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The Middle East and the Geopolitics of Energy: A Graphic Analysis

Part One

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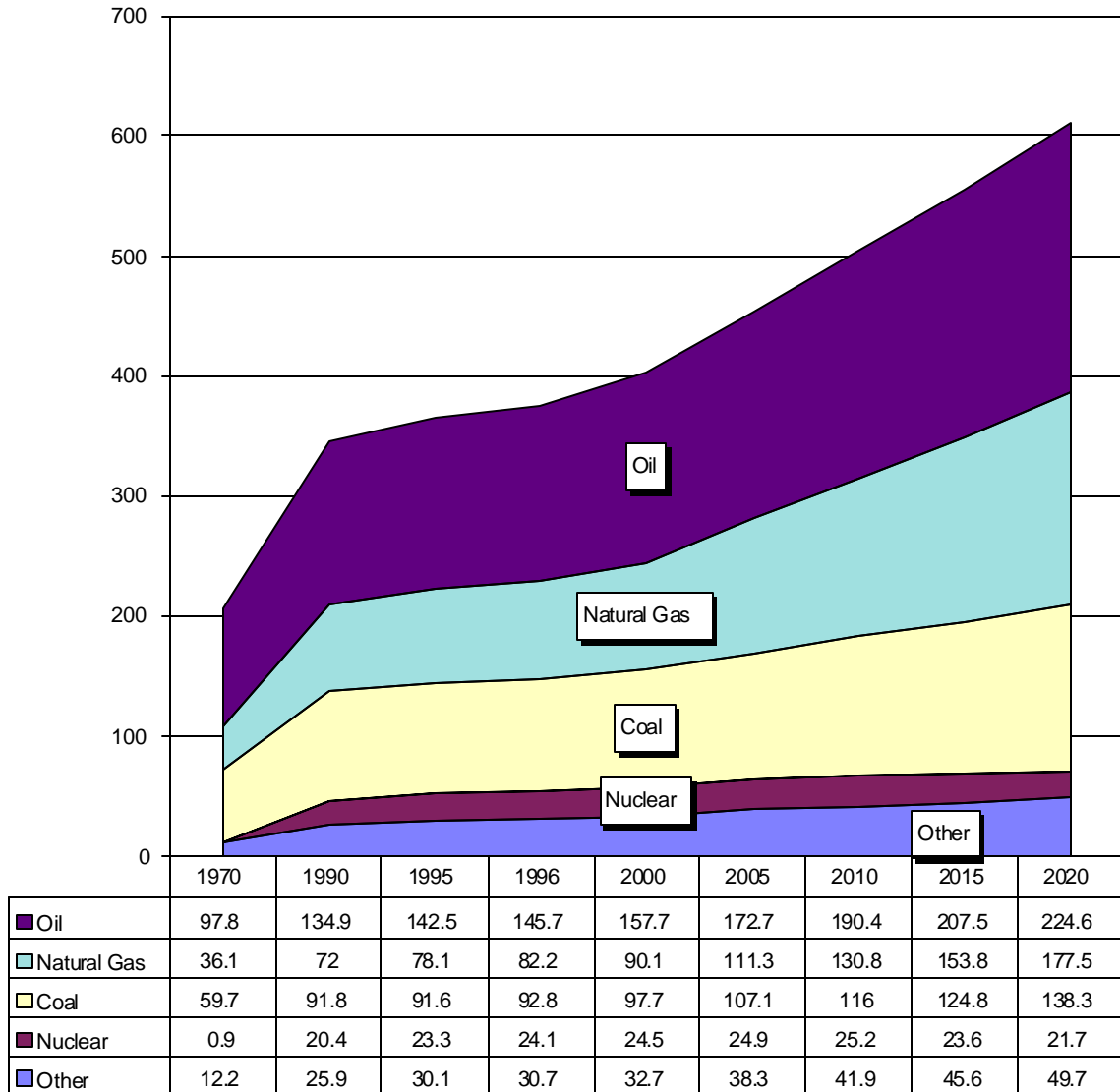
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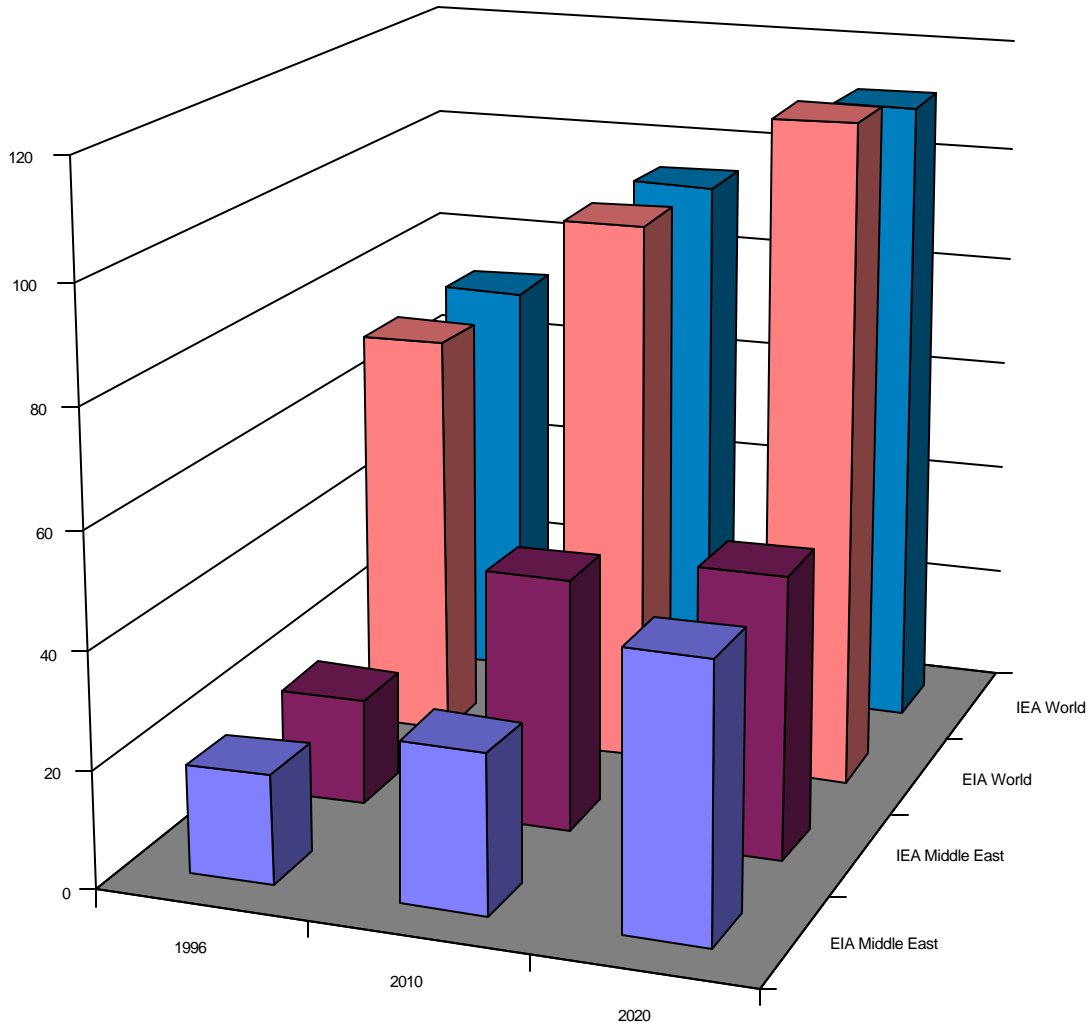
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Figure I.1
Rising World Energy Demand By Type of Primary Fuel: 1970-2020
 (Quadrillion BTU)



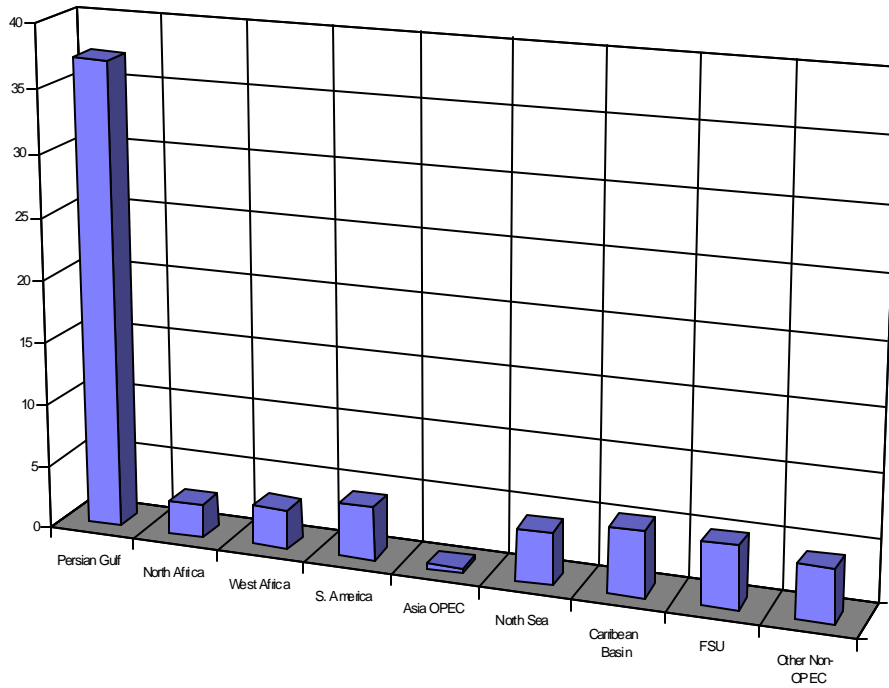
Source: EIA, International Energy Outlook, 1999, DOE/EIA-0484(99), pp. 142-143.

Figure I.2
Projected Middle Eastern and World Oil Production: IEA versus EIA
 (In Millions of Barrels Per Day)



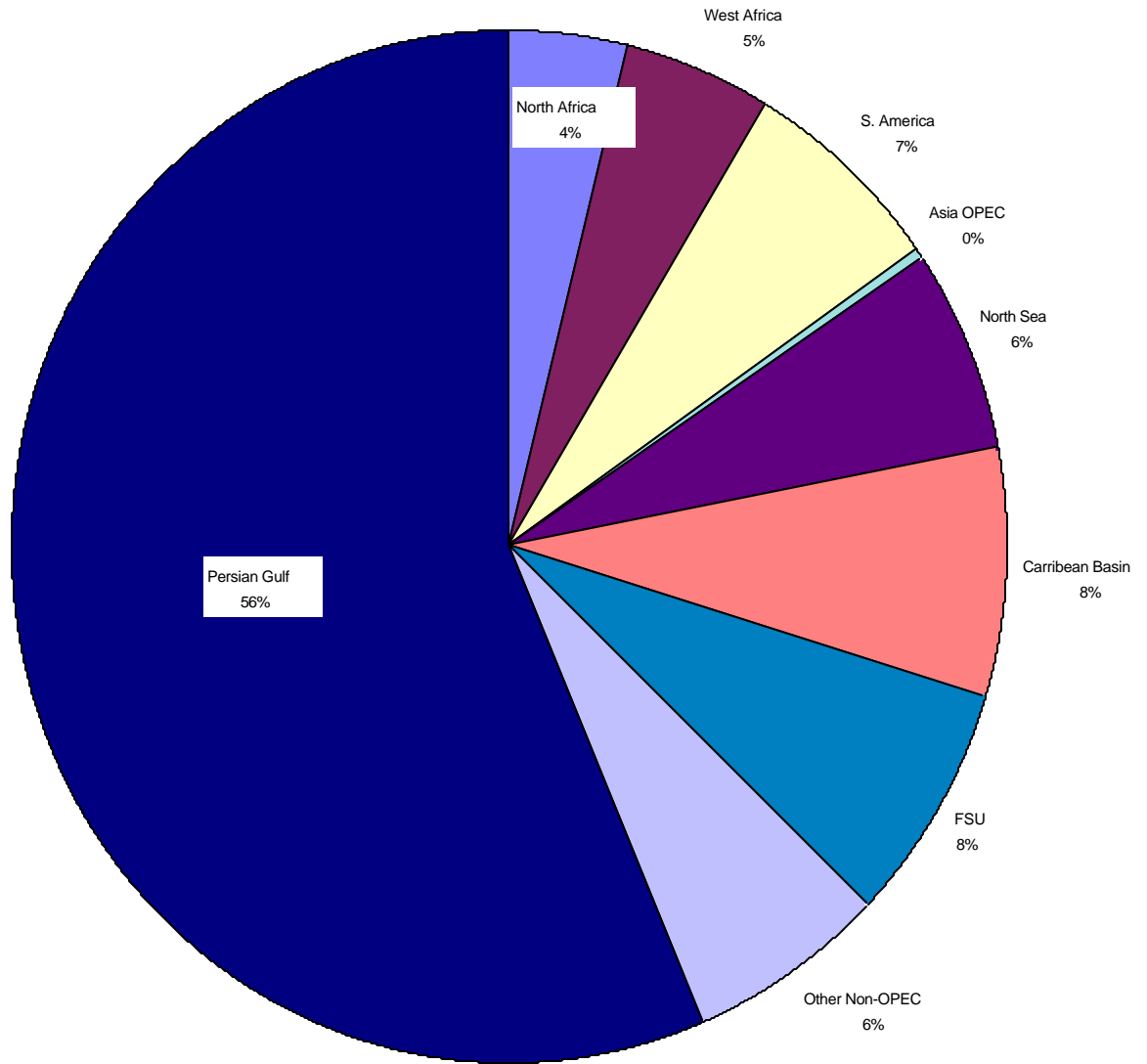
	1996	2010	2020
EIA Middle East	18.5	27.2	47.3
IEA Middle East	18.5	43.7	48.9
EIA World	71.8	95.5	115.9
IEA World	72	94.8	111.5

Figure I.3
The Global Importance of Middle Eastern Energy Exports in 2020
(EIA Reference Case Estimate in MMBD)



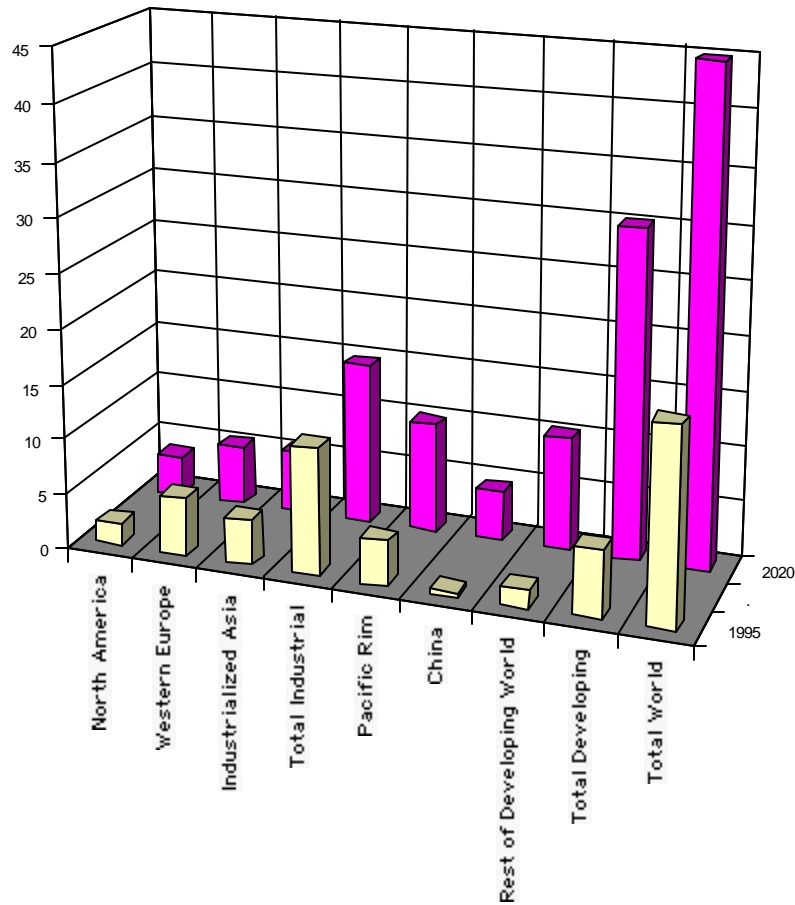
Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1999, DOE/EIA-0484 (99), March 1999, p.32.

Figure I.4
Middle Eastern Energy Exports as a Percent of World Total in 2020
(EIA Reference Case Estimate in Percent)



Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1999, DOE/EIA-0484 (99), April 1999, pp. 31-33.

Figure I.5
The EIA Estimate of Middle Eastern Oil Exports by Destination: 1995 versus 2020
 (in MMBD)

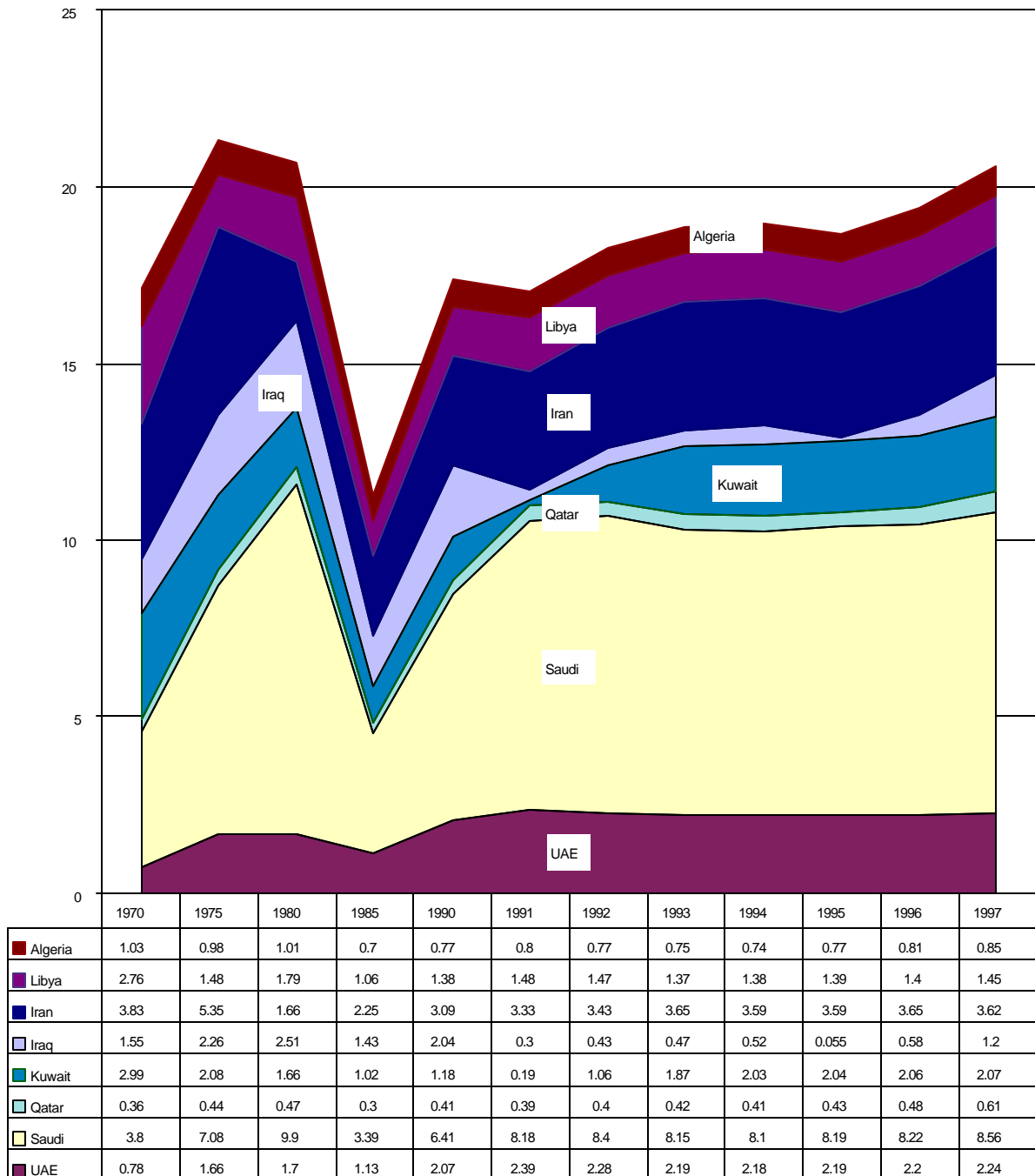


	North America	Western Europe	Industrialized Asia	Total Industrial	Pacific Rim	China	Rest of Developing World	Total Developing	Total World
1995	2.1	5.3	4.2	11.6	4.1	0.4	1.6	6.1	17.7
2020	3.7	5.4	5.7	14.8	10	4.6	10.4	30	44.8

Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1999, DOE/EIA-0484 (99), March 1999, pp. 32-37.

Figure II.1

CEA Estimate of Historical Trends in Middle Eastern Oil Production: 1970-1997
(\$Current Billions)

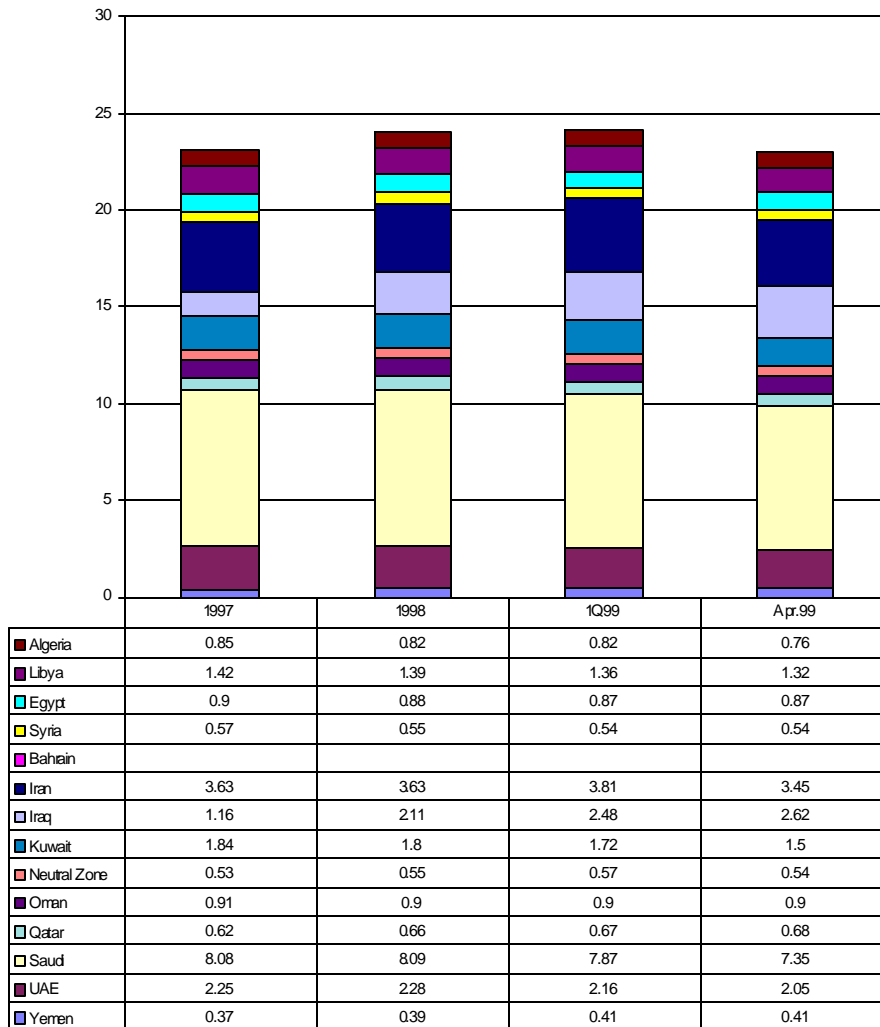


Total ME												
OPEC	13.31	18.87	17.91	9.53	15.19	14.77	15.99	16.75	16.84	16.99	17.18	18.30
Total ME	13.95	19.57	18.40	10.25	16.49	16.19	17.43	18.34	18.59	18.84	19.08	20.16

Adapted by Anthony H. Cordesman from Cambridge Energy Associates, *World Oil Trends, 1998*, Cambridge, Mass., 1998, pp. 26-27.

Figure II.2

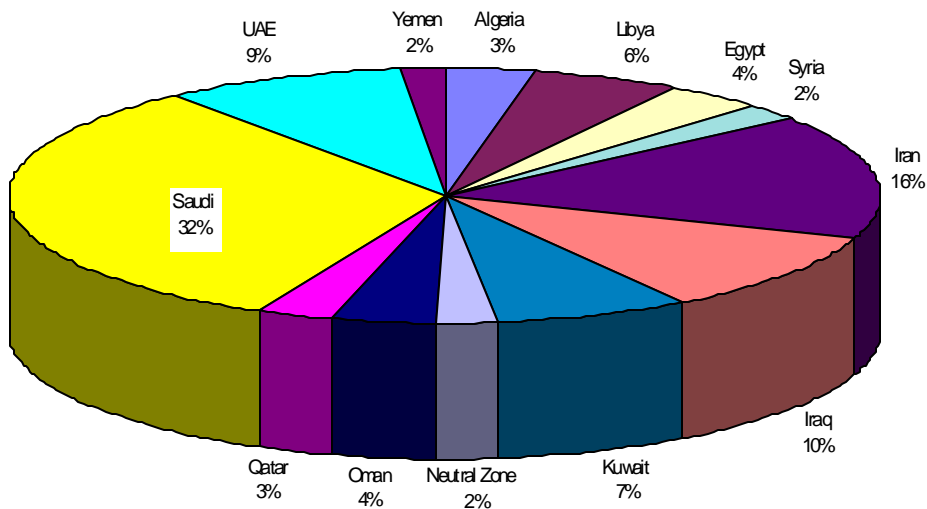
IEA Current Middle Eastern Oil Production Levels by Country
(In Millions of Barrels Per Day)



Adapted by Anthony H. Cordesman from data provided by the IEA, Oil Market Report, May 10, 1999

Figure II.3

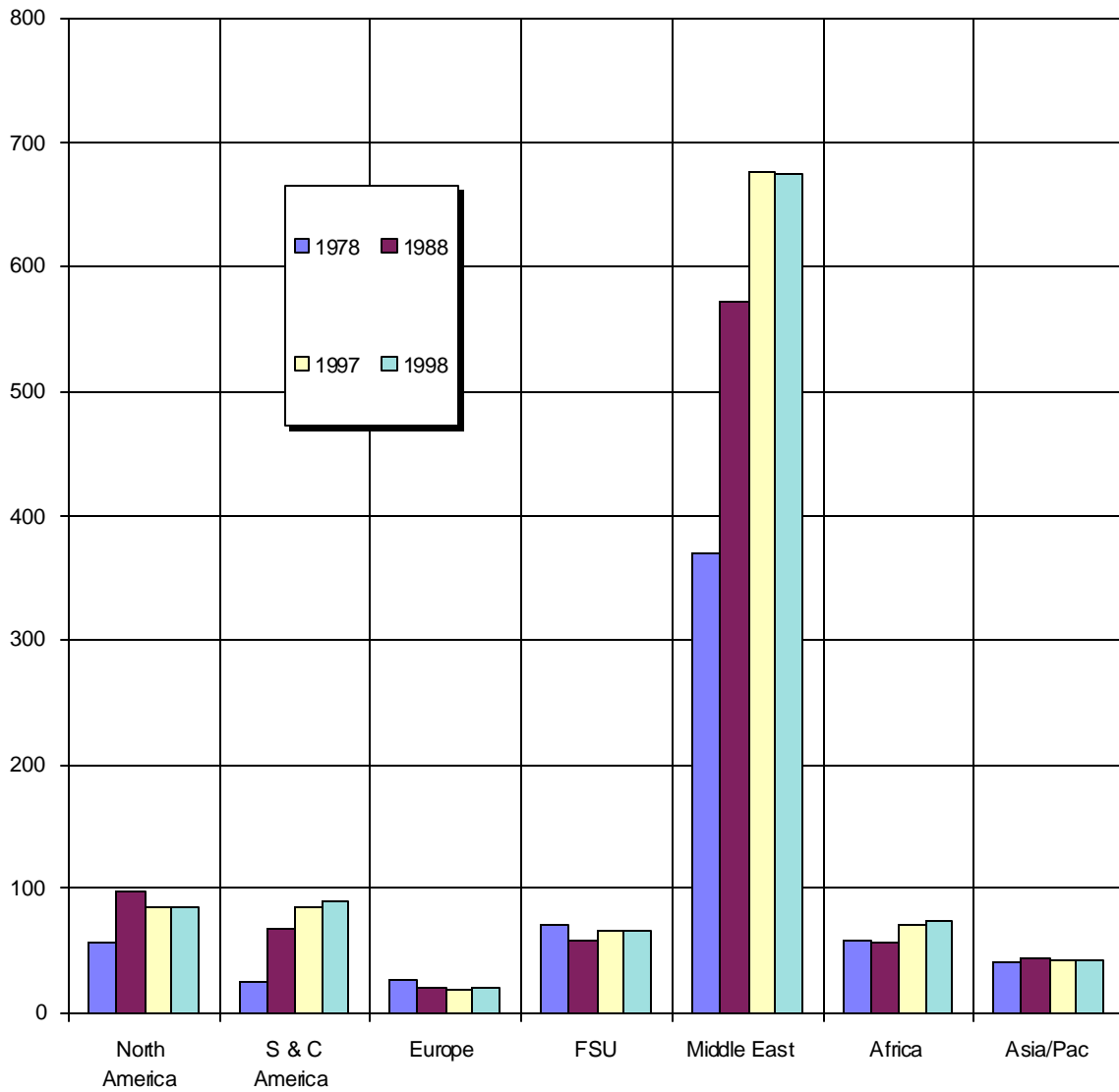
IEA Estimate of Percentage of Total Current Middle Eastern Oil Production by Country
(Percent in 1st Quarter 1999)



Adapted by Anthony H. Cordesman from data provided by the IEA, Oil Market Report, May 10, 1999.

Figure II.4

Shifts in the Regional Balance of Oil Reserves
(Billions of Barrels)



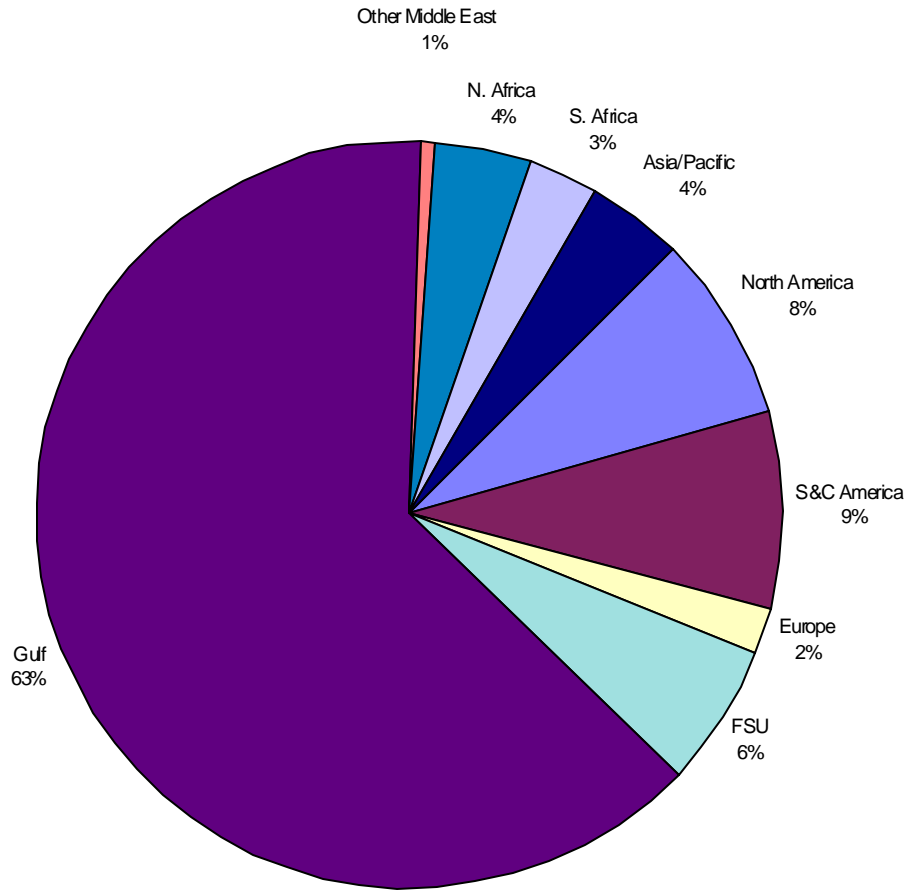
1978	57.1	25.3	27.4	71	369.6	57.9	40
1988	97.8	67.8	20.3	58.5	571.6	56.9	45
1997	85.2	86.2	20.2	65.4	676.9	70	42.3
1998	85.1	89.5	20.7	65.4	673.7	75.4	43.1

Source: Oil and Gas Journal, and BP Statistical Review of World Energy, 1999, p. 4.

Figure II.5

The Middle East and the Gulf Dominate Future Oil Supply: World Oil Reserves by Region as a Percent of World Total

(Based on Oil and Gas Journal Forecast for and a World Total of 1,052.9 billion barrels)

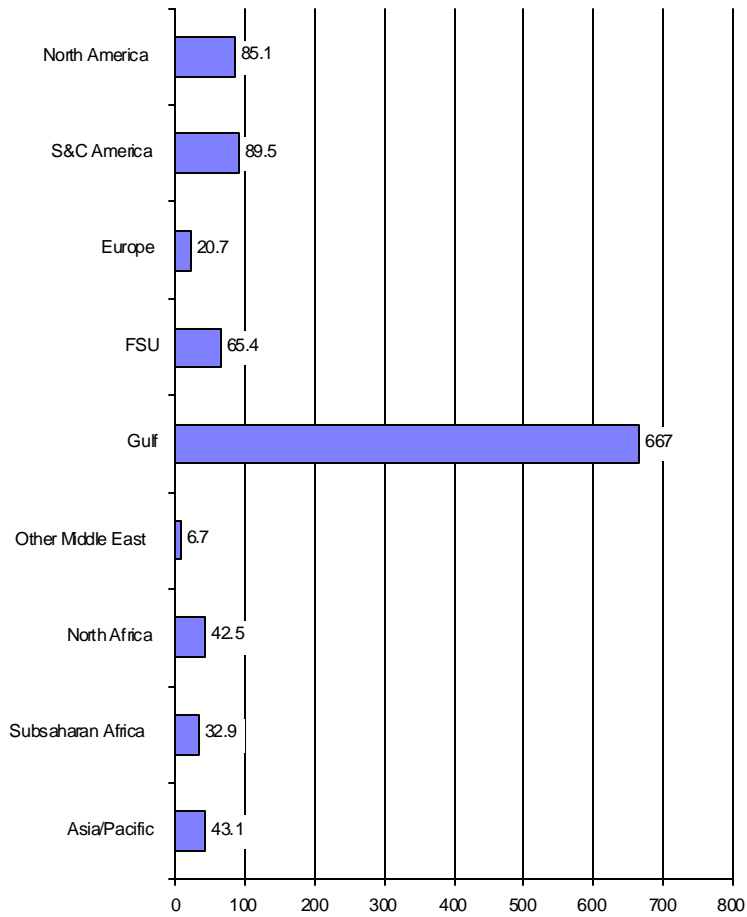


Source: Oil and Gas Journal, and BP Statistical Review of World Energy, 1999, p. 4.

Figure II.6

The Middle East and the Gulf Dominate Future Oil Supply: World Oil Reserves by Region in Billions of Barrels

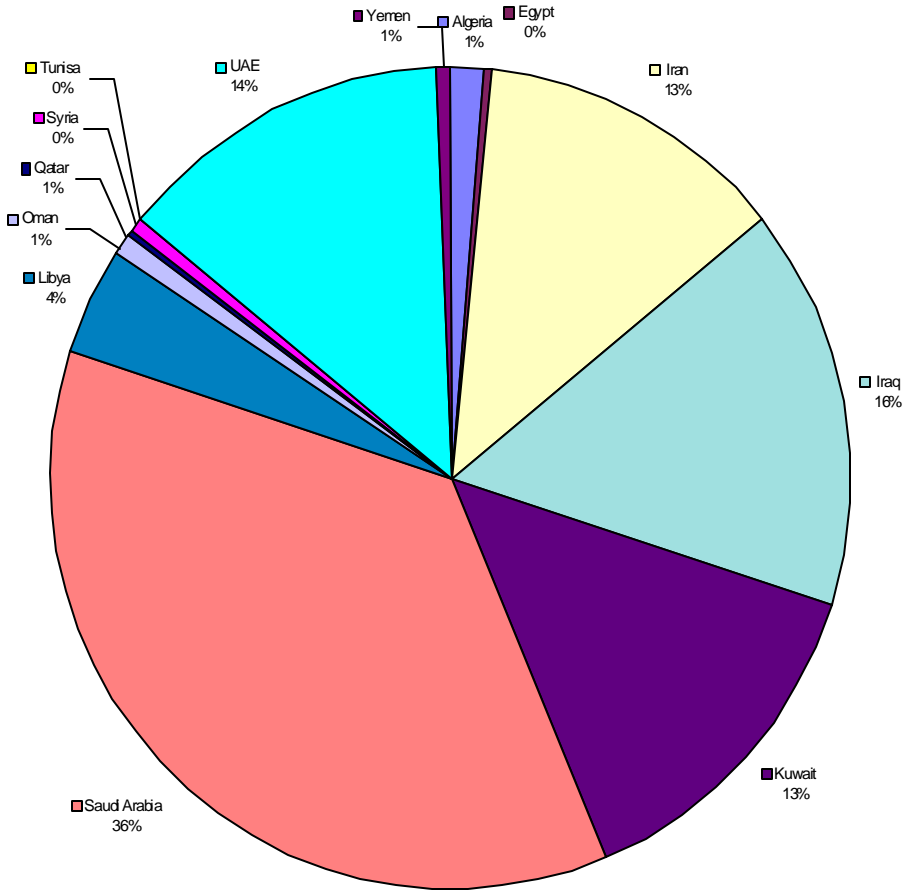
(Based on Oil and Gas Journal Forecast for and a World Total of 1,052.9 billion barrels)



Source: Oil and Gas Journal, and BP Statistical Review of World Energy, 1999, p. 4.

Figure II.7

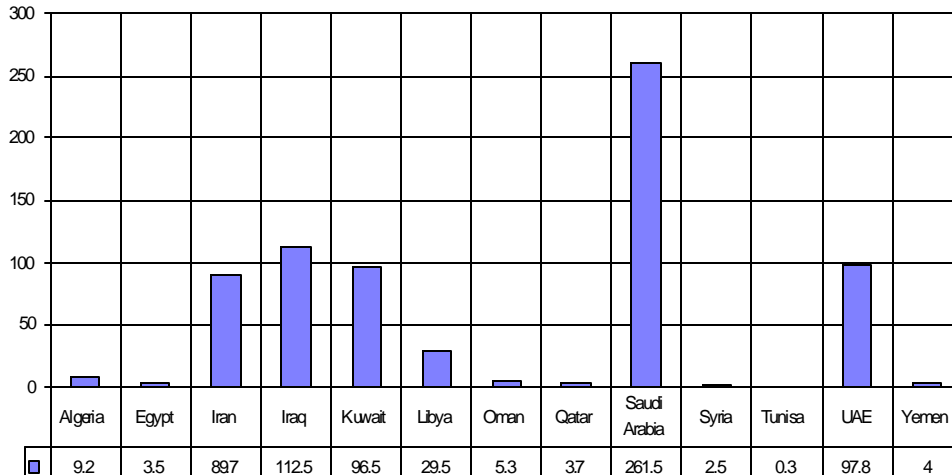
Country Shares of Middle Eastern Oil Reserves
(in Percent of Total)



Source: BP Amoco Statistical Review of World Energy, 1999, p.4.

Figure II.8

Proven Middle Eastern Oil Reserves by Country
(in Billions of Barrels)

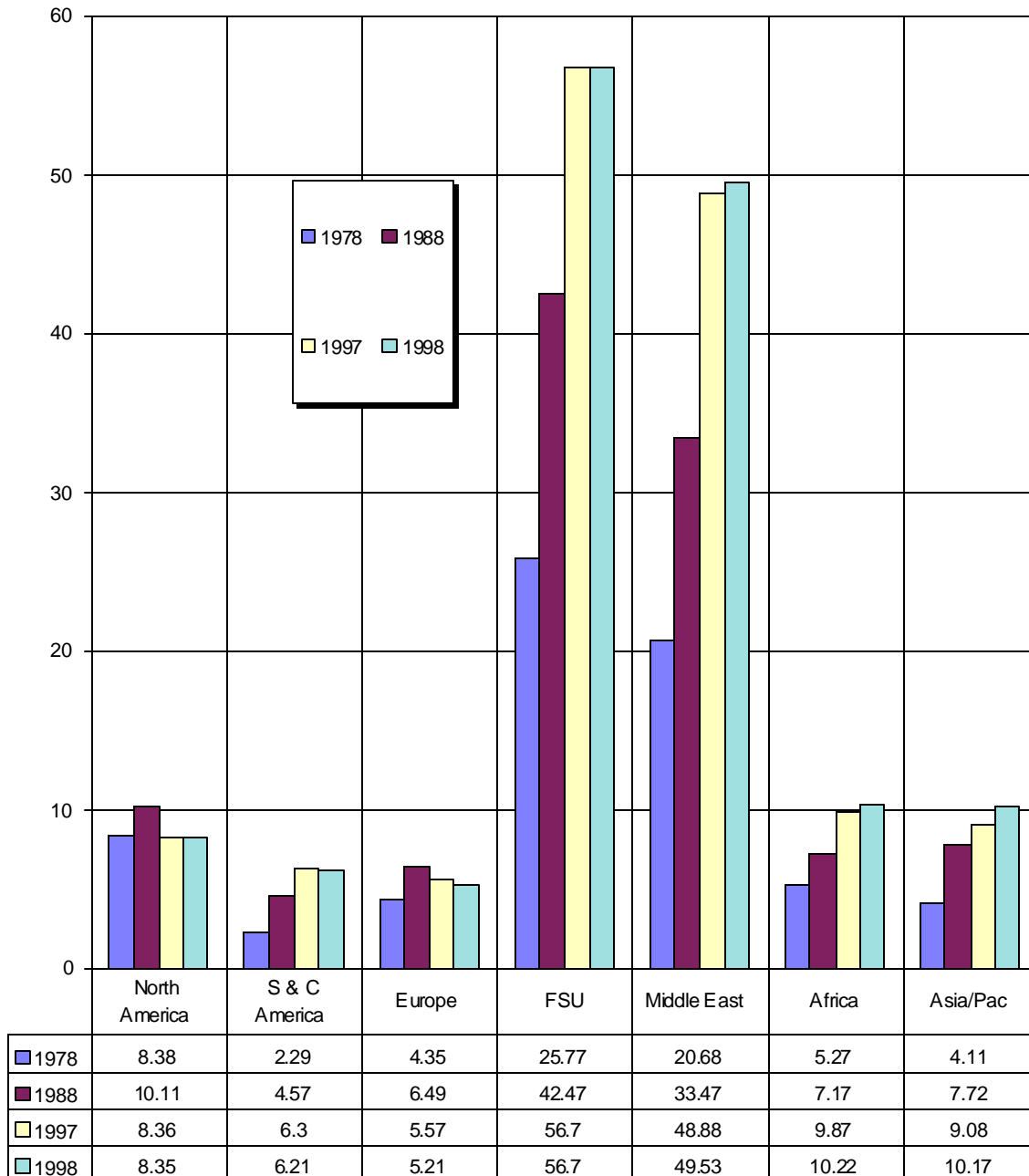


Country	<u>End-1997</u>	<u>End-1998</u>	<u>Percent of World Proven Reserves</u>	<u>Reserve to Production Ratio In Years at Current Rates</u>
Algeria	9.2	9.2	0.9	19.8
Egypt	3.8	3.5	0.3	11.4
Iran	93.0	89.7	8.5	65.3
Iraq	112.5	112.5	10.7	100+
Kuwait	96.5	96.5	9.2	100+
Libya	29.5	29.5	2.8	56.4
Oman	5.2	5.3	0.5	16
Qatar	3.7	3.7	0.4	13.3
Saudi Arabia	261.5	261.5	24.8	80.7
Syria	2.5	2.5	0.2	12.2
Tunisia	0.3	0.3	0.5	13.9
UAE	97.8	97.8	9.3	100+
Yemen	4.0	4.0	0.4	28.7
Total	719.5	716	68	83.2

Source: BP Amoco Statistical Review of World Energy, 1999, p.4.

Figure II.9

The Role of the Middle East in the Regional Balance of World Gas Reserves: 1978-1998
(Trillions of Cubic Meters)

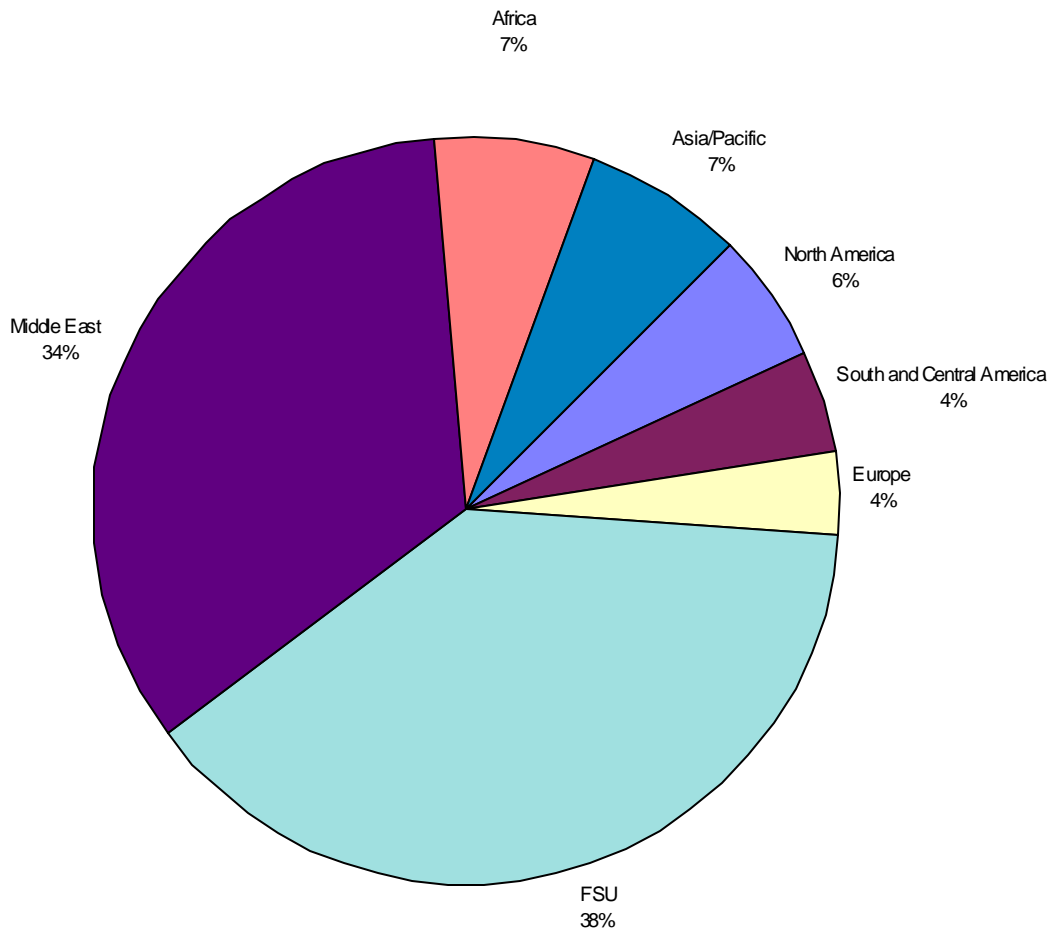


Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 1999, p. 20.

Figure II.10

Proved Middle Eastern and the Gulf Gas Reserves as a Percent of World Total

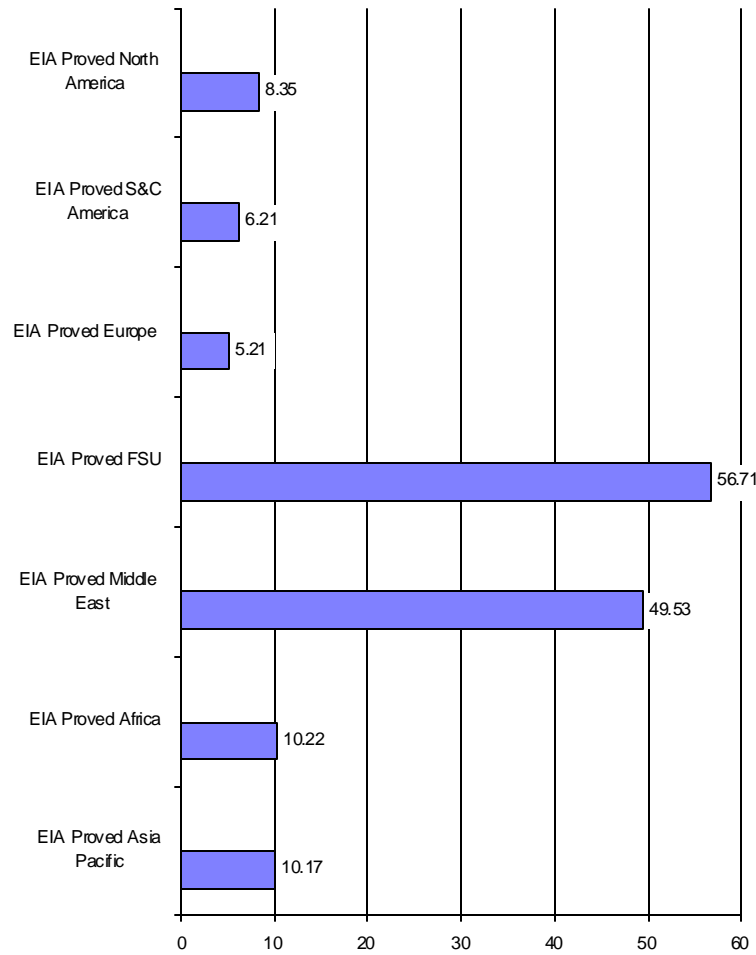
(Based on Oil and Gas Journal Forecast for a World Total of 146.39 Trillion Cubic Meters)



Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 1999, p. 20.

Figure II.11

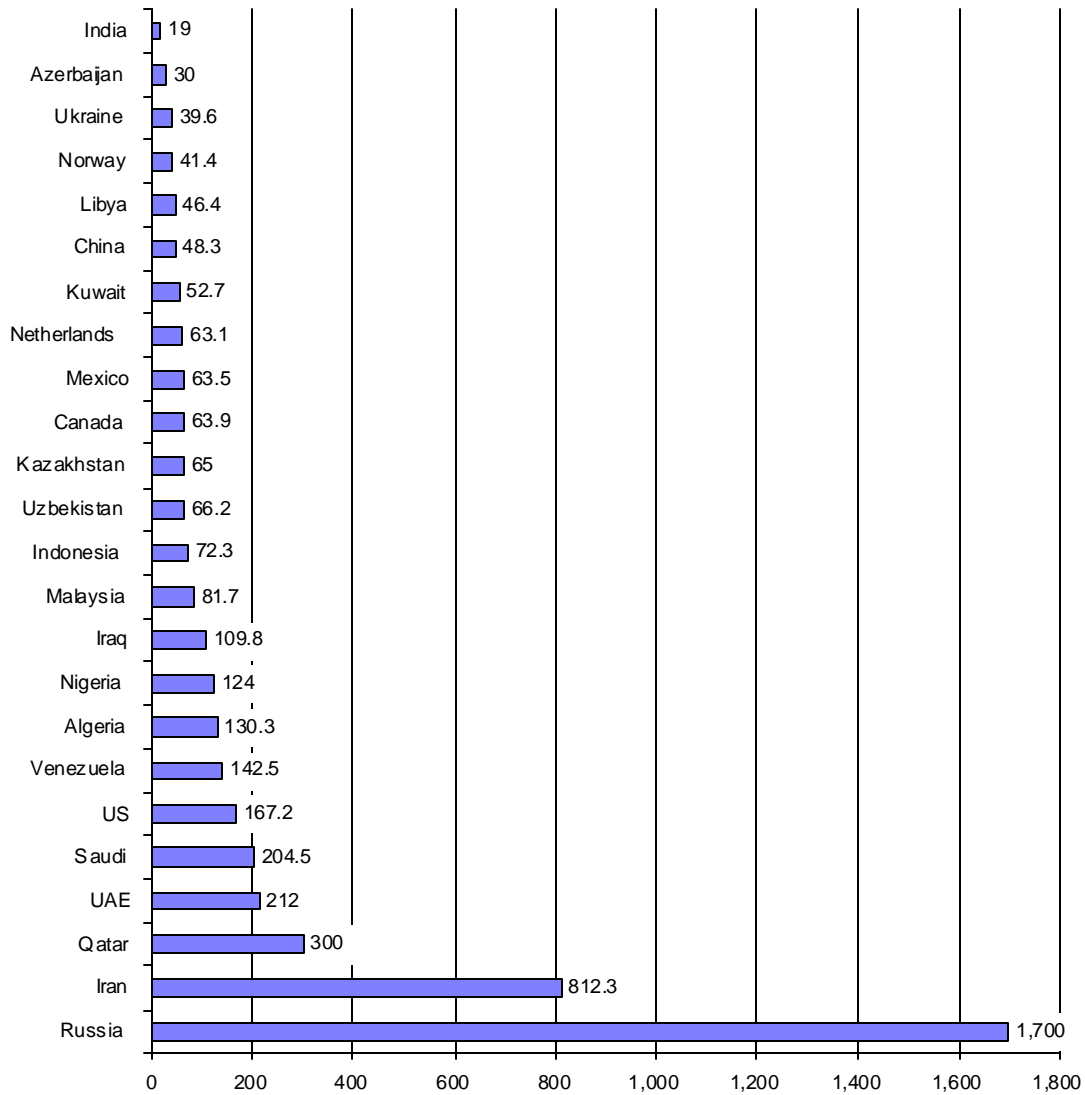
The FSU and the Middle East Dominate Proven World Gas Reserves
(in Trillions of Cubic Meters)



Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 199, p. 20.

Figure II.12

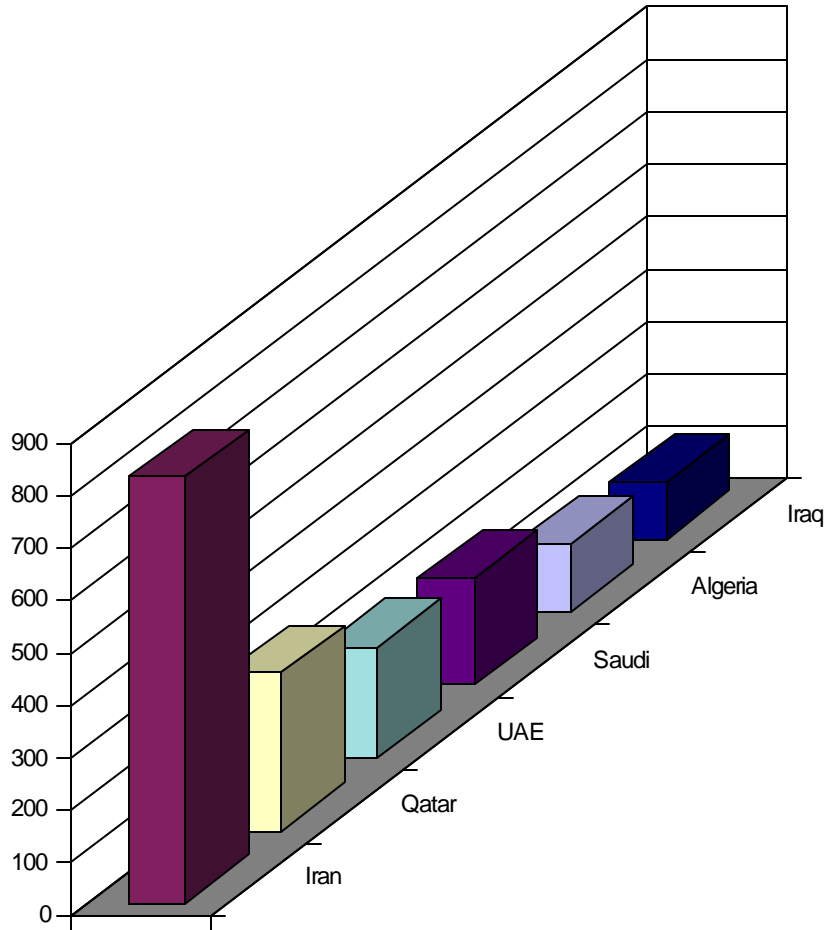
**The Importance of Middle Eastern States in Terms of Proven World Gas Reserves
by Key Nations**
(Trillions of Cubic Feet in Reserves)



Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 1999, p. 20.

Figure II.13

Proven Gas Reserves by Middle Eastern Nation
 (Nations with At Least 100 Trillion Cubic Feet in Reserves)

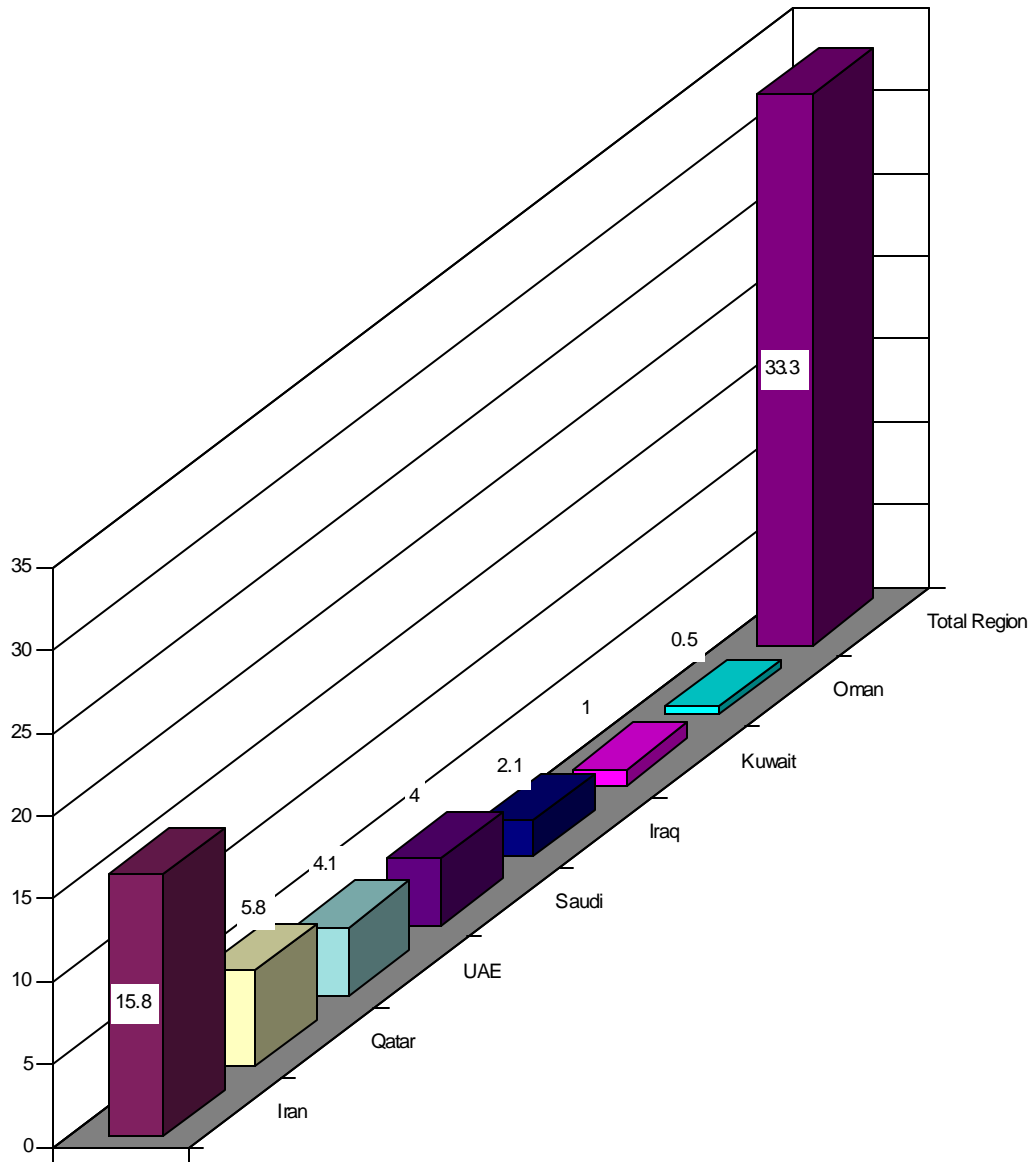


■ Iran	812
■ Qatar	300
■ UAE	212
■ Saudi	204
■ Algeria	130
■ Iraq	110

Source: Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 1999, March 1998, DOE/EIA-0484(99), Reference Case, p. 38.

Figure II.14

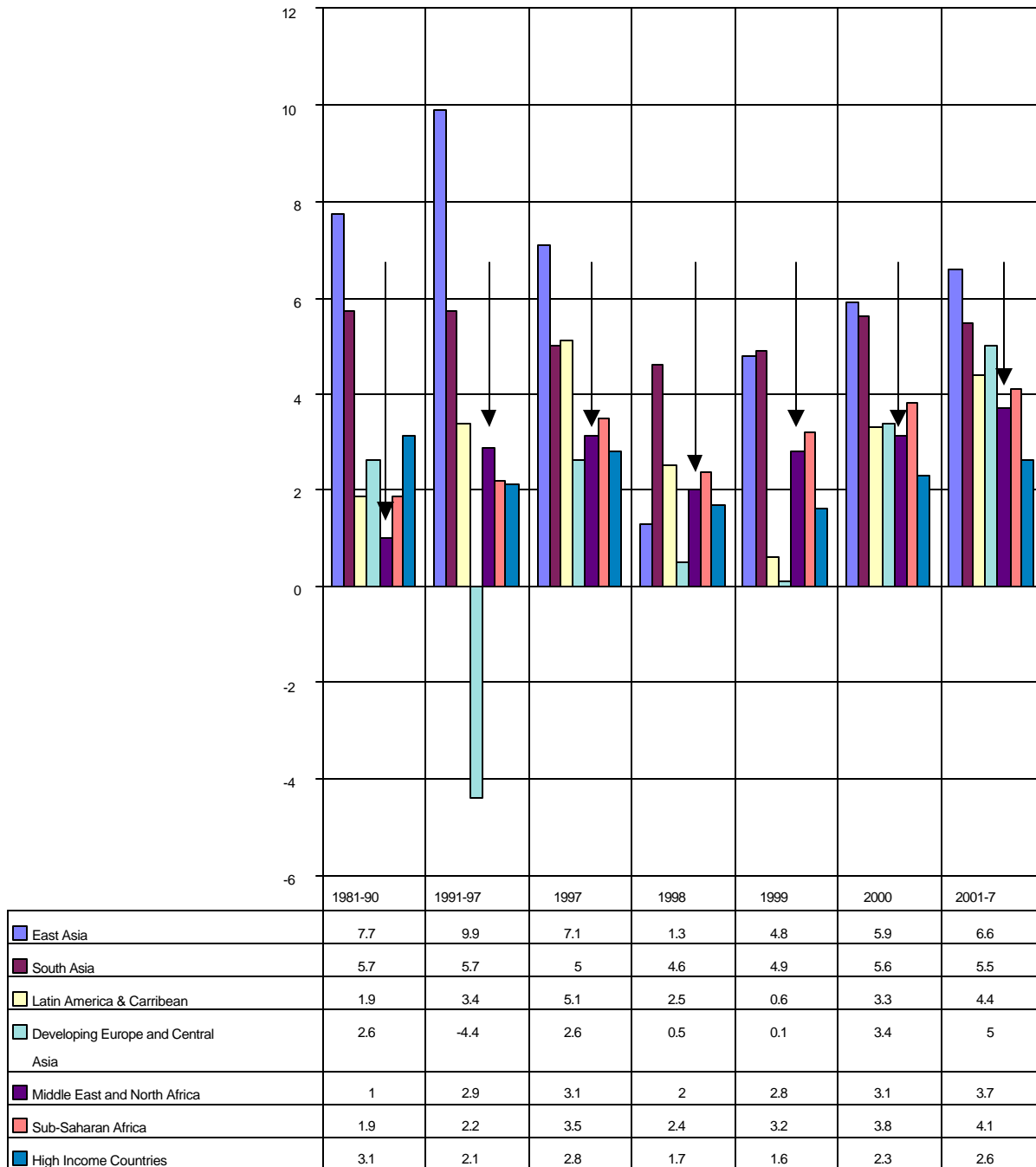
Proven Gulf Gas Reserves as Percent of Total Proved World Gas Reserves



Source: Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 1999, March 1999, DOE/EIA-0484(99), Reference Case, p. 38.

Figure III.1

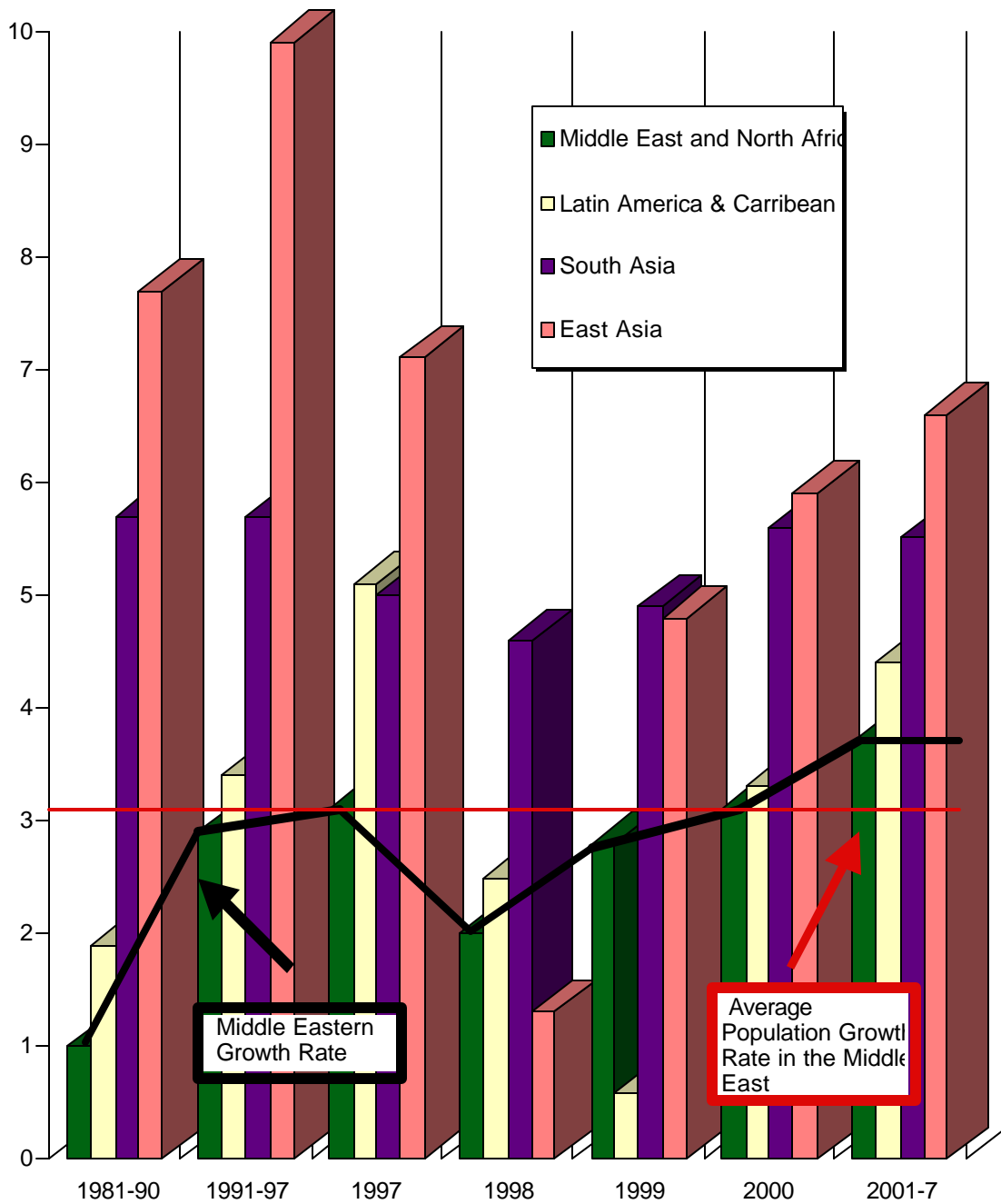
The Middle East's Track Record in Economic Growth: 1981-2007
(Growth as a Percent of GDP)



Source: Adapted by Anthony H. Cordesman from World Bank, Global Economic Prospects and the Developing Countries, 1996, p. 22

Figure III.2

Economic Growth Rate Versus Other Developing Regions and the Population
Growth Rate in the Middle East
 (Growth as a Percent of GDP)

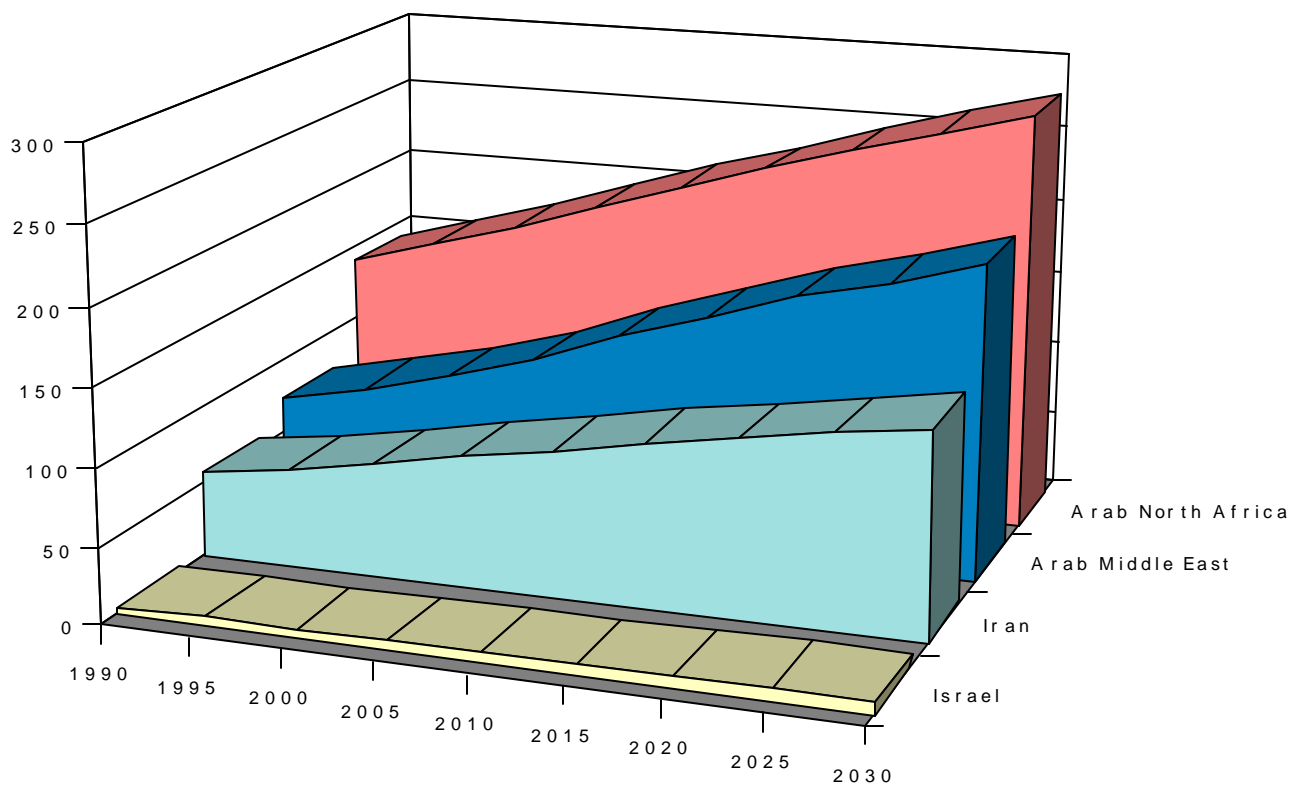


Source: Adapted by Anthony H. Cordesman from World Bank, Global Economic Prospects and the Developing Countries, 1996, p. 22

Figure III.3

The Population Time Bomb: Demographics of the Middle East: 1990-2030:

(Johns Hopkins/World Bank Estimate in Millions)

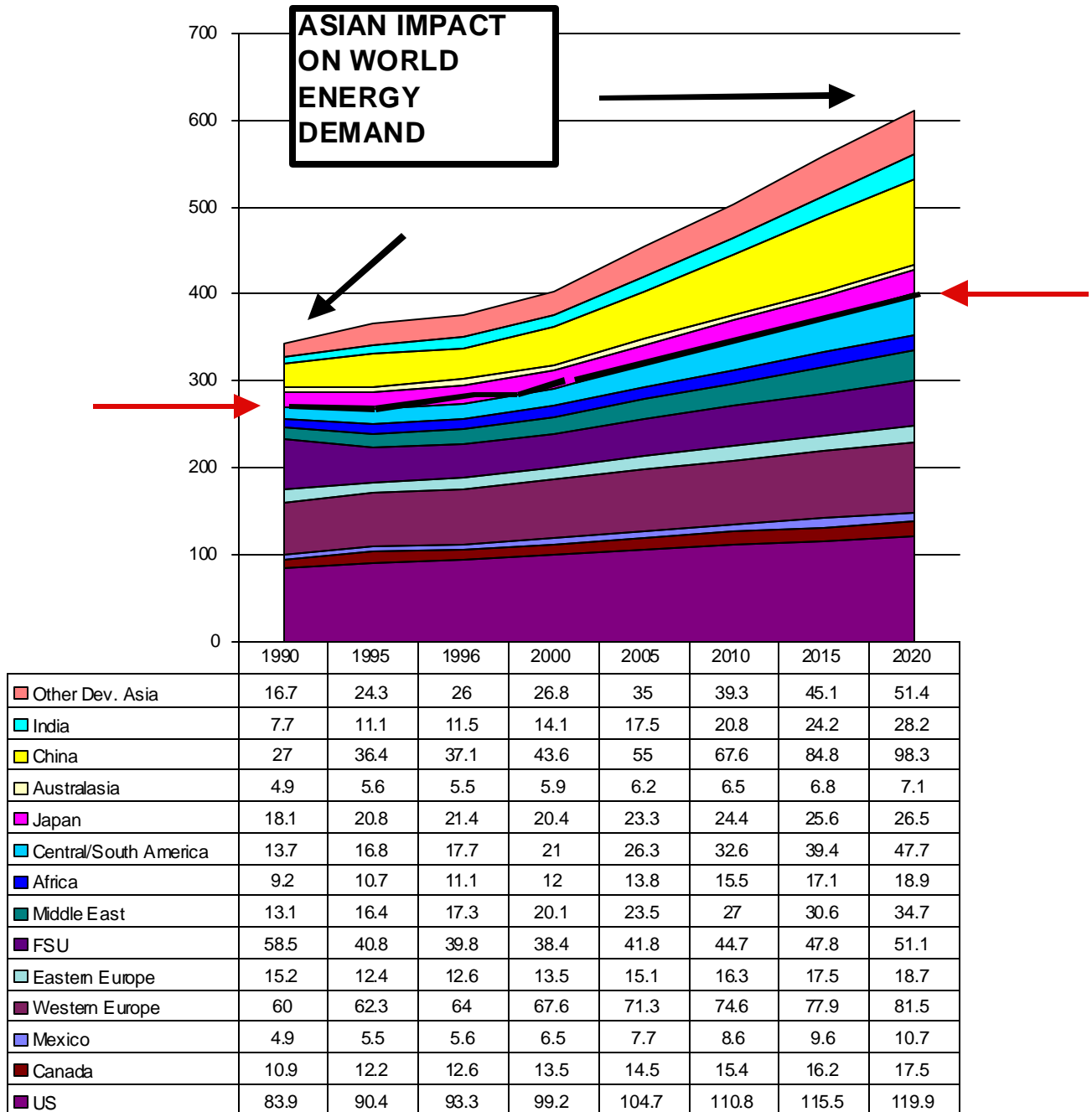


Adapted by Anthony H. Cordesman from World Bank data base for World Population Projections, 1996.

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Figure IV.1

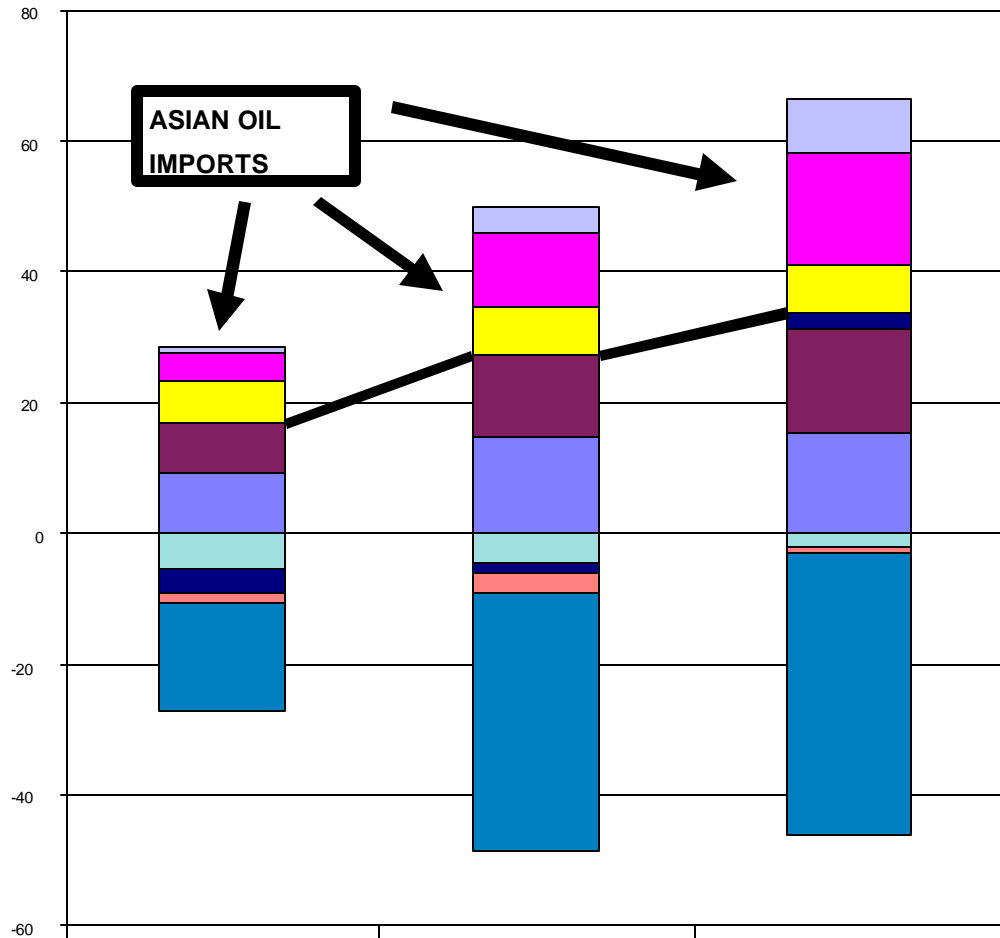
Rising World Energy Demand by Region: 1970-2015
(Quadrillion BTU)



Source: EIA, International Energy Outlook, 1999, DOE/EIA-0484(99), March 1999, p.141.

Figure IV.2

The Impact of Asia on World Oil Demand, Supply, and Imports: 1996-2020
(In Millions of Barrels Per Day)

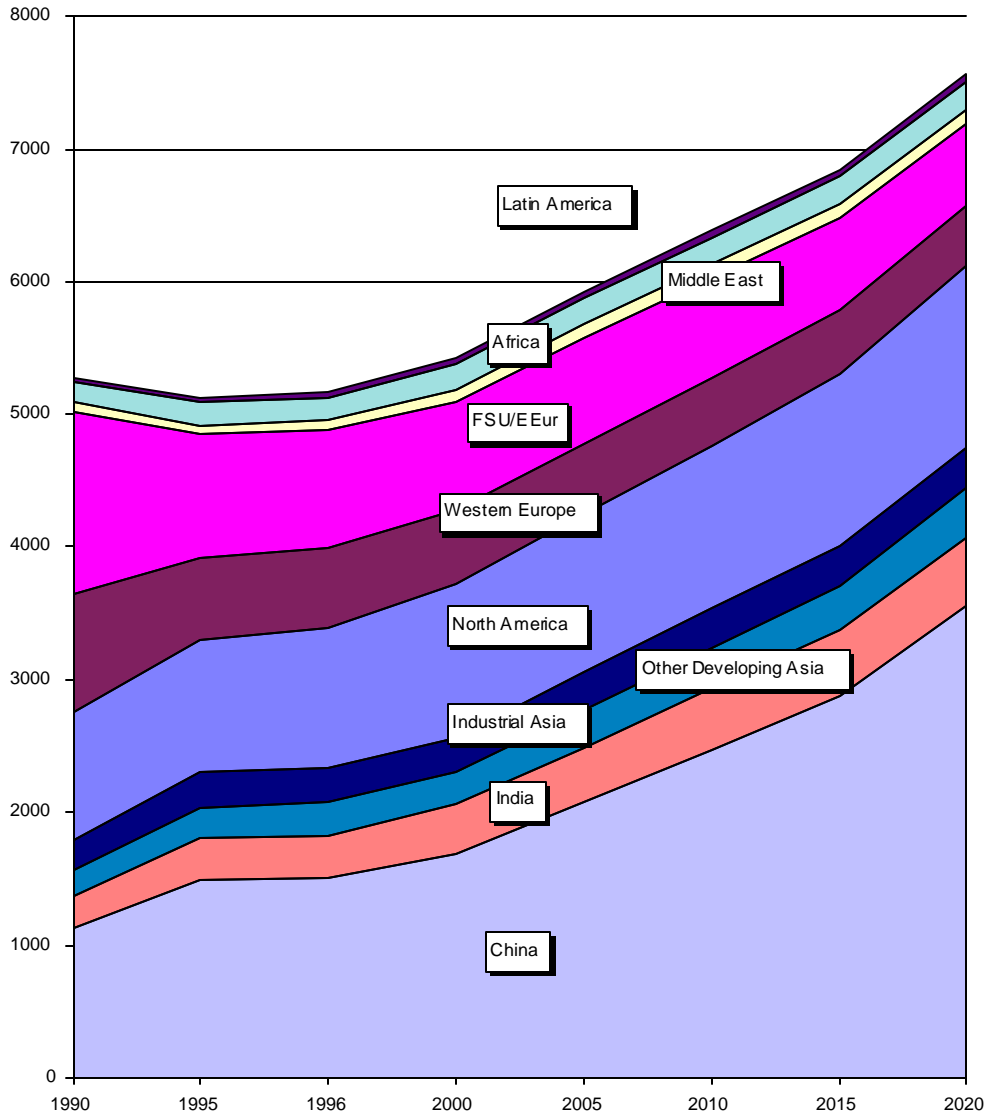


	1996- Net Imports	2010 - Net Imports	2020 - Net Imports
China	0.5	3.9	8.1
S & E. Asia	4.8	11.3	17.2
OECD Pacific	6	7.4	7.6
Middle East	-16.3	-39.7	-42.9
FSU & EE	-1.8	-3	-0.9
Latin America	-3.5	-1.4	2.5
Africa	-5.5	-4.6	-2.2
OECD Europe	7.7	12.5	15.9
OECD North America	9.3	14.8	15.1

Adapted by Anthony H. Cordesman IEA, *World Energy Outlook, 1998*, pp. 116-118.

Figure IV. 3

Coal Consumption and Potential Oil Demand: 1990-2020
(Million Short Tons)

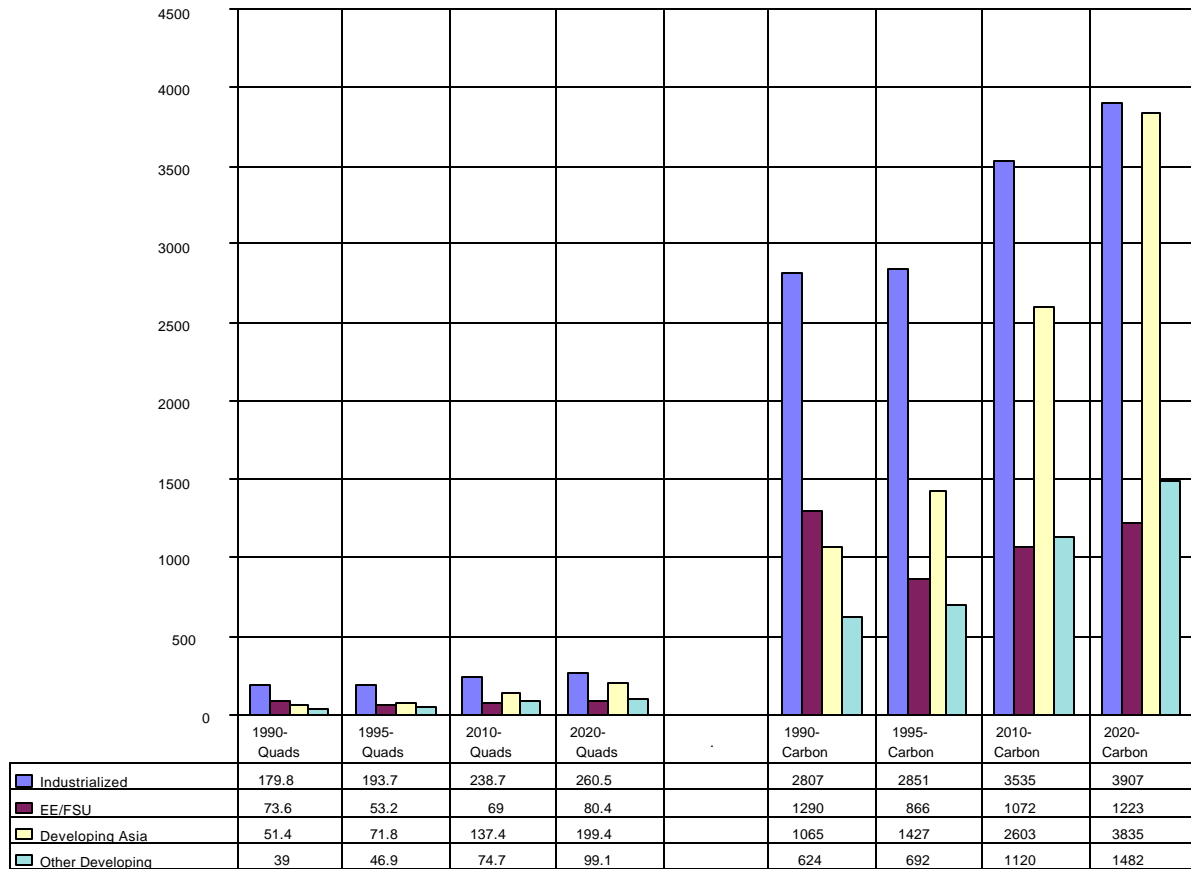


Source: Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 1999, Washington, DOE, EIA-0484(99), March 1999, p.147.

Figure IV. 4

Environmental Uncertainties and Demand: The Potential Impact of the “Kyoto Challenge” on Oil and Gas Imports

(Energy Consumption in Quads vs. Carbon Emissions In Millions of Metric Tons, EIA Reference Case)

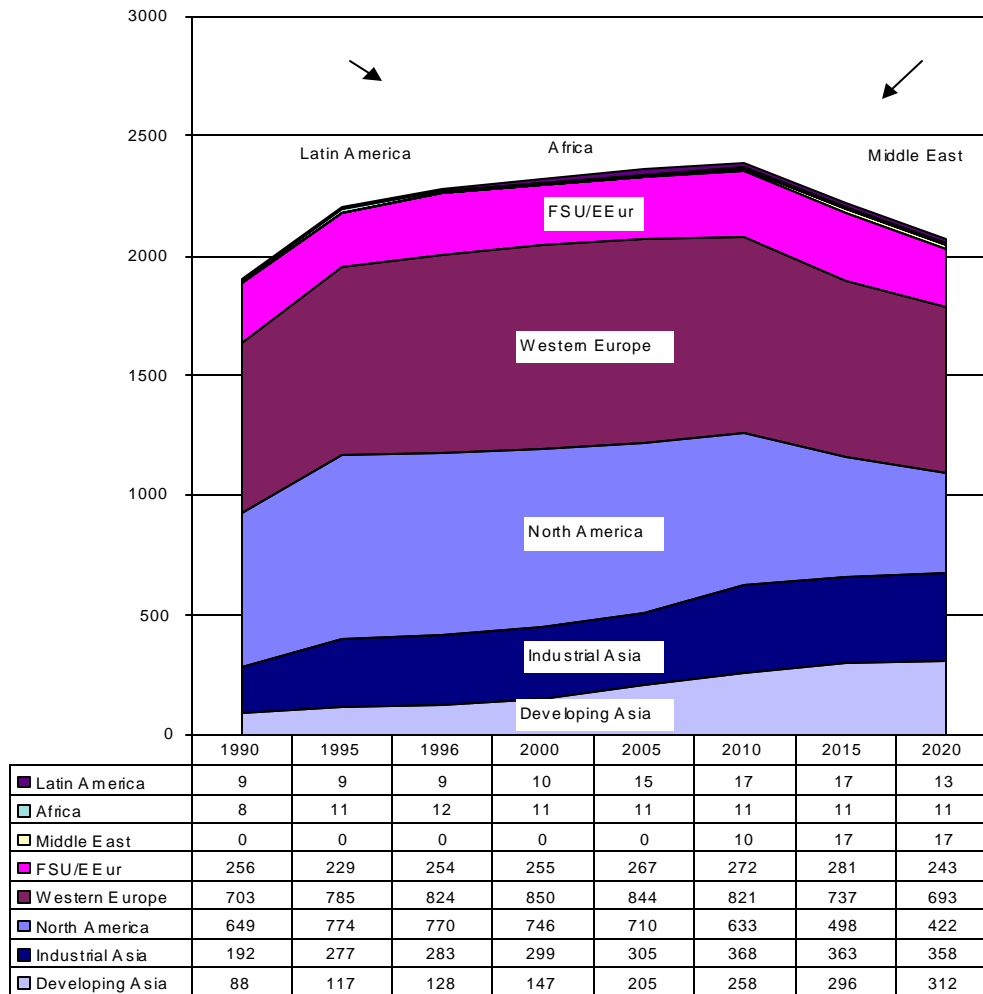


Total Annex 1	253.4	246.8	307.6	340.9	4097	3717	4607	5130
Total Developing	90.4	118.7	212.0	298.5	1689	2121	3723	5317
Total World	343.8	365.6	519.6	639.4	5786	5841	8330	10447

Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1998, DOE/EIA-0484 (98), April 1998, p. 3.

Figure IV.5

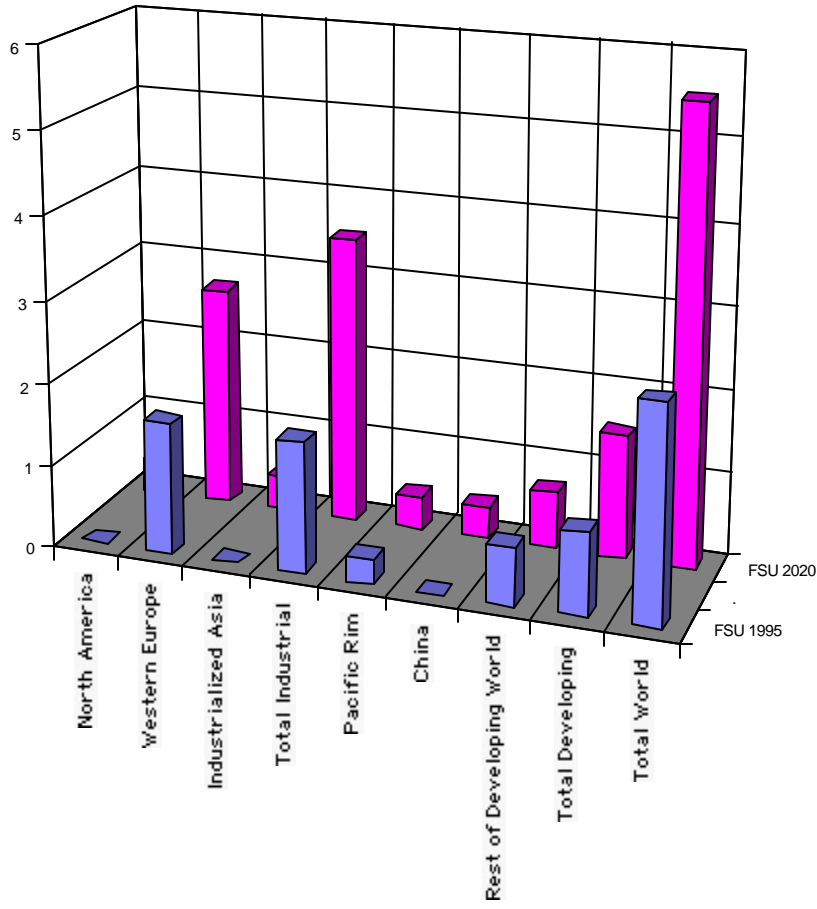
Uncertain Demand for Nuclear Energy: Total World Consumption by Region: 1990-2020
(Billion Kilowatt Hours)



Source: Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 1999, Washington, DOE, EIA-0484(99), March 1999, p.148.

Figure IV.6

FSU Oil Exports by Destination: 1995 versus 2020
(in MMBD)

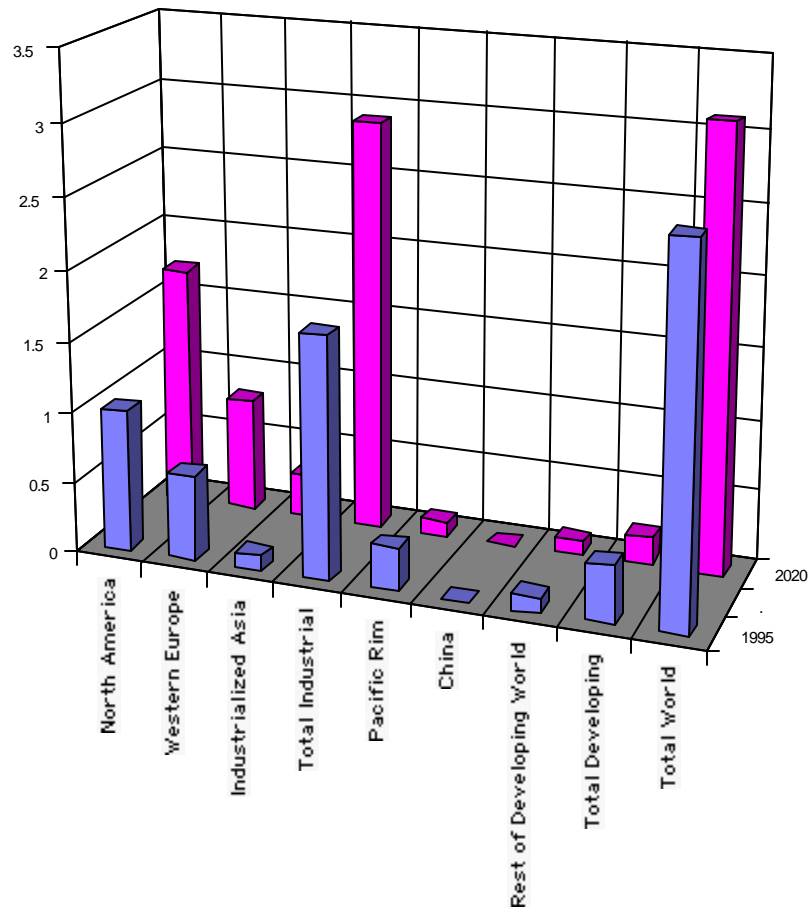


	North America	Western Europe	Industrialized Asia	Total Industrial	Pacific Rim	China	Rest of Developing World	Total Developing	Total World
FSU 1995	0	1.6	0	1.6	0.3	0	0.7	1	2.6
FSU 2020	0.4	2.7	0.4	3.5	0.4	0.4	0.7	1.5	5.5

Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1999, DOE/EIA-0484 (99), March 1999, p. 32.

Figure IV.7

**The Other Side of the Hill: West African Oil Exports by Destination:
1995 versus 2020**
(EIA Reference Case Estimate in MMBD)

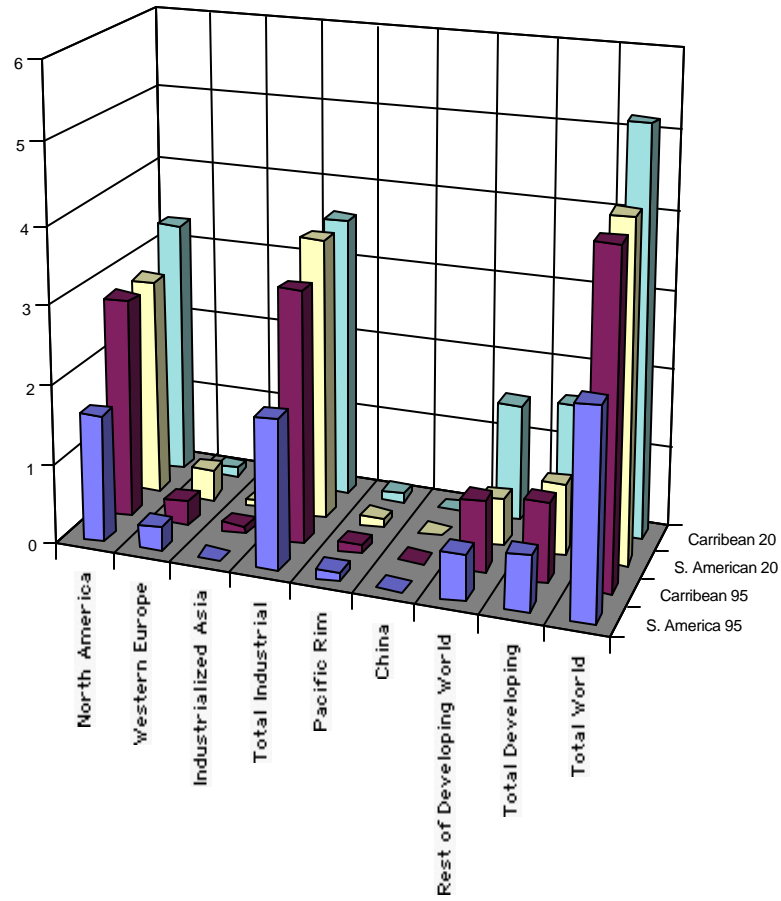


	North America	Western Europe	Industrialized Asia	Total Industrial	Pacific Rim	China	Rest of Developing World	Total Developing	Total World
1995	1	0.6	0.1	1.7	0.3	0	0.1	0.4	2.6
2020	1.7	0.8	0.3	2.9	0.1	0	0.1	0.2	3.1

Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1999, DOE/EIA-0484 (99), March 1999, p. 32.

Figure IV.8

**The Other Side of the Hill: South American and Caribbean Basin Exports by Destination:
1995 versus 2020**
(EIA Reference Case Estimate in MMBD)



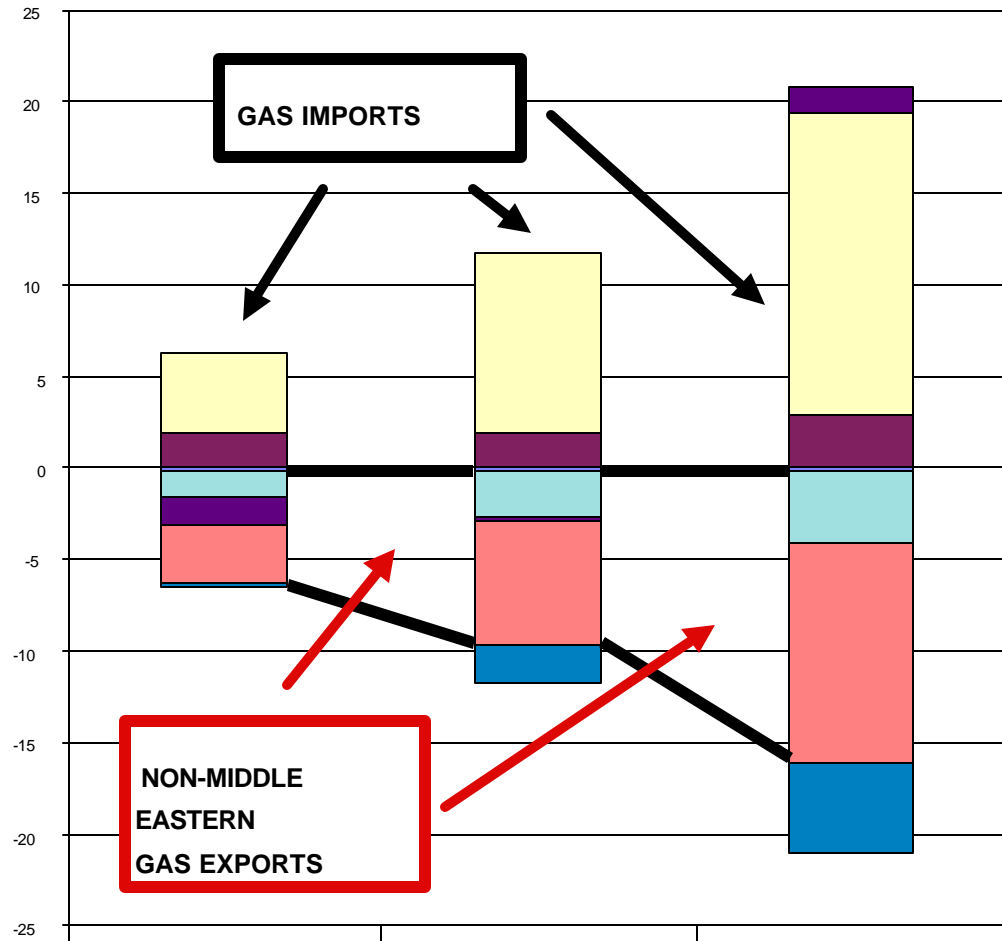
	North America	Western Europe	Industrialized Asia	Total Industrial	Pacific Rim	China	Rest of Developing World	Total Developing	Total World
S. America 95	1.6	0.3	0	1.9	0.1	0	0.6	0.7	2.6
Caribbean 95	2.8	0.3	0.1	3.2	0.1	0	0.9	1	4.2
S. American 20	2.8	0.4	0.1	3.6	0.1	0	0.6	0.9	4.3
Caribbean 20	3.3	0.1	0.1	3.6	0.1	0	1.5	1.6	5.2

Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1999, DOE/EIA-0484 (99), March 1999, p. 32.

Figure IV.9

Gas Exports from Other Regions: 1995-2020

(In Trillions of Cubic Feet)



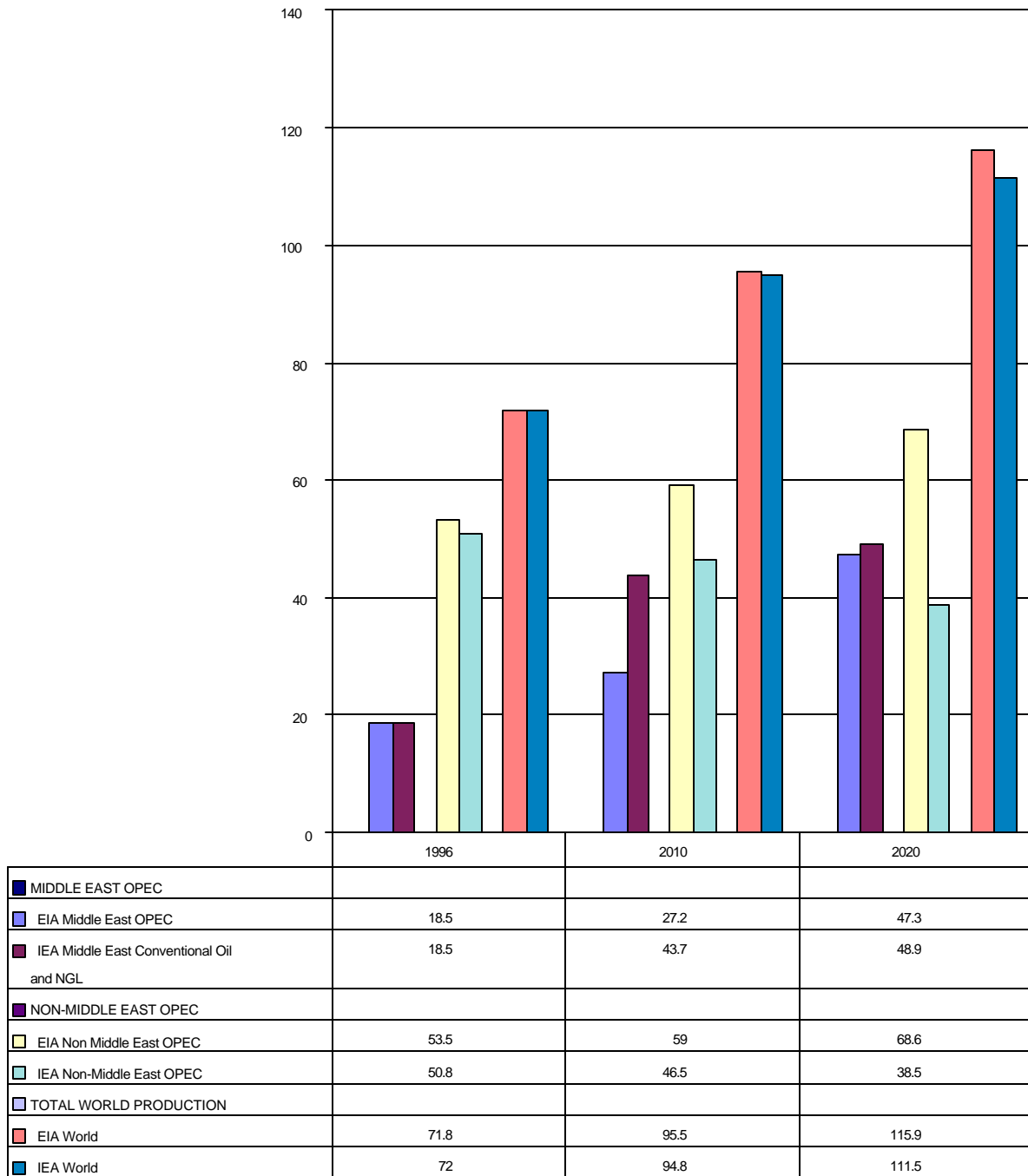
	1995	2010	2020
China	0	0	0
Middle East	-0.2	-2.1	-4.9
FSU & EE	-3.2	-6.9	-12
S & E. Asia	-1.5	-0.1	1.4
Latin America	0	0	0
Africa	-1.5	-2.6	-4
OECD Europe	4.5	9.9	16.6
OECD Pacific	1.8	1.8	2.8
OECD North America	-0.1	-0.1	-0.1

Note: North America includes Mexico.

Adapted by Anthony H. Cordesman IEA, *World Energy Outlook, 1998*, pp. 133-134.

Figure V.1

Projected Middle Eastern, Non-Middle East, and World Oil Production: IEA versus EIA
(In Millions of Barrels Per Day)

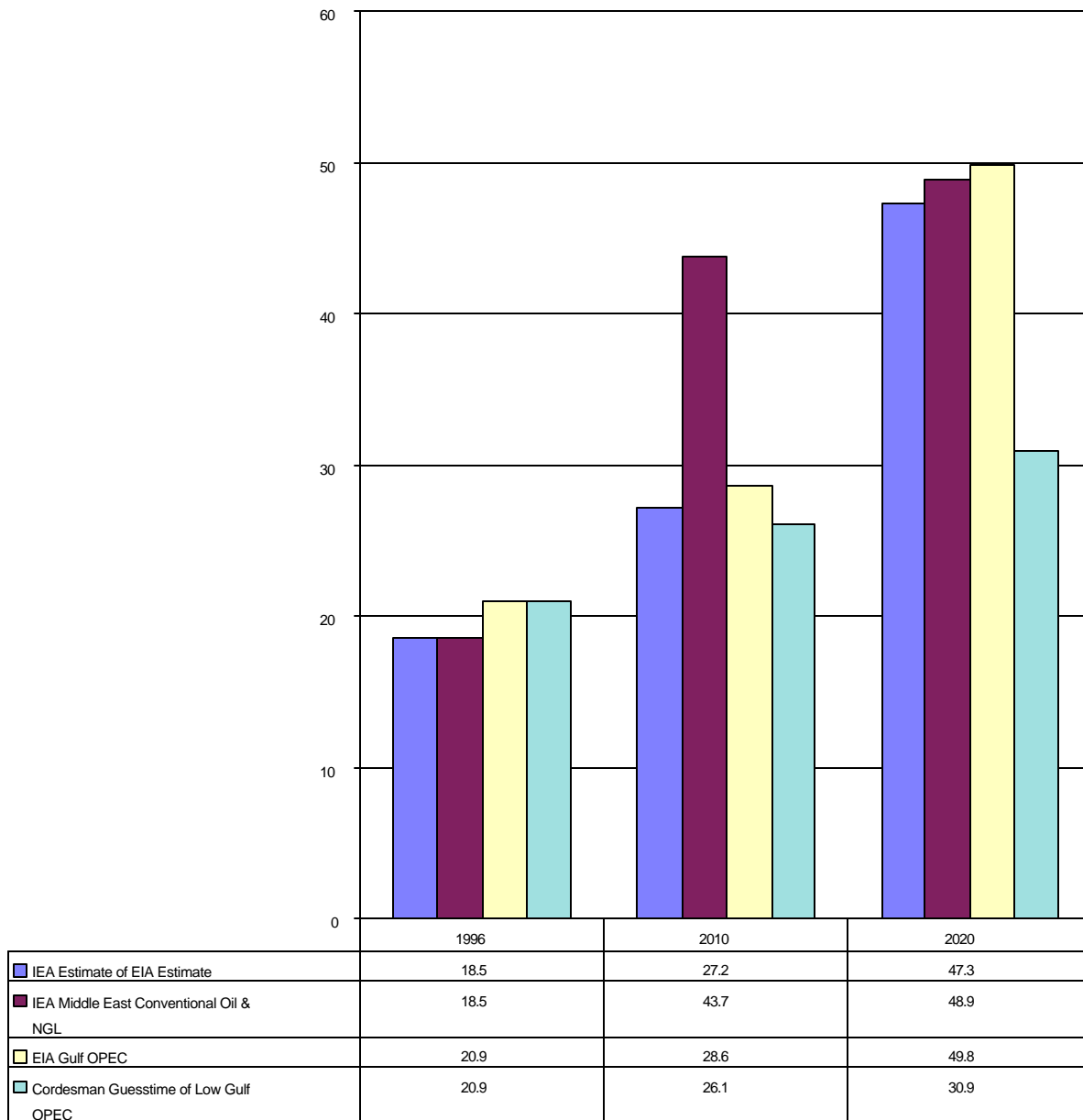


Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 1998, April, 1998, DOE/EIA-484(97), Reference Case, p. 51 and IEA, World Energy Outlook, 1998, pp. 101 and 119-21.

Figure V.2

Just How Uncertain is Future Middle Eastern Production? IEA Versus EIA Versus Cordesman Guesstimate: 1995 vs. 2010 vs. 2020

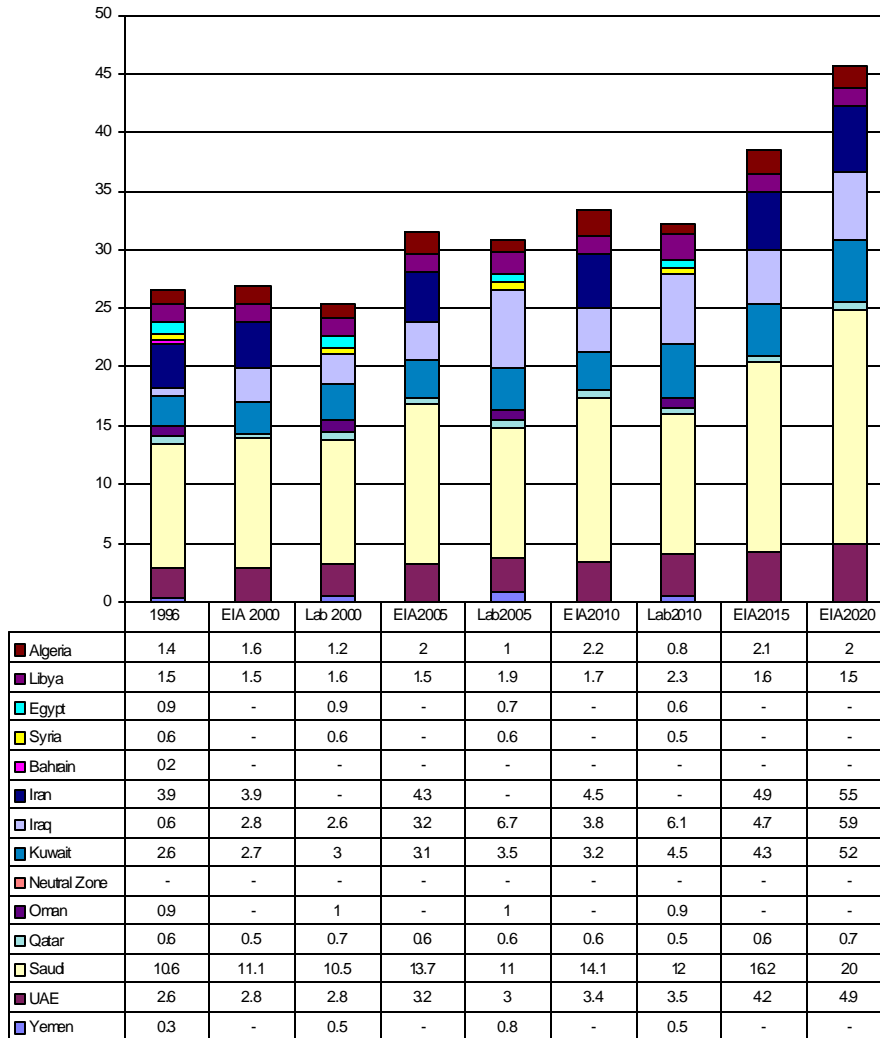
(In Millions of Barrels Per Day)



Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 1998, April, 1998, DOE/EIA-484(97), Reference Case, p. 51 and IEA, World Energy Outlook, 1998, pp. 101 and 119-21.

Figure V.3

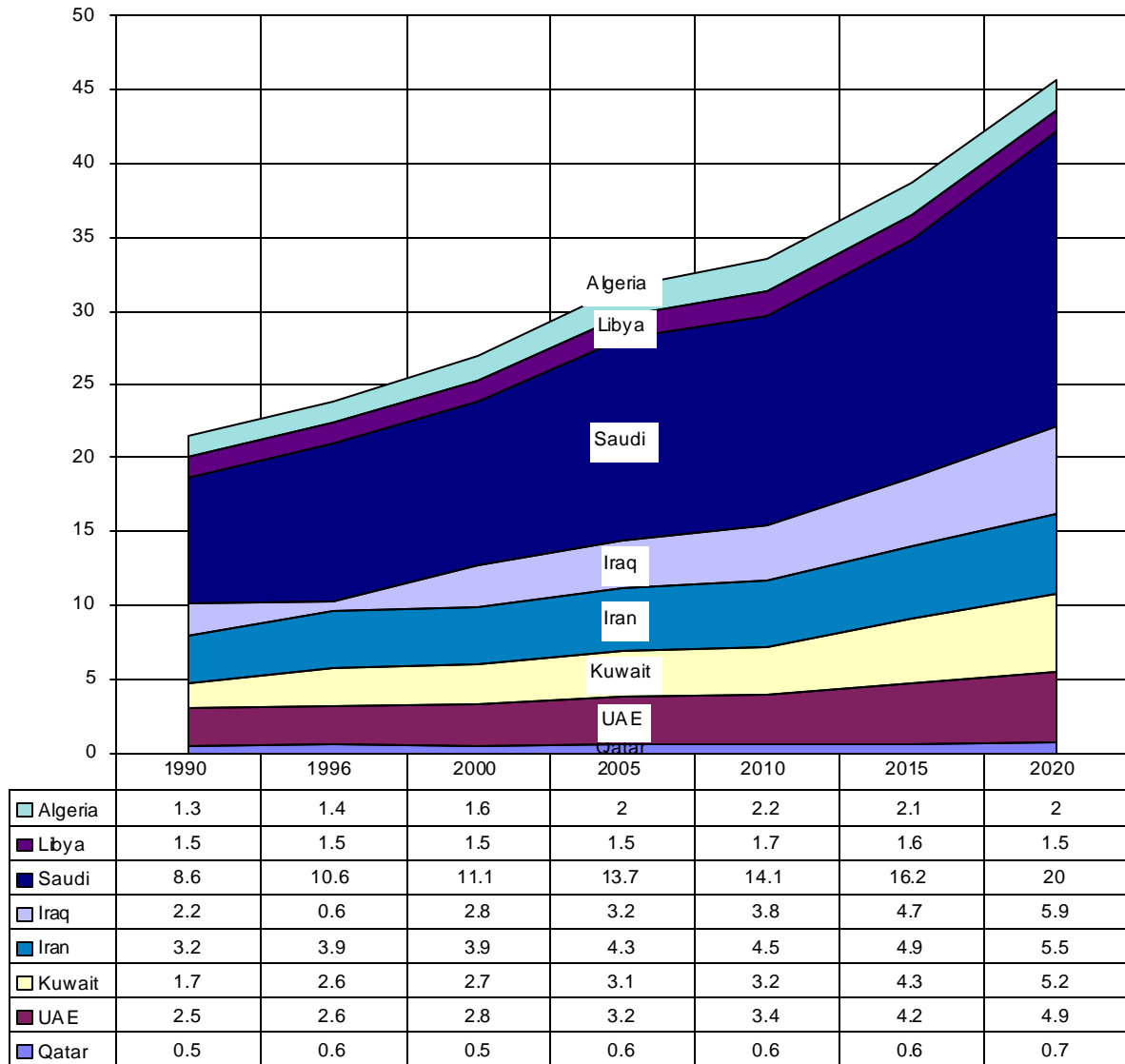
Comparative EIA and Arab Estimates of Middle Eastern Oil Production Capacity by Country
(In Millions of Barrels Per Day)



Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 1999, March 1999, DOE/EIA-484(99), Reference Case, p.201 and Dr. M. Mukhtar Al-Lababidi, Energy Resources in the Arab Countries, Kuwait, November 19-21, 1998.

Figure V.4

The EIA Reference Case Estimate of Middle Eastern Production by Country: 1990-2020
(EIA Reference Case in MMBD)

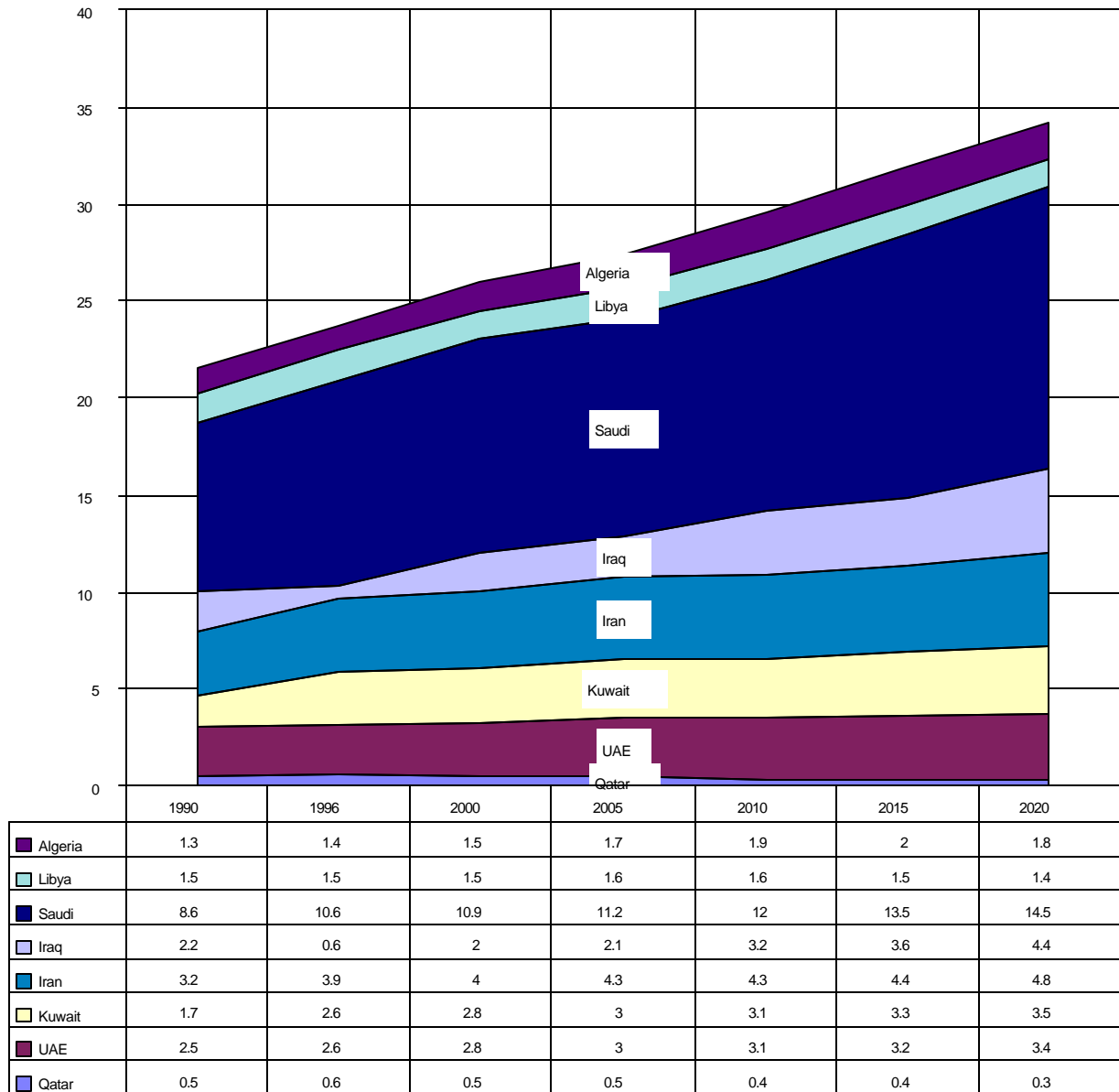


Total Gulf OPEC	18.7	20.9	21.6	24.4	28.6	38.4	49.8
Total MENA OPEC	21.5	23.8	24.7	27.9	32.5	42.1	53.3

Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1999, DOE/EIA-0484 (99), March 1999, p.201, and EIA, Monthly Energy Review, April, 1997, pp. 130-131.

Figure V.5

**Cordesman Guesstimate of Middle Eastern Production by Country:
1990-2020**
(Case in MMBD)

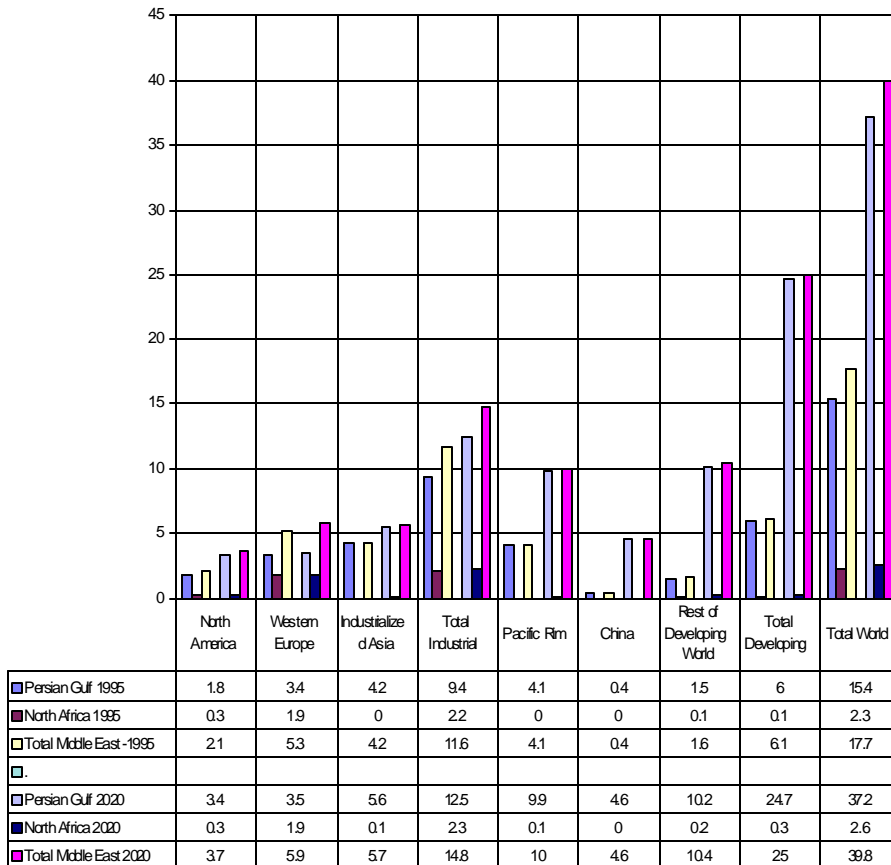


Total Gulf OPEC	18.7	20.9	23.0	24.1	26.1	28.4	30.9
Total MENA OPEC	21.5	23.8	26/0	27.4	29.6	31.9	34.1

Source: Estimated by Anthony H. Cordesman.

Figure V.6

**The EIA Estimate of Middle Eastern Oil Exports by Destination:
1995 versus 2020
(in MMBD)**

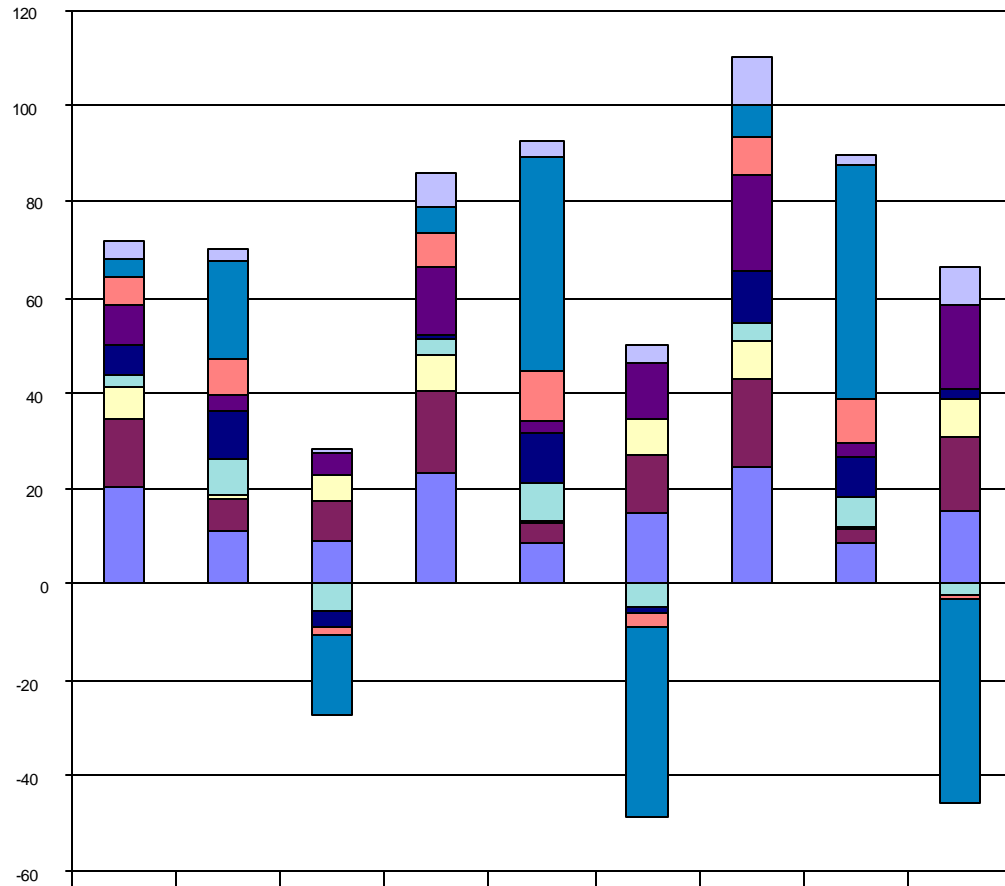


	North America	Western Europe	Industrialized Asia	Total Industrial	Pacific Rim	China	Rest of Developing World	Total Developing	Total World
Total – 1995	8.9	11.7	6.1	26.7	5.1	0.6	4.7	10.4	37.1
World Total – 2020	15.2	13.5	7.0	35.7	11.0	5.2	14.1	30.3	66.0

Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1999, DOE/EIA-0484 (99), March 1999, p.32.

Figure V.7

IEA Estimate of World Oil Demand, Supply, Imports, and Exports: 1996-2020
(In Millions of Barrels Per Day)



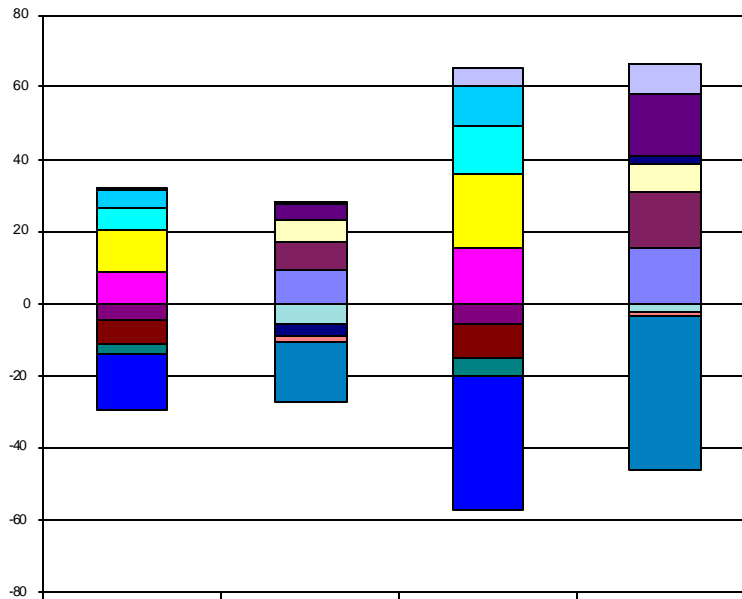
	1996 - Demand	1996 - Supply	1996 - Net Imports	2010 - Demand	2010 - Supply	2010 - Net Imports	2020 - Demand	2020 - Supply	2020 - Net Imports
China	3.6	3.1	0.5	7.1	3.2	3.9	10.1	2	8.1
Middle East	4.1	20.4	-16.3	4.9	44.7	-39.7	6.3	49.2	-42.9
FSU & EE	5.5	7.3	-1.8	7.2	10.2	-3	8.5	9.4	-0.9
S & E. Asia	8.5	3.7	4.8	14.2	2.9	11.3	19.5	2.4	17.2
Latin America	6.3	9.8	-3.5	0.9	10.4	-1.4	11	8.6	2.5
Africa	2.2	7.7	-5.5	3.3	7.8	-4.6	4	6.3	-2.2
OECD Pacific	6.7	0.7	6	7.7	0.3	7.4	7.9	0.3	7.6
OECD Europe	14.4	6.7	7.7	17	4.5	12.5	18.7	2.8	15.9
OECD North America	20.3	11.1	9.3	23.4	8.6	14.8	24.1	8.9	15.1

Total World Identified	71.7	70.5	1.1	94.2	92.7	1.5	111.1	89.9	21.1
Total World	72.0	72.0	0.0	94.8	94.8	0.0	111.5	92.4	19.1

Adapted by Anthony H. Cordesman IEA, World Energy Outlook, 1998, pp. 116-118.

Figure V.8

IEA versus EIA Estimate of World Oil Imports and Exports: 1996-2020
(In Millions of Barrels Per Day)

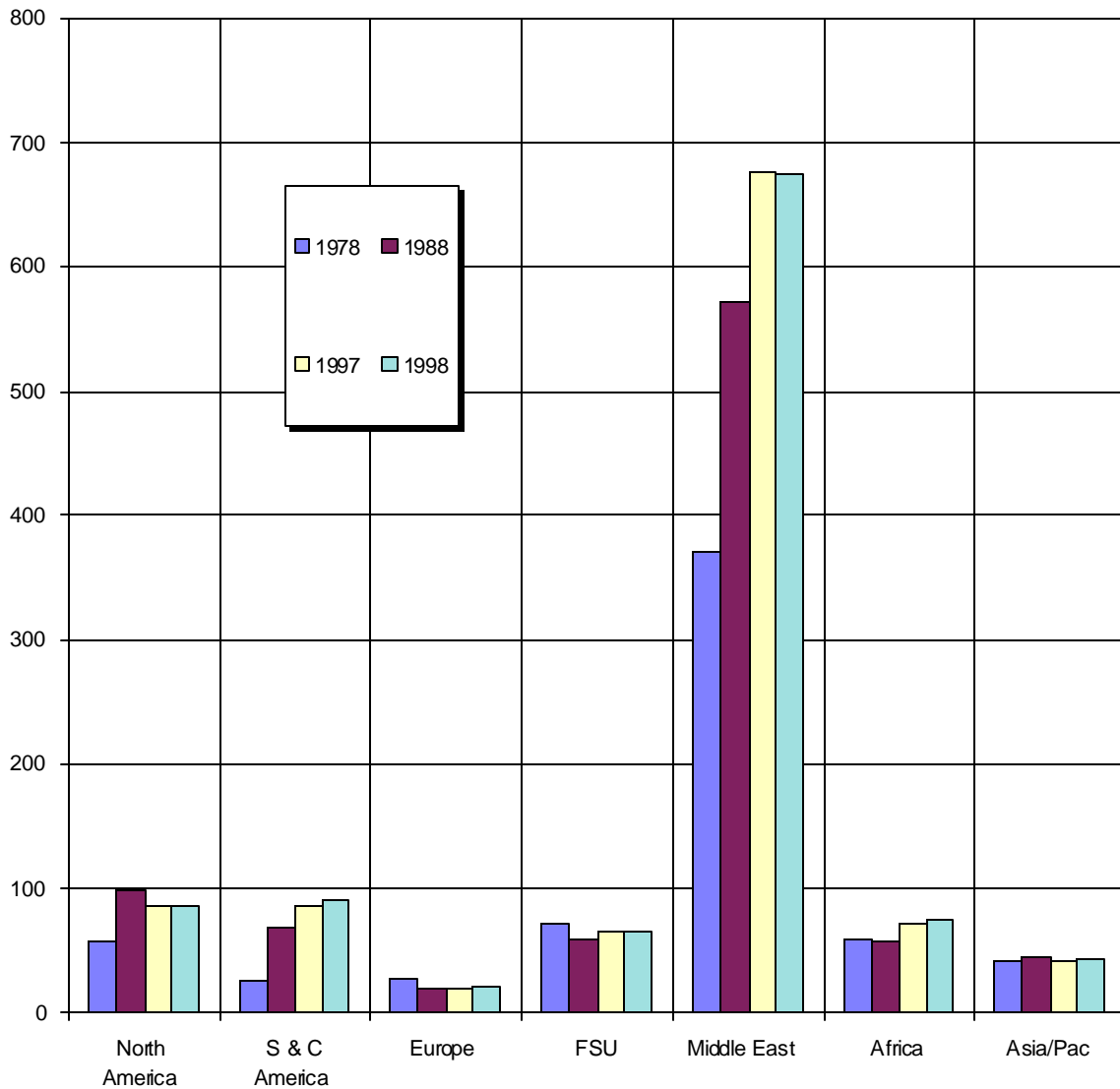


	EIA 1996 Net Imports	IEA 1996 Net Imports	EIA 2020 Net Imports	IEA 2020 Net Imports
China	0.6	0.5	5.2	8.1
Persian Gulf	-15.4		-37.2	
Middle East		-16.3		-42.9
FSU	-2.6		-5	
FSU & EE		-1.8		-0.9
Pacific Rim	5.1		11	
S & E. Asia		4.8		17.2
L. America & Carib	-6.8		-9.5	
Latin America		-3.5		2.5
North & West Africa	-4.4		-5.7	
Africa		-5.5		-22
Indust. Asia	6.1		13.3	
OECD Pacific		6		7.6
Western Europe	11.7		20.5	
OECD Europe		7.7		15.9
North America	8.9		15.2	

Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 1999, March 1999, DOE/EIA-484(99), Reference Case, p. 32 and IEA, World Energy Outlook, 1998, pp. 116-118.

Figure V.9

Shifts in the Regional Balance of Oil Reserves
(Billions of Barrels)

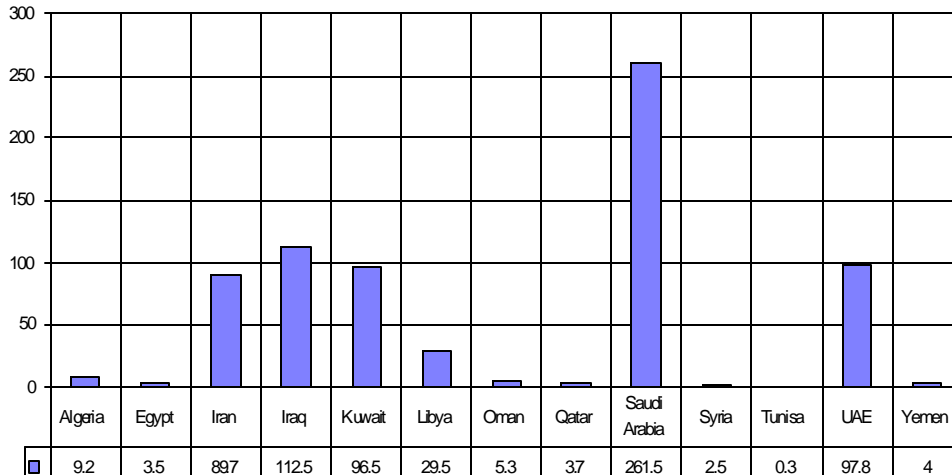


1978	57.1	25.3	27.4	71	369.6	57.9	40
1988	97.8	67.8	20.3	58.5	571.6	56.9	45
1997	85.2	86.2	20.2	65.4	676.9	70	42.3
1998	85.1	89.5	20.7	65.4	673.7	75.4	43.1

Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 1999, p. 4.

Figure V.10

Proven Middle Eastern Oil Reserves by Country
(in Billions of Barrels)

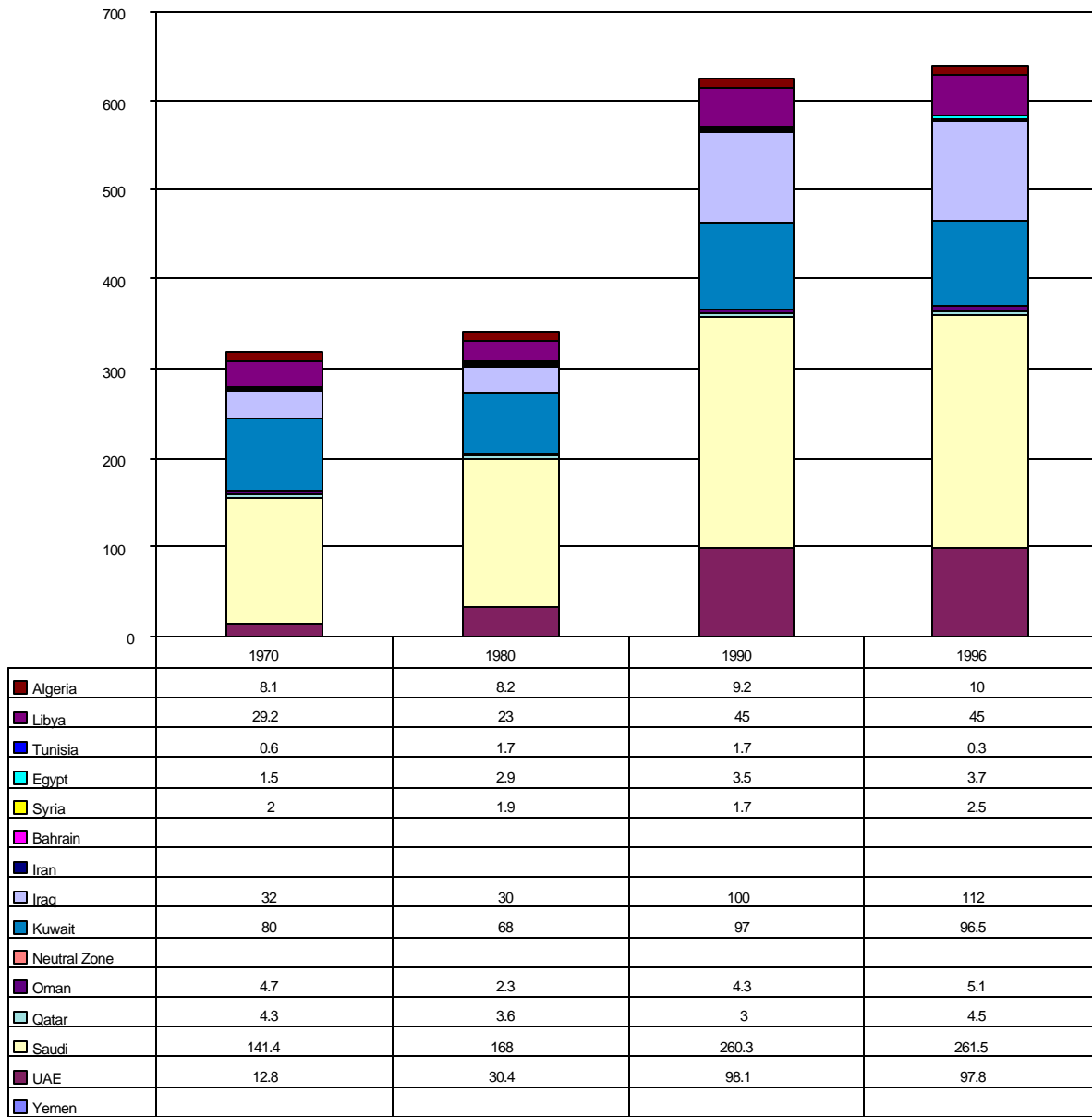


Country	<u>End-1997</u>	<u>End-1998</u>	<u>Percent of World Proven Reserves</u>	<u>Reserve to Production Ratio In Years at Current Rates</u>
Algeria	9.2	9.2	0.9	19.8
Egypt	3.8	3.5	0.3	11.4
Iran	93.0	89.7	8.5	65.3
Iraq	112.5	112.5	10.7	100+
Kuwait	96.5	96.5	9.2	100+
Libya	29.5	29.5	2.8	56.4
Oman	5.2	5.3	0.5	16
Qatar	3.7	3.7	0.4	13.3
Saudi Arabia	261.5	261.5	24.8	80.7
Syria	2.5	2.5	0.2	12.2
Tunisia	0.3	0.3	.05	13.9
UAE	97.8	97.8	9.3	100+
Yemen	4.0	4.0	0.4	28.7
Total	719.5	716	68	83.2

Source: BP Amoco Statistical Review of World Energy, 1998, p.4.

Figure V.11

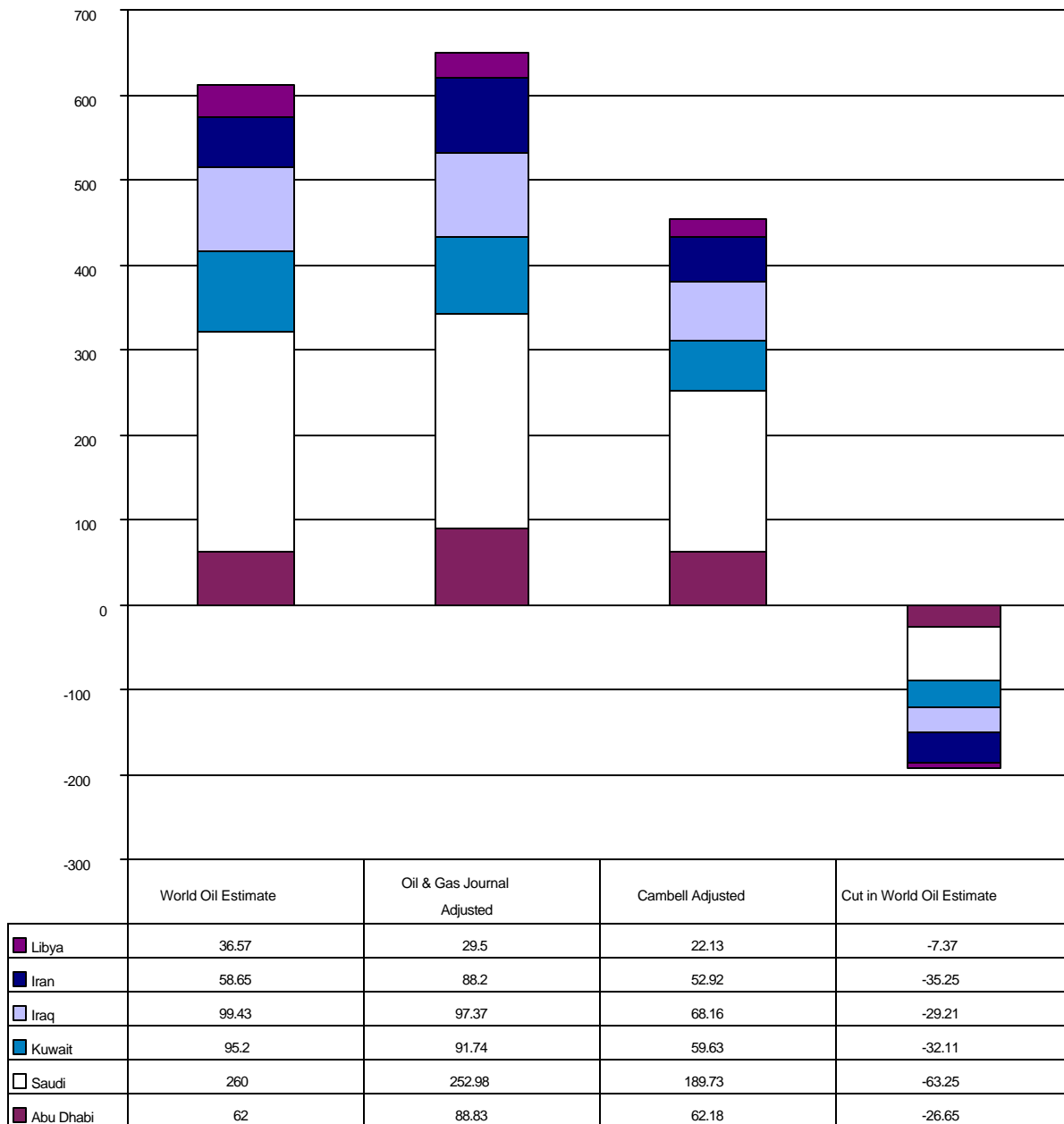
**An Arab Estimate of the Trends in the Size of Middle Eastern Oil Proved Reserves
by Country**
(In Billions of Barrels at Year's End)



Adapted by Anthony H. Cordesman from Dr. M. Mukhtar Al-Lababidi, Energy Resources in the Arab Countries, Kuwait, November 19-21, 1998.

Figure V.12

IEA Estimate of the Uncertainties in Middle Eastern Oil Proved Reserves by OPEC Country
(In Billions of Barrels)

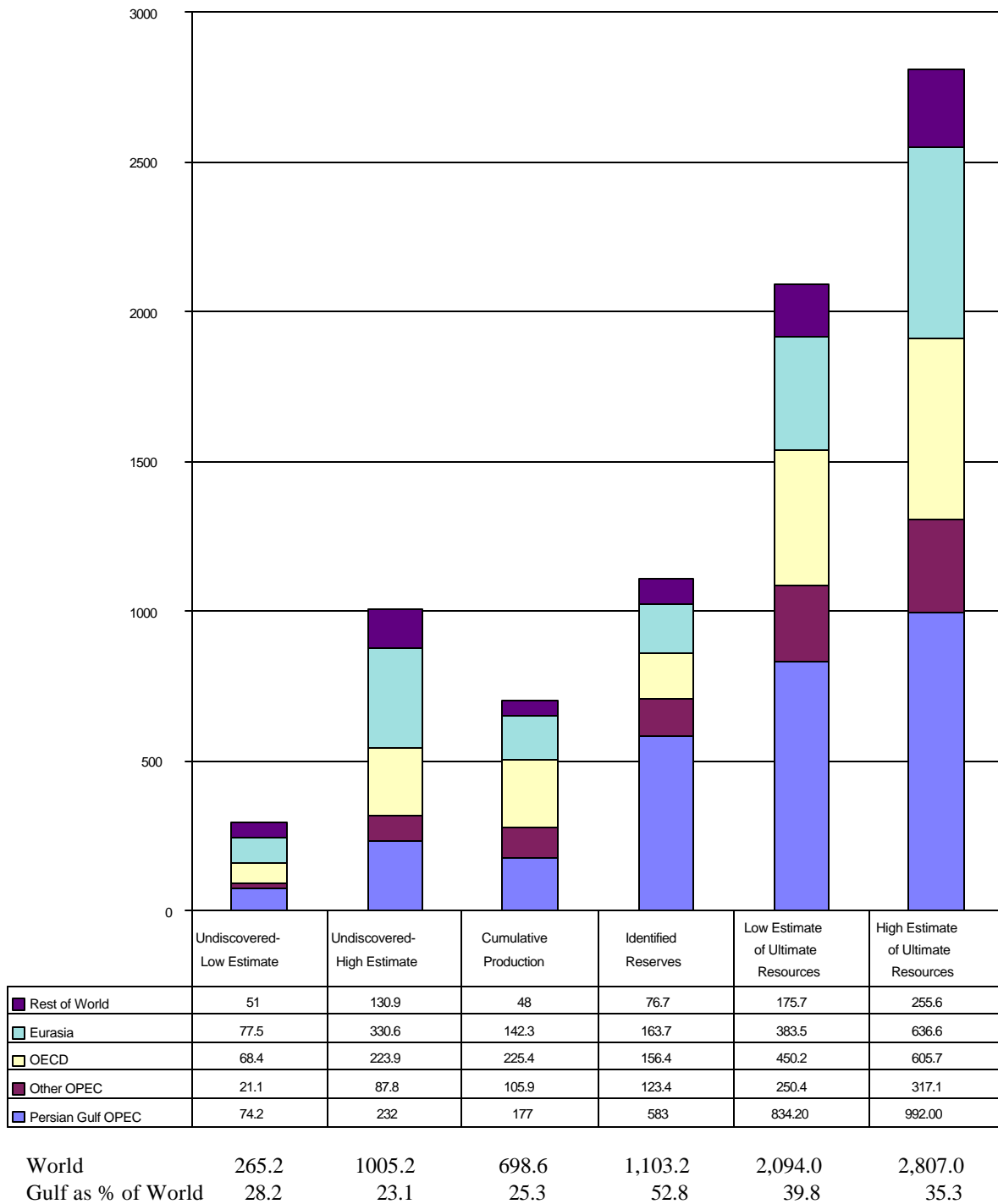


The Campbell adjusted estimate is the mean in an estimate based on Petroconsultants oil field data bas deadjusted for the years in which the published Oil and Gas Journal reserves did not alter to reflect the fact that oil production had taken place during the pervious six months.

Adapted by Anthony H. Cordesman from IEA, World Energy Outlook, 1998, Paris, IEA/OECD, 1998, pp. 94-95.

Figure V.13

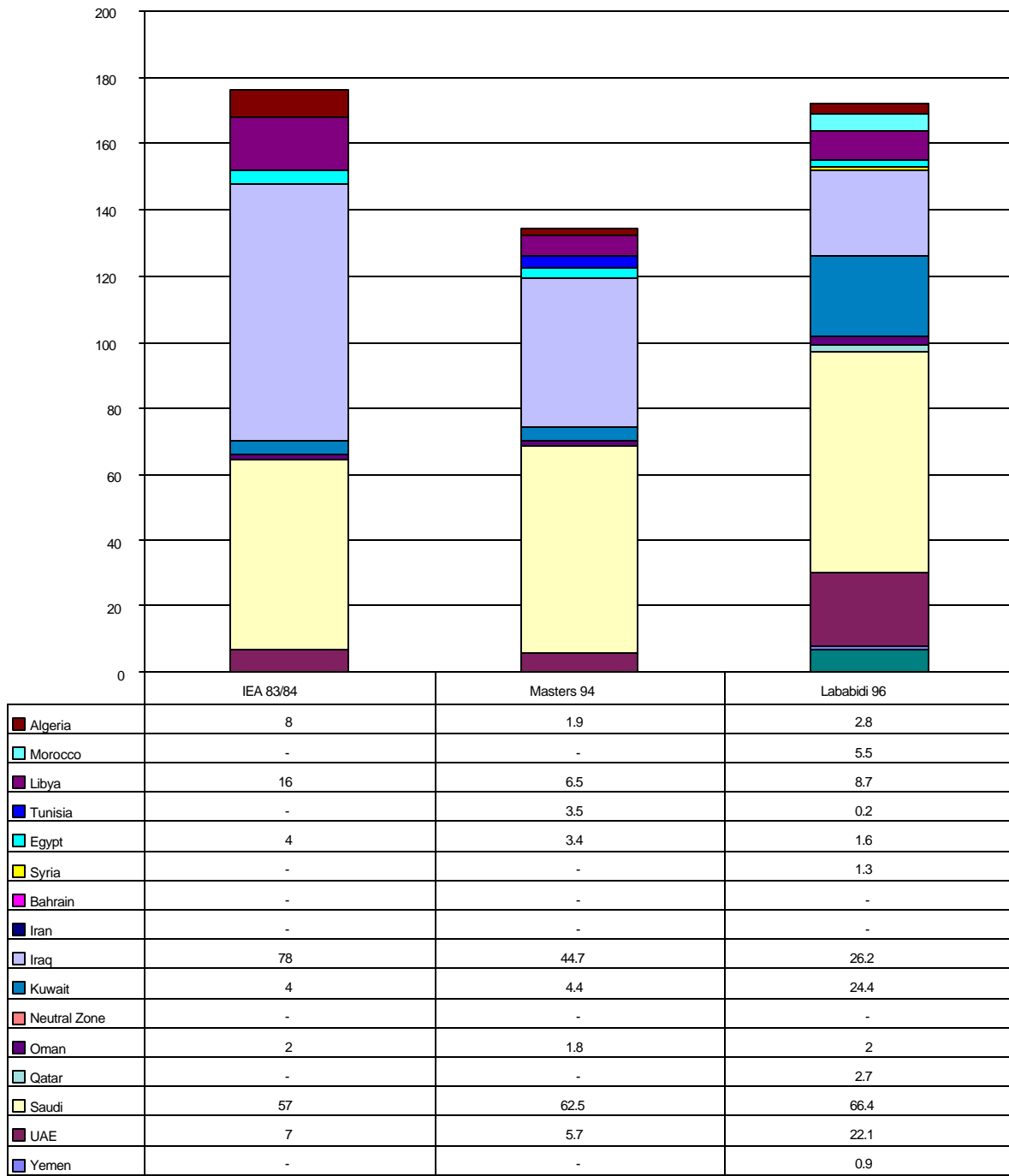
EIA Estimate of Undiscovered Potential Oil Recovery of Middle Eastern Oil Producing Countries
(In Billions of Barrels)



Adapted by Anthony H. Cordesman from DOE/EIA, International Energy Outlook, 1997, DOE/EIA-0484(97), April 1997, pp. 34-36.

Figure V.14

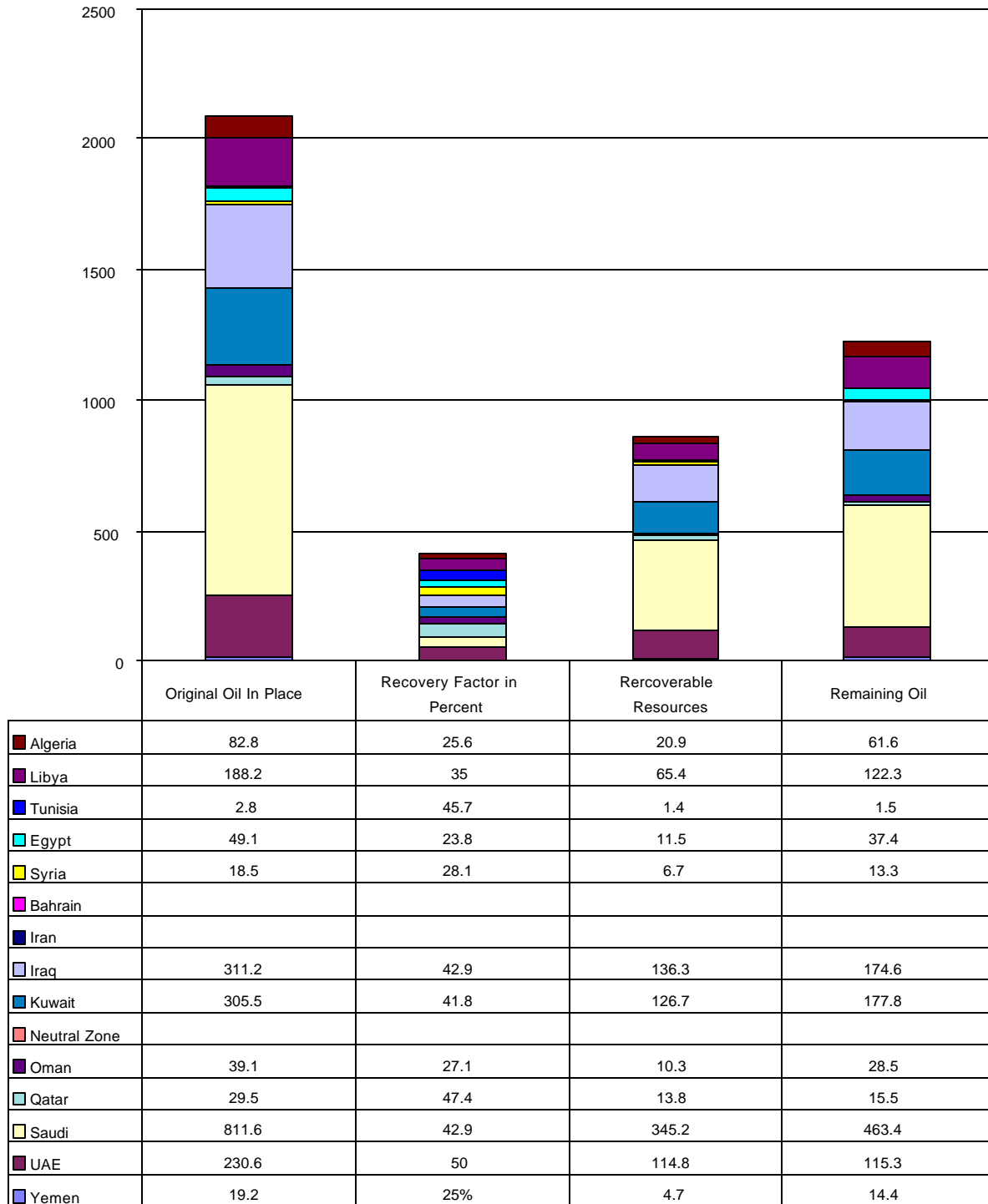
Arab Estimate of Undiscovered Potential Oil Recovery of Middle Eastern Oil Producing Countries
(In Billions of Barrels)



Does not include Lababidi's estimate of 9.3 billion barrels in Mauritania, 0.890 in Jordan, 158 in Lebanon, and 6.302 in Somalia. Adapted by Anthony H. Cordesman from Dr. M. Mukhtar Al-Lababidi, Energy Resources in the Arab Countries, Kuwait, November 19-21, 1998.

Figure V.15

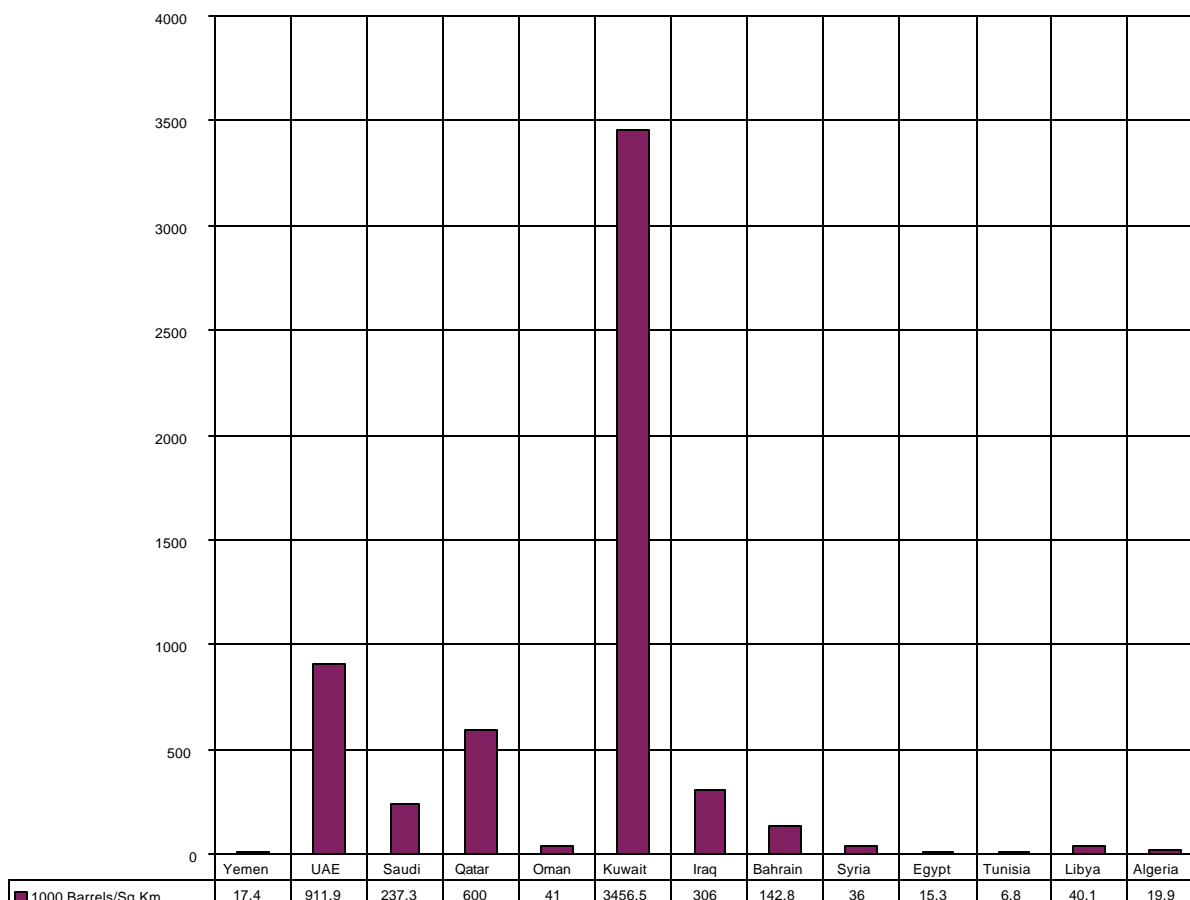
Primary and Secondary Recovery Capability Versus Original Oil in Place
(In Billions of Barrels)



Adapted by Anthony H. Cordesman from Dr. M. Mukhtar Al-Lababidi, *Energy Resources in the Arab Countries*, Kuwait, November 19-21, 1998.

Figure V.16

Average Discovery Ratio Per Unit in Middle Eastern Countries

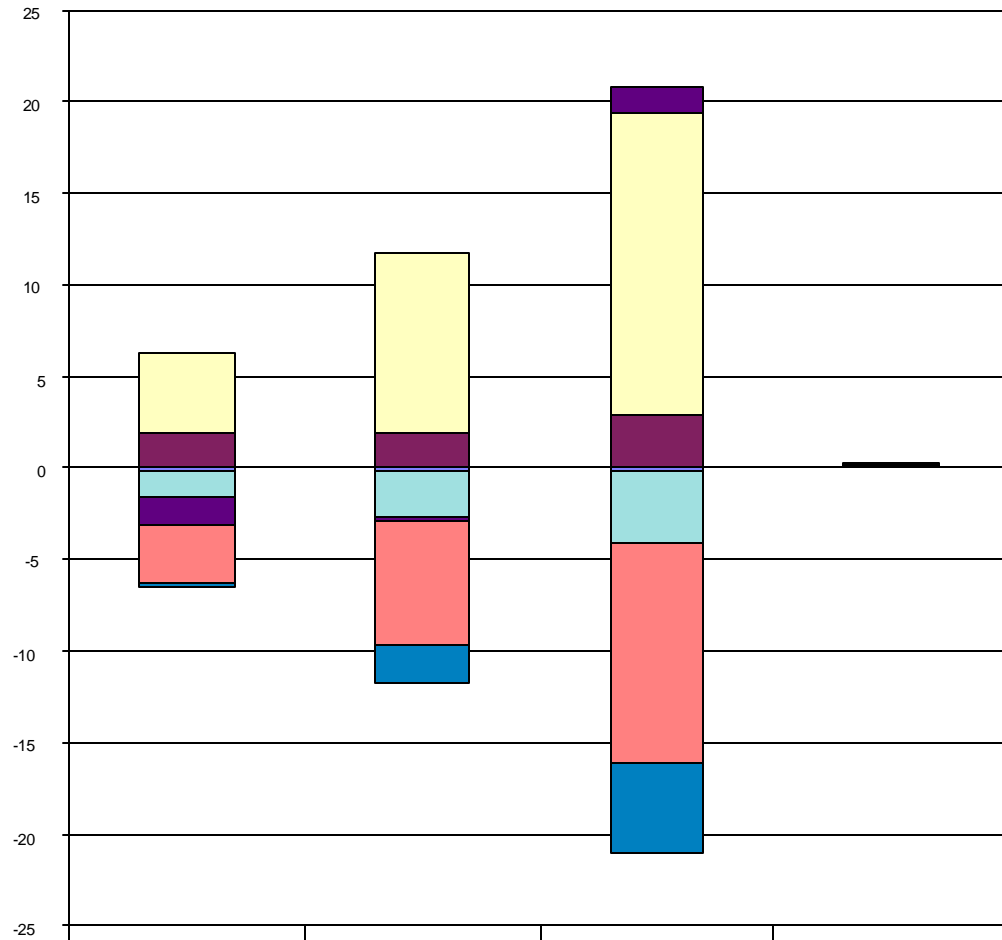


	Sedimentary Area in Sq. Km.	Discovered Reserves in Billions of Barrels	1000 Barrels/Sq. Km.
Sudan	-	-	-
Yemen	270,000	4.7	17.4
UAE	125,890	114.8	911.9
Saudi	1,455,000	345.2	237.3
Qatar	23	13.8	600
Oman	251,100	10.3	41
Neutral Zone			
Kuwait	36,656	126.7	3456.5
Iraq	445,480	136.3	306
Iran			
Bahrain	7000	1	142.8
Gulf Area	2,093,026	737.8	352.5
Syria	186,300	6.7	36
Egypt	753,000	11.5	15.3
Tunisia	206,600	1.4	6.8
Libya	1,631,500	65.4	40.1
Algeria	1,108,500	20.9	19.9
World	83,800,000	2272.5	27.1

Adapted by Anthony H. Cordesman from Dr. M. Mukhtar Al-Lababidi, Energy Resources in the Arab Countries, Kuwait, November 19-21, 1998.

Figure V.17

**IEA Estimate of World Gas Imports and Exports:
1995-2020**
(In Trillions of Cubic Feet)



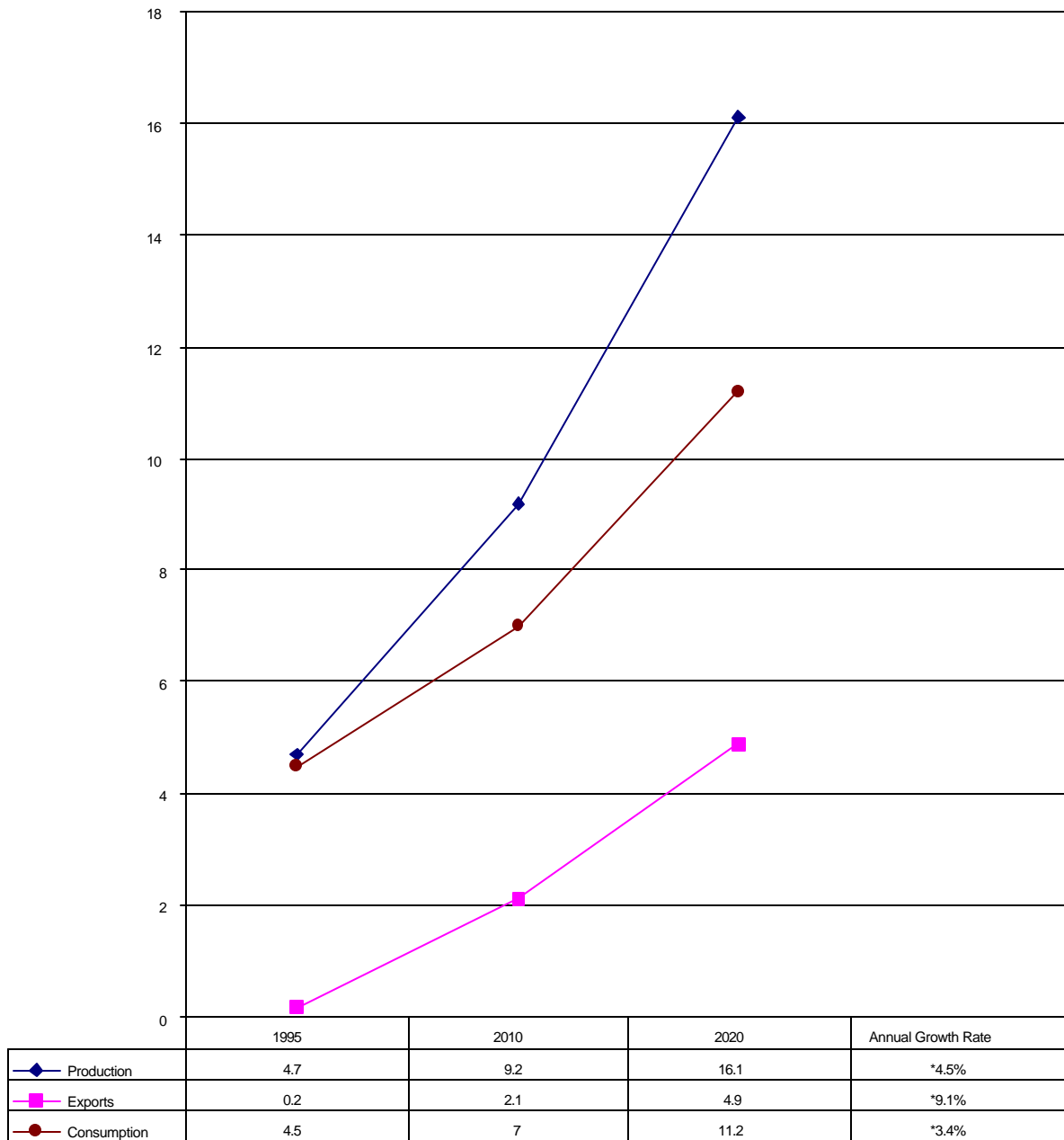
	1995	2010	2020	Annual Growth Rate
China	0	0	0	na
Middle East	-0.2	-2.1	-4.9	9.10%
FSU & EE	-3.2	-6.9	-12	4.50%
S & E. Asia	-1.5	-0.1	1.4	na
Latin America	0	0	0	0%
Africa	-1.5	-2.6	-4	3.20%
OECD Europe	4.5	9.9	16.6	4.30%
OECD Pacific	1.8	1.8	2.8	1.70%
OECD North America	-0.1	-0.1	-0.1	0.00%

Note: North America includes Mexico.

Adapted by Anthony H. Cordesman IEA, *World Energy Outlook, 1998*, pp. 133-134.

Figure V.18

**IEA Estimate of Middle East Gas Production, Consumption, and Exports:
1995-2020**
(In Trillions of Cubic Feet)

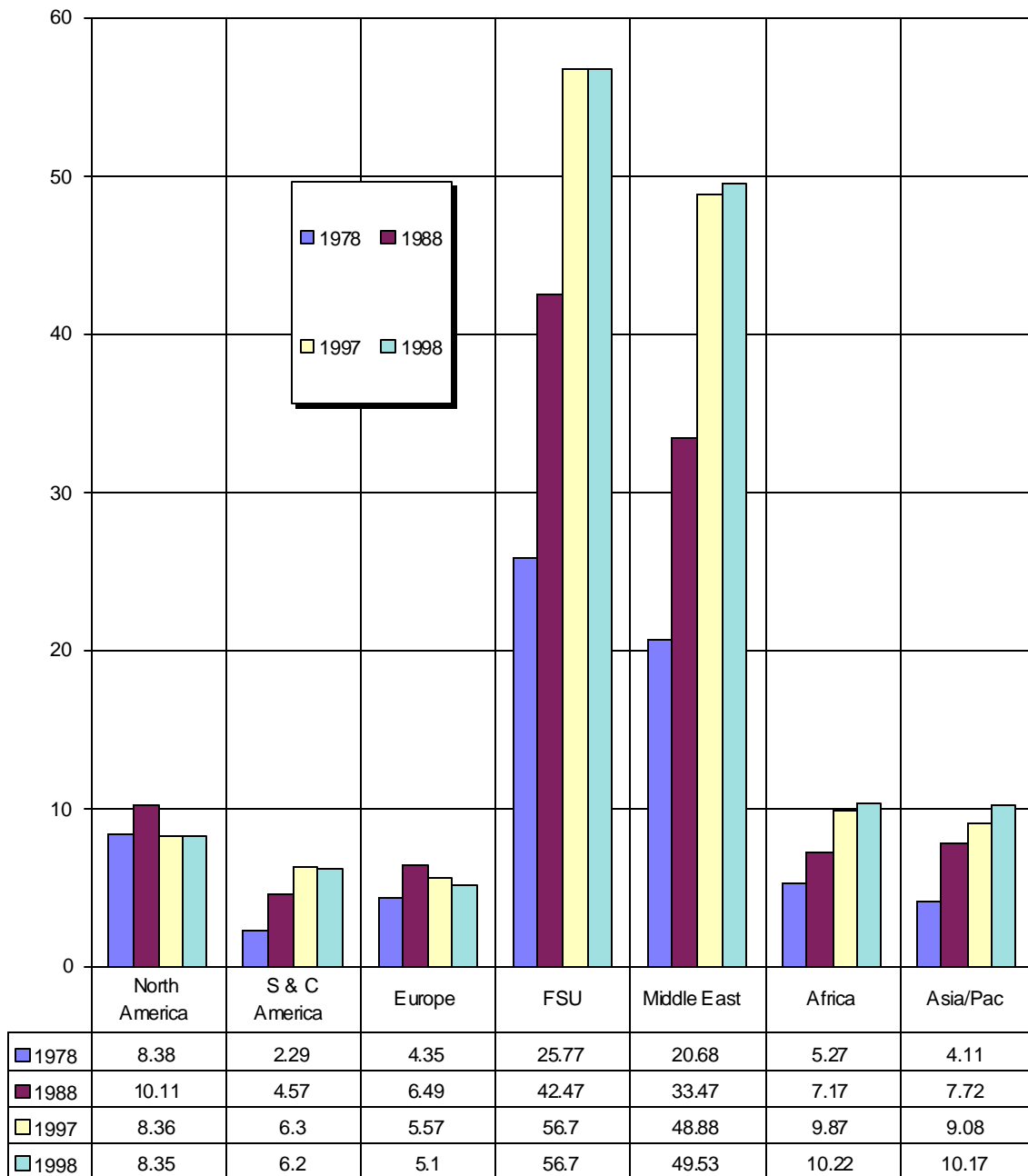


Note: North America includes Mexico.

Adapted by Anthony H. Cordesman IEA, World Energy Outlook, 1998, pp. 133-134.

Figure V.19

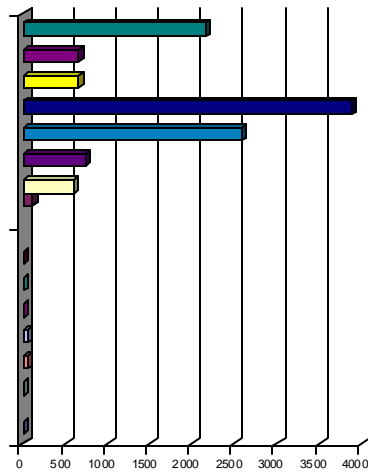
The Role of the Middle East in the Regional Balance of World Gas Reserves: 1997-1998
(Trillions of Cubic Meters)



Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 1999, p. 20.

Figure V.20

The Massive Uncertainties in World Gas Reserves: BP Amoco Estimates of Proved and IEA Estimates Ultimate World Gas Reserves by Region
(In Trillions of Cubic Meters)

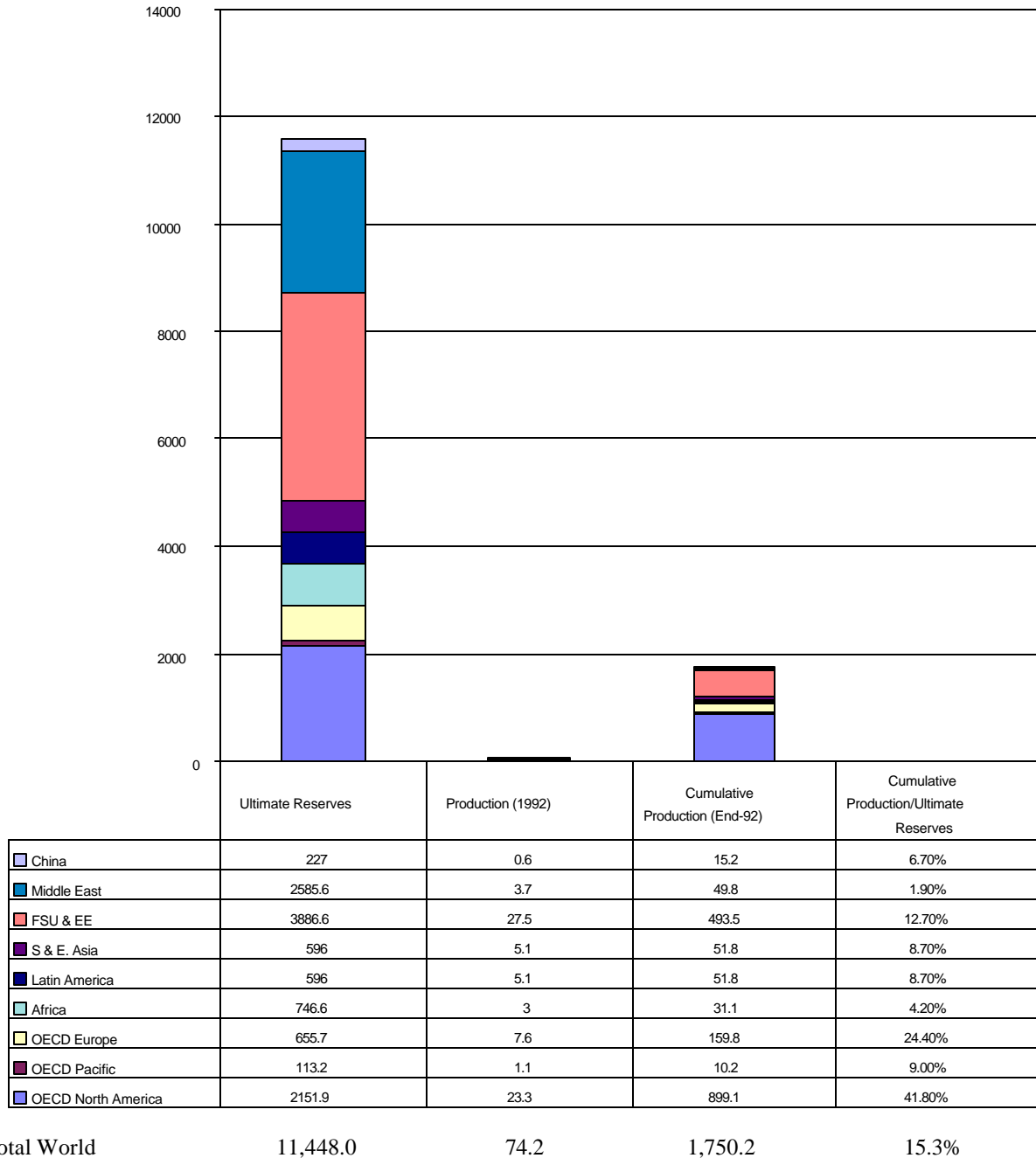


IEA Ultimate OECD North America		2151.9
BP Proved North America	8.35	
IEA Ultimate Latin America		655.7
BP Proved S&C America	6.21	
IEA Ultimate OECD Europe		655.7
BP Proved Europe	5.21	
IEA Ultimate Transition		3886.6
BP Proved FSU	56.7	
IEA Ultimate Middle East		2585.6
BP Proved Middle East	49.53	
IEA Ultimate Africa		746.6
BP Proved Africa	10.22	
IEA Ultimate S and E, Asia		596
IEA Ultimate OECD Pacific		113.2
BP Proved Asia Pacific	10.17	

Source: Oil and Gas Journal, and BP Amoco Statistical Review of World Energy, 1999, p. 20; IEA World Energy Outlook, 1998, Paris, IEA/OECD, 1998, pp. 129-130.

Figure V.21

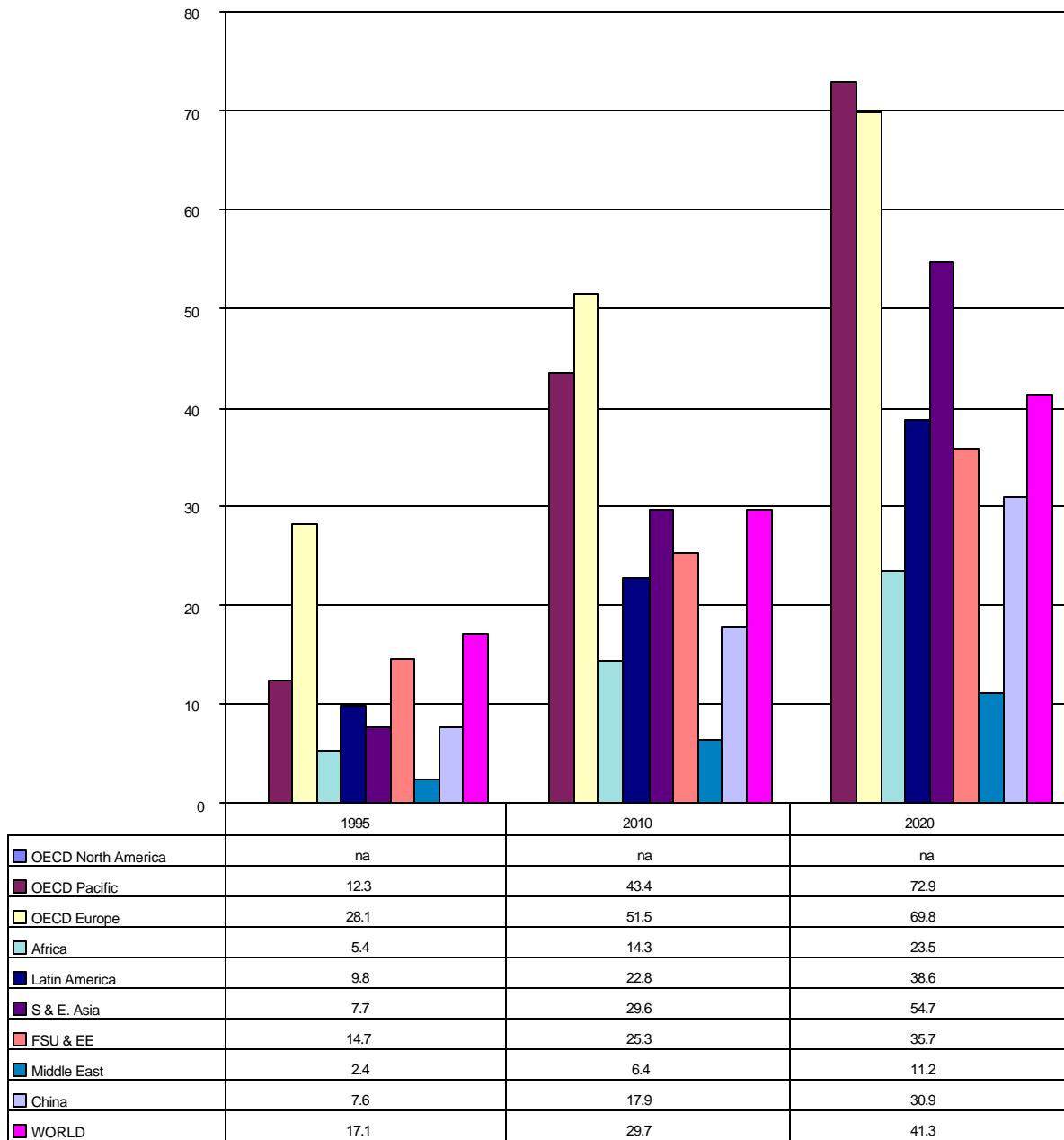
Another View of Uncertainty: USGS Estimate of Ultimate World Gas Reserves by Region
(In Trillions of Cubic Feet)



Adapted by Anthony H. Cordesman IEA, *World Energy Outlook, 1998*, pp. 129-131.

Figure V.22

How Quickly Will Middle Eastern and World Gas Reserves be Consumed? IEA Estimate of Future World Gas Production as a Percent of USGS Estimated Conventional Gas Reserves: 1995-2020

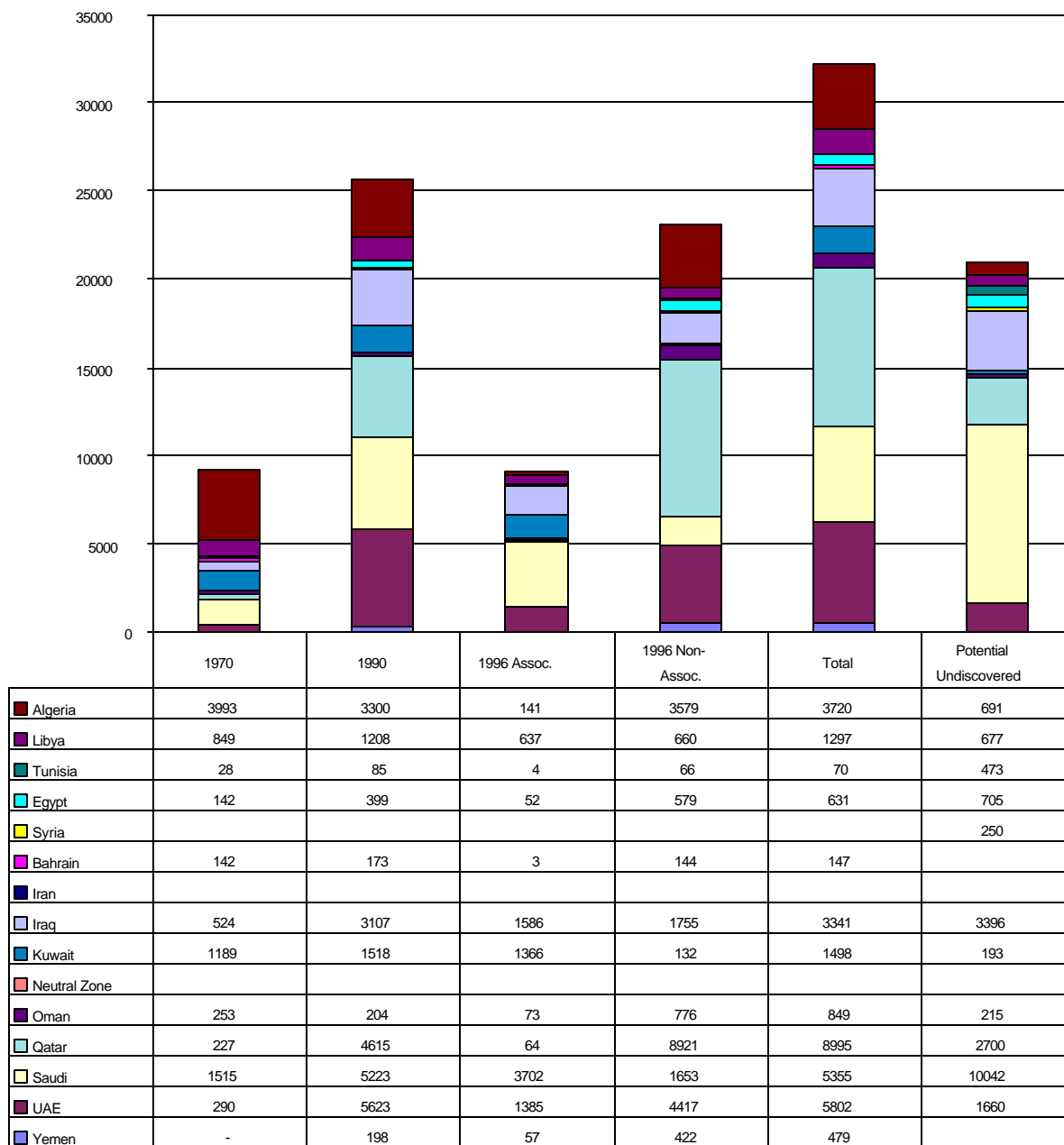


Note: North America includes Mexico

Adapted by Anthony H. Cordesman IEA, World Energy Outlook, 1998, pp. 136-138..

Figure V.23

An Arab Estimate of Arab Natural Gas Reserves by Country
(In Billions of Cubic Meters)



Total Arab	9175	25809	9105	23569	32674	22520
Gulf Arab	4163	20817	8271	18685	26956	18456
North African Arab	5012	4992	834	4884	5718	4064
Arab as % of World	23.3%	19.8%	62.1%	17.4%	21.7%	NA

Adapted by Anthony H. Cordesman from Dr. M. Mukhtar Al-Lababidi, Energy Resources in the Arab Countries, Kuwait, November 19-21, 1998.

Table V.1**OPEC and Non-OPEC Quotas and Actual Production in 1998**

(Production in thousands of barrels per day)

<u>Country</u>	Actual	OPEC	Cutbacks	OPEC Quota	Cutbacks	<u>Actual Production</u>	
	Production	Base	Effective	<u>7/1/98</u>	Effective	<u>9/98</u>	<u>Q398</u>
	<u>2/98</u>	<u>2/98</u>	<u>4/1/98</u>		<u>7/1/98</u>		
Algeria	860	868	50	788	30	790	793
Indonesia	1,340	1,380	70	1,280	30	1,330	1,323
Iran	3,600	3,623	140	3,318	165	3,650	3,532
Iraq+++	-	-	-	2,550	-	2,900	2,961
Kuwait+	2,210	2,205	125	1,980	100	1,972	2,205
Libya	1,450	1,453	80	1,323	50	1,335	1,345
Nigeria	2,153	2,258	125	2,033	100	1,900	1,951
Qatar	700	700	30	640	30	630	640
Saudi Arabia+	8,760	8,748	300	8,023	425	8,173	8,225
UAE++	2,355	2,382	125	2,157	100	2,220	2,213
Venezuela	3,370	3,370	200	2,845	325	2,900	2,961
Total OPEC					NA	27,450	27,490
Mexico	3,140	NA	100	-	100	-	-
Norway	3,230	NA	100	-	-	-	-
Russia	6,040	NA	-	-	100	-	-
Oman	910	NA	30	-	20	-	-
Yemen	380	NA	20	-	-	-	-
Egypt	860	NA	-	-	20	-	-
Total							
Non-OPEC	14,560	NA	250	-	240	-	-
TOTAL	41,358	NA	1,495	-	1,595	-	-

*Quotas are based on crude oil production.

**Crude oil does not include natural gas liquids or lease condensate.

+Kuwaiti and Saudi Arabian figures each include half of production from the Neutral Zone between the two countries.

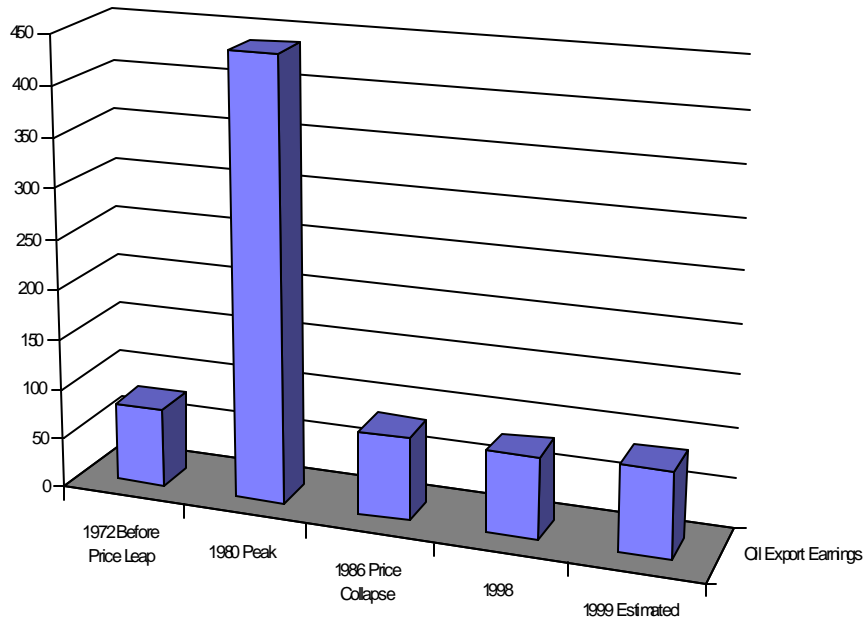
++Quota applies only to Abu Dhabi.

+++Iraqi oil production is constrained by the United Nations' limits on its exports and as such has not been a part of any OPEC agreements in 1998. The numbers provided as Iraqi quotas are EIA estimates of what OPEC may have assumed in coming up with the cutback agreements.

Source: EIA On-Line Factsheets, July 14, 1998 and December 1, 1998.

Figure V.24

**The “Oil Shock in Reverse:” Shifts in Total OPEC Earnings
(\$1990 Billions)**

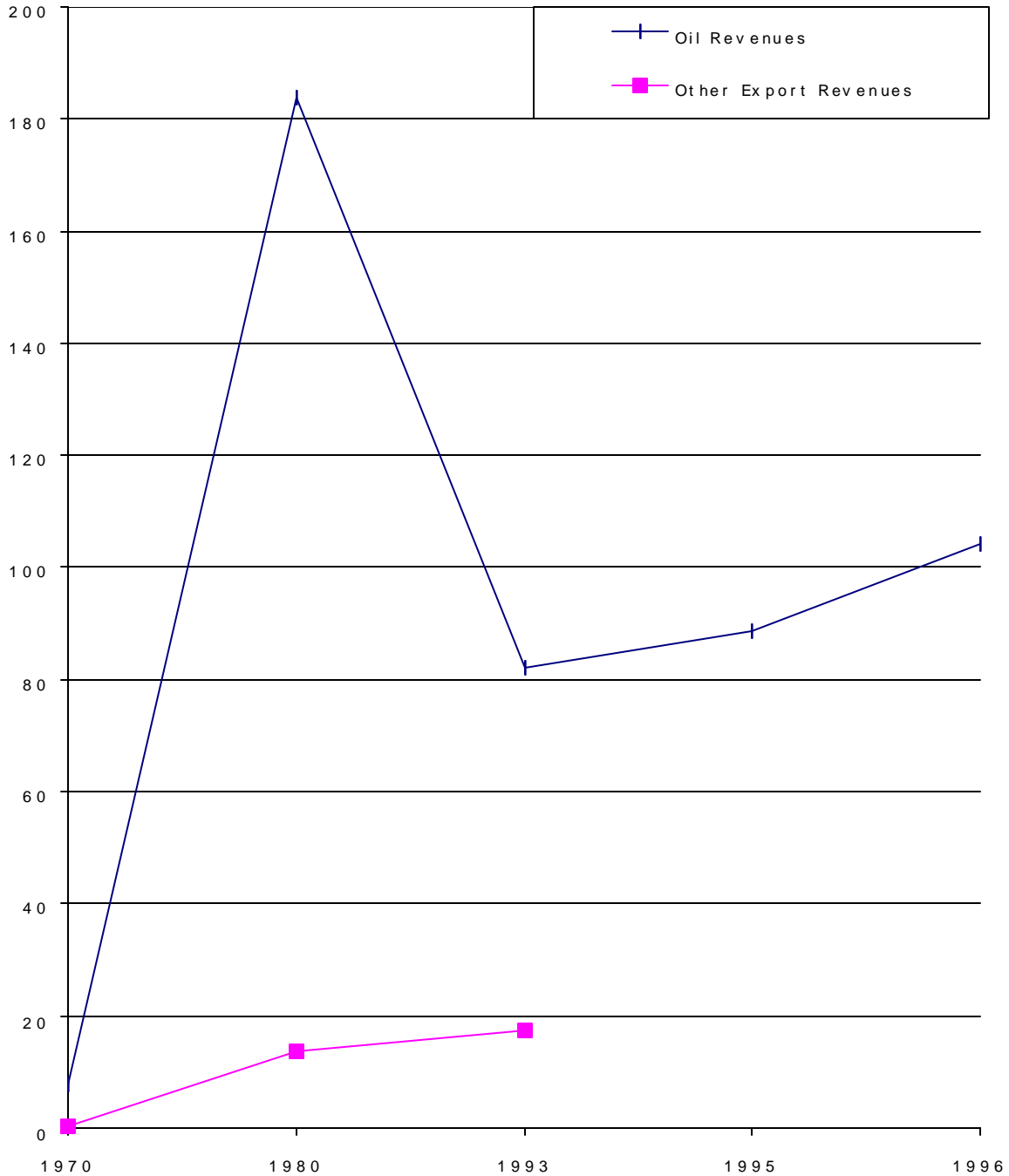


	1972 Before Price Leap	1980 Peak	1986 Price Collapse	1998	1999 Estimated
Oil Export Earnings	77	439	83	80	85

Adapted by Anthony H. Cordesman from data provided by DOE/EIA. June 1999.

Figure V.25

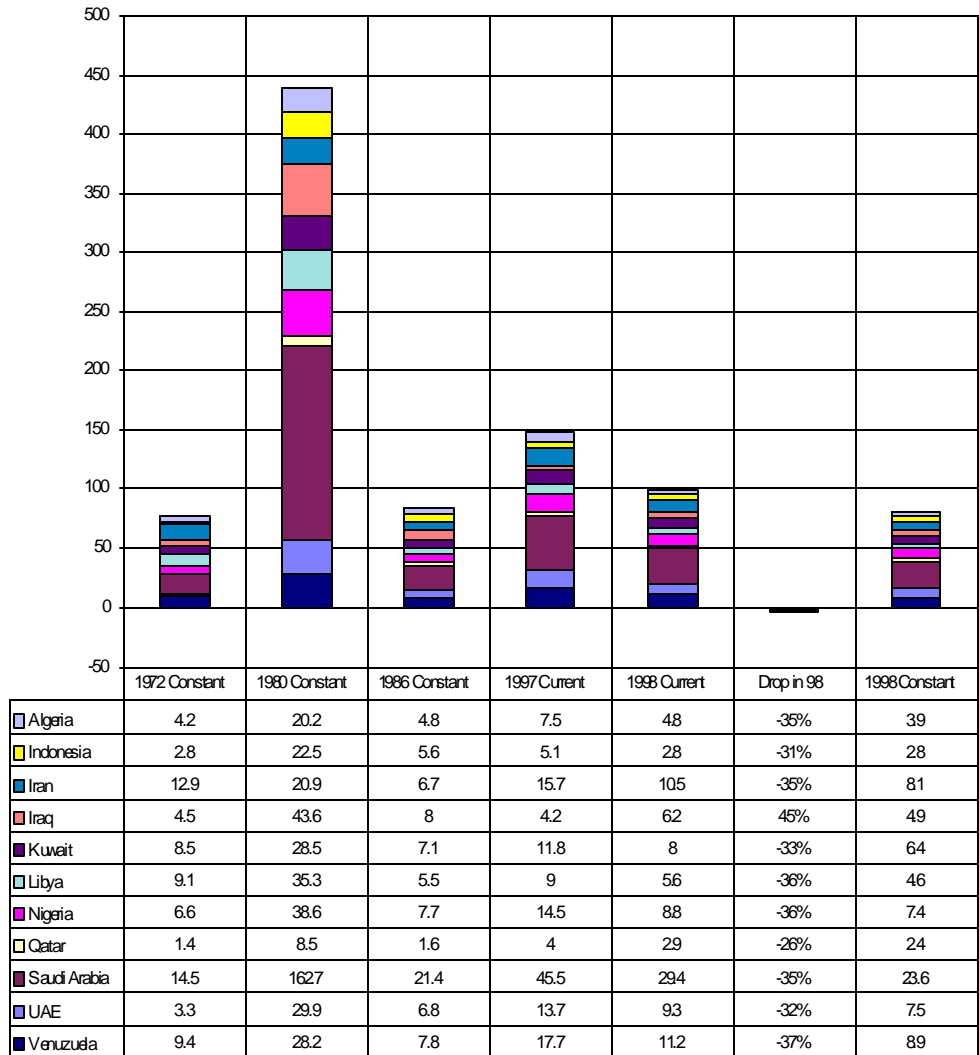
The “Oil Shock in Reverse:” Shifts in Gulf Export Earnings 1970-1996
 (\$Current Billions)



Adapted by Anthony H. Cordesman from data provided by Hubert des Longchamps of Elf Aquitaine and The Economist, December 21, 1996, p. 54.

Figure V.26

The “Oil Shock in Reverse:” Shifts in OPEC Earnings by Major Country: 1972-1998
(in \$US Current and 1990 Constant Billions)



Total 77.2 438.8 83.0 148.7 100.6 -32% 80.5

Source: Adapted by Anthony H. Cordesman from data provided by the EIA as of May 1999.