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**The US, the Gulf, and the Middle East:  
Energy Dependence, Demographics, and the  
Forces Shaping Internal Stability**

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Arleigh A. Burke Chair in Strategy**

**December 9, 2002**

The latest flap over the possible Saudi funding of terrorism has led to new talk about reducing our dependence on imported oil. Well, everyone is entitled to his or her own opinions, but no one is entitled to their own facts. The Bush Administration, the Congress, and the press have said some remarkably silly things in recent months about US dependence on oil imports and the Middle East. They have implied that US domestic energy efforts can make a near and mid-term impact on our dependence on oil imports when it can't. There have been truly silly articles about Russia displacing Saudi Arabia as an enduring oil power. There have been many articles that ignore the fact that US energy forecasts already call for major increases in energy efficiency and conservation, the use of renewables, and other energy sources.

The facts seem to be very different. There is one aspect of energy over which there is virtually no debate. All of our projections of energy supply indicate that we face the need to project the world's key sources of oil exports for decades to come. After nearly three decades of intense effort to find commercial viable proven oil reserves outside the Middle East, current estimates indicate that the Middle Eastern and North African Arab states have between 68% and 70% of the world's reserves – a percentage nearly 10% higher than in the 1970s, when this exploration effort began. The Gulf alone has 65% of the world's proven reserves.

Russia – a high cost producer with an inefficient oil production infrastructure – may be able to sustain high levels of production for a while, but the Department of energy currently estimates that it only has 4.6% of the world's proven oil reserves and always has to sell at the maximum it can produce. If the US gets oil from Russia, the end result is simply to make some other customer buy their oil from another exporter. The supply of oil is still the same and global competition ensures that the US pays the same world price for Russian oil as everyone else pays for oil all over the world.

There are no massive supplies of oil in other parts of the FSU. The entire reserves of the Caspian and Central Asian states only add another 2.3%. The US has only 2.9%.<sup>i</sup> In contrast Saudi Arabia alone has at least 25% and probably well over 30% Iran, Iraq, Kuwait, and the UAE each have some 8-11%. All can produce new oil at only 20-30% of the cost of either Russia or the Caspian states.<sup>ii</sup>

Talking about the size of future imports and exports is more uncertain. There are many private projections of energy based on politics, lobbying, ideology, and pure guesswork. However, only OPEC, the International Energy Agency, and the Energy Information Agency (EIA) of the US Department of Energy have the ability to create large scale data bases on energy reserves, flow, and consumption, and model them with real credibility. All three of these sources roughly agree about future trends and based their estimates on models and data that have proved roughly correct over more than a decade. There are no certainties in energy, but to the extent there are facts, they are contained in the work done by these sources.

If one looks at the EIA projections, which are the authoritative source for US government analysis, one gets a very different “fact-based” view of the future from the ones in the Bush Administration's policy statements, Congressional debates, and carelessly researched news articles. The noise surrounding the Bush energy policy issued in 2001 and the resulting Congressional debate over the 2002 energy bill disguises the fact that even if *all* the additional US

production of oil and all other forms of energy called for in such policies was actually achieved, it would have virtually no impact on dependence on US strategic dependence on oil exports.

The Bush energy policy documents issued in 2001 never addressed the foreign side of energy supply and consumption, and never included any meaningful quantified forecasts of the impact of its policy. However, the Department of Energy's Energy Information Agency (DOE EIA) has issued quantified forecast since that time.<sup>iii</sup> Even though these forecasts do call for significant additional energy efficiency and conservation, and increases in other fuels and renewables, they still call for US direct imports of oil to increase from roughly 9.2 MMBD in 2002 to a best estimate of 26 MMBD in 2020 (a 183% increase over less than two decades), and to a range from 25 to 29 MMBD.

Yet, such estimates grossly understate our true dependence on oil imports. The US now imports around \$1.2 trillion worth of goods and services a year.<sup>iv</sup> Many are manufactured goods from Europe and Asia that are critically dependent on imported oil. We have no estimate of such indirect energy imports in any of our energy plans, but it is clear that they would add at least another 1 MMBD to our import level – far more oil than either the Bush energy policy or Congressional variation on this policy in the 2002 energy bill – would save in terms of energy imports. Our imports and true level of oil import dependence will also increase through 2020.

Moreover, we are critically dependent on “globalism” in terms of the ability of other nations to buy our exports and invest in our economy. Not only must we compete for oil imports at market prices in a world market – an issue that makes where our oil imports come from in any given period largely irrelevant. Our vital strategic interests depend on the global availability of oil at moderate prices, not on our own imports.

If the world economy is to keep growing a moderate average rate during the next two decades, the EIA indicates that total Middle Eastern oil production capacity must increase from 29 MMBD in 2002 to 51 MMBD by 2020 – a more than 75% increase. Total Gulf capacity must rise from 24 MMBD to 43 MMBD – a nearly 80% increase. Saudi capacity alone must increase from 11.4 to 22.1 MMBD – a 93% increase.<sup>v</sup>

World demand for oil exports will continue to steadily increase in spite of major projected increases in gas, renewables, other fuels, and energy efficiency and conservation. Total petroleum exports are projected to increase from 42.4 to 70.9 MMBD (a 67% increase), and exports from the Gulf from 14.8 MMBD to 33.5 MMBD (a 126% increase). While the US and other industrialized nations will consume part of this increase, most will be vital to the growth of less developed nations. The EIA projected that industrialized states will need another 6.2 MMBD by 2020, but that developing nations will need an increase of 17 MMBD. China alone will need 7.2 MMBD.

A similar analysis by the International Energy Agency, of the OECD, estimates that global demand for oil increased from 2,450 million tons of oil equivalent (Mtoe) in 1971 to 3,604 Mtoe in 2000 – a nearly 50% increase. Rising demand in the developing world is projected to increase demand to 4,272 Mtoe in 2010 (a 19 percent increase), and 5,769 Mtoe in 2030 (a 60 percent increase). This will occur in spite of massive increases in the consumption of coal, gas, hydro, and renewables and an average decline in energy intensity (the amount of energy needed for a given amount of economic output) will drop by an average of 1.2% per year.<sup>vi</sup> This is a growth from 75 MMBD in 2000 to 89 MMBD in 2010 and 120 MMBD in 2030. The IEA estimates that more than 60% of the increase will go to developing countries, many of which are trading partners of the US and effectively reexport oil in the form of finished goods. This will require a global

increase in the intraregional aspects of oil exports from 45% to 58%, almost all of the increase coming from Middle Eastern oil exporters. Some 30% of the total increase in oil demand, however, will go to OECD countries and be critical to the economic growth of the US and its industrialized allies in the West.

The punchline is simple. When we talk about Iraq, the Middle East, the Gulf, our strategic interests, and the world's economy, the fact is that all of our projections of energy supply indicate that we will be dependent on the world's key source of oil exports for decades to come. We can't make this going away with fantasies about other energy resources, by political discussions of domestic energy policy that ignore the realities of what such policies can or cannot hope to accomplish, or by exaggerating the role of smaller oil powers. We have one vital strategic interest in the Middle East: energy exports. Barring a technological miracle, that dependence will continue for decades. We cannot ignore today's threat from Iraq, and even if we are successful in going to war with Saddam. We will still have to prepare for a major regional contingency in the Middle East.

Anthony H. Cordesman holds the Arleigh A. Burke Chair in Strategy at the Center for Strategic and International Studies. He is a former official at the Department of Energy and the author of Iraq's Military Forces: A Net Assessment, CSIS, 2002).

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Chart One

Middle Eastern Oil Reserves Continue to Dominate Total World Reserves  
(In Billions of Barrels)



Source: BP Amoco, Statistical Review of World Energy, 2002, June 2002, [www.bpamoco.com/alive](http://www.bpamoco.com/alive).

Table One

Comparative Oil Reserves and Production Levels of the Gulf States – Part One  
Comparative Reserves

Comparative Oil Reserves in Billions of Barrels

<u>Country</u>	<u>Identified</u>	<u>Undiscovered</u>	<u>Identified + Undiscovered</u>	<u>Proven</u>	<u>% of World Total</u>
Bahrain	-	-	-	.2	(-0.05%)
Iran	69.2	19.0	88.2	89.7	8.6%
Iraq	90.8	35.0	125.8	112.5	10.8%
Kuwait	92.6	3.0	95.6	96.5	9.2%
Oman	-	-	-	5.5	0.5%
Qatar	3.9	0	3.9	13.2	1.3%
Saudi Arabia	265.5	51.0	316.5	261.7	25.0%
UAE	61.1	4.2	65.3	97.8	9.3%
Total	583.0	112.2	695.2	677.1	64.7%
Algeria	-	-	-	9.2	0.9%
Egypt	-	-	-	2.9	0.3%
Libya	-	-	-	29.5	2.9%
Syria	-	-	-	2.5	0.2%
Tunisia	-	-	-	0.3	(-0.05%)
Yemen	-	-	-	4.0	0.4%
Total Middle East & North Africa	-	-	-	725.5	69.4%
Rest of World	-	-	-	320.9	31.4%
(US)	-	-	-	29.76	2.8%
(North America)	-	-	-	64.4	6.1%
(Russia)	-	-	-	48.6	4.6%
(FSU)	-	-	-	65.3	6.4%
World	-	-	-	1,046.4	100.0%

Source: Adapted by Anthony H. Cordesman from estimates in US Geological survey, World Petroleum Assessment 2000, [usgs.gov/energy/WorldEnergy/DDS-60](http://usgs.gov/energy/WorldEnergy/DDS-60); and BPAmoco, Statistical Review of World Energy, 2001, June 2001, [www. bpamoco.com/alive](http://www.bpamoco.com/alive) .



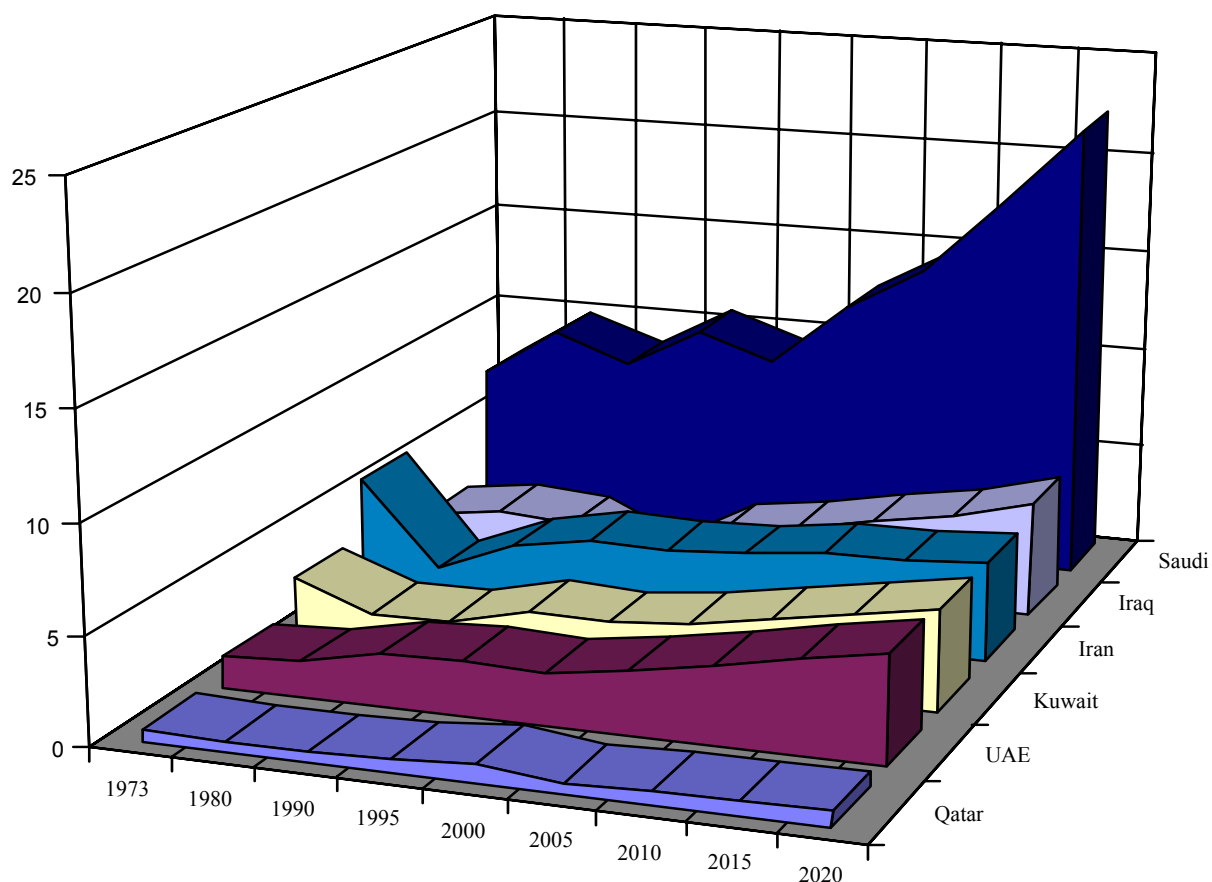
Table TwoComparative Oil Reserves and Production Levels of the Gulf States Comparative Production and Production CapacityComparative Oil Production Capacity (In Millions of Barrels Per Day)

<u>Country</u>	<u>DOE Reference Case Estimate of Maximum Sustainable Production Capacity</u>							<u>Actual</u>		
	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>2020</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Bahrain	-	-	-	-	-	-	-	-	-	-
Iran	3.2	3.9	3.9	4.0	4.4	4.5	4.7	3.2	3.7	3.8
Iraq	2.2	0.6	2.8	3.1	3.9	4.5	5.5	2.2	0.6	2.6
Kuwait	1.7	2.6	2.6	2.8	3.5	4.1	4.8	1.7	2.1	2.5
Oman	-	-	-	-	-	-	-	-	0.9	0.9
Qatar	0.5	0.6	0.6	0.5	0.6	0.7	0.7	0.5	0.5	0.7
Saudi Arabia	8.6	10.6	11.4	12.5	14.6	18.2	22.1	8.6	8.9	9.4
UAE	2.5	2.6	2.7	3.0	3.7	4.4	5.1	2.5	2.5	2.5
Total Gulf	18.7	20.9	24.0	25.9	30.7	36.4	42.9	18.7	19.6	21.7
Other Middle East	1.4	1.6	1.9	2.2	2.4	2.5	2.4	1.4	1.1	2.0
Algeria	1.3	1.4	1.4	1.9	2.2	2.3	2.5	1.3	1.3	1.4
Libya	1.5	1.5	1.5	2.1	2.5	2.8	3.2	1.5	1.4	1.5
Total North Africa	2.8	2.9	2.9	4.0	4.7	5.1	5.7	2.8	2.7	2.9
Total Middle East & North Africa	22.9	25.4	28.8	32.1	37.8	44.0	51.0	22.9	23.4	26.6
World	69.4	73.0	78.7	88.0	98.4	109.8	121.3	69.4	68.0	77.4
(Saudi Arabia as % Of World)	12.4%	14.5%	14.5%	14.2%	14.8%	16.5%	18.2%	12.4%	13.0%	12.1%

Source: Adapted by Anthony H. Cordesman from estimates in DOE/EIA, International Energy Outlook, 2002, Washington, DOE/EIA, p. 235.

### Chart Two

The US Projects Massive Increases in Gulf Oil Production Capacity in Order to Meet Global Demand: 2000-2020  
(EIA Reference Case in MMBD)



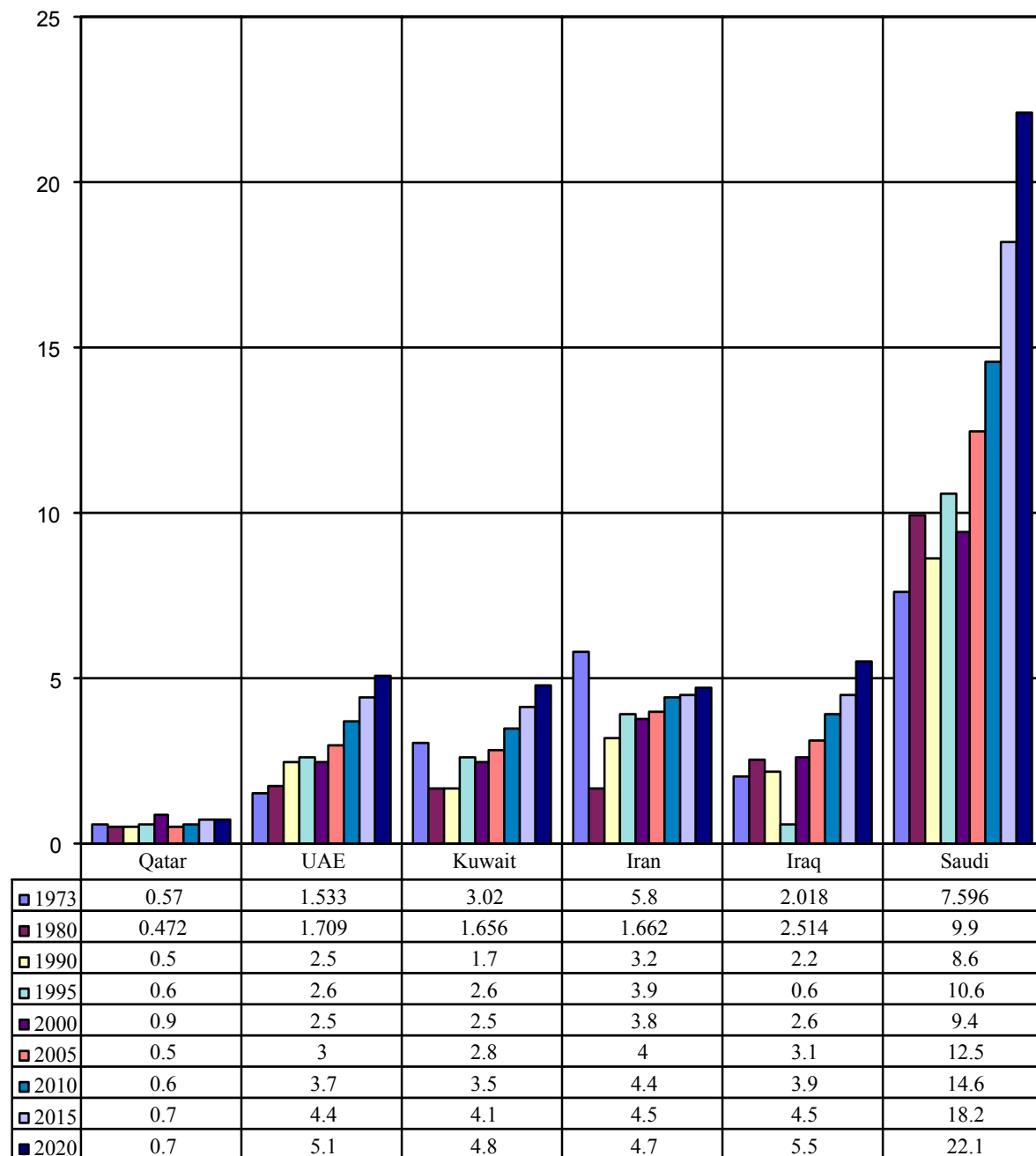
	1973	1980	1990	1995	2000	2005	2010	2015	2020
Qatar	0.57	0.472	0.5	0.6	0.9	0.5	0.6	0.7	0.7
UAE	1.533	1.709	2.5	2.6	2.5	3	3.7	4.4	5.1
Kuwait	3.02	1.656	1.7	2.6	2.5	2.8	3.5	4.1	4.8
Iran	5.8	1.662	3.2	3.9	3.8	4	4.4	4.5	4.7
Iraq	2.018	2.514	2.2	0.6	2.6	3.1	3.9	4.5	5.5
Saudi	7.596	9.9	8.6	10.6	9.4	12.5	14.6	18.2	22.1

Total Gulf	-	18.7	-	21.7	25.9	30.7	36.4	42.9
Saudi Arabia as % of Total	-	45.95	-	43.35	48.2	47.6	50.0	51.53
Total OPEC	-	27.2	-	31.4	38.4	44.8	52.0	60.2
Total World	-	69.4	-	77.4	88.0	98.4	109.8	121.3
Saudi Arabia as % of Total	-	12.4	-	12.1	14.25	14.8	16.6	18.21

Source: Adapted by Anthony H. Cordesman from EIA, International Energy Outlook, 1997, DOE/EIA-0484 (97), April 1997, pp. 157-160, and EIA, International Energy Outlook, 2002, DOE/EIA-0484 (2002), March 2002, Table D1.

### Chart Three

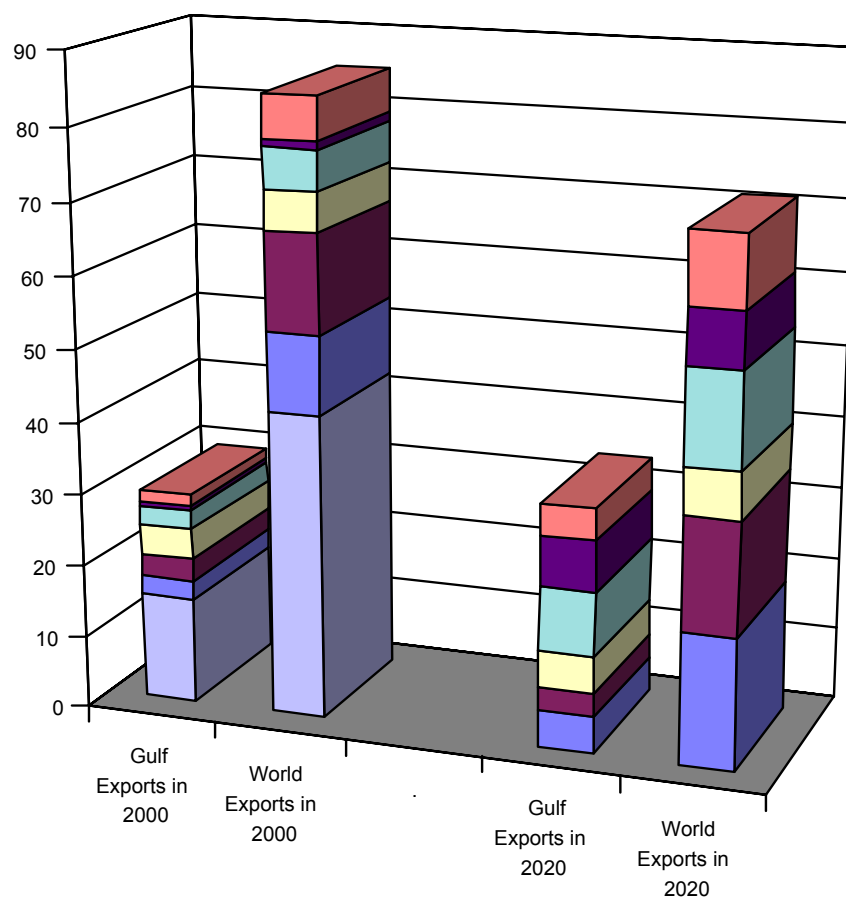
The Increase by Gulf Country Illustrates the Level of Increasing Dependence on Key Gulf Exporters: 2000-2020  
(EIA Reference Case in MMBD)



Source: Adapted by Anthony H. Cordesman from EIA, [International Energy Outlook, 1997](#), DOE/EIA-0484 (97), April 1997, pp. 157-160, and EIA, [International Energy Outlook, 2002](#), DOE/EIA-0484 (2002), March 2002, Table D1.

### Chart Four

The Same is True of US Projections of Gulf Oil Exports:  
Daily Imports by Region 2000 versus 2020  
(In Millions of Barrels Per Day)



	Gulf Exports in 2000	World Exports in 2000		Gulf Exports in 2020	World Exports in 2020
Rest of World	1.5	5.9		4.3	9.9
China	0.7	1.1		7.1	7.6
Pacific Rim	2.7	5.6		8.7	13.1
Industrial Asia	4.1	5.4		5	6.5
Western Europe	3.2	13.7		3.5	15.6
North America	2.6	10.7		4.9	18.2
TOTAL	14.8	42.4		*33.5	*70.9

Gulf as % of World

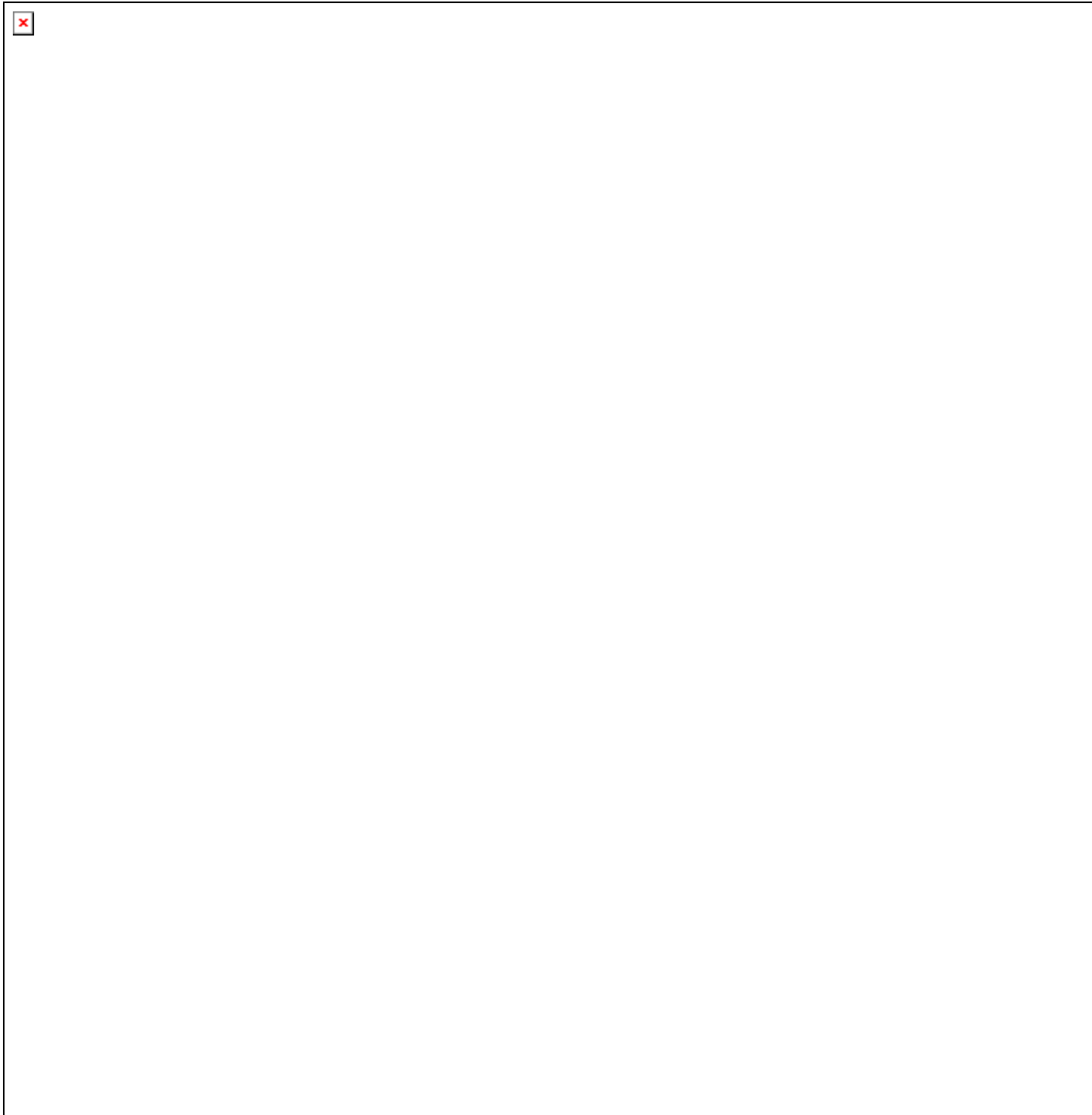
34.9%

47.2%

Source: Adapted by Anthony H. Cordesman from US Department of Energy, International Energy Outlook, 2002, Washington, Energy Information Agency, March 2002, Table 13, p. 38.

Chart Five

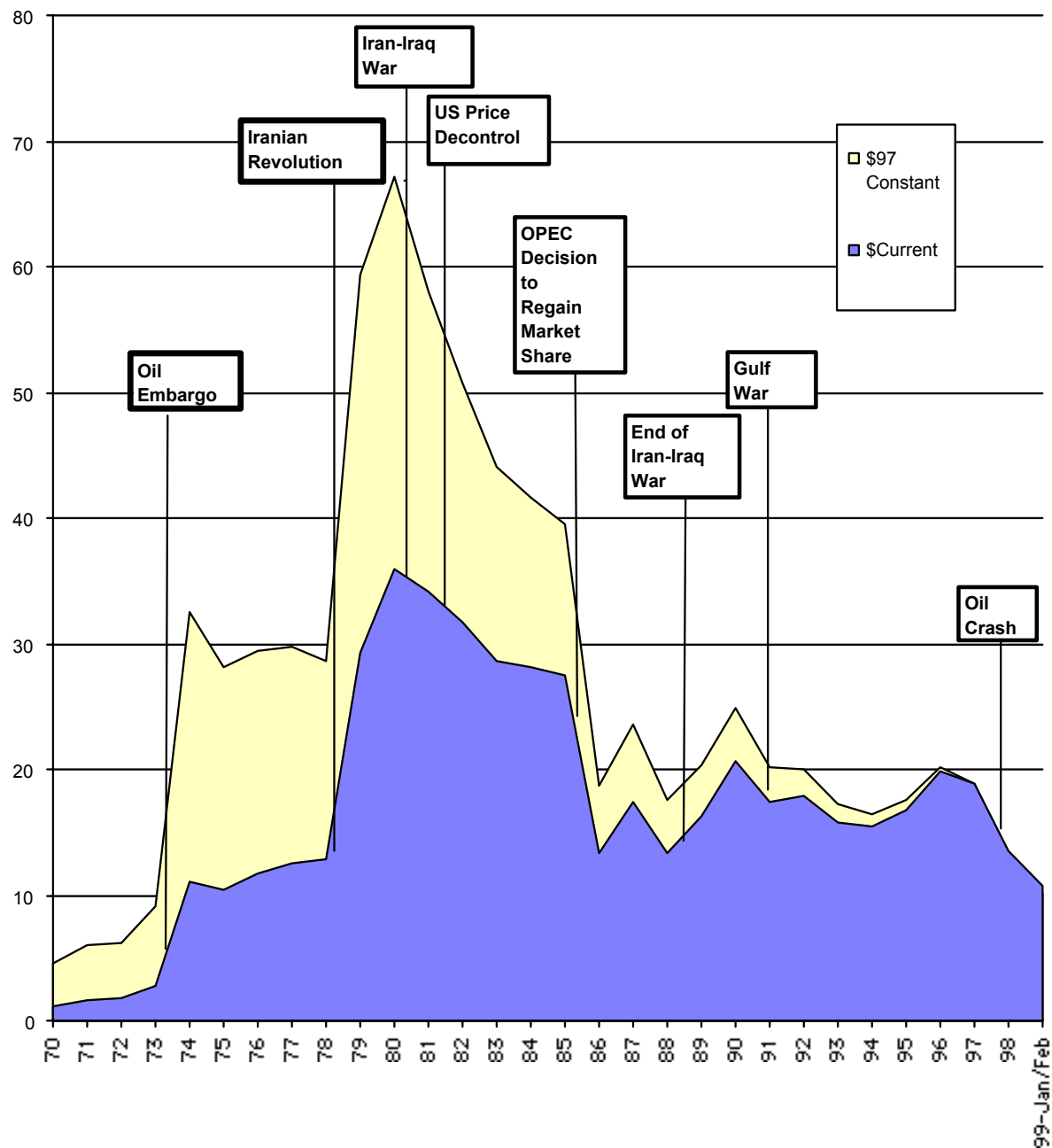
The Net Result is Massive Increases in US and Other Industrialized Nation  
Energy Dependence on Imported Oil  
(in Millions of Barrels)



Source: DOE/EIA, International Energy Outlook, June 2002, [www.bpamoco.com/alive](http://www.bpamoco.com/alive).

Chart Six

Beyond Market Forces: Oil is a Conflict-Driven Business:  
Politics, War, and the Trends in the Price of Saudi Arabia Light Crude: 1970-1999  
 (\$US Current and \$US 1997 Constant)

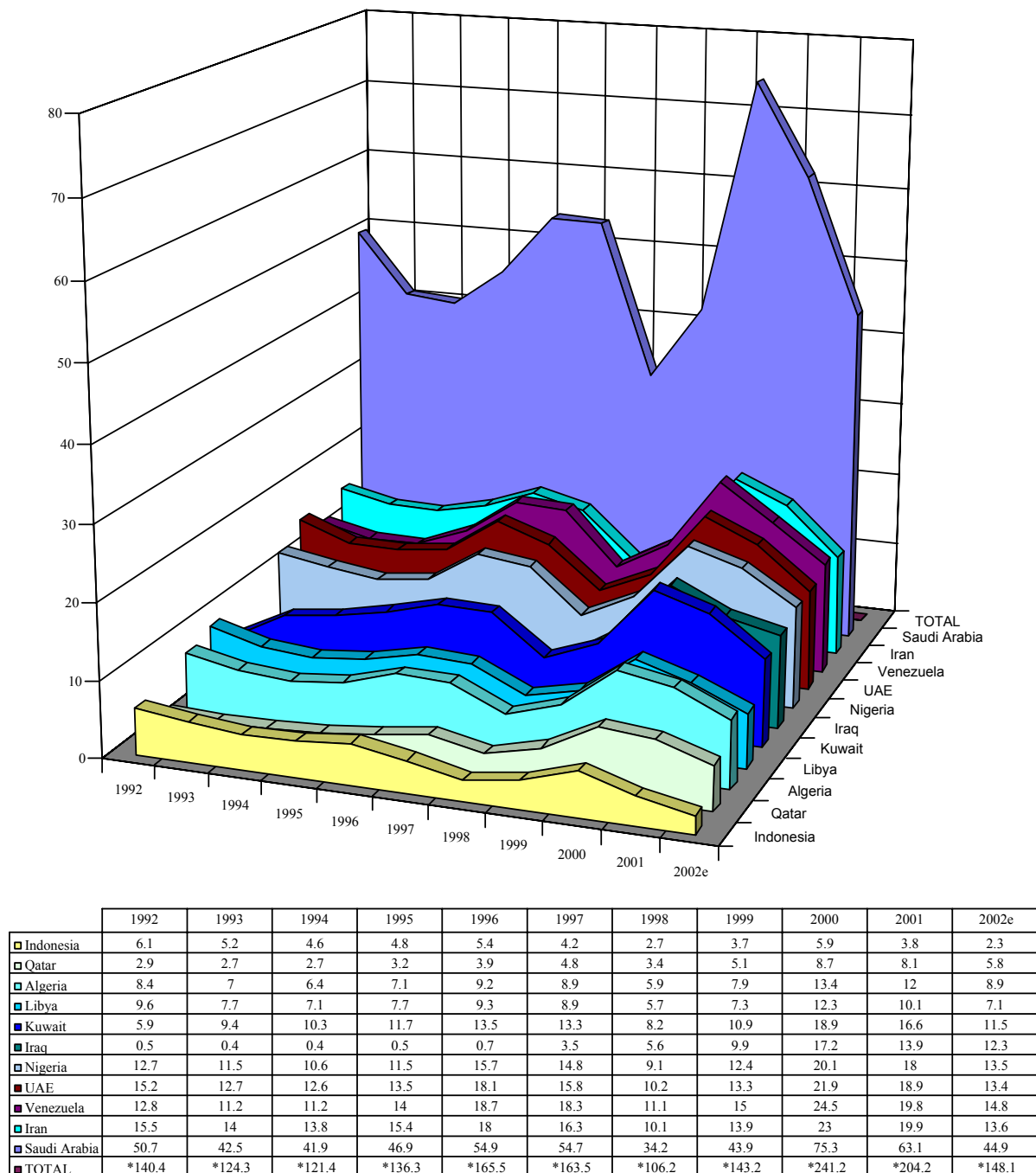


Total ME												
OPEC	13/31	18/87	17/91	9/53	15/19	14.77	15.99	16.75	16.84	16.99	17.18	18.30
Total ME	13.95	19.57	18.40	10.25	16.49	16.19	17.43	18.34	18.59	18.84	19.08	20.16

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

Chart Seven

“Oil Crash” to “Oil Boom” in 1992-2001: Even in Peacetime, Oil Revenues are Unpredictable and Have Massive Regional Macroeconomic Impacts  
(In US Current Billions)

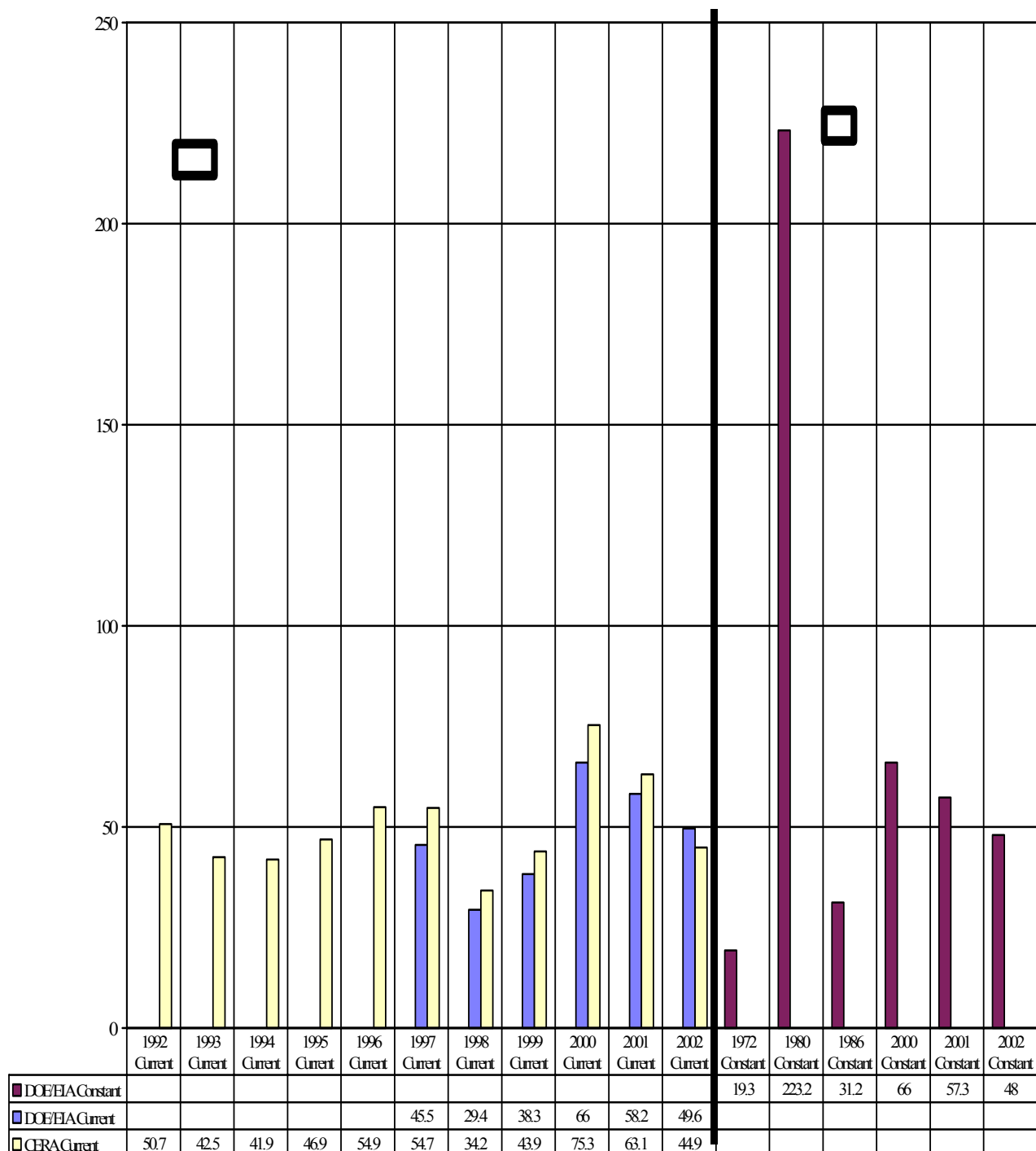


Source: Adapted by Anthony H. Cordesman from projections by the EIA in various editions of its “OPEC Revenues Sheet,” and from Cambridge Energy Associates (CERA), “OPEC Tilts to Market Share,” *World Oil Watch*, Winter 2002, p. 28.

### Chart Eight

#### Saudi Arabia As a Case Study: The Oil Boom is Long Over

(In \$US Current and 2000 Constant Billions)



Note: EIA data are for crude oil exports. CERA data are for total petroleum exports.

Source: Adapted by Anthony H. Cordesman from data provided by the EIA as of March 2001 and December 2002

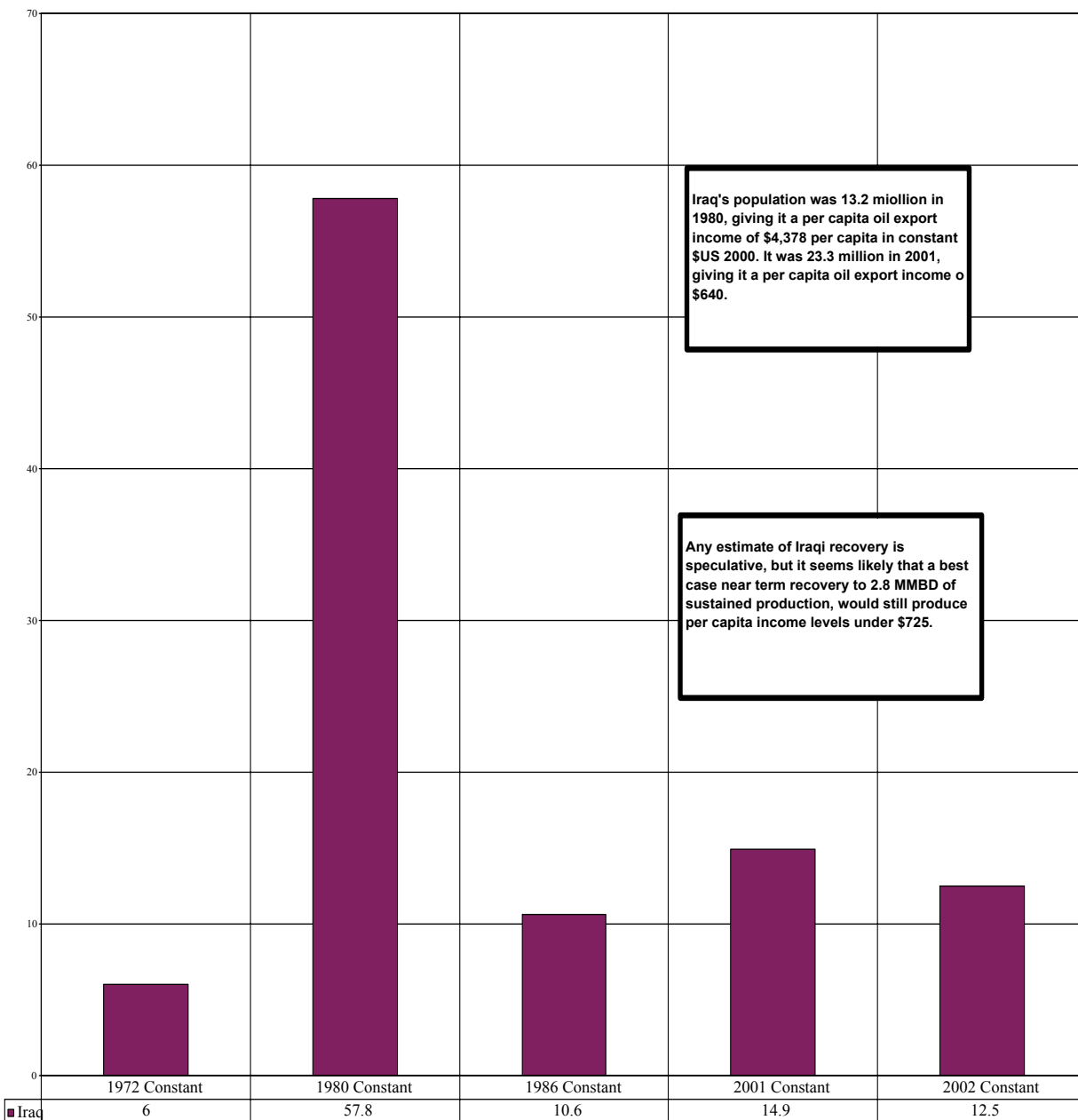
([www.eia.gov/emeu/cabs/opecrev.html](http://www.eia.gov/emeu/cabs/opecrev.html).) and in Cambridge Energy Research Associates, OPEC Tilts to Market Share, *World Oil Watch*, Winter 2002, p. 28.



### Chart Nine

#### Iraq As a Case Study: Oil Wealth is Now Far More Relative

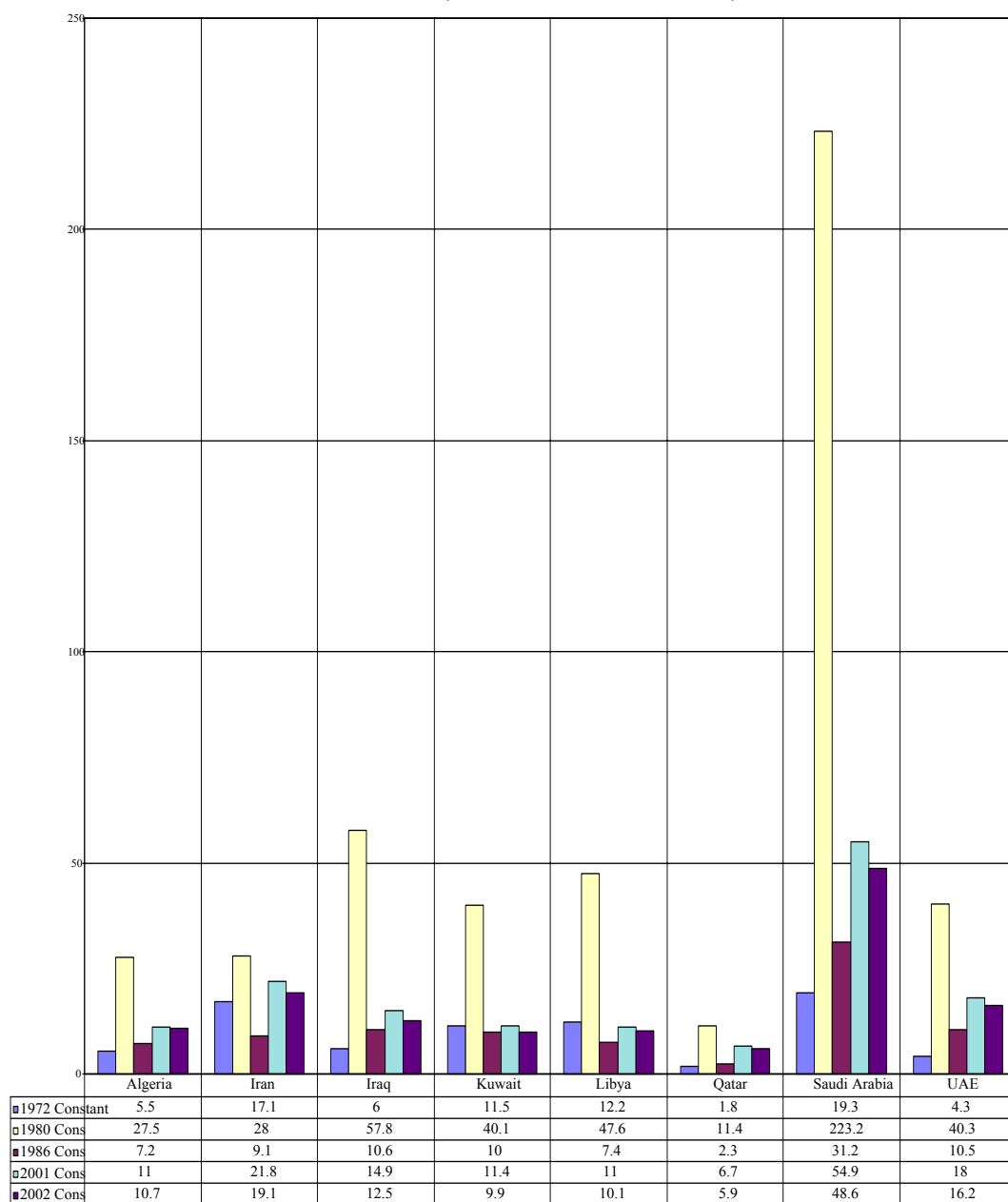
(In \$US Current and 2000 Constant Billions)



Source: Adapted by Anthony H. Cordesman from data provided by the EIA as of March 2001 and December 2002 ([www.eia.gov/emeu/cabs/opecrev.html](http://www.eia.gov/emeu/cabs/opecrev.html)) and the EIA country analysis for Iraq as of October 2002, ([www.eia.doe.gov/emeu/cabs/iraq.html](http://www.eia.doe.gov/emeu/cabs/iraq.html).)

### Chart Ten

#### All Middle Eastern Exporters: The “Oil Boom” Is Over Throughout the Region (In \$US 2000 Constant Billions)

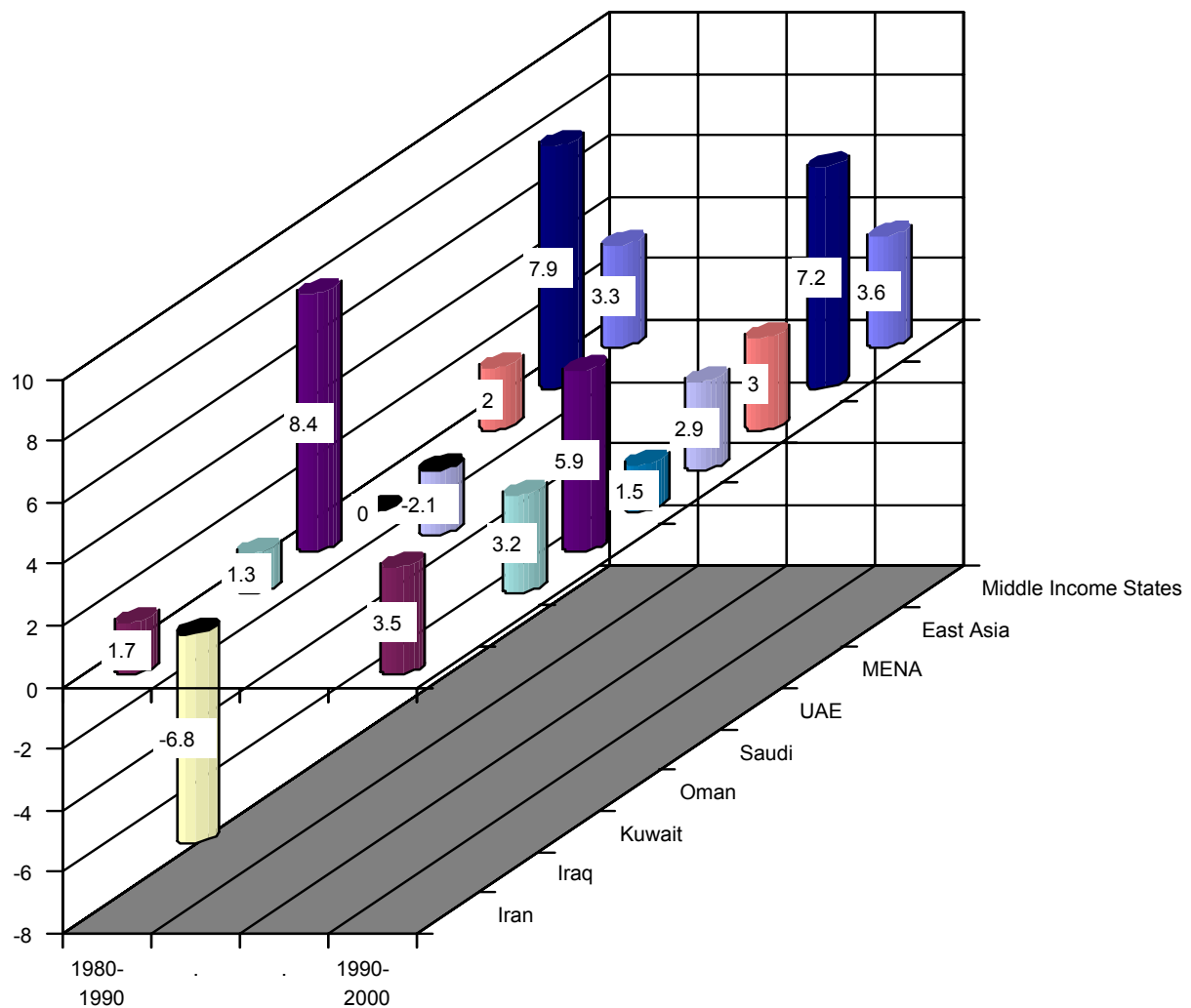


Note: EIA data are for crude oil exports. CERA data are for total petroleum exports.

Source: Adapted by Anthony H. Cordesman from data provided by the EIA as of March 2001 and December 2002 ([www.eia.gov/emeu/cabs/opecrev.html](http://www.eia.gov/emeu/cabs/opecrev.html).)

Chart Eleven

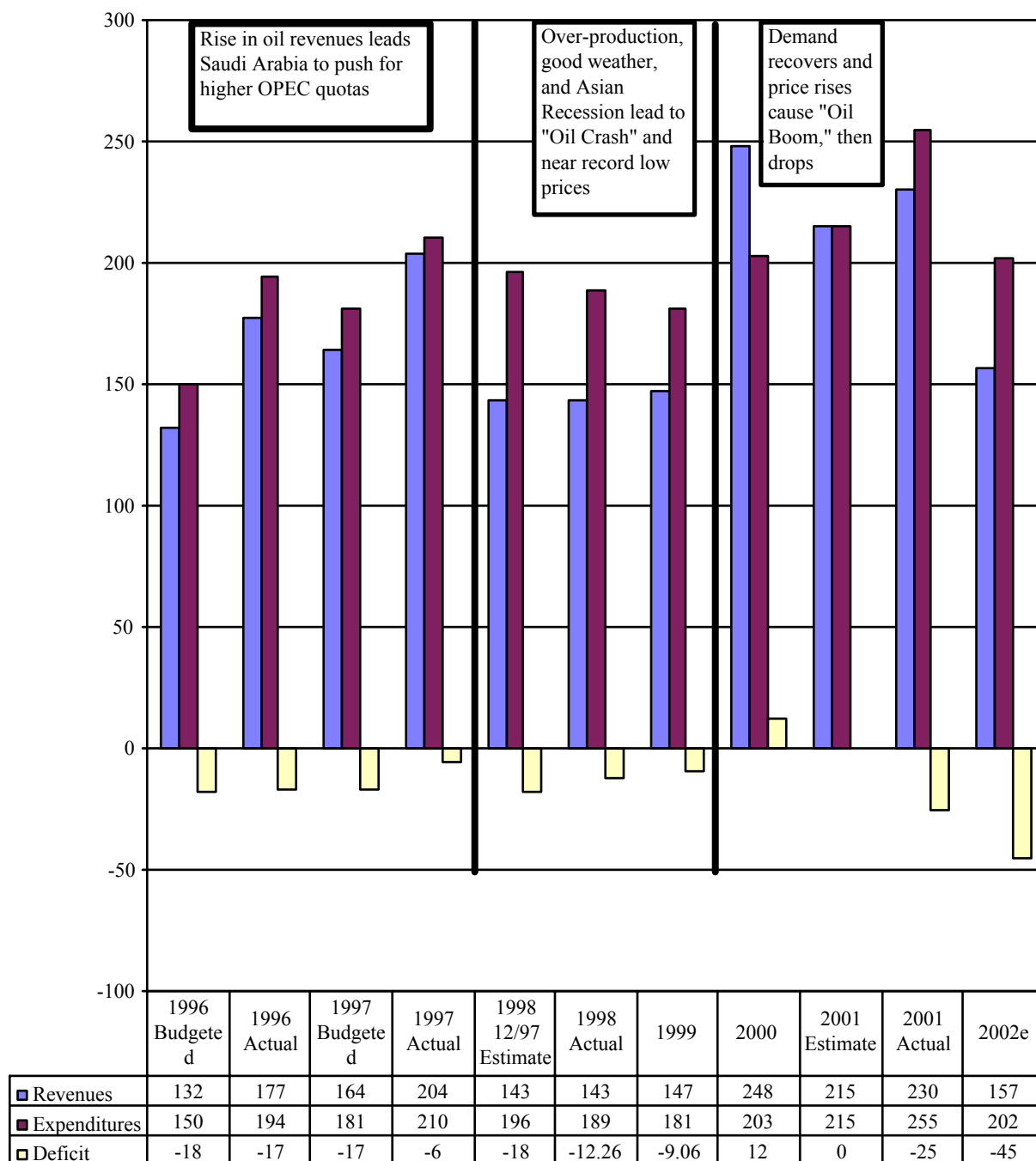
GDP Growth of the Other Gulf and MENA States Lagged Behind East Asia and Middle Income States, During the 1980s and 1990s  
(Percent of Real Annual Change during 1980-2000)



Adapted by Anthony H. Cordesman from World Bank, World Development Indicators, 2002, pp. 204-206

Chart Twelve

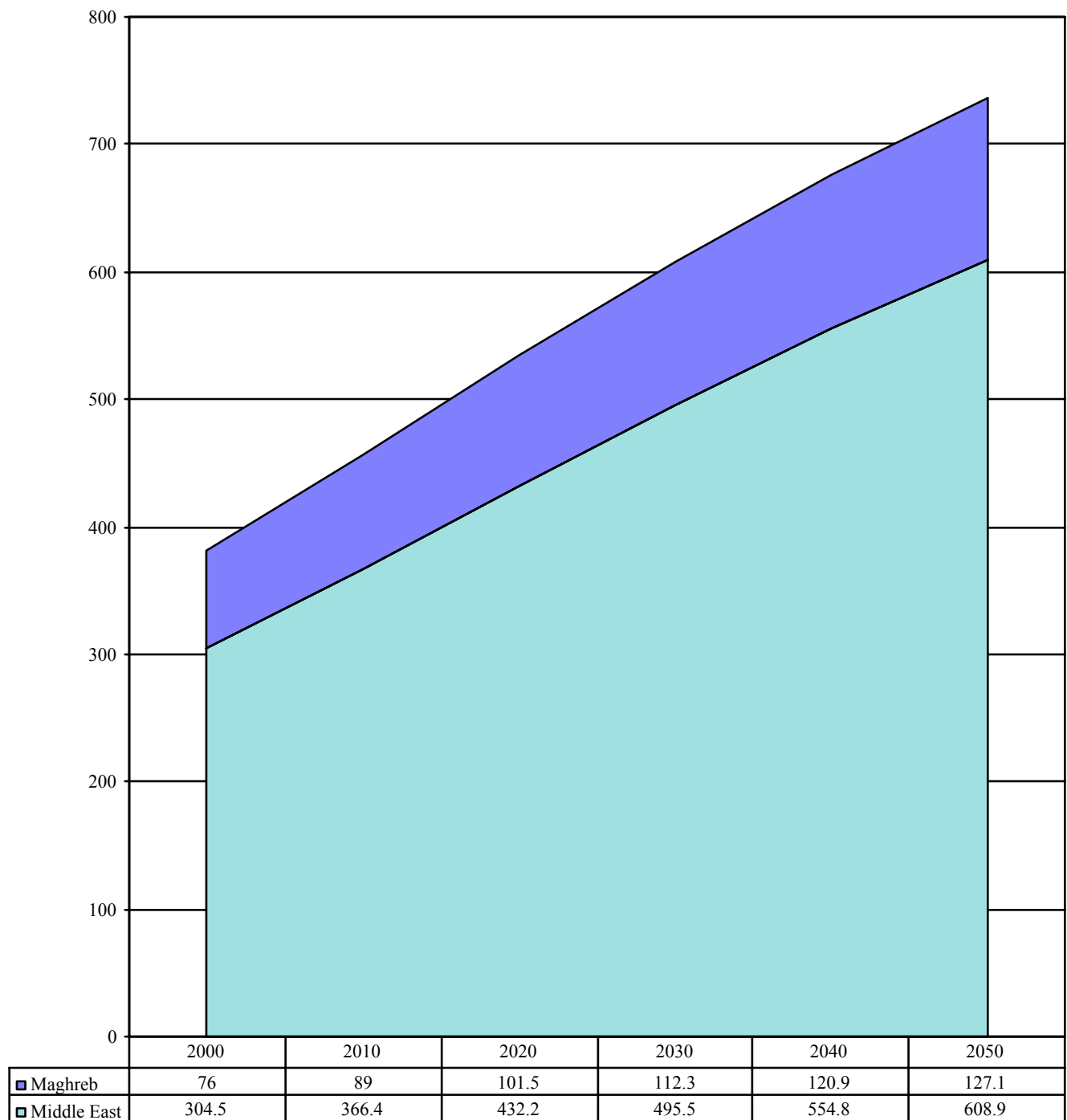
**Pressures on the Saudi Budget: The Impact of the Recent "Oil Crash" and "Oil Boom"**  
(In billions of Saudi Riyals)



Source: Adapted by Anthony H. Cordesman from US-Saudi Business Brief, Winter, 1998, p. 1; Reuters, December 28, 1998, 1728; data provided by the Saudi Information Office in Washington DC in March 2001; and Brad Bourland, The Saudi Economy in 2002, Saudi American Bank, Riyadh, February 2002, p. 10.

Chart ThirteenLiving in a Crowded Desert: Massive Ongoing Population Growth in the Total Middle East and  
Mahgreb

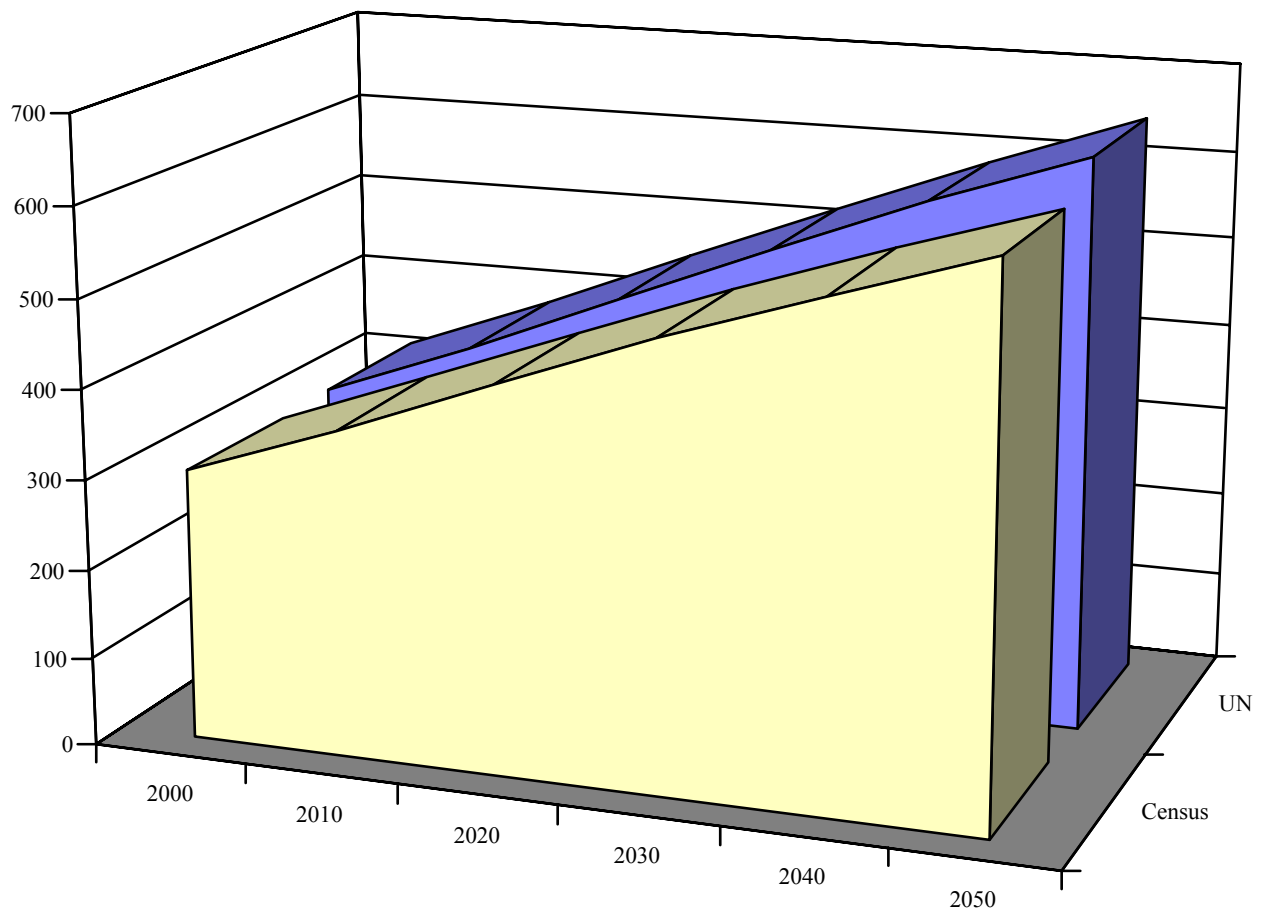
(US Census Bureau Estimate - Population in Millions)



Adapted by Anthony H. Cordesman from data provided by the US Census Bureau

### Chart Fourteen

Living in a Crowded Desert: Massive Ongoing Population Growth in the Total Middle East: UN  
versus Census Bureau Estimates  
 (UN Estimate - Population in Millions)

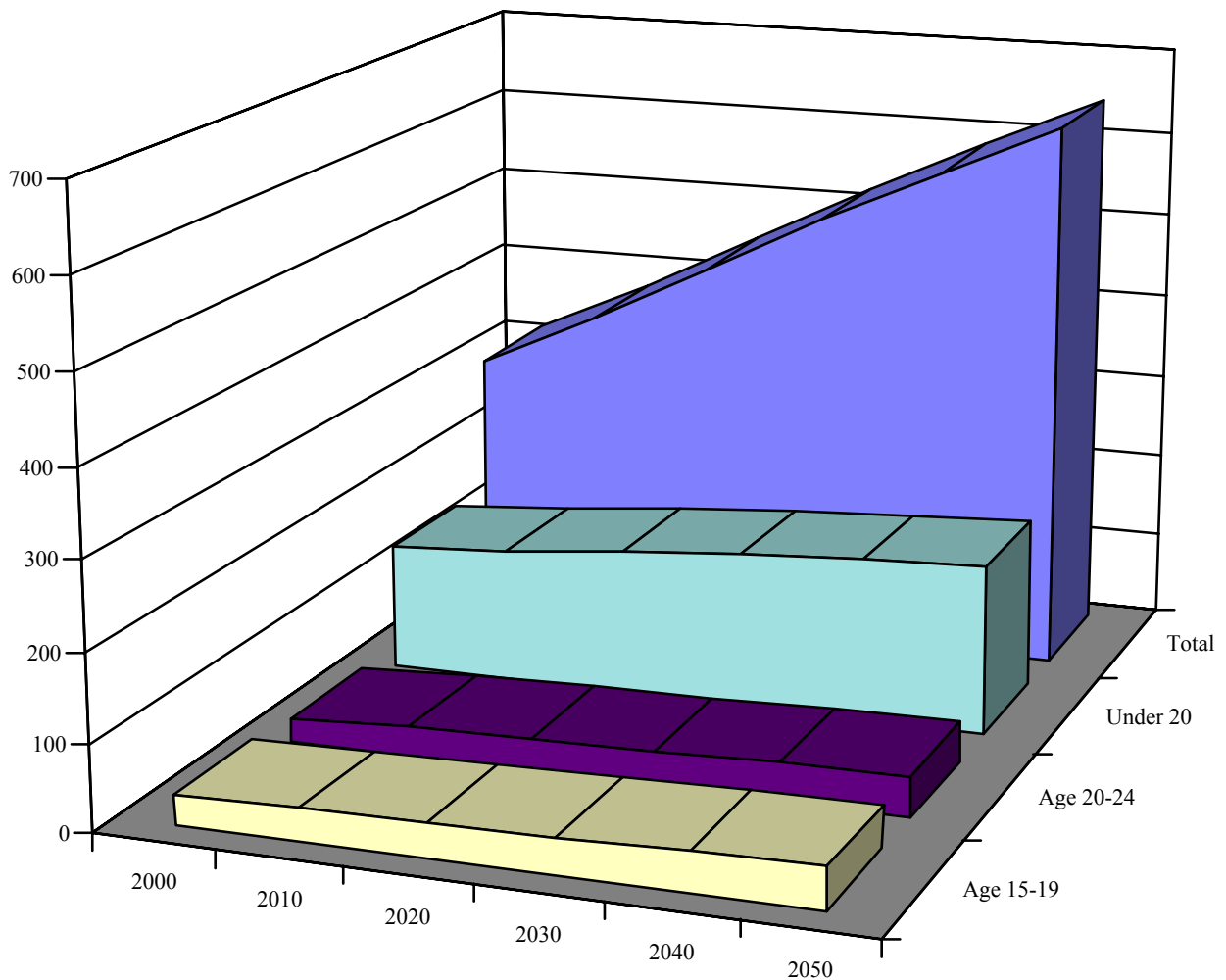


	2000	2010	2020	2030	2040	2050
■ Census	304.5	366.4	432.2	495.5	554.8	608.9
■ UN	308	373.5	444.1	514.4	581	643

Adapted by Anthony H. Cordesman from data provided by the United Nations and US census Bureau.

### Chart Fifteen

Living in a Crowded Desert: Massive Ongoing Population Growth in the Total Middle East and a Continuing “Youth Explosion”  
(UN Estimate - Population in Millions)



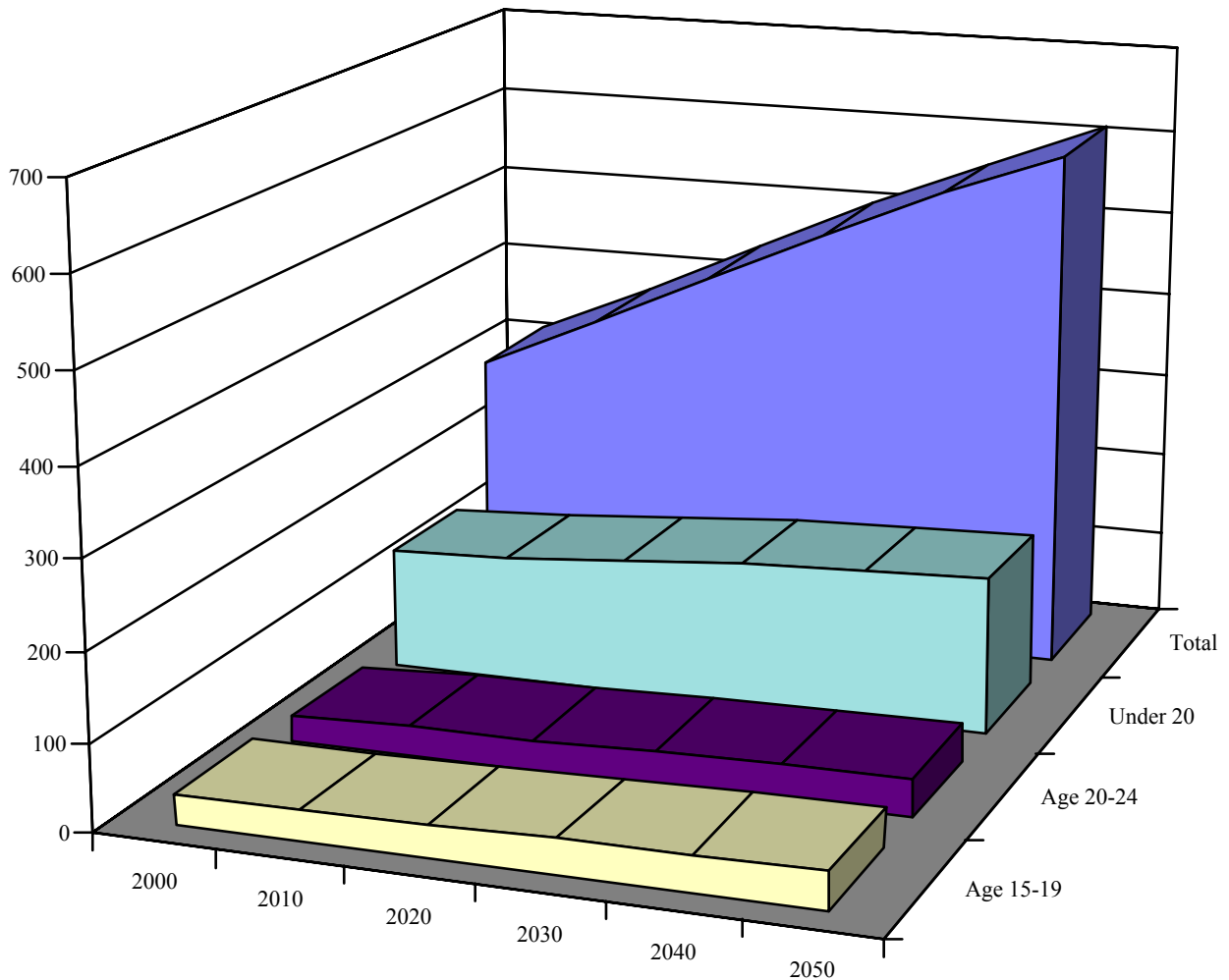
	2000	2010	2020	2030	2040	2050
Age 15-19	34.2	37.7	39.9	43.5	46.9	48.2
Age 20-24	28.8	36.2	38	41.2	45.7	47.2
Under 20	147.6	157.8	171.1	183.9	192.2	199.3
Total	308	373.5	444.1	514.4	581	643

Adapted by Anthony H. Cordesman from data provided by the United Nations.

### Chart Sixteen

#### Living in a Crowded Desert: Massive Ongoing Population Growth in the Total Middle East and a Continuing “Youth Explosion”

(US Census Bureau Estimate - Population in Millions)



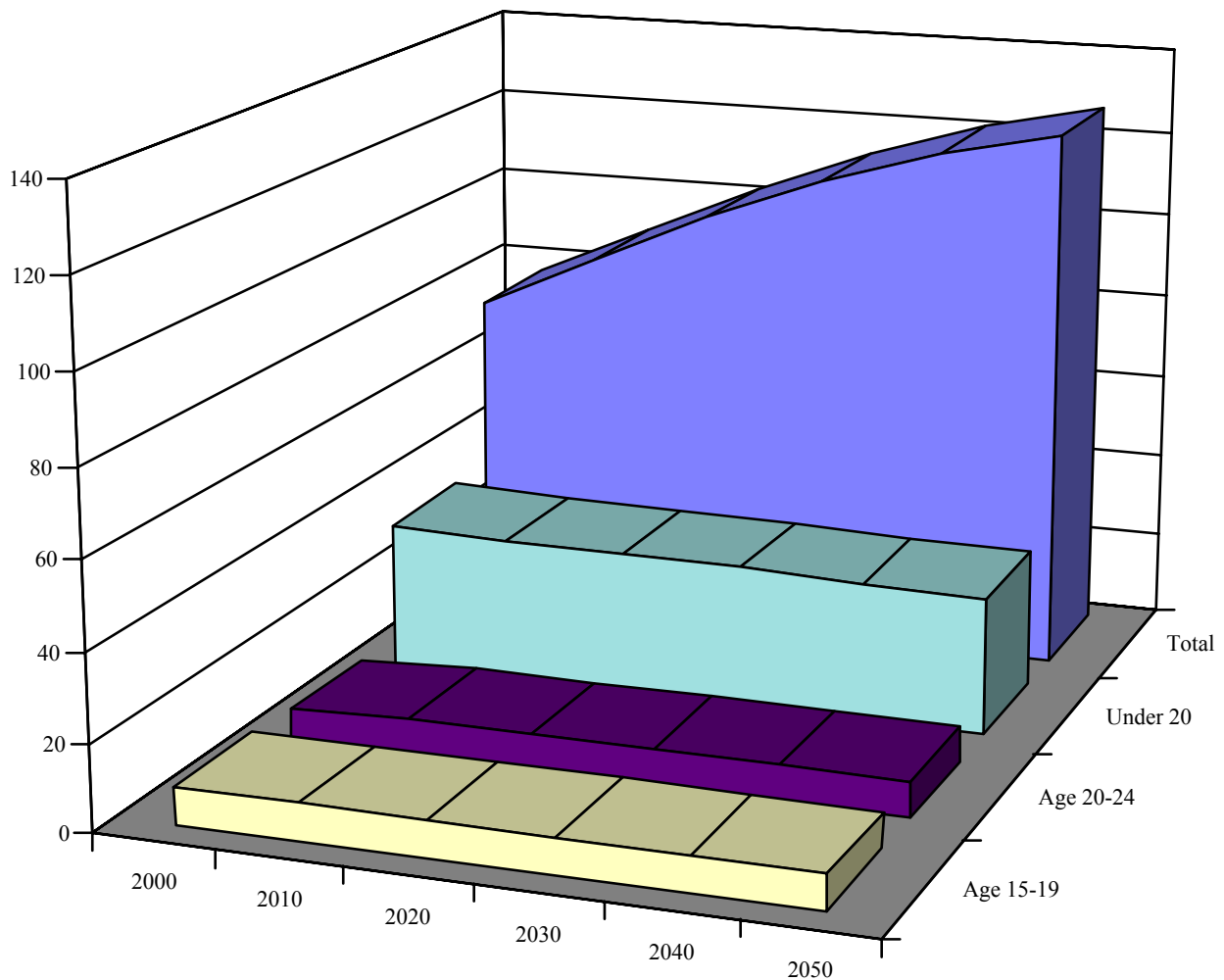
	2000	2010	2020	2030	2040	2050
■ Age 15-19	33.8	35.3	36.9	41.1	42.9	44.2
■ Age 20-24	29.4	36.2	35.8	39.1	42.5	43.5
■ Under 20	142	147.6	159.9	170.1	176	182
■ Total	304.4	366.4	432.2	495.5	554.8	608.9

Adapted by Anthony H. Cordesman from data provided by the US Census Bureau.



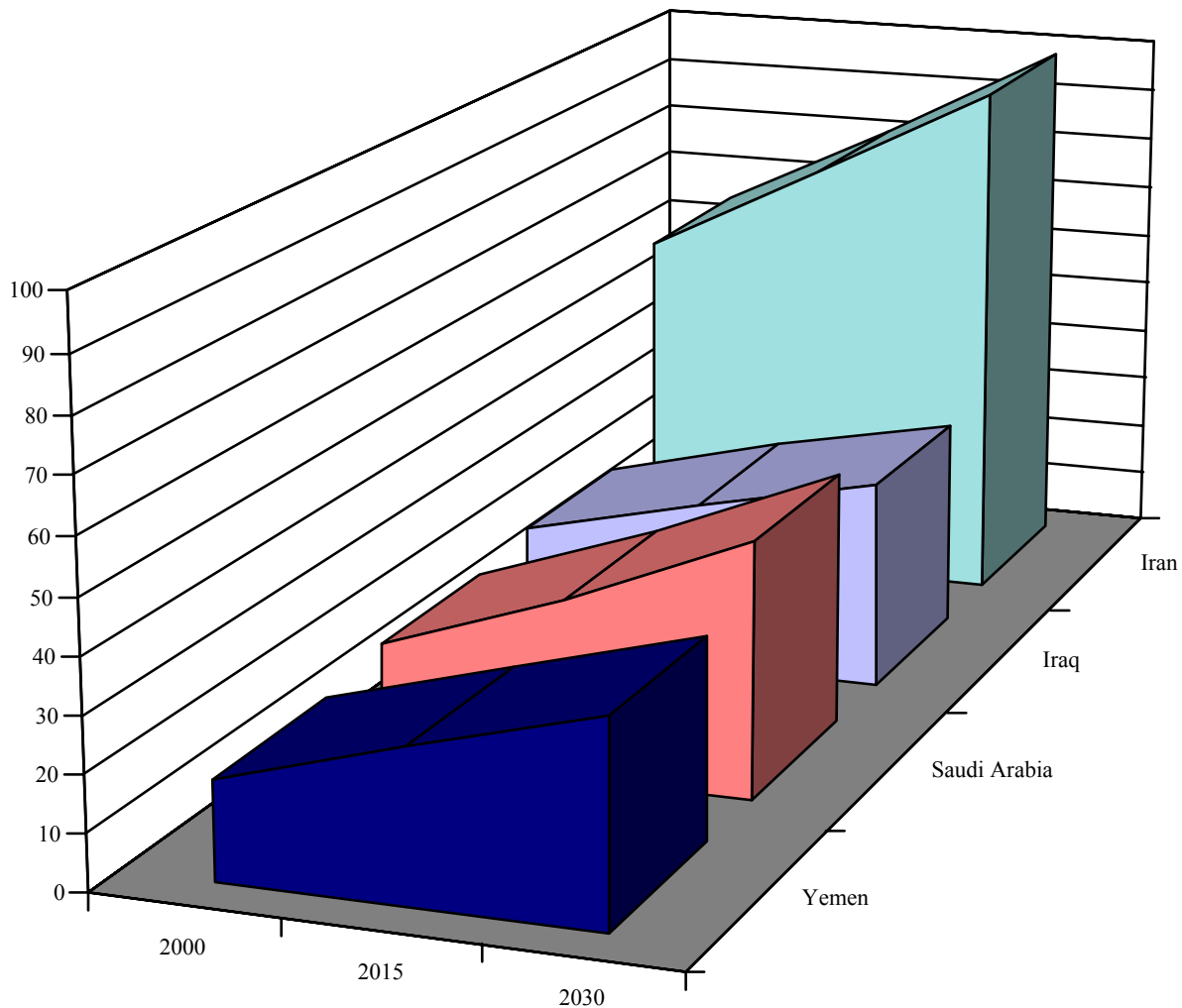
### Chart Seventeen

Living in a Crowded Desert: Massive Ongoing Population Growth in the Total Mahgreb and a Continuing “Youth Explosion”  
(US Census Bureau Estimate - Population in Millions)



	2000	2010	2020	2030	2040	2050
Age 15-19	8.9	8.7	8.4	8.6	8.3	8.1
Age 20-24	7.7	8.8	8.4	8.4	8.5	8.1
Under 20	35	34.2	34	33.6	32.6	32.2
Total	76	89	101.5	112.3	120.9	127.1

Adapted by Anthony H. Cordesman from data provided by the US Census Bureau.

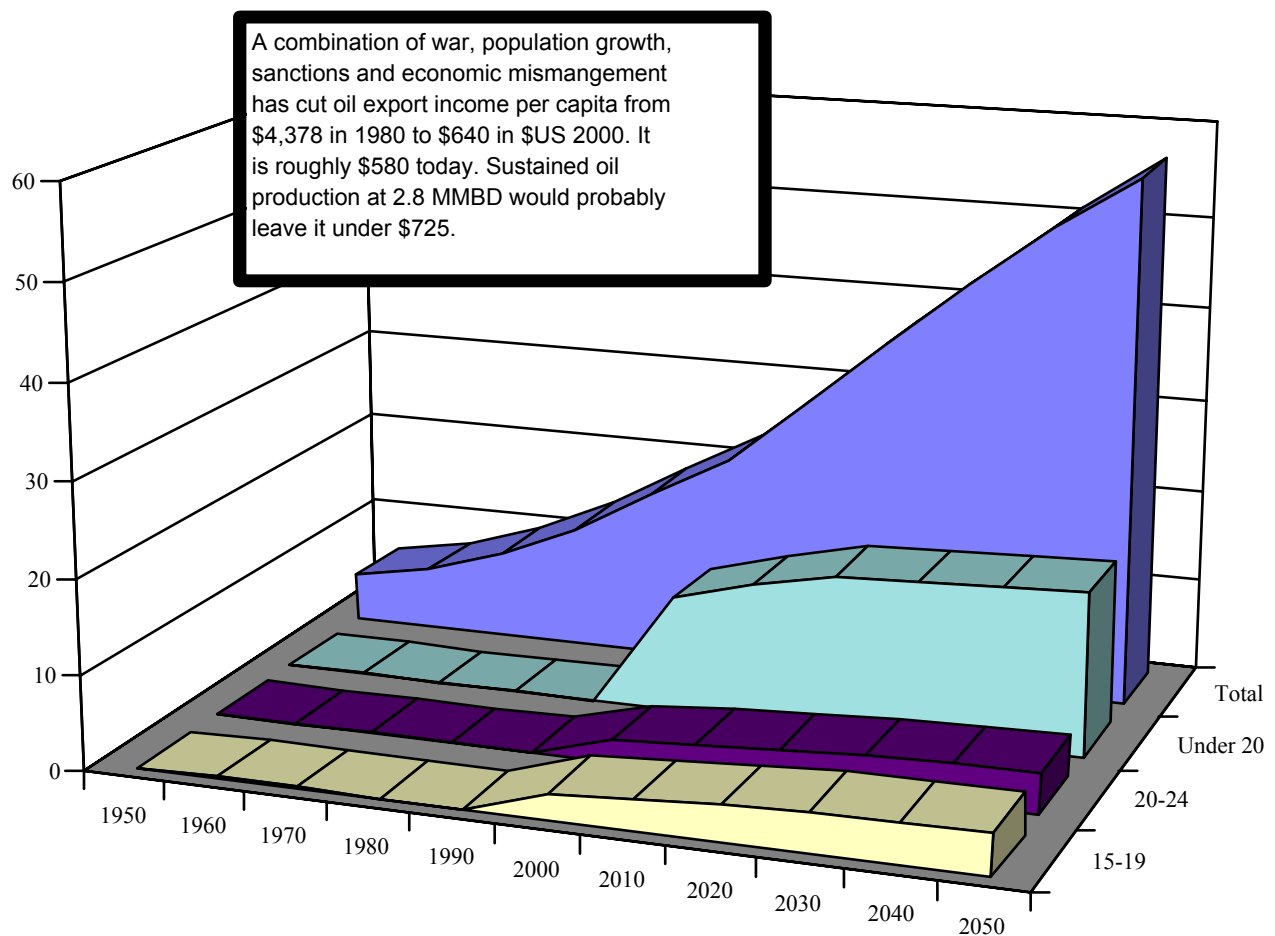
Chart EighteenLiving in a Crowded Desert: Population Growth in Key Gulf Countries  
(Population in Millions)

	2000	2015	2030
■ Yemen	17.5	27	36
■ Saudi Arabia	20.7	32.1	46
■ Iraq	23.3	31.2	38
■ Iran	63.7	80.4	98

Adapted by Anthony H. Cordesman from data provided by the US State Department, the World Bank database for [World Development Indicators, 2000](#), pp. 40 and 44, and the [World Development Indicators, 2002](#), pp. 48-50. The World Bank does not report on Bahrain and Qatar. World Bank figures are otherwise used for 1980, 1998, 2000, and 20015.

### Chart Nineteen

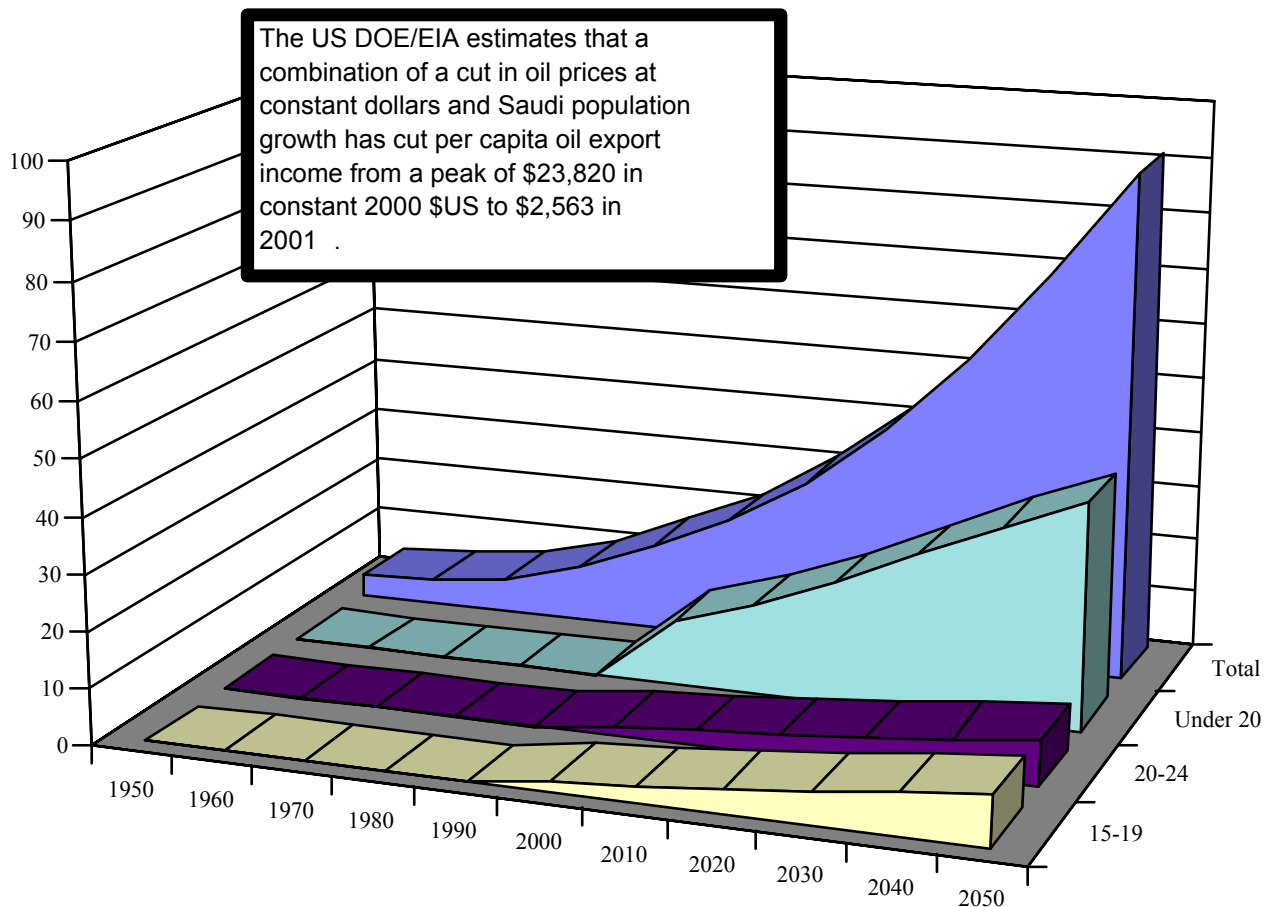
#### Case Examples: Population Growth and the Youth Explosion in Iraq (US Census Bureau Estimate - Population in Millions)



Adapted by Anthony H. Cordesman from data provided by the US Census Bureau.

### Chart Twenty-One

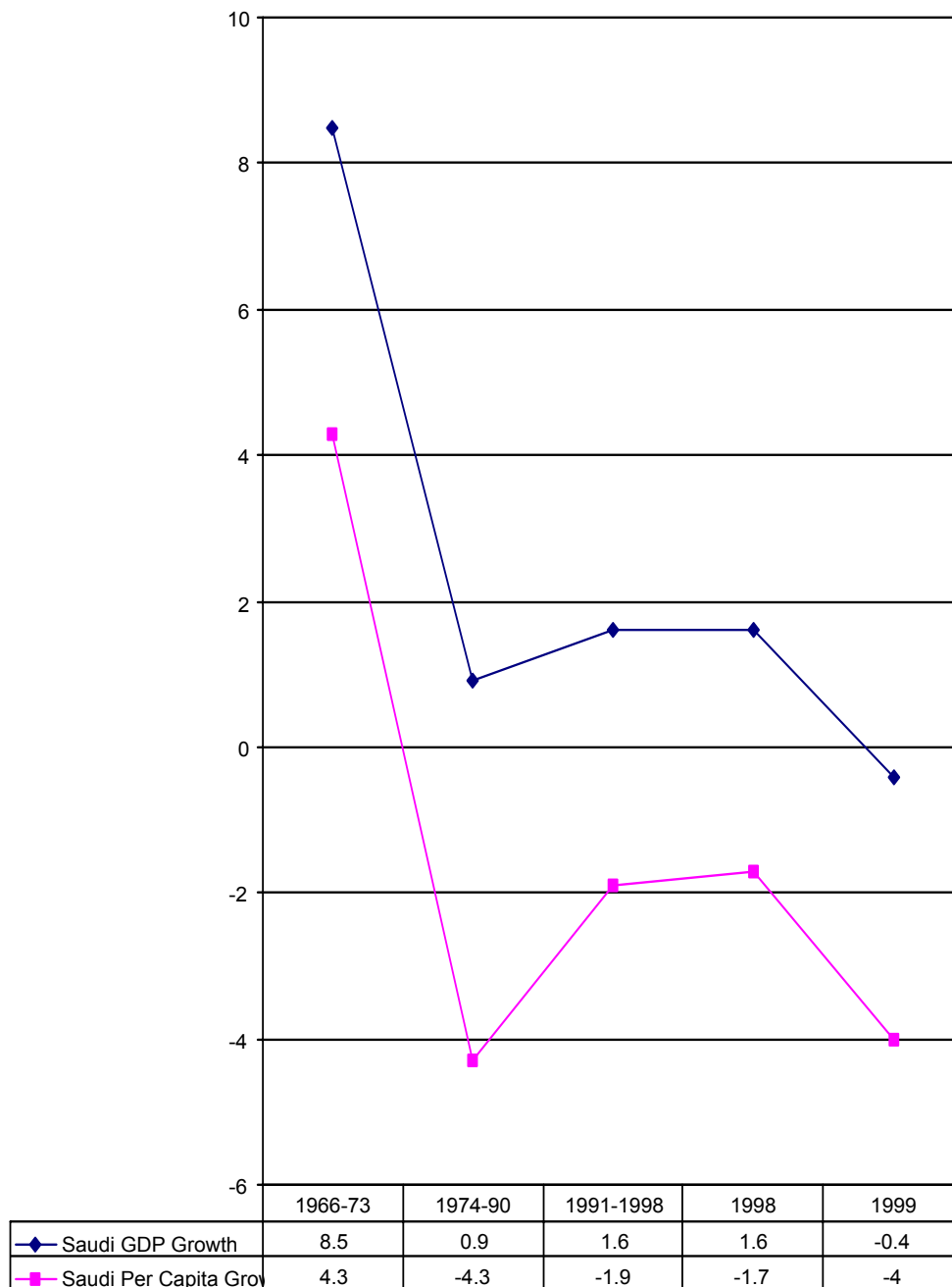
#### Case Examples: Population Growth and the “Youth Explosion” in Saudi Arabia (US Census Bureau Estimate - Population in Millions)



Adapted by Anthony H. Cordesman from data provided by the US Census Bureau.

### Chart Twenty-Two

The Impact of Demographics on Wealth in a Key Gulf State:  
Saudi Annual Growth in GDP and GNP Per Capita: 1966-1999  
(In Percent)

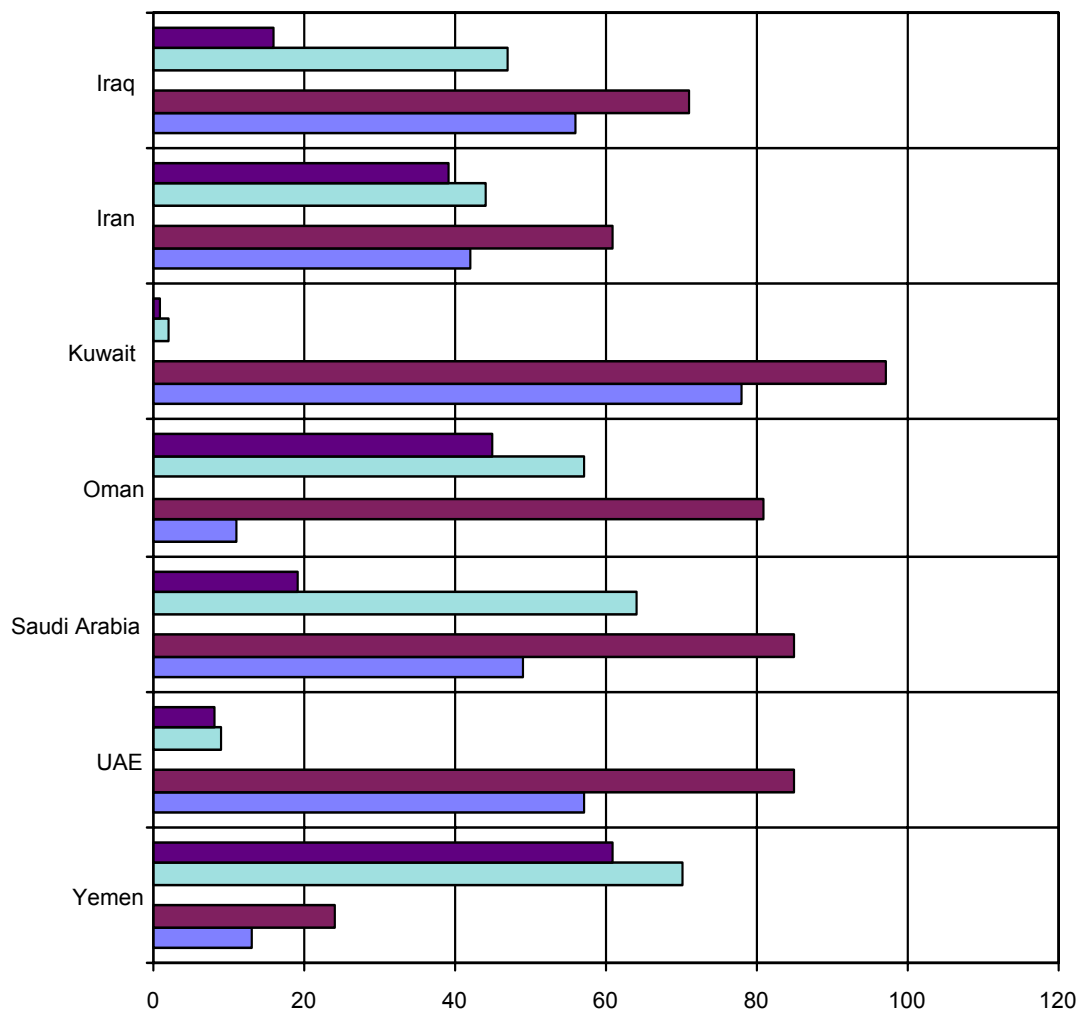


Adapted by Anthony H. Cordesman from World Bank, Global Economic Prospects: 2000, Washington, World Bank, pp. 152-153

### Chart Twenty-Three

#### Massive On-Going Pressures for Social Change: Massive Urbanization and Sharp Decline in the Role of Agriculture

(Labor in Agriculture in Percentages of labor force and Urbanization as Percent of Total Population)

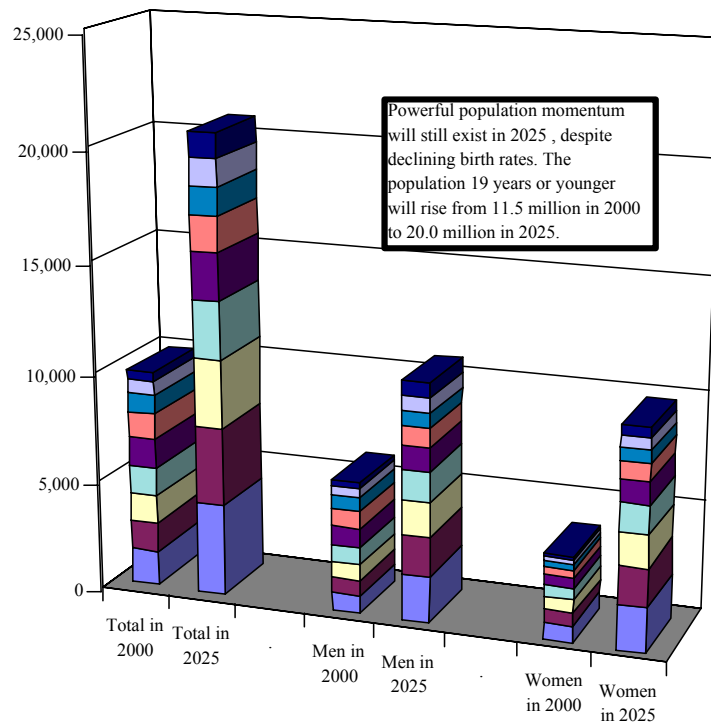


	Yemen	UAE	Saudi Arabia	Oman	Kuwait	Iran	Iraq
■ Labor in Agriculture in 1998	61	8	19	45	1	39	16
■ Labor in Agriculture 1970	70	9	64	57	2	44	47
■ .							
■ Urbanization in 1998	24	85	85	81	97	61	71
■ Urbanization in 1970	13	57	49	11	78	42	56

Source: Adapted by Anthony H. Cordesman World Bank, World Development Indicators, 2000, pp. 26-28.

### Chart Twenty-Four

#### The Challenge to Come: Growth in the Saudi Labor Force: 2000 versus 2025 (In Thousands in Prime Working Age)



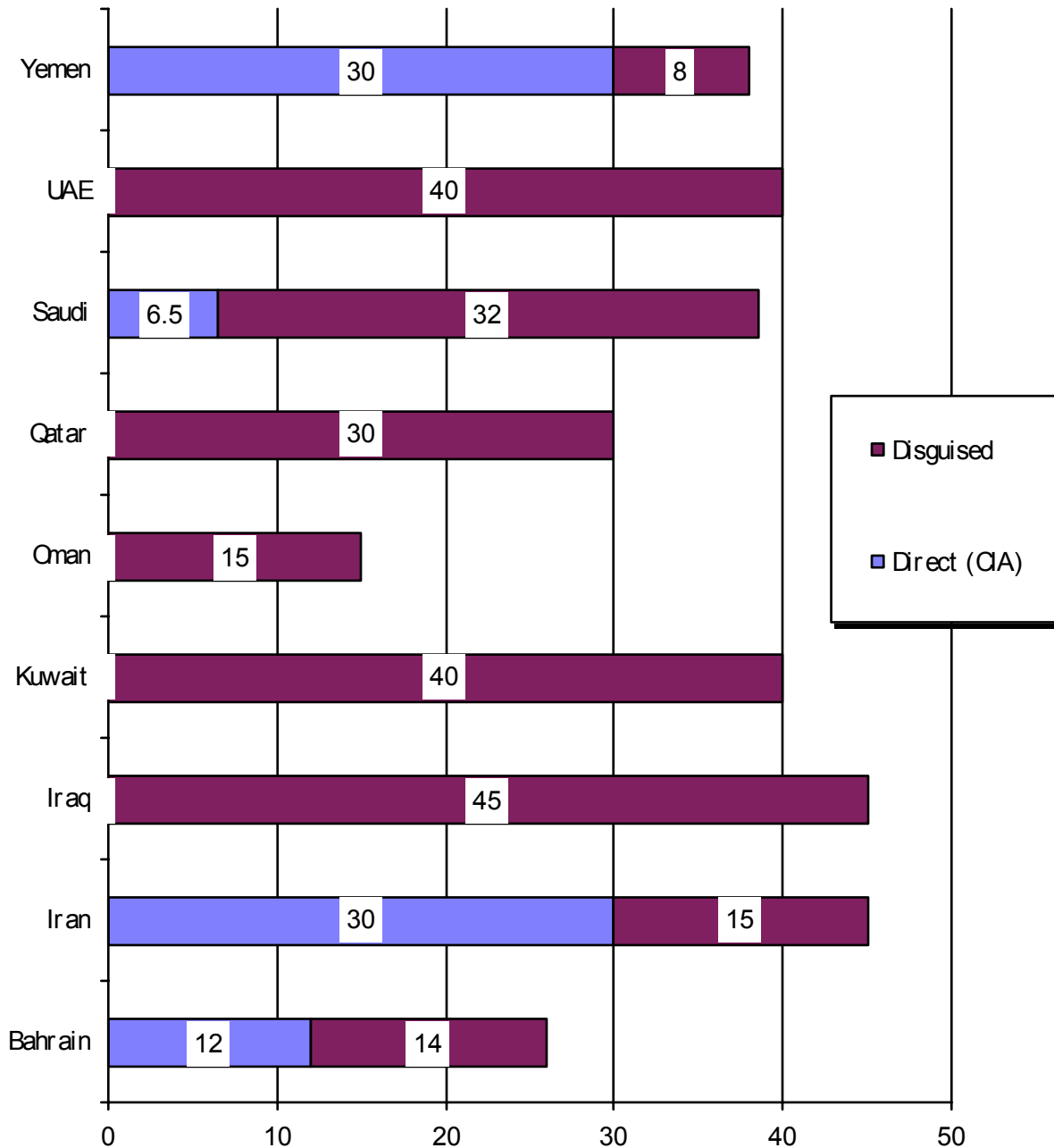
Age 60-64	415	1,143		265	683		151	460
Age 55-59								
Age 50-54								
Age 45-49								
Age 40-44								
Age 35-39								
Age 30-34								
Age 25-29								
Age 20-24								

Source: Adapted by Anthony H. Cordesman from US Census Bureau on line demographic data for Saudi Arabia, accessed May, 2001.

Chart Twenty-Five

Over-Dependence on Non-Productive Government Jobs Has a Cost: Estimated Comparative Direct and Disguised Unemployment Rate in the Middle East; A Rough Estimate

(Rate measured in Percent)



Rough estimate by Anthony H. Cordesman based on CIA and World Bank estimates for 2002. Disguised includes public sector, civil service, and private sector jobs with no use economic output.



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<sup>i</sup> These figures are based on the estimates in the BP Statistical Review of World Energy, June 2002.

<sup>ii</sup> BP Statistical Review of World Energy, June 2002

<sup>iii</sup> See the DOE/EIA Annual Energy Outlook, 2002, and International Energy Outlook, 2002.

<sup>iv</sup> CIA, World Factbook 2002.

<sup>v</sup> These data, and the following figures, are based on the reference case projections by DOE EIA in International Energy Outlook, 2002.

<sup>vi</sup> International Energy Agency, World Energy Outlook, Highlights, 2002, Paris, OECD/IEA, 2002, pp. 26-27, 32, 329