices
2000	177.2	177.2
2001	148.6	145.8
2002	142.0	137.3
2003	159.5	151.7
2004	219.0	204.2
2005	305.8	279.4
2006	375.1	335.9
2007	410.2	359.7
2008	585.3	503.8
2009	352.8	301.4
2010	450.9	381.4
2011	624.8	521.7
2012	702.6	579.5
2013 *	654.3	533.2

* Estimated data.

Note: Real revenues are obtained by deflating current prices by the GDP Deflator of industrial countries as published by the IMF.

Source:

- OAPEC - Economics Department.

Table 1-17

Energy Consumption in the Arab Countries, 2010-2013 (Thousand boe/d)

	2010	2011	2012	2013
Petroleum products				
Member countries	5233	5237	5436	5600
Other Arab countries	6131	945	898	930
Total Arab countries	6131	6182	6334	6530
Natural gas				
Member countries	6130	6159	6562	7000
Other Arab countries	371	339	335	360
Total Arab countries	6501	6498	6897	7360
Hydroelectricity				
Member countries	68	68	69	69
Other Arab countries	34	34	34	34
Total Arab countries	102	102	103	103
Coal				
Member countries	22	22	22	22
Other Arab countries	72	80	80	80
Total Arab countries	94	102	102	102
Total Energy				
Member countries	11452	11486	12090	12691
Other Arab countries	1374	1397	1347	1404
Total Arab countries	12827	12883	13436	14095

* Estimated data.

Note : The total may not add up due to rounding.

Source:

- OAPC - Databank.

Table 1-18

**Per Capita Energy Consumption in the Arab Countries,
2010 and 2013
(Boe/year)**

	2010	2013*
Algeria	8.4	10.2
Bahrain	75.7	75.9
Egypt	7.6	7.8
Iraq	7.6	8.2
Kuwait	59.6	51.1
Libya	27.7	22.6
Qatar	285.7	271.6
Saudi Arabia	46.8	50.6
Syria	8.8	6.0
Tunisia	5.2	5.4
UAE	62.9	60.5
OAPEC member countries	18.4	18.9
Other Arab countries	4.0	4.1
Total Arab countries	13.3	13.9

* Estimated data.

Source:

- OAPEC - Economics Department.

Table 1-19

**Energy Consumption in OAPEC Member Countries,
2010-2013
(Thousand boe/d)**

	2010	2011	2012	2013*
Algeria	826	889	989	1063
Bahrain	255	244	264	274
Egypt	1629	1712	1767	1800
Iraq	687	739	777	795
Kuwait	585	531	538	560
Libya	652	343	460	530
Qatar	1344	1345	1391	1456
Saudi Arabia	3531	3706	3939	4165
Syria	476	465	393	362
Tunisia	149	155	159	161
UAE	1319	1357	1414	1525
Total	11452	11486	12090	12691

* Estimated data.

Note : The total may not add up due to rounding.

Source:

- OAPEC - Databank.

Table 1-20

**Energy Consumption in OAPEC Member Countries
by Source, 2010-2013
(Thousand boe/d)**

	2010	2011	2012	2013*
Petroleum products	5233	5237	5436	5600
Natural gas	6130	6159	6562	7000
Hydroelectricity	68	68	69	69
Coal	22	22	22	22
Total energy	11452	11486	12090	12691

* Estimated data.

Note : The total may not add up due to rounding.

Source:

- OAPEC - Databank.

Table 1-21

**Natural Gas Consumption in OAPEC Member Countries,
2010-2013
(Thousand boe/d)**

	2010	2011	2012	2013*
Algeria	364	369	409	425
Bahrain	28	26	28	29
Egypt	757	755	792	800
Iraq	538	593	639	660
Kuwait	337	282	279	290
Libya	359	247	254	265
Qatar	92	103	113	121
Saudi Arabia	2020	2116	2227	2330
Syria	322	326	262	230
Tunisia	91	97	93	95
UAE	325	324	341	355
Total	5233	5237	5436	5600

* Estimated data.

Note : The total may not add up due to rounding.

Source:

- OAPEC - Databank.

Table 1-22

**Petroleum Products Consumption in OAPEC Member
Countries, 2010-2013
(Thousand boe/d)**

	2010	2011	2012	2013*
Algeria	455	512	272	630
Bahrain	227	218	236	245
Egypt	798	883	899	925
Iraq	149	146	138	135
Kuwait	248	249	259	270
Libya	294	96	207	265
Qatar	1251	1243	1277	1335
Saudi Arabia	1511	1590	1712	1835
Syria	146	132	124	125
Tunisia	57	57	65	65
UAE	994	1034	1073	1170
Total	6130	6159	6562	7000

* Estimated data.

Note : The total may not add up due to rounding.

Source:

- OAPEC - Databank.

Table 1-23

**Hydroelectricity Consumption in OAPEC Member Countries,
2010-2013**
(Thousand boe/d)

	2010	2011	2012	2013*
Algeria	0.1	0.6	0.7	0.6
Egypt	59.3	58.8	60.7	60.0
Syria	7.1	7.1	7.0	7.0
Tunisia	1.2	1.0	1.0	1.0
Total	67.7	67.5	69.4	68.6

* Estimated data.

Source:

- OAPEC - Databank.

Table 1-24

**Coal Consumption in OAPEC Member Countries,
2010-2013
(Thousand boe/d)**

	2010	2011	2012	2013*
Algeria	6.8	6.8	6.8	7.0
Syria	0.1	0.1	0.1	0.0
Egypt	15.0	15.0	15.3	15.0
Total	21.9	21.9	22.2	22.0

* Estimated data.

Source:

- OAPEC - Databank.

Table 1-25

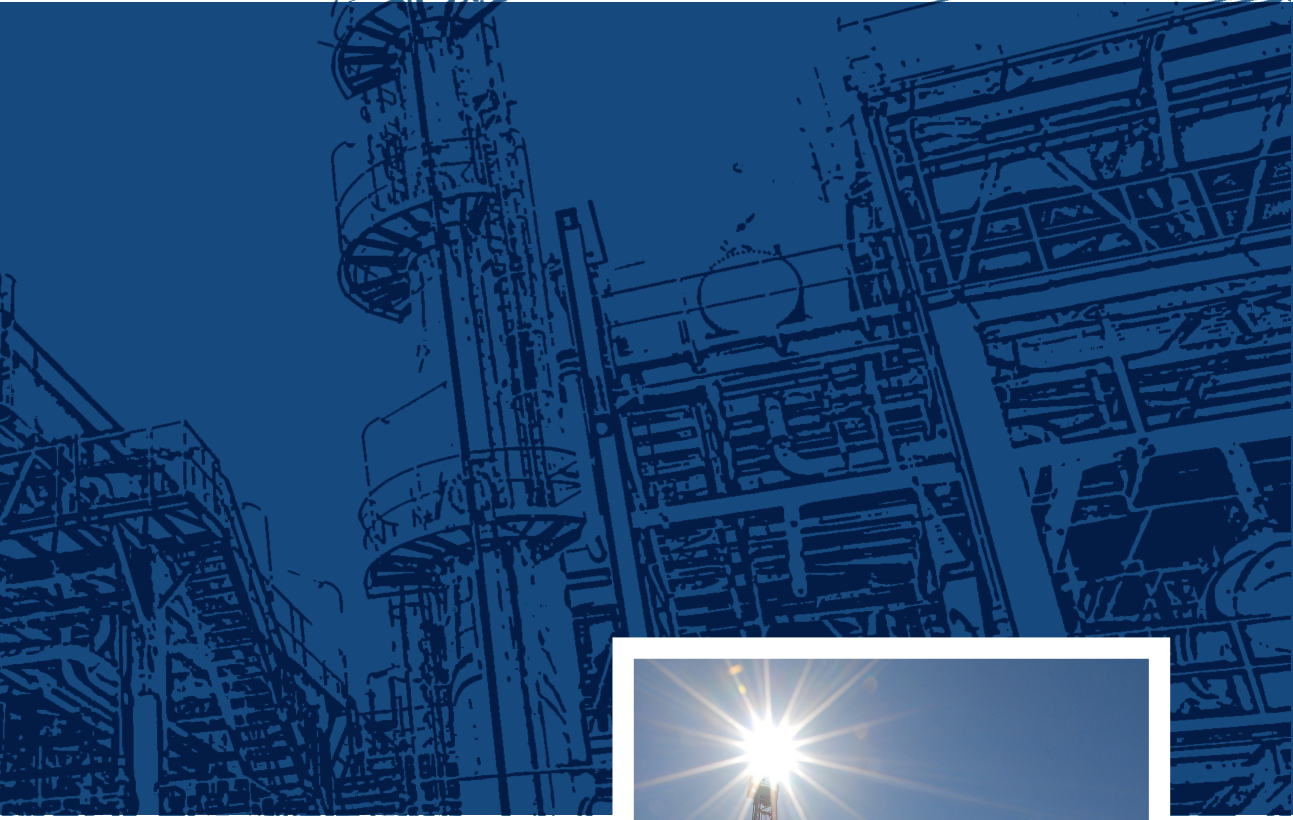
**Domestic Prices of Petroleum Products in OAPEC
Member Countries, 2013
(Local currency/liter)**

	Currency	Gasoline		Household Kerosene	Gas oil/ Diesel	LPG
		Premium	Regular			
Algeria	Dinar	23.00	21.20	-	13.70	9.00
Bahrain	Dinar	0.100	0.080	0.025	0.100	1.200*
Egypt	Pound	5.85	0.90	1.10	0.10	8.00*
Iraq	Dinar	-	450	150	400	160
Kuwait	Dinar	0.065	-	0.055	0.055	0.75*
Libya	Dinar	0.150	-	0.080	0.170	0.054
Qatar	Riyal	0.80	0.70	0.55	0.70	15.00*
Saudi Arabia	Riyal	0.60	0.45	0.44	0.25	0.70
Syria	Lira	55	50	40	20	250**
Tunisia	Dinar	0.998	0.998	0.180	0.357	158
UAE	Dirham	1.78	1.52	2.51	3.45-3.7	2.15*

* Per cylinder.

Source:

- OAPEC - Annual Statistical Report 2013.



CHAPTER TWO



ARAB AND WORLD DEVELOPMENTS IN THE EXPLORATION, RESERVES AND PRODUCTION OF ENERGY RESOURCES

CHAPTER TWO

ARAB AND WORLD DEVELOPMENTS IN THE EXPLORATION, RESERVES AND PRODUCTION OF ENERGY RESOURCES

I. OIL AND GAS

1. Exploration and Production: An Overview

Exploration for deep oil and gas has prevailed in 2013. It seems that efforts are focused on the exploration of buried petroleum accumulations at depths more than 4500m. Except for the USA, the number of oil and gas sedimentary basins is about 87 globally recognized basins. North America embraces a large number of deep petroleum discoveries. The basins of the Gulf of Mexico, the Arabian Peninsula, and east Venezuela are the richest in the world as they contain about half of the world's proven and probable reserves.¹

A recent study published by Wood Mackenzie affirmed that drilling spending in deepwater reached \$43 billion in 2012 and it is expected to reach \$114 billion in 2022. The study explained that licensed deep water areas formed 39% of business of 20 biggest companies in the field in 2012. It also showed that 41% of new discoveries in the last decade were in deepwater. Their value according to prevailing prices reached \$351 billion surpassing onshore and shallow waters discoveries.² It looks like the world has overcome Macondo well crisis, as data shows that annual drilling rates in the Gulf of Mexico have returned to their previous levels. It is expected that deep water drilling rates will increase by 9% per year in the next ten years, which in turn will increase the number of exploration, appraisal, and development wells by 150%, from 500 wells per year to 1250 wells

¹Cao et al, *More attention recommended for global deep reservoirs*, Oil and Gas Journal, Vol.111, Issue-9, 2/9/2013

² Wood Mackenzie, Official website, 27/6/2013



annually. This matter will contribute to the activation of drilling rigs industry as the world would need 95 new rigs until 2022 with up to \$65 billion of investments.

The number of offshore producing fields around the world reached 1292 fields in 2012, constituting more than 18% of the 7124 producing fields worldwide. Offshore production capacity has trebled (especially from deep waters) between 2000 and 2010, from 1.5m b/d in 2000 to more than 5m b/d by the end of 2009. It is estimated to reach 10m b/d in 2015. Some Arab countries have been working on a number of offshore oil and gas projects, including Cran gas project which produces on average 4.2 million m³ of gas/day; Manifa project in KSA, which produces about half a million barrel of heavy oil per day and whose production capacity is expected to reach 900000 b/d of oil and 65000 b/d of condensates. The project also processes 2.55 million m³ of associate gas per day in 2014. These and other projects will contribute to provide current production capacities with new indispensable quantities of oil and gas for domestic and international consumption.

In another report on the status of water in the petroleum industry, Wood Mackenzie explained that transparency and modern technology would contribute to limiting the industry's water-related risks in the next few years when water resources are expected to become rare. The report built its conclusions on data issued by the World Resources Institute (WRI). The said institute has made a survey on the risks resulting from using water in areas with highest energy production in the world; it found that highest risks were related to shale oil production plays in the USA. This was followed by coal production, China's electricity power production from plants powered by coal, then crude oil production in the Middle East.¹

More attention has been given to safety and security in offshore exploration and production. Various recommendations were issued

¹ Oil and Gas Journal, WoodMac examines rising water risks for oil, gas industry, 13/11/2013



in this regard by many authorities. In its review of a study¹ published in *Det Norske Veritas* in mid 2013, *Oil and Gas Journal* summed up these recommendations by saying that in the past twenty years, the petroleum industry has managed to double the development of its safety and security performance by ten folds. During the same period, an improvement in facing huge accidents risks has been noticed although the type of improvement differed from one place to another. The study showed the need for considering many points including:

- Performance based regulation: these are negotiations related to having a system in place for health, safety, and environment administration affairs. Such a system is essential to ensure continuous improvement, innovation and adaptations to relevant conditions and new risks.
- Clear roles and responsibilities: petroleum industry operations involve many parties at any one time; therefore, all parties should understand their roles and responsibilities with regard to safety and having a common goal for all.
- Holistic risk concept: any risks related to offshore oil and gas operations are site, operation, and time specific. To ensure a holistic risk management approach, it is imperative to make the latest risk developments recording tool accessible and to provide a comprehensive view on any risks that may face assets, belongings, projects or even the company itself.
- Shared performance monitoring: to ensure effective risk management, all parties involved in planning and executing of an offshore operation should be involved in the same safety procedures objectives, observe these objectives, and to have the same mutual understanding of the situation and the consequences of deviations.

¹ Steven Poruban, Enhancing Offshore Safety and Environment Performance, *Oil and Gas Journal*, 10/7/2013.

On another note, 2013 witnessed the continuation of the unstable situation in some Middle Eastern and African countries, including Tunisia, Libya, Egypt, Algeria, and Syria and its impact on neighboring countries like Iraq. This situation led to fluctuation and drop of production in these countries in some circumstances, however, that matter has not prevented the growth of exploration and production activities in addition to attracting investments in the other Arab countries.

In Algeria, the situation has become appropriate for resuming production at Ain Amnas Gas Processing Installation between 16 and 20 January 2013. The installation is a joint venture between BP, Statoil, and Sonatrach and is considered one of the largest wet gas projects in the country. The installation develops and produces natural gas and gas liquids from various fields in Elizi basin south east Algeria since 2006. Its capacity is 9bm³/year. Production has returned on a limited scale from train-1 in February 2013.

In Iraq, the pipeline connecting Kirkuk oilfields with Turkey's Jihan port has been blasted in April. The incident led to oil production suspension temporarily but production was resumed later.

In Syria, US Energy Information Administration (EIA) pointed out in February 2013 that HE the Syrian Oil Minister has confirmed that the loss of the petroleum sector amounted to \$2.9b since the outbreak of events till October 2012.¹

On the other hand, some natural disasters have affected petroleum activities elsewhere in the world. Flood in US Colorado in early September is one example, as the affected area embraces more than 20,000 oil and gas wells within Denver-Julesberg basin, a site for hydraulic cracking where large companies like Nobel and Anadarko work to develop Wattenberg field targeting shale oil in Niobrara formation. The area produces 134,000 b/d. With water levels going up due to the flood, some companies operating in the area shut down more than 1900 wells. The area was affected by relatively slight

¹ Arab Oil and Gas, No.998, 16/4/2013

pollution due to the damage of two tanks containing 450 barrels of oil, and a partial gas leakage in some wells and flow lines.

However, 2013 has witnessed a clear offshore and onshore exploration and development, for example:

A- At OAPEC Member Countries:

In the **UAE**, Abu Dhabi Marine Operating Company, (ADMA-OPCO) and National Petroleum Construction Company(NPCC) have signed a contract worth about \$766m including engineering, procurement, and construction works needed for executing the first stage of Umm Lulu oilfield, which is part of National Oil Company (ADNOC) strategy to increase ADMA oil production capacity by adding 300,000 b/d from new fields¹. The new fields are: Satah Al-Razboot Umm Lulu and Nasr as their total production would increase from 600,000 b/d currently to 1 million b/d by 2020.

ADNOC has also signed an agreement on oil and gas exploration in the eastern region of Abu Dhabi with OMV East Abu Dhabi Exploration. According to the agreement, the two companies would conduct a four-year program covering seismic surveys and exploration drilling for a number of wells. Once any discovery is made, both companies can develop it mutually in accordance with the country's laws. ²

ADMA-OPCO has awarded a turnkey contract to Technip to execute a overhaul program for flare modification in Das Island 290km offshore Abu Dhabi.³ the contract covers engineering, procurement, installation works and assisting in operation according to a plan aiming at mitigating hazards resulting from associated gas combustion at integrated gas development project facilities. It also aims at limiting staff exposure to gas during operating and

¹ World Oil, 26/6/2013

² World Oil, 24/6/2013

³ Offshore Magazine, 30/5/2013



maintenance works. Work should be completed in the first quarter of 2015.

As part of its efforts to develop Bab sour gas field Abu Dhabi National Oil Company (ADNOC) - ADMA-OPCO has also signed a 30 years agreement with Shell worth \$10billion. According to the agreement, ADNOC will own 60% of the shares of a joint venture company to develop the field. Shell will own the remaining 40% of the shares. Both companies are scheduled to work together using the latest sour gas technologies to develop the field.¹

Petrofac Emirates, a joint venture between UK's Petrofac and UAE's Mubadala, has won a \$3.7 billion contract to develop Abu Dhabi's upper Zakum filed. The company is planned to establish a consortium with Daewoo Shipbuilding and Marine Engineering Co., Ltd (DSME) to develop the field. According to contract conditions, the consortium will be in charge of engineering, procurement, construction, transportation, and commissioning of surface facilities of the four industrial islands in the field. The project will include launching control supply of well head control, manifold pipelines, crude oil process facilities, water injection and gas lift, export pumps, power generation, and other requirements. These facilities are expected to operate in 2016. The contract was signed between Zakum Development Company [ZADCO] and Petrofac. Petrofac's obligations to the project are worth about \$2.9 billion.²

Later in 2013, Dana Gas contracted Adryard Abu Dhabi Co (a subsidiary of Interserve) to build a marine platform worth \$17 million to develop Al Zora field.³ Dana Gas had previously signed a contract with Sharjah Emirate and Ajman Emirate to develop the mutual offshore field in their territorial waters.

¹ Shell, Official website, 30/4/2013

² Energy Business Review, 12/4/2013

³ Oil and Gas journal, 19/11/2013



The platform is scheduled to be fixed in waters of 24m depth. The company expects to produce about 1.13 m³ of gas/day in the first half of 2015. The produced gas is planned to be transported to gas processing facility in Sharjah through a pipeline of 34km length.

These activities all contribute to achieving ADNOC¹ plan. ADNOC's general manager said that the company aims at boosting its production capacity to 3.5 million b/d by 2017. During the Middle East 21st Oil and Gas Conference 2013, he has also mentioned that ADNOC managed to overcome challenges resulting from sour gas production from Shah field. The field is scheduled for production towards the end of 2014.

In Algeria, in the beginning of 2013, Petrofac has won a three years service contract to develop hydrocarbons production from Ain Saleh and Ain Aminas. The contract has been given by the joint venture managing the two fields, namely BP, Statoil, and Sonatrach. As part of the contract, Petrofac will provide consultancy and designs in addition to procurement in various fields. The contract has an option of extending it for another additional year.²

Touat Gas has signed an agreement worth \$ 1billion with Tenicas Reunidas to develop Touat field in Idrar Province south west Algeria. The contract covers engineering, procurement, construction, and operating of the complex including its gathering systems, gas and condensates processing units, compressors, filtering units, and dehydration units. The first stage of the development plan includes project production in 2016 with an annual capacity of about 4.5 billion m³ of gas and 630,000 barrels of condensates. Touat (1) plans to drill 25 wells in the first development phase.³

¹ ADNOC News, second issue, 2013

² Energy Business Review, 9/1/2013

³ Energy Business Review, 9/8/2013

In **KSA**, Saudi Aramco has awarded engineering, procurement and construction contract to Larsen and Toubro Arabia for its Midyan gas plant located the Tabuk region of Saudi Arabia. Aramco plans to increase its gas production capacity to meet the increasing domestic demand. The produced gas will be used to operate electricity power plants. The plant will process 2.1 million cubic meter per day of non-associated gas and 4500 barrels per day of condensate. It will consist of two pipelines stretching a length of 98 kilometers to deliver sales gas and stabilized hydrocarbon liquids to a power plant near Duba.¹ The Midyan gas plant is expected to be operational by 2016.

Also, Saudi Aramco leased two offshore rigs under construction in Singapore (AOD II) and (AOD III) from Asia Offshore Drilling through a three years contract with an option of extending it for a fourth year. The contract is worth about \$462 million.²

Aramco CEO has stated that KSA plans to maintain a spare production capacity that exceeds 2 million b/d stressing that the company has doubled its annual budget tenfold during the last ten years hitting \$40 billion. He also affirmed that the company is working on increasing the average recovery factor (RF) from its fields to 70%, which is double the world average. The CEO said that maintaining a production capacity of 12.5 million b/d includes production from new offshore projects like Manifa field . the company also hopes to add 550,000 b/d to its production capacity from Al Shiba and Khurais fields in 2017. He stressed that Al Shiba field will produce 1 million b/d by the end of 2016 or early 2017 after adding 250,000 b/d to its production capacity. Khurais field's production capacity will be increasing by 300,000 b/d to reach 1.5 million b/d in 2017. He explained that production quantities will include a high percentage of light oil for exportation. Heavier crude produced by Manifa field is

¹ Upstream online, 21/5/2013

² Arab Oil and Gas, No.997,1/4/2013



earmarked for refineries being developed by the company in Yanbu' and Jubail.¹

It is worth mentioning that while developing its business, Aramco has adopted a policy changing its position from being a buyer and user of technology to establishing its status as a creator of new technologies. The company's CEO² stressed that there were plans to double research budget by five folds and science and technology staff by three folds until 2020.

Iraq has signed an initial agreement with Jordan to construct a pipeline to transfer Iraqi oil from Basra to Jordan's Aqaba Port. Canada's SNC-Lavalin started technical studies on the project in the second quarter of 2013. The said company has won an engineering contract worth \$13.5 million back in 2011 to conduct studies on the same project. Iraqi Oil Ministry explained that the pipeline will be 1700 km long and expected to be completed by 2017. The new pipeline will create more than one thousand job opportunities in Iraq and three thousand in Jordan. Designs and technical studies were supposed to be completed during the last quarter of 2013. Then a bidding to execute the project's first phase should be made. Investment companies were invited and qualified to take part in the project's second phase expected to be completed during the first quarter of 2014. The project's first phase is expected to run from south Iraq to Haditha city, a phase to be executed completely by the Iraqi Government. The second phase until Jordan's Aqaba will be tendered for investment. The capacity of the first phase (the pipeline between Basra and Haditha) is estimated at about 2.25 million b/d. Oil quantities that will reach Aqaba Port are expected at one million b/d, 150,000 b/d of which will go to Jordan. The rest will be exported as the project shall secure a new port outlet to export Iraq's oil via Al Aqaba Gulf.³

¹ World Oil, 14/10/2013

² Saudi Aramco, Upstream focus for offshore conference, Latest News, 2013

³ Arab Oil and Gas, No.998, 16/4/2013

In Qatar, Qatar Petroleum has signed two contracts with Gulf Drilling International to extend the use of Doha and Zubarah drilling rigs. Each contract includes an extension period of five years that ends in 2018. The two contracts are worth QR1.7 billion, or \$467 million.¹

Qatar Petroleum and Occidental Petroleum have agreed on the fifth phase of developing the northern dome of offshore Idd El Shargi field in order to maintain production levels at 100,000 b/d during the next six years. Both parties have collaborated to develop the field since the signing of the mutual developing and production agreement with the Qatari government in mid 1994. The fifth phase includes the implementation and improvement of water injection technology in all field reservoirs. The partners also plan to drill more than 200 new injecting and water production wells. Special equipments will be installed to support the wells operations like small platforms, well heads, fluid processing equipments, transport pipelines and else. Moreover, pilot studies on re-inject water resulting from improved petroleum production will be implemented. The project's total cost will exceed \$3 billion.²

Qatar is planning to increase oil production through changing the nature of contracts which its production partners work according to. According to a report by Qatar National Bank (QNB), Qatar Petroleum is planning to inject investments not only in its fully owned fields but also in fields fully operated by international oil companies. This step would boost Qatari oil production, as Qatar Petroleum plans to transform all production sharing agreements with foreign partners into joint ventures to increase oil production rates. The report has mentioned that a number of production partnership agreements will be expired soon. This matter has encouraged Qatar Petroleum to renegotiate conditions on a number of the country's big producing fields which reached maturity and fall in production.

¹ Offshore Magazine, 10/6/2013

² Offshore Magazine, 10/7/2013



The report added that Qatar Petroleum has discussed the conditions on extending the license of Total which manages Al Khaliij field operations. The idea is to change the production partnership contract into a joint venture in 2014. This would reduce Total's operation shares from 100%

to 40% so Qatar Petroleum becomes the principal owner of the field's shares whose production capacity is about 25,000 barrel of oil per day. Qatar Petroleum also focuses on two big fields: Al Shaheen, managed by Maersk, produces about 300,000 b/d, and whose license expires in 2017. The other one is a field which produces about 90,000 b/d and operated by Oxy through a license that expires in 2019. QNB report said that the limited options to raise production rates would contribute in developing the Qatari production to hit 780,000 b/d in 2016. The report mentioned that in spite of the drop in the current Qatari oil production compared to 2008, this drop is replaced by increasing the production of condensates by about 350,000 b/d, stemming from the increase in gas production in the liquefied natural gas sector. Condensates production has hit 900,000 b/d in 2012 exceeding Qatari oil production which the report said it hit 740,000 b/d that year. ¹

In Kuwait, Terra Energy & Resource Technologies has won a service contract from Kuwait Oil Company, according to which Terra Energy would deploy its prospecting technology over an area of 200km² to the south and north of Ritqa field within four months of the contract's date.

His Excellency Deputy Premiere and Oil Minister has stated that Kuwait can increase its oil production up to 4 million b/d in 2020 instead of the current 3.2 million b/d. the statement came following the 32nd meeting for The Petroleum Cooperation Committee in the GCC countries (Oil Ministers) ³.

¹ OPEC bulletin 6-7/13

² Business Energy Review, 21/2/2013

³ Kuwaiti Oil Ministry, official website, 24/9/2013

On another note, in the divided zone between KSA and Kuwait, Al-Khafji Joint Operations [KJO] has given the British Mott MacDonald a contract to develop Al Khafji field. No details revealed on the contract financial conditions. The contract covers conducting feasibility studies and providing initial engineering field designs. It also includes providing technical consultation during tenders and developing final engineering designs of other industrial projects.¹ SK Engineering & Construction has won a contract to renovate and develop a number of onshore facilities of Al Wafra field located at the shared area. The contract is worth \$160 million and includes updating the field's main oil gathering station, in addition to upgrading a number of pipelines and heating and cooling equipments.² required work is expected to be completed by September 2015.

As for Libya, the third quarter of 2013 witnessed shutting down all oil exporting ports except Al Zawya Port due to the country's political and security conditions. As a result, the Mediterranean oil market has faced a drop in supplies that reached 500,000 b/d of the sweet light crude. Libyan oil export has also dropped by 70%. OPEC reports indicated that available data showed a drop in Libyan production rates by 173,000 b/d in the period between the end of the second quarter and July 2013. Indirect statements though stated that the drop in that same period reached 280,000 b/d as shown in the following table:

2013 Production b/d	Q1	Q2	May	June	July
Direct data	1489	1415	1441	1286	1242
Indirect data	1399	1342	1402	1186	1062

On another note, it was said that the main indirect reason for the fall in production has been attributed to a strike by exporting ports staff calling for raising their wages which led to a fall in production in August to 400,000 b/d only.

¹ Energy Business Review, 24/5/2013

² Arab Oil and Gas, No.997, 1/4/2013



In November 2013, the German Wintershall company announced that the closure of one of oil exporting ports in Libya forced them to stop production. The company said at the time that it suspended oil production weeks ago. The company affirmed that its oil production before the Libyan war reached 100,000 b/d while its production in Q1 of 2013 reached about 85,000 b/d.¹ Head of the managing committee in the Arabian Gulf Oil Company in late December announced resuming the operation of Misallah oilfield and Tabraq and Al Sareer refineries. In the same context, a member of the Operations, Maintenance, and Refineries Department said that Tabraq and Sareer refineries have resumed production and operation normally since 28/12/2013. He added that the pumping of oil from Al Misallah field reached about 25,000 b/d. Crude pumping from Misallah and Sareer to Haraika Port has reached about 38,000 b/d. he clarified that Tabraq and Sareer refineries have started working normally.²

In Egypt, Sea Dragon Energy has announced working on reviewing a number of methods to boost their production from onshore Shaqeer license in Suez Gulf offshore Egypt.³ The license is given for shallow waters 300km off south east Cairo and covers Shaqeer and Jama fields. SFB-5 well in Shaqeer field has been in production since 2006. It's accumulated production has reached more than 1.1 million barrel of upper and lower Radees sands as it used a jet pump at an average of 380 b/d. The company has carried out a work-over on the well including replacing corroded tubing and well cleaning in order to increase its production to 500 b/d.

Eni, through its arm IEOC, has won the full oil and gas exploration share in the exploration area 9 offshore Shurook in the deep waters of the Mediterranean offshore Egypt. It extends across 3765km² with a depth of 1400-1800m of water. Eni's oil and gas production in

¹ Oil and Gas Financial Journal, 27/11/2013

² National Oil Corporation, 29/12/2013

³ Offshore Magazine, 18/3/2013

Egypt has reached about 234,000 BOE/d by the end of 2013.¹

On another note, the Egyptian Government has signed an agreement with the Iraqi Government on a pipeline project to transfer Iraqi oil to Egypt through Jordan. The project will cost about \$17 billion. The agreement includes providing four million barrel of oil per month to Egyptian refineries to cover for the shortage in diesel production.²

His Excellency Egypt's Minister of Petroleum and Mineral Resources has signed five new agreements for the Egyptian General Petroleum Co (EGPC) on exploring oil and gas in west Gazalat in western desert and in south west and south Ghareb in eastern desert and eastern Lajia in collaboration with Canada's TransGlobe Energy and Greece's Vegas Oil and Gas. It will be done by investment worth \$115.5 minimum and grants worth \$41 million. The agreements include drilling 72 wells. The Minister explained that the signing of the five agreements³ came within the framework of 21 petroleum agreements that had laws issued in their regard; nine of which were signed end of October 2013. The total number of the agreements signed with international companies has reached 14 worth \$585 million of investments and included bonus worth about \$91 million targeting the drilling of 87 wells.

In addition to the above, the Egyptian Petroleum and Mineral Resources Ministry has signed an agreement with RWE Dea and Dove Energy on the license for east marine Ras Badran. RWE Dea will be in charge of the operations in the licensed area with a share of 80% while the remaining 20% goes to the other company.⁴ The license is in the Gulf of

Suez near previously owned installations by RWE Dea in Ras Badran with a space of 45km². The company plans to conduct a 3D seismic survey and drill one exploration well in the first three years

¹ Energy Business Review, 24/4/2013.

² Egyptian Petroleum Ministry, official website, 13/3/2013

³ Egyptian Petroleum Ministry, official website, 5/11/2013

⁴ World Oil, 19/12/2013



of exploration targeting Cretaceous period sand plays in Ras Badran. The license was tendered in 2011 by EGPC and RWE Dea won the contract in 2012.

In Tunisia, ETAP CEO said that the company has registered a noticeable development in exploration activities in 2013. It drilled 15 wells compared to 11 wells in 2012 and 11 wells in 2011. It has carried out seismic surveys widely in as part of its efforts to put an exploration and development program in the near future. He added that there were 32 blocks constituting an investment opportunity in the country. He explained that the company aims at realizing its vision on a major gas project through developing Nawwarah block southern Tunisia. ¹ Supply contracts for the project's materials and infrastructure are expected to be finalized in 2014.

B- At non-OAPEC Arab Countries Level:

Jordan's Natural Resources Authority has announced bids for production partnership in south Jordan's block across an area of 10416km², including 375km² of seismic surveys² and 3 previously drilled wells.

In **Oman**, DNO International ASA has acquired a share of 75% of Allied Petroleum Exploration Inc. to explore Block 36 in The Rub' al Khali (Empty Quarter) basin across an area of more than 18000 km². In the past, two wells were drilled and affirmed the existence of source rocks from hot shale belonging to the Silurian Period. These rocks have contributed to the creation of most of the oil and gas fields in the Arabian Peninsula and North Africa. Air magnetic and gravity surveys have contributed to the interpretation of 10,000 linear kilometers of 2D seismic surveys showing potential layered units forming potential reservoirs containing oil. Technological data

¹ Arabian Oil and Gas, Business Stable in Tunisia Despite Turmoil Nearby, 25/9/2013

² Natural Resources Authority, official website, 15/4/2013

showed that there were indications of the availability of reserves of up to 100 million barrels.¹

In Lebanon, Spectrum Company has launched a 3D offshore seismic survey in the first half of 2013 offshore the Lebanese coast in east Mediterranean.² The new survey covers an area of 2200km² and includes the northern part of the basin and its borders towards the north of the previous survey that has covered an area of 3052 km² in 2012.

In Morocco, the National Office for Hydrocarbons and Minerals has signed a new exploration agreement with Chevron Morocco Exploration for three offshore areas. The agreement conditions include carrying out a seismic survey and other studies in deep waters for Cape Rear area (1), Cape Cantine and Cape Walydia in an area of 100 and 200 km west and north west Aghadeer across 29,200 km² with water depths between 100-4500m. Morocco Chevron's share is 75% of the three areas and the remaining share goes to the National Office.³ Plains Exploration and Production Company has signed an agreement with Pura Vida Energy by which it would participate in Mazjan exploration license. The agreement states that PXP pays \$15 million to be a partner to PVE which owns 70% of the licensed shares located in Esawriya basin, 100km offshore Moroccan shores across an area of 11,000km². The area has many potentials belonging to the Middle Miocene and lower Cretaceous, which were identified by data re-processing of previous 3D seismic surveys.⁴

In **Yemen**, the Ministry of Oil and Minerals has chosen a unit from DNO International ASA, as the best bidder for onshore block 84 in Masila- Seion basin. The block extends over an area of 731km² next to Block 14 where more than 1 billion barrels of oil were discovered. In collaboration with its partners, the said company will

¹ Oil and Gas Journal, 11/7/2013

² Offshore Magazine, 1/5/2013

³ Offshore Magazine, 23/1/2013

⁴ Energy Business Review, 4/1/2013



conduct a 3D seismic survey and drill two exploration wells in the first exploration phase.¹

C- In the Rest of the World:

There have been a number of exploration and development activities in 2013 that can be referred to in the following examples:

In Ethiopia, Africa Oil has signed a production partnership agreement covering 42519km² within a rift basin for which the company has conducted a joint study earlier under the umbrella of what is known as “Rift Valley Block” Agreement. The said area is to the east and north of South Omo block and includes the east African rift of the Tertiary towards Ethiopia. The company’s plan 2013 included carrying out a full magnetic survey and studying the social environmental impacts as part of area assessment covered by the agreement.²

In Afghanistan, a group led by Dragon Oil PLC and Turkish Government-owned Turkiye Petrolleri AO has signed exploration and production sharing contracts to develop oil and gas in Sanduqli and Mazari-Sharif blocks north west the country within the first phase of Afghan- Tajik development proposal. Each company’s share is 40%, the remaining 20% goes to Ghazanfar Group. Sanduqli block is about 2583km² and is at the borders with Turkmenistan and Uzbekistan. Mazari-Sharif block is 2715km² bordering Uzbekistan. Contracts include an exploration phase over four years covering

seismic surveys and interpreting them in addition to drilling two exploration wells in each block.³

Brazil has decided in Q2 2013 to bring forward to October 2013 a first of its kind bidding round in order to award an exploration area in pre salt basin through production sharing contracts. CNPE

¹ Oil and Gas Journal, 10/7/2013

² Oil and Gas Journal, 21/2/2013

³ Oil and Gas Journal, 5/11/2013

mentioned that the first area to be tendered is within Libra field, which- according to recent statements- is expected to contain 16 billion barrels of recoverable reserves. The said date is a month earlier than the scheduled date as Brazil has been granted about \$1.4 billion in May 2013 as a bonus of signing the first license contract in the area in the past five years.¹

In Sri Lanka, the government has invited bids for six exploration blocks in ultra deep waters within a range of 18,000 and 26,000 km². The bids were due on 29 November 2013. The country's frame agreements state that work time should be two years excluding the time spent on data collection, processing and interpreting. This stage would be followed by a period of one year of discussions with PRDS on next steps.² Moreover, BP and CNOOC signed a production sharing agreement on block 54/11 in the deep waters of Pearl River Mouth within the South China Sea.³ The block covers an area of 4586km² in waters with a depth of 370 to 2300m. It is close to two neighboring blocks for which BP has obtained an exploration license in 2010 and 2011.

In Cyprus, an Eni led consortium has signed an exploration and production sharing agreement with Cyprus's Ministry of Commerce, Industry, and Tourism for blocks 2, 3, and 9 in the deep waters of Levantine basin offshore Cyprus. Total area size is more than 12530km². the company's share is 80% while the remaining goes to Korea's Kogas.⁴ It is clear that the petroleum industry pays great attention to the east Mediterranean as an exploration area with promising potentials of huge gas potentials.

In the USA, the USA government has awarded licenses for areas exceeding 36400km² for exploration and development in the oil and

¹ World Oil, 23/5/2013

² Offshore Technology, 29/8/2013

³ BP, official website, 16/7/2013

⁴ World Oil, 29/1/2013

gas sector in the Gulf of Mexico. The licenses attracted investments worth more than \$1.2 billion and they covered areas at the outer continental shelf offshore Louisiana, Mississippi and Alabama. The last government bid of this type had attracted 52 companies operating in the field of energy. They submitted 407 bids for 320 sectors over an area of 7000km². Investments in these bids have hit \$1.5 billion.¹

In general, East Africa is witnessing a (hydrocarbon) prosperity that is expected to last for decades to come in light of the increase in big oil and gas discoveries in Kenya, Uganda, Mozambique, and Tanzania in the past few years. Some indicate that Somalia might in turn become one of the important countries in this regard in spite of the unstable security situation that hinder explorations. Kenyan President has announced in 2012 that oil has been discovered for the first time in his country. Uganda, however, has affirmed in 2012 the presence of about 3.5 billion barrels of oil reserves in its lands and is working hard to produce no less than 1.2 billion barrels of these reserves over the coming three decades.

C- Unconventional Hydrocarbons Resources

Unconventional hydrocarbon resources continued to play an important role in petroleum industry. Economic indicators of merging and acquisition have shown that most spending in North America could be attributed to the interest in shale oil and gas. The amount of transactions for unconventional resources of shale oil and gas, and tight gas has hit over \$57 billion in 2011. Merging and acquisitions hit more than \$232 billion in 2012. Reports show that spending in this field is expected to continue increasing supported mainly by growth in operations in tight oil and wet gas lays, which leads to the assumption that US oil production might reach 11.5million BOE/day by the end of this decade according to HIS. They stressed that conventional and unconventional resources in the USA attract more

¹ Offshore Technology, 22/3/2013



investments; while at the same time these investments increase in oil in West Africa and in gas in East Africa due to abundant quantities of oil on the one hand and the increase in gas discoveries in deep waters on the other. ¹

It looks like these growing investments come in the context of anticipated improvement in the global economy. A report by the same company² indicated that this economy will grow by 3.3% in 2014 compared to a growth rate of 2.5% in 2013.

In this context³, some reports indicate that North America might become energy independent by 2020; it might become an exporter too. These reports focus on the emergence of the US shale oil has contributed to the reevaluation of strategies of opening the Pacific region markets for gas exporting. Shale oil has contributed to adding about 1 million b/d to the US and Canada production in 2012 and there is a big difference when looking at predicted future production⁴ as estimates range between 3.5 and 8 million barrels/day until 2020.

Many countries in the world work on developing the uses of such kind of unconventional resources once available; for example:

A. In Arab Countries:

Saudi Arabia Petroleum and Mineral Resources Minister His Excellency Ali bin Ibrahim Al Naimi stated that KSA was planning to drill seven exploration wells in search for shale oil in identified areas. Primary estimations indicate reserves of about 17 trillion m³ of this kind of gas. The statement was given during the Sixteenth Asian Investment Conference in Hong Kong from 18 to 22 March 2013.

¹ Oil and Gas Journal, Unconventionals continue to Play a Role in 2013 Energy M&A, 15/8/2013

² HIS, Global Economy to See Modest 3.3 Percent Growth in 2014, 12/12/2013

³ Oil and Gas Journal, WoodMac: Unconventional Production Changing Energy Trade Patterns, 26/9/2013

⁴ Per Magnus Nysveen, Forecasting Shale Oil Production, Oil and Gas Journal, 11/7/2013



In Jordan¹, Jordanian Ministry of Environment has given permission for Enefit joint venture to undertake electricity power generation from oil shale plant project, the first of its kind in the Kingdom, with a capacity up to 500 megawatt in Attarat Umm Ghudran area, 110km south Amman. The plant will combust oil shale within twin circulation fluidized bed boilers using fluidized bed technique to generate steam needed for drive turbines, a technique that allows for reducing the environmental impact caused by burning oil shale. The plant needs about 1200 tons of oil shale per hour which is secured from an area 11km away from the plant. The site reserves are expected to meet the plant's needs for forty years. The plant is expected to start operations by 2017, which will contribute to reducing Jordan's expenditures on petroleum products for electricity generation by \$490 million.

In **Morocco**, San Leon has won a license from the National Office for Hydrocarbons and Minerals to appraise shale oil in a block that stretches across 36km² in Tamahdeet.

The license allows the company to appraise the possibility of using superficial repair operations in the project. These operations include thermal analysis of shale oil and pyrolysis and steam condensation. The company said that the area contained layers rich with shale whose oil constituted 99 liter/ton, the highest of its kind in Morocco. Shale is less wet among other shale oil formations in the world.

Analysis by Enefit Outotec Technology proved that shale oil in Tamahdeet would have commercial value if surface retorting process used in processing it. The said company has completed a initial evaluation study using available data about shale oil in the area. It clarified that the project would be commercial if a plant processing 280 tons of shale oil per hour was built. The study said that the surface retorting process unit would produce 3600 barrel of oil per day. Two other units could be added to increase production up to

¹ MEES, 21/6/2013

11,000 barrels of oil per day. Both units would include equipments to develop synthetic oil and power generation.¹

B. International Level:

In **Argentina**, Chevron Argentina has signed an agreement with a subsidy of Argentine's YPF to develop shale oil and gas resources in Vaca Muetra formations with Neuquén basin. The terms of the agreement include spending about \$1.24 billion on the first phase of Loma La Lata Norte and Loma Campaña areas. Initial timetable includes the drilling of 100 wells within 20km² (the area's agreed total size is 388km²). This strategic agreement will enable Chevron to take part in developing Vaca Muetra formations, one of the most important shale oil formations in the world. Also, it will give the company the opportunity to increase its production rates in comparison to the rates mentioned in its scheduled plan for 2017 which are 3.3 million b/d according to its Deputy CEO.² Loma La Lata produces about 10,000 BOE/d of crude oil, and 113,000m³/d of natural gas from Neuquén basin as the company has shares ranging between 18.8-100% in various fields.

With growing interest in its potential tight gas and shale oil resources, Australia has invited interested companies to bid for six offshore and onshore blocks western the country, whose total size together exceeds 21,000km².

L13-3 in Perth basin is among these blocks which a pipeline to transport oil and gas goes through it. The basin is considered potential resources for shale and tight gases in the western area. Government estimates indicate a potential of 8 trillion m³ of shale gas and tight gas, 2 trillion m³ of which are in the northern part of the basin. Also,

¹ Energy Business Review, 19/8/2013

² Oil and Gas Financial Journal, 5/8/2013



about 8 trillion m³ ¹ are estimated to exist in Canning basin.

An Australian Council Learned Academies (ACOLA) report has mentioned that the country's unexploited shale gas reserves is about 28 trillion m³ ², however using these resources needs new regulations and legalizations and cost cuts. The report shows that exploring site of this kind of gas has been most of the time economically unfeasible. It would also contribute to the producing greater amounts of carbon emissions to the air in volumes more than those produced by natural gas resources. The report indicates that the infrastructure costs in Australia would be double those in the USA and would need gas prices to go up in order to be economically feasible. In spite of all these points, the report expects oil and gas companies to invest \$500 million in shale gas uses in Australia between 2014 and 2015. Santos Company has actually started drilling the first well for this purpose in Queensland.

In Uruguay, Petrel Energy announced plans to test oil and gas presence in an area of 14164km² in Norte basin within a program that has started in August 2013. It included drilling two wells: Pidra Sola (1330m deep) and Salto (700m deep). Drilling is planned to reach rocks rich with organic substances which will allow for testing the limit parameters to evaluate source and reservoir rocks of the same age that exist in a similar formation in Bakken in the USA.³

In the **United Kingdom**, BGS, in collaboration with DECC, has completed a report which mentioned that shale gas initially in place in the UK's midlands between Blackpool and Wrexham to the West, and Nottingham and Scarborough to the East are between 23.3 trillion m³ and 64.6 trillion m³ while most likely estimates to 37.6 trillion m³. the report has affirmed that the amount of gas to be produced was not defined and that it

¹ Wall Street Journal, 11/6/2013

² ACOLA, Official Website, 4/6/2013

³ Energy Business Review, 12/7/2013

would depend on economic, technical and social factors.¹ In the second half of 2013, IGas has announced the results of a new study that showed that shale gas initially in place in north west the UK, including Bowland whose share fully owned by IGas, varied between 0.4-4.9 trillion m³. Average reserves most likely estimate to about 2.9 trillion m³. The results of the new study were based on a geological model that included the processing of data of 330km of seismic surveys and analyzing some cores and logs of some wells near the area in addition to early carboniferous formations. In 2013 Q4, it is scheduled that the company starts drilling wells in the said area to support the findings of its study.²

In the second half of 2013, all British Government's parties have endorsed a report that showed that the estimated reserve volume in eleven areas north Britain is about 37 trillion m³ of shale oil. This is based on an independent study by BGS. The Government has also announced a package of reforms aiming at accelerating shale gas investment including discussions on tax incentives and change in the planning system. At the same time, a number of oil companies have disclosed an integrated package of social benefits that were introduced by some companies that are looking to secure a position before applying for any license. The benefits package includes granting £100,000 (more than \$130,000) for those living near every exploration well in addition to 1% of every production site revenues. Environment protection authorities have helped in spreading the systems relevant to shale oil production in addition to some technical instructions on observing environmental issue at work.³

In Colombia, a consortium of Canacol Energy Ltd and ConocoPhillips has started drilling the exploration well Oso Pardo-1 to test the possibility of oil presence in a sand rocks formation from the Triassic period; in addition to examining other deeper reservoirs

¹ BGS, Official Website, 26/6/2013

² IGas website, 3/6/2013

³ Oil and Gas Financial Journal, 1/7/2013

formed of fractured shale and carbon rocks of the Cretaceous period. The well is located 12km to the west of Mono Arana-1 that contained conventional oil discovered in the same formations that the new well targeted.¹

In **India**, a new policy has been endorsed allowing granting shale oil and gas exploration licenses to companies operating in areas licensed for conventional hydrocarbon explorations. Governmental committee for economic affairs has approved the Oil and Gas Ministry's proposal in this regard. The new policy allows companies to work in three assessment phases where each stage takes three years. Government royalty and other taxes should remain as is for conventional resources.²

In the **USA**, Pioneer Natural Resources has started production from Wolfcamp in Martin Province in Texas State via Mabee K #1H well. The well's production from shale rocks has been at a rate of 1572 BOE/d³, 77% of which was oil. The well has been drilled and stimulated in thirty stages of fracturing within a horizontal stem of 2250m height.

¹ Oil and Gas Journal, 14/6/2013

² Oil and Gas Journal, 30/9/2013

³ Energy Business Review, 22/5/2013



Major oil exploration and production development in Arab countries and the word are summarized below.

1- 1 Seismic Surveys:

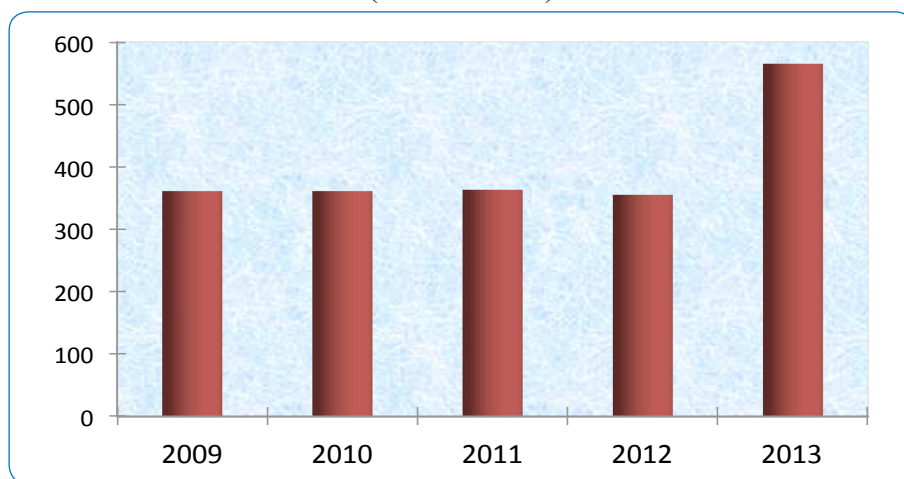
Available data show a significant rise in the number of seismic survey crews worldwide; from 355 crew/month in 2012 to 565 crew/month in 2013 **Figure (2-1)** and **Table (2-1)**.

This rise seems to have come basically from Russia, CIS and the Far East.

Figure 2-1

Seismic Surveying Activity in Different Parts of the World, 2009-2013

(Crew/month)

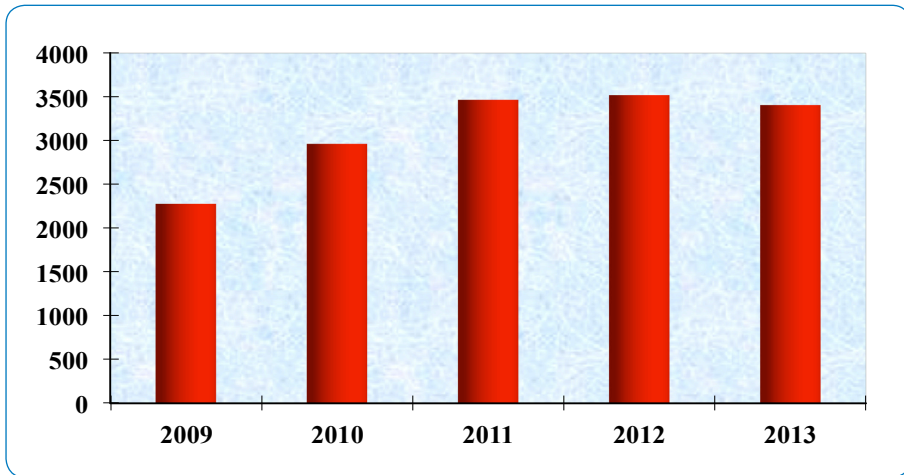


1- 2 Exploration and Development Drilling:

Exploration drilling activities have dropped by more than 3% as the number of operating rigs decreased from 3519 rigs in 2012 to 3406 rigs in 2013. This drop has basically come from the drop in the number of rigs operating in the USA by 8.3% from 1919 rigs in 2012 to 1760 rigs in 2013. **Figures (2-2), (2-3)** and **Table (2-2)**.

Figure (2-2)

Average Number of Operating Rigs Worldwide 2009-2013
(Rig)



Figures (2-3)

Rigs Distribution Worldwide 2013
(%)

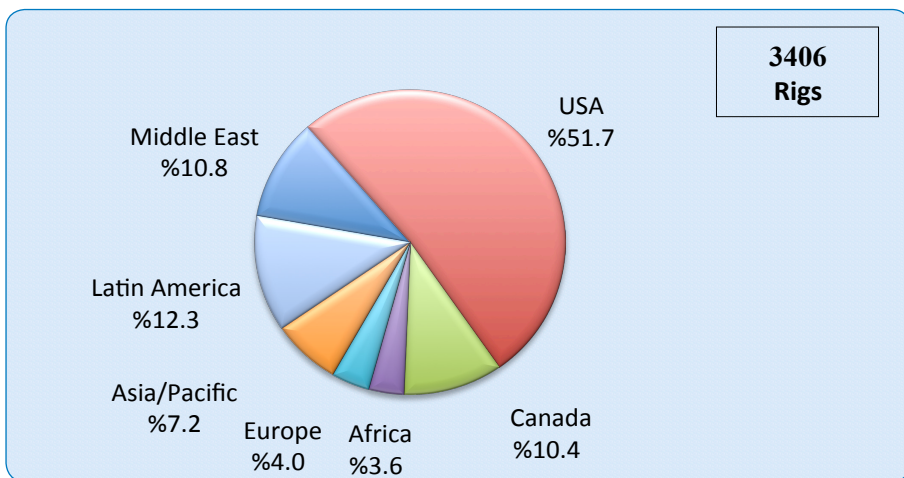
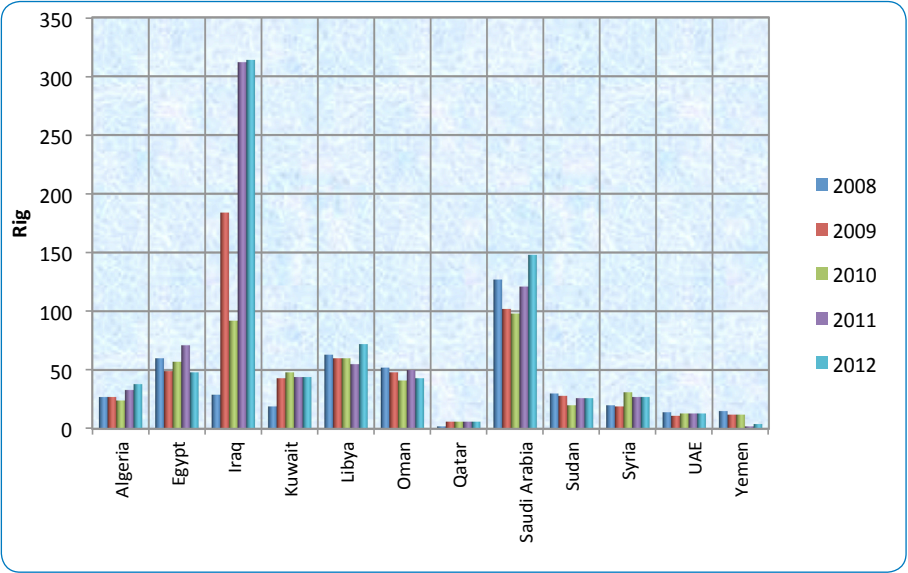


Figure (A) shows the number of operating rigs in a number of Arab countries during the period from 2008 to 2012. It is noticed that the number of these rigs has risen between 2011 and 2012 in Algeria, KSA, Iraq, Libya, and Yemen; but dropped in Oman and Egypt. It remained unchanged in the UAE, Syria, Qatar, Kuwait and Sudan.

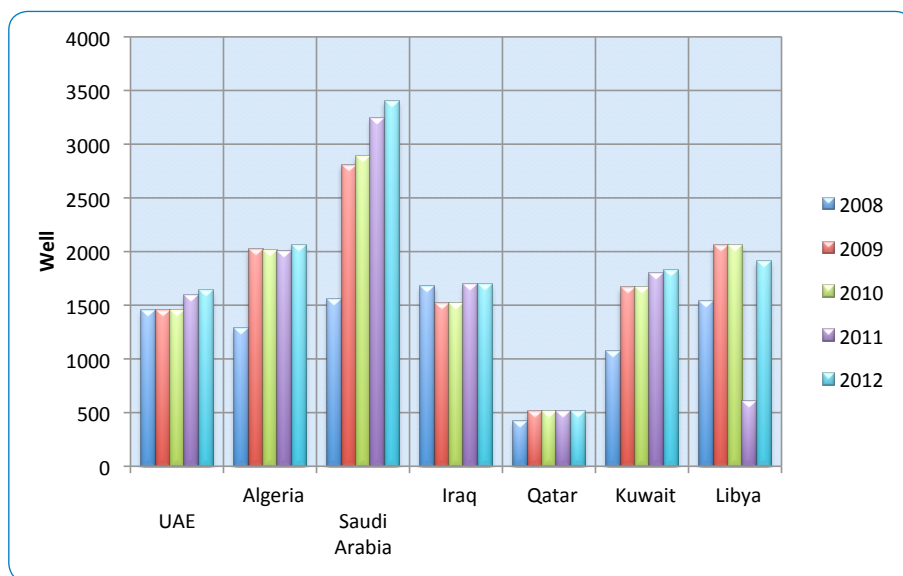
Figure A

Number of Operating Rigs in Some Arab Countries 2008-2012



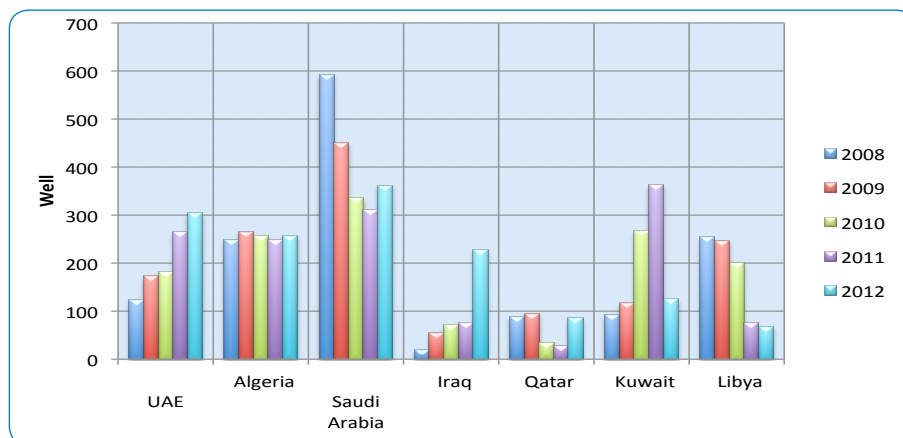
The number of wells that have been completed was as follows: UAE 304, Algeria 258, KSA 362, Iraq 288, Qatar 87, Kuwait 126, and Libya 68 wells **Figure (B)**.

Figure B
Completed wells in some Arab Countries 2008- 2012



It has been noted that the number of these wells have increased in all these countries except for Kuwait and Libya whose completed wells number has dropped compared to 2011. The number of wells that have been completed worldwide has increased from 99039 wells in 2011 to 101757 wells in 2012.

Producing wells have increased in number worldwide by 9719 wells from 971897 wells in 2011 to 981598 wells in 2012. This number has increased in all OPEC Arab counties **Figure (C)** except Qatar ¹ whose producing well number has not changed between 2011 and 2012.

Figure C**Producing wells in some Arab Countries 2008- 2012**

Exploration drilling has contributed to making many discoveries in Arab countries during 2013. Available data show that OAPEC member countries have made together 34 oil discoveries and 10 gas discoveries. Oman and Yemen have made one discovery each. Two

gas discoveries were registered in occupied Palestine.¹ That increases the number of oil discoveries in Arab countries to 36 with 12 gas discoveries Table (2-3). Available data also show that the rest of the world has made 45 oil discoveries and 26 gas discoveries, which means that the number of discoveries around the world has reached 81 oil discoveries. There were 38 gas discoveries.

Following are some of these discoveries:

A. Arab Countries

In **Algeria**, Spain's Repsol has made a huge discovery of gas south east Elizi basin close to Algerian-Libyan borders. TGE-1 well has encountered about 50m column of gas, and when tested produced 235,000m³ of gas per day.²

¹ Such discoveries are not included in the Organization's tables

² Financial Times, 8/4/2013



In 2013 Q4, Sonatrach has made a giant oil discovery in Amqeed Masoud in Warqla State 112km off Hassi Messaoud field, the biggest field in the country. During a visit to Hassi Toumiyat field, His Excellency the Minister of Energy and Mines stated that this discovery was one of the most important discoveries by Sonatrach for the past 20 years. The discovery's reserves are estimated at 1.3 billion barrels. It is planned that Sonatrach would opt for unconventional drilling techniques to get 50% of Hassi Toumiyat reserves. On another note, a Sonatrach official indicated that hydraulic fracturing would be used in the field, which means an extra cost of 10% of the project's total cost. The field will be developed in 3 to 4 years.¹

In Iraq, Norway's DNO International has made a new oil discovery through Tawki-17 well, which when tested produced 1500 b/d of 26°-28° API from a reservoir belonging to the Late Cretaceous Era in Tawki Field, Iraq's Kurdistan.² It is worth mentioning that the company owns 55% of the field's shares, while General Energy owns 25%, and Kurdistan region government owns 20%.

UK-Turkey's General Energy has made a new oil discovery through a side track that was drilled through Bier Bahar1 exploration well in Bier Bahar block in Kurdistan region northern Iraq. Bier Bahar1 has been drilled to a depth of 3933m in May 2012. At the time, the company found an oil saturated column of 300m thickness within Shizari formation of the Jurassic. Tests, however, did not result in producing oil or gas from the well. While the side track that was drilled through the well succeeded in producing 2100 b/d of 15° API oil from Sargelu formation of the mid Jurassic.³

Marathon Oil has made new oil and gas discovery through their arm Marathon Oil KDV as stacked zones containing oil and gas were discovered in Al Harir block operated by the company in Iraq's Kurdistan. The new discovery, Mirawa-1, 65km north east Erbil, has

¹ Algeria Press Service, 26/10/2013

² World Oil, 11/6/2013

³ Hurriyet Daily News, 31/5/2013

been drilled to a depth of 4267m, oil and gas traces were found in the rocks of the Jurassic and Triassic periods within a total thickness extending from 1767m to the total depth of the well. Extensive drill-stem testing was conducted, production was at a rate of 11,000 b/d of the Jurassic reservoirs period. The oil quality varied between API 39° and 45°. The Triassic rocks have produced free gas at a rate of 2 million m³/d and 1700 b/d of condensates. Production rates during tests were limited by the available surface equipments.¹

Oryx Petroleum has made its third oil discovery through Howler license in Iraq's Kurdistan via ZEG-1 well that has been drilled to a depth of 4398m and produced when tested at an average of 4800 b/d of oil.²

Earlier on, Oryx Petroleum had announced its second oil discovery in Howler license in Iraq's Kurdistan as AAS-1 well targeted major potential reservoirs of the lower Jurassic and Triassic, in addition to a secondary reservoir of the Cretaceous. The well's depth reached 3039m in the beginning of September 2013 as it reached the rocks of the Upper Triassic. The plan has been to drill to 3700m but the drilling was halted due to loss of circulation that led to a bottom hole assembly stuck. The company is carrying out more tests while planning to drill an appraisal well in the field in 2014.³

Qatar has made a new gas discovery, the first of its kind since 1971. The discovery was made by Wintershall operating in Block4 near the giant North Field, in water at a depth of 70m. The company had entered an exploration and production sharing agreement with Qatar Petroleum in 2008. Then the two were joined by Mistui Gas Development Qatar in 2010. Discovered reserves were estimated at about 71 billion m³.⁴

In Kuwait, Kuwait Oil Company has announced a new oil discovery in Kabd west of the country, northern Manaqaesh field.

¹ Oil and Gas Financial Journal, 30/10/2013

² Oryx Petroleum, 4/12/2013

³ Energy Business Review, 25/10/2013

⁴ Offshore Magazine, 14/3/2013



When tested, the new well produced 5500 b/d of oil and 127,000 m³ of gas per day. The company's CEO has clarified that the new discovery needs between 4 and 5 years to be developed so that the field can be put on the official production schedule after completing the demarcation of the reservoir and studying the number of required wells to get its maximum production. The well is far from inhibited areas and located in Kabd to the farthest north beside Al Salmy line.¹

In **Libya**, National Oil Corporation has announced in February 2013 that it made a new oil and gas discovery in Ghadames Basin through an exploration and production partnership agreement for area 95/96 signed in 2008 with Sonatrach2, Oil India, and Indian Oil. The exploration well A1-96/01 was drilled 360km to the south east of Tripoli and 70km to the south of Wafaa field. The following table shows the results of the well tests that produced from Taharah carbon formation ²:

Formation	Chock Size (inch)	Oil Production Rate (B/D)	Gas Production Rate (million m ³ /D)	API
Tahara	32/64	2188	42	45

Sirte Oil Company has announced two new oil discoveries in license 6 in Sirt basin. The first discovery has been made through the wildcat well Z1-64 that was drilled to a depth of 2435m and 4km south east Nasser Field (Zaltan Station). When tested, the well produced form Al Harash formation at an average of 1751 b/d of oil (API 38°) and 27,000m³ of gas per day. ³

The second discovery has been made through the wildcat well B1-65 that, 2km northeast Nasser Field. It was drilled to a depth of 2560. When tested, the well produced at an average of 433.7 b/d of oil (API 30.4°) and 42,000m³ of gas per day from Zaltan formation.

¹ Kuwait Oil Company, Official Website, 29/7/2013

² The National Oil Corporation, 21/2/2013

³ Sirte Oil Company, Official Website, 15/7/2013

The National Oil Corporation has also announced in September 2013 a new gas discovery in Ghadames basin in the same area 95/96, which is 800km to the southwest of capital Tripoli and 120km south Al Wafaa field. It was made via the B1-95/2 wildcat well that when tested has produced an average of 283,000m³ of gas per day from the Upper Memouniat formation of the Ordovician.

The corporation also announced during the same period that Polish Oil and Gas (operating company) has made a new gas discovery via A1-113/1 exploration well in the contracted area 2-1/113 in Mirziq basin 750km southwest Tripoli and 150km northwest Sharara Field.

When tested, the well produced an average of 113,000m³ of gas per day from Tahara formation.¹

In October 2013, a consortium led by Repsol has made a light oil discovery via A1-129/02 well in NC115 block in Mizriq basin 800km south the capital Tripoli.² The final depth of the well was 1836m and when tested it produced an average of 528 b/d of light oil (API 40) from the Memouniat formation of the Ordovician. This is the third well within an exploration drilling program covering 8 wells that the company plans to drill in the block until 2015. Repsol share in the block is 40%; the rest is distributed evenly between OMV and Total.

In December, the National Oil Corporation³ has announced that a consortium of Libya's Sonatrach, (operator), Oil India, and Indian Oil made a new gas discovery through B1-96/1 exploration well in the 95/96 contract area in Ghadames basin 650km southwest Tripoli and 70km south Al Wafa Field.

The following table shows the results of the producing layers test in the well, the third in the said area:

Formation	Chock Size (inch)	Gas Production Rate (million m ³ /D)	Condensates Production Rate (b/d)	Wellhead Pressure PSI
Tadart	32/64	0.34	250	2145
Uwainat and Yenin	32/64	0.25	245	1635
Tahara	32/64	0.23	231	1778

¹ National Oil Corporation, September 2013

² Oil and Gas Journal, 21/10/2013

³ National Oil Corporation, 30/12/2013



In **Egypt**, the Ministry of Oil and Mineral Resources has announced that the petroleum sector has made 14 discoveries in the first three months in 2013; 10 of which were oil discoveries and 4 natural gas discoveries. These discoveries were made in west desert, the Gulf of Suez, the Mediterranean, and Upper Egypt. The total discovered reserves were about 12 million barrels of oil and condensates, and 3.5 billion m³ of gas. The announcement also mentioned that the Egyptian General Petroleum Co (EGPC) has made 12 new discoveries out of the above (9 oil and 3 natural gas); in addition to a discovery by EGAS in the Mediterranean and another by GANOPE in Upper Egypt.

The announcement has also stated that several other new discoveries have been made in the western desert including Alam Shaweesh discovery- east 3 of PetroSannan Company which produced an average of 3800 b/d. ¹

Eni has made a new discovery through RozaNorth-1X well in Maliha license in western desert. The drilling of the well has come as part of the company's strategy to rediscover some deep plays in the region. The well encountered about 80 meters of active thickness within multiple good quality sandstone in Bahariya, Alam El Bueib, Khataiba, and Ras Qatara. Tests have proved the presence of oil (API 43°-48°). The company said at the time that it was scheduled to develop the discovery through the drilling of two other wells with an estimated production capacity of about 2000 b/d. RozaNorth Field is estimated to produce about 5000 b/d in the first 12 months of production. Its production will be delivered to the available surface facilities in the neighboring Maliha Field. ²

Apache Corporation announced in Q1 2013 its new discovery through Amoun NE-1X in the northern flank of Khalda ridge. When tested, it produced at an average of 3186 b/d of oil and condensates and 0.3 million m³ of natural gas per day from two separate zones of

¹ Egyptian Oil Ministry, 3/5/2013

² Oil Voice, 7/2/013

the Cretaceous within Upper and Lower Safa formations. The said well has been the first to be drilled by the company according to 2013 plan which includes a number of wells in the northern and southern parts of the ridge which are relatively near production facilities which makes it easier to complete it and put it on the production list.¹

In Q2 2013, Apache has made three new discoveries in separate basins which enhance chances of developing new quantities of oil and gas in the blocks where the company operates in Egypt. The said discoveries include the following:

- NRQ 3151-1X exploration in Al Alamain basin north Ras El Qatara. When tested, the well produced at an average of 1625 b/d of oil and 530,000m³ of natural gas within two intervals of Safa formation of the Lower Jurassic age. The well logs have shown the presence of about 33m of pay sand within various zones including a Bahariya formation of the Upper Cretaceous Age and Zahra Jurassic formation; in addition to zones in upper and lower Safa formations. Apache owns 70% of North Ras El Qatara license, the remaining 30% are owned by IPR.
- SIWA L-1X discovery in Siwa license with Faghur basin. When tested, the well produced at an average of 2014 b/d of the lower part of Disoqi sands of the Paleozoic. The discovery is 6.4km to the south of the nearest producing well in the basin. It encountered 40m of producing rocks within Alam El Bueib formation of the Cretaceous, and the rocks of Safa formation and Disoqi zone. Apache and Tharwa Petroleum Co own the shares of this license evenly.
- NTRK-G-1X discovery in north Tarek license within Matrouh basin. This exploration well encountered 18m of pay in upper Safa. When tested, it produced at an average of 1522 b/d of oil, and 419,000 m³ of gas per day.

It has been noted that the costs of the wells (drilling, casing, and testing) were relatively low, an advantage of the wells handled by the company in the western desert², as costs reached \$7.6 million for

¹ Oil and Gas Journal, 4/3/2013

² Wall Street Journal, 7/5/2013



NRQ 3151-1X well, \$3.7 million for SIWA L-1X, and \$4.4 million for NTRK-G-1X well.

That was followed by Dana Gas announcement on the discovery of new natural gas field in Gharb El Manزالah license in the Nile Delta. Biguina-1 exploration well has been drilled targeting high quality sandstones reservoir within lower Abu Madi formation as it encountered 15m of hydrocarbon pay. When tested the well produced 266,000 m³ of gas per day and 133 barrels of condensates. Estimates have shown that the discovered reserves is between 198 and 425mm³ of gas and about 100,000 barrels of condensates.¹

In 2013 Q3, Sea Dragon Energy Inc announced making a new oil discovery through Amer SE18 development well in Kareem formation northwest Ghamasa. The well was drilled to a depth of 3170m as logs indicated to the presence of 20m of pay containing oil in two formations.² Apache then announced making seven oil and gas discoveries in the western desert within four geological basins, namely Faghur, Shushan, Matrouh, and Abu El Gharadeq. Following table shows the results of the discoveries tests ³:

Basin	Discovery	Test Results	
		Oil b/d	Gas Mm ³ /D
Abu El Gharadeq	Riviera SW-1X	5800	0.08
West Matrouh	Jade N-2X	146*	0.32
Faghur	Narmer-1X	1200	0.01
	WKAL-T-1X	2900	0.08
	WKAL-N-3X***	3500	0.09
	SIWA-R-1X	1900	-
	Buchis W-2X	1700	-
Shushan	Falak NW-1X	1200	0.17

*Condensates

** Appraisal well

¹ Dana Gas, 30/6/2013

² Oil Voice, 8/8/2013

³ Oil and Gas Journal, 12/8/2013

During the same period Kuwait Energy announced making a new oil discovery through Al Salmiya-2 well in the licensed area where the company operates in Abu Sennan in the western desert. The company is considered the main operator in the license with an operating share 50%. The remaining shares are owned by Beach Petroleum Pty Ltd (22%) and Dover Investment (28%) while The Egyptian General Petroleum Co (EGPC) is the main partner by granting the license. Oil has been discovered in the well within Kharita formation. Initial tests showed that oil reservoirs capable of producing 3530 b/d. this discovery is the sixth success story in a row in the Abu Sennan license.¹ It is also the company's 21st discovery in Egypt since 2008.

BP has made an important gas discovery through the exploration well Salamat, 75km to the north of Damietta. The company said that it was the deepest well drilled in the Nile Delta. It is also the first well in offshore North Damietta's license which the company obtained in February 2010. The well reached a depth of 7000m and has been drilled in waters of a depth of 649m using a submersible platform. The well logs, fluid sample tests, and pressure data all showed the presence of gas and condensates within a reservoir of sandstones of the Oligocene with play of 38m. Deputy CEO for Exploration Affairs said that the success story of Salamat well proved the presence of gas and condensates in a center of a structure with a length of 50km and total thickness of more than 180m carrying hydrocarbons. This matter enhances the importance of deep Oligocene in the East Nile Delta.²

In the end of 2013, IPR announced a big gas and condensates discovery in Alamain license in the Western Desert. The company has been searching for years within a new play targeting Alam El Bueib formation. Yidma-11X well has been drilled 130km southwest Alexandria; gas and condensates were discovered at a depth of 3657m.

¹ Kuwait Energy, 28/2/2013

² Oil and Gas Journal, 10/9/2013



When tested, the well produced 405,000m³ of gas per day in addition to 1000 b/d of condensates with API 53°. No associated water has been detected during the test. High quality 3D seismic surveys have contributed to making this discovery when it showed various bright spots. IPR is also planning to invest in 57 wells in Egypt in 2014 as part of an ambitious growth plan in the east Mediterranean.¹

As for non-OAPEC Arab countries, in Oman, CC Energy Development SAL started production tests for B4EW4 exploration well in block 4 onshore north Oman. This came following the discovery of oil in four formations within the well that has been drilled to a depth of 3030m based on a 2D seismic survey for about 20km along Gharb Siwan East oil field.² Oil shows have been seen in Lower Bashir, Bouwah, Khafi, and Maseera formations. Samples have been taken to test pressure, volume, and PVT temperature during wireline logging of the well. It is scheduled that the program tests Khafi and Bouah formations as confirmed by Tethys Oil AB that owns 30% of the block shares, while 50% of the shares are owned by CC Energy and the remaining by Mitsui E&P Middle East BV.

In Yemen, DNO International ASA has made a new oil discovery (API 36°) in block 32 in Hadhramaut province through Salsala-1 exploration well that has been drilled to a depth of 4147m. It showed the presence of oil traces in the carbon Shaqra formation as TCP, perforation and acid job and tests have been made along 32m of it. The well produced at an average of 5900b/d of oil before reducing production to 3400 b/d due to limited capacity of surface equipments available onsite. It also produced gas at an average of 56,000m³. Yemeni Minister of Oil and Minerals stated that it was the first time to produce from Shaqra formation on this block. The well drilling started in July 2013. Drilling, completion and testing cost about \$10 million. Block 32 includes two producing fields, namely Jawda and Tassour fields. Together they produce about 2500 b/d.³

¹ Rigzone, 30/12/2013

² Oil and Gas Journal, 12/2/2013

³ Scandinavian Oil and Gas Magazine, 5/11/2013

B. The Rest of the World

Here are a few examples:

In **Angola**, Eni made a new oil discovery through Vandumbul well in block 15/06, 150km offshore Angola within waters of a depth of 976m while the well's final depth is 4107m. The well encountered about 114m of pay within high quality sands of the Lower Miocene. The company estimates the well's production capacity to reach about 5000b/d. This discovery is the company's ninth of its kind in the said block.¹ Cobalt International Energy has made two other oil discoveries pre-salt layer in deep waters of two neighboring blocks through two exploration wells: Lontra-1 in block 20 and Mavinga-1 in block 21. No further details have been released by the company about the new discoveries.²

In **Australia**, Chevron has made a new gas discovery through Kentish Knock South-1 exploration well that was drilled in deep waters of 1168m while the well's depth reached 3065m in WA-365-P license, 280km offshore Exmouth offshore the country's west coasts. The well encountered 75m of pay within Mungaroo sand formation of the Triassic Age.³ The company owns 50% of the license shares while the rest is owned by Shell Development Australia. This is Chevron's twentieth discovery offshore Australian west coasts since 2009.

Santos has made a natural gas discovery through Bassett West-1 exploration well in Browse basin that has been drilled in waters with a depth of 368m. The well reached a depth of 5239m and the well loggings showed the presence of a gas bearing zone with a thickness of 7.5m within sandstones of the Jurassic period.⁴

Chevron has made a gas discovery offshore Australia in Carnarvon basin 170km northwest Barrow Island in waters with a depth of

¹ Energy Business Review, 18/3/2013

² PreSalt, 5/11/2013

³ Offshore Magazine, 7/2/2013

⁴ World Oil, 6/6/2013



1143m. The well reached a depth of 3630m and encountered more than 40m of net gas pay.¹

Tap Oil confirmed a gas discovery through Bianchi-1 exploration well which was drilled to a depth of 5429m in Carnarvon basin offshore Australia's west coasts with waters with a depth of 112m. Drilling targeted Mungaroo formation of the Triassic Age within a fault block that is one of a series of structures that form the greater Zola area. The well is 6.4km northeast a previous gas discovery in Zola-1/ST1 and 20.8km southwest Gorgon-1 gas discovery.² Potential gas resources in Zola have been estimated at about 10.7billion m³ of gas by PRS Energy Services, an independent consultant.

Santos has made a new gas discovery though Winchester-1 exploration well in WA-323-P block within Carnarvon basin 135km northwest Dampier offshore Australia's west coasts in waters with a depth of 75m. It is the company's fourth discovery of its kind in that region. Well loggings and pressure analysis showed the presence of 40m of net gas pay in two formations: Angel of the Jurassic period and Mungaroo of the Triassic Age.³

In late 2013, Senex Energy has made a new oil discovery in Patchawarra formation in Worrior Field in the southern part of PPL 207 license in Cooper basin, which the company owns 70% of its shares. The remainder shares are owned by Cooper Energy. Warrior-8 well has been drilled to a depth of 1778m and penetrated 18m of active thickness within McKinlay zone in Patchawarra and Namur sand formations. When tested, the well produced at a rate of 670b/d of oil and 19,800m³ of natural gas per day.⁴

¹ World Oil, 23/4/2013

² Proactive Investors, 16/7/2013

³ Oil and Gas Financial Journal, 5/8/2013

⁴ Oil Voice, 22/11/2013

In **Ukraine**, Kulczyk Oil Ventures has made a gas discovery in Makeevskoye license through M-16 exploration well which was drilled to a depth of 4300 m. When tested, the well averaged daily production of 121,000m³ of gas ¹.

In **Indonesia**, SKK Migas said it made three oil and gas discoveries east Indonesia through South Kecapi-1 well in Bontang block offshore east Kalimantan, Ajek-1 in Kofiau block west Papua, and North Klain-3 in Bermuda block west Papua too. The following table shows some of these discoveries data ²:

Well	Operator	Oil Production b/d	Gas Production m ³ /d
South Kecapi-1	Salamander Energy Pte Ltd	6000	0.23
North Klain-3	PetroChina International Ltd.	240 (condensates)	0.22
Ajek-1	Niko Resources	NA	NA

In **Italy**, a group led by Po Valley Energy has made a gas discovery in Gradizza license within La Prospera in Po Valley. Gradizza-1 well was drilled to a depth of 1060 m. Well loggings showed the presence of a gas bearing sand zone within the Quaternary rocks³ with a total thickness of 10m and net pay of 9m.

In **Papua New Guinea**, Oil Search Ltd. has made a gas discovery through Kidukidu-1 well, 267km northwest Moresby Port in shallow waters with a depth of 97m within two zones⁴ the first with a thickness of 51m and the second with a thickness of 20m.

¹ Market Watch, 9/4/2013

² Tempo Interactive, 13/3/2013

³ Oil and Gas Journal, 29/8/2013

⁴ Penn Energy, 30/8/2013



In **Pakistan**, Pakistan Petroleum Limited has announced the discovery of gas and condensates in Sangahar District in Sind Region through Wafig X-1 that was drilled to a depth of 3550m. Well loggings showed the presence of a number of hydrocarbon bearing zones. When tested, the well produced an average between 167,000 and 209,000m³ of gas and 40-54 barrels of condensates per day. When increasing the chock size, it produced an average of 476,000m³ of gas and 144 barrels of condensates per day.¹ Eni has made a gas discovery in Sukhpur block, 270km north Karachi valleys in Sind Region southern the country. It is expected that the new gas discovery will help reducing the severe gas shortage crisis which the industry and transport sectors face in Pakistan. The company said that when tested, Lundali-1 well produced at an average of 934,000m³ of natural gas per day from a sand reservoir of the Paleocene Period at a depth of 2660m of excellent reservoir characteristics.² the company plans to drill another exploration well in the said block in 2014. Eni has been operating in Pakistan since 2000 and is the biggest oil and gas producer among all international companies operating in the country. Eni's production capacity in 2012 reached about 57,000 boe/d. It operates in the block within a joint group including Pakistan Petroleum Ltd that owns 30% of the shares, and KUFPEC that owns 25% of the shares, while Eni owns the remaining 45% of the shares. OMV has made an oil and gas discovery through 2-Sofiya within Mehar license in Sind Region, 10km north Mehar Field. Well loggings and tests have confirmed the presence of hydrocarbons³. When tested, the well produced 1550 b/d of condensates, and 510,000m³ of gas per day from Ranikot formation. In late 2013, OGDC has made a new gas discovery in Sind Region. Saand-1 well has been drilled in Tando Allah Yar to a depth of 2651m targeting Lower Grou

¹ Business Record, 19/6/2013

² Upstream Online, 7/5/2013

³ The Express Tribune, 30/8/2013

formation that when tested produced 165,000 m³ of gas per day and 65 b/d of condensates.¹

In **Brazil**, six oil discoveries and one gas discovery have been announced in 2013 including discoveries in deep and very deep waters. Petrobras has made an oil discovery in deep waters post salt layers in Marlim Sul Field in Campos basin. 4-MLS-105D-RJS well penetrated about 30m of net oil pay whose quality varied between API13-16°. The well was drilled in waters with a depth of 1874m, 126km offshore Rio de Janeiro. The well is close to P-56 platform operating in Marlim Sul Field where production and flow equipments are available. This matter could make the new discovery's production² easier during 2014. Petrobras has also made an oil discovery in ultra deep waters in an area obtained from the government; a development that is expected to contribute in highlighting some similar exploration areas. Florim Well was drilled to pre-salt thick layers as previous discoveries were made which were considered the biggest in thirty years of discoveries history in Brazil. The company has laid down plans to spend \$237 billion until 2016, most of which would go to developing fields pre-salt layers in an area offshore Rio de Janeiro and Sao Paolo coasts. It is estimated that this area contains 100 billion barrels of oil.³

In general, available data indicate making 39 offshore discoveries in 2013; 10 of which in waters with a depth more than 2000m. This goes in line with what was mentioned in the beginning about the general status of exploration in the world. The following tables show places, types and depths of these discoveries⁴ :

¹ Upstream Online, 29/11/2013

² Oil and Gas Journal, 4/1/2013

³ World Oil, 19/2/2013

⁴ Tables sources: Arab and World Energy Resources Monitor Bulletin, Technical Department, OAPEC, 2013 Issues

Discoveries in water (Depth: more than 2000m)

Country	Water Depth (m)	Well Depth(m)	Type of Discovery
Brazil	2158	NA	Oil
	2128	6672	Oil
	2009	6004	Oil
USA	2590	8740	Oil
	2006	5863	Oil
Tanzania	2500	NA	Gas
	2300	NA	Gas
Côte d'Ivoire	2280	5044	Oil
Mozambique	2492	6203	Gas
	2035	5270	Gas

Discoveries in water (Depth: more than 1000m and less than 2000m)

Country	Water Depth (m)	Well Depth(m)	Type of Discovery
Brazil	1874	NA	Oil
USA	1860	9997	Oil
	1493	8906	Oil
Australia	1168	3065	Gas
	1143	3630	Gas
Occupied Palestine	1737	4810	Gas
	1647	5310	Gas
Cyprus	1700	5750	Gas
Canada	1097	NA	Oil
Namibia	1391	NA	Oil
India	1024	NA	Gas

Discoveries in water (Depth: more than 600m and less than 1000m)

Country	Water Depth (m)	Well Depth(m)	Type of Discovery
Ghana	990	NA	Oil
Angola	976	4107	Oil
Brazil	976	NA	Oil
Egypt	649	7000	Gas



Discoveries in water (Depth: more than 100m and less than 400m)

Country	Water Depth (m)	Well Depth(m)	Type of Discovery
Norway	373	905	Oil
	113	NA	Oil
	126	NA	Oil
	101	NA	Oil
USA	114	NA	Oil
Australia	368	5239	Gas
	112	NA	Gas
Gabon	116	3432	Oil

Discoveries in water (Depth: less than 100m)

Country	Water Depth (m)	Well Depth(m)	Type of Discovery
Australia	75	NA	Gas
Papua New Guinea	97	NA	Gas
Denmark	52	4431	Gas
Qatar	70	NA	Gas
Malaysia	75	4030	Oil
	67	NA	Gas

Considering the classification of water depths, shallow water is water with a depth of no more than 300m while deep water is water with a depth of between 300 and 1500m; anything else is considered ultra deep water. It can be noted from the above tables that 15 discoveries have been made in ultra deep water, which constitute more than 38% of offshore discoveries in 2013. Discoveries in deep water claimed 30% while the rest were made in shallow waters.

Figures (2-4) and (2-5) show the number of oil and gas discoveries in OAPC member countries and other Arab countries between 2009 and 2013.

Figure 2-4

The Number of Oil Discoveries in OAPC Members and Other Arab Countries

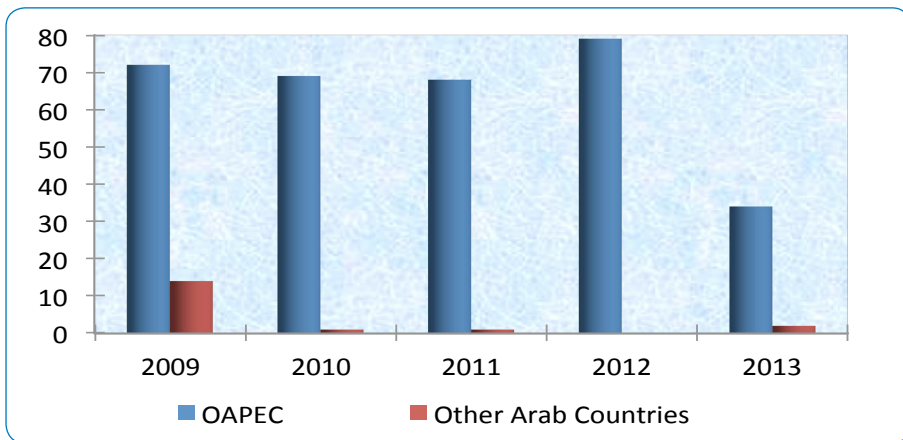
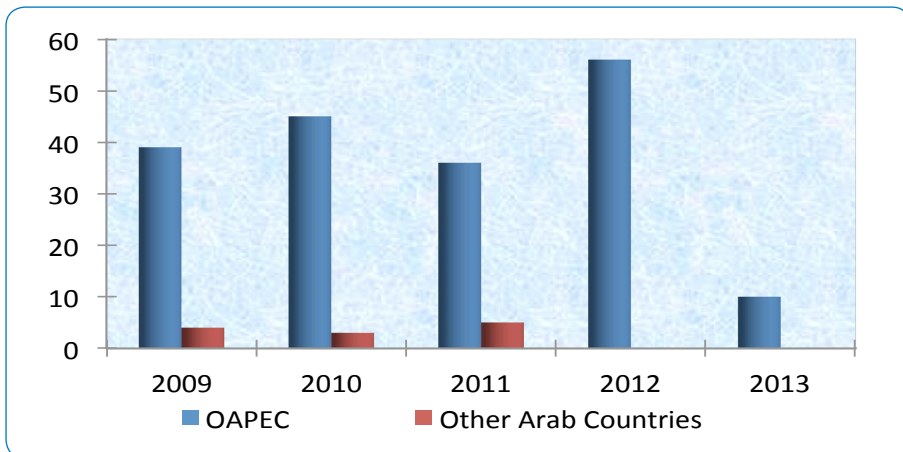


Figure 2-5

The Number of Gas Discoveries in OAPC Members and Other Arab Countries



2. Oil and Natural Gas Reserves

2- 1 Oil Reserves:

OAPEC estimates indicate a rise in global oil reserves from 1266.45 billion barrels in the end of 2012 to 1277.7 billion barrels by the end of 2013; a rise of 11.25 billion barrels which is a slight increase of 0.9%. These estimates do not cover unconventional oil reserves like tar sands and oil shale in Canada. They also exclude bitumen, heavy and very heavy oils in Venezuela.

2-1-1 OAPEC Members and Other Arab Countries

Oil reserves of OAPEC or non- OAPEC Arab countries remained with no significant change since 2012. Oil reserves of OAPEC members in 2013 was estimated at about 703 billion barrels, while total Arab oil reserves reached about 713 billion barrels. It is notable that Iraqi oil reserves have practically risen from 2011 estimates of 141.4 billion barrels to 145.3 billion barrels in 2012 and 2013. Also, Libyan oil reserves increased from 48 billion barrels in 2011, to 48.5 billion barrels in 2012 and 2013. Therefore it could be said that OAPEC members reserves have risen by 4.39 bb between 2011 and 2013. That is the reason behind unchanged total Arab oil reserves in 2012 and 2013 in spite of the decline in Sudanese reserves estimates from 5 billion barrels to 1.5 billion barrels following the split of South Sudan officially. This conforms to what OAPEC has published earlier in the Secretary General's 39th Annual Report estimating that Sudan's reserves after split would be about 1.6 billion barrels.

Figure (2-6), shows the contribution rate of OAPEC members and other international groups in global oil reserves by the end of 2013, while **Figure (2-7)** shows OAPEC and OPEC members' proven oil reserves evolution between 2009 and 2013.

Figure 2-6
World Oil Reserves by the End of 2013
(%)

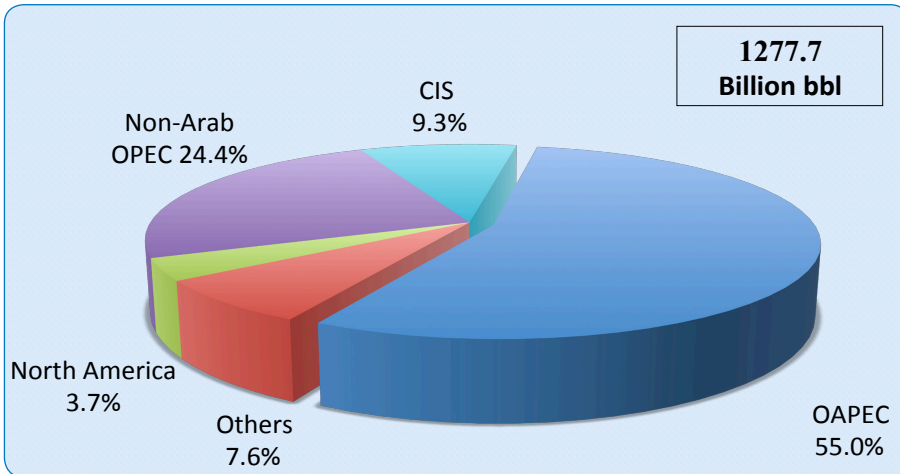
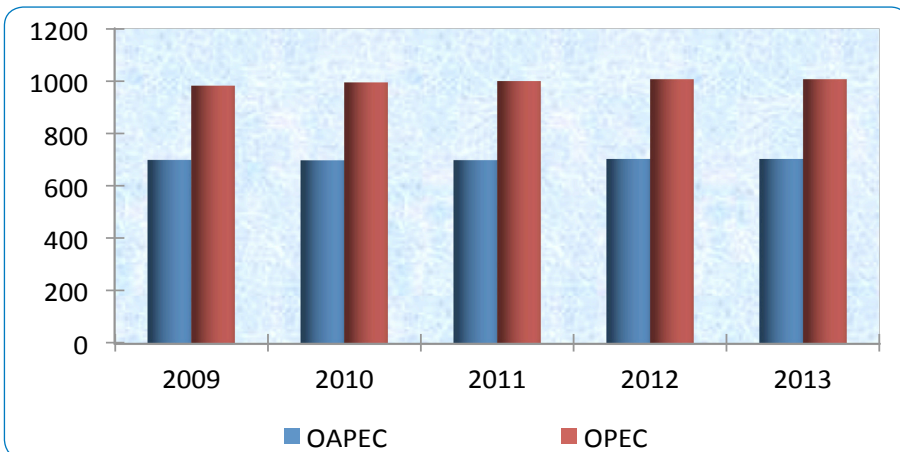


Figure 2-7
The Evolution of Oil Reserves in OAPEC and OPEC Member Countries, 2009- 2013
(Billion barrel)



2-1-2 International Groups and other Countries:

Oil reserve estimates increased in many countries in 2013, like Brazil, where reserves rose by 0.5% from 13.15 billion barrels in 2012 to 13.22 billion barrels in 2013. Norway reserves increased by 8.6% to 5.83 billion barrels. Reserves in China increased by 2.8% from 23.72 billion barrels in 2012, to 24.38 billion barrels in 2013. The USA reserves increased by more than 2.8 billion barrels from 28.95 billion barrels in 2012 to 31.78 billion barrels in 2013. On the other hand, estimates have shown a decline in many countries reserves like the UK from 3.1 billion barrels in 2012 to 2.98 billion barrels in 2013, or 3.9%. Mexico reserves have also slightly declined from 10.26 billion barrels in 2012 to 10.07 billion barrels in 2013. Table (2-4).

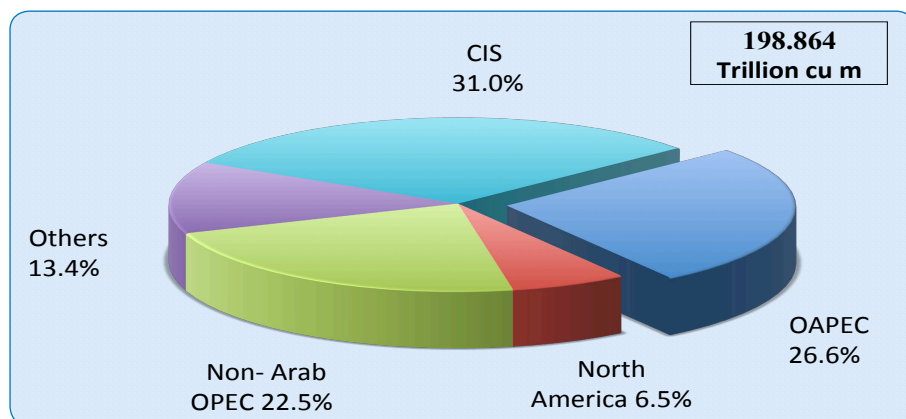
2-2 Natural Gas Reserves:

World natural gas reserves were estimated at more than 198.86 trillion cubic meters in 2013, representing an increase of about 1.9% from 2012 estimations of 195.1 trillion cubic meters. Figure (2-8) and Table (2-5).

Figure 2-8

World Natural Gas Reserves, by end of 2013

(%)

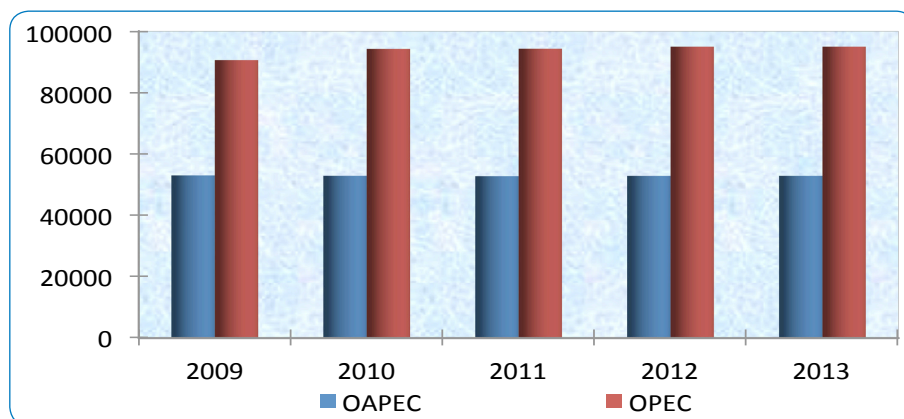


2-2-1 OAPEC Members and other Arab Countries

Estimates show that OAPEC members' gas reserves increased from 52.75 trillion cubic meters in 2011, to about 52.87 trillion cubic meters in 2013 with no significant change from 2012. It is worth mentioning that Iraq's estimates have risen by about 536 billion cubic meters between 2011 and 2013. Saudi gas reserves have risen from 8150 billion cubic meters in 2011 to 8234 billion cubic meters in 2013. Egypt's reserves have increased from 2045 billion cubic meters in 2011 to 2186 billion cubic meters in 2013, an increase of 141 billion cubic meters. However, Qatar's gas reserves declined from 25030 billion cubic meters in 2011 to 24400 billion cubic meters in 2013. Also, Libyan reserves declined by 15 billion cubic meters between 2011 and 2013. Although it is not mentioned in the tables annexed to this report, the separation of South Sudan made Sudan's gas reserves no more than 21 billion cubic meters.

OAPEC members' natural gas reserves represented 26.6% of total world reserves, while the Arab countries together accounted for about 27.3% of world reserves at the end of 2013. **Figure (2-9)** shows the evolution of natural gas reserves in member countries and OPEC members in the period 2009- 2013.

Figure 2-9
The Evolution of Natural Gas Reserves in OAPEC
and OPEC Member Countries, 2009-2013
(Billion cubic meter by the end of the year)



2-2-2 International Groups and Other Countries

Natural gas estimates increased in many countries around the world, like the USA whose reserves increased from 7717 billion cubic meters in 2011, to 9877 billion cubic meters in 2012 and 10539 billion cubic meters in 2013. In China, the reserves increased from 3036 billion cubic meters in 2011, to 4006 in 2012 and 4406 in 2013. Iran gas reserves increased from 33090 billion cubic meters in 2011 to 33780 billion cubic meters in 2013, an increase of 690 billion cubic meters.

On the other hand, gas reserve estimates between 2011 and 2013 declined in many countries like Nigeria, Ecuador, Brazil, the UK, and others.

3. Hydrocarbon Liquids and Natural Gas Production

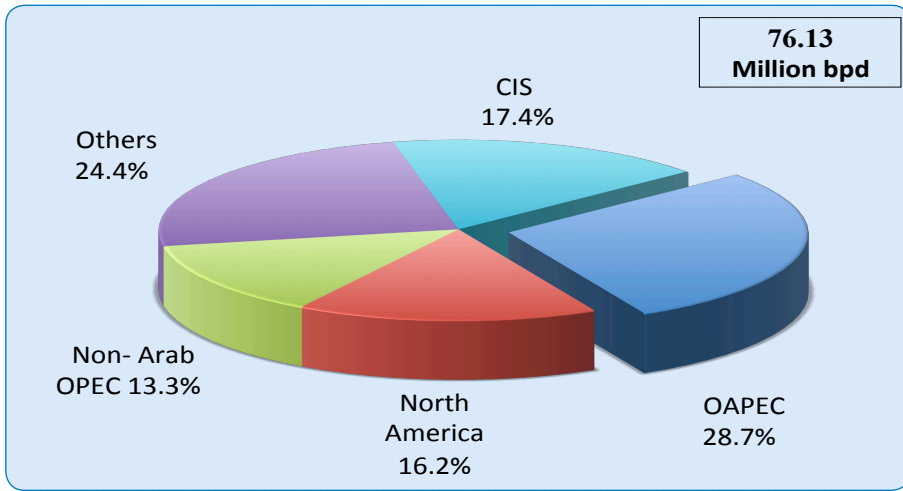
3-1 Hydrocarbon Liquid Production

Hydrocarbon liquids production covers crude oil, condensates and natural gas liquids (NGLs), while oil production covers both crude oil and condensates production.

3-1-1 Oil Production

Estimates show that world oil production reached more than 76.13 million b/d in 2013 compared to about 73.5 million b/d in 2012, an increase of 3.5%. Natural gas liquids production in 2012 was estimated at about 9.7 million b/d, an increase of 3.2% when compared to 2011. The average world production of hydrocarbon liquids in 2013 was about 85.7 million b/d, which is an increase of about 2.6 million b/d when compared to 2012. **Figure (2-10)** and **Table (2-6)**.

Figure 2-10
World Oil Production Distribution in 2013
(%)



3-1-1-1 OIAPEC Members and Other Arab Countries

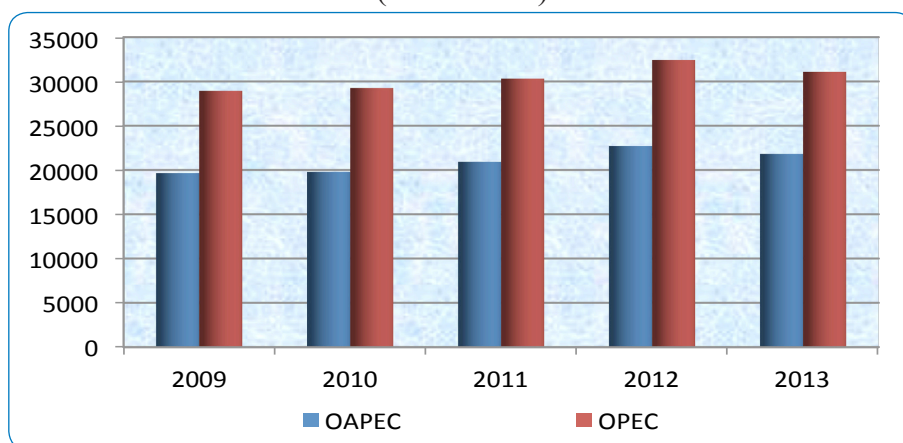
Available figures show that total crude oil production in member countries has declined between 2012 and 2013. Oil production in Tunisia has dropped from 66800 b/d to 62700 b/d. Saudi oil production has also dropped from 97.63 million b/d, to 96.96 million b/d. Syria's production has dropped by about 82% during the same period due to security conditions that led to a decline in daily production from 170000 b/d in 2012 to about 31000 b/d in 2013. Libyan oil production has also dropped by 54.5% from 1.454 million b/d in 2012 to 661,000 b/d in 2013. On the other hand, the UAE's crude oil production increased by 3.3% from 2.65 million b/d in 2012 to 2.74 million b/d in 2013. Bahrain's production has increased by 1.6% from 175800 b/d in 2012 to 183000 b/d in 2013. In general, OIAPEC members average production rate has dropped from 22.7 million b/d in 2012 to 21.8 million b/d in 2013, or by 3.9%.

As for non- OAPEC Arab countries, Sudanese oil production has dropped from 453000 b/d in 2011 to about 85000 b/d in 2013 due to the separation of South Sudan which owned the biggest hydrocarbon reserves. Yemen's crude production has dropped from 190000 b/d in 2011 to 180100 b/d in 2012 hitting 158800 b/d in 2013. On the other hand, Oman's oil production increased by 3.3% from 813000 b/d in 2012 to 840000 b/d in 2013. Therefore, Arab countries' total production rate has dropped from 23.78 million b/d in 2012 to about 22.9 million b/d in 2013, or by 3.7%. **Figures (2-10), (2-11) and Table (2-6).**

Figure 2-11

Oil Production Rates in OAPEC and OPEC Member Countries, 2009- 2013

(Million b/d)



3-1-2 NGL Production in OAPEC Members and the World

World natural gas liquids production has increased by 3.2% between 2011 and 2012 from 9.26 million b/d to 9.56 million b/d. NGL production has slumped in Bahrain, Algeria, Iraq and Egypt while it increased in other OAPEC member countries. The output is an increase in the total average production in member countries from 2.9 million b/d in 2011 to about 3 million b/d in 2012, or 32.4%

of the total world production. Also, Arab countries NGL production has increased from 3.05 million b/d in 2011 to 3.22 million b/d in 2012. Table (2-7).

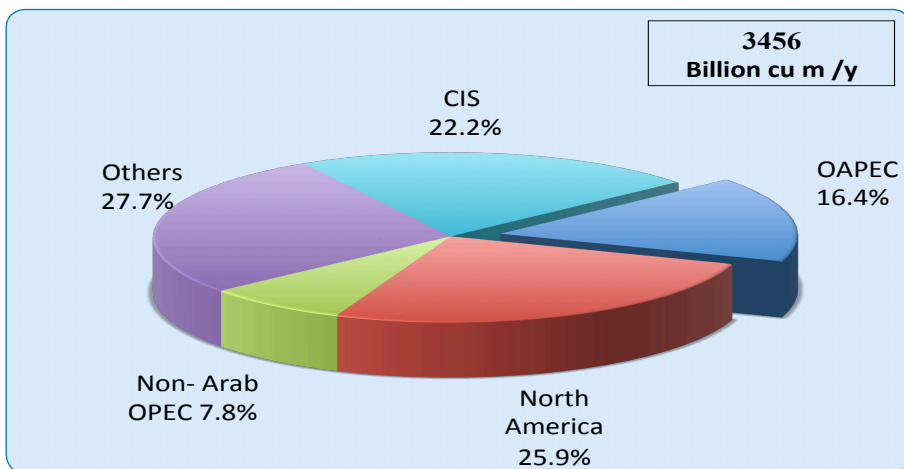
3-2 Marketed Natural Gas

The marketed natural gas worldwide increased by 2.2% in 2012, as marketed natural gas reached about 3382 billion cubic meters in 2011, and 3465 billion cubic meters in 2012. Figure (2-12) and Table (2-8).

Figure 2-12

World Marketed Natural Gas Distribution in 2012

(%)



3-2-1 OAPEC Members and other Arab countries:

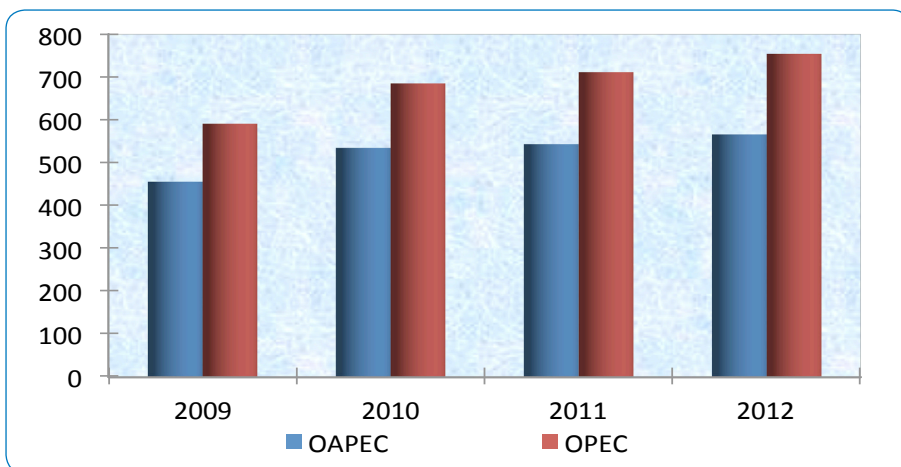
Marketed natural gas of OAPEC members increased from 5434 billion cubic meters in 2011 up to 5661 billion cubic meters in 2012, or about 4.2%. Increases have been recorded in UAE (3.8%), Bahrain (7.9%), Algeria (3.8%), Saudi Arabia (7.6%), Qatar (0.7%), Kuwait (14.8%), and Libya (130.4%). While the marketed natural gas dropped in Tunisia (3.6%), Syria (13.9%), Iraq (5.3%) and Egypt (4.1%). OAPEC members' total share of world marketed natural gas was 16.4% in 2012, compared to 16.1% in 2011.

As for non-OAPEC Arab countries, marketed natural gas increased in Oman by 6.3% from 27 billion cubic meters in 2011, to about 28.7 billion cubic meters in 2012. Arab countries collective share of the world's marketed natural gas was about 17.2% in 2012 compared to about 16.9% in 2011. **Figures (2-12), (2-13) and Table (2-8).**

Figure 2-13

The Evolution of Marketed Natural Gas in OAPEC and OPEC Member Countries, 2009-2012

(Billion Cubic Meters/Year)



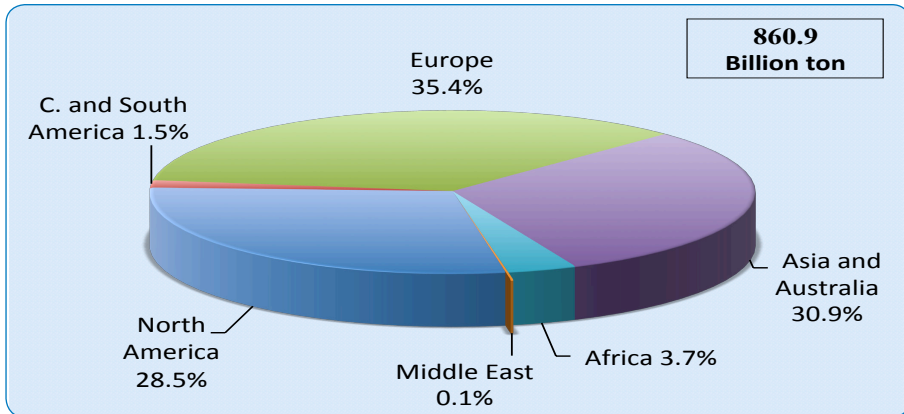
II. COAL

No significant change was recorded concerning world coal reserves in 2012 compared to 2011, estimates hovered at about 860.9 billion tons.

The world's largest coal reserves are concentrated in the USA which accounted for about 27.6% of world reserves at the end of 2012, followed by FSU countries with 26.5%, China with 13.3%, Australia with 8.9%, and India with 7%. **Figure (2-14)**

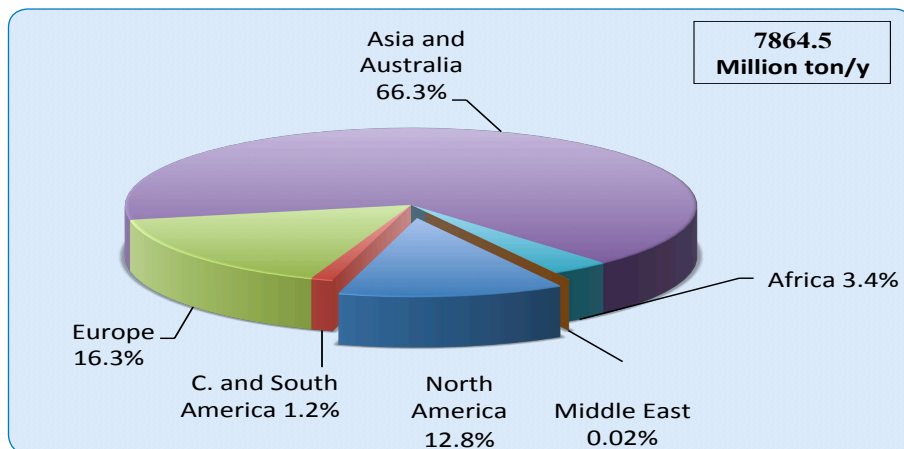
As for world grouping, the largest coal reserves are located in Europe and FSU countries with a share of 35.4%, followed by Asia and Australia with 30.9%, then North America with 28.3%. The rest of the reserves are divided among South America, Africa and the Middle East.

Figure 2-14
World Coal Reserves, by the end of 2012
(%)



World coal production increased by 2.2% between 2011 and 2012 to reach 7864.5 million tons, 3650 tons of which produced by China alone, or 47.5% of the world production. It is followed by the USA with about 922 million tons in 2012, which represented about 13.4% of world coal production. Table (2-10) and Figure (2-15).

Figure 2-15
Distribution of World Production of Coal by the end of 2012
(%)



III. NUCLEAR ENERGY

The number of nuclear power reactors in operation worldwide reached 437 reactors in 2012, with a total design capacity of 373069 MWe, along with 67 reactors that were under construction with a total capacity of 64252 MWe. [Table \(2-11\)](#).

In this regard, the **UAE** started the construction work on its second nuclear reactor as part of Barakah power plant worth about \$20 billion. Work on the first reactor started in 2012 and is due in 2017.

In Algeria, Energy and Mines Minister announced that his country plans to build Algeria's first nuclear plant in 2025 to meet increasing demand for electricity. The Minister pointed out in a press conference on 19/05/2013 that Algeria's Nuclear Engineering Institute will supervise the graduation of engineers and technicians who will be in charge of operating the nuclear plant. Algerian Commission of Atomic Energy has informed The International Atomic Energy Agency (IAEA) in 2012 that the demand for energy in general and electricity in particular has been increasing in the country by 5% per year. So Algeria decided to partially resort to nuclear energy to generate electricity in order to make energy production cheaper in a country where electricity consumption has increased by 15 to 20% in recent years.

Algeria announced in 2008 that it planned to establish its first nuclear plant in 2020. Algeria expected to start work on establishing a new nuclear plant every five years since that date. However, the Minister declared that there were 3 challenges facing the establishment of the plant including facility security, location, and the necessity of the availability of huge water resources. Figures released by the ministry indicated that Algeria's proven uranium reserves were estimated at about 29000 tons¹ which would allow for operating two nuclear plants only with a capacity of 1000 megawatt for each of them over 60 years.

In 2013 Q2, KSA has signed a cooperation agreement with France's AREVA, nuclear specialists, and UK's EDF to cooperate with KSA's National Institute of Technology on developing specialists' nuclear

¹ Power Engineering, 20/05/2013



technical skills in the kingdom. Both companies will contribute to training those technicians on welding, electrical equipment installing, mechanic work, and else. This agreement is part of the two companies' strategy to depend on local staff with the countries they operate in.¹

Westinghouse Electric Company has entered a partnership agreement with Toshiba and Exelon Nuclear Partners to offer a joint proposal to build the first Saudi nuclear plant in King Abdullah City for Atomic and Renewable Energy (KACARE), established in 2008 to encourage using alternative energy resources. The Kingdom plans to operate it for commercial use in 2022 and build 16 nuclear plants for power generation with a capacity up to 17600 megawatt by 2032.

In Egypt, His Excellency Minister of Electricity and Energy has announced in the beginning of 2013 that the plans to build the first Egyptian nuclear reactor are underway. He said that the Ministry has completed preparations required for requesting bids, proposals and other specifications for building a nuclear plant. He mentioned that Egypt's National Nuclear Program aimed at building four nuclear plants to generate 4000 megawatt of electricity by 2025. The first plant is scheduled to start operating in 2020.²

In Jordan, **Jordan Nuclear Regulatory Commission** has endorsed building the first nuclear reactor to generate electrical power, a step towards acquiring expertise and facilities in preparation for building nuclear plants in the future. AREVA has won a contract from KAERI/DAEWOO consortium to supply nuclear fuel elements to the training and research reactor built near Erbid northern Jordan. It will generate 5 megawatt of thermal power that can be increased to 10 megawatt. The company said that the reactor will be used in neutron beam research and neutron irradiation like producing radioisotope, in addition to training Jordanian engineers and scientists.³ The Company expects fuel elements delivery to start beginning of 2015. Jordan had been granted a loan worth \$70 million by South Korea of the project's \$130 million costs. The project is due to be completed in 2016.⁴

¹ Energy Business Review, 12/7/2013

² Energy Business Review, 2/1/2013

³ Energy Business Review, 18/4/2013

⁴ Energy Business Review, 22/8/2013

IV. RENEWABLE ENERGY SOURCES

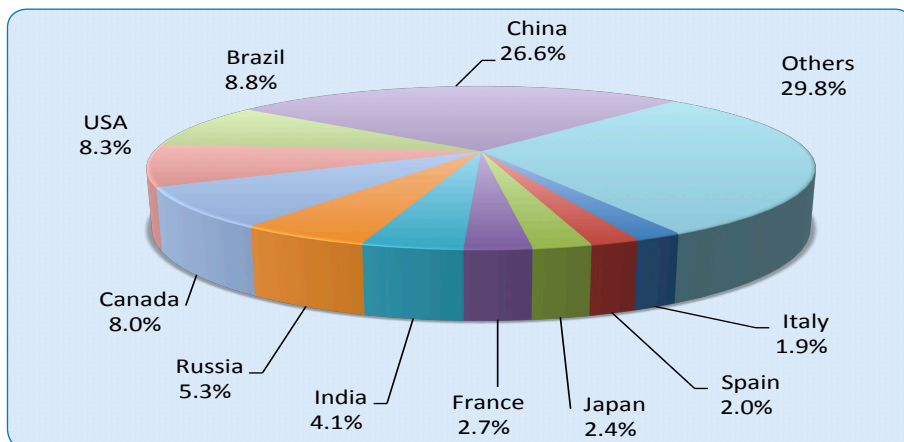
1. Hydropower

1-1 Hydropower in the World

China came first among the countries that utilise hydropower resources, its total installed hydropower capacity amounted to 249 GW at the end of 2011, followed by Brazil with total installed hydropower capacity of 82.5 GW, while the USA came in third place with total installed hydropower capacity of 77.5 GW in 2011 compared to 79 GW in 2010. In Japan, total installed hydropower capacity declined to 22.4 GW in 2011 compared to 28 GW in 2010. France's total installed hydropower capacity has not changed; it remained at 25.3 GW of 2011. World total installed hydropower capacity reached 934.7 GW in 2011 compared to 936 GW in 2010 as shown in Table (2- 12). **Figure (C)** shows installed hydropower capacity distribution rates among these countries.

Figure C

The distribution of installed hydropower capacity in some countries in 2011



1-2 Hydropower in the Arab Countries

Many Arab countries are using hydropower for electricity generation, like Egypt, Iraq, Morocco, Sudan, Syria, and others. In

2013, the most significant activity in this regard has been Sudan's launch of Rusairus Dam ramping at the Blue Nile in order to increase its capacity by 50% to produce 1800 MW.¹

Statistics² show that consumption of hydroelectricity was 0.2 terra watt hour (TWh) in Algeria in 2010, increased to 0.4 TWh in 2011, and remained unchanged in 2012. Hydroelectricity consumption in Egypt was 12.9 TWh in 2010, 12.9 TWh in 2011, and 13.4 TWh in 2012.

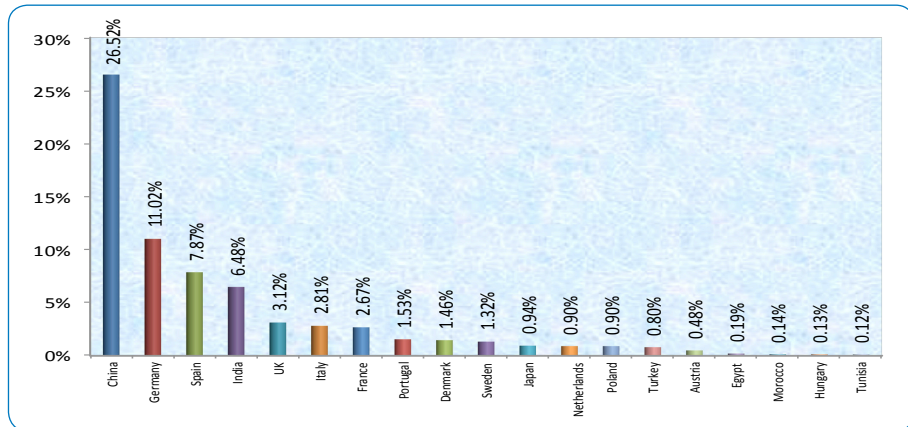
2. Wind Energy

2-1 Wind Energy in the World

The total installed wind power capacity in the world in 2012 increased by an average rate of 18.9% compared to 2011 to reach 248.2 GW. **Figure (D)** illustrates total installed wind power capacity in some countries.³

Figure D

Distribution of the total installed wind power capacity in some countries worldwide



2-2 Wind Energy in the Arab Countries

Total installed wind power capacity in Egypt reached 552 MW in 2012 without any change from 2011, while installed wind power

capacity in Morocco increased from 292 MW in 2011 to 394 MW in 2012. It also increased in Tunisia from 277 MW in 2011 to 327 MW in 2012. Morocco has announced in 2013 the start of the construction of a wind farm with a capacity of 300 MW in Tarfaya, a project whose shares were distributed between Morocco's Nareva Holding and France's GDF SUEZ. It would be completed by the end of 2014 to be the biggest of its kind in Africa.¹

3. Solar Energy

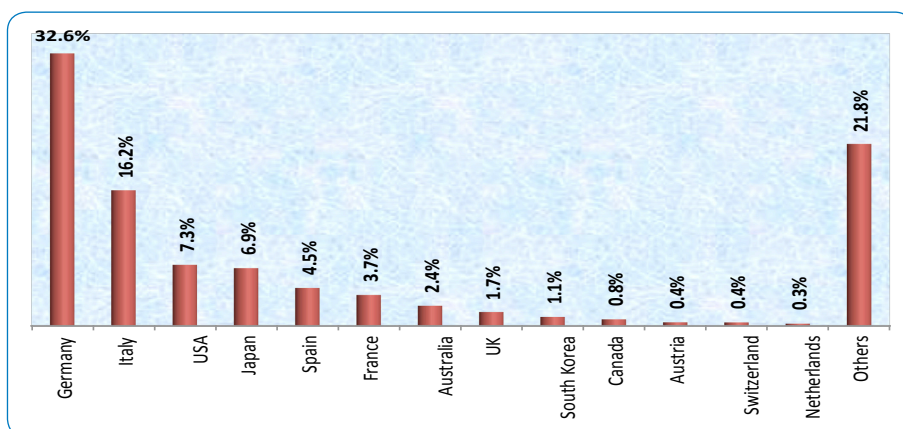
A- Solar Energy in the World

World total cumulative installed photovoltaic capacity increased in 2012 to over 100 GW, an increase of 43.3% when compared to about 69.9 GW in 2011. Germany has come first in 2012 with total installed photovoltaic capacity of 32.6 GW, which represents an increase of 30% in 2011. Italy followed by 16.2 GW in 2012 compared to about 12.8 GW in 2011, an increase of 27%.

Figure (E) shows the rank of some countries according to the percentage of total cumulative installed photovoltaic capacity in 2012.

Figure E

The ratio of total installed photovoltaic capacity in some countries to the world total installed photovoltaic capacity in 2012



¹ Energy Business Review, 8/2/2013

B- Solar Energy in the Arab Countries

The availability of solar energy in the Arab countries led to paying attention to investing in this kind of renewable energies like:

In March 2013, the UAE opened Shams-1 plant in the western area, 120km southwest Abu Dhabi and 6km away from Zayed city. The project is considered one of the biggest in the world and first of its kind in the Middle East. The plant uses parabolic solar collector technique with a production capacity that is estimated at 100MW.¹

In the beginning of 2013 in KSA, Mecca Municipality announced the launch of installing solar energy street lampposts. The first stage should cover about 43million square meters and it would take one year to be completed. The project has been introduced to 3 developers and investors to bid for installing 30,000 to 40,000 lampposts. If succeeded, the project would be generalized in the rest of Holy Mecca. Some local resources have indicated that the projects costs amount to about \$650 million.

In October, Saudi Aramco has awarded a contract to Canadian Solar to supply high quality solar energy panels to King Abdullah Petroleum Studies and Research Center (KAPSARC) in Riyadh. The mentioned solar panels production capacity is 1.78 MW.²

In late 2013, Mecca Municipality announced the completion of another project on installing 400 solar powered cameras. These cameras have been installed to monitor al municipality services like cleaning, waste piles, water leaks, floods, lighting, project contractors' follow up, street vendors, cleaning equipment tracking, violations tracking, in addition to air density studying and monitoring³.

In mid 2013 in Morocco, Morocco's Agency for Solar Energy has started building the first stage of Wazazat Solar Energy project. The project cost is about \$680 million. Its production capacity is planned to reach 160MW. It is due in 28 months.⁴

¹ SHAMS Energy Company, The Project in a Few Lines

² Energy Business Review, 23/1/2013

³ Saudi Gazette, 30/12/2013

⁴ Energy Business Review, 20/5/2013



4. Geothermal Energy

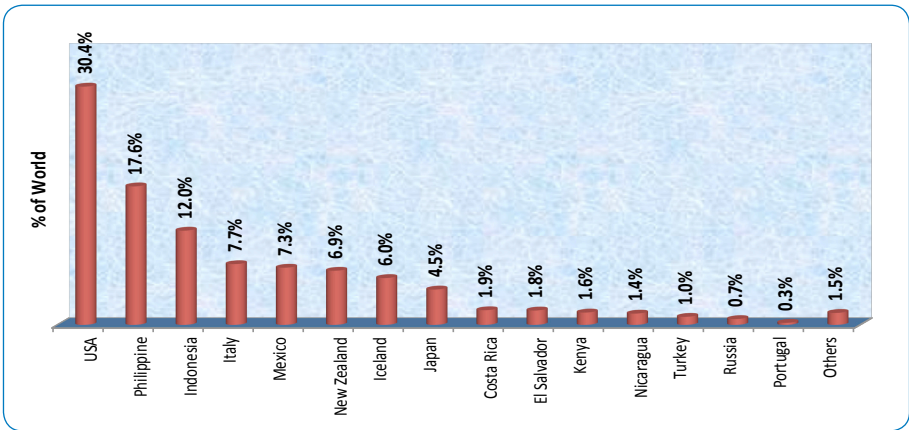
A- Geothermal Energy in the World

The installed geothermal capacity in the world amounted from 11.2 GW in 2011, to 11.45 GW in 2012 at an annual growth rate of 2.6%. **Table (2-15)**. USA ranked first in utilizing this type of power, its installed geothermal capacity is 3386 MW in 2012. Total installed geothermal capacity increased in many countries like Nicaragua with about 160 MW in 2012 compared to 88 MW in 2011, an annual increase of about 82%. Total installed geothermal capacity has increased also in Indonesia by 10.8% and Kenya 4.8%.

While total installed geothermal capacity declined in Mexico by 8.5%, for the second consecutive year. **Figure (F)** shows the shares of installed geothermal capacity in some countries in 2012.

Figure F

Ratio of installed geothermal capacity in some countries to the world total installed geothermal capacity in 2012



B- Geothermal Energy in the Arab Countries

Geothermal Energy resources discovered in Arab countries are still limited and geological surveys operations have not completed

yet. Nevertheless, limited unexploited potentials have been found in Egypt, Jordan, Yemen, Syria, Saudi Arabia, Morocco, Tunisia, and Algeria.

The only registered activity was in Djibouti in July 2013. The African Development Group in collaboration with the Danish Government has given support of a \$7.5 million to Africa's Sustainable Energy Fund as part of funding a geothermal project in Assal Lake. The project cost is estimated at \$32 million. Djibouti's Federal Central Government is scheduled to drill exploration and

appraisal wells for the project. The private sector will be in charge of other drilling operations, steam collecting systems, power production and transfer to the national network.¹

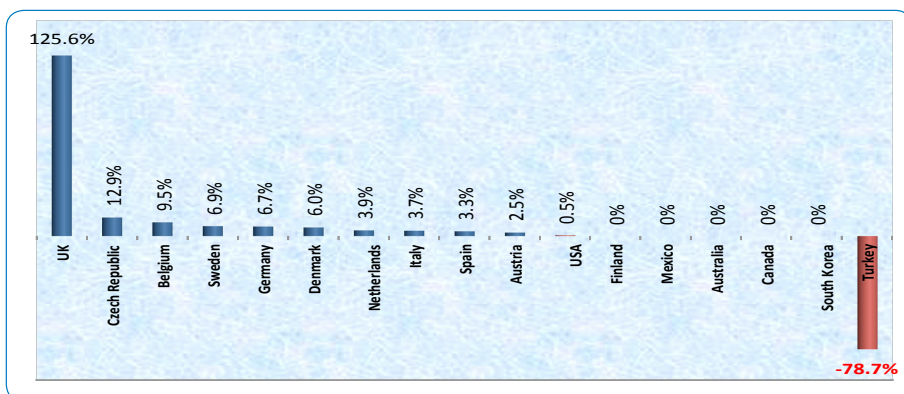
5. Solid Biomass Energy

USA ranked first in terms of installed solid biomass capacity, with about 7400 MW in 2011 with a slight increase of 0.5% comparing to 2010. As for growth rate of total installed biomass capacity between 2010 and 2011, the UK came first with a growth rate of 125.6%. Table (2-16).

Figure (G) illustrates these shares among some members of IEA, where it is noted that installed capacities in some of these countries have not changed between 2010 and 2011, namely Finland, Mexico, Australia, Canada, and South Korea, while the installed capacity decreased in Turkey by 78.7% from 47 MW in 2010 to 10 MW in 2011.

¹ Energy Business Review, 9/7/2013



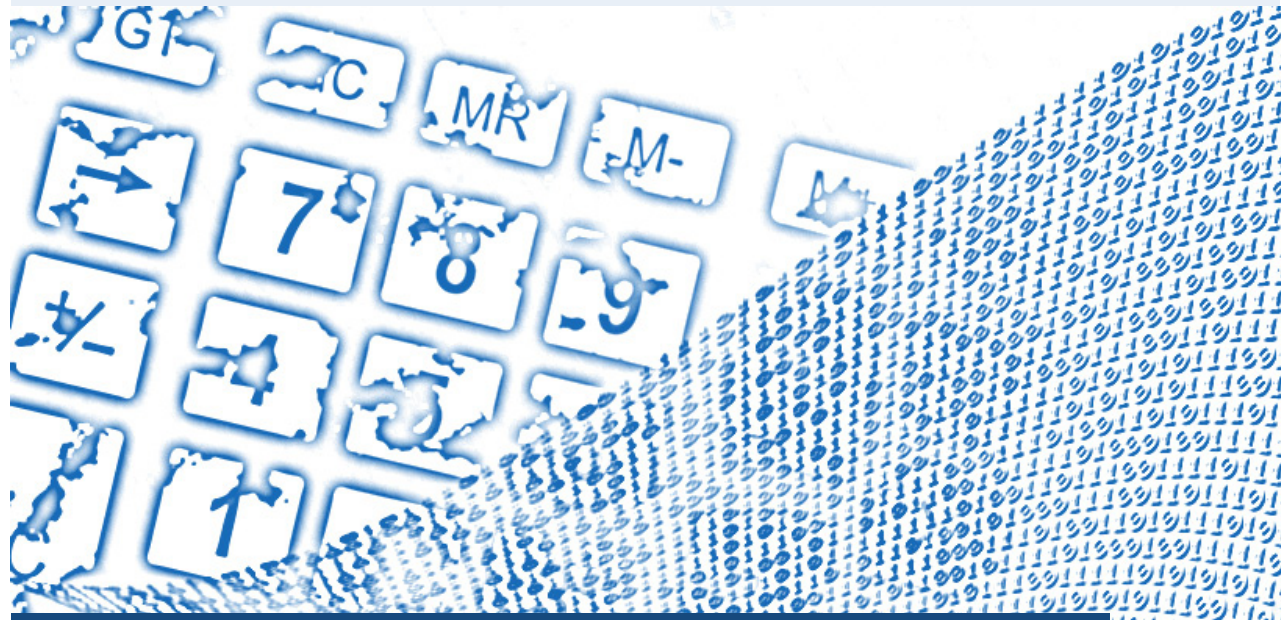
Figure G**Growth in shares of total installed biomass energy in 2010 and 2011****A- Solid Biomass Energy in the Arab Countries**

Solid biomass energy is used in the Arab countries primitively for cooking and heating, especially in remote areas. However, these resources are relatively limited due to the semi- arid nature of most lands. Agricultural, animal and timber waste are the main source of biomass. On industrial level, this energy's use is limited and related to the private sector. In September, it was mentioned that Morocco's Leisure Cristal for oil and soap industries has been granted a loan from the European Bank for Reconstruction and Development (EBRD) worth \$3.3 m in order to install a boiler operating on olive industry waste. In the same period, Biokast Energy in Tunisia has signed a contract with a Portuguese company to obtain 8000 tons/year of biodiesel for a plant under construction.¹

6. Ocean and Tidal Power

According to the IEA statistics, the total installed ocean and tidal power energy in its member countries in 2012 has remained at 261MW. It is unchanged from previous years where France accounted for 240 MW, Canada for 20 MW, and the UK for 1 MW. In 2012, 536GW/H have been generated in the OECD, 509MW/H of which have been generated in France and 27MW/H in Canada.

¹ Energy Business Review, 17/9/2013



TABLES

CHAPTER TWO

Table 2-1

Seismic Surveys Worldwide, 2009- 2013
(Crew /Month)

	2009	2010	2011	2012	2013*
Middle East	34	33	35	33	21
Africa	72	71	60	54	56
Europe	32	30	35	39	35
Russia/CIS**	45	47	47	46	219
Far East	70	68	68	67	122
USA	63	63	67	69	72
Canada	10	9	14	13	8
Latin America	35	40	37	34	32
World Total	361	361	363	355	565

Source:

* Society of Exploration Physicists

** Including CIS by HIS from 2009 to 2012. Russia’s data were included in 2013 based on Society of Exploration Physicists surveys.

Table 2-2

Average Number of Active Rigs Worldwide, 2009-2013 (Rig)

	2009	2010	2011	2012	2013*
Africa	62	83	78	96	124
Asia/Pacific	243	269	256	241	245
Canada	206	351	423	365	353
Europe	84	94	118	119	136
Latin America	356	383	424	423	419
Middle East	252	265	292	356	369
USA	1075	1541	1875	1919	1760
World Total	2278	2986	3466	3519	3406

Sources:

- *Baker Hughes, Jan. - Nov. 2013.

Table 2-3

Petroleum Discoveries in OAPEC Members and Other Arab Countries, 2009-2013

	2009		2010		2011		2012		2013*	
	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil	Gas	Oil
Algeria	12	4	15	3	10	-	23	3	1	1
Bahrain	-	-	-	-	-	-	-	-	-	-
Egypt	22	41	22	40	21	57	29	57	6	22
Iraq	1	3	1	1	1	2	1	6	-	5
Kuwait	-	1	1	1	2	2	-	6	-	1
Libya	2	11	1	20	-	-	1	4	2	5
Qatar	-	-	-	-	-	-	-	-	1	-
Saudi Arabia	1	5	1	-	-	-	2	-	-	-
Syria	1	5	-	2	1	3	0	1	-	-
Tunisia	-	1	4	1	1	4	-	2	-	-
UAE	-	1	-	1	-	-	-	-	-	-
Total OAPEC	39	72	45	69	36	68	56	79	10	34
Morocco	3	-	1	-	3	-	-	-	-	
Oman	-	5	2	1	-	1	-	-	-	1
Sudan	-	-	-	-	-	-	-	-	-	-
Yemen	1	9	-	-	2	-	-	-	-	1
Total Arab Countries	43	86	48	70	41	69	56	79	10	36

* Estimates

Source:

OAPEC Energy Resources Monitor, issues of 2013

Data collection Survey

Table 2-4

Arab and World Oil Reserves, 2009- 2013 (Billion barrels at year end)

	2009	2010	2011	2012	2013*	(%) Change 2012/2013
Algeria	12.20	12.20	12.20	12.20	12.20	0.0
Bahrain	0.12	0.12	0.12	0.12	0.12	0.0
Egypt	4.50	4.30	4.30	4.20	4.20	0.0
Iraq	143.10	142.30	141.40	145.30	145.30	0.0
Kuwait	101.50	101.50	101.50	101.50	101.50	0.0
Libya	46.42	47.10	48.00	48.50	48.50	0.0
Qatar	26.70	25.50	25.30	24.90	24.90	0.0
Saudi Arabia	264.59	264.59	265.40	265.9	265.90	0.0
Syria	2.50	2.50	2.50	2.50	2.50	0.0
Tunisia	0.43	0.43	0.43	0.43	0.43	0.0
UAE	97.80	97.80	97.80	97.80	97.80	0.0
Total OAPEC	699.86	698.34	698.95	703.34	703.34	0.0
Oman	5.50	5.50	5.50	5.50	5.50	0.0
Sudan	5.00	5.00	5.00	1.50	1.50	0.0
Yemen	2.67	2.67	2.67	2.67	2.67	0.0
Total Arab Countries	713.03	711.51	712.12	713.01	713.01	0.0
Angola	9.50	9.06	9.06	9.06	9.06	0.1
Ecuador	6.51	7.21	8.24	8.24	8.24	0.0
Iran	137.62	151.17	154.58	157.30	157.30	0.0
Nigeria	37.20	37.20	37.20	37.14	37.14	0.0
Venezuela	99.40	99.40	99.40	99.40	99.40	0.0
Total Non-Arab OPEC	290.23	304.03	308.47	311.13	311.13	0.0
Total OPEC	982.54	995.02	1000.07	1007.22	1007.23	0.0

Cont./

Table 2-4 Cont.

	2009	2010	2011	2012	2013*	(%) Change 2012/2013
Brazil	12.80	12.86	13.99	13.15	13.22	0.5
Canada	6.10	6.10	5.60	6.00	6.00	0.0
China	20.35	20.35	20.35	23.72	24.38	2.8
Mexico	10.40	10.40	10.16	10.26	10.07	(1.9)
Norway	6.68	5.67	5.32	5.37	5.83	8.6
UK	3.08	2.86	2.83	3.10	2.98	(3.9)
USA	19.12	19.12	20.68	28.95	31.78	9.8
CIS	98.90	98.90	98.90	119.06	118.89	(0.1)
Of which: Azerbaijan	7.00	7.00	7.00	7.00	7.00	0.0
Uzbekistan	0.59	0.59	0.59	0.59	0.59	0.7
Turkmenistan	0.60	0.60	0.60	0.60	0.60	0.0
Russian Federation	60.00	60.00	60.00	80.00	80.00	0.0
Kazakhstan	30.00	30.00	30.00	30.00	30.00	0.0
Rest of the world	33.83	39.19	43.17	32.7	40.41	23.6
World Total	1214.52	1230.99	1241.59	1266.45	1277.70	0.9
OAPEC/ world (%)	57.6	56.7	56.3	55.5	55.0	
Arab countries/ world (%)	58.7	57.8	57.4	56.3	55.8	
OPEC/ world (%)	80.9	80.8	80.5	79.5	78.8	

*Estimates

** Official sources.

Notes

A- Parentheses denote negative figures.

B- 50% of the Divided Zone's oil reserves is added to each of Saudi Arabia and Kuwait oil reserves.

C - Total reserves excludes bitumen and extra heavy oil in Venezuela (197 billion barrels).

D - Canada reserves excludes unconventional oil sands estimated by BP at about (26.5 billion barrels).

Sources:

- OAPEC Data Bank.
- BP Statistical Review of World Energy, June 2013
- Oil & Gas Journal, 1 Jan. 2014
- OPEC Annual Statistical Bulletin, 2013

Table 2-5

Arab and World Natural Gas Reserves, 2009- 2013
(Billion cubic meters at year end)

	2009	2010	2011	2012	2013*	(%) Change 2012/2013
UAE	6091	6091	6091	6091	6091	0.0
Bahrain	92	92	92	92	92	0.0
Tunisia	65	65	65	65	65	0.0
Algeria	4504	4504	4504	4504	4505	0.0
Saudi Arabia	7920	8016	8150	8234	8234	0.0
Syria	285	285	285	285	285	0.0
Iraq	3170	3170	3158	3694	3694	0.0
Qatar	25340	25190	25030	24400	24400	0.0
Kuwait	1784	1784	1784	1784	1784	0.0
Libya	1549	1495	1547	1532	1532	0.0
Egypt**	2211	2193	2045	2186	2186	0.0
Total OAPEC	53011	52885	52751	52867	52868	0.0
Sudan	85	85	85	85.0	85	0.0
Oman	950	950	950	950.0	950	0.0
Yemen	479	479	479	479.0	479	0.0
Total Arab countries	54525	54399	54265	54381	54382	0.0
Angola	275	275	275	275	275	0.0
Iran	29610	33090	33090	33780	33780	0.0
Venezuela	5065	5525	5525	5563	5562	(0.0)
Nigeria	5292	5110	5154	5118	5118	0.0
Ecuador	8	8	8	6	6	0.0
Total Non-Arab OPEC	40250	44008	44052	44742	44741	(0.0)
Total OPEC	90608	94258	94316	94981	94981	0.0
Cont./						

Table 2-5 Cont.

	2009	2010	2011	2012	2013*	(%) Change 2012/2013
Brazil	364	366	417	396	389	(1.6)
UK	292	256	253	246	244	(0.8)
Norway	2313	2039	2007	2070	2090	1.0
USA	6928	6928	7717	9877	10539	6.7
Mexico	360	339	490	488	484	(0.8)
Canada	1754	1754	1727	1930	1889	(2.1)
CIS	61301	61301	61301	61675	61675	0.0
Of which: Azerbaijan	850	850	850	991	991	(0.0)
Uzbekistan	1841	1841	1841	1841	1841	0.0
Turkmenistan	7504	7504	7504	7504	7504	0.0
Russian Federation	47573	47573	47573	47806	47806	0.0
Kazakhstan	2407	2407	2407	2407	2407	0.0
China	3036	3036	3036	4006	4406	10.0
Rest of the world	17095	17160	15777	15297	18025	17.8
World Total	188218	191586	191042	195107	198864	1.9
OAPEC/ world (%)	28.2	27.6	27.6	27.1	26.6	
Arab countries/ world (%)	29.0	28.4	28.4	27.9	27.3	
OPEC/ world (%)	48.1	49.2	49.4	48.7	47.8	

*Estimates

**Official sources.

- Parentheses denote negative figures.

Source:

- Oil & Gas Journal, 1 Jan. 2014.

- OPEC Annual Statistical Bulletin, 2013.

Table 2-6

Arab and World Hydrocarbon Liquids Production, 2009-2013 (Thousand b/d)

First : Crude Oil Production

	2009	2010	2011	2012	2013*	(%) Change 2012/2013
UAE	2241.6	2324.0	2564.0	2652.5	2741.0	3.3
Bahrain+	182.0	182.0	190.0	173.0	175.8	1.6
Tunisia*	82.0	78.8	70.0	66.8	62.7	(6.1)
Algeria	1221.0	1189.8	1262.0	1203.0	1206.0	0.2
Saudi Arabia	8184.0	8165.6	9311.0	9763.4	9696.0	(0.7)
Syria*	375.1	387.0	330.0	170.0	31.0	(81.8)
Iraq	2346.0	2359.0	2653.0	2942.0	3024.0	2.8
Qatar	733.0	733.4	734.0	736.0	722.0	(1.9)
Kuwait	2261.6	2312.1	2658.7	2977.6	2922.0	(1.9)
Libya	1473.9	1495.0	589.5	1454.0	661.0	(54.5)
Egypt*	546.2	560.7	566.0	571.5	571.9	0.1
Total OAPEC	19646.4	19787.4	20928.2	22709.8	21813.4	(3.9)
Sudan	475.2	462.1	453.0	82.0	85.0	3.7
Oman**	712.0	758.3	780.2	813.2	840.0	3.3
Yemen	284.1	275.0	190.0	180.1	158.8	(11.8)
Total Arab countries	21117.7	21282.8	22351.4	23785.1	22897.2	(3.7)
Angola	1738.9	1757.6	1618.0	1704.0	1656.0	(2.8)
Iran	3557.1	3544.0	3576.0	3739.8	3396.0	(9.2)
Venezuela	2878.1	2853.6	2880.9	2803.9	2813.0	0.3
Nigeria	1842.0	2048.3	1974.8	1954.1	1731.0	(11.4)
Ecuador	464.7	476.4	500.3	503.6	525.0	4.2
Totoal Non-Arab OPEC	10480.8	10679.9	10550.0	10705.4	10121.0	(5.5)
Total OPEC	28941.9	29258.8	30322.2	32433.9	31093.0	(4.1)

Cont./

Table 2-6 Cont.

	2009	2010	2011	2012	2013*	(%) Change 2012/2013
Brazil	1957.0	2049.7	2094.0	2017.5	2092.2	3.7
UK	1292.7	1196.2	993.6	869.0	777.4	(10.5)
Norway	2017.0	1875.0	1739.4	1604.5	1500.0	(6.5)
USA	5309.0	5486.0	5642.5	6504.2	7343.7	12.9
Mexico	2620.7	2594.3	2561.3	2553.9	2531.5	(0.9)
Canada	2034.0	2016.8	2082.8	2339.5	2450.6	4.7
CIS	12661.0	13220.5	13264.5	12792.0	13271.9	3.8
Of which: Azerbaijan	1014.0	1027.4	931.0	861.3	865.2	0.5
Uzbekistan	85.0	87.0	86.0	70.0	59.0	(15.7)
Turkmenistan	220.0	220.0	220.0	215.4	229.7	6.6
Russian Federation	9919.3	10147.6	10325.0	9935.0	10403.9	4.7
Kazakhstan	1285.8	1600.0	1600.0	1559.5	1618.9	3.8
China	3802.0	4049.0	4090.2	4228.1	4211.5	(0.4)
Rest of the world	7442.1	7501.6	7136.9	6156.8	8312.7	35.0
World Total	70734.0	71951.8	72506.6	73556.0	76129.7	3.5
OAPEC/ world (%)	27.8	27.5	28.9	30.9	28.7	
Arab countries/ world (%)	29.9	29.6	30.8	32.3	30.1	
OPEC/ world (%)	40.9	40.7	41.8	44.1	40.8	
Second : Natural Gas Liquids Production						
OAPEC Members Production	2767.1	2947.2	2924.0	3096.6		
Arab countries Production	2887.1	3073.4	3049.5	3221.7		
World NGL Production	8522.0	8929.0	9263.0	9562.0		
Total Hydrocarbon Liquids Production						
World Total Production	79256.0	80880.8	81769.6	83118.0		
OAPEC/world (%)	28.3	28.1	29.2	31.0		
Arab Countries/ world (%)	30.3	30.1	31.1	32.5		

+Bahrain: Average Bahrain oil field production (Jan. - Sep. 2013) as per JODI+ the share of Abu Sa'afah joint oil field with Saudi Arabia (about 128 K bpd according to latest available data).

Tunisia figures are average 8 months (Jan. - Nov. 2013) as per JODI.

OPEC members' data are 11 months average (Jan. - Nov. 2013) according to OPEC monthly reports.

*Estimates

**Official figures, average 10 months (Jan. - Oct. 2013)

- Parentheses denote negative figures.

Saudi and Kuwait production includes their share of the divided zone.

Source:

- Oil & Gas Journal, 1 Jan. 2014.

- OPEC Annual Statistical Bulletin 2013

- JODI Data Initiative

Table 2-7

**NGL Production in OAPEC Members and Other Arab
Countries, 2008-2012
(Thousand b/d)**

	2008	2009	2010	2011	2012	(%) Change 2011/2012
Algeria*	1100	572	514	486	449	(7.6)
Bahrain*	10	10	10	11	10	(9.1)
Egypt***	164	158	158	109	96	(11.8)
Iraq**	30	41	44	45	41	(8.9)
Kuwait*	30	106	126	137	152	10.9
Libya*	86	84	70	19	83	332.5
Qatar*	200	636	835	1001	1066	6.5
Saudi Arabia*	1434	897	962	1009	1093	8.3
Syria	10	10	10	10	10	0.0
Tunisia	3	3	4	3	3	0.0
UAE	250	250	214	94	94	0.0
Total OAPEC	3317	2767	2947	2924	3097	5.9
Oman***	88	100	106	106	105	(0.4)
Yemen	10	20	20	20	20	0.0
Total Arab countries	3415	2887	3073	3050	3222	5.6
World Total	8878	8522	8929	9263.0	9562.0	3.2
OAPEC/ world (%)	37.4	32.5	33.0	31.6	32.4	

- Parentheses denote negative figures.

Source:

*Official data (2009- 2012) for Bahrain, Algeria, Saudi Arabia, Kuwait, and Libya

**Official data (2010- 2012) Iraq

*** Official data (2008- 2012) Egypt and Oman

Oil & Energy Trends, Annual Statistical Review, 2013.

Table 2-8

**Arab and World Marketed Natural Gas,
2008 - 2012**
(Million cubic meters/year)

	2008	2009	2010	2011	2012 *	Change 2011-2012 (%)
UAE	50240	48840	51282	52300	54300	3.8
Bahrain**	12600	12700	13200	12700	13700	7.9
Tunisia	1700	1800	2000	1930	1860	(3.6)
Algeria**	86500	82600	83800	82600	85700	3.8
Saudi Arabia**	80440	78500	87700	92300	99300	7.6
Syria	6000	6500	8900	7900	6800	(13.9)
Iraq**	8300	9412	8641	8470	8024	(5.3)
Qatar**	76981	119400	182400	202500	204000	0.7
Kuwait**	12700	11500	11700	13500	15500	14.8
Libya**	15900	22500	23400	7900	18200	130.4
Egypt**	60994	62070	61600	61300	58800	(4.1)
Total OAPEC	412355	455822	534623	543400	566184	4.2
Oman**	25200	24500	25800	27000	28700	6.3
Total Arab countries	437555	480322	560423	570400	594884	4.3
Angola	680	690	733	752.0	760	1.1
Iran	116300	175742	187357	188753.0	202431	7.2
Venezuela	20750	18430	19728	20769.0	22726	9.4
Nigeria	32825	23206	28099	41323.0	42571	3.0
Ecuador	260	296	330	241.0	517	114.5
Total Non-Arab OPEC	170815	218364	236247	251838	269005	6.8
Total OPEC	501876	591116	685170	711408	754029	6.0
						Cont./

Table 2-8 Cont.

	2008	2009	2010	2011	*2012	Change 2011-2012 (%)
UK	73500	62400	59700	47600	41000	(13.9)
Norway	99300	104800	107700	101700	114900	13.0
USA	570800	584000	603600	648500	681400	5.1
Mexico	53400	59400	57600	58300	58500	0.3
Canada	176600	164000	159900	159700	156500	(2.0)
CIS	782700	676000	741900	776500	767700	(1.1)
Of which: Azerbaijan	14800	14800	15100	14800	15600	5.4
Uzbekistan	62200	60000	59600	57000	56900	(0.2)
Turkmenistan	66100	36400	42400	59500	64400	8.2
Russian Federation	601700	527500	588900	607000	592300	(2.4)
Kazakhstan	18700	17800	17600	19300	19700	2.1
China	80300	85300	94800	102700	107200	4.4
Rest of the world	631930	614740	673871	664932	664935	0.0
World Total	3,076,900	3,049,326	3,295,741	3,382,170	3,456,024	2.2
OAPEC/ world (%)	13.4	14.9	16.2	16.1	16.4	
Arab countries/ world (%)	14.2	15.8	17.0	16.9	17.2	
OPEC/ world (%)	16.3	19.4	20.8	21.0	21.8	

*Estimates

**Official data

Parentheses denote negative figures.

Source:

- OPEC Annual Statistical Bulletin 2013.

- BP Statistical review of world energy full report 2013.

Table 2-9

World Coal Reserves, 2008 - 2012 (Billion tons at year end)

	2008	2009	2010	2011	2012
North America	244.9	244.9	243.9	245.1	245.1
Canada	6.6	6.6	6.6	6.6	6.6
USA	238.3	238.3	237.3	237.3	237.3
Central & South America	16.2	16.2	13.7	12.5	12.5
Of which: Brazil	7.1	7.1	4.6	4.6	4.6
Colombia	6.8	6.8	6.7	6.7	6.7
Europe	272.2	272.2	304.6	304.6	304.6
Of which: FSU	222.2	222.2	224.5	228	228
Asia/Oceania	259.3	259.3	265.8	265.8	265.8
Of which: Australia	76.2	76.2	76.4	76.4	76.4
Indonesia	4.3	4.3	5.5	5.5	5.5
China	114.5	114.5	114.5	114.5	114.5
India	58.6	58.6	60.6	60.6	60.6
Africa	32.0	32.0	31.7	31.7	31.7
Of which: South Africa	30.4	30.4	30.2	30.2	30.2
Middle East	1.4	1.4	1.2	1.2	1.2
World total	826.0	826.0	860.9	860.9	860.9

- BP Statistical Review of World Energy, June 2009- June 2013 .

Table 2-10

World Coal Production, 2008 - 2012 (Million tons/year)

	2008	2009	2010	2011	2012
North America	1131.4	1050.2	1063.7	1075.9	1002.8
Canada	68.4	64.6	68.0	67.5	66.9
USA	1063.0	975.2	983.7	993.9	922.1
Central & South America	85.7	81.9	83.0	94.1	97.3
Of which: Brazil	6.6	5.1	5.4	5.4	5.8
Colombia	73.5	72.8	74.4	85.8	89.2
Europe	1253.6	1181.9	1193.0	1256.8	1281
Of which: FSU	539.3	495.6	527.6	555	584.2
Asia/Oceania	4082.7	4332.4	4649.4	5007.6	5218
Of which: Australia	404.6	418.5	424.0	415.5	431.2
China	2802.0	2973.0	3235.0	3516	3650
India	515.9	556.0	573.8	570.1	605.8
Africa	255.8	253.8	261.7	255.9	264.4
Of which: South Africa	252.6	250.6	257.2	251.6	260
Middle East	1.6	1.2	1.0	1.2	1.2
World total	6822.2	6901.3	7251.8	7691.6	7864.5
World total	6822.1	6904.6	7254.6	7695.4	

Source:

- BP Statistical Review of World Energy, June 2009- June 2013 .

Table 2-11

Nuclear Power Reactors in Operation and Under Construction Worldwide (End of 2012)

Country	Reactors in Operation		Reactors Under Construction		Electricity Supplied by Nuclear Reactors 2012	
	Capacity	No. of	Capacity	No. of	Capacity	No. of
	(MWe)	Units	(MWe)	Units	(MWe)	Units
UAE	1345	1			-	-
Argentina	692	1	935	2	4.7	5.9
Armenia	-	-	375	1	26.6	2.1
Spain	-	-	7560	8	20.5	58.7
Germany	-	-	12068	9	16.1	94.1
Ukraine	1900	2	13107	15	46.2	84.9
Iran	-	-	915	1	0.6	1.3
Pakistan			725	3	5.3	5.3
Brazil	1245	1	1884	2	3.1	15.2
Belgium	-	-	5927	7	51.0	38.5
Bulgaria			1906	2	31.7	14.9
Taiwan	2600	2	5028	6	18.4	38.7
Czech Republic	-	-	3804	6	35.3	28.6
Slovak Republic	880	2	1816	4	53.8	14.4
South Africa	-	-	1860	2	5.1	12.4
Russia	9297	11	23643	33	17.8	166.3
Romania	630	2	1300	2	19.4	10.6
Slovenia	-	-	688	1	36.0	5.2
Cont./						

Table 2-11 Cont.

Country	Reactors in Operation		Reactors Under Construction		Electricity Supplied by Nuclear Reactors 2012	
	Capacity	No. of	Capacity	No. of	Capacity	No. of
	(MWe)	Units	(MWe)	Units	(MWe)	Units
Sweden	-	-	9395	10	38.1	61.5
Switzerland	-	-	3278	5	35.9	24.5
China	28844	29	12860	17	2.0	92.7
France	1600	1	63130	58	74.8	407.4
Finland	1600	1	2752	4	32.6	22.1
Canada	-	-	13500	19	15.3	89.1
South Korea	4980	4	20739	23	30.4	143.6
Mexico	-	-	1530	2	4.7	8.4
UK	-	-	9231	16	18.1	64.0
India	4824	7	4391	20	3.6	29.7
Hungary	-	-	1889	4	45.9	14.8
The Netherlands	-	-	482	1	4.4	3.7
USA	1165	1	102136	104	19.0	770.7
Japan	2650	2	44215	50	2.1	17.2
Total	64252	67	373069	437		2347

Source:

- IAEA, Nuclear Power Reactors in the World, 2013

Table 2-12

Installed Hydro Power Capacities in some Countries, 2011

	Installed Capacity (Megawatt-MWe)
Country	2011
China	249000
Brazil	82459
USA	77500
Canada	75104
Russia	49700
India	38106
France	25332
Japan	22362
Spain	18540
Italy	18092
Rest if the World	278538
Total	934733

Sources:
World Energy Resources, 2013 Survey

Table 2-13

Installed Wind Power Capacities in some Countries, 2009-2012

Country	Installed Capacity (Megawatt-MWe)				Annual Growth Rate 2011/2012 (%)
	2009	2010	2011	2012	
Germany	25777	27191	29075	31315	7.7
China	25805	44781	62412	75372	20.8
Spain	19160	19850	21239	22362	5.3
India	10926	13065	16179	18420	13.9
Italy	4849	5793	6733	7998	18.8
France	4574	5961	6836	7593	11.1
Denmark	3465	3805	3926	4137	5.4
United Kingdom	4245	5378	6488	8871	36.7
Portugal	3535	3837	4214	4363	3.5
Netherlands	2223	2241	2309	2552	10.5
Japan	2085	2429	2595	2673	3.0
Sweden	1560	2141	2904	3750	29.1
Austria	995	1013	1086	1378	26.9
Poland	725	1231	1667	2547	52.8
Turkey	801	1320	1729	2261	30.8
Egypt	430	552	552	552	0.0
Morocco	253	263	292	394	34.9
Hungary	201	323	357	357	0.0
Tunisia	54	247	277	327	18.1
Others	48485	56452	68255	87015	27.5
Total	160148	197873	239125	284237	18.9

Sources:

- BP Statistical Review of World Energy, June 2013 .

Table 2-14

Cumulative Installed Photovoltaic Power Capacities in Some Countries, 2009-2012 (Megawatt)

Country	Cumulative Installed Capacity Megawatt-Mwe)				Annual Growth Rate 2011/2012 (%)
	2009	2010	2011	2012	
Germany	10566	17554	25039	32643	30
Italy	1181	3502	12803	16241	27
USA	1698	3055	3966	7312	84
Japan	2627	3618	4914	6914	41
Spain	3523	3915	4260	4537	7
France	380	1197	2660	3692	39
Australia	188	571	1408	2408	71
United Kingdom	26	70	976	1655	70
South Korea	524	656	812	1064	31
Canada	95	291	497	766	54
Austria	53	96	187	422	126
Switzerland	74	111	211	410	94
Netherlands	68	88	131	256	95
Rest of the World	2978	5692	12007	21795	82
Total	23979	40416	69871	100115	43.3
World total	39529.0			69371.1	75.5

Sources:

- BP Statistical Review of World Energy, June 2013 .
- IEA Renewables Information, 2013 .
- National Survey Report of PV Power Applications in Canada, June, 2013

Table 2-15

Installed Geothermal Capacities in Some Countries, 2011 and 2012

	Installed Capacity (Megawatt-MWe)		Annual Growth Rate 2011/2012 (%)
	2011	2012	
USA	3236	3386	4.6
Philippines	1967	1968	0.1
Indonesia	1209	1339	10.8
Mexico	887	812	(8.5)
Italy	863	863	0.0
New Zealand	769	769	0.0
Iceland	665	665	0.0
Japan	502	502	0.0
Salvador	204	204	(0.2)
Kenya	167	175	4.8
Costa Rica	208	208	0.0
Nicaragua	88	160	81.8
Russia	82	82	0.0
Turkey	114	114	0.0
Portugal	29	29	0.0
Rest of the World	166	170	2.7
Total	11156	11446	2.6

Sources:

- BP Statistical Review of World Energy, June 2013 .

Table 2-16

Installed Solid Biomass Capacities in some Countries, 2010 and 2011

	Installed Capacity (Megawatt-MWe)		Annual Growth Rate 2011/2012 (%)
	2010	2011	
USA	7361	7400	0.5
Sweden	3178	3397	6.9
Italy	406	421	3.7
Finland	1910	1910	0.0
Austria	1589	1628	2.5
Germany	2014	2148	6.7
Denmark	868	920	6.0
United Kingdom	739	1667	125.6
Mexico	473	473	0.0
Czech Republic	271	306	12.9
Australia	597	597	0.0
Belgium	640	701	9.5
Canada	1553	1553	0.0
Netherlands	686	713	3.9
Spain	545	563	3.3
Turkey	47	10	(78.7)
South Korea	46	46	0.0

Parentheses denote negative figures

Sources:

- IEA Renewables Information, 2013 .



CHAPTER THREE



ARAB AND WORLD DEVELOPMENTS IN PETROLEUM DOWNSTREAM INDUSTRIES

CHAPTER THREE

ARAB AND WORLD DEVELOPMENTS IN PETROLEUM DOWNSTREAM INDUSTRIES

I. REFINING INDUSTRY

1. World Developments

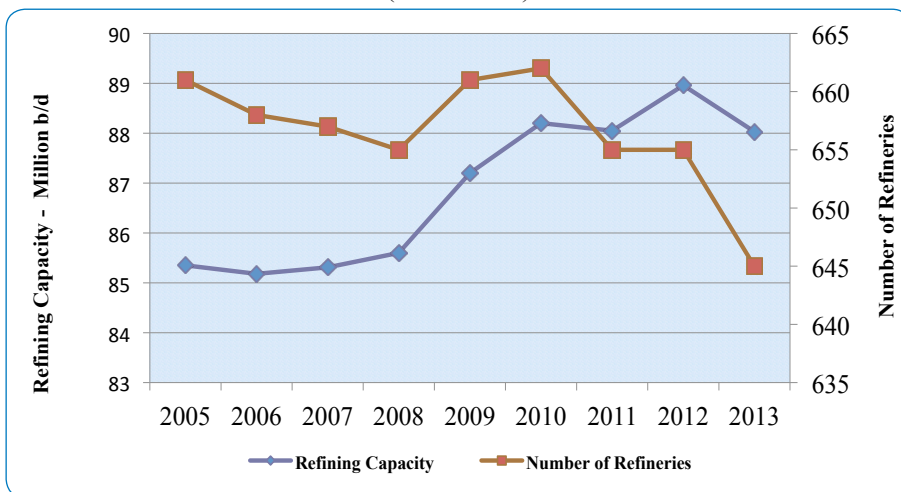
Total world primary distillation capacity of crude oil recorded a decrease of 940000 b/d and 1.06% from its level last year. It totalled about 88.02 million b/d at the end of 2013 compared to 88.96 million b/d at the end of 2012. The number of operational refineries decreased as well by 10 refineries from 2012. It totalled 645 refineries.

Figure (3-1) shows the development of refining capacity and the number of world refineries between 2005 and 2013.

Figure 3-1

Development of World Refining Capacity and the Number of Refineries

(2005-2013)



The Middle East was the only region that registered an increase in refining capacity by less than 2% compared to 2012.

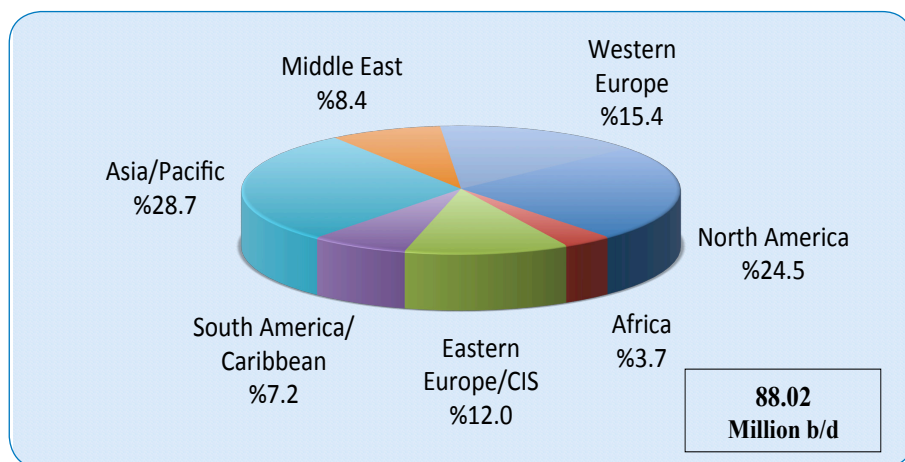
Western Europe came on top of the regions that registered decline in refining capacities, as they dropped by more than 3% compared to 2012.

Asia Pacific has also witnessed a drop in refining capacities by 1.4% compared to 2012.

Figure (3-2) shows the distribution of the total world primary distillation capacities by region by the end of 2013. **Table (3-1)** compares world primary distillation capacities by the end of 2012 and 2013.

Figure 3-2

Distribution of World Primary Distillation Capacity by Region, End of 2013

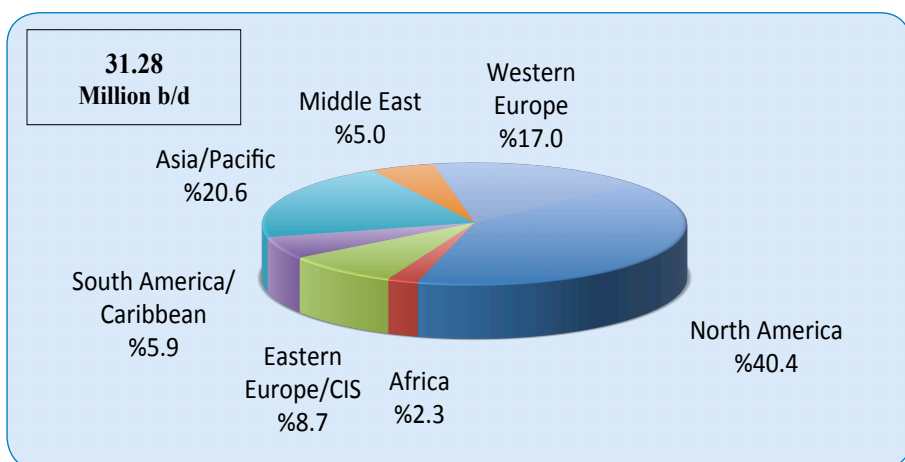


Despite the increase recorded in North America and South America, the total capacity for catalytic conversion processes, which include fluid catalytic cracking (FCC), catalytic hydrocracking, and catalytic reforming, declined by the end of 2013. It totalled to 31.28 million b/d at the end of 2013 compared to about 31.64 million b/d in 2012. This is due to the decline in unit capacity in Western Europe

with about 110000 b/d or 2% from its 2012 level and the decline in the Middle East by 50000 b/d or 3.11%, Asia Pacific by 230000 b/d or 3.44% from their 2012 levels.

Figure (3-3) shows the distribution of world catalytic conversion capacity by region by the end of 2013. **Table (3-2)** compares world catalytic Conversion capacity by region in 2012 and 2013.

Figure 3-3
Distribution of World Catalytic Conversion Capacity by Region, End of 2013



The decline concentrated in the total capacity of catalytic cracking processes and reforming capacity with about 210000 b/d each. Catalytic reforming capacity has declined from 11.49 million b/d in 2012 to 11.28 million b/d in 2013 or by 1.85%.

The increase that partially made up for the catalytic conversion capacity came from catalytic hydrocracking by about 40000 b/d or 0.72% with 5.60 million b/d at the end of 2013 compared to 5.56 million b/d at the end of 2012.

Table (3-3) compares the total catalytic conversion capacities at the end of 2012 and 2013.

Figures (3-4), (3-5) and (3-6) show comparisons among world catalytic reforming capacity by region, catalytic cracking, and catalytic hydrocracking at the end of 2012 and 2013.

Figure 3-4
Comparison of World Catalytic Reforming Capacity by Region,
End of 2012 and 2013
(%)

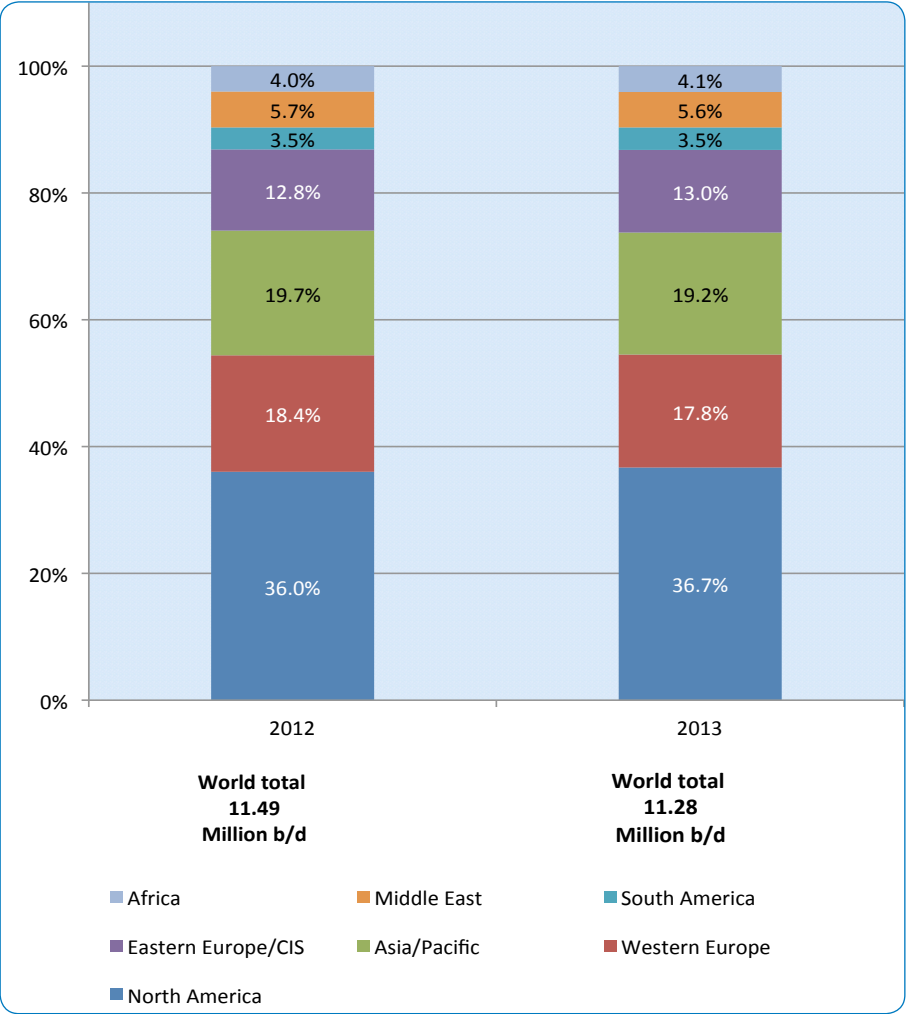


Figure 3-5
Comparison of World Fluid Catalytic Cracking Capacity by Region, End of 2012 and 2013
(%)

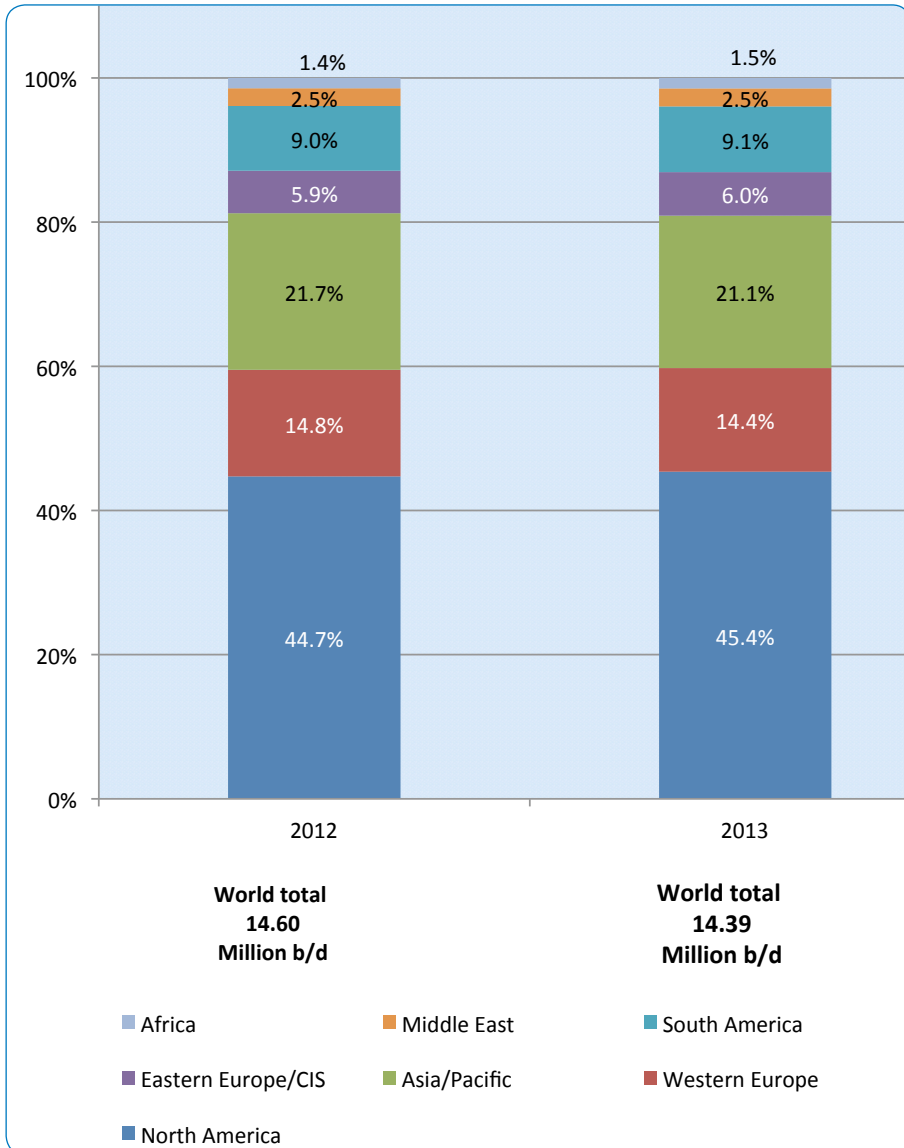
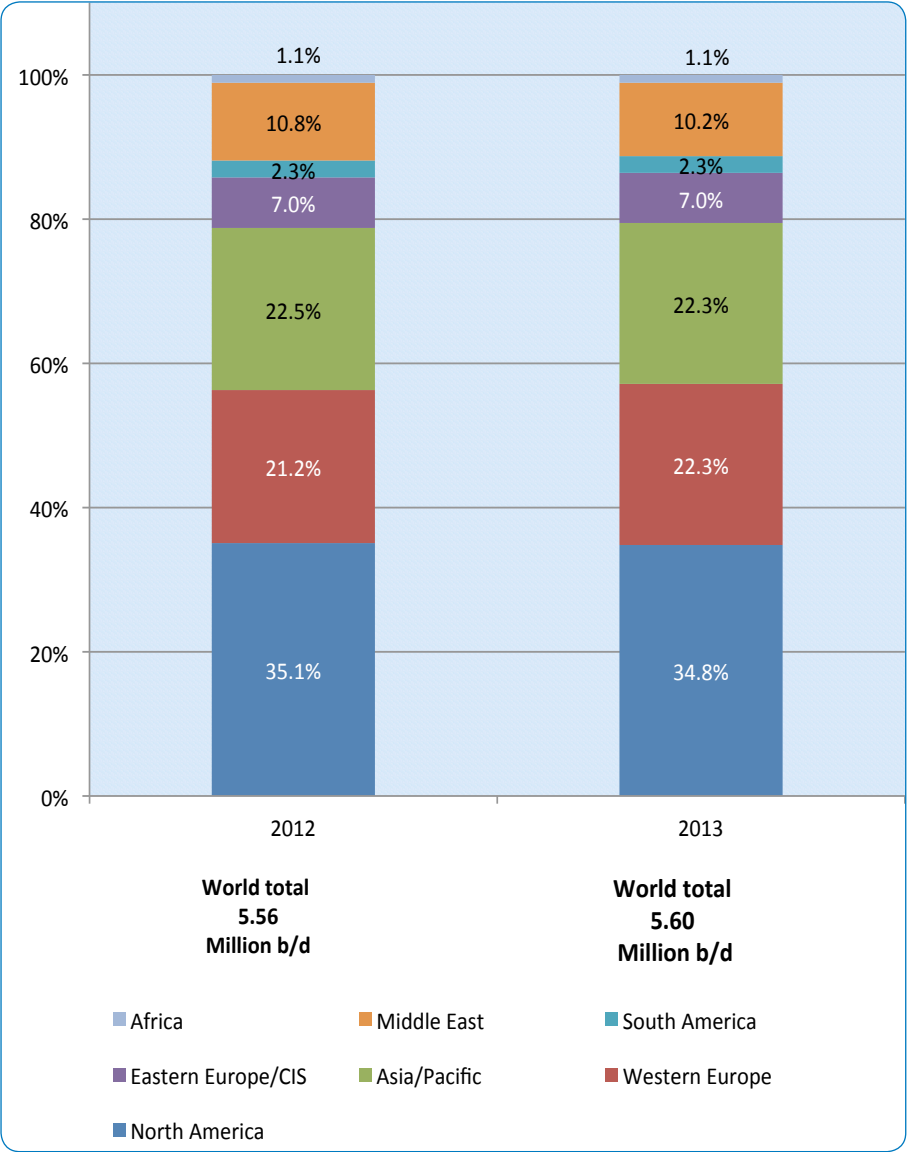


Figure 3-6

Comparison of World Hydrocracking Capacity by Region, End of 2012 and 2013

(%)



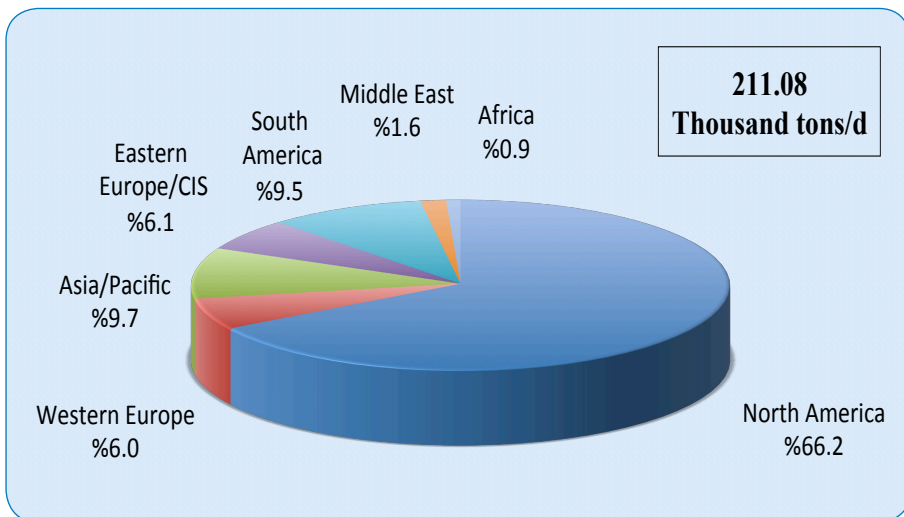
As for thermal conversion processes, which include both coking and thermal cracking processes; their total coke production capacity in 2013 recorded an increase of 1940 tons/day, or 0.93% above its level in 2012. At the end of 2013 it totalled to about 211080 tons/day, compared to 209140 tons/day at the end of 2012.

This increase centred in North America with around 6060 tons/day, or 4.53%, Eastern Europe with about 380 tons/day or 3.02% compared to 2012. It declined in South America by about 4500 tons/day or 18.26% from its 2012 level.

Table (3-4) shows a comparison between world capacity coke production from thermal conversion processes by region at the end of 2012 and 2013. **Figure (3-7)** shows world capacity coke production from thermal conversion processes by region at the end of 2013.

Figure 3-7

World Capacity for Producing Coke from Thermal Conversion Processes by Region, End of 2013



On the other hand, total hydrotreating capacity in 2013 recorded a decline of 880000 b/d, or 1.92 % from its 2012 level. It totalled to 44.97 million b/d compared to 45.85 million b/d at the end of 2012.

=Western Europe registered the biggest decline with 440000 b/d or 4.38%, followed by Asia Pacific with about 350000 b/d or 3.42%. Eastern Europe recorded an increase of 60000 b/d, or 1.37%, followed by North America with 60000 b/d, or 0.36% compared to its level in 2012.

Table (3-5) compares total world hydrotreating capacity by region at the end of 2012 and 2013. Figure (3-8) shows the distribution of total hydrotreating capacity by region at the end of 2013.

Figure 3-8

Distribution of Total Hydrotreating Capacity by Region, End, 2013

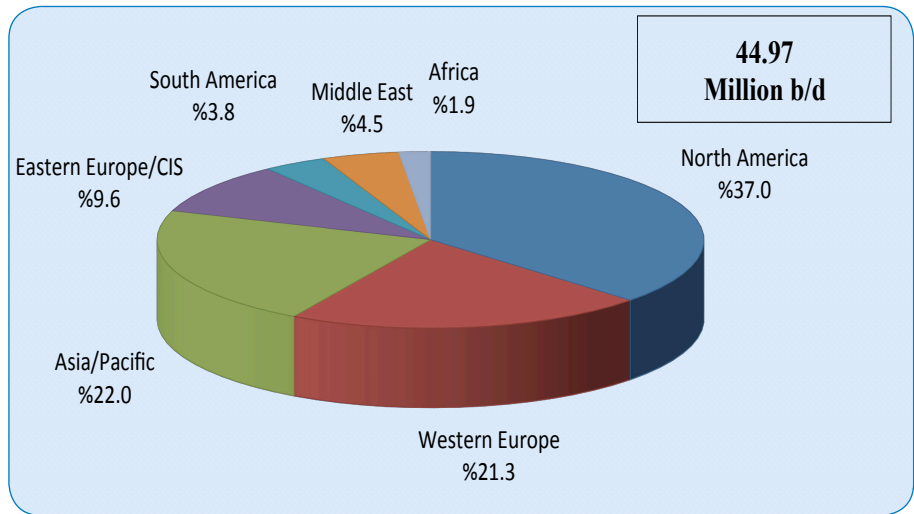


Table (3-6) lists the top 25 refining companies that own most of the refinery capacity in the world. The table includes also partial shares in refineries that the company do not wholly own.



Slight changes in positions took place in 2013: Saudi Aramco jumped from tenth rank in the beginning of 2013 to the fifth with the beginning of 2014 due to operating its complex in Jubail in KSA with a capacity of 400000 b/d. Also, Marathon Petroleum jumped from the 17th rank in the beginning of 2013 to the 13th in the beginning of 2014 due to the acquisition of BP-PLC's refinery in Texas. Other changes shown in [table \(3-6\)](#) were due to released statements.

Table (3-7) lists the world's largest refineries with a minimum capacity of 400000 b/d at the end of 2013. It shows that Hovensa LLC has been removed from the table due to closing one of its refineries and transforming it into a loading terminal, a joint venture between Hess and Petroleo de Venezuela SA. SATORP refinery has entered the list, a joint venture between Saudi Aramco and France's Total which has been operated in Jubail in KSA.

Following are the most significant developments in the oil refining industry worldwide in 2013:

1-1 Asia Pacific

Total Asia Pacific primary distillation capacity has declined by 360000 b/d compared to its 2012 level.

The said decline occurred due to closing a number of refineries in Japan following the government's decision to boost operating efficiency of oil refining industry. In 2010, the Japanese government decided to raise cracking processes percentage to crude oil distillation capacity from 10% to a minimum of 13% in refineries by 2014.

Refining capacity has dropped in Japan from 4.8 million b/d in 2012 to 4.4 million b/d in 2013 due to the closure of three refineries.

Refining industry in China has not registered any increase in 2013 from the end of 2012 levels. Most recorded increases were in 2012 Q4.

In November 2012, China government's Petroleum and Chemical Corporation- Sinopec has completed the establishment of a crude oil

distillation unit with a capacity of 200000 b/d to boost sour crude oil refining in Maoming refinery, Guangdong. This increase has contributed to increasing the refining capacity of the refinery up to 400000 b/d.

In May 2013, PetroChina, an affiliate to CNPC, postponed the execution of a plan to double the refining capacity of Huabei refinery in Hebei from 100000 b/d to 200000 b/d. It was expected to complete the project by the end of 2012. The company expects to complete the expansion project by the end of 2014. It is expected to start operating in the beginning of 2015.

In September 2013, China's Environment Protection Ministry has suspended all proposed refining projects by Sinopec and China National Petroleum Corporation, the two biggest refining companies in China. The reason for the ban has been the failure of the two companies in responding to the targeted emissions levels which would lead to slowing down work pace in executing other planned projects for the period from 2014 to 2025.

The Chinese government has also suspended the joint venture between PetroChina, Royal Dutch PLC, and Qatar Petroleum to establish an oil refinery with a capacity of 400000 b/d and a petrochemicals complex in Taizhoa east Zhejiang.

In September 2013, PetroChina postponed operating Pengzhou refinery with a capacity of 200000 b/d southwest Sichuan (southwest China). Pengzhou is considered the first refinery in Sichuan. It will process crude oil from northwest China and Kazakhstan.

In spite of the economic recession in the first three quarters of 2013, recovery has been noted by the end of the year which encouraged Chinese refining companies to present plans for adding new refining capacities.

In July 2013, PetroChina disclosed a study on evaluating the environmental footprint of Kunming refinery project southwest Yunnan with a refining capacity of 200000 b/d. It is expected to start operating in 2014.

In November 2013, CNPC signed an agreement with Russia's Rosneft to supply oil and set up a refinery with a capacity of 260000 b/d east Tianjin City's port. The refinery is expected to start operating before the end of 2020.

Rosneft will be the prime oil supplier for the refinery which will also be granted oil importing and petroleum products exporting rights in addition to the possibility of selling their products to the Chinese government.

Sinochem is also planning to start operating a refinery with a capacity of 240000 b/d in Quanzhou south Fujian by the end of 2014.

China National Offshore Oil Co. (CNOOC), third on China's oil refining companies' list, announced a plan to add a refining capacity of 200000 b/d in to its Huizhou refinery in Guangdong province whose current capacity is 240000 b/d.

India has maintained its commitment towards its refinery expansion plans to meet increasing local demand.

In March 2013, Hindustan Petroleum Corporation Limited signed a memorandum of understanding with Indian government- owned Rajasthan to build a refining and petrochemicals complex in Barmer. The project costs are expected to be \$6.85 billion. It will take four years to be built. Its refining capacity has not been announced yet.

In May 2013, Hindustan Petroleum Corporation Limited has also declared its plans to build a refining and petrochemicals complex in Wisakhapatnam with a refining capacity of 300000 b/d south Andhra Pradesh province.

During 2013, Bharat Petroleum Limited in Mumbai has continued the procedures of awarding expansion and development contracts of Kochi refinery in Ambalmugal, Kerala. The project will increase the refinery capacity from 200000 b/d to 300000 b/d through establishing a distillation unit, an FCC unit, and a delayed coking unit.

Other countries in Asia Pacific plan to expand their refining capacities.



In April 2013, Pakistan's National Oil has signed a memorandum of understanding with the Government of northwest Khayber Pakhtunkhwa to build a refinery with a capacity of 40000 b/d in Kohat city. The refinery will refine crude oil produced from neighbouring local sources to produce petroleum products meeting Euro-5 standards. The project will be operating in 2017.

In Australia, refining capacity has declined in 2013 following the closure of Clyde refinery in Sydney with a capacity of 79000 b/d. Also Shell Australia announced in April 2013 that it was seeking buyers for its other remaining refinery in Australia.

1-1 North America

In Canada, work started in a new oil refinery for the first time in North America after a long pause that lasted for 30 years. The refinery capacity is 150000 b/d and costs 5.7 billion Canadian dollars. The refinery is in north Edmonton. It will refine bitumen to produce diesel, naphtha, low-sulphur vacuum gas oil, in addition to; light products like butane, propane, and ethane. The first stage is expected to operate with a capacity of 50000 b/d by the end of 2016.

In February 2013, Marathon Petroleum Corporation concluded a procurement deal acquiring BP refinery in Texas with a capacity of 451000 b/d. it named it Galveston Bay Refinery.

In the same month, Hess completed the closure of its Port Reading Refinery in New Jersey with a capacity of 70000 b/d.

In the end of 2013, Motiva Enterprise- Port Arthur in Texas has become the biggest refinery in North America after completing the refining capacity expansion project increasing it from 325000 b/d up to 600000 b/d. Motiva is a joint venture owned by Saudi Aramco and Royal Dutch Shell.

1-2 Western Europe

Western Europe faces reducing refining capacities more than any other region in the world. There are many refineries for sale or



transformation to oil products storage terminal.

In the beginning of 2013, TotalErg, a joint venture between Total (49%) and Italy's Erg (51%), declared that it had closed Roma Refinery, whose refining capacity was 86000 b/d and transformed it into a product storage terminal.

Another refinery, Mantua, with a capacity of 52000 b/d stopped operating in Italy. It will be transformed into a product storage terminal.

1-3 Eastern Europe

The Russian oil producing company, Gazprom Neft, has announced its plans to upgrade Moscow Refinery during the period 2013-2015 with a cost of \$1.5 billion.

The plans include upgrading the refinery to produce better products, increase oil conversion to light products rates, improving the efficiency of energy consumption, reducing the refinery environment footprint, and building crude oil distillation unit with a capacity of 118000 b/d.

1-4 Africa

Angola government- owned Sonangol started construction work in Sonaref refinery in Benguela with a capacity of 200000 b/d. It is estimated to cost about \$8 billion. The refinery will refine oil produced in Angola. It is expected to start operating in 2016.

2. Developments in Arab Countries

Total primary distillation capacity of refineries in the Arab states in 2012 has increased by the end of 2013 from 7.949 million b/d to 8.322 million b/d, or 4.96% increase when compared to its 2012 levels.

Total primary distillation capacities of the 51 oil refineries in OAPEC member countries accounted for 7.55 million b/d, or

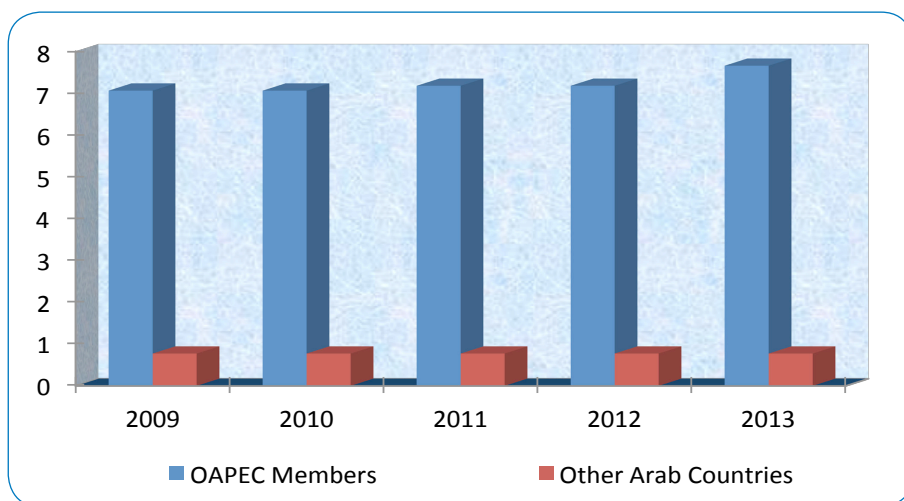
90.72% of the total primary distillation capacity of the Arab countries amounting to 8.322 million b/d. Total primary distillation capacity at the 11 oil refineries in other non-OAPEC Arab countries accounted for the remaining 772000 b/d, or 9.28%, of the Arab total.

Figure (3-9) shows the evolution of primary distillation capacity in the Arab countries from 2009 to 2013. Table (3-8) shows the evolution of primary distillation capacity in the Arab countries from 2009 to 2013 and the number of refineries in 2013.

Figure 3-9

Evolution of Primary Distillation Capacity in the Arab Countries, 2009-2013

(Million b/d)



A long list of projects, totalling almost 4.9 million b/d of distillation capacity announced by the Arab countries is still facing many difficulties in implementation due to several reasons. It is expected that only about 2.4 million b/d of additional capacity will come into operation during 2014-2018. Major additional capacity is expected from new grassroots projects in Yanbu and Jizan in Saudi Arabia, as well as Ruwais refinery in United Arab Emirates, Mina Al Zour refinery in Kuwait, four refineries in Iraq, and four refineries in



Algeria. Tables (3-9) and (3-10) summarize project status of the new refineries in OAPEC and non-OAPEC Arab countries in 2013.

Moreover, many projects in the Arab countries are oriented toward adding conversion and hydro-treating capacity to meet the rising demand for middle and light distillates that meet the requirements of the environmental legislation related to clean fuel production.

The following are the most important developments recorded in the Arab countries in 2013.

2-1 Algeria

In September 2012, Algeria started construction of a new 100000 b/d refinery near the city of Biskra 300km south of Algeria at a cost of \$3 billion. This refinery is the first of four new similar configuration plants totalling 400000 b/d set to come on stream by 2018. These new refineries will be in Ghardaia, Tiaret and Hassi Messaoud. The Biskra refinery will produce 11600 b/d of gasoline, 7000 b/d of LPG and 3600 b/d of Kerosene.

Algeria is still undertaking a major upgrade and expansion project at its existing refineries. The work to expand the country's largest refinery at Skikda to 335000 b/d from 300000 b/d for boosting diesel and gasoline production is underway and set for completion early 2014. Work is being carried out by South Korea's Samsung Engineering, which won a \$2.6 billion contract in 2010.

In August 2013, Sonatrach awarded civil works contract of Algeria Refinery to OCI, a construction company, as part of Algeria Refinery upgrading project whose refining capacity was 60000 b/d.

2-2 Bahrain

Bahrain Petroleum Company's (Bapco) decided to increase the capacity of Sitra refinery from 267000 b/d up to 360000 instead of 450000 b/d at a cost of \$6-8 billion. The project is expected to be completed by stages; the first stage to start in 2017 while the final stage will be in 2020.

The project includes setting up new units, replacing many old units which would make Bahrain's refinery one of the most sophisticated in the region.

The new units consist of vacuum gasoil hydrocracking unit, diesel hydrotreating unit, delayed coking unit, and a vacuum distillation unit.

Bapco will also need to establish a new hydrogen unit in order to be able to produce high quality oil products like ULSD eligible for exportation to European and other markets with stringent fuel standards.

2-3 Iraq

The implementation of the ambitious plan of the Iraqi government to increase the refining capacity from 860000 b/d to almost 1.6 million b/d is still in progress. The plan includes building four new refineries and expansion of the existing refineries, which would require an investment of \$30 billion.

In October 2013, the Iraqi Government signed a contract with Switzerland's Satarem to build and operate Misan refinery at a cost of \$6 billion with a capacity of 150000 b/d.

Misan refinery is expected to be completed through BOO contract where the Iraqi government pledges to provide crude oil supplies at low rates while the company will enjoy the right to export any products that cannot be sold at the local market. The project is due for completion in 2018.

Work is in progress in Nasriyah refinery project with a capacity of 300000 b/d. US Show Group completed the final engineering designs of the Kirkuk refinery with a capacity of 140000 b/d in April 2013.

The Iraqi Government has also decided to execute Karbala refinery project with a capacity of 140000 b/d as part of the oil refining development plan in the Republic of Iraq. Main units consist of naphtha a hydrotreating unit with a capacity of 41500 b/d, a catalytic reforming unit, a hydrogen treatment unit for diesel with a capacity of 36000 b/d, and a fluid catalytic cracking (FCC) unit.

2-4 Kuwait

In the end of 2012, KNPC awarded UK's AMEC a contract of managing the fourth refinery construction project with a capacity of 615000 b/d. The contract is worth \$500 million and due for completion in 2018.

The idea of building Al-Zour refinery is part of the clean fuel project that involves revamping of the existing other three refineries at a cost of \$15-17 billion. The revamping project aims to boost the capability of the existing refineries to produce high quality fuel, according to international standards. The project includes the following work:

- Capacity expansion at Mina Abdulla Refinery from 270000 b/d to 420000 b/d, to cover the shortfall of the refining capacity of Mina Al- Ahmadi refinery, which will result from shutting down one of its 86000 b/d distillation units.
- Installing 156000 b/d heavy atmospheric residue conversion unit at Mina Al-Ahmadi refinery.
- Installing a new 45000 b/d hydrotreating unit at Mina Al-Ahmadi refinery.

On the other hand, the state of Kuwait continues its efforts to create investment opportunities in Asia in the field of downstream industry, through Kuwait Petroleum International (KPI) owned by Kuwait Petroleum Corporation (KPC). In July 2013, Nghi Son Refining and Petrochemicals awarded Foster Wheeler management and consultancy services contract for the construction project of a refining and petrochemicals complex in the Vietnamese Thanh Hoa Province at a total cost of \$6 billion. The refinery's capacity is 200000 barrels per day. It will refine Kuwaiti heavy crude oil. Production expected to start in 2017. The project is owned by Kuwait Petroleum International Company (KPI), in addition two Japanese partners Idemitsu Kosan Corp (35.1% each), Vietnam's PetroVietNam, and Japan's Mitsui Chemicals Inc by 25.1% and 4.7% respectively.

The new oil refinery project in Balongan West Java, Indonesia, in collaboration with Pertamina Co. is still in the planning stage. The refinery's



processing capacity is expected to be between 200000 to 300000 b/d. KPI is looking for an international partner. The project is due for completion in 2016.

2-5 Libya

The Libyan Government endorsed a plan to construct two new oil refineries, the first in Tobruk east Libya with a capacity of 300000 b/d; and the other in Ubari southeast with a capacity of 50000 b/d.

Tobruk refinery aims at meeting the oil products needs of most of the eastern area. The little refinery aims at meeting the oil products needs of the southern area which is considered of small population.

The plan also includes doubling the refining capacity of Al Zawiya refinery to 300000 b/d and Ras Lanuf refinery, the biggest in Libya, to 300000 b/d at a cost of \$6 to 7 billion.

2-6 Qatar

In April 2013, Qatar Petroleum signed a joint venture agreement with Total, Japan's Idemitsu, Cosmo Oil, Mitsui, and Marubeni to expand Laffan condensate refinery at Ras Laffan with a capacity of 146000 b/d at a cost of \$1.5 billion. The configuration will be the same as the current same-size splitter.

The expansion project would process the untreated condensates produced by the giant north gas field. It will produce about 60000 b/d of naphtha, 53000 b/d of jet fuel, 24000 b/d of gasoil, and 9000 b/d of liquefied petroleum gas. The project is due for completion in 2016. Qatar Gas will operate it.

Construction work still in progress for diesel hydrotreating unit with a capacity of 54000 b/d of diesel produced from the current and new refineries. This project is part of Qatar's national vision to secure supplying the local market products conforming to the European standard (Euro-5), the strictest environmental standard. Project is expected to start production in 2014 at an estimated cost of about \$96 million.

2-7 Saudi Arabia

Saudi Aramco made remarkable progress in many key projects aiming to expand its downstream industry sector at a total cost of \$ 50-60 billion.

In September 2013, Full Conversion Refinery started operating in Aramco and Total (SATORP) refining and petrochemical complex in Al-Jubail with a capacity of 400000 b/d.

Al- Jubail refinery was designed to refine heavy crude from Safania and Manifa field of Saudi Arabia. The refinery will produce high quality petrochemical and petroleum products. It will be the first to produce petroleum coke in KSA.

SATORP refinery is a joint venture owned by Saudi Aramco (62.5%) and Total (37.5%) at a total cost of \$14 billion.

Work is still ongoing in Saudi Aramco and Chinese state firm Sinopec Yanbu refinery project. It is due to operate in 2016.

The Yanbu Aramco Sinopec Refinery Company (YASREF) marks the first major Chinese petroleum refining industry investment in the kingdom. YASREF will produce 90000 b/d of gasoline, 263000 b/d of ultra low sulphur diesel, along with 6300 tons/day of petroleum coke and 1200 tons/day of sulphur.

Saudi Aramco is also studying bids from international engineering firms to build the 400000 b/d Jazan refinery, which is intended to open in 2016. It will be a semi-conversion refinery and will largely process Arab light and Arab medium rather than more difficult heavy crudes. It will produce benzene, ultra low sulphur diesel, and paraxylene.

Saudi Aramco has awarded South Korea's Samsung Engineering the engineering, procurement and construction (EPC) contract for the Clean Fuel Project at its 120000 b/d Riyadh refinery. The Riyadh refinery upgrade is part of a Saudi Aramco plan to reduce the sulphur content of its refineries' gasoline and diesel output to a maximum of 10 parts per million. The project will include installing



new isomerization, naphtha splitting and hydrotreating units, as well as addition of new equipment. The project cost is estimated at \$300 million.

2-8 United Arab Emirates

Work is still ongoing in Takreer's (Abu Dhabi Oil Refining Company) Ruwais refinery expansion project. The expansion will add a capacity of 417000 b/d. It is expected to operate in the first half of 2014.

In September 2013, Emirates National Oil Company- ENOC has signed an agreement with China-Sonagol to set up Dubai's second refinery. China-Sonagol is a joint venture between Angola's Sonagol and Hong Kong's privately owned New Bright International Enterprise Limited. ENOC is now running Jebel Ali Refinery in Dubai with a capacity of 120000 b/d.

International Petroleum Investment Company (IPIC) announced that France's Technip has completed the final engineering designs for establishing a refinery with a capacity of 200000 b/d in Fujairah northeast the UAE which is worth \$3 billion. The refinery is to start operating in 2016.

Non-OAPEC countries' developments can be summed up as follows:

2-9 Oman

Oman Oil Refineries & Petroleum Industries (Orpic) awarded the engineering, procurement and construction contract of Sohar Refinery expansion project to the UK's Petrofac and Korea's Daelim worth \$2.1 billion.

Sohar refinery's upgrading and expansion project will reduce the production of heavy products, and increase the production of high quality light products. It will also enable the refinery to refine heavy crude oils. The project includes adding a new 71500 b/d crude distillation unit, 96800 b/d vacuum distillation unit, 66450 b/d

hydrocracker, and 42400 b/d solvent deasphaltating unit.

Duqm Refinery and Petrochemical Industries Company (DRPIC) selected Shaw Energy and Chemicals as the project management consultant for the \$6 billion, 230000 b/d refinery and petrochemicals complex. The project is a joint venture owned by state-owned Oman Oil Company (OOC) and Abu Dhabi's state-owned International Petroleum Investment Company (IPIC). The refinery is scheduled for start up in 2017.

2-10 Sudan

The Sudanese Government has announced a plan to increase the refining capacity of the three existing refineries: Al Jaili refinery north Khartoum whose capacity is 100000 b/d, Red Sea Port Sudan refinery whose capacity is 25000 b/d, and Al Ubayyidh refinery with a capacity of 15000 b/d.

The Sudanese Government owns Khartoum refinery with 60% shares while China National Petroleum Corporation (CNPC) owns 40%. The refinery's capacity will be increased up to 200000 b/d, while Port Sudan and Al Ubayyidh refineries capacities will be increased to 50000 b/d each.



II. PETROCHEMICAL INDUSTRIES

1. World Developments

World ethylene production capacity in 2012 had risen by the same average of 2011. It increased to 143.40 million tons/year by the end of 2012 compared to 141 million tons/year in 2011, an increase of 2.4 million tons/year, or about 1.74%. This increase was due to the addition in the UAE, China, and the USA. Japan, however, has shut down a plant with a capacity of 330000 tons/year.

Figure (3-10) shows the increases in world existing ethylene production capacities recorded during the period (2000- 2012).

Figure 3-10
Increases in World Existing Ethylene Production Capacity
(Million tons/year)

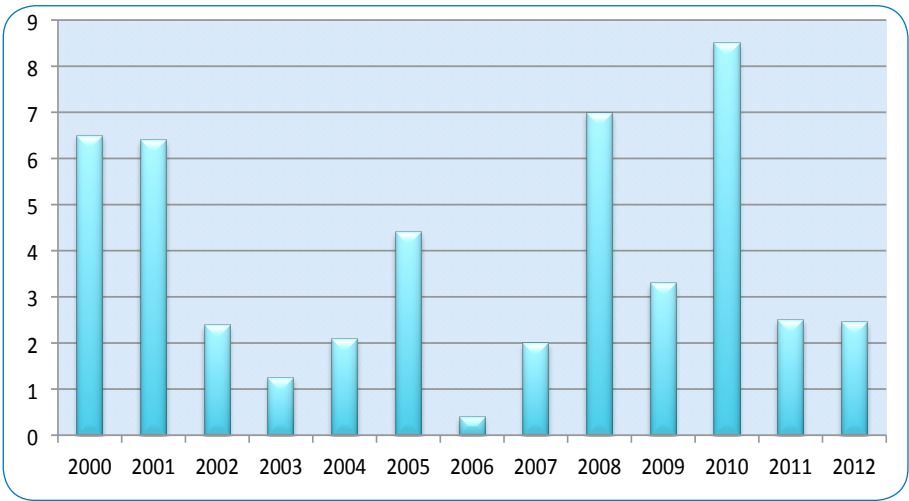


Table (3-11) shows the world's ten largest ethylene production complexes by the end of 2012. The order remains unchanged from the previous year.

Figure (3-11) shows distribution of total existing ethylene capacities in the end of 2012.

Figure (3-11)

Distribution of Total Existing Ethylene Capacities at the end of 2012

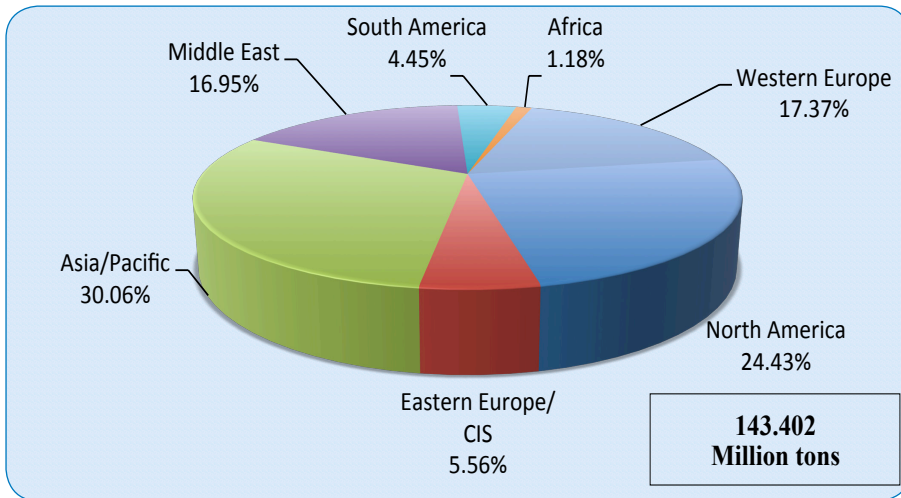


Table (3-12) compares the existing ethylene production capacity worldwide by regions in 2011 and 2012. The Middle East recorded the biggest increase with a share of 1.45 million tons/year. North America came second, bringing on stream 0.528 million tons/year of ethylene capacity. Asia-Pacific recorded an increase of 0.470 million tons/year. Western Europe, South America, Africa, and Eastern Europe remained unchanged.

Table (3-13) shows distribution of ethylene production capacity worldwide by countries in 2011 and 2012. It is noted that the UAE achieved the largest increase followed by China and the USA.

Table (3-14) lists the world's ten largest ethylene producers in the beginning of 2013. The table also shows the number of sites and the percentage of companies' actual shares in joint ownership.

If all projects under construction remain on announced schedule, 2013 will see production capacity added by nearly 11 million tons/year. That pace will fall considerably in 2014, to a little less than 1.2 million tons/year, and then it will begin to accelerate in 2015.

The following are the most important projects planned and under construction in the world regions.

1-1 Asia- Pacific

In October 2012, PetroChina Co. Ltd. has started up an 800,000 tons/year ethylene unit at its Fushun Petrochemical Co. refining and petrochemical complex in Liaoning Province, bringing ethylene capacity to 1 million tons/year.

In India, Technip was awarded by Reliance Industries Limited (RIL) a license, supply of basic engineering package and an engineering and procurement services contract for the Refinery Off-Gas Cracker (ROGC) plant. This contract is part of the expansion project being executed at RIL's world-scale Jamnagar refining and petrochemical complex in Gujarat, on the West coast of India. The ROGC plant will be among the largest ethylene crackers in the world and will be integrated to RIL's Jamnagar refinery complex, using refinery off-gas as feedstock. The products from that plant will be utilized as feedstock for the new downstream petrochemical plants.

In Indonesia, PT Pertamina has started last year preparations for the construction and operation of a naphtha cracker. The cracker is to start up at an unspecified site in 2017 to produce 250000 tons/year of ethylene, 400000 tons/year of polyethylene, 350000 tons/year of polypropylene, and 200000 tons/year of polyvinyl chloride (PVC).

During the past years, Singapore was among the most active countries in Asia Pacific to carry out projects on increasing ethylene capacity. Shell announced that it was expanding its upstream ethylene cracker - core to its Shell Eastern Petrochemicals Complex (SEPC) in Jurong. The debottlenecking of the cracker will be boosting its production of petrochemicals like ethylene, propylene and benzene to one million tons/year from the current 800000tons/year.

In December 2012, ExxonMobil completed building one of the world's largest ethylene steam crackers. The project added 2.6 million tons/year of new finished product capacity. It doubled the



size of their finished product capacity. The expansion included two new polyethylene plants, a polypropylene plant, a metallocene elastomers unit, an oxo-alcohol unit and an aromatics expansion. They are all completed and have begun operation.

In the end of 2012, Korea Petrochemical Industry (KPIC) has contracted Toyo Engineering Korea, a Korean subsidiary of the Toyo Engineering Corporation, to construct its ethylene oxide (EO) and ethylene glycol (EG) plant in Ulsan, South Korea. TOYO will provide engineering, procurement and construction management. The EO/EG plant, which is scheduled to be completed by the end of May 2014.

In June 2012, Mitsubishi Chemical Holdings Corp shut one of its two Kashima ethylene cracker east Japan to reduce the complex fixed costs by \$50 million per year.

It will also be closing an ethylene cracker with capacity of 390000 tons/year in its first plant in 2014. However, Mitsubishi has increased the capacity of its second plant by 50000 tons/year to reach 540000 tons/year.

In 2013, Sumitomo Chemical has decided to close down an ethylene plant in Chiba. After the closure of the unit, Sumitomo Chemical will procure necessary quantities of ethylene and other basic petrochemical feedstock by increasing purchases from Keiyo Ethylene Co. (Keiyo Ethylene), a joint venture among Maruzen Petrochemical Co. (Maruzen Petrochemical), Mitsui Chemicals Inc. (Mitsui Chemicals) and Sumitomo Chemical.

1-2 North America

Westlake Chemical Co. started construction work in a project for increasing ethane feedstock-based ethylene capacity at its complex in Lake Charles, La.

The project includes expansion of the first ethylene cracker from 567000 tons/year to 671000 tons/year and the second from 522000 tons/year to 631000 tons/year. The project will be completed by the end of 2014.

Chevron Phillips plans to build a new ethylene unit outside Houston at the US Gulf, which will cost \$5 billion. It is due to start production in 2017.

Dow Chemicals will start constructing its previously announced, 1.5-million tons/year ethylene cracker at its Freeport, Texas, complex. The project is worth \$1.7 billion, and remains on track for start-up in 2017.

ExxonMobil Chemical announced plans to expand its Baytown refining and petrochemicals complex, Texas, east Houston. The project includes building an ethane cracker unit with capacity of 1.5 tons/year and two polyethylene units with capacity of 650000 tons/year. Production is projected in 2016.

Williams Olefins plans to invest \$500-600 million and start up facilities by mid-2015. Ultimate production of ethane, propane, ethylene, and propylene could reach 15000 b/d.

In April 2013, Technip was awarded by NOVA Chemicals Corporation the contract for the Polyethylene 1 expansion project located at their Joffre site near Red Deer in Alta. The project includes the installation of a world-scale 450000 tons/year single-train linear low density polyethylene (LLDPE) unit. NOVA Chemicals will expand its total Joffre site polyethylene capacity by approximately 40%. The project work started in 2012 and projected to complete in 2015.

The BASF TOTAL Petrochemicals Co has completed the project on revamping The Port Arthur steam cracker with a capacity of 1 million tons of ethylene per year so it can now use ethane as a feedstock. The company plans to build another steam cracker unit near The Port Arthur refinery with a capacity of 170000 b/d to be operated by Total refining and petrochemicals corp. in the USA. It was commissioned in 2001 to process naphtha.

In March 2013, LyondellBasell announced it is on schedule with projects to increase ethylene capacity at the US Gulf Coast. The company said that, starting in 2014, it will expand its Corpus Christi,



Texas, cracker by about 363000 tons/year with start-up targeted for 2015. Construction associated with the La Porte, Texas, expansion was to begin in March 2013, adding about 363000 tons/year upon completion in 2014. A third project in Channelview, Texas, will add about 113000 tons/year of ethylene in 2015.

Braskem Idesa S.A.P.I. awarded to a joint venture formed by Odebrecht, Empresas ICA and ICA Fluor a contract worth about US\$ 3 billion for the engineering, procurement and construction (EPC) of a petrochemical complex to be built in the Coatzacoalcos/Nanchital region, in the Mexican state of Veracruz. The petrochemical complex will include the following facilities: an ethane-based ethylene cracker, producing 1 million tons per year, and two high density polyethylene plants. Production is projected to start in 2015.

2- Arab Developments

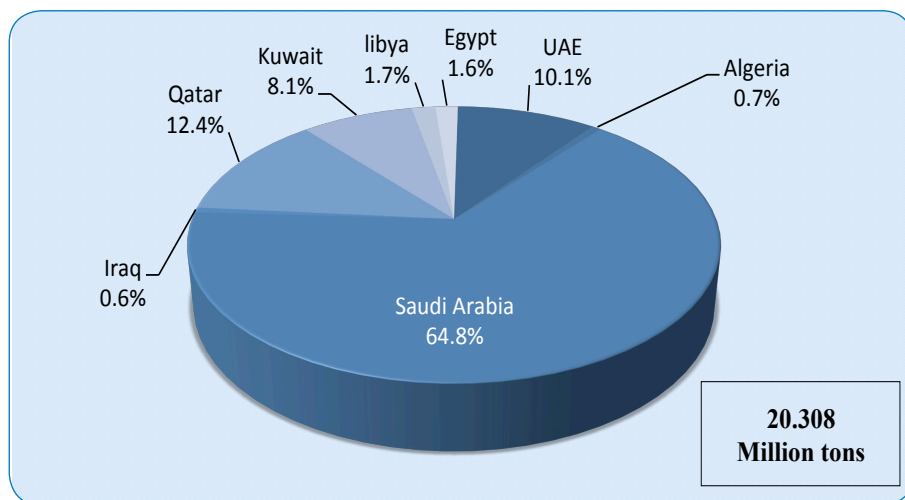
Total ethylene production capacity in Arab countries has increased in 2012 to 20.308 million tons/year compared to 18.858 million tons/year in 2011, with an increase of 7.7%. This increase came from the start up of the second stage of the UAE's Borouge project with a capacity of 1.45 million tons/year.

Percentage share of total ethylene production capacity in Arab countries reached 14.16% of total world ethylene production capacity in 2012 compared with 13.52% in 2011.

Table (3-15) shows the development of ethylene production in Arab countries (2008-2012), while Figure (3-12) shows the distribution of total ethylene capacities in Arab countries in 2012.

Figure (3-12)

Distribution of Total Ethylene Capacities in Arab Countries, 2012



2-1 Algeria

Algeria's Sonatrach announced plans to shut down Skikda petrochemical plant because it has become unprofitable. The plant used to be one of the biggest petrochemical plants in Africa in 1978, but its 120000 tons/year production capacity has become unable to compete with current plants with over 1 million tons/year capacity.

It is worth mentioning that Sonatrach has established a low density polyethylene (LDPE) unit with a capacity of 48000 tons/year, and a high density polyethylene (HDPE) unit with a capacity of 130000 tons/year in the site of Skikda plant. However, production rates of the ethane cracker and (HDPE) unit have dropped gradually between 2010 and 2012 to 37% of its nameplate capacity. Also, low density polyethylene (LDPE) unit has been shutdown since 2006 for economic reasons.

Sonatrach has also announced its plans to build a new mega petrochemical complex to replace Skikda plant near Biskra refinery scheduled for operating in 2017 with a capacity of 100000 b/d.



2-2 Qatar

Qatar Petroleum (QP) and Dutch Shell announced plans to build an olefins plant for an estimated cost of \$6.4 billion in Ras Laffan. It would include a steam cracker and a mono-ethylene glycol plant with a capacity of 1.5 million tons/year. The complex would be able to produce 300000 tons/year of linear alpha olefins. The project is scheduled to start production in 2018.

Qatar Petroleum (QP) and Qatar Petrochemical Company (Qapco) have signed an agreement for the development of petrochemicals complex in Ras Laffan to produce 1.4 million tons/year of ethylene, 850000 tons/year of high density polyethylene (HDPE), 340000 tons/year of linear low density polyethylene (LLDPE), 760000 tons/year of polypropylene, and 83000 tons/year of butadiene.

Qatar Petroleum (QP) and Qatar Petrochemical Company (Qapco) have awarded the front-end engineering and design contract for their Al Sejeel joint venture to Italy's Technimont SPA. It is one of the two biggest major projects of international standards enlisted on the strategic program for the expansion of the petrochemicals industry in Qatar. QP has an 80% equity interest in the project, with Qapco holding the remaining 20%. Production should start in 2018.

The project, whose production capacity is 2.2 million tons/year of polymers, will depend on ethane, butane, and naphtha as feedstock in order to ensure maximum use of natural resources with a big flexibility to diversify products.

The project has acquired the technology licensing by Univation Technologies for the PE plants and with Dow Chemical for the PP units. Al Sejeel forms part of Qatar's large expansion of the petrochemicals sector to support petrochemicals output to reach 23 million tons/year from the current 16 million tons/year by 2020.

Qatar Petrochemical Company (QAPCO) has announced plans to build a new ethylene unit in its complex in Mesaieed Industrial City. Qatar Petroleum (QP) and Zeon Corporation and Mitsui & Company, both Japan-based, have signed a memorandum of understanding

(MOU) for the development of an integrated butadiene extraction and elastomer complex in Ras Laffan.

Qapco also plans to build a new plant at a cost of \$330 million to produce 400000 tons/year of ethylene by 2016. With this Qapco's installed ethylene production capacity will be hiked to approximately 1.2 million tons/year and the existing two ethylene units combined capacity will be increased to 800000 tons/year.

2-3 Saudi Arabia

A recent report by The Gulf Petrochemicals and Chemicals Association (GPCA) said that Saudi Arabia could invest an amount up to \$150 billion in petrochemicals industry projects during the next five years.

Among these projects, Sadara Chemical Company (Sadara), the world's biggest petrochemicals joint venture, is expected to be completed in 2016, at a cost of \$20 billion in Jubail industrial area. Project products include polyethylene, elastomers, amines, glycol ethers, propylene oxide, and propylene glycol.

Saudi Basic Industries Corporation (SABIC) started work to build the world's biggest integrated plant for producing 250000 tons/year of Methyl Methacrylate (MMA) and 40000 tons/year of Polymethylmethacrylate (PMMA) in Jubail, Saudi Arabia.

Saudi International Petrochemical Company (Sipchem) will establish a joint venture with South Korea's Hanwha Chemicals Corporation to form a new company. Sipchem Chemicals Company owns 75 percent of new company capital while Korean Hanwha owns 25 percent with investments worth \$60 billion. The joint venture will operate two plants; the first in Hail to produce 4000 tons/year of ethylene vinyl acetate (EVA) plastic films. The second facility will be located in Riyadh and has been designed to manufacture about 1000 tons of various types of molds and dyes used in plastic and encapsulation plants.



SCC will use state-of-the-art technology of Mitsui Chemicals Tohcello (MCTI) Inc. Japan, for the EVA film project, which will be the first of its kind in the region. Germany's Kiefer Werkzeugbau GmbH's know-how transfer and project services will be used for the moulds project.

Work is in progress at Petro Rabigh-2, a joint venture between Sumitomo Chemical and Saudi Aramco, at a cost of \$5 billion. The Rabigh-2 Project's main products will include ethylene propylene rubber (EPDM), thermoplastic polyolefin (TPO), methyl methacrylate (MMA) monomer, polymethyl methacrylate (PMMA), low-density polyethylene, ethylene vinyl acetate (LDPE/EVA), para-xylene, benzene, cumene and phenol/acetone.

Petro Rabigh is a joint venture between Saudi Aramco and Sumitomo Chemical. It operates an integrated complex consisting of an oil refinery and Rabigh-1 petrochemicals production units in Rabigh, KSA.

Petrochemical Company (Kemya), a joint venture between Saudi Basic Industries Corporation (SABIC) and the US ExxonMobil, is constructing a world-scale specialty elastomers facility in Al Jubail at a cost of \$3 billion. The facility will have the capacity to produce up to 400000 tons/year of rubber and specialty polymers.

Saudi Basic Industry Corp. (SABIC) has also started construction of a new acrylonitrile butadiene styrene (ABS) plant, the first of its kind in Saudi, with a production capacity of 140000 tons/year. The project's total cost is estimated at \$561 billion with completion anticipated for 2015.

Saudi Kayan Petrochemical (Saudi Kayan), Sadara (joint venture between Aramco and Dow Chemical), and Saudi Acrylic Acid Co (SAAC) have announced a Saudi joint venture to establish the world's biggest plant to produce n-butanol (NBA).

SABIC, Kayan's mother company, announced that the n-butanol company would be the first of its kind in the Middle East, with a production capacity of 330000 tons/year of normal n-butanol and

11000 tons/year of Iso- butanol. The plant is scheduled for operating in Q1 2015. The plant will be built in the site of Tasnee petrochemicals complex in Jubail. It will be operated by a national Tasnee company owned by SAAC and Sahara Petrochemicals Co.

Each one of the three partners will hold equal shares of the project which is expected to support the value chain in coating manufacturing in KSA. Butanol- based products should contribute to the success of the downstream industry in the KSA.

Sinopec SABIC Tianjin Petrochemical Company (SSTPC) laid the foundation for a polycarbonate production complex with 260000 metric tons/year capacity at a cost of \$1.7 billion, in the Tianjin, China. The plant is the second phase of a joint venture between China Petroleum and Chemical Corporation (Sinopec) and Saudi Basic Industries Corporation (SABIC) who hold equal shares. Phase 1 included building an ethylene production unit with a capacity of one million tons/year. It started production in 2010.

2-4 The United Arab Emirate

Abu Dhabi Polymers Co Ltd (Borouge), a joint venture of the Abu Dhabi National Oil Company and Austria's Borealis has announced the completion of the expansion programme (Borouge 2) that added polyethylene and polypropylene production capacity of 2 million tons/year. The project also includes an ethane cracker unit with a capacity of 1.45 million tons/year, an olefins conversion unit with a capacity of 752000 tons/year, two polypropylene units with a capacity of 800000 tons/year and 540000 tons/year a polyethylene unit.

(Borouge 3) construction work in Ruwais is still in process of development. It is projected to be completed by 2014. The expansion project aims at increasing poly olefins production capacity by four times to reach 4.5 tons/year. It will be allocated for exporting to the Middle East and Asia. The project consists of two polyethylene units with a total cost of \$1.255 billion and total production capacity of 1.08 million tons/year and two polypropylene units with total capacity of

960000 tons/year, in addition to a low density polyethylene (LDPE) unit with a capacity of 350000 tons/year.

2-5 Oman

Oman Oil Company and South Korea's LG Chemicals have signed a joint venture agreement to build a chemical plant in the Port of Sohar. The plant will produce purified terephthalic acid (PTA) with a capacity of 1.1 million tons/year, in addition to poly ethylene terephthalate (PET). The development of the PTA/PET complex is an important investment project and will enable further downstream projects based on PET.

Oman Oil Company (OOC) and Abu Dhabi's International Petroleum Investment Company (IPIC) formed a joint venture, the Duqm Petroleum Terminal Company (DPTC) which was established to develop a refinery and petrochemicals project in Duqm, Oman. Both companies hold equal shares.



III-NATURAL GAS CONSUMPTION, TRADE AND PROCESSING

1- Global Developments

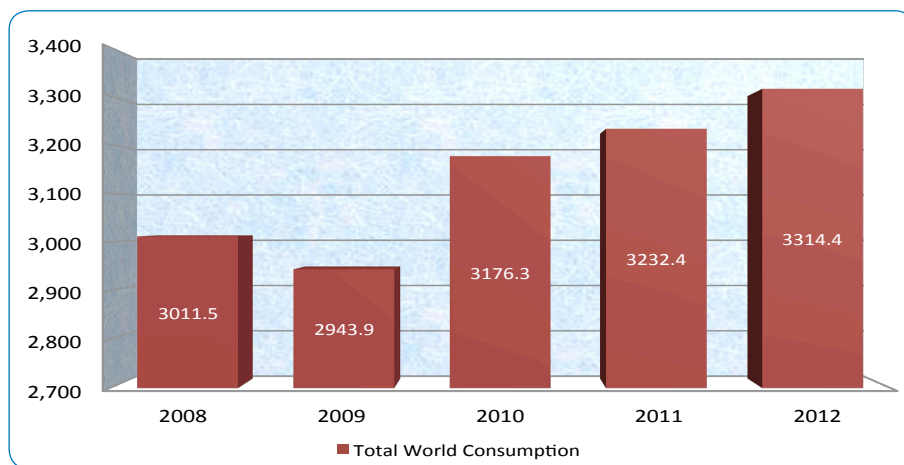
1-1 Natural Gas Consumption

World consumption growth of natural gas in 2012 increased by 2.2%¹, which is less than the historic average of 2.7%. World's consumption totalled about 3314.4 billion cubic meters against about 3232.4 billion cubic meters in 2011. **Figure (3-13)** shows the development of world natural gas consumption between 2008 and 2012. The share of natural gas in the world's total commercial energy consumption in 2012 has increased to 23.9%² compared to 23.8% in 2011.

Figure 3-13

Development of world natural gas consumption between 2008 and 2012

(Billion cubic meters)



¹ Growth rates and annual changes of consumption and production have been calculated according to simple year (365 days) since 2012 was a leap year, and according to estimated rates by TOE million units.

² Contribution to total consumption by TOE million units have been calculated.



In 2012, most regions of the world, except Europe and Eurasia, witnessed an increase in consumption more than global growth. The USA recorded the largest volumetric increase in consumption worldwide as it rose from 690.5 billion cubic meters in 2011 to 722.1 billion cubic meters in 2012, or an increase by 4.1%. It is followed by China and Japan, where the consumption of natural gas in China increased from 130.5 billion cubic meters in 2011 to 143.8 cubic meters in 2012, or an increase of 9.9%. While in Japan, consumption rose from 105.5 billion cubic meters in 2011 to 116.7 billion cubic meters in 2012, an increase of 10.3%. On the contrary, consumption rates dropped in the EU to 443.9 billion cubic meters in 2012 compared to 453.1 billion cubic meters in 2011, a fall by 2.3%. FSU countries consumption dropped to 584.9 billion cubic meters in 2012 compared to 599.2 billion cubic meters in 2011, a decline of 2.6%. For the first time since 2000, OECD natural gas consumption growth rate exceeded that of non OECD countries.

Most world regions witnessed different growth rates of natural gas consumption during 2012. The Middle East region recorded the lowest growth rate with 4% against Africa's highest growth rate with 7.5%. Natural gas quantities consumed in Africa reached 122.8 billion cubic meters in 2012 compared to 114 billion cubic meters in 2011. It is followed by Central and South Americas with 5.3%, where consumption rose to 165.1 billion cubic meters in 2012 against 156.4 billion cubic meters in 2011.

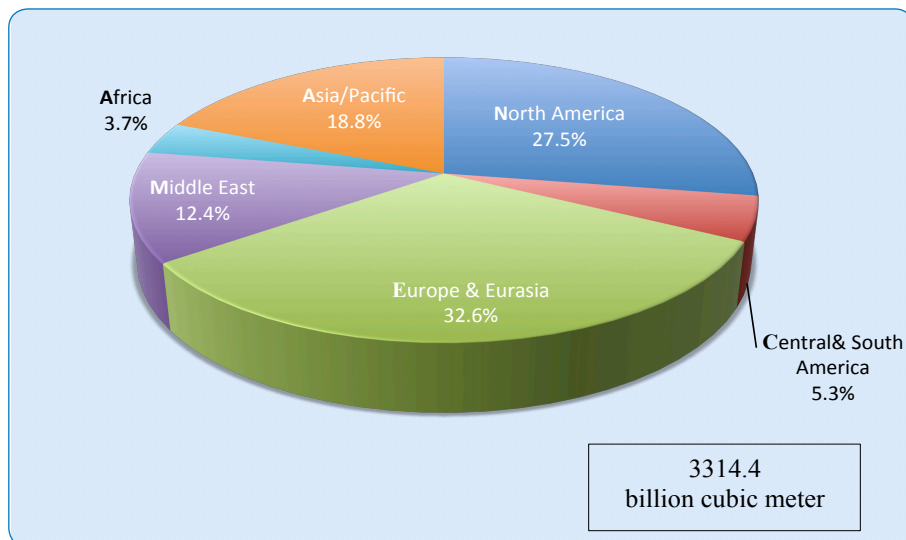
Asia/Pacific consumption increased to 625 billion cubic meters in 2012 against 593.6 billion cubic meters in 2011, or an increase of 5%, followed by North America with 4%, where consumption hiked to 906.5 billion cubic meters in 2012 from 868 billion cubic meters in 2011. The lowest growth rate of about 4.0% was recorded in the Middle East, where consumption increased to 411.8 billion cubic meters in 2012 against 394.7 billion cubic meters in 2011.

Against these increases there have been noticeable decline in consumption growth in Europe and Eurasia (including Europe, CIS, and Turkey) where it dropped by 2.3% to 1083.3 billion cubic meters

in 2012 against 1105.8 billion cubic meters in 2011. Table (3-16) and Figure (3-14) show the distribution of natural gas consumption worldwide in 2012.

Figure 3-14

Distribution of natural gas consumption worldwide in 2012



Natural gas production, however, has increased worldwide from 3291.3 billion cubic meters in 2011 to 3363.9 billion cubic meters in 2012, with an increase of 1.9%. The USA maintained its position as the largest natural gas producer worldwide. Its natural gas production increased from 648.5 billion cubic meters in 2011 to 681.4 billion cubic meters in 2012, or by 4.7%. A number of countries have achieved a significant increase in production figures; in Norway, production increased to 114.9 billion cubic meters in 2012 against 101.7 billion cubic meters in 2011, or by 12.6%.

In Qatar, production increased to 157 billion cubic meters in 2012 against 145.3 billion cubic meters in 2011, or by 7.8%. In KSA, production increased to 102.8 billion cubic meters in 2012 against 92.3 billion cubic meters in 2011, or by 11.1%. While in Russia, production declined to 592.3 billion cubic meters in 2012 against

607 billion cubic meters in 2011, or by 2.7%, which is the largest volumetric decline worldwide.

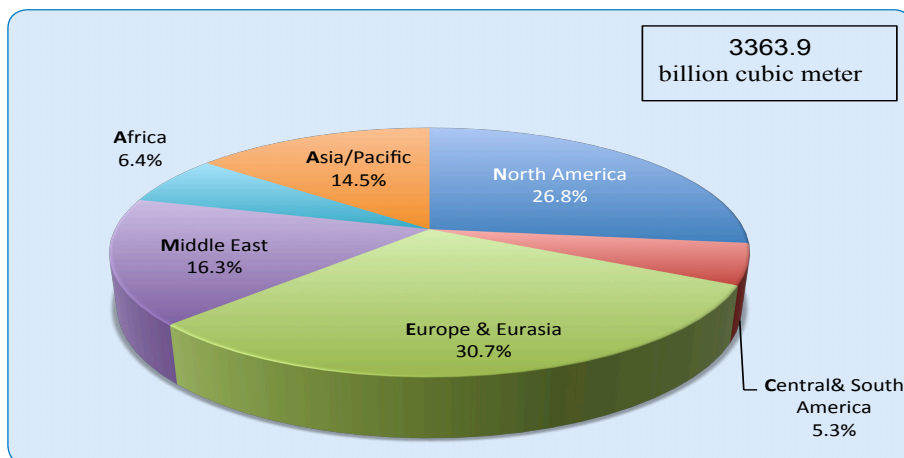
The Middle East recorded the highest production increase rates of about 5.4%. Production increased from 518.7 billion cubic meters in 2011 to 548.4 billion cubic meters in 2012. North America followed with an increase of 3.1%, as production increased from 866.5 billion cubic meters in 2011 to 896.4 billion cubic meters in 2012. Central and South Americas followed with 3.1%, where production increased from 171.5 billion cubic meters in 2011 to 177.3 billion cubic meters in 2012.

Africa's production has increased from 212.2 billion cubic meters in 2011 to 216.2 billion cubic meters in 2012, with a growth rate of 2.1%. The lowest growth rate of about 1.1% was recorded in Asia/Pacific. Production increased from 483.6 billion cubic meters in 2011 to 490.2 billion cubic meters in 2012.

This increase happened against a decline in Europe's and Eurasia's (including Europe, CIS, and Turkey) growth rates. Production dropped from 1039.9 billion cubic meters in 2011 to 1035.4 billion cubic meters in 2012, or a drop of 0.7%. **Figure (3-15)** show the distribution of natural gas production worldwide in 2012.

Figure 3-15

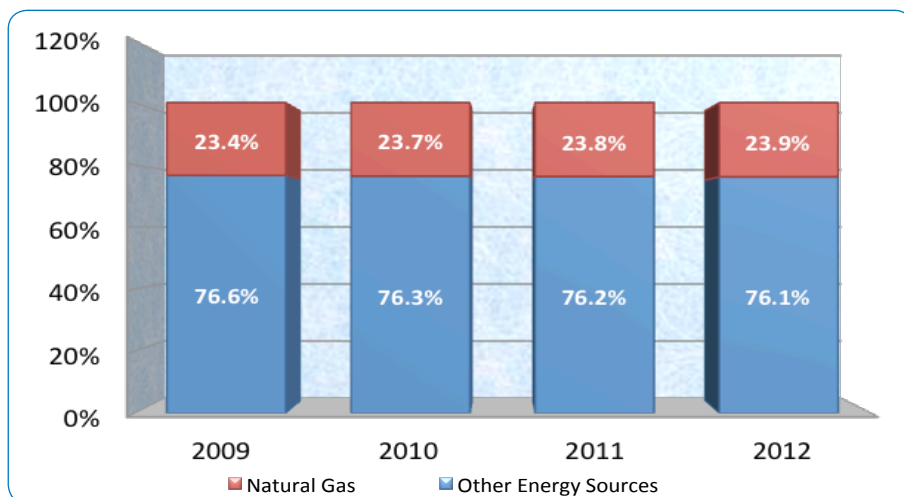
Distribution of natural gas production by region in 2012



In 2012, most regions of the world maintained their share of natural gas in commercial energy balance. The Middle East region maintained the highest share with 48.6% against 48.8% in 2011. The share ranged between 33.3% in Europe and Eurasia region against 33.9% in 2011, about 30.1% in North America, and 11.3% in Asia/Pacific. Table (3-17) and Figure (3-16) show the evolution of the share of natural gas in total commercial energy consumption worldwide in 2009-2012.

Figure 3-16

Evolution of the share of natural gas in total commercial energy consumption worldwide in 2009-2012

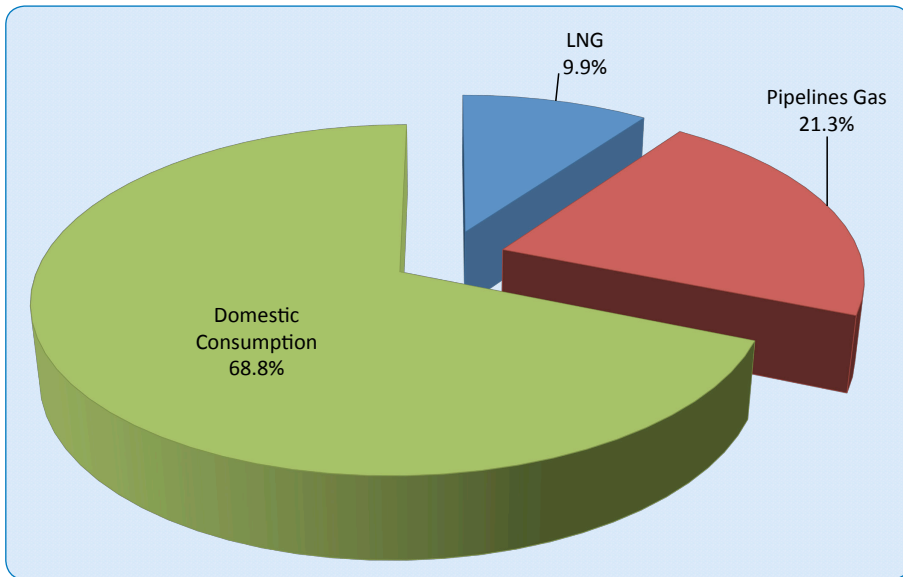


1-2 Natural Gas Trade

Natural gas exports worldwide increased very moderately in 2012 by 0.1% only, reaching a total of about 1033.4 billion cubic meters against about 1029.8 billion cubic meters in 2011. These figures cover gas exports via both pipelines and as liquefied natural gas (LNG). The total amount of both claims about 31.2% of the total natural gas consumption worldwide. The rest is consumed domestically in the producing countries. Figure (3-17) shows the distribution of global demand for natural gas during 2012.

Figure 3-17

Distribution of Global Demand for Natural Gas during 2012



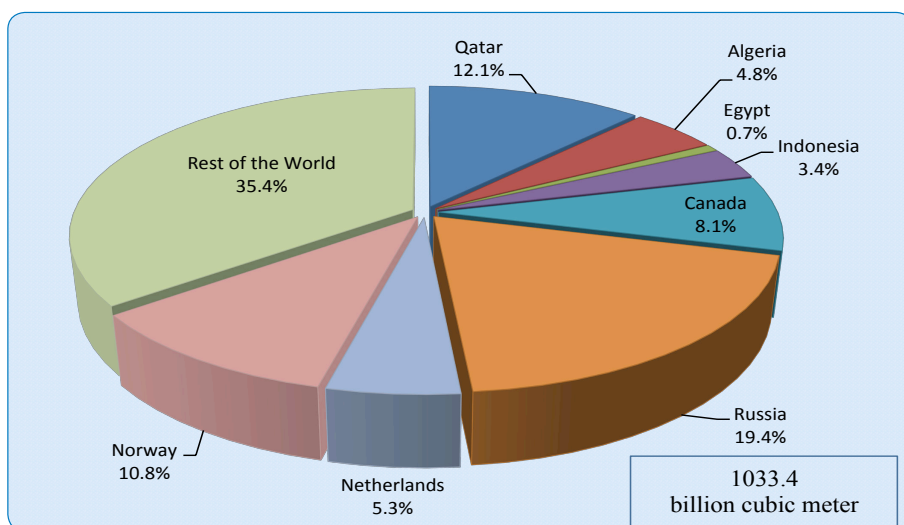
With regards to natural gas exports distribution worldwide, former Soviet Union region topped the list with 26.1% of total exports. Europe came second with 19.9%, followed by the Middle East with 15.4%, North America with 12.6%, Asia Pacific with 12.4%, while Africa contributed with 9.7%. South America came last with 4% of the world's total natural gas exports.

US total imports of natural gas via pipelines decreased to 83.8 billion cubic meters in 2012 compared to about 88.3 billion cubic meters in 2011. Canada remained the largest supplier of natural gas to the USA. US imported about only 4.9 billion cubic meters of LNG from Trinidad and Tobago, Norway, Yemen, Qatar, and Egypt representing about 5.5% of total US natural gas imports. US total exports of natural gas in 2012 increased to 45.9 billion cubic meters. Its exports to Canada by pipelines reached 27.5 billion cubic meters and 17.6 billion cubic meters to Mexico. Its exports of LNG to Brazil, India, and Japan totalled about 0.8 billion cubic meters.

Russia topped the world's natural gas exporters, with a share of about 19.4% of world exports in 2012. Its natural gas exports to most European countries totalled 200.7 billion cubic meters, with a decline of 20.5 billion cubic meters compared to 2011. Qatar came second with 12.1%, followed by Norway with 10.8%, Canada 8.1%, the Netherlands 5.3%, Algeria 4.85%, United States 4.4% and Indonesia 3.4%. The exports of the aforementioned countries collectively constitute about 68.35% of total world exports of natural gas, as shown in Table (3-18) and Figure (3-18).

Figure 3-18

Natural Gas Exports Worldwide, 2012



The volume of natural gas exports by pipelines rose from about 700.0 billion cubic meters in 2011 to about 705.5 billion cubic meters in 2012, or by an increase of 0.5%. Russia's natural gas exports by pipelines have dropped by 12%, while Norway's exports jumped by 12%. LNG exports by tankers have dropped for the first time since three decades by 0.9% from 329.8 billion cubic meters in 2011 to 327.9 billion cubic meters in 2012. 2012 witnessed a noticeable decline in LNG imports by Europe by 28.2%, while it rose by Asia by 22.8%.

Pipelines exports accounted for 68.3% of total natural gas exports in 2012, with a slight increase over the level 68% recorded in 2011.

LNG accounted for 31.7% of the total world natural gas exports in 2012, against 32% recorded in 2011, as shown in Table (3-19), Figure (3-19), and Figure (3-20).

Figure 3-19
Evolution of Natural Gas Exports Worldwide, 2008-2012
(Billion cubic meters)

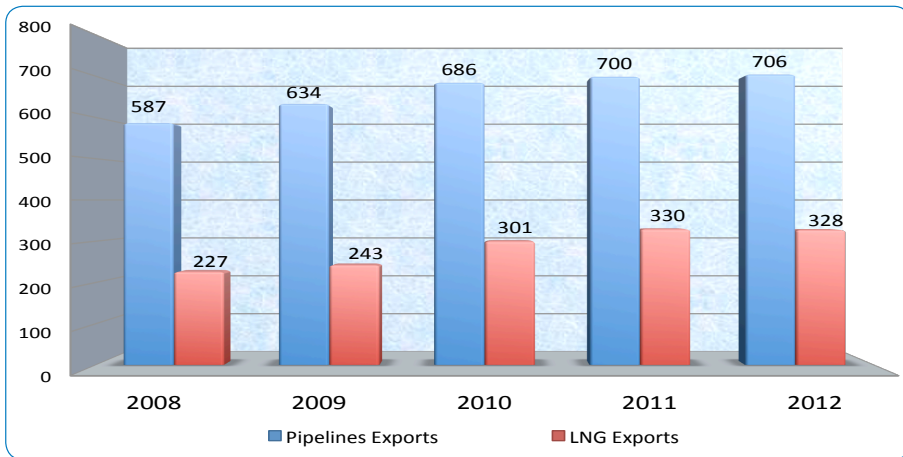
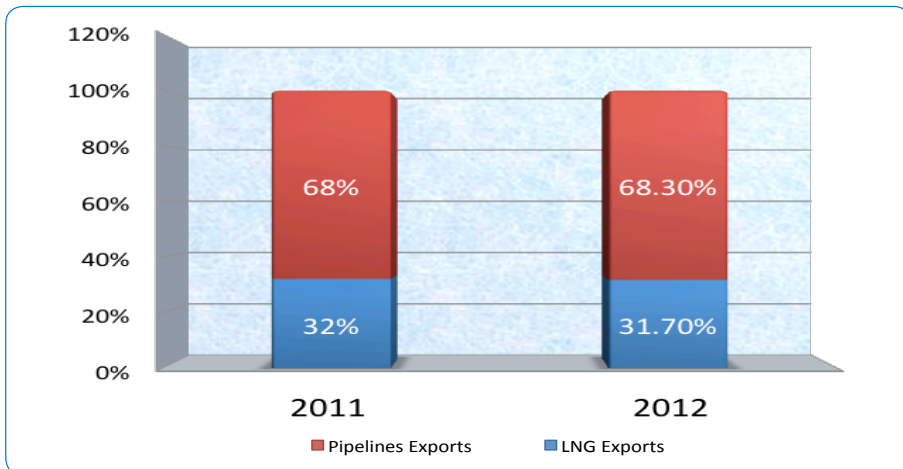


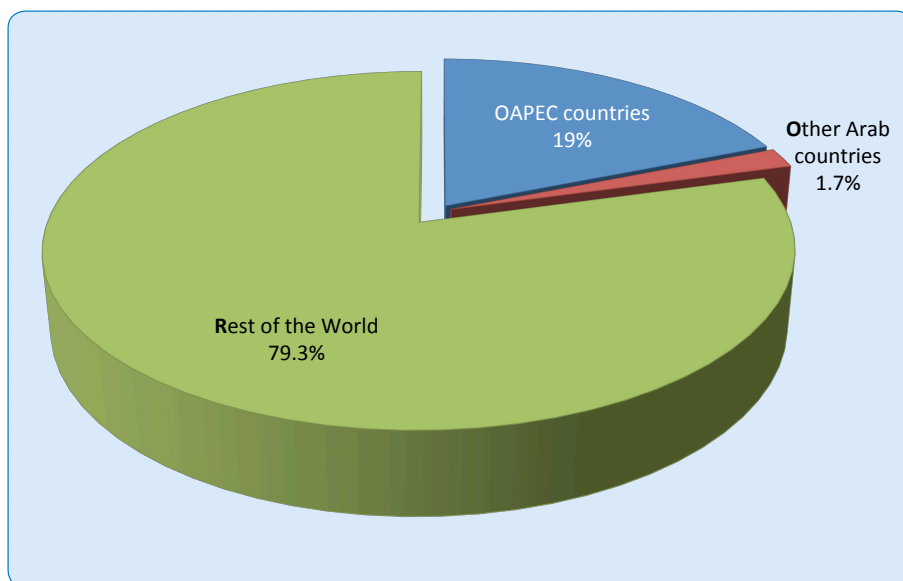
Figure 3-20
Distribution of Natural Gas Exports Worldwide, 2011 and 2012



LNG and pipeline gas exports from Arab countries to the global markets in 2012 totalled 214.5 billion cubic meters which are almost the same rates recorded in 2011 which totalled 214 billion cubic meters. Combined Arab exports account for 20.76% of the world's total natural gas exports. **Figure (3-21).**

Figure 3-21

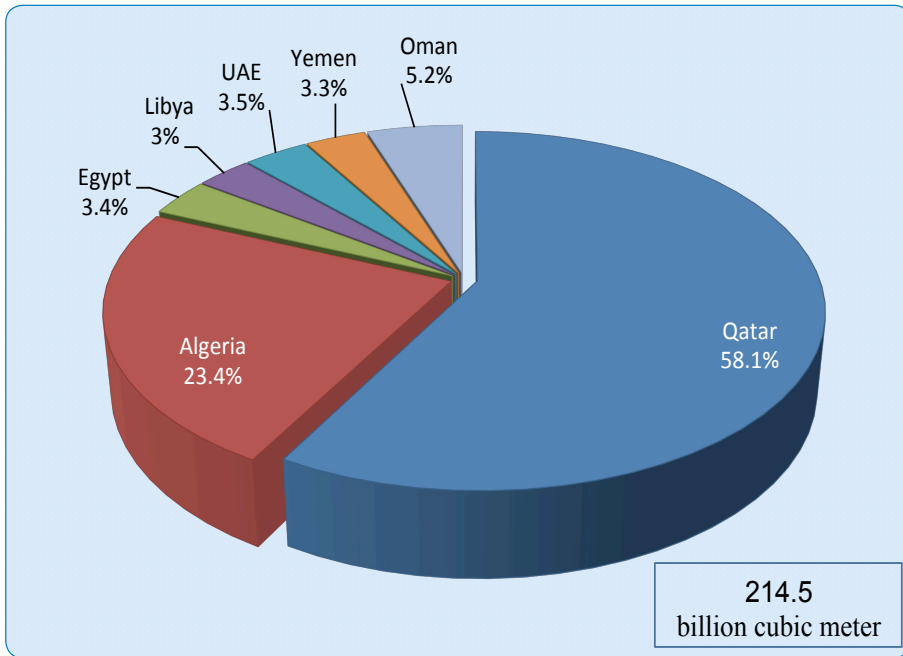
Distribution of Natural Gas Exports Worldwide, 2012



Qatar topped Arab countries list with gas exports of 124.7 billion cubic meters, representing 58.1% of total Arab exports in 2012. Algeria came second with total exports of 50.1 billion cubic meters, or 23.4% of total Arab exports, followed by Oman 5.2%, UAE 3.5%, Egypt (whose exports declined noticeably due to domestic demand in summer with total gas exports of 7.3 billion cubic meters) 3.4%, Yemen 3.3% and finally Libya 3%, as shown in **Figure (3-22).**

Figure 3-22

Natural Gas Exports from Arab Countries, 2012
(Billion cubic meters)

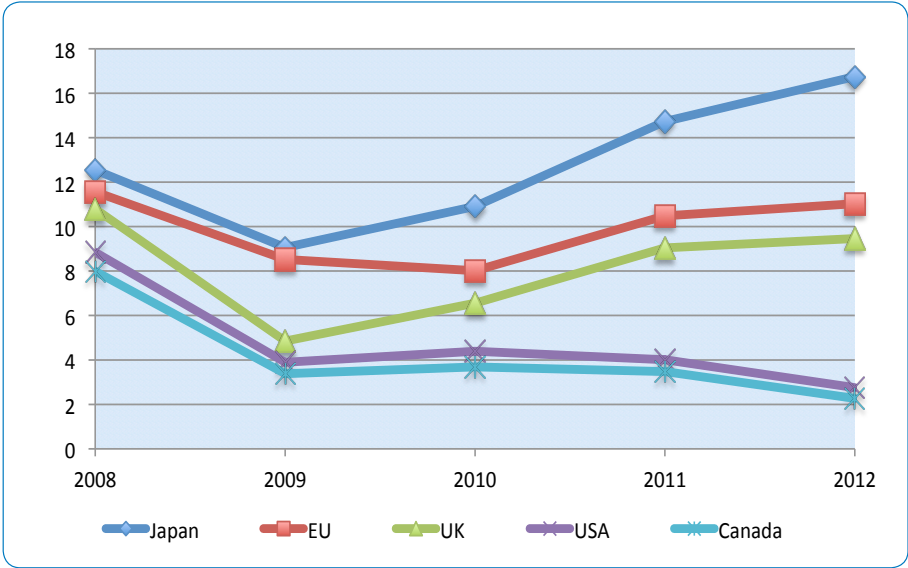


1-3 World Natural Gas Prices

Natural gas prices, for both pipeline and LNG sales rose in major markets in 2012, compared with its rates in 2011. The price of natural gas in UK markets rose by 4.6% and in EU countries by 5.2%. Prices of natural gas transported to Japan (in the form of LNG) rose by about 13.7%, while- according to Henry Hub- it dropped in United States by 31.2% and in Canada by 34.6%, as shown in **Figure (3-23)** and **Table (3-20)**.

Figure 3-23

World Prices of Natural Gas, 2008-2012
(USD/Million BTU)



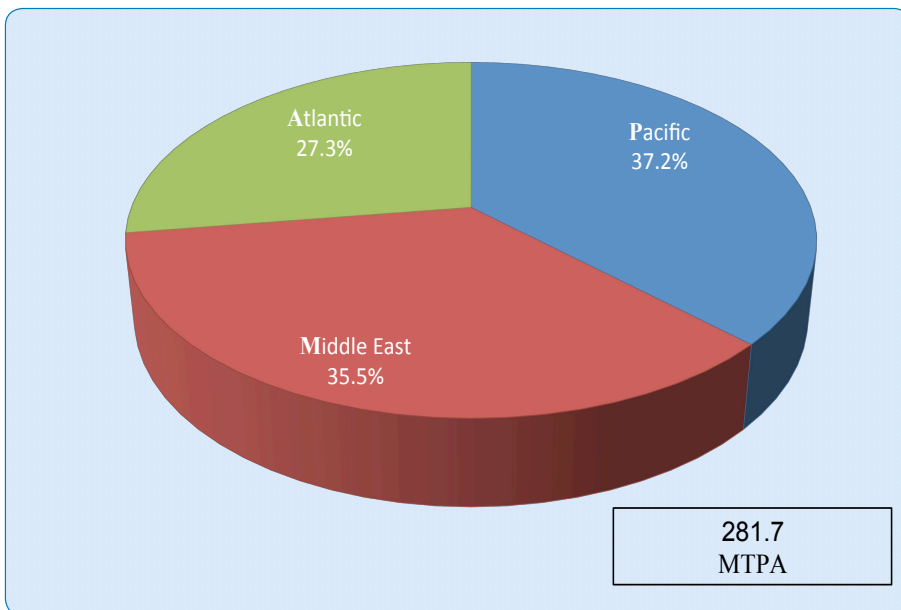
1-4 World's Most Important Gas Activities

By the end of 2012, the world's nominal LNG production capacity reached about 281.7 million tons against 278 million tons in 2011, or an increase of 1%. The number of LNG trains reached about 89 trains distributed in 17 out of 18 countries following the suspension of Libya's Marsa Brega natural gas liquefaction plant due to damage caused to its facilities by the recent security situation. Qatar tops the world with a production capacity of about 77 million tons/year or about 27.3% of the total world production capacity. It is followed by Indonesia with about 34 million tons/year or about 12.1%, then Malaysia with 25 million tons/year or 8.9% of the world's production capacity. The three countries combined production accounts for about 48.3% of the world's total LNG production capacity. [Table \(3-6\)](#) .

As for the distribution of the world's nominal LNG production capacity by region by the end of 2012, Asia-Pacific topped the list with a total of about 104.9 million tons/ year, or 37.2% of the world's total production capacity. The Middle East came second with about 99.9 million tons/year, or 35.5%, and finally the Atlantic region with 76.9 million tons/year or 27.3% of the world's total production capacity. Table (3-21) and figure (3-24).

Figure (3-24)

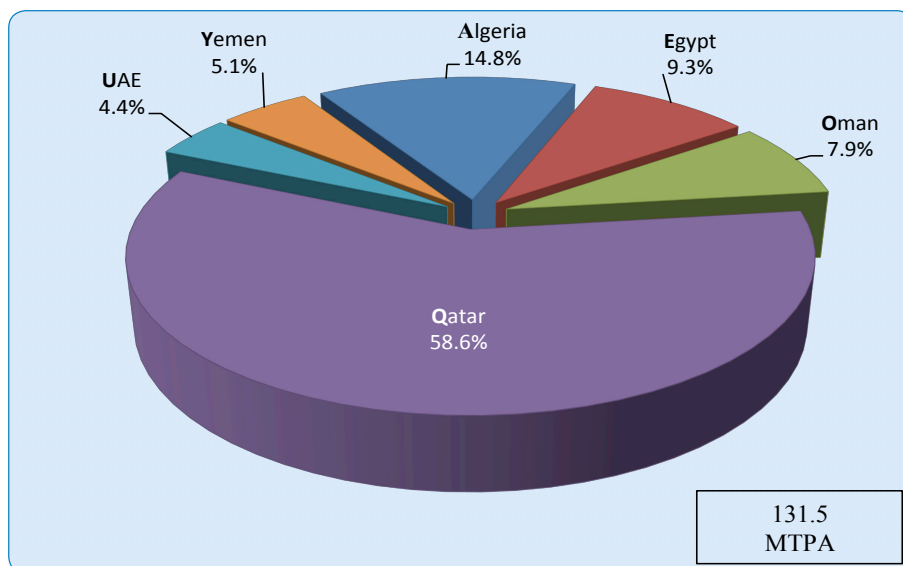
Distribution of the world's nominal LNG production capacity by region



Arab countries' nominal LNG production capacity is about 131.5 million tons/year, or about 46.7% of the world's LNG production capacity. Qatar tops the list with about 58.6% of the Arab countries' production, followed by Algeria with 14.8%, Egypt 9.3%, Oman 7.9%, Yemen 5.1%, and UAE with 4.4%. Table (3-22) and figure (3-25).

Figure (3-25)

Distribution of Arab countries' nominal LNG production capacity by the end of 2012



LNG production started in a number of projects that have been completed recently. In April 2012, Australia's Pluto LNG T1 plant began production with a capacity of 4.3 million tons/year. The first LNG cargo has been exported to Japan's Kanasi Electric in May 2012. In April 2013, a new LNG train started operating in Algeria's Skikda- GL1K with a capacity of 4.5 million tons/year. The first cargo has been exported to European markets. The project investments are worth \$2.8 billion. KPR carried out engineering, procurement, and construction works since March 2007. This project replaced the three old trains that have been damaged by an explosion in 2004.

In Angola, Angola LNG, a joint venture between Sonangol (22.8%), Italy's ENI (13.6%), France's Total (13.6%), Chevron (36.4%), and BP (13.6%), commenced operations at the Angola LNG T1 plant in June 2013 with a capacity of 5.2 million tons/ year. Its first cargo has been shipped to Brazil. The project investments reach about \$10 billion. It is the first of its kind in Angola that

provides a solution to minimize flaring and environmental pollution by gathering associated gas from Angola's offshore oil fields.

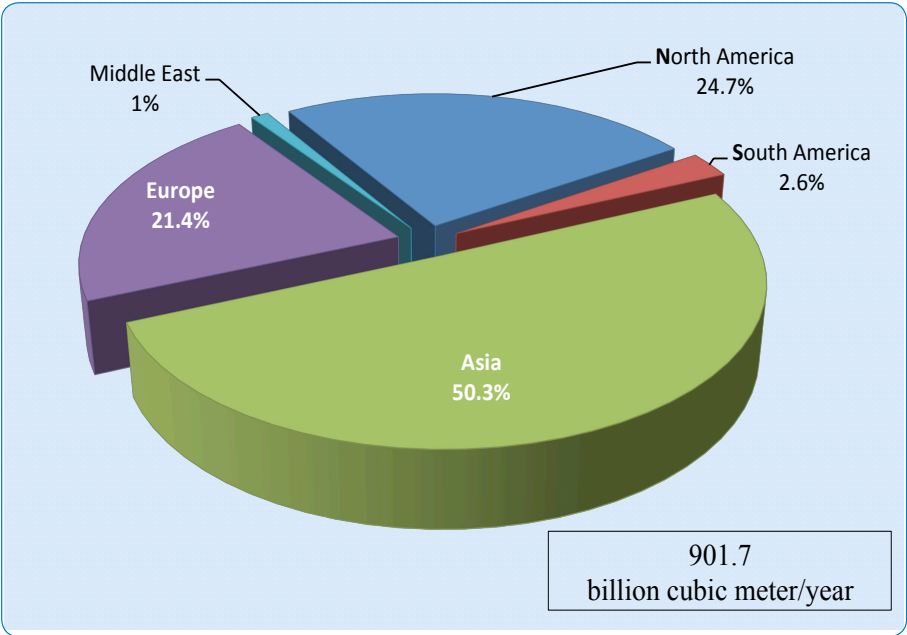
As for the terminals receiving LNG cargos, the number of LNG receiving and regasification terminals has reached 93 terminals by the end of 2012 with total capacity of 668 million tons/year (901.7 billion cubic meters/year), which is more than double nominal LNG production capacity worldwide. The number of fixed LNG receiving and regasification terminals has reached 82 with a total capacity of about 628.4 million tons/year. The remaining facilities represent floating storage and regasification units (FSRUs) with a total capacity of about 39.6 million tons/year. The current trend is increasing demand for such facilities due low cost and little time needed for installing them compared to fixed facilities. Indonesia has joined the group of LNG importing countries by the end of 2012. The total number of LNG importers has reached 26 countries.

With regards to the distribution of design capacity for LNG regasification terminals worldwide in 2012, it is noted that Asia alone accounts for about 50.3% of the world's total, where design capacity is about 453.8 billion cubic meters of gas per year as Asia is the main market for LNG exports, followed by North America with 24.7% but is expected to lower in the coming period as the USA has become the biggest natural gas producer in the world. It is also expected that the US will become one of the LNG exporting countries following the transformation of its receiving terminals into LNG plants. Europe comes third with 21.4% of the world's total as its design capacity has reached about 193 billion cubic meters of gas per year. Europe is also the second most important major market for LNG exports. Design capacity has reached about 23.4 billion cubic meters or about 2.6% in South America, and about 9.3 billion cubic meters or 1% in the Middle East. Both, South America and the Middle East, are considered as emerging markets for LNG exports. **Figure (3-26)**



Figure (3-26)

Distribution of LNG regasification capacity by region at the end of 2012



In the same context, a number of LNG receiving facilities, that were completed recently, have been put into operation. In China, China National offshore Oil Corporation's (CNOOC) started its first test operations of Zhejiang LNG Terminal with a capacity of 3 million tons/year. It also received the first LNG cargo delivered by Qatar.

In Japan, Hokkaido Gas Co Limited started final operating of Ishikari LNG Terminal to import LNG in December 2012 with a capacity of 1.7 million tons/year. This step took place after the success of the test operating stage in October of the same year. Japan is the world's biggest LNG importer and its relying on natural gas imports has increased to meet domestic energy demands following the Fukushima reactor's incident.

In Indonesia, Nusantara Regas started up the country's first LNG terminal, with a capacity of 5.2 million cubic meters per year following the successful test operating stage. Nusantara Regas is 15km offshore north Jakarta. It is the first LNG import port in Indonesia which ranks second worldwide in terms of LNG production capacity.

In Cyprus, the government and France's Total signed a memorandum of understanding (MOU) in November 2013 for the development of a natural gas fields in the offshore blocks within Total's recently granted licence of February 2013. The MoU records Total's support for the monetisation of potential natural gas reserves through a variety of options giving priority to liquefaction and LNG export to European and Asian markets.

In Russia, OAO NOVATEK announced in December 2013 that the Board of Directors of Yamal LNG approved a final investment decision (FID) for the Yamal LNG project, a joint venture between OAO NOVATEK (80%) and Total (20%). The Yamal LNG plant will consist of three (3) liquefaction trains with overall capacity of 16.5 million tons per year. Overall capital expenditures of the project are estimated at \$26.9 billion.

In Pakistan, work started in March 2013 to establish the Pakistani side of the Iran-Pakistan (IP) pipeline with little progress. Pakistan announced that it failed to provide the necessary funding for establishing the pipeline through its lands as its cost was estimated at about \$1.5- \$2 billion. The project aims at providing Pakistan with about 750 million cubic feet of gas a day from Iran. The agreement stipulates that each country is obliged to build the pipeline through its lands till it reaches the other country's borders. The line would stretch about 800km from the Pakistani side and 1110km from the Iranian side. 900km have already been built from Assaluyeh to Iran Shahr. It is scheduled for operation in 2017 instead of the earlier released date of 2014.



2-Arab Developments

2-1 Algeria

Sonatrach announced in June 2013 the completion of 10% of the construction work at the main GR5 gas pipeline, essential to unlocking southwest Algeria's Gas Project stretching across 780km to transfer gas from southwest Hassi R'Mel fields. The line's design capacity is 20 billion cubic meters of gas/year. It will be onstream in March 2016.

Algeria's Ministry of Energy and Mining announced plans to double its current natural gas production in the coming 10 years following the recent successful gas discoveries. It is currently conducting a study and evaluation of shale gas resources estimated at 707 trillion cubic feet according to an EIA study. Resources exploitation should start in the coming years.

In January 2013, Turkey reached an agreement with Algeria to buy 4 billion cubic meters of natural gas over another 10 years starting 2014. Current contract between the two countries ends in 2014. According to the agreement, Algeria will provide Turkey with 4 billion cubic meters of LNG/year with a potential to increase it to 6 billion cubic meters/year.

Sonatrach announced in April 2013 the start of operating the new LNG train in Skikda to produce the first LNG cargo. The new unit's design capacity is 4.5 million tons/year. It replaced the three old units damaged by a fire in 2004 with a production capacity of 3 million tons/year.

Germany's RWE Dea has announced plans to operate Reggane Nord project by 2017. The project will cost \$3 billion and aims at producing 285 million cubic feet of gas per day.

Work has started gradually at In Amenas gas plant in Jezi Province. The facility was attacked and damaged beginning of this year which resulted in the suspension of the operation. The plant design capacity is 9 billion cubic meters/year.



2-2 Bahrain

Bahrain plans to build a FSRU north Bahrain at an initial estimated cost of about \$500 million and design capacity of 500 cubic feet per day in response to the increasing domestic demand for gas in various sectors, mainly electricity. Electricity sector currently consumes 37% of the total production while Alba consumes 22%. By 2023, demand is expected to exceed domestic production according to supply and demand indicators, which requires looking into natural gas import options. Bahrain's National Oil and Gas Authority (NOGA) has sought the advice of the US-based consultancy, Galway Energy ,on best recommendations to identify best LNG import options. The study, that has taken longer than planned, is still underway and should be ready by the beginning of 2014. Once the feasibility study has been completed, the FSRU contract is scheduled to be signed in 2014.

2-3 Egypt

Egypt has put 9 projects for production during the fiscal year 2012/2013. They include 7 wells, 31 development wells by various companies with a total of an average daily production of 610 million cubic feet of gas and 6570 barrels of condensate.

Within the framework of the state strategy to protect the environment through expanding the use of gas as an environment-friendly fuel and to reduce liquid fuel imports by gradual replacement in vehicles and public transport, about 20400 vehicles have been converted during the fiscal year 2012/2013. This has been done through 72 car conversion centers with an increase of about 20% compared to last year. Total converted car number is about 194000 vehicles using natural gas since the start of activity till the end of June 2013. 166 natural gas stations are available for this purpose. Housing units supplied with natural gas have reached about 588000 units in the fiscal year 2012/2013 compared to 576000 in the previous year, or an increase of 2% which is 1 unit per minute.

Egyptian Natural Gas Holding Company (EGAS) is currently assessing Egyptian, Indian, Norwegian, and Malaysian companies' bids for building an FSRU under the government's current plans to import natural gas. Egypt suffers from an increasing demand for natural gas which is used for electricity power generation that peaks in summer. Egypt had to stop gas supplies to the Spanish Egyptian Gas Company (SEGAS LNG) plant in Damietta in order to supply the domestic market instead. This has led to the plant's complete stop of production by the beginning of 2013. Egypt started talks with Qatar in May 2013 to import 18 LNG cargos. The talks resulted in Egypt winning 5 Qatari LNG shipments fully received in 2013.

2-4 Iraq

In May 2013, Shell officially announced the commencement of operations of Basrah Gas Company (BGC), a joint venture between South Gas Company (51%), Shell (44%) and Mitsubishi (5%). It will be the world's largest flares reduction project. The Joint Venture captures associated gas that is currently being flared from three oil fields in southern Iraq – Rumaila, West Qurna 1 and Zubair. The project investments are worth \$12.8 billion, in addition to another \$4.8 billion in case of executing a future LNG project for export with a capacity of 4 million tons/year (600 million cubic feet of gas per day) after meeting the Iraqi domestic market demands of natural gas.

Under the agreement signed with the Iraqi Ministry of Oil, BGC will sell processed gas to state-owned South Gas Company. BGC will be dedicated to the rehabilitation and upgrade of the current facilities to put them back to work safely as well as building new assets which is expected to increase the production capacity from a current 400 million cubic feet per day to 2 billion cubic feet per day. Since the agreements were signed in November 2011, SGC and Shell have increased production capacity from about 240 million cubic feet/day to around 400million cubic feet/day of gas. It aims at taking the production up to 1 billion cubic feet per day by the end of 2013. The final capacity is projected at 2 billion cubic feet per day in the



coming years; however, this would depend on plans for developing south oil fields in Iraq.

In July 2013, Iraq signed an agreement to import 850 million cubic feet of natural gas per day from Iran to be used to feed three power plants in Baghdad and Diyala provinces. Iran will get about \$3.7 billion annual revenues out of this project.

In October 2013, Genel Energy, the largest oil producer in Iraq's Kurdistan, said that a gas deal between the Iraqi Kurdistan Regional Government (KRG) and Turkey would be signed by Q1 of 2014. According to the deal, Iraq Kurdistan would be exporting 10 billion cubic meters of gas a year to Turkey. While Turkish government owned Botas is currently preparing to build an export pipeline to Silopi southeast on the borders between Turkey and Iraq's Kurdistan to import Kurdish natural gas.

2-5 Kuwait

Kuwait National Petroleum Company (KNPC) has concluded a feasibility study on building a land-based LNG receiving terminal with a capacity of 7.7 million tons/year (about 1 billion cubic feet of gas/day). It is projected for operation by 2020.

In July 2013, Golar LNG, one of 3 bidding companies for the project, won a contract worth about \$212.9 million to provide the Kuwait National Petroleum Company (KNPC) with FSRU services for their LNG import operations for a period of five years starting from March 2014. Golar is replacing Excelerate Energy, whose contract expires by the end of 2013. The FSRU's capacity is about 550 million cubic feet of gas/day. It comprises the provision of portside FSRU services for an anticipated nine months of the year together with a three month window where the vessel is free to pursue other short term business opportunities. Gas will be compressed at KNPC after being received from the vessels at Mina Ahmadi refinery.

It is worth mentioning that Kuwait is witnessing an increasing demand on natural gas that exceeds current production rates

especially in summer due to its use in electricity power generation. This situation has led Kuwait to import LNG since 2009.

Kuwait's Jurassic gas development project is still facing several challenges as the current production rate has been standing at 135-145 million cubic feet of natural gas per day, and about 55000 b/d of condensate and light oil. This is a four years lag behind the plan of the first stage originally aiming at 175 million cubic feet of gas per day. in light of the changes and difficulties facing the project, which is considered one of the most difficult of its kind worldwide, Kuwait Oil Company has amended the date for achieving production ceiling of about 1 billion cubic feet of gas/day and 350000 b/d of condensate and light oil to be 2020 instead of 2015.

2-6 Libya

Due to the security situation in Libya, work is still suspended in Marsa Al Brega LNG plant that was severely damaged in 2011. Marsa Al Brega plant has been operating since the beginning of 1970 with a design capacity of about 3.2 million tons/year.

2-7 Qatar

Germany's Wintershall is currently conducting a feasibility study, in collaboration with Qatar Petroleum and Japan's Mitsui, on the new gas discovery Block 4-N, which is estimated to contain about 2.5 trillion cubic feet of recoverable gas. In its initial stages, the gas is projected to flow at a rate of 200-250 million cubic feet a day until reaching the final production rate that will be decided after receiving the required data.

Qatargas and Thailand's PTT has signed a long-term LNG agreement spanning 20 years at an annual volume of 2 million tons from Qatargas-3, with the first LNG delivery date to PTT set for January 2015.

Negotiations between the Turkish and Qatari governments on signing an agreement on long term import of 6 billion cubic meters



of Qatari liquefied natural gas per year to Turkey have stopped. Turkey is seeking to lessen its dependence on gas imports from Russia, Iran and Azerbaijan, which combined account for about 85% of the Turkish natural gas imports.

In July 2013, Qatargas has announced that it has sold Qatar's first-ever cargo of LNG to Malaysia's Petronas LNG Ltd. The cargo was delivered to Malaysia's first LNG receiving terminal located in Melaka. The cargo was supplied by Qatargas 2, a joint venture between Qatar Petroleum, ExxonMobil and Total. Qatargas and Petronas recently concluded a Master Sales and Purchase Agreement (MSPA) to facilitate the sale of this spot cargo and future volumes.

In September 2013, Qatar Liquefied Gas Company Limited (4) (Qatargas 4) and PETRONAS LNG (UK) Ltd. (PLUK) signed a five-year Sales and Purchase Agreement (SPA) for an annual LNG volume of 1.14 million tons/year, effective January 2014. The LNG will be delivered to PETRONAS' Dragon LNG Terminal located in Milford Haven, United Kingdom

In October 2013, Qatargas and E.ON Global Commodities signed a five-year agreement for the supply of about 1.5 million tons of LNG per year from QatarGas4 to the GATE Regasification Terminal in Rotterdam. Supplies start in 2014.

In November 2013, RasGas Company Limited (RasGas) announced the completion of more than 80 per cent of the \$10.3 billion Barzan Gas Project's offshore and onshore construction, including 30 development wells with a total length of about 138km at a depth of more than 3000m subsea. Also, two pipelines to deliver gas to a new onshore gas processing plant in Ras Laffan Industrial City have been completed.

2-8 Saudi Arabia

In May 2013, India's Larsen and Toubro has won an EPC order from Saudi Aramco to construct a gas plant in the Midyan gas field in Tabuk with a capacity of 75 million standard cubic feet per day

of non-associated gas and 4500 barrels per day of condensates. The project will also include the establishment of two pipelines stretching a length of 98km to deliver sales gas to a sophisticated power plant near Duba at the Red Sea to generate electricity with high efficiency. A study was conducted in mid 2009 on The Midyan field to evaluate various alternatives for the development of the field and identify ways to optimize economic production. The study showed that the field plant's gas production would support more future expansion in electricity power generation and distribution in the region. The Midyan field was discovered in 1992 during the Red Sea coastal plain exploration, when Aramco drilled three appraisal wells in 1992 and 1993. Since then no development work has been done in the field.

In September 2013, Lukoil has announced that it has plans to start natural gas production from (block A) in Saudi Arabia in 2014. The oil firm has made a discovery of 14 trillion cubic feet of non-associated gas in the Saudi Empty Quarter. Lukoil is now the first foreign operator for a gas project in KSA.

Shell and Saudi Aramco are still negotiating developing the Kidan sour gas field in the Empty Quarter. Shell and Saudi Aramco estimated the investment to develop Kidan to exceed 6\$/MMBTU. This has made the project's feasibility low as gas prices in the KSA are highly subsidized reaching 0.75\$/MMBTU.

2-9 Syria

Syria and Iran signed an MOU for the construction of a gas pipeline where Iran exports natural gas to Syria via Iraq. The project is called the Islamic Gas Pipeline. No further details given. Earlier this year, the Iraqi government agreed to allow the pipeline to traverse through Iraqi territory. Iran and Syria signed this MOU in July 2011. The deal will see Iranian gas transited to Syria then Lebanon in the future, via a 600km pipeline with a diameter of 56 inches and a design capacity of 3.9 billion cubic feet per day in Iran, and 1200km in Iraq and Syria (each). The project cost is estimated at about \$10 billion.



2-10 Tunisia

Tunisian National Oil Company (ETAP) still clinches to go ahead with its South Tunisian Gas development project in spite of Italy's Eni withdrawal end of last year. The joint venture includes ETAP and OMV. In June 2013, the project goals amendment were announced involving the construction of a gas processing facility with a capacity of 90 million cubic feet per day at Nawara field, and a gas treatment plant located on the coast in the industrial area near Gabès that will produce sales gas and LPG for export with a capacity of 90 million cubic feet per day. Both facilities will be linked by a 370 km pipeline with a design capacity of 350 million cubic feet/day. The project's initial cost is estimated at about \$1 billion. The project is being constructed in a 50/50 joint venture by ETAP and OMV. ETAP plans to sign contracts in the coming days. Work should start in the beginning of 2014 and completed by Q1 of 2016.

2-11 UAE

UAE is witnessing an increasing demand for natural gas especially during summer to be used as fuel for power generation. The UAE imports about 2 billion cubic feet of gas per day from Qatar through Dolphin pipeline. Dubai imports a contract volume of about 1 million tons/year of LNG via a FSRU in addition to spot cargos. Although Abu Dhabi exports LNG to Japan, estimates show that the UAE might become a net importer of natural gas in case current domestic production rates failed to meet increasing demand for gas. Current deficit rate is estimated at 2 billion cubic feet per day during peak consumption periods in summer. Therefore, the UAE is currently carrying out a number of projects aiming at adding about 2.55 billion cubic feet of gas per day of natural gas imports through Dolphin pipeline and building a receiving LNG terminal, in addition to; developing a number of natural gas fields to be ready for production in 2014. Following are highlights of the current developments in the UAE.

Dolphin Energy is currently installing three new gas compressors to be added to the existing 6 compressors (an increase of capacity by 50%) of Dolphin pipeline, which transfers gas from Qatar's North Gas field to Abu Dhabi at a cost of \$370-380 million. The new compressors will help enhance the overall reliability and availability of natural gas supply by adding about 1.2 billion cubic feet of gas per day by mid 2014. This means increasing design capacity from the current 2 billion cubic feet of gas per day to 3.2 billion cubic feet of gas per day. However, no agreement has been made on the gas price between Qatar Petroleum and Dolphin Energy.

Shell has been chosen by the Abu Dhabi National Oil Company (ADNOC) to participate in a 30-year joint venture to develop the major Bab sour gas field, 150 km southwest the city of Abu Dhabi. Shell will hold a 40% equity stake in the joint venture, with ADNOC holding 60%. EPC bidding is expected to be launched in 2015-2016. The joint venture aims at producing 500 million cubic feet of sales gas per day for investments worth \$10 billion. The field is scheduled for production by 2020.

In mid 2013, Abu Dhabi Gas Industries Ltd. (Gasco), owner and operator of Habshan-5 gas plant, announced that it completed full test operations of the plant whose capacity is about 2.15 billion cubic feet per day. Habshan-5 is part of an integrated gas development project (IGD) in Abu Dhabi with investments worth about \$5.7 billion. The project aims at linking offshore and onshore oil and gas operations. The plant's design capacity is about 2.15 billion cubic feet of gas per day including the treatment of associated and unassociated gas through developing three oil and gas fields to produce about 750 million cubic feet of sales gas, in addition to 12000 tons per day of ethane and natural gas liquids.

Abu Dhabi National Oil Company (Adnoc) has announced completing actual processing operations at the Integrated Gas Development (IGD) project by the end of the year. The line will transfer gas on a daily basis from Umm Shaif to Das Island to be dried and compressed then transferred through offshore pipeline to

Habshan complex to complete processing operations then pumped into the National Gas Network. The project investments are worth \$10 billion with a design capacity of 1 billion cubic feet of gas per day (750 million cubic feet of gas per day would be transferred from offshore fields to Habshan gas processing complex. 250 million cubic feet of gas per day would be left as spare capacity to be used for the transfer of associated gases that feed Das Island liquefaction plant in case of emergencies).

In October 2013, Abu Dhabi Gas Development Company (Al Hosn Gas), a joint venture partnership between ADNOC (60%) and Occidental Petroleum (Oxy, 40%), announced that 90% of the sour Shah field construction works were completed. All development works should be completed by Q4 of 2014. The project investments are estimated at about \$10 billion. It is scheduled to process 1 billion cubic feet per day of gas by 2015 to produce about 540 billion cubic feet of sales gas per day in addition to 50000 b/d of natural gas liquids and 10000 tons/d of granulated solid sulfur. However, the hydrogen sulphide content at the Shah gas field reaches 23%; it would be extracted and converted to granulated solid sulfur then exported through Al Ruwais port in Abu Dhabi via the 226km long railway currently under construction by Etihad Rail. The railway links between Shah field and Al Ruwais port and due for operation in Q4 of 2014 to coincide with the start of Shah field production.

In November 2013, Emirates LNG, a joint venture between International Petroleum Investment Company (IPIC) and Mubadala Petroleum, announced that it will build and operate the Middle East's first land-based liquefied natural gas (LNG) re-gasification facility at Fujairah port on Gulf of Oman. EmiratesLNG's regasification terminal will have an average throughput capacity of 1.2 billion standard cubic feet of natural gas per day. The Abu Dhabi Executive Council has already approved the project. The Front End Engineering Design, or Feed, was undertaken by France's Technip. The engineering, procurement and construction, or EPC, contract is currently under evaluation and will be awarded to one of the bidders.



No timeframe for choosing any of the bids was given. Until recently, Emirates LNG has been planning to use an FSRU with a capacity of 600 million cubic feet per day as a first stage of Fujairah project. This stage was supposed to end by the time an onshore LNG import terminal has been completed to reach a total capacity of 1.2 billion cubic feet per day. In the light of these changes, Fujairah project will not be ready to import LNG before 2016 or 2017.

2-12 Jordan

Jordan plans to diversify its natural gas imports sources especially after the drop in Egyptian gas exports through the Arab Gas pipeline, which reached 90-100 million cubic feet/day, or 36-40% of the agreed 250 million cubic feet/day in the contract. This is due to the repeated attacks against the pipeline in Sinai Peninsula.

Golar LNG Limited has won a firm Floating Storage and Regasification (FSRU) time charter with the Government of the Hashemite Kingdom of Jordan in July 2013. The contract is worth \$445 on the span of 10 years starting in Q1 of 2015. The FSRU Golar will be delivering up to 500 million cubic feet per day with a peaking capacity of 750 million cubic feet per day. Earlier in March 2013, Jordan announced a bidding to import 150 cubic feet of gas per day in the last quarter of 2014.

In November 2013, Netherlands-based Bam International has won a \$47 million contract to design and construct the liquefied natural gas (LNG) receiving terminal at the Red Sea, 18km south Aqaba Port. The work includes building an LNG jetty with an approach trestle, as well as providing mechanical, engineering and piping services to link it to the Arab Gas pipeline. The project is expected to be completed in 15 months. In May 2013, Jordan has been granted a loan worth \$65 million by Kuwait to fund the FSRU project in Aqaba Port with a capacity of 500 million cubic feet of gas per day peaking up to 750 million cubic feet of gas per day.

2-13 Oman

In March 2013, Oman LNG Company announced that by 2024, LNG operations will stop in the three gas liquefaction trains which are operated by the company (2 trains of the Oman LNG Company with a design capacity of 3.3 million tons/year each, and one Qalhat LNG train with a design capacity of 3.8 million tons/year). This step is taken due to the increasing domestic demand for natural gas in Oman. The three LNG units work at a rate of about 84% of the total nominal production capacity. They are barely capable of producing the contracted quantities for the importers.

In August 2013, Iran and Oman signed an agreement for Iran to supply about 880 million cubic feet/day of natural gas via offshore pipeline to Oman over 25 years starting from 2015. The pipeline will cross the Gulf of Oman. According to National Iranian Gas Exports, 70% (615 million cubic feet of gas per day) of that volume will be pumped into the Omani national gas network. Oman LNG will liquefy the remaining volume which is 265 million cubic feet of gas per day to be exported as LNG in favour of the Iranian side. The National Iranian Gas Company conducted a feasibility study studying best possible shipment routes. According to the study, the route would start from Rudan to Kuh Mobarak on the Iranian side stretching over 160km in the Gulf of Oman to reach Sohar Refining and Petrochemical Complex north Oman.

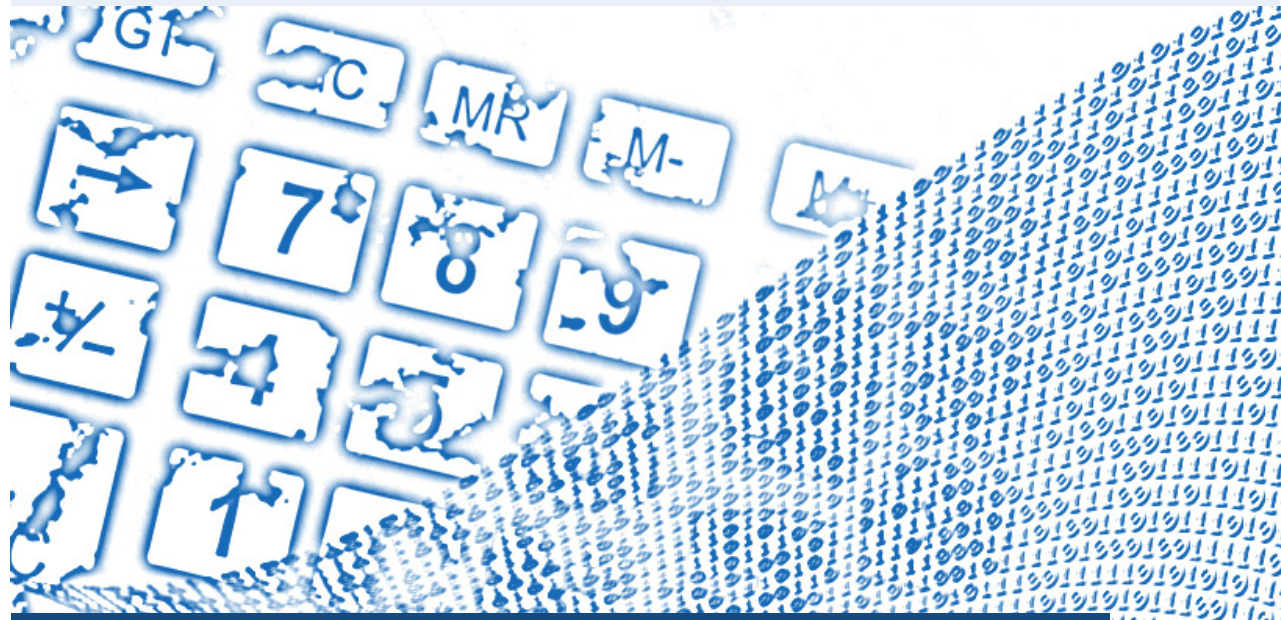
In December 2013, British Petroleum (BP) has signed 30-year deals to develop Oman's Khazzan tight gas project at an estimated investment of \$16 billion following 4 years of long negotiations. The Khazzan gas project aims to extract around one billion cubic feet per day of gas from a deep reservoir in central Oman. BP has already spent hundreds of millions of dollars on the project since winning the concession in 2007. Construction is expected to begin in 2014, with first gas expected in late 2017 and plateau production of around 1 billion cubic feet per day expected in 2018. BP, which will operate the project, expects to drill about 300 wells throughout 15 years to develop around 1 billion cubic feet of gas in the Khazzan project, and



to pump around 25000 barrels per day of condensate from the field. After months of haggling, Oman agreed in mid-2013 on the price at which BP could sell gas. The agreed price has not been disclosed.

2-14 Lebanon

Lebanon's Ministry of Energy and Water is currently assessing bids for importing LNG and establish an FSRU. Plans are set for using LNG in Dair Ammar power plant to generate electricity with a capacity of 450 megawatt. Contract is expected to be signed in Q3 or Q4 of 2014.



TABLES

CHAPTER THREE

Table 3-1

World Existing Topping Distillation Capacity by Region, 2012 and 2013

(Million b/d)

	2012	2013	Difference	(%) Change 2012/2013
Africa	3.22	3.22	0.00	0.00
Asia/Pacific	25.64	25.28	(0.36)	(1.40)
Eastern Europe/CIS	10.60	10.60	0.00	0.00
Middle East	7.28	7.39	0.11	1.51
North America	21.59	21.59	0.00	0.00
South America/ Caribbean	6.60	6.36	(0.24)	(3.64)
Western Europe	14.03	13.58	(0.45)	(3.21)
Total	88.96	88.02	(0.94)	(1.06)

Note: Parentheses denote negative figures.

Source:

- Oil & Gas Journal, 3Dec. 2012 & 2 Dec. 2013.

Table 3-2

**World Catalytic Conversion Capacity by Region*,
2012 and 2013**
(Million b/d)

	2012	2013	(%) Change 2012/2013
Africa	0.73	0.73	0.00
Asia/Pacific	6.68	6.45	(3.44)
Eastern Europe/CIS	2.72	2.72	0.00
Middle East	1.61	1.56	(3.11)
North America	12.62	12.64	0.16
South America/Caribbean	1.84	1.85	0.54
Western Europe	5.44	5.33	(2.02)
Total	31.64	31.28	(1.14)

* Includes catalytic cracking, hydrocracking and catalytic reforming.

Note: Parentheses denote negative figures.

Source:

- Oil & Gas Journal, 3 Dec. 2012 & 2 Dec. 2013

Regional Catalytic Conversion Capacity by Process, 2012 and 2013 (Million b/d)

Table 3-3

	Catalytic Reforming				Catalytic Cracking				Catalytic Hydrocracking			
	2012	2013	Dif-ferent	(%) Change 2013/2012	2012	2013	Dif-ferent	(%) Change 2013/2012	2012	2013	Dif-ferent	(%) Change 2013/2012
Africa	0.46	0.46	(0.00)	(0.43)	0.21	0.21	0.00	0.00	0.06	0.06	0.00	0.00
Asia/Pacific	2.26	2.17	(0.09)	(4.03)	3.17	3.04	(0.13)	(4.10)	1.25	1.25	0.00	0.00
Eastern Europe/CIS	1.47	1.47	(0.00)	(0.27)	0.86	0.87	0.01	0.93	0.39	0.39	0.00	0.00
Middle East	0.65	0.63	(0.02)	(2.97)	0.36	0.36	0.00	0.00	0.60	0.57	(0.03)	(5.00)
North America	4.14	4.15	0.01	0.14	6.53	6.53	0.00	0.00	1.95	1.95	0.00	0.00
South America	0.40	0.40	0.00	0.50	1.31	1.31	0.00	0.00	0.13	0.13	0.00	0.00
Western Europe	2.11	2.01	(0.10)	(4.93)	2.16	2.07	(0.09)	(4.17)	1.18	1.25	0.07	5.93
Total	11.49	11.28	(0.21)	(1.85)	14.60	14.39	(0.21)	(1.45)	5.56	5.60	0.04	0.72

* Includes catalytic cracking, hydrocracking and catalytic reforming.

Note: Parentheses denote negative figures.

Source:

Oil & Gas Journal, 3Dec. 2012 & 2 Dec. 2013

Table 3-4

World Coke Production Capacity from Thermal Conversion Process by Region, 2012 and 2013

(Thousand tons/d)

	2012	2013	Difference	(%) Change 2012/2013
Africa	1.84	1.84	0.00	0.00
Asia/Pacific	20.45	20.45	0.00	0.00
Eastern Europe/CIS	12.57	12.95	0.38	3.02
Middle East	3.30	3.30	0.00	0.00
North America	133.73	139.79	6.06	4.53
South America	24.64	20.14	(4.50)	(18.26)
Western Europe	12.61	12.61	0.00	0.00
Total	209.14	211.08	1.94	0.93

Note: Parentheses denote negative figures.

Source:

Oil & Gas Journal, 3 Dec. 2012& 2 Dec. 2013.

Table 3-5

**World Hydrotreating Capacity by Region,
2012 and 2013**
(Million b/d)

	2012	2013	Difference	(%) Change 2012/2013
Africa	0.84	0.84	0.00	0.00
Asia/Pacific	10.23	9.88	(0.35)	(3.41)
Eastern Europe/CIS	4.24	4.30	0.06	1.37
Middle East	2.04	2.04	0.00	0.00
North America	16.58	16.64	0.06	0.36
South America	1.90	1.69	(0.21)	(11.11)
Western Europe	10.02	9.58	(0.44)	(4.38)
Total	45.85	44.97	(0.88)	(1.92)
South America	1.90	1.90	0.00	0.00
Africa	0.84	0.84	0.01	0.00
Total	45.73	45.85	0.12	0.26

Note: Parentheses denote negative figures.

Source:

Oil & Gas Journal, 3 Dec. 2012& 2 Dec. 2013.

Table 3-6

World's Top 25 Largest Refining Companies, Jan, (2013 - 2014)

Rank as in Jan. 2013	Company	Refining Capacity *1000 b/d	Rank as in Jan. 2014
1	Exxon Mobile Corp	5589.0	1
2	Royal Dutch Shell PLC	4109.2	2
3	Sinope	3971.0	3
4	BP PLC	2858.9	4
10	Saudi Aramco	2851.5	5
5	Valero Energy Corp	2776.5	6
6	Petroleos de Venezuela SA	2675.0	7
7	China National Petroleum Corp	2675.0	8
8	Chevron **	2539.6	9
9	ConocoPhillips	2514.2	10
11	Total SA	2304.0	11
12	Petroleo Brasileiro SA	1997.0	12
17	Marathon Petroleum Co.LP	1714.0	13
13	Petroleos Mexicanos SA	17.3	14
14	National Iranian Petroleum Co	1451.0	15
15	JX Nippon Oil&Energ Corp	1423.2	16
16	Rosneft	1293.0	17
18	OAOLukoil	1217.0	18
19	SK Corp	1115.0	19
20	Repsol	1105.0	20
21	Kuwait National Petroleum Co	1085.0	21
22	Petramina	993.0	22
23	Agip Petroli SPA	904.0	23
24	Flint Hills Resources	714.4	24
25	Sunoco Inco	505.0	25

* Include partial interests in refineries not wholly owned by the company

** Includes holdings in Caltex Oil and GS Caltex

Source:

Oil & Gas Journal, 3 Dec. 2012& 2 Dec. 2013.

Table 3-7

Ranking of World's Top Largest Oil Refineries , January 2014

	Company	Location	Refining Capacity 1000 b/d
1 -	Paraguana Refining Center	Cardon/Judibana, Falcon, Venezuela	940.0
2 -	SK Corporation	Ulsan, South Korea	840.0
3 -	GS Caltex Corp	Yeosu, South Korea	775.0
4 -	S-Oil Corp	Onsan, South Korea	669.0
5 -	Reliance Petroleum	Jamnagar, India	660.0
6 -	ExxonMobil Refining&Supply Co	Jurong, Singapore	592.0
7 -	Reliance Industries, Ltd	Jamnagar, India	580.0
8 -	ExxonMobil Refining&Supply Co	Baytown, Texas, USA	560.5
9 -	Saudi Aramco	Ras Tanura, Saudi Arabia	550.0
10 -	Formosa Petrochemical Co	Mailiao, Taiwan	540.0
11 -	Marathon Petroleum Co. LLC	Garyville, Louisiana, USA	522.0
12 -	ExxonMobil Refining&Supply Co	Baton Rouge, Louisiana, USA	502.0
13 -	Kuwait National Petroleum Co	Mina Al-Ahmadi, Kuwait	466.0
14 -	Shell Eastern Petroleum Ltd	Pulau, Bukom, Singapore	462.0
15 -	Marathon Petroleum Co. LLC	Galveston Bay, Tex.	451.3
16 -	Citgo Petroleum Corp	Lake Charles, Louisiana, USA	440.0
17 -	Shell Nederland Raffinaderij BV	Pernis, Netherlands	404.0
18 -	Sinopec	Zhenhai, China	403.0
19 -	Saudi Aramco	Rabigh, Saudi Arabia	400.0
20 -	Saudi Aramco-Mobil	Yanbu, Saudi Arabia	400.0
21 -	Saudi Aramco Refining and Petrochemicals Co	Jubail	400.0

Source:
Oil & Gas Journal, 2 Dec. 2013.

Table 3-8

**Installed Refining Capacity in the Arab Countries,
2009-2013**
(Thousand b/d)

	Number of Refineries in 2013	2009	2010	2011	2012	2013
Algeria	5	491	582.9	582.9	582.9	582.9
Bahrain	1	267	267.0	267.0	267.0	267.0
Egypt	8	726	725.5	725.5	725.5	769.8
Iraq	12	789	860.0	860.0	860.0	860.0
Kuwait	3	936	936.0	936.0	936.0	936.0
Libya	5	380	380.0	380.0	380.0	380.0
Qatar	2	283	283.0	283.0	283.0	283.0
Saudi Arabia	8	2109	2107.0	2107.0	2107.0	2507.0
Syria	2	240	240.1	240.1	240.1	240.1
Tunisia	1	34	34.0	34.0	34.0	34.0
UAE	4	758	761.3	761.3	761.3	690.0
Total OAPEC	51	7013	7177	7177	7177	7550
Jordan	1	90.4	90.4	90.4	90.4	90.4
Sudan	3	140.0	140.0	140.0	140.0	140.0
Oman	2	222.0	222.0	222.0	222.0	222.0
Morocco	2	155.0	155.0	155.0	155.0	155.0
Mauritania	1	25.0	25.0	25.0	25.0	25.0
Yemen	2	140.0	140.0	140.0	140.0	140.0
Total other Arab countries	11	772	772	772	772	772
Total Arab countries	62	7786	7949	7949	7949	8322

Table 3-9

New Refinery Construction Projects in OAPEC Member Countries

Country	Project	Status 2012	Refining Capacity 1000 b/d	Status 2013
Algeria	Biscra	Study	100	Construction
	Gurdaia	Study	100	Engineering design
	Tiaret	Study	100	Engineering design
	Hasi-Masuod	Study	100	Engineering design
Egypt	Musturud	Study	160	Postponing
	Ain al-Sokhna	Study	130	Postponing
Iraq	Nasirya	Design	300	Construction
	Karbala	Design	140	Engineering design
	Misan	Design	150	EPC Contract
	Kirkuk	Design	150	Engineering design
Kuwait	Mina Al-Zour	Study	530	EPC Contract
Libya	Tubruq		300	Initial Study
	Obari		50	Initial Study
Saudi Arabia	Yanbu	Bid Evaluation	400	EPC Contract
	Jubail	Construction	400	Start-up
	Ras Tanura	Postponing	400	Postponing
	Jazan	Engineering design	400	Construction Bid Evaluation
Syria	Furoqlos	Postponing	140	Postponing
UAE	Fujaira	Engineering design	200	EPC Contract
	Ruwais	Construction	417	Construction

Table 3-10

New Refinery Construction Projects in Other Arab Countries

Country	Project	Status 2012	Refining Capacity 1000 b/d	Status 2013
Oman	Dukum	Engineering design	230	Construction
Sudan	Port Sudan	Postponing	100	Postponing
Morocco	Al-Jufr Al-asfar	Postponing	200	Postponing
Yemen	Rass Issa	Postponing	160	Postponing
	Hadramout	Postponing	50	Postponing



Table 3-11

World Top 10 Ethylene Complexes, January 2013

Company Name		Location	Production Capacity Thousand) (tons/Year
1-	Formosa Petrochemical Corporation	Mailiao, Taiwan, China	2935
2-	Nova Chemicals Corporation	Joffre, Alta , Canada	2812
3-	Arabian Petrochemical Company	Jubail, Saudi Arabia	2250
4-	Exxon Mobil Chemical Company	Baytown, Tex	2197
5-	Chevron Phillips Chemical Company	Sweeny - Tex	1865
6-	Dow Chemical Company	Terneuzen, Netherlands	1800
7-	Ineos Olefins & Polymers	Chocolate Bayou, Tex	1752
8-	Equistar Chemicals LP	Channel view , Tex	1750
9-	Yanbu Petrochemical Company	Yanbu, Saudi Arabia	1705
10-	Equate Petrochemical Company	Shuaiba,Kuwait	1650

Source:
Oil&Gas Journal, 1 July, 2013

Table 3-12

**World Ethylene Capacity by Region,
2011 and 2012**
(Thousand tons at the end of the year)

	2011	2012	Difference	(%) Change 2011/2012
North America	34508	35035	527.0	1.53
Asia/Pacific	42631	43101	470.0	1.10
Western Europe	24904	24904	0.0	0.00
Middle East	22859	24309	1450.0	6.34
Eastern Europe/CIS	7971	7971	0.0	0.00
South America	6384	6384	0.0	0.00
Africa	1698	1698	0.0	0.00
Total	140955	143402	2447.0	1.74

Note: Parentheses denote negative figures.

Source:

Oil&Gas Journal, 2 July,2012 & 1 July, 2013

Table 3-13

**World Ethylene Production Capacity by Country,
2005 and 2006
(Thousand tons /Year)**

Country	2011	2012	Change
Algeria	133	133	0
Argentina	839	839	0
Australia	502	502	0
Austria	500	500	0
Azerbaijan	330	330	0
Belgium	2460	2460	0
Brazil	3500	3500	0
Bulgaria	400	400	0
Canada	5531	5531	0
Chile	45	45	0
China	12978	13778	800
Colombia	100	100	0
Croatia	90	90	0
Czech Republic	544	544	0
Egypt	330	330	0
Finland	330	330	0
France	3373	3373	0
Germany	5743	5743	0
Greece	20	20	0
India	3315	3315	0
Indonesia	600	600	0
Iran	4734	4734	0
Italy	2170	2170	0
Japan	7265	6935	(330)
Kazakhstan	130	130	0
Kuwait	1650	1650	0
Slovak Republic	220	220	0

/.Cont

Table 3-13 Cont.

Libya	350	350	0
Malaysia	1723	1723	0
Mexico	1384	1384	0
Netherlands	3965	3965	0
Nigeria	300	300	0
North Korea	60	60	0
Norway	660	660	0
Norway	550	550	0
Palestine	200	200	0
Poland	700	700	0
Portugal	330	330	0
Qatar	2520	2520	0
Romania	944	944	0
Russia	3490	3490	0
Russian Federation	193	193	0
Saudi Arabia	13155	13155	0
Serbia and Montenegro	200	200	0
Singapore	2780	2780	0
Slovak Republic	220	220	0
South Africa	585	585	0
South Korea	5630	5630	0
Spain	1430	1430	0
Sweden	625	625	0
Switzerland	33	33	0
Taiwan	4006	4006	0
Thailand	3172	3172	0
Turkey	520	520	0
UAE	600	2050	1450
UK	2855	2855	0
Ukraine	630	630	0
USA	27593	28121	528
Uzbekistan	140	140	0
Venezuela	1900	1900	0

Note: Parentheses denote negative figures.

Source:

Oil&Gas Journal, 2 July, 2012 & 1 July, 2013

Table 3-14

Top 10 Ethylene Producers Jan 2013

Company Name	No. of Sites	Production Capacity (Thousand tons/Year)	
		of entire Complexes	With only Company Partial interests
1 - Saudi Basic Industries Corp.	15	13392	10274
2 - Dow Chemical Co.	21	13045	10529
3 - Exxon Mobil Corp.	20	12515	8551
4 - Royal Dutch Shell Plc	13	9358	5947
5 - Sinopec	13	7895	7275
6 - Total AS	11	5933	3472
7 - Chevron Phillips Petrochemical Co.	8	5607	5352
8 - Lyondell Basell	8	5200	5200
9 - Iran National Petrochemical	7	4734	4734
10 - Ineos	6	4656	4286

Source:

- Oil & Gas Journal, 1 July, 2013

Table 3-15

**Ethylene Production Capacity in the Arab Countries,
2008-2012**
(Thousand tons/year)

	2008	2009	2010	2011	2012
Algeria	133	133	133	133	133
Egypt	330	330	330	330	330
Iraq	120	120	120	120	120
Kuwait	1650	1650	1650	1650	1650
Libya	350	350	350	350	350
Qatar	1000	1220	2520	2520	2520
Saudi Arabia	9400	9400	11955	13155	13155
UAE	600	600	600	600	2050
Total	13583	13803	17658	18858	20308

Source:

Oil & Gas Journal, 27 July 2009, 26 July 2010, 6 July 2011, 2 July 2012 & 1 July, 2013

Table 3-16

**Natural Gas Consumption by Region,
2011 and 2012
(Billion cubic meters)**

	2011	2012	(%) Change* 2011/2012
Africa	114.0	122.8	7.5
Asia/Pacific	593.6	625.0	5
Central & South America	156.4	165.1	5.3
Europe & Eurasia**	1105.8	1083.3	(2.3)
Middle East	394.7	411.8	4
North America	868.0	906.5	4
Total	3232.4	3314.4	2.2

*Annual changes are adjusted for leap years and calculated based million tonnes oil equivalent figures

** CIS , Europe and Turkey represented by Europe & Eurasia.

Note:

Parentheses denote negative figures

Source:

- BP Statistical Review of World Energy, June 2012 and June 2013

Table 3-17

**Evolution of Natural Gas Share of Total Commercial
Energy Consumption by region, 2009-2012**
(%)

	2009	2010	2011	2012
Africa	24.7	25.2	26.7	27.4
Asia/Pacific	10.8	11.0	11.2	11.3
Central& South America	20.8	21.8	21.7	22.3
Europe&Eurasia*	33.5	34.4	33.9	33.3
Middle East	46.6	47.4	48.8	48.6
North America	27.3	27.4	28.3	30.1
Total	23.4	23.7	23.8	23.9

* CIS , Europe and Turkey represented by Europe & Eurasia.

Note:

Shares of total are calculated in million tonnes oil equivalent figures

Source:

- BP Statistical Review of World Energy, June 2010 , June 2011 , June 2012, June 2013

Table 3-18

Natural Gas Exports by Region, 2011 and 2012

Billion cubic meter

	2011	2012	(%) of Total	(%) Change* 2012/2011
Asia/Pacific	126.6	128.1	12.4	0.9
Of which: Australia	25.9	28.1	2.7	8.2
Brunei	9.4	9.1	0.9	(3.5)
Indonesia	38.6	35.3	3.4	(8.8)
Malaysia	32	31.8	3.1	(0.9)
Myanmar	8.6	8.5	0.8	(1.4)
Africa	100.40	99.9	9.7	(0.8)
Of which: Algeria	52.2	50.1	4.8	(4.3)
Egypt	10.4	7.3	0.7	(30.0)
Libya	2.4	6.5	0.6	170.1
Nigeria	25.9	27.2	2.6	4.7
FSU	284.2	269.5	26.1	(5.4)
Of which: Russia	221.2	200.7	19.4	(9.5)
Others	63.00	68.8	6.7	8.9
Middle East	156.9	159.0	15.4	1.1
Of which: Oman	10.90	11.2	1.1	2.5
Iran	9.1	8.4	0.8	(7.9)
Qatar	119.6	124.7	12.1	4.0
UAE	8.0	7.6	0.7	(5.3)
North America	130.7	129.7	12.6	(1.0)
Of which: Canada	88.2	83.8	8.1	(5.2)
USA	42.4	45.9	4.4	8.0
South America	38.5	41.8	4.0	8.4
of which: Trinidad & Tobago	18.5	19.1	1.8	3.0
Others	20.0	22.7	2.2	13.2
Western Europe	192.6	205.4	19.9	6.4
Of which: Norway	99.4	111.4	10.8	11.8
Netherlands	50.4	54.5	5.3	7.8
UK	16.0	12.0	1.2	(25.2)
Total	1029.85	1033.4	100.0	0.1

*Annual changes are adjusted for leap years

Source:

- BP Statistical Review of World Energy, June 2012 and June 2013

Table 3-19

World Natural Gas Exports by Region, 2011 and 2012

(Billion cubic meters)

	2011	(%)	2012	(%)
A- Exports by Pipelines.				
Africa	42.6	6.1	45.8	6.5
Asia/Pacific	28.6	4.1	34.1	4.8
Europe	186.7	26.7	197.5	28.0
FSU	270.0	38.6	254.7	36.1
North America	129.0	18.4	128.9	18.3
South America	14.8	2.1	16.9	2.4
Total World Exports by Pipelines	700.0	100.0	705.5	100.0
B- LNG Exports				
Africa	57.8	17.5	54.1	16.5
Asia/ Pacific	98.0	29.7	94.0	28.7
Europe	5.9	1.8	7.9	2.4
FSU	14.2	4.3	14.8	4.5
North America	1.7	0.5	0.8	0.2
South America	23.6	7.2	24.9	7.9
Total World LNG Exports	329.8	100.0	327.9	100.0
Total World Gas Exports	1029.8		1033.4	
Exports by Pipelines/Total (%)	67.98		68.27	
LNG Exports/Total (%)	32.02		31.73	
Exports as LNG/ Total Exports (%)	30.48		32.25	

Source:

- BP Statistical Review of World Energy, June 2012 and June 2013

Table 3-20

Evolution of World Natural Gas Prices*, 2008 - 2012

USD / MMBTU

	2008	2009	2010	2011	2012	(%) Change 2011/2012
Japan**	12.55	9.06	10.91	14.73	16.75	13.7
Canada	7.99	3.38	3.69	3.47	2.27	(34.6)
EU	11.56	8.52	8.01	10.48	11.03	5.2
UK	10.79	4.85	6.56	9.04	9.46	4.6
USA	8.85	3.89	4.39	4.01	2.76	(31.2)

* CIF: Cost+Freight+insurance

**LNG

Source:

- BP Statistical Review of World Energy, June 2013

Table 3-21

**Distribution of LNG Nameplate Production Capacity in
the world, 2012
(MTPA)**

	Nameplate Production Capacity (MTPA)	(%) of Global Capacity
Atlantic	76.9	27.3
Of which: Algeria	19.4	6.9
Egypt	12.2	4.3
Equatorial Guinea	3.7	1.3
Nigeria	21.8	7.7
Norway	4.3	1.5
Trinidad and Tobago	15.5	5.5
Middle East	99.9	35.5
Of Which: UAE	5.8	2.1
Oman	10.4	3.7
Qatar	77	27.3
Yemen	6.7	2.4
Pacific	104.9	37.2
Of Which: Australia	24.1	8.6
Brunei	7.1	2.5
USA	1.4	0.5
Indonesia	34.1	12.1
Malaysia	24.2	8.6
Perú	4.45	1.6
Russia	9.55	3.4
Total	281.70	100

Sources:

- GIIGNL ,the LNG industry in 2012
- IGU world LNG report-2013 edition

Table 3-22

**Distribution of LNG Nameplate Production Capacity in
the Arab Countries, 2012**
(MTPA)

	Nameplate Capacity	(%) of Global Capacity
	MTPA	
Algeria	19.4	6.9
Egypt	12.2	4.3
Oman	10.4	3.7
Qatar	77	27.3
UAE	5.8	2.1
Yemen	6.7	2.4
Total	131.5	46.7

Sources:
- GIIGNL ,the LNG industry in 2012
- IGU world LNG report-2013 edition



PART TWO



OAPEC ACTIVITIES IN 2013



Chapter 1

THE MINISTERIAL COUNCIL AND THE EXECUTIVE BUREAU

1-1 THE MINISTERIAL COUNCIL

The Ministerial Council of the Organization of Arab Petroleum Exporting Countries held its 90th meeting in Cairo, the Arab Republic of Egypt, on 26 May 2013. The meeting was held at the level of Executive Bureau members representing the ministers and was chaired by His Excellency Engineer Naser Bin Ibrahim Al Fouzan, the representative of the Kingdom of Saudi Arabia which holds the chair for the current session. The council held its 91st meeting in Doha- Qatar on 21 December 2013, the meeting was chaired by His Excellency Engineer Ali bin Ibrahim Al Naimi, Minister of Petroleum and Mineral Resources of the Kingdom of Saudi Arabia.

The decisions adopted by the Ministerial Council this year are included in the press releases issued after two meetings, and are appended to this Report.

1-2 THE EXECUTIVE BUREAU

The Executive Bureau held its 135th meeting in Cairo, the Arab Republic of Egypt, on 23-25 May to prepare the agenda of the 90th Ministerial Council Meeting (at the level of the Executive Bureau). It held its 136th meeting in Cairo on 5-6 May 2013, to consider the 2014 budget of the (Secretariat General and the Judicial Tribunal) and to submit recommendations to the 91st Ministerial Council Meeting.

The Bureau also held its 137th meeting in Doha-Qatar on 18-19 December 2013, to draw up the agenda for the 91st meeting of the Ministerial Council.

Chapter 2

The Secretariat General

First: Studies, Papers and Reports

OAPEC Secretariat General has implemented its annual program for 2013, including completion of technical and economic studies and research papers relevant to petroleum industries. The Secretariat General has also completed its 2013 proposed program seminars and workshops.

These activities are reviewed as follows:

1-1 A Study on “Oil Refining Industry in the Arab Countries: Present and Future”

The study aims to shed light on the most important features experienced by the oil refining industry in each Arab country, difficulties encountered in its outset, actions taken to enable the refineries to cope with these difficulties, and to draw lessons that will enable those in charge of the industry to develop appropriate solutions to improve performance to international standards.

The study comprises Three Chapters:

Chapter One: defines the main features and changes experienced by the refining industry since its early stages.

Chapter Two: includes major general characteristics of oil refining industry in the Arab countries, challenges intercepted and factors that led to the emergence of such challenges, and a reference to the available opportunities and best approaches to maximize benefit from these opportunities to improve the refineries' performance.

Chapter Three: deals with detailed characteristics of each oil refinery in the Arab countries, noting future development expected in light of the plans drawn for development and expansion of these refineries.

In conclusion, the study reviewed some of the recommendations that can contribute to the development of the oil refining industry in the Arab countries and improve their competitive edge.

1-2 Offshore Exploration & Production and their Role in Developing Oil and Gas Reserves

The study covered the history and present-day of offshore exploration and production, and the role they are playing in securing global energy demand in the light of scarcity of giant onshore discoveries that are the main contributor to the world reserves. The study featured different examples either from the Arab region or other territories.

On the other hand, the study highlighted the potential risks of offshore petroleum activities such as environmental issues, technical obstacles, and the effect of isolated working- conditions on the work crews. It includes four chapters:

Chapter 1: defines the offshore drilling, classification of rigs, history of exploration and production and the reasons behind successful operations.

Chapter 2: reviews the evolution of world oil and gas reserves and production, and the drop in the number of onshore giant discoveries and their actual effect on world reserves.

Chapter 3: points out the key Arab and international offshore projects.

Chapter 4: focused on the offshore drilling risks and the cost of deep water fields development.

1-3 Study: Nuclear Energy and Future Outlook: In the Aftermath of Fukushima Accident – Japan

The study aims at highlighting nuclear energy and its future outlook in the aftermath of Fukushima accident – Japan. Part 1 of the study provides historic background of the evolution of nuclear energy in the world.



Part 2 addresses the disaster of the Japanese Fukushima Complex, which took place on 11 March 2011.

Part 3 tackles the Arab and global current situation of nuclear energy, which contributed about 5% of world energy consumption, as of 2011, and claimed about 13.5% of total power generation in the world as on the outset of 2012. As of the end of 2011, there were 435 nuclear reactors for power generation in the world, with a total capacity of 364 gigawatt of electricity.

Part 4 reviews the future outlook of nuclear energy in the world. Despite the Fukushima disaster, certain nuclear countries still seek to maintain, or even expand, their nuclear capabilities. Meanwhile, certain non-nuclear countries still desire to enter into the scene of nuclear energy.

Regarding the implications of the Fukushima accident for the Arab countries, the study mainly concluded as follows:

- Some Arab countries canceled or deferred their nuclear plans and programs. Hence, those countries may have to depend, to a larger extent, on gas or oil or may resort to other options to diversify the fuel utilized in power generating, especially the renewable energy, such as solar and wind.
- Natural gas is the main beneficiary in the event of curbing the growth of nuclear energy in the future. However, few Arab countries will be able to increase their exporting capacity of gas, and benefit from any future increase in global demand for gas as a result of lower nuclear energy, as most of the Arab countries sometimes suffer from gas deficits.

1-4 Study: Growing Role of National Petroleum Companies: Implications for Petroleum Industry in Member Countries

This study mainly targets highlighting the growing role of national petroleum companies and its implications for the petroleum industry in member countries.



Part 1 provides a historic background of the evolution of national petroleum companies. Part 2 tackles the global ratings of petroleum companies according to core operating standards. Part 3 addresses the global ratings of petroleum companies by financial performance. Part 4 reviews national petroleum companies in OAPEC member countries. Part 5 lists the factors of success for national petroleum companies. Part 6 highlights the major challenges and opportunities for national petroleum companies. Finally, Part 7 exhibits the main conclusions of the study.

Some of the main conclusions of the study are:

- The share of national oil companies amongst the Top 100 group accounted for about 78.7% of total proven global oil reserves and about 63.9% of total proven global natural gas reserves in 2010. Meanwhile, they contributed 58.7% of total global oil supplies and about 48.3% of total global natural gas supplies in 2010. Their sales accounted for about 34.3% of total global sales of petroleum products for 2010, and managed about 34.7% of total global distilling capacities for 2010.
- Eight national petroleum companies, owned by OAPEC member countries: Saudi ARAMCO, Kuwait Petroleum Corporation (KPC), Sonatrach of Algeria, Abu Dhabi National Oil Company (ADNOC), Qatar Petroleum, Egyptian General Petroleum Corporation (EGPC), Iraq National Oil Company (INOC), and Libya National Oil Corporation, claimed leading positions within the 30 largest petroleum companies in the world for 2011. Syrian Petroleum Company claimed 43rd place among the top 100 global petroleum companies, according to the 6 core operating standards for 2011.
- During the period 1987-2011 Saudi ARAMCO topped the list of the world's largest petroleum companies, according to all periodic ratings of petroleum companies in the world, using the 6 core operating standards. Ratings of certain national petroleum

companies owned by OAPEC member countries slightly retreated, while others advanced. Notably, Qatar Petroleum has largely advanced, claiming leading positions during the period in question.

- Sub-ratings of the 6 core operating standards show that the national petroleum companies owned by OAPEC member countries have claimed leading positions, specifically by oil reserves and natural gas reserves standards, then by oil liquids production and natural gas production standards, at a lower degree, while receding from their leading positions by refining capacity and petroleum products sales standards.
- Due to the availability of a clearly defined plan, and identified obligations, a national petroleum company may support the economy and boost the state developmental process by achieving added-value to production industries, diversifying and increasing revenues over time, thus adding more value to petroleum products.
- Of the major challenges facing national petroleum companies at present are the change in business environment, global relations, meeting the increase in future global demand for oil, enhancing the role of petroleum in the global energy mix, supporting the economic growth, and boosting socio-economic development process. Against this situation, the new reality provides opportunities that may be seized by establishing business alliances between the national and global petroleum companies in several diversified forms.

1-5 Study: Oil and Natural Gas Exports from Member Countries: World Waterways for Petroleum Shipments

The study mainly aims at recognizing the size of petroleum exports of member countries, on one part, and the trends of such exports, on the other part.

Part 1 gives an overview of oil and natural gas reserves, production and consumption in the member countries and other world groups.

Part 2 traces the development of member countries' exports of crude oil, petroleum products, and importers during the period 2000-2011. Part 3 deals with the member countries' natural gas exports. It highlights the methods of export, including tankers and pipelines. Finally, the study provides an overview of global waterways which the petroleum exports pass through.

Some of the main conclusions of the study are:

1. During the period 2000-2011 crude oil exports of member countries increased with a humble rate of 0.8% per annum, to 16.2 million b/d in 2011. Their exports of petroleum products retreated by 0.8% to 3.4 million b/d in 2011.
2. There are three main directions for oil exports from the member countries. These are; eastwards to two countries: Japan and South Korea. Westwards, representing the US, and Northwards to European countries, mainly including Italy, Holland, Spain and France.
3. Regarding natural gas, member countries' exports witnessed notable developments during the period 2000-2011. These exports more than doubled from 84.5 billion cubic meters in 2000 to 202.8 billion cubic meters in 2011. Qatar registered tremendous developments in the size of its natural gas exports, increasing by more than eight-fold.
4. The largest portion of natural gas is exported from member countries through tankers. The quantity of natural gas exported by tankers exceeded 70.4% of total natural gas exports in 2011. Regarding natural gas exports through pipelines, Algeria leads Arab countries in this arena.
5. More than half of world production of oil is transported by tankers, making marine security one of the most significant factors in energy security. Prior to delivery to the final consumer, oil transported by sea passes through the so called choke points, i.e. narrow waterways that may be vulnerable to interruption.



6. There are 8 main choke points in the world: Hormuz Strait, Suez Canal, Bab el-Mandeb, Strait of Malacca, Turkish Straits, Strait of Gibraltar, Panama Canal, and Danish Straits. About 28.3 million b/d of crude oil and petroleum products were transported across those straits in 2010. The three main straits are located in the Middle East region, across which about 21.7 million b/d passed, or 76.7% of crude oil and petroleum products transported across the world choke points in 2010.

1-6 Paper entitled “Heavy Crude Oil Perspective in the World and Arab Countries”

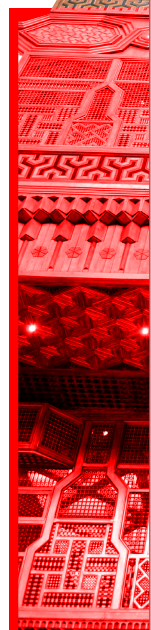
This paper was presented to the Conference on Heavy Crude Oil Refining Options in the Arab Countries, which was held in Cairo, Arab Republic of Egypt, during the period 12-14 February 2013.

The paper identifies the main specifications used to evaluate quality of crude oil, such as density, viscosity, content of sulfur and minerals, ratio of producing desired light products, such as naphtha, kerosene, and diesel, with reference to the particulars of heavy crude, as compared to medium and light types.

The paper traces evolution of crude oil in the world by type over the past two decades, with reference to the increasing rate of production of heavy and medium types. Over the next two decades, the density level of total global crude oil production is expected to decline from 33.4 API in 2010 to 33.0 API in 2035. Average total sulfur content is also expected to rise from 1.18% in weight to 1.3% in weight during the period in question.

The paper summarizes the main challenges facing the refineries when refining heavy crude, as follows:

- Higher investment cost resulting from the necessity to construct expensive conversion unit to convert the residual of heavy distillation operations into light products that cope with the demand rates in local and global markets.



- Higher operating cost as a result of increasing hydrogen consumption rate for segregation of sulfur from the final products, and the necessity to replace minerals used in manufacturing vessels, pipes, and equipment with anti-acidic mixes.
- Environmental problems, such as the increasing emissions resulting from the increasing energy consumption in the additional conversion units necessary to convert the distilling residual into light products.

The paper reviews the main potential options to improve the characteristics of heavy crude, types of technologies adopted, characteristics of each technology, and the latest developments made thereon.

The paper highlighted the main drivers of improving the characteristics of heavy crude oil prior to refining, as follows:

- Increasing the refining capacity of refinery as a result of reducing crude oil viscosity.
- Increasing refinery operating hours as a result of reducing the ratios of fractions that cause blockage and interruption of heat exchangers for purging.
- Reducing the volume of atmospheric and vacuum distillation residue.
- Reducing consumption of energy necessary for transporting crude oil, as a result of reducing viscosity.

The paper reviews the major investment projects being implemented in OAPEC member countries, which aim at upgrading and improving dynamics of heavy crude oil refining industry, with reference to the locations of such projects, while highlighting the cause that motivated member countries to refine such types.

In conclusion, the paper exhibits some recommendations, mainly:

- Most of the world refineries seek to improve their heavy crude oil refining capacity.

- Heavy crude refineries are facing several challenges when refining heavy oil.
- New technologies contribute to helping oil refineries overcome the difficulties facing them when refining the heavy crude, and improve their capacity of converting cheap oils into valuable products.
- Oil refineries having flexibility in refining heavy and acidic oils are characterized by high profitability.
- Arab countries seek to upgrade the existing oil refineries and expand refining capacity so as to maximize their ability to refine the heavy types of crude oil.

1-7 Paper Entitled “Overview of heavy Crude Oil in the Arab Countries: Challenges and Opportunities”

This paper was presented to the Downstream Petroleum Industries Week, which was held in Abu Dhabi – UAE, during the period 12-15 May 2013 under the sponsorship of Abu Dhabi Refining Co. and a number of global oil companies.

The paper summarized the major challenges facing oil refineries when refining heavy crude.

The paper reviewed the main options to improve the characteristics of heavy crude, its types, the technologies adopted, features of each technology, and the latest developments.

The paper highlighted the main drivers of improving the characteristics of heavy crude oil prior to refining.

The paper addressed the major investment projects under implementation in OAPC member countries, which aim at upgrading and improving the dynamics of refining industry in refining heavy crude, with reference to the locations of such projects, emphasizing the causes that motivated the member countries to refine such types.

1-8 Paper entitled “Global Prospects of Gas Industry: Challenges and Opportunities”

This paper was presented to the Conference on “Prospects of Natural Gas Industry: Reality, Challenges and Available Opportunities”, which was held in the Kingdom of Bahrain, during the period 28-30 October 2013. The paper aimed at providing the participants with global background on natural gas industry, its major developments, as well as the challenges it faces. The paper gave a view of the proven global reserves of natural gas, which were estimated at about 6,614 trillion cubic feet in 2012 (equivalent to 187.3 trillion cubic meters).

Middle East region, alone, claims about 47.3% of total global reserves, equivalent to 3,128.5 trillion cubic meters, followed by the Former Soviet Union (FSU) republics, with 29.2% of total global reserves, Asia Pacific region, with 8.2%, which was one of the major natural gas exporters during the past decade. Its share of liquefied natural gas trade is expected to increase over the next five years.

Meanwhile, North America ranked 4th, with reserves representing 5.8% of total proven global natural gas reserves, which are mainly located in the USA, who possesses 300 trillion cubic feet.

Only five countries collectively claim about 62.8% of total proven global reserves of natural gas: Iran, Russia, Qatar, Turkmenistan, and the USA.

It is noted that Arab countries natural gas reserves represent about 28.4% of total proven global reserves. The State of Qatar tops the list with the largest proven reserves exceeding 885 trillion cubic feet, mostly from the giant North Field. State of Qatar’s reserves represent about 46% of total Arab countries proven natural gas reserves.

The paper indicated that global natural gas production has witnessed an increasing growth in the various regions of the world over the past ten years. Global production of natural gas totaled nearly 3,364 billion cubic meters in 2012, compared to about 2,524 billion cubic meters in 2002. Growth rate of natural gas production



dropped in 2012 to about 1.9%, compared to about 3.1% in 2011. The Middle East region has contributed the largest portion of increase in global production of gas from 2002 to 2013, with 38.5%, while the US continued to lead as the world's largest gas producer since 2010, with about 20.4% in 2012.

The paper addressed the future of demand for gas, indicating that the International Energy Agency proposed scenarios for the future of demand for energy. It expects that the global demand for gas will continue to grow up to 2035, covering 3 scenarios that assume annual demand for gas of 0.7%-1.9%.

The paper tackled the unconventional sources of natural gas, referring to the substantial success in natural gas production from unconventional sources in the US, based on five major factors of success:

- The tremendous technological advancement in horizontal directional drilling and hydraulic fracturing.
- The existence of a large number of technologically qualified prospecting, exploration, and oil service companies.
- Granting equity rights of underground mineral resources to private landlords.
- Availability of huge resources of water necessary for hydraulic fracturing.
- Easy provision of legislative procedures.

Owing to the successful production of gas from unconventional sources in the USA, countries all over the world, that possess huge potential of those sources, shall inevitably commence exploration in preclusion for exploitation of such resources. Studies show the existence of substantial resources of the shale gas in China and Europe, in addition to North America. However, the utilization depends on the availability of factors that contributed to the successful production in the USA.



The paper highlighted the growth of shale gas in the USA, which created abundance of gas supplies in North American market, leading to the reduction of gas prices from over \$12/million British thermal units (BTU) in mid 2008 to less than \$2/million BTU on the outset of 2012. At these levels, the shale gas production projects are economically infeasible. Thus, a sharp drop in the drilling activities occurs, followed by a decline in gas production.

In completion of the scene background, the paper reviewed the option of converting the gas into returns and maximizing benefit from gas, according to the availability of infrastructure for gas transport and utilization, whether gaseous, compressed, or liquefied, or its conversion into liquids or feedstock in petrochemicals. It highlighted the significance of local, regional and international gas trade and its various markets.

The paper ended with some conclusions, which stressed the following:

- Global demand for natural gas is expected to grow, driven by the increase in electrical power production.
- Unconventional sources are expected to play a significant role in meeting the substantially growing demand for gas from three countries (China, USA, and Australia). Meanwhile, gas production from these sources is still ambiguous in other regions due to ecological concerns, non-acceptance of public opinion, shortage of technology, scarcity of water resources necessary for fracturing, and shortage in expertise and personnel.
- International natural gas trade via pipelines constitutes about 68%, while liquefied gas trade is expected to increase to meet the increasing demand in Asian markets.
- Limited impact of gas liquefaction industry on the global market due to the relatively low global production of this industry.
- Opportunities of exporting Liquefied natural gas from the US and East Africa may spark competition with present supplies, and may help the Asian market diversify the sources of its supplies.

Second: Conferences and Seminars Organized by the Secretariat General

2-1 Options for Heavy Crude Oil Refining in Arab Countries Conference Enhancing Cooperation between OAPEC and JCCP

In light of the growing global need for more energy, heavy oil ... The option for the future, JCCP and the Organization of Arab Petroleum Exporting Countries (OAPEC) jointly held a conference in Cairo, Egypt, in cooperation with the Ministry of Petroleum and Mineral Resources of Egypt, from February 12 to 14, 2013, under the patronage of H.E. Eng. Osama Mohamed Kamal, Minister of Petroleum and Mineral Resources of Egypt and in attendance of H.E. Mr. Norihiro Okuda, Ambassador of Japan to Egypt, Mr. Morihiro Yoshida, Managing Director of JCCP, and H.E. Mr. Abbas Ali Al-Naqi, Secretary General of OAPEC.

The main theme was “Options for Heavy Crude Oil Refining in Arab Countries”. Technical sessions took place, where Arab and Japanese experts and downstream petroleum industry and petrochemical specialist, during their lectures, highlighted the characteristics and places of existence of heavy crude in the Arab countries. They addressed the techniques to improve its properties and the benefits of heavy crude refining to improving the profitability margins of the refineries. They also discussed technical methods to mitigate the environmental impacts that may arise from refining these types of crudes.

More than 160 oil refining industry specialists have participated in the conference representing OAPEC member countries' oil companies, JCCP, regional and international research institutions, including Middle East Oil Refining (MIDOR), Egyptian General Petroleum Corporation, Egyptian Petroleum Research Institute, Kuwait Institute for Scientific Research (KISR), British Hart Energy Company, Canadian Natural Resources Limited, Arab Petroleum Investment Corporation (APICORP), Arab Industrial Development and Mining Organization.



The conference was opened by a speech delivered by H.E. Eng. Osama Mohamed Kamal, Minister of Petroleum and Mineral Resources of Egypt, confirming the essential role played by the petroleum refining industry in providing energy for economic development and social welfare. H.E. noted the need to keep pace with technological developments in the petroleum refining area, thus allowing Arab countries and oil companies to increase production to meet growing domestic demand and global petroleum products, as well as enhancing their economic value. HE indicated that such action would allow meeting regional and global environmental requirements. Concluding the address, H.E. extended his sincere thanks and appreciation to the General Secretariat of OAPEC for the efforts that have been exerted towards making the conference a success.

H.E. Mr. Norihiro Okuda, Ambassador of Japan to Egypt, pointed out the importance of the theme of the conference and the need to deal with heavy oil to cope with the environmental/economic requirements and motives to meet the world's growing demand for oil and petroleum products. In conclusion, H.E. the Ambassador stressed on the continued cooperation between Japan and Arab oil-exporting countries in the petroleum industry, particularly in developing heavy crude oil exploitation and refinery techniques.

Mr. Morihiro Yoshida, Managing Director of JCCP, mentioned the activities of JCCP to enhance mutual cooperation between Japan and Arab oil-producing countries through organizing symposia and conferences covering technological and economic aspects related to petroleum and energy. In addition to conducting training courses and utilizing technological programs, Mr. Yoshida listed the number of Japan's achievements in the development of downstream industry techniques.

H.E. Mr. Abbas Ali Al-Naqi, OAPEC's Secretary General, delivered an address, referring to the success achieved in "Hydrocarbon Transportation Pipelines in Arab Countries Conference", jointly held between JCCP and the Organization of Arab Petroleum Exporting Countries (OAPEC) in Cairo, February 2012. The conference was the first fruitful cooperation between JCCP and OAPEC. Mr. AL-Naqi

said the objective of this conference were to provide an opportunity to experts and petroleum industry specialist to exchange views and experiences on the major developments emerging in heavy oil refining techniques. Mr. Al-Naqi added that OAPEC's member countries are keen to upgrade the refining industry sector with technological developments and the requirements of maintaining health and safety environment in consistence with the international standard.

H.E. Mr. Al-Naqi, OAPEC's Secretary General, expressed profound appreciation to their Excellencies Ministers of Energy and Petroleum for their continued support for the Organization's activities and for acceptance of the participation of many specialists and technical staff. Special thanks were also extended to Arab and International research institutions and entities for delegating their representatives to the conference, thus enriching it with the latest developments, and exchanging experiences with technicians and specialists from OAPEC members.

Following the opening session, the conference commenced according to the two-day, four-session time frame. During the session 16 lectures and one paper related to "Options for Heavy Crude Oil Refining in Arab Countries" were introduced.

- Heavy crude oil perspective worldwide and in Arab countries.
- Impact of heavy crude refining on refineries revenues.
- Heavy crude oil upgrading and refining technologies.
- Refiner's experiences and case studies in upgrading and refining heavy crude oil.
- Environmental impact on heavy crude oil.

Through the 16 papers presented to the conference and discussions, participants highlighted the major conclusions and recommendations as follows:

- Improving capacity of heavy crude oil refineries worldwide.
- Challenges facing heavy crude oil refineries.
- Advanced technologies used to overcome heavy crude oil difficulties encountered in refining, and to improve their ability to increase a higher valued product.



- Oil refineries that have flexibility in refining acidic heavy crude oil obtain high profitability.
- Arab countries seek to upgrade and expand existing oil refineries to maximize refining heavy crude oil.
- Heavy crude oil production is expected to increase exports worldwide in the international market to 2035, whereas majority production in Asia and Africa.
- Heavy crude oil exploitation in the Arab countries is still in its early stages with the exception of the divided zone between Saudi Arabia and Kuwait.
- Economic feasibility study of the exploiting heavy oil project include four elements: evaluation of the characteristics of oil reservoirs rocks, applying the latest experiences, and using best methods technique.
- Modernizing Arab countries existing heavy crude oil refineries to convert heavy products to a high value light products due to negative environmental repercussions.
- The Arab national oil companies must benefit from heavy crude oil exploitation and refining experiences particularly the Canadian experience.

2-2 22nd Forum on the Fundamentals of the Oil and Gas Industry

The Secretariat General held its 22nd Forum on the Fundamentals of Oil and Gas Industry, in Kuwait, during the period 7-11 April 2013.

(122) representatives from member countries and OAPEC Secretariat General participated in the Forum. The Forum aims at acquainting middle management and specialists working in the Arab oil industry with an overview of the fundamentals of the oil and gas industry broadening their knowledge and work horizons by recognizing the various stages of exploration, production, refining, and transportation.

The Forum is concerned with economic, media, and environmental aspects of the industry including climate change and sustainable development. The Forum also provides a detailed definition of OAPEC objectives, activities and its sponsored ventures, providing the researchers with a good scientific and intellectual basis of oil, gas, and energy in the Arab and global markets.

2-3 13th Experts Meeting on Potential Cooperation in Natural Gas Investment

The 13th Expert Meeting was held in Cairo during the period from 30 September and 1 October 2013, with the participation of 23 specialists from OAPEC member countries, in addition to OAPEC Secretariat General delegation.

The meeting was chaired by His Excellency OAPEC Secretary General, stating that the meeting aims at reviewing the development of natural gas industry in the member countries during the period between the 12th and 13th meetings, in addition to discussing other topics relating to these meetings to explore potential cooperation between the member countries in this area. In conclusion of his address, he wished the participants success in achieving the meeting objectives.

Participants gave presentations on the Natural Gas Industry developments in their countries and detailed discussion and constrictive inquires.

A summary of the recommendations and conclusions drawn by the meeting:-

1. Papers presented at the meeting discussed member countries concern to increase their natural gas resources reserves and how to exploit these resources by adopting strategic plans, as well as projects development and expansion of existing facilities for the natural gas industry, in addition to proposed projects for liquefied natural gas plants, especially in the Kingdom of Bahrain and the

State of Kuwait to meet the growing domestic demand for the commodity.

2. Increasing trend of member countries in the use of natural gas, especially in the field of electricity generation, water desalination, and feedstock in the petrochemical industry, in addition to its use as a fuel in air conditioners, and industrial plants, or household consumption.
3. Participants commended the General Secretariat's efforts in providing a copy of the Glossary of Energy within the recommendations of the twelfth experts meeting, in order to benefit from the standardization of terminology used in the natural gas industry in Arabic.
4. Participants emphasized the importance of strengthening bilateral and multilateral cooperation between member countries in the field of natural gas industry and benefit from those with experience in these areas, including the establishment of natural gas networks for homes, producing mixture of ethane/propane used as a feedstock in petrochemical industry.
5. Participants praised the workshop prepared by the Arab Republic of Egypt on the sidelines of the meeting to introduce its expertise in using compressed natural gas, which included three offers: 1) conversion motors of natural gas, technologies for automotive compressed natural gas, and the use of natural gas in the air conditioning and refrigeration.
6. Participants requested the General Secretariat to continue following up the recommendations of the meeting including providing them with topics related to the development, production, and marketing of the natural gas industry.
7. Participants commended the efforts of the General Secretariat in holding such meetings and ensuring appropriate atmosphere to exchange information and experiences among natural gas industry specialists.



2-4 Prospects of Natural Gas Industry Development: Reality, Challenges, and Opportunities

The Organization of Arab Petroleum Exporting Countries (OAPEC), in cooperation with the National Oil and Gas Authority (NOGA) of Bahrain, under the auspices of His Excellency Sheikh Ahmed bin Mohammed Al Khalifa, Minister of Finance, Supervisor of Oil and Gas Affairs in the Kingdom of Bahrain, and in support by Gulf Petrochemical Industries Company (GPIC), opened a conference on “Prospects of Natural Gas Industry Development: Reality, Challenges, and Opportunities” in the Kingdom of Bahrain, on October 28-30 2013.

The Conference aimed at reviewing the current situation of natural industry, and its significant developments, mainly the development of the unconventional sources of gas in the world and certain Arab countries, the technologies available for investment and production, and the impact on global gas markets. It also addressed the methods of natural gas transport and its various uses as fuel, or as feedstock for petrochemical industry, in addition to reviewing the environmental policies and their impact on gas industry.

The Conference saw the participation of 93 natural gas and petrochemicals experts and specialists, representatives of ministries of oil and energy, concerned OAPEC member countries' authorities and companies, representatives of Equate Petrochemicals Company, Gulf Petrochemical Industries Company (GPIC), Libyan Oil Institute, International Energy Group of the USA, Canadian Natural Resources Company, in addition to OAPEC Secretariat General's delegation.

Speakers were a selective group of those working in gas industry in the member countries, and experts in gas production, processing, transport and distribution companies in Arab countries and at global level. Day 3 of the conference events was dedicated for on-site visits to Gulf Petrochemical Company in Sitra – Kingdom of Bahrain. The General Secretariat presented three papers during the conference.

2-5 OAPEC's Member Countries Second Coordination Meeting Liaison Officers of Data Bank Information

The Secretariat General of the Organization of Arab Petroleum Exporting Countries (OAPEC) held its “2nd Coordination Meeting Liaison Officers of Data Bank Information” on April 17-18, 2013 at the Secretariat General Headquarters with the participation of 9 specialists from OAPEC members, in addition to the Data Bank of OAPEC Secretariat General.

His Excellency Mr. Abbas Ali Al Naqi, OAPEC's Secretary General opened the meeting by welcoming the participants, and extending his profound appreciation for their fruitful efforts and cooperation. His Excellency indicated that their contribution and deliberation will enrich the events and desired goals.

The meeting main objective was to review the recommendations drawn up by the “1st Coordination Meeting Liaison Officers of Data Bank Information” held in April 2012, and evaluate the monitoring mechanism applied during phase one as well as seeking approaches to continue communication.



Third: Conferences and Seminars Attended by the Secretariat General

3-1 4th Meeting of the Electricity Experts Committee in Arab Countries, and 28th Meeting of the Executive Bureau of the Council of Arab Electricity Ministers

Upon invitation by the Secretariat General of the Arab League (Economic Sector, Energy Department, Secretariat of the Council of Arab Electricity Ministers), OAPEC Secretariat General participated in the 4th Meeting of Electricity Experts Committee in Arab Countries, which was held in Doha, State of Qatar, during the period 6-7 January 2013. The Secretariat General also participated in the 28th Meeting of the Executive Bureau of the Council of Arab Electricity Ministers, which was held in Doha, on 8 January 2013, and was generously hosted by the Qatar General Electricity and Water Corporation.

Participants to the meeting were representatives of a number of Arab countries: Jordan, UAE, Bahrain, Tunisia, Algeria, Saudi Arabia, Iraq, Oman, Qatar, Kuwait, Libya, Egypt, Morocco, and Yemen. The meeting was attended, as observers, by: Arab Union of Electricity, Secretariat General of 8-Country Electricity Interconnection Project, GCC Interconnection Authority, Arab Atomic Energy Agency (AAEA), UN Economic and Social Commission for Western Asia (ESCWA), Organization of Arab Petroleum Exporting Countries (OAPEC), in addition to Energy Department and Secretariat of the Arab Council of Electricity Ministers of the Arab League.

Participants to the 28th Meeting of the Executive Bureau were delegations from Arab countries members of the Executive Bureau: Algeria, Saudi Arabia, Sudan, Iraq, Oman, Qatar, Libya, and Egypt. The meeting was attended, as observers by: AAEA, ESCWA, OAPEC, Arab Fund for Economic and Social Development (AFESD), Arab Union of Electricity, Secretariat General of 8-Country Electricity Interconnection Project, GCC Interconnection Authority, Regional Centre for Renewable Energies and Energy Efficiency (RCREEE),

in addition to Energy Department and Secretariat of the Arab Council of Electricity Ministers of the Arab League.

Both meetings discussed the items on the major periodic agenda, including: Arab electricity interconnection, peaceful uses of nuclear energy, supporting electricity equipment industries for the production, transportation and distribution of electricity in Arab countries, and cooperation with regional and international organizations and authorities.

3-2 1st Meeting of Energy Ministers from Arab and South American Countries (ASPA)

In response to an invitation from the Arab League Secretariat General and the Ministry of Foreign Affairs in the United Arab Emirates, OAPEC's General Secretariat participated in the "First Energy Ministerial of South American and Arab Countries (ASPA)", in Abu Dhabi on January 15-16, 2013.

Energy ministers and senior governments officials from South American and Arab Countries, Arab League Secretariat General, International Renewable Energy Agency (IRENA), and Latin American Energy Organization (OLADE) attended the meeting.

OAPEC's General Secretariat submitted a technical paper dealt with the Arab countries position on the world oil map. His Excellency Abbas Ali Al-Naqi, the Secretary General of OAPEC presented an explanation on the development of oil and natural gas industry and future prospects for enhanced cooperation between the two regions that have enormous natural gas resources reserves in the midst of their political desire.

The Declaration adopted during the meeting, reaffirm member countries commitment to enhance energy link between the two regions and highlighted opportunities for future cooperation in the areas of renewable energy, oil and gas energy efficiency, and the power sector.



The Abu Dhabi Declaration further agrees to a three-year work program and subsequent Ministerial meetings every three years.

3-3 14th Kuwait-Japan Joint Symposium

In response to an invitation from the Kuwait Institute for Scientific Research “KISR”, the Secretariat General of OAPEC participated in the 14th Kuwait-Japan Joint Symposium with the theme of “Advancement in Petroleum Refining Process”, held on January 15-16, 2013 in Kuwait, jointly hosted by Kuwait Institute for Scientific Research (KISR), Japan Corporation Center-Petroleum (JCCP), Kuwait National Petroleum Company (KNPC), and Japan Petroleum Institute (JPI).

The symposium featured four sessions and sixteen technical papers covering the following aspects:

- Heavy oil upgrading
- Clean fuel technology
- Corrosion in oil refining and petrochemical.
- Innovative oil refining technologies.

In conclusion, a dialogue session was held to review the key recommendations and findings drawn:

- Integration between oil refining and petrochemicals is significant in improving profitability and enhancing the competitiveness of Arab oil companies.
- It is imperative to enhance cooperation between oil refining companies, scientific research institutes, catalysts producing companies, and companies operating in development of hydrogen treatment processes, thus enabling refineries to produce petroleum products compatible with local and international environmental standard.
- Arab oil exporting countries possess several strengths to compete with international companies, such as the availability of crude oil and natural gas at cheap prices, and skilled manpower.

- Promoting scientific research on upgrading refining techniques that enable refineries to produce cost-effective, clean fuels.

3-4 3rd Meeting for Monitoring Work in 1st and 2nd Parts of Arab Electricity Interconnection Study, and Evaluation of Natural Gas Utilization for Electricity Export

Upon invitation by the Secretariat General of the Arab League (Economic Sector, Energy Department, Secretariat of the Arab Electricity Ministerial Council), the Secretariat General participated in the “3rd Meeting for Monitoring Work in 1st and 2nd Parts of Arab Electricity Interconnection Study, and Evaluation of Natural Gas Utilization for Electricity Export”, which was held at the headquarters of the Arab League, during the period 18-19 February 2013.

Participants to the meeting, beside the working group of the study, were liaison officers for electricity and gas from the Kingdom of Saudi Arabia, State of Libya, Arab Republic of Egypt, State of Qatar, UAE, Republic of Algeria, Kingdom of Bahrain, Republic of Iraq, Republic of Sudan, Republic of Tunisia, Kingdom of Morocco, Kingdom of Jordan, Sultanate of Oman, and State of Palestine. A number of Arab organizations and authorities also participated. These are: GCC Electricity Interconnection Authority, 8-Country Interconnection for Arabian East Countries, OAPEC, Energy Department, Secretariat of the Electricity Ministerial Council of the Arab League, in addition to the consulting alliance team assigned to prepare the study and working group from Arab Fund for Economic and Social Development (AFESD).

The meeting mainly aimed at discussing the main results of the primary report on electricity interconnection grids, natural gas system in the Arab countries, responses of the consultants to the comments of the liaison officers of the Arab countries, as well as reviewing the initial results of the three proposed interconnection scenarios.



3-5 3rd Meeting of the Arab Negotiating Group on Climate Change

Upon invitation by the Secretariat General of the Arab League (Economic Sector, Environment, Housing and Sustainable Development Department) the Secretariat General participated in the “3rd Meeting of the Arab Negotiating Group on Climate Change”, which was held at the headquarters of the Arab League in Cairo during the period 13-14 March 2013.

The Secretariat General presented its perspective regarding cooperation in sectorial approaches on actions relating to emission and trading mitigation at air and marine transport sectors, as well as economic diversification. Following discussion of all items on the agenda, a number of recommendations were drawn, mainly:

- Urging the Arab governments to provide information, opinions and proposals regarding the initiatives, actions and options to boost ambition to attain the Secretariat of the UNFCCC on a timely basis by the Convention Secretariat.
- Urging the Arab countries possessing expertise and projects in the area of clean development mechanism to exchange such expertise with other Arab countries, and invite the Arab League to hold a workshop to this effect.
- Supporting the nominations of the Arab countries' representatives to the organizations, committees and authorities operating in climate change, and following up, and communicating, with Arab countries' representatives to the various international organizations in the relevant issues.
- Activating the role of national climate committees in the Arab countries to confront the so called Carbon Footprint, and its adverse impact on national economies of the Arab countries.
- Activating the exchange of information, expertise, and knowledge between Arab experts by initiating an Arab website for climate change, benefiting from the Arab Environmental Information Network, and

attempting to benefit from the finance available according to Article 6 of the provision of the Convention in this respect.

3-6 GCC Petroleum Media Forum - Realities and Aspirations

The Secretariat General of the Organization of Arab Petroleum Exporting Countries (OAPEC) participated in the “First Petroleum Media Forum” with the theme “GCC Petroleum Media...Realities and Aspirations” held in Kuwait March 25-26, 2013. His Excellency Mr. Hani Abdul Aziz Hussein, Kuwait Minister of Oil, represented His Highness the Prime Minister, Sheikh Jaber Al-Mubarak Al-Hamad Al-Sabah, along with His Excellency Engineer Ali Al-Naimi, Saudi Minister of Petroleum and Mineral Resources, Sheikh Ahmad Bin Mohammad Al-Khalif, Bahrain’s Minister of Finance and Officer-In-Charge of Oil and Gas Affairs as well as distinguished oil sector guests from GCC.

In an opening ceremony statement by His Excellency Mr. Hani Hussein, in which he emphasized the importance of the GCC petroleum media to provide public information on policies and interests, as well as GCC’s commitments and efforts in stabilizing global oil markets were highlighted. His Excellency expressed hope that the Forum discussions and deliberations would give further support for efforts to enhance environment needs and to support projects for economic and social needs in the poor developing countries. In highlighting Kuwait’s petroleum media activities, he noted the Forum as a new era of petroleum media cooperation and joint action among GCC countries.

The Forum discussed over the two days a number of topics related to the petroleum media:

- **Session One:**

“The Role of the Media GCC Oil in Achieving Petroleum Media Strategy for the GCC Countries”, chaired by His Excellency Hani Hussein Minister of Oil – State of Kuwait.



- **Session Two:**

“E- Development Investment in Highlighting the Role of Oil Revenues in the Process of Economic and Social Development of the GCC Countries and the Preservation of the Environment”, chaired by Dr. Matar Al-Niyadi, undersecretary of the Ministry of Energy in the United Arab Emirates.

- **Session Three:**

“The Role of the Media in Promoting and Strengthening the Culture of Petroleum Among GCC Communities”, chaired by Mr. Farouk Hussein Al-Zenki, Deputy Chairman of the board of Directors, and Chief Executive Officer of Kuwait Petroleum Corporation (KPC).

In conclusion of the Forum, a number of recommendations were drawn up for the disseminating petroleum culture in the GCC countries through cooperation with the petroleum organizations (OPEC and OAPEC), as well as ministries of information in the GCC countries.

3-7 Petroleum Downstream Industries Week

Sponsored by Abu Dhabi Oil Refining Company “Takreer”, OAPEC Secretariat General participated in the “Petroleum Downstream Industries Week” held in Abu-Dhabi – UAE during 12-15 May 2013.

The week included the following events:

- Seminar on Innovative Technological Solutions for Competitive edge, organized by Axens French Company on 12.5.2013.
- The 14th Annual Meeting on Refining Industry in the Middle East, during 13-14 May 2013, the meeting included a number of joint sessions, and other sessions concurrently with the Petchem Arabia 2013.
- Human Resources improvement and efficiency workshop, on 15.5.2013.

Experts from OAPEC member countries participated in the event (UAE, Bahrain, Saudi Arabia, Qatar, Kuwait, Libya, Iraq, and Egypt), as well as experts from other Arab countries (Oman, and Morocco). In addition, International oil companies, oil services companies, and refining and petrochemical industries supplies, also participated.

OAPEC's Secretariat General took part in the "Petroleum Downstream Industries Week", and presented a paper entitled "Heavy Crude Oil Outlook in the Arab Countries : Challenges and Opportunities."

At the end of the Conference participants reviewed the main points covered in the technical papers, and panel discussions, most notably with regard to the challenges facing the refining industry in the world in general, and in the Middle East in particular. The conference also reviewed possible solutions to confront such challenges. The following are the main conclusions and recommendations drawn by the participants:

- Participants stressed the necessity to upgrade refining industry in the Middle East in order to meet the challenges, and to improve the specifications of petroleum products, in accordance with the requirements of environmental anti-pollution legislation by upgrading the existing refineries or constructing new refineries.
- With the emergence of positive indicators confirming the return of the high demand for petroleum products in global markets as a result of the global economic recovery from the crisis for the past two years, it was noticed that activity recovered in the implementation of refineries development and expansion projects, which were inactive in the Middle East.
- Integration process between the refining and petrochemical industries contributes to improving profitability, and meeting the challenges facing oil refineries, in addition to energy conservation, and meeting the requirements of the environment anti-pollution regulations.
- Emphasizing the role of governments in providing appropriate



support to oil refineries, thus helping them to upgrade their production operations, and enabling them to meet the environmental legislative requirements, and producing clean fuels in accordance with environmental anti-pollution specifications and standards.

- Advanced technologies contribute to modifying refinery products proportions to meet global markets requirements and ensure proper petrochemical industry feedstock, while maintaining the highest possible profitability of refineries.
- National and international oil companies face challenges that require full mobilization of the energies, skills, and enhancement of cooperation and coordination in the long term through equitable risk gains sharing.

3-8 Lecture by His Excellency Mr. Abbas Ali Al-Naqi at the Japan Cooperation Centre, Petroleum (JCCP)

The Importance of OAPEC Member Countries in the Global Oil and Natural Gas Market.

His Excellency Mr. Abbas Ali Al-Naqi emphasized to the significant position of OAPEC member countries in the global and natural gas market, thanks to the global oil and natural gas confirmed reserve, in addition to oil it produces and exports to the global market. OAPEC member countries are considered the backbone of the global economy.

His Excellency said in a lecture delivered during his visit in June 2013 to the Japan Cooperation Centre, Petroleum (JCCP) that OAPEC member countries continue to provide consuming countries secure and dependable supply which requires to pump additional investment. However, additional transparency in regard to the global demand for oil is required from consuming countries.

His Excellency Mr. Al Naqi reviewed the two distinguished



relations between OAPEC and Japan Cooperation Centre, Petroleum (JCCP) which culminated in the signing of a memorandum of understanding between the two parties on March 9th 2011, and as a result two conferences animated the first in Cairo 21-23 February 2012 entitled “Hydrocarbon Transportation Pipelines in Arab Countries” and the second in Abu Dhabi 4-5 June 2013 entitled “Options of Heavy Crude Oil Refining in Arab Countries”.

His Excellency pointed out at the end of his lecture to the promising prospects for cooperation in the petroleum industry between OAPEC and Japan especially in the field of technology and modern techniques adding that OAPEC member countries including (Saudi Arabia, Kuwait, UAE, Egypt, and Algeria) have joint ventures and cooperation with the Japanese petroleum companies.

3-9 3rd IEF NOC-IOC Forum: Challenges, Investment and Cooperation

In response to the invitation of His Excellency Dr. Aldo Floreis-Quiroga, Secretary General of International Energy Forum (IEF), His Excellency Mr. Abbas Ali Al-Naqi, Secretary General of OAPEC, participated in the event of the “3rd IEF NOC-IOC Forum: Challenges, Investment and Cooperation”, held in the Indian capital New Delhi during the period 11-12 June 2013. Participants were a distinguished group of international leaders and experts of global energy industry.

The Forum discussed over the course of two days a number of important issues related to the global energy demand, investment challenges, and the role of governments in stimulating plans.

The Forum addressed the following topics:

- A Conversation on the Dynamic Nature of Industry Structure.
- Opportunities and Challenges in an increasingly Complex Environment.
- Investments: Key Risks and Opportunities.
- Deepening Interdependence.

The forum constitutes a new milestone in tracking the rounds of dialogue between national and international oil companies, Kuwait Forum in 2009, entitled “Enhancing Global Energy Security through Cooperation and Partnership”, and Paris Forum in 2011, entitled “Brining Together Distinctive Competencies for Common Challenges”.

It should be noted that the dialogue between the national and international oil companies is supported by Their Excellencies the Ministers of Oil and Energy of the IEF member countries. The dialogue is viewed as one of the most significant tools to face future challenges to global energy industry. It aims at enhancing joint understanding between both parties in the issues relating to energy, technology, environment, economic growth, and development.

3-10 4th Meeting for Monitoring Work on Arab Electricity Interconnection Feasibility Study, and Evaluation of Natural Gas Utilization for Electricity Export

In response to an invitation by the General Secretariat of the Arab League (Economic Sector, Energy Department, Secretariat of the Arab Electricity Ministerial Council) the General Secretariat participated in the “4th Meeting for Monitoring Work on Arab Electricity Interconnection Feasibility Study, and Evaluation of Natural Gas Utilization for Electricity Export” (Parts 1 and 2 of the overall study) being prepared by the Arab Fund for Economic and Social Development (AFESD), which was held in Amman, Hashemite Kingdom of Jordan, during the period 25-26 June 2013.

The 4th Meeting for Monitoring Work on the Study comes in continuation of the actions commenced by AFESD to assign a specialized consulting alliance to study the overall Arab electricity interconnection and evaluate the utilization of natural gas for electricity export according to the Terms of Reference (TOR) adopted by the Arab Electricity Ministerial Council.

Participants were liaison officers from the Arab countries, assigned

to monitor the electricity and gas issues, members of the Arab electricity interconnection study group, members of the Steering Committee, working group from AFESD, as well as the consultants by AFESD to prepare the study.

The study has reached its final stages, and is expected to be finalized by the end of December 2013.

3-11 1st GCC-Swiss Forum

H.E. Al-Naqi: Broad Prospects of Cooperation between the GCC Countries and Switzerland.

H.E. Abbas Ali Al-Naqi, OAPEC's Secretary General, said that OAPEC member countries and GCC Countries will continue to represent the main source of hydrocarbon energy the world for decades to come, even as some industrialized countries increasingly seek to reduce consumption of fossil fuels (mainly oil) to match with environmental regulations, or for other reasons.

Mr. Al-Naqi, in an address delivered during the GCC-Swiss Forum in Switzerland, held on 3-4 September 2013, confirmed the keen interest of OAPEC member countries and the GCC countries in supporting the development of all types of energy sources, including clean, efficient and environmentally friendly energies. In this regard, several Arab countries, including GCC members, are planning to develop and use nuclear technology for electricity generation, in addition to developing and using renewable energies, such as solar, geothermal and wind.

Al-Naqi reviewed some figures and indicators about oil and natural gas reserves in the GCC countries, including five OAPEC members, namely (Saudi Arabia, Kuwait, Bahrain, United Arab Emirates, and Qatar), which hold the world's most prominent position in oil and natural gas industry.

His Excellency referred to the constant coordinating role between OAPEC member countries and GCC countries through conferences



of the parties to the United Nations Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol.

Al-Naqi emphasized that any agreement related to a post-Kyoto protocol should be based on the negotiations taking place in both the Ad Hoc Working Group on Long-Term Cooperative Action and the Ad Hoc Working Group on Further Commitments for Annex I Parties under the Kyoto Protocol, taking into consideration the current framework convention (UNFCCC) and the Kyoto Protocol (KP), stressing the interests of oil producing and exporting countries, particularly those whose economies and revenues are highly dependent on one kind of resource for their sustainable developmental such as oil and gas.

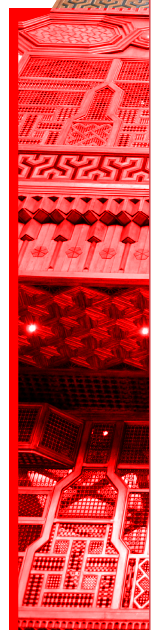
Al-Naqi outlined the potential and broad prospects between GCC Countries and Switzerland in the various areas, including energy sector and sources of new and renewable energies.

In conclusion, Mr. Al-Naqi re-iterated the significance of energy security, which is considered one of the most important issues worldwide. He highlighted the correlation of supply/demand security. He also called for enhancing co-operation by promoting transparency between the major players in the global oil market, whether producers or consumers.

3-12 92nd Ordinary Session of the Economic and Social Council

The Secretariat General participated, as observer, in the 92nd Meeting of the Economic Committee of the Economic and Social Council, which was held at the headquarters of the Arab League during 9-10 September 2013. The meeting was attended by delegations from all Arab countries, with the exception of Syria, and representatives of 22 Arab organizations and institutions.

Based on its close interest in joint Arab action, in general, and monitoring the latest developments in the area of economic integration of the Arab countries, in particular, OAPEC Secretariat



General is keen on participating in the meetings of the Economic and Social Council as observer.

The agenda of the meeting covered discussion of several topics, mainly monitoring the implementation of the economic paragraphs of Lima Declaration issued by the 3rd Arab-South American Countries Summit, held on 1-2 October 2012, and economic file for presentation to the Afro-Arab Summit, in its 3rd Session, to be held in the State of Kuwait on 19-20 November 2013 as well as the economic topics covering 6 items, mainly the item relating to the Greater Arab Free Trade Zone, developments of Arab Customs Union, investment in Arab countries, and monitoring other periodic reports, including Joint Arab Economic Report, 2013, Investment Climate in Arab Countries Report- 2013, and Arab Food Security Report- 2012.

3-13 Africa Oil and Gas Finance and Investment Forum (AOGFI)

Within the framework of supporting and expanding cooperation with international institutions and bodies concerned with energy in general and oil in particular. OAPEC Secretariat General participated in the “Africa Oil and Gas Finance and Investment Forum” which was held in Dubai, UAE on 22-23 October 2013. The forum was organized by African Petroleum Producers Association (APPA) Fund For Technical Cooperation.

The forum gathered a number of regional and international financial institutions, multilateral financial agencies, institutional investors, national and international oil companies, in addition to delegations from Africa’s petroleum producing countries, in order to explore solution for finance and to seek effective strategies for opening the unexpected oil zones and gas prospects in Africa along the value chain, while offering the major oil and gas investment projects in the region.

Among the topics addressed in the forum are: Developments in financing operations for oil and gas projects and promising prospects in Africa , growth of the African oil and gas industry through its

finance mergers and acquisitions (M&A) activity, and maximization of investment opportunities in the oil and gas industry in Africa.

The Secretariat General participated with a paper entitled “Increasing Role of OAPEC Member Countries in Global Oil and Gas Markets”. The paper reviewed the increasing role of OAPEC member countries in Global Energy markets by addressing a number of main indicators of energy, including the size of proven reserves and produced and exported quantities of oil and gas. Another topic addressed the situation of energy in Africa and the challenges facing oil and gas producing African countries, mainly the substantial investment needs along the chain of oil and natural gas.

3-14 Afro-Arab Economic Forum

OAPEC Secretariat General participated in the events of the Afro-Arab Economic Forum, which was held in the State of Kuwait during the period 11-12 November 2013. Topics of the Forum included Afro-Arab cooperation in the area of development, joint Afro-Arab investment, enhancing Afro-Arab trade, as well as the relevant areas and cooperation between Afro-Arab non-governmental organizations (NGOs) in development.

3-15 Conference on Refining and Petrochemicals Technology in the GCC

Upon invitation by International Quality and Productivity Center (IQPC), the Secretariat General participated in the Conference on Refining and Petrochemical Technology in GCC, which was held in Doha, State of Qatar, during the period 8-9 December 2013. The Conference was followed by two workshops on 10-11 December 2013. The first workshop was entitled “Management of Oil Refinery Units Shutdown: Preparation for Turnaround Maintenance, and Health, Security, Safety, and Environment (HSSE) Management. The second workshop was held under the title “Strategies of Maximizing Performance of Refining and Petrochemical Industry Control System.”



The events saw the participation of experts from OAPEC member countries (UAE, Kingdom of Saudi Arabia, State of Qatar, State of Kuwait, and Arab Republic of Egypt), in addition to a number of representatives of international oil companies, and refining and petrochemical equipment providers.

The Conference covered several sessions, wherein a number of papers were presented, addressing the following main topics:

- The challenges facing refining and petrochemical industry in the Arab countries, especially GCC countries.
- Prospects of developing refining industry in the Arab countries, enabling them to produce clean fuel.
- The role of research and development (R&D) in innovating new technology to improve performance of petroleum downstream operations.
- Reviewing certain new scientific researches in developing the catalysts used in refining and petrochemical industry.

The Secretariat General participated in the events of the Conference by presenting a paper entitled “Development of Oil Refining Industry in the Arab Countries: Present and Future”.

Participants reviewed the main conclusions and recommendations drawn during discussion of papers presented to the Conference, mainly:

- Refining industry in most of the world countries tend to improve the specifications of oil products, in accordance with the requirements of legislation for the protection of the environment from pollution, through the development of existing refineries and building new refineries.
- Initiate an association for GCC oil refineries by establishing a development database created by each refinery, addressing the challenges encountered, in addition to holding periodical meetings for refining experts and maintenance engineers, responsible for managing health, safety and the environment, with a view to exchange experiences and discuss possible solutions to upgrade the refining industry performance in the region to a global level.

- Strengthening cooperation between national and international oil companies in the implementation of joint ventures to promote the exchange of experiences and sharing of risk and technology transfer.
- Focusing in the programs for the treatment of contaminated water emerging from refining and petrochemical industry facilities and issue national standards for member countries in the GCC, emphasizing the need to focus on recycling of treated water to reduce consumption and save water resources and protect them from pollution.
- Exchange on-site visits to oil refineries operating in the Arab countries, to improve operational performance, implementation of development projects for the production of clean fuels, and improving compliance with the requirements of the legislation on the reduction of pollutants to the environment.

3-16 Preparatory Meeting for the 4th Session on China-Arab Energy Cooperation Conference

The Secretariat General participated in the meeting of the Joint Higher Committee between the Arab and Chinese sides, assigned to prepare for the 4th Session of the China-Arab Energy Cooperation Conference, which was held in Cairo, Arab Republic of Egypt, at the headquarters of the Arab League, on 11 December 2013.

It is noted that the Higher Committee was formed in accordance with the contents of Article 6 of the Memorandum of Understanding (MOU) between the Arab League and the China National Energy Authority, which was signed on 28 January 2010, on the sidelines of the 2nd Session of the China-Arab Energy Cooperation Conference, held in Khartoum during the period 26-28 January 2010. The Committee was assigned the tasks of preparation and follow-up on the China-Arab Energy Cooperation Conference.

3-17 Arab Investment Forum: Investment Attractiveness Gap

In response to an invitation by Direct Investment Encouragement Authority, Arab Investment and Export Credit Guarantee Corporation

(DHAMAN), and Arab Planning Institute (API), OAPEC Secretariat General participated in the events of the “Arab Investment Forum: Investment Attractiveness Gap”, which was held in the State of Kuwait during the period 11-12 December 2013.

The Forum addressed the exchange of information and expertise, and benefiting from the successful Arab and international experiments in encouraging and attracting foreign and Arab investment, reformulating the investment policies in the Arab countries, within the framework of developmental policies and plans.

3-18 The Joint Arab Economic Report, 2012

The 2012 Joint Arab Economic Report has been recently released. The report is co-authored by Secretariat of the League of Arab States, the Arab Fund for Economic and Social Development, the Arab Monetary Fund, and the Organization of Arab Petroleum Exporting Countries (OAPEC), and contains 13 chapters.

The report indicates that oil market indexed records level in 2011 in terms of prices, supplies and demand. Global market has been affected by several factors, mainly the geopolitical development in the Arab region, FOREX fluctuations, commodity market speculations, and global market unrest. The aggravating sovereignty debt crisis in the Euro Zone, slower global economic growth, lower future expectations of surplus in oil production capacity and global oil inventory levels, are added factors.

The report highlights the significant role performed by Arab oil exporting countries via OPEC in safeguarding the stability of oil market, particularly in the second half of 2011.

The report mentions that the main Arab oil producing and exporting countries, i.e. GCC countries, Algeria and Iraq, have attained relatively high growth rates in line with the rising global oil prices in 2011. Against this situation, other Arab countries were negatively affected by the retreating levels of demand and economic



activity in the European countries, in addition to being affected by the political events in the region.

As an outcome of the aforementioned developments, GDP of Arab countries, as a group, rose from about \$2 trillion in 2010 to nearly \$2.37 trillion in 2011. GDP ratio in current prices of the entire Arab countries, stood at 18.0% in 2011, against 15.5% in 2010. Average Arab GDP per capita increased from \$5.842 to \$6.731 over the same period.

The report highlighted the sum trade of the Arab countries have been positively affected by the developments in the worlds energy markets for 2011, where it contributed to the increase in world crude oil prices to reach a value of Export by 30.6% to around \$1.196 billion, as well as the imports value rose by 12.8% to about \$753 billion. This is synchronized with the increasing public expenditure in the major oil exporting countries coupled with higher volume in oil importing countries.

The report noted that the total overall Arab trade activity has been influenced by the positive developments in the world energy market in 2011. The increase in the world crude oil prices has contributed to increasing the value of Arab exports by 30.6% to \$1.196 billion. Moreover, the value of Arab imports has increased by 12.8% to reach about \$735 billion in light of the increasing public spending of the major oil exporting countries and the increasing oil imports to importing countries.

The main focus of the report this year has been the opportunities and challenges of penetrating financial, banking and financing services in the Arab countries. The report then highlights the Arab and international developmental aids. The total developmental aids offered by donating Arab countries in 2011 reached about \$6.3 billion. Also, within the framework of highlighting the significance of the mutual Arab cooperation, the report included a chapter on the Arab cooperation in combating desertification. The report concludes by a chapter on the conditions of the Palestinian economy.

Fourth: Environment, Climate Change, and Sustainable Development: OAPEC Role

In line with the global focus on climate change, and to safeguard the interests of OAPEC-member countries, the Organization has shed light on this issue, and exerts efforts towards concerting the stances of member countries in this respect. Furthermore, OAPEC performs a coordinating role in preparation for the convening of conferences of the parties to UN Climate Change Framework Agreement, by cooperating with the international community to this end. The aim is to thoroughly and effectively discuss the challenges surrounding the climate change issue. OAPEC also coordinates stances of the delegations of OPEC and OAPEC member countries, and the Arab Group, towards discussing the draft resolutions under negotiations. OAPEC is keen to avoid any resolutions that may adversely reflect on the economic interests of its members.

Report on General Secretariat's Follow-up of the Developments of UNFCCC And Kyoto Protocol, as well as Sustainable Development Meetings During the Second Half of 2013

In line with the directives by the Council of Minister of the Organization of Arab Petroleum Exporting Countries (OAPEC), the Secretariat General of the Organization has monitored the developments of the UN Framework Convention on Climate Change (UNFCCC) and Kyoto Protocol (KP), as well as the sustainable development meetings.

Following is a review of the events monitored during the second half of 2013:



4-1 The Thirty-Eighth Session of the Subsidiary Body for Implementation (SBI 38), (ABATA 38) and the Second Part of the Second Session of the Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP 2-2)

The Secretariat General participated, as observer, in the 38th Meetings of both SBI and SBSTA, and the meeting of the second part of the second session of The Ad Hoc Working Group on the Durban Platform for Enhanced Action (ADP2-2) in Bonn, Germany, during the period 3-14 June 2013.

4-2 19th Meeting of Sub-Committee on Climate and Climate Change

In response to the invitation by the Secretariat General of the League of Arab States (Economic Sector – Environment, Housing and Sustainable Development Department), OAPEC Secretariat General participated in the 19th Meeting of the Sub-Committee on Climate, which was held at the headquarters of the Arab League in Egypt, during the period 1-3 October 2013.

Participants to the meeting were representatives of the Arab member countries, representatives of the UN Economic and Social Commission for Western Asia (ESCWA), United Nations Office for Disaster Risk Reduction (UNISDR), Arab Network for Environment and Development (RAED), the General Secretariat of the Arab League – Environment and Housing Department, and OAPEC.

4-3 20th Coordinating Meeting of Environmental Experts in the Arab Countries

In implementation of the OAPEC action plan for 2013, the 20th Coordinating Meeting of Environmental Experts in the Member Countries was held in Cairo, Egypt, during the period 2-3 October 2013.

Participants to the meeting were specialists from 7 OAPEC member countries: UAE, Bahrain, Algeria, Iraq, Qatar, Kuwait and Egypt, in addition to experts from Arab League, General Secretariat of GCC and OPEC.

OAPEC Secretariat General presented a paper on: “Output of Bonn Discussions – 2013 of UNFCCC”, as well as the negotiating position of the member countries and the coordinated recommendations to safeguard their petroleum interests.

4-4 5th Meeting of the Arab Negotiating Group on Climate Change:

In response to an invitation by the Secretariat General of the Arab League (Economic Sector – Environment, Housing and Sustainable Development Department), OAPEC Secretariat General participated in the 5th Meeting of the Arab Negotiating Group on Climate Change, which was held in Amman, Jordan, during the period 22-24 October 2013. During the meeting, the Secretariat General exhibited its perspective with regard to the mechanisms for the negotiating group during 2013, while stressing the importance of Arab coordination in all relevant global forums to ensure that any resolutions issued by them will not affect the interests of Arab countries.

4-5 Workshop on Developing the Abilities of Arab Negotiators on the Topics Laid on the Negotiation Table on Climate Change

Co-organized by the Arab League and the Economic and Social Commission for Western Asia (ESCWA), the Workshop on Developing the Abilities of Arab Negotiators on the Topics Laid on the Negotiation Table on Climate Change, with the participation of (16) experts from (9) Arab countries, OAPEC, in addition to representatives of Arab League and ESCWA. Representatives of Arab League, Saudi Arabia, Egypt, and representative of OAPEC and ESCWA, lectured on the following topics:



- Confronting the possible impact of climate change from Arab perspective, and outcome of the meetings of the Arab negotiating group.
- The nationally suitable measure to reduce emissions.
- Capacity building to reduce emissions.
- Guidelines for climate change negotiations.
- Developments of UNFCCC.

4-6 OPEC Member Countries Coordinating Meeting to Prepare for the next Conference of the Parties (COP 19)

In response to an invitation by the Secretariat of OPEC, OAPEC Secretariat General participated in the OPEC Member Countries Coordinating Meeting to prepare for the next Conference of the Parties (COP 19) to be held at OPEC headquarters in Vienna on 28 October 2013.

Participants to the meeting were representatives of OPEC member countries, and representative of OAPEC Secretariat General. At the beginning of the meeting the representative of Qatar was elected to chair the meeting, and the representative of Saudi Arabia as vice-chairman. OPEC Secretariat presented its perspective regarding the developments on the table of negotiations, such as Durban Platform ADP, both negotiating streams, and the developments of the negotiations on finance. It also reviewed the climate change policies and their impact on the economies of the member countries, the response measures, and other issues subject of negotiation, during the course of next negotiations in Warsaw (COP 19). Representatives of the countries also reviewed the latest developments of the negotiations, especially the status quo of the SBI, the Russian position on the procedural and legal matters relating to the subject of voting, their impact and implications for the track of next negotiations, as well as the position of the countries and international negotiating groups in this respect.

In conclusion of the meeting, OPEC Secretariat stressed the importance of holding bilateral coordinating meetings between OPEC and OAPEC during the course of negotiations, and the importance of meeting and consultations to highlight the strategic petroleum interests of the member countries.

4-7 COP19/CMP9 UNITED NATIONS CLIMATE CHANGE CONFERENCE - Warsaw, Poland, 11-23 November 2013

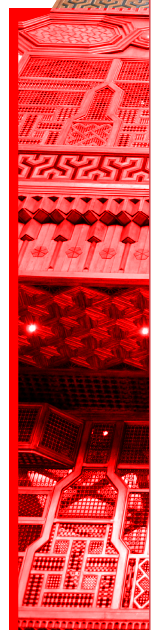
OAPEC Secretariat General took part as Observer in The United Nations 19th Conference of the Parties (COP-19) and the “9th Conference of the Parties Serving as the Meeting of Parties to the Kyoto Protocol” (CMP9) in Warsaw, Poland from 11 to 23 November 2013.

Following is a summary of the COP19 most important outcomes:

The party countries agreed on a range of decisions by drawing a roadmap to work on a draft text of a new universal climate agreement so it would appear on the table at the next UN Climate Change conference in Peru. This is an essential step to reach a final agreement in Paris, in 2015.

- **Funding- financial issues:**

- Governments provided more clarity on mobilizing finance to support developing countries' actions to curb emissions and adapt to climate change. This includes requesting developed countries to prepare biennial submissions on their updated strategies and approaches for scaling up finance between 2014 and 2020.
- Developed countries, including Austria, Belgium, Finland, France, Germany, Norway, Sweden, Switzerland have also paid or pledged over \$100 million to add to the Adaptation Fund, which has now started to fund national projects in the poor countries of the world to deal with the inevitable impacts of climate change.



- The Republic of Korea pledged to pay \$40 million to The Green Climate Fund. Seven European Governments pledged to pay \$72.5 million to the Adaptation Fund.
- The Green Climate Board is to commence its initial resource mobilization process as soon as possible and developed countries were asked for ambitious, timely contributions by COP 20, to enable an effective operationalization.
- **Loss and damage:**
 - During the closing session, it was agreed to distinguish between loss and damage caused by adoption based on Doha Amendment. Developed countries will provide financial support as per 2016 presentation. The conference also decided to establish a new international mechanism to provide most vulnerable populations with better protection against loss and damage caused by extreme weather events and slow onset events such as rising sea levels. Detailed work on the “Warsaw international mechanism for loss and damage”.
- **Party countries could not agree on** main issues with regard to markets, agriculture, response measures, and articles 5,7, and 8 (approaches within the protocol) i.e., non-market approaches like market mechanisms and carbon markets, which are two difficult issues on the COP20 agenda in Peru next year.
- **The Durban Platform for Enhanced Action (ADP)**, the Parties decided to initiate or intensify domestic preparation for their intended national contributions towards that 2015 agreement, which will come into force from 2020. Confidence in UNFCCC's ability to reach big achievements in a very short time was among the COP19 missions. However, there were insufficient results in the absence of potential components to draw the 2015 agreement. There was a call for urgent measures before COP20 in Lima, Peru.

- **REDD**

The agreements included a significant set of decisions on ways to help developing countries reduce greenhouse gas emissions from deforestation and the degradation of forests. The Warsaw Framework for REDD+ is backed by pledges of \$280 million financing from the US, Norway and the UK.

- **Governments completed work on the Climate Technology Centre and Network (CTCN)** so that it can immediately respond to requests from developing countries for advice and assistance on the transfer of technology. The CTCN is open for business and is encouraging developing countries to set up focal points to accelerate the transfer of technology.
- **In the high-level meeting, the UN Secretary General invited the Parties to attend the Climate Summit in New York on 23 September 2014. It was also called the “Solutions Summit”.**



Fifth: MEDIA ACTIVITY

The Secretariat General continued its media activity, covering the following areas:

5-1 Editing, Printing, Publishing and Distribution

The Secretariat General continued to issue all OAPEC's publications, including books and periodicals. This action involved all matters relating to editing, proofreading, translation, designing, layouts, printing, publishing and distribution.

5-2 Press and Media Activity

A number of press releases were issued by the Secretariat General, covering the various activities of the Organization, such as the meetings of OAPEC Council of Ministers, and the meetings of the Executive Bureau. On the other hand, certain local and Arab newspapers highlighted OAPEC activities, its role in coordinating between its member countries, and its efforts towards supporting the joint Arab action under the Arab and international circumstances and developments. The Secretariat General continued to monitor the contents published by local, Arab and certain foreign newspapers on energy affairs, and collected and archived the top oil, economic and environmental stories. In addition, it monitored certain other topics that belong to member countries in general.

5-3 Website

The Secretariat General released its upgraded website in the first quarter of 2012, with concerted efforts of its technical staff, and in coordination between its various departments. The upgraded website has new sections, including a sections dedicated for OAPEC organs, General Secretariat's activities, addresses of His Excellency the Secretary General to the conferences and seminars organized by the Secretariat General, or in which it participated, in addition to a presentation of the studies and reports produced by the Secretariat General.



5-4 38th Arab Book Fair

OAPEC Secretariat General participated in the 38th Arab Book Fair, which was held in Kuwait during the period November 20-30 2013, under the auspices of the National Council for Culture, Arts, and Literature–State of Kuwait.

About 530 publishers, from 16 Arab and 9 foreign countries, participated in the fair, in addition to several Kuwait-based organizations, including the Arab Center for Educational Research, Arabization Center For Medical Science (ACMLS) – League of Arab States, Organization of Arab Petroleum Exporting Countries (OAPEC), and other organizations situated outside Kuwait, including Arab Writers Union - Syria, Secretariat General of the Gulf Cooperation Council (GCC) – Saudi Arabia, and Arab Administrative Development Organization (ARADO).

A number of Arab and foreign embassies, as well as Arab organizations and diplomatic corps participated directly, or indirectly, via publishers. Several cultural and art events were held on the sidelines of the fair.

5-5 Information and Library Services

The Library sustained its usual activities and received researchers and visitors from various government agencies. In 2013 it received about 115 visitors and provided the following services:

5-5-1 Information and Documentation

The Library continued to input new data pertinent to Arab and foreign publications to the e-database of the Library. In addition, information retrieval, response to inquiries, and reference services are provided to researchers from within OAPEC and outsiders, as well as researchers visiting the Library from Arab Fund for Economic and Social Development (AFESD) and Arab Investment Guarantee Corporation, at the same headquarters.

The Library pursued services in the area of documentation. Four issues of the quarterly Bibliography, published in Oil and Arab Cooperation Magazine, were prepared, in addition to the preparation of an independent index for the topics of Oil and Arab Cooperation Magazine

5-5-2 Indexing and Classification

The Library continued to provide technical services related to indexing and classifying and entered the publications received into the relevant database.

5-5-3 Acquisition

The Library was characterized in 2013 by its acquisition activities, including purchasing publications, periodical subscription, invoices and accounts on its own database, as well as pursuing the following:

- Providing the Library with new information sources and references as proposed by the Library and Information Department Director and other departments, in addition to following up the new acquired editions of subscriptions, references, and annual books.
- Monitoring the subscription of Arab, foreign periodicals and official publications of the government authorities and departments, as well as oil companies in the Arab countries.
- Monitoring and downloading the electronic periodicals and studies received on the internet.
- Monitoring the development of the electronic publications which are stored on an external CD.

Therefore, the Library's collectibles turned to 30210 from books and 5641 from documents. English periodicals have reached 220, and Arabic periodicals 210.

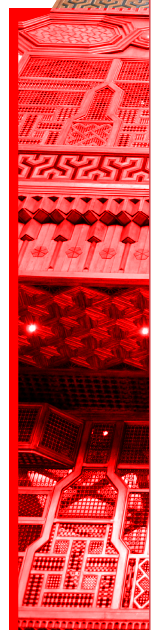
Sixth: DATABANK

6-1 Monitoring Developments of Database

- The Databank continued to update the database, mainly relying on the data received from member countries (energy data collection form), and the data released by Arab national institutions and authorities, which were made available. Furthermore, the Secretariat General's database was updated with the information in the technical papers and studies presented during the events organized by the Secretariat General in 2013.
- The Databank has initiated and designed a database for national petroleum companies in OAPEC member countries, using Oracle 11g technology and placed it within the Secretariat General database. Meanwhile, work is underway in feeding the information received from member countries on these companies.
- The Databank, in collaboration with Information and Library Department, has designed the internal subscription system to the Secretariat General's publications, using Oracle 11g.
- On August 1st 2013, OAPEC Secretariat General launched its Energy and Oil Industry database on its website. The project aims at providing the largest possible number of specialists with the opportunity to benefit from the data and information available on the Data Bank. This project gained positive response and the statistics on the Arab countries' energy sector were commended by numerous interested parties.

6-2 Reports and Papers

- The Databank, in collaboration with the specialized departments in the General Secretariats, completed the statistical report for 2012, covering the period 2008-2012, which was uploaded on the Secretariat General's website, and on CDs.
- Energy Data publication was prepared, by world group, for the



period 1970-2012, relying on the BP database. This publication is annually updated. It was uploaded on CD. As per the agreement with BP, the distribution of this publication will remain limited to member countries.

- The Databank processed and released a publication on the data issued by ENI of Italy, relating to the oil and natural gas production, consumption, imports and exports, published in its annual report "World Oil & Gas Review 2012."

6-3 Other Activities

The Databank prepared a CD-ROM covering the publications of the Secretariat General, the technical papers and studies to be distributed through its participations, locally or abroad.

6-4 Strengthening Cooperation between OAPEC Secretariat General and its Member Countries

In implementation of the plan to activate the Secretariat General Databank in order to ensure the success of its statistical project internally and externally at the member countries level, and in implementing the recommendations of the 1st Coordinating Meeting of the Member Countries Liaison Officers in the area of Databank, OAPEC Secretariat General held its 2nd Coordinating Meeting of Member Countries Liaison Officers in OAPEC Data Bank during the period 17-18 April 2013 at OAPEC Headquarter in the State of Kuwait. The meeting aimed at:

- Evaluating the follow-up mechanism of Phase 1 for implementation of the system and finding methods for the success of communication with liaison officers of the member countries.
- Holding consultations on the statistical and technical shortcomings that appeared during follow-up of the Phase 1 of system implementation.

- Noting the member countries liaison officers' recommendations and observations on the implementation of Phase 1 of the system and their future perceptions.
- Discussing the developments and expansion on the energy data collection form.



Seventh: Encouraging Scientific Research

7-1 OAPEC Scientific Award 2012

Pursuant to the provisions of the Award regulations, winners of the Scientific Award 2012 were honored delivered the certificates of appreciation. The Award was entitled “Technological Advancement in the Exploration and Utilization of Unconventional Natural Gas Resources in Arab Countries” by OAPEC Council of Ministers at its meeting held in Doha - State of Qatar on Saturday, 21 December 2013.

7-2 OAPEC Scientific Award 2014

In continuance of OAPEC policy to encourage scientific research by allocating two bi-annual merit awards, the first is valued KD 7,000, and the second KD 5,000, it has been resolved to specify the title of the scientific research to win OAPEC Award 2014 as “Integration between Refining and Petrochemicals.” The Secretariat General announced the award and notified the related parties. It continued to publish announcements on its monthly Bulletin and quarterly magazine, as well as its website. The end of May 2014 was set as deadline for receiving the research works.

Eighth: ADMINISTRATIVE AND FINANCIAL ACTIVITIES

8-1 Evolution of the Administrative Structure

At the end of 2013 there were (45) employees working at the Secretariat General, 22 of whom were professional staff and 23 general staff.

8-2 Evolution of Expenditure

The Secretariat General's expenditure in 2013 totaled KD 1.755.383 .

Estimated until the final accounts for 2013 are ratified at the end of May 2014.



Chapter 3

OAPEC Joint Ventures

The report observes the challenges and opportunities to access financial and banking services, and the funding in the Arab countries. The report exhibits the Arab and International developmental aid about \$6.3 billion in 2011, in the framework of highlighting the importance of the joint Arab economic cooperation. The report includes a chapter on Arab cooperation in the area of anti-desertification. In conclusion the report comprises a chapter on the Palestinian economy.

OAPEC joint ventures continued executing their successful projects and businesses during 2012 and the first half of 2013 in spite of the political developments in the Arab region. These developments had their direct impact on a number of the joint ventures, especially The Arab Petroleum Services Company (APSCO) and its affiliate companies in Libya, which were under attack that caused serious damage to their equipment and offices. Work was resumed gradually but needed special security services.

OAPEC joint ventures have been facing difficult challenges for decades due to the nature of their activities and the severe competitiveness with major international energy players of similar activities, in addition to; the difficulties in getting into some Arab markets. In spite of these difficulties, OAPEC joint ventures spared no effort in boosting their activities and presence in the Arab energy markets relying on their wealth of knowledge and expertise in businesses relevant to the oil and natural gas industries. These efforts were crowned by achieving good operational and financial results by some of these joint ventures, which exceeded previous years' results.

Various inter-wined factors helped in achieving these positive results for the fiscal year 2012-2013, most important of which was the increase in the size of petroleum projects in some member countries due to the increasing economic growth, which resulted in boosting



and increasing the joint ventures' activities. Also, the continuous support of the OAPEC member countries and the efforts of the joint ventures' boards and their staff had positive and tangible effects on supporting the joint ventures and overcoming this critical stage of their history.

OAPEC joint ventures enjoy a complete administrative and financial independence, as their assembly generals, formed by their owners (i.e. member countries), and their boards draw their strategies and specify their future trends, in addition to; take appropriate decisions with regard to their development.

OAPEC Secretary General plays a coordinative role among the joint ventures through organizing annual meetings for the joint ventures officials where cooperation opportunities and mutual challenges are discussed in light of the Arab and international developments in the oil and natural gas industries.

While witnessing such a positive progress of OAPEC joint ventures depending on their independent finances and capacities, OAPEC Secretariat General calls for giving priority and preference to OAPEC joint ventures and other Arab national petroleum companies through facilitating the customs and administrative restrictions at the areas where they operate. This will help achieving the goals for which these joint ventures were created.

I: Summary of Major Activities and Obstacles Facing Joint Ventures

ARAB MARITIME PETROLEUM TRANSPORT COMPANY (AMPTC)

Arab Maritime Petroleum Transport Company (AMPTC) was established on 6 May 1972, with an authorized capital of US\$500 million, and paid-up capital of US\$250 million. The company is situated in the State of Kuwait, and all OAPEC members, with the exception of Syrian Arab Republic, have stakes in the company.

The object of the company is to carry out maritime transport of hydrocarbons. Shares were distributed to the member countries, pro-rata their stakes in the company's capital.

AMPTC Activities in 2012

The company's fleet consists of 11 crude oil, liquefied gas, and clean petroleum products tankers. The company charters out its tankers under time charter contracts or spot voyage system according to the prevailing market rates.

Owing to the current decline in chartering rates at petroleum maritime transport markets, which is expected to continue for the at least the next three years, this additional activity of the company (gas trading) enables it to realize subordinate financial revenues and profits, as well as financing and compensating the operating losses of the fleet operating in the free markets. It should be mentioned that the company, by entering into the field of liquefied gas trading, has successfully cooperated with the sisterly Arab gas exporting companies by concluding liquefied gas purchasing contracts from Arab marketing institutions, with total quantities amounting to about 1.8 million tons annually. This led to enhanced cooperation between the company and those companies in the member countries (Saudi ARAMCO, Kuwait Petroleum Corporation, Tasweeq of Qatar, and SONATRACH).

On the other hand, the company, from its own resources and in spite of the global financial crisis, continued to implement its plans aimed at upgrading and increasing the units of its fleet. In March 2013, the company received a 122,000 ton clean petroleum products tanker.

AMPTC Financial Results for the Financial Year 2012

In 2012 the company's revenues amounted to about US\$89.85 million, and the actual operating expenses, before tanker depreciation,



stood at US\$72.94 million. Book depreciation of tankers amounted to nearly US\$24.885 million.

Gas transport and supply projects posted a net profit of about US\$80.61 million. Taking into consideration the impairment of market value of tankers of about US\$50 million, the net profit posted by the company amounted to about US\$12.97 million in 2012.

Company's Financial Results for the First Half of 2013

Tanker operating income amounted to approximately US\$58.64 million, and the operating expenses were nearly US\$41.59 million. Meanwhile, book tanker depreciation amounted to about US\$12.81 million. Net of general and administrative expenses, and financing interest to banks, the company posted a net profit of about US\$12.41 million for the first half of 2013.

Training and Staffing

The company seeks to upgrade its staff by training according to needs of each. Six employees were delegated in training courses during the period from July 2012 to June 2013.

The company has 69 employees, including 45 Arabs. The fleet has 163 sailors, including 119 Pakistanis, and 44 of the Philippine nationality, being officers and engineers.

THE ARAB SHIPBUILDING AND REPAIR YARD COMPANY (ASRY)

Established on 8 December 1973, Arab Shipbuilding and Repair Yard Company (ASRY) has an authorized capital of US\$340 million, issued and paid-up capital of US\$170 million. The company is located in Manama, Kingdom of Bahrain, and all OAPEC member countries, with the exception of the Democratic People's Republic of Algeria and Arab Republic of Egypt, have stakes in the company.

The objectives of the company cover all operations of building, repairing and maintaining all types of ships, tankers, and other maritime vessels for transporting hydrocarbons, etc.

ASRY Activities in 2012

The year 2012 was a axial year in ASRY's history. It witnessed the completion of the majority of expansionary projects adopted by the previous 5-year strategic plan. Investment in those projects amounted to about US\$188 million. Those projects contributed to shifting ASRY into a new phase of progress, from a repair yard to an advanced complex capable of providing diversified maritime services.

The year 2012 witnessed a substantial turnaround by diversifying and dividing the company into four business units: ship repair services, maritime services, consulting services, and energy services.

In 2012 ASRY realized a good income despite the difficult global economic conditions and the sharp competition it faced regionally and internationally. Sales amounted to US\$177.6 million, an increase of 5.23% compared to sales of 2011 of US\$168.8 million. 185 ships were repaired this year, compared to 200 ships for 2011. However, the average income per ship rose to about US\$854,000, compared to US\$787,000 for the previous year.

ASRY realized new gains in two areas: First, transparency in the company has realized advanced stages by implementing new procedures in procurement and accounting, whereby each customer or supplier can guarantee equity when dealing with the company. Second, the social support initiatives, such as training partnerships in millions of dollars with public and private sectors. In appreciation to these efforts during the second half of 2012, ASRY won "Sea Trade Corporate Social Responsibility (CSR) Award, and "Lloyds List" Award in Safety. Both awards remind of the importance of institutional values in achieving growth and success.

Financial Results 2012

Despite the difficult economic conditions, and the sharp competition at the regional and global levels, the company posted a good income in 2012, with a net profit of US\$1,620,996.

Training and Arabizing

In 2012 ASRY continued its training and Arabization plans aimed at developing the Arab staff. In line with the plan, more Arab trainee staff were employed and promoted, and staff performance and skills were developed. Training included several aspects, covering the company's technical and administrative requirements. The objective was to cope with global development in ship repair and to confront the severe competition in the industry.

ASRY organized different training programs for top, middle and supervisory management. The company held 142 miscellaneous professional training courses and general courses for 1244 employees.

By the end of 2012 the company had 1867 employees, including 805 Arabs. The company recruited 13 interim employees in 2012 to meet the business needs. At peak times, the company outsources sub-contractors.

Financial Results in the First Half of 2013

The company achieved good results in the first half of 2013, with net operating revenues amounting to US\$110,211,000, an increase by 31% against the same period of last year.

By the end of June 100 ships were repaired, compared to 96 ships for the same period of 2012.



THE ARAB PETROLEUM INVESTMENTS CORPORATION (APICORP)

The Arab Petroleum Investments Corporation (APICORP) was established in Khobar, Saudi Arabia on 11 September 1974 with an authorized capital of US\$1.2 billion. The fully paid-up capital is US\$550 million. All OAPEC member countries have stakes in this corporation, whose objective is to participate in the financing of oil industry's projects and relevant activities, or to assist in such projects to the benefit of member countries by supporting their ability to benefit from their petroleum resources and invest their savings to boost their economic and financial capacity.

According to the resolution of the extraordinary general assembly, held in the Kingdom of Bahrain in April 2012, the company's authorized capital was increased from US\$1.2 billion to US\$2.4 billion, and the subscribed capital by US\$1,500 million.

Project and Trade Finance in 2012

In 2012 APICORP maintained its foothold as one of the largest regional financial institutions in project and trade finance sector, which saw some signs of recovery in the GCC countries during 2012, compared to the previous year. In North Africa, however, the geopolitical events caused the delay of certain financing operations commenced. Under such circumstances, the project financiers and developers were obliged to take precautionary measures.

APICORP continued to improve its loan portfolio, with net value by end of 2012 amounting to about US\$2.8 billion, compared to US\$2.8 billion by the end of 2011. APICORP maintained a high quality loan portfolio, giving grounds for rating it at an affirmed "stable", with AA for internal rating. Meanwhile, defaults on loan installment repayments remained at their minimum levels.

Project and trade finance activity posted a net profit of about US\$44.8 million in 2012, compared to nearly US\$30.8 million in 2011.



Direct Participations in Project Capitals for 2012

APICORP's objective is to participate in developing hydrocarbon and energy industry projects in the Arab region. APICORP participates in the capitals of 12 projects that have presence in 5 Arab countries: Saudi Arabia, Libya, Iraq, Egypt, and Tunisia. Those projects cover different activities, including petrochemical industries, nitrogen fertilizers, liquefied petroleum gas (LPG), geophysical services, oil and gas well drilling, and storage materials for petroleum products.

By the end of 2012 the corporation's net book value of equity portfolio amounted to about US\$318 million, compared to nearly US\$324.3 million by the end of 2011. The decline, by about 2%, is attributable to two reasons: sale of a part of shares of YENSAB, quoted in the Saudi Capital Market (TADAWOL), and taking provision for some participations of APICORP portfolio.

APICORP's financial statements for 2012 show that earnings from participations amounted to about US\$74.5 million, compared to nearly US\$100.4 million earned in 2011.

Financial Results in 2012

APICORP posted a net profit of US\$108.9 million in 2012, compared to a net profit of US\$105.3 million realized in 2011, an increase by 3% over the previous year. Operating revenues for 2012 stood at US\$131 million, net of cost of funding.

In line with the extraordinary general assembly's resolution, at its meeting last year, to increase the company's authorized capital from US\$1.2 billion to US\$2.4 billion, and subscription of US\$1,500 million, the general assembly, upon recommendation by the board of directors, approved, at its meeting held in the Kingdom of Bahrain in April 2013, not to distributed dividends and retain the earning for capitalization later to help implement the general assembly's resolution.

Project Finance Activity for the First Half of 2013

Project finance and trade activity maintained the pace of last year, where this activity continued in GCC countries. However, this activity was quite in other Arab countries.

Project Finance

In the first half of 2013, APICORP entered into 11 finance transactions with a total of US\$495 million. Financed projects included two in UAE of Emirates Aluminum Limited (US\$150 million) and Gulf Refinery Co. (US\$40 million), and two project in the Kingdom of Saudi Arabia.

Financial Results for the First Half of 2013

APICORP posted a net profit of US\$65.8 million in the first six months of 2013. The corporation's assets totaled US\$5,039 million as of 30 June 2013, compared to US\$5,078 million as of 31 December 2012. The corporation's total shareholders' equity increased to US\$1,379 million, from US\$1,309 million as of 31 December 2012.

Staff and Training

Currently, APICORP employees about 120 staff members at the corporation's headquarters in Khobar, Saudi Arabia, and at the foreign banking unit in the Kingdom of Bahrain. About 120 staff, 68% of the employees are Arabs (82 employees, out of whom 93% are GCC citizens), and the others are of non-Arab nationalities (38 employees). According to the human resources strategy, and as needed, the corporation increases the number of non-Arab employees to achieve balance between Arab and non-Arab expertise in certain technical and specialist jobs that require experience unavailable to Arabs, or difficult to obtain.

The corporation exerts efforts to develop the skills and capabilities of its employees to achieve balance between the training requirements

necessary for the efficient performance of work and the necessity to cope with the latest developments in economic, financial, petroleum, administrative, and ICT areas. To realize this goal, the corporation utilizes the employee performance appraisal program.

THE ARAB PETROLEUM SERVICES COMPANY (APSCO)

The Arab Petroleum Services Company (APSCO) is an Arab shareholding company established on 23 November 1975 under an agreement signed by the governments of OAPEC member countries, with an authorized capital of 100 million Libyan dinars (LD), and a subscribed capital of LD 15 million, with OAPEC member countries having stakes in the company. The company's capital was increased from LD 44 million to LD49 million under General Assembly Resolution No. 221/38/2010 issued on 19 June 2010.

APSCO's Activities in 2012

The company's activity was centered during the year on monitoring improving and developing the activities of the existing ventures of the company, expanding through them, and studying the possibility to establish other companies to implement the objectives stated in its incorporation agreement. These companies are:

1. The Arab Drilling and Workover Company (ADWOC).
2. The Arab Well Logging Company (AWLCO).
3. The Arab Geophysical Exploration Services Company (ADESCO).

Financial Results for 2012

APSCO's net loss for 2012 amounted to LD2,918.887. The net loss was carried forward to the retained earnings account, bringing the total retained losses to LD 621,048 as of 31 December 2012.



Company Activity during the First Half of 2013

The company continued to monitor and support the three existing companies. Over the past period, the company was about to establish new partnerships with Wither Ford. Agreement was made and the company was named. However, as a result of circumstances, the partnership was canceled. Also, partnership intended in geological studies with Kuwait Energy and Synergy was canceled due to technical reasons relating to the articles of association of both companies.

Manpower

As of 30 June 2013, the company employed 14 staff members, all Arabs.

Financial Results for the First Half of 2013

APSCO's financial results for the first half ended 30 June 2012, are summarized as follows:

	LD
Total revenues	69216.227
Total expenses	(1530281.664)
Losses for the period	(1461065.437)

THE ARAB DRILLING AND WORKOVER COMPANY (ADWOC)

The Arab Drilling and Workover Company is an Arab company specialized in offshore/onshore oil and gas well drilling and workover. It is a subsidiary of some OAPEC sponsored ventures.

The company was established in 1979 under an international agreement between three companies: Arab Petroleum Services Company (APSCO), Arab Petroleum Investments Corporation (APICORP), and Santafe International Services Company. The



company's authorized capital is LD12 million, and its paid-up capital is LD12 million, which was later increased to LD60 million upon the shareholders general assembly resolution No. 8/29/2008, issued on 27 June 2008. The company is located in Tripoli, Libya. In 2009 Santafe sold its stake in ADWOC to First Energy Limited.

Company Activities in 2012

By the end of 2012 10 rigs owned by the company, and 3 chartered rigs were operated, totaling 13 rigs. It is expected to operate more of the company's 16 rigs by the end of 2013, in addition to operating two new chartered rigs the company contracted to purchase.

ADWOC Financial Results for 2012

Income totaled US\$45,230,940, and expenses totaled US\$45,551,744. Although the company realized losses in the first half of 2012, it covered those losses during the third quarter of 2012. By the end of 2012, the company posted a net profit of LD 3,375,787.

Manpower and Training

The company prepared various courses and more safety officers were appointed at the work sites. 20 employees were sent to Cairo for 10 days to obtain well eruption control certificate, and two inspectors at the drilling department were sent to Cairo to renew their certificates.

By the end of 2012 there were 1053 employees, including 770 nationals, 130 Arabs, and 153 foreigners.

Company Activities in the First Half of 2013

By the end of the first half of 2013, the company operated 12 rigs, and two chartered rigs, totaling 14 rigs. Two chartered rigs in service in April and May 2013, were released.

Company Financial Results for the first Half of 2013

During the first half of 2013, the company posted a net profit of US\$8,227,542.

Company Selection as the Best Drilling Company in the Middle East

London Stock Exchange assessed drilling and workover companies in the Middle East for their activity over the past five years, and customer satisfaction. Arab Drilling and Workover Company (ADWOC) was selected as the best drilling company in the Middle East for 2012.

THE ARAB WELL LOGGING COMPANY (AWLCO)

One of the specialized companies subsidiary of Arab Petroleum Services Company (APSCO) AWLCO was established on 24 March 1983, with a fully paid-up capital of US\$20 million, and is based in Baghdad, Republic of Iraq. All OAPEC member countries have stakes in the company pro-rata their stakes in the Arab Petroleum Services Company (APSCO). The company specializes in well logging and perforation, and has operation centers in the north and south.

Company Activities During the Period from 1 January 2012 to 30 June 2013

In 2012 and first half of 2013 AWLCO continued to provide well logging and perforation services in all the Iraqi fields. The company continued to provide services to production sector in the North, Middle, Missan, and South

Relations with Iraqi Beneficiaries

The Ministry of Oil, its central departments, north and south oil companies, Missan Oil Company, Middle Oil Company, and Iraqi



Drilling, continued to provide AWLCO with assistance to perform its business, as follows:

- A land parcel was received, of 2000 m, to construct the Middle Operations Center in East Baghdad Field thereon.
- Economic Department prepared all official letters required by the tax and customs departments to cover the business activities of the company.
- Economic and Financial Department caused the issuance of all security approvals to acquire and enter perforators into Iraq, with delivery to the work sites.
- Administrative Department provided the company with all administrative letters necessary for its business.
- Production companies provided all fuels and certain materials necessary for work.
- Studies, Planning and Follow-up Department assisted the company to obtain licenses for possession of radio-active elements and its shelters.
- Reservoirs and Field Development Department assisted the company in all technical matters the company requires.
- Providing the necessary protection for the company and its employees, especially upon transporting the perforation output and radio-active elements by the oil protection units.
- Production sector companies provided stores for keeping the perforators and the relevant accessories.
- Production sector companies settled all costs of operations for 2012.
- North Oil Company and South Oil Company repaid both first and second installments for 2011 and 2012 of the debts of AWLCO on the Iraqi Ministry of Oil under the company's debt settlement agreement, and the settlement mechanism signed between the representatives of the Iraqi government and AWLCO.

Training and Manpower

The company engaged a number of its employees in training courses within the country during 2012 and the first half of 2013, as follows:

- Training two (2) engineers on the operation of production loggers.
- Training five engineers in China on open well logging devices.
- Training one (1) engineer in China on interpreting the lining erosion loggers.
- Training company staff in operations centers on industrial and safety and protection against radiation.

Company Financial Results for 2012 and First Half of 2013

In 2012 and the first half of 2013 work continued and the company posted a net profit of US\$2,510,052 in 2012, and a net profit of US\$756,531 in the first half of 2013.

THE ARAB GEOPHYSICAL EXPLORATION SERVICES COMPANY (AGESCO)

AGESCO was established in 1984 in Tripoli, Libya, with an authorized and paid-up capital of LD19 million. APSCO has a stake of 66.66%, APICORP has a stake of 16.67%, and National Oil Corporation has a stake of 16.67% in AGESCO.

Company Activities in 2012

Crew AG-002

The Crew resumed their activity in May 2012 after an interruption period due to the events in Libya, on concession No. MN-47 for Arabian Gulf Oil Company, recording 165.20km² in May and 237.88km² in June and 186.49km² in August.



Crew AG-003

This crew resumed activity after one year of interruption for Arabian Gulf Oil Company in concession No. MN-4. The crew recorded 34.42km² in February, 232.58km² in March, 217.45km² in April, 235.48km² in May, 228.94km² in June, and in the first week of July they recorded 42.97km², thus ending the program agreed with Arabian Gulf Oil Company.

AGESCO/CGG VERITAS Seismic Data Processing Center

AGESCO/CGG VERITAS Seismic Data Processing Center ceased activity in 2011 due to the events in Libya, and has not resumed activity to date.

Financial Results for the 2012

By the end of 2012 the company posted a net profit of 1,1381 thousand LD.

Manpower and Training

By the end of 2012 the company had 692 employees, out of whom 29 were foreigner.

THE ARAB DETERGENT CHEMICALS COMPANY (ARADET)

The company was established on 12 March 1981 in Baghdad, Iraq, with an authorized capital of ID72 million and subscribed and fully paid-up capital of ID36 million. Three OAPEC member countries, i.e. Iraq, Saudi Arabia, and Kuwait, in addition to three companies: APICORP, Arab Mining Company – Jordan, and Arab Investment Company, have stakes in ARADET.

Company Activities in 2012

- In 2012 the company managed to maintain an acceptable level of production and marketing.
- During 2012 net sales were made, exceeding ID98 billion, equivalent to about US\$82 million

The Company's Financial Status in 2012

The financial statements showed a total profit in 2012 of nearly US\$7.7 million, compared to a total profit of about US\$12.8 million realized in 2011. Meanwhile, net profit for the financial year ended 31 December 2012 was about US\$4.2 million, against US\$7.9 million in 2011.

Manpower and Training in 2012

Manpower movement in 2012 was characterized by the stability of the remaining senior staff, and young employees were appointed to occupy vacancies of company owners. By the end of 2012 the company had 344 employees, including 295 Iraqis and one Arab.

Company Activity during the First Half of 2013

As a result of interruption and turnaround works during the first half of 2013, which lasted for over 75 days, the company could not achieve its production plans for the first half of 2013, but could market part of its realized production to the local and export markets, despite the unstable conditions in the company's product distribution areas during the first half of this year.

Financial Results for the First Half of 2013

Financial statements for the first half of 2013 show a total profit of US\$4.3 million, while the net profit for the period amounted to US\$3.6 million.

Manpower in the First Half of 2013

During the first half of 2013, the company had 349 employees, out of whom 304 Iraqis and one Arab.



APPENDICES



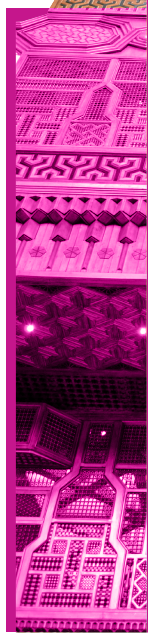
PRESS RELEASES OF OAPEC MINISTERIAL COUNCIL MEETINGS IN 2013

Ninetieth Meeting of OAPEC'S Ministerial Council *(At the level of the Executive Bureau Members)*

The Ministerial Council conveyed its 90th meeting on 16 Rajab, 1434, corresponding to 26 May 2013, in Cairo, Egypt. The meeting was held at the level of the Executive Bureau Members representing their Excellencies the ministers and was chaired by H.E. Engineer Nasir Bin Ibrahim Al-Fuzan, the Executive Bureau Representative of the Kingdom of Saudi Arabia, which has the chair for the current session.

H.E. the Chairman welcomed their Excellencies the Ministers held at the level of the Executive Bureau members, and H.E. OAPEC's Secretary General. He expressed thanks to the Secretariat General for the outstanding preparation for the meeting. His Excellency extended thanks and gratitude to the Arab Republic of Egypt for the hospitality and constant support accorded to the General Secretariat of OAPEC.

H.E. Mr. Abbas Ali Al-Naqi, OAPEC's Secretary General welcomed their Excellencies the Executive Bureau representatives of their member countries to the 90th Ministerial Council Meeting. Mr. Al-Naqi expressed profound appreciation to H.E. Engineer Sherif Hasan Hadara, Minister of Petroleum and Mineral Resources in Egypt and to all officials for facilitating success of the meeting and for gracious hospitality.



Afterwards, the Council commenced discussions by adopting the draft agenda:

- The Council ratified the proceedings of the 89th OAPEC Council of Ministers Meeting held in Cairo on 22/12/2012.
- The Council approved OAPEC's financial statements (General Secretariat and Judicial Tribunal) for 2012.
- The Council reviewed the preparations relating to the 10th Arab Energy Conference to be held in Tripoli, Libya in October 2014.
- The Council also reviewed the activity report of OAPEC General Secretariat, adopted the Executive Bureau recommendations including follow-up of environment and climate change, annual program of seminars and meetings organized or attended by the General Secretariat at the level of the Arab League, and the course of Data Bank.
- In addition to the program of studies to be conducted, accomplishments up to date, and the studies to be completed in the second half of 2013.

The Council concluded the meeting, expressing their thanks and appreciation to the Arab Republic of Egypt for the hospitality and quality preparations towards the success of the meeting.

Cairo: 26 May 2013

91st OAPEC Council of Ministers Meeting

OAPEC Council of Ministers held its 91st meeting, chaired by His Excellency Engineer Ali Bin Ebrahim Al-Nuaimi, Minister of Petroleum and Mineral Resources in the Kingdom of Saudi Arabia, Chairman of the current session of the Council, in Doha, State of Qatar, on 21 December 2013.

His Excellency the Chairman opened the meeting, welcoming Their Excellencies the Ministers and heads of delegations. His Excellency expressed hope for successful deliberations of the items on the agenda, and emphasizing that OAPEC's main objective is to achieve cooperation between the member countries in the various aspects of economic, technical and human activities in petroleum industry. His Excellency congratulated the leadership, government and people of the sisterly State of Qatar on the occasion of the National Day, wishing them constant prosperity.

His Excellency welcomed Their Excellencies the Ministers, participating, for the first time, in the Ministerial Meeting. These are: His Excellency Sheikh Ahmed bin Mohammed Al Khalifa, Minister of Finance – Minister Supervising Oil and Gas Affairs, and His Excellency Mr. Mostafa Jassim Al-Shamali, Deputy Prime Minister and Minister of Oil in the State of Kuwait, His Excellency Mr. Suhail Bin Mohammad Faraj Fares Al-Mazrouei, Minister of Energy in UAE wishing them all success in their new tasks.

His Excellency indicated that OAPEC member countries continued to play a positive, significant role towards safeguarding the stability of petroleum market and prices at suitable prices for producing and consuming countries, and the growth of global economy, particularly the emerging and developing economic.

His Excellency mentioned that today's OAPEC meeting comes after two weeks of OPEC meetings, wherein the Organization's production ceiling was upheld, as the petroleum market is in a stable position, and the prices are suitable for all.



Following, His Excellency Mr. Abbas Ali Al-Naqi, OAPEC Secretary General, welcomed Their Excellencies the Ministers and heads of delegations participating in OAPEC Council of Ministers Meeting, wishing them successful deliberations and pleasant stay in the State of Qatar. His Excellency expressed aspiration that they will continue supporting the activity of the Organization. His Excellency commended the great facilities provided by the State of Qatar to OAPEC's meeting in its territories, which substantially contributed to the success of the meetings, wishing the State of Qatar all progress and prosperity.

Following the adoption by the Council of the draft agenda, covering several topics relevant to OAPEC's activities and joint Arab action in the area of energy, the Council adopted the following resolutions:

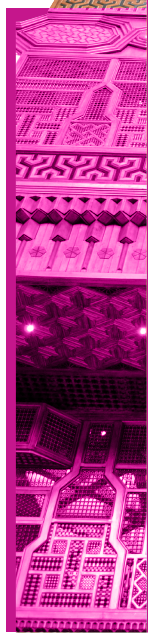
- Honoring the winners of OAPEC Scientific Award 2012 for their researches addressing the topic of "Technological Advancement and Utilization of Unconventional Natural Gas Resources in the Arab Countries", where the second award of KD 5,000 was granted equally to both papers presented by:
- **Mr. Ahmad Ali Abdul Majeed, and Mr. Mohammad Khalid Khalifa**, from the Arab Republic of Egypt.
- **Mr. Ahmad Mahmoud Shehata**, from the Arab Republic of Egypt.

Meanwhile, the first award of KD 7,000 was concealed.

- The draft OAPEC budget for 2014 was approved.
- Tareq Al-Osaimi & Partners were appointed at OAPEC Auditors for 2014.
- Reviewing the reports exhibiting the General Secretariat's activities for 2013, representing preparation of the various studies relating to oil, gas and energy industry technologies, organization of seminars and meetings, monitoring the matters relating to environmental affairs and climate change, as well as developing the Data Bank.

- The Council took note of the preparations for the 10th Arab Energy Conference to be held in Tripoli - Libya during the period 27-29 October 2014. It has been resolved to hold the conference in Abu Dhabi – UAE during the same period. The 11th Arab Energy Conference is to be held in the State of Libya.
- The Council reviewed the OAPEC Sponsored Ventures Activity Report, and took note of the outcome of the 42nd Coordinating Meeting of the Sponsored Ventures Officials, which was held in Cairo on 7 October 2013.
- The Council resolved to extend the period where the Republic of Iraq is assigned to supervise the Arab Oil Training Institute, for one year, with effect from 1 January 2014.
- The Council approved the renewal of the service of His Excellency Mr. Abbas Ali Al-Naqi, OAPEC Secretary General, for a three-year term, with effect from 1 March 2014.
- His Excellency the Chairman of the Ministerial Council, on behalf of Their Excellencies The Ministers and heads of delegations, sent a cable to His Highness Sheikh Tamim Bin Hamad Al Thani, Amir of the State of Qatar, expressing profound thanks and appreciation for the hospitality towards the success of the conference.
- It was agreed to hold the next meeting in Abu Dhabi UAE on 21 December 2014.

Doha: 18 Safar 1435H, corresponding to: 21 December 2013AD





Organization of Arab Petroleum Exporting Countries (OAPEC)

