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**M E M O R A N D U M**

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**DATE:** December 30, 1997

**FROM:** John H. Lichtblau

**RE:** IEA Presentation - November 12, 1997

Attached is a copy of the viewgraphs presented at an IEA session in Paris on historic oil trends and developments.

**International Energy Agency**

**FIFTY YEARS DEALING WITH CYCLES  
OF OPTIMISM AND PESSIMISM**

**John Lichtblau  
Chairman, Petroleum Industry Foundation Inc.**

**Joint Session**

**STANDING GROUP ON THE OIL MARKET  
STANDING GROUP ON EMERGENCY QUESTIONS  
12 NOVEMBER 1997**



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PIRINC

# Before . . . And . . . After 1973

Price Low, Stable

Majors in Control

Volume Soaring

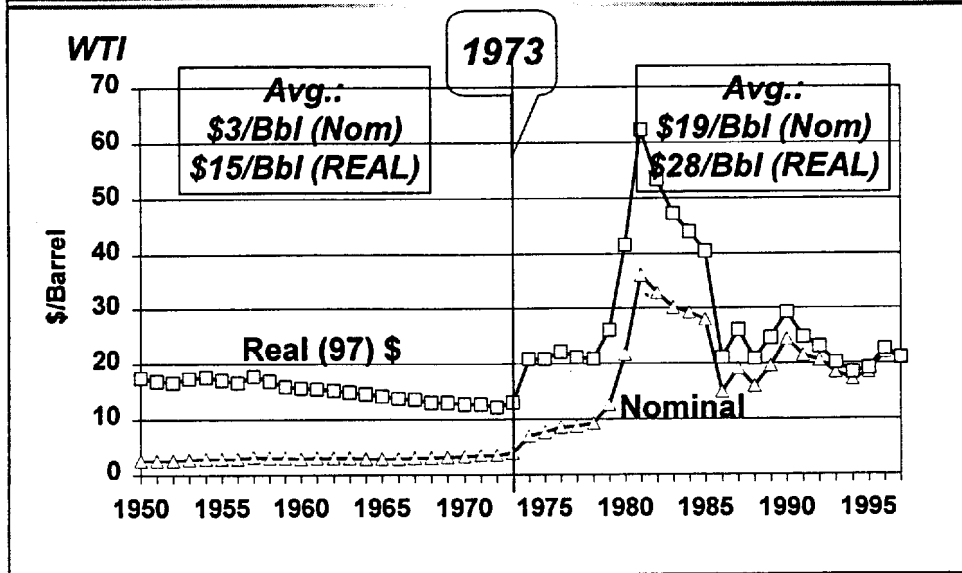
Price Higher,  
Volatile

Producing Gov'ts  
Take Control

Volume Falling, Flat,  
then Rising

*Markets Dominate*

# The 1973 Break: Crude Oil Prices



WTI NOMINAL \$

WTI (1997\$)

----- AVERAGE 1950-73 -----

\$3.03/BBL

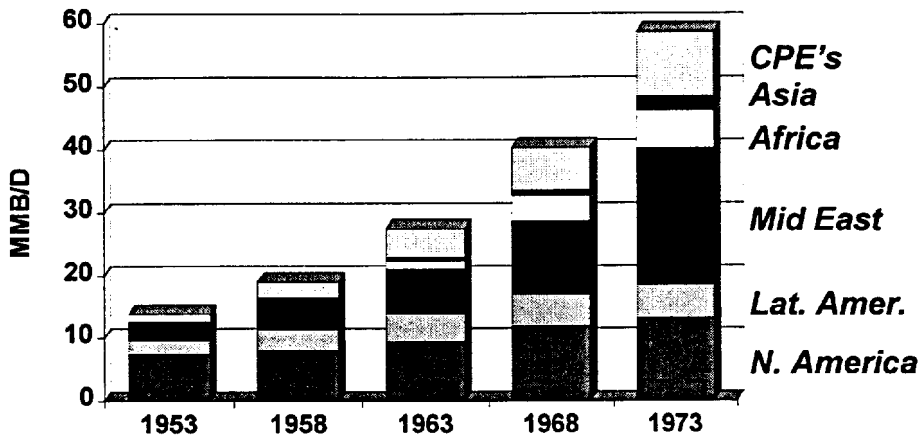
15.23/BBL

----- AVERAGE 1973-97 -----

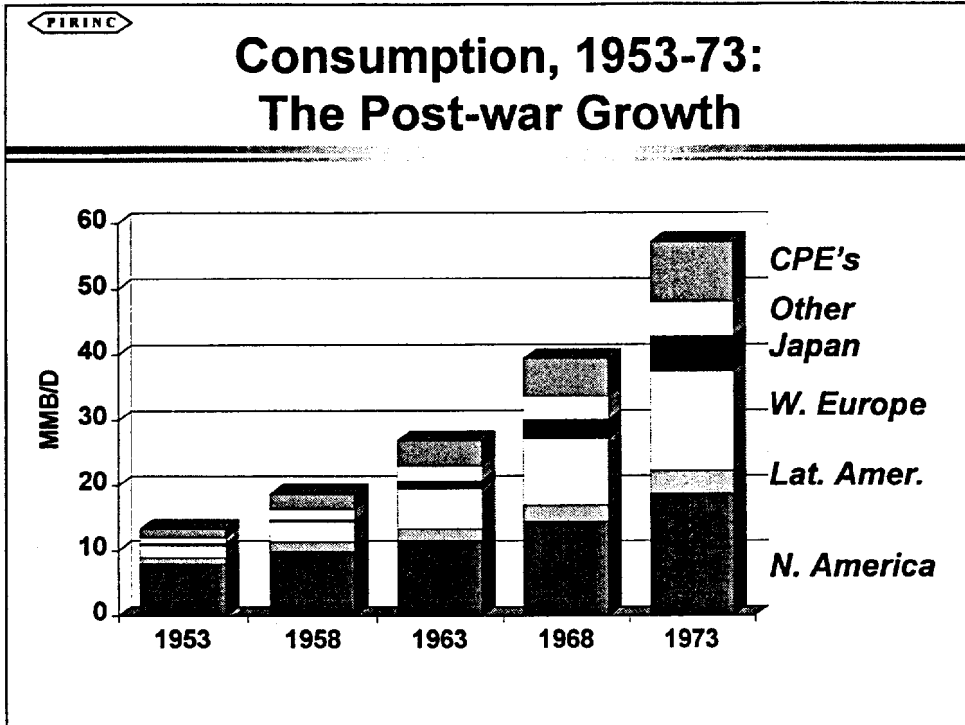
\$18.78/BBL

\$28.22/BBL

### Production, 1953-73: Mideast Comes of Age

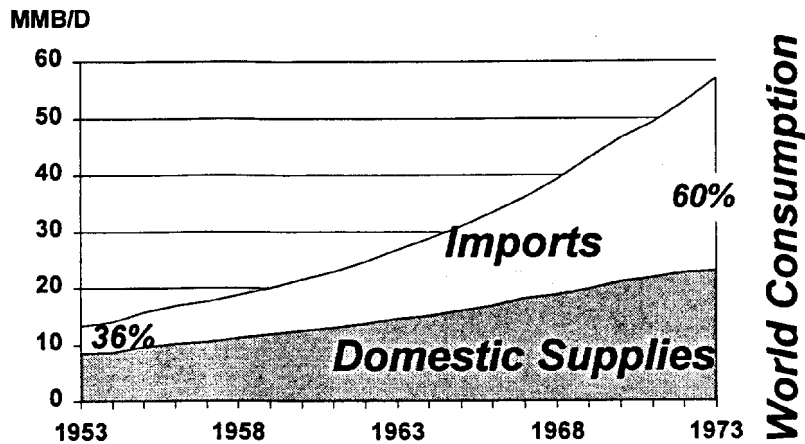


**WORLD PRODUCTION QUADRUPLED WHILE  
REAL PRICES DECLINED BY NEARLY 50%.  
MIDDLE EAST LARGEST GROWTH AND  
LOWEST COST REGION.**

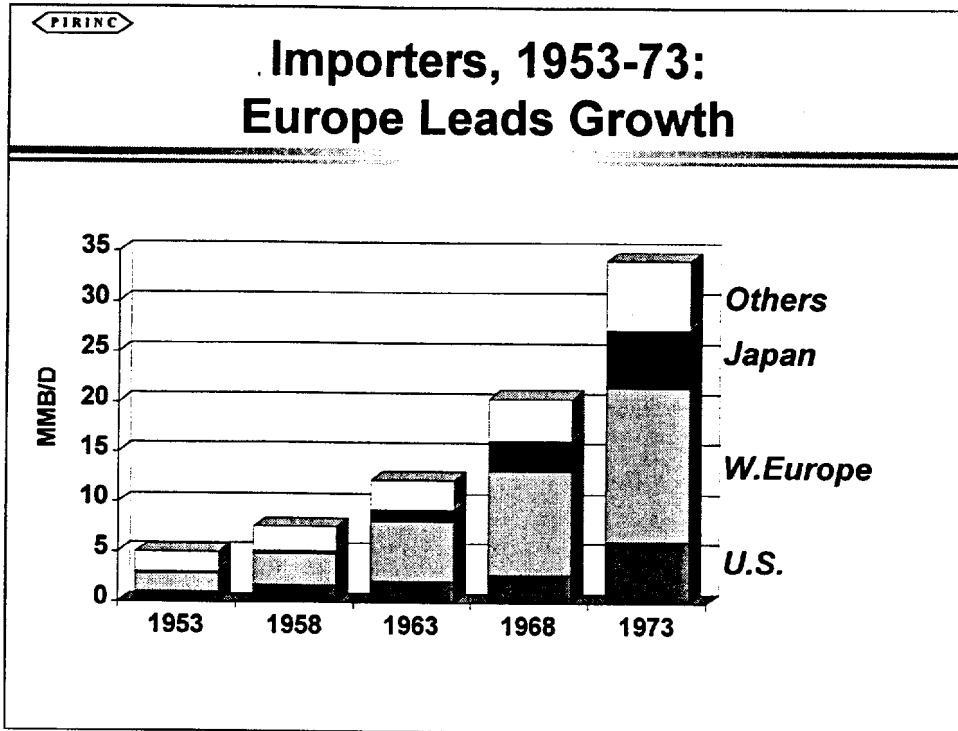


**AVERAGE ANNUAL GROWTH RATE 7% (8% IN 1968/73 PERIOD). NEARLY ALL EUROPEAN CONSUMPTION IMPORTED.**

# Imports Provide the Growth

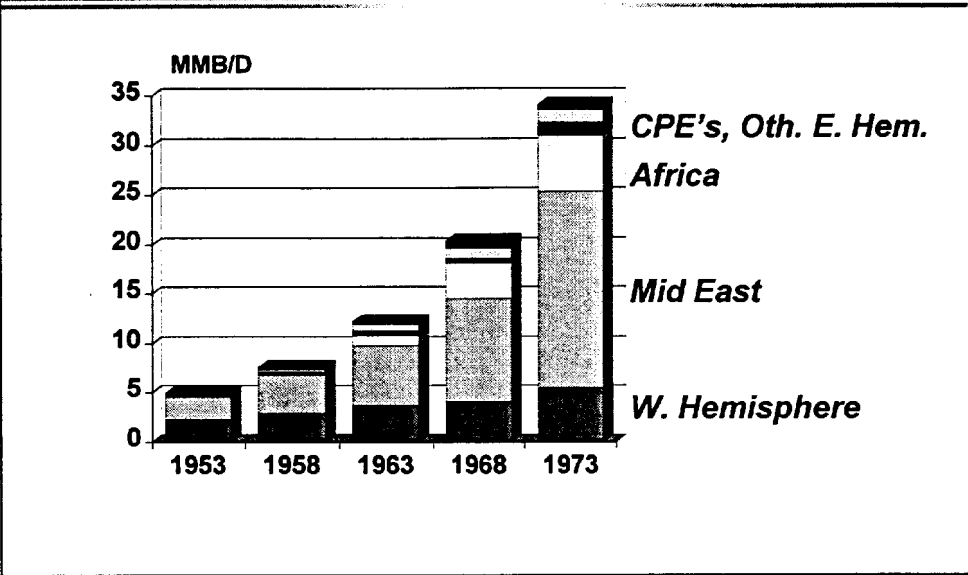






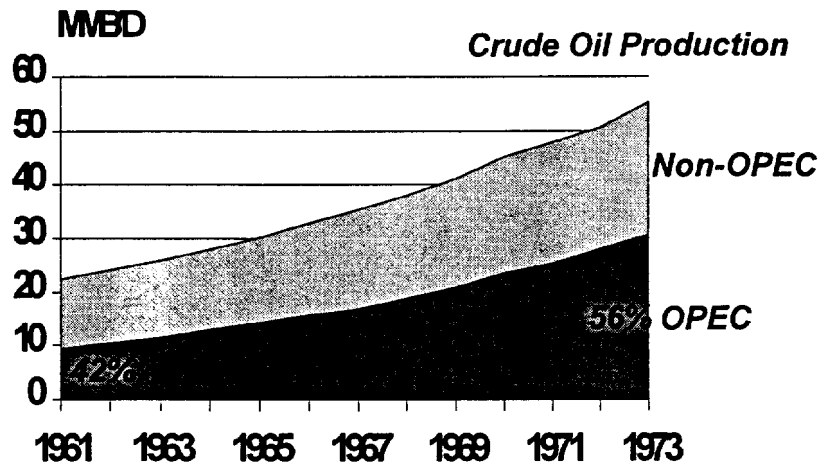
**DEMAND GROWTH REQUIRED LOW PRICES.  
RESIDUAL FUEL OIL, PRICE COMPETITIVE  
WITH COAL, LARGEST REFINED PRODUCT IN  
EUROPE IN EARLY 70'S**

# Exporters, 1953-73: The Mideast Dominates



**MIDDLE EAST LOWEST COST, FASTEST GROWTH. SEVEN SISTERS SET VOLUME AND PRICE.**

## Enter OPEC

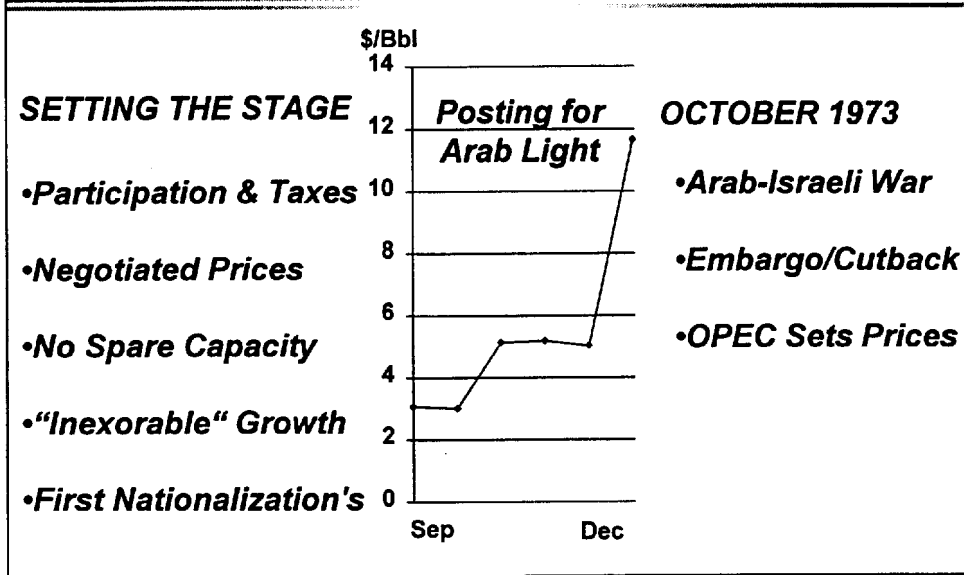


**1960, AFTER OIL COMPANIES LOWERED PRICES**

**IRAN, IRAQ, KUWAIT, SAUDI ARABIA, & VENEZUELA**

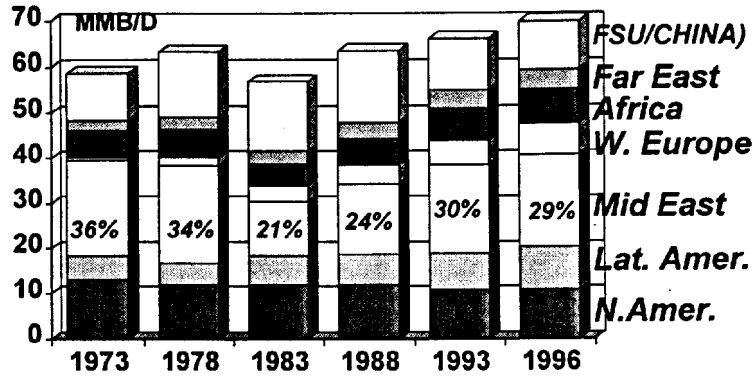
**GOAL: PRICE DETERMINATION; PRICE STABILITY; RESOURCE SOVEREIGNTY**

## October 1973: The New World Dawns



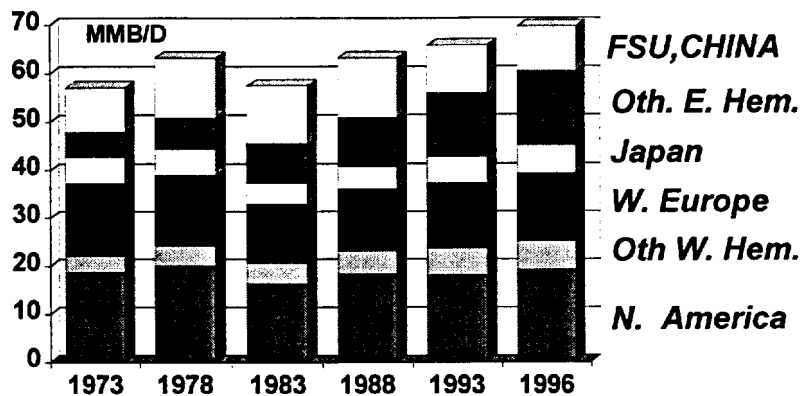
**FIRST PRICE EXPLOSION - IRREVERSIBLE INCREASE**

## Production Since 1973: Decline and Revival



**MIDDLE EAST SHARE BELOW 20% IN 1985.  
SHIFT IN WORLD RESERVES OWNERSHIP: 1997  
80% GOVERNMENT OWNED; 1973 LESS THAN  
25% GOVERNMENT OWNED.**

## Consumption Since 1973: Decline and Revival

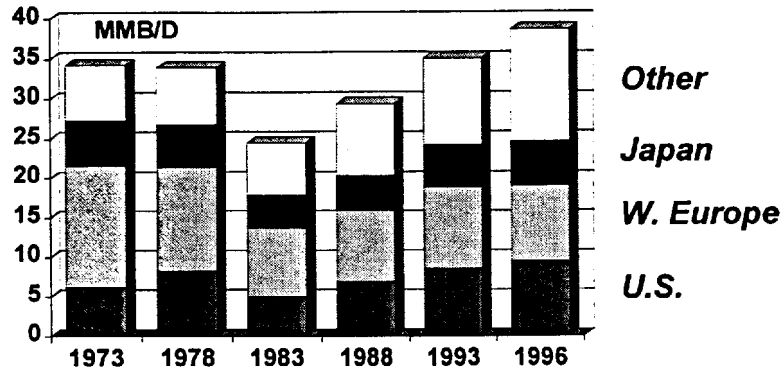


### AVERAGE ANNUAL GROWTH RATE 1973-1996

WORLD 0.85%

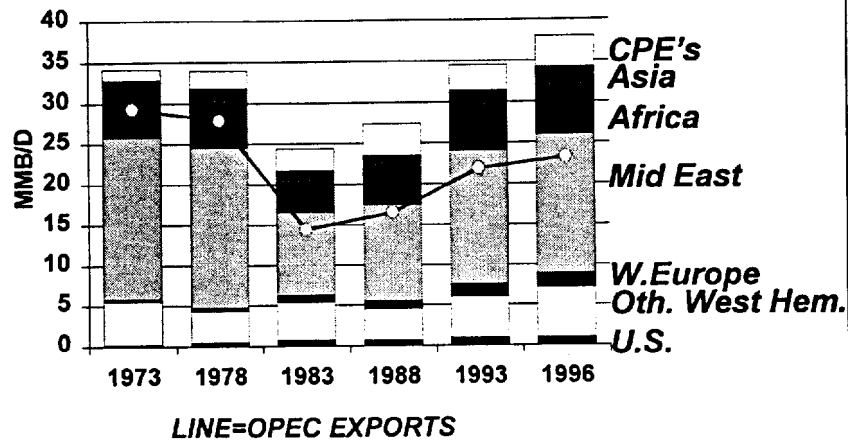
WORLD EXCL. FSU 1.20%

## Importers since 1973



**SHIFT FROM INDUSTRIAL COUNTRIES TO DEVELOPING COUNTRIES. "OTHER" PRIMARILY ASIAN EMERGING MARKET ECONOMIES.**

## Exporters since 1973



**MIDDLE EAST DOMINATES**

**OPEC REGAINING AFTER 1986 PRICE BREAK.**

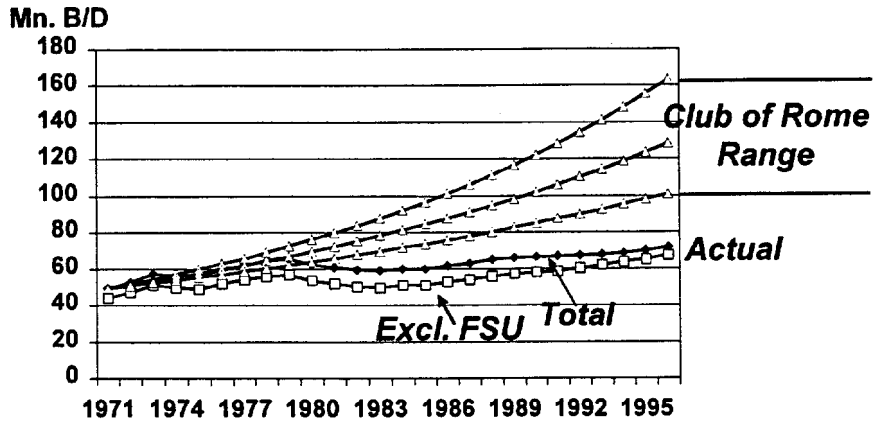


**Oil's Share of World  
Primary Energy Consumption**

	<u>Global</u>	<u>Excl. FSU</u>
	(%)	
<b>1965</b>	<b>37.1</b>	
<b>1975</b>	<b>43.9</b>	<b>45.5</b>
<b>1985</b>	<b>37.9</b>	<b>39.5</b>
<b>1990</b>	<b>38.6</b>	<b>40.3</b>
<b>1996</b>	<b>39.5</b>	<b>41.8</b>

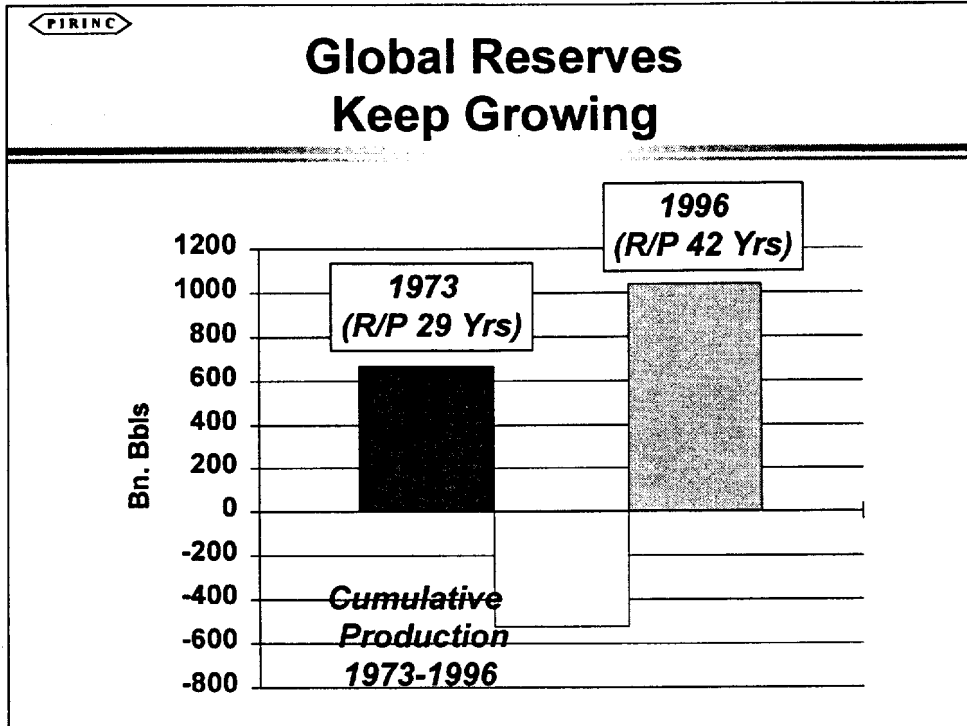
**RISING PRICES (1973-1985) CAUSE DROP IN OIL'S SHARE. PRICE BREAK IN 1986 REVERSES TREND. OIL'S SHARE IN RUSSIAN(FSU) ENERGY DROPS FROM 30% IN 1990 TO 21% IN 1996.**

## “Limits to Growth”? Markets and Technology



**“CLUB OF ROME” 1972 FORECAST TO 21ST CENTURY: 3 GROWTH RATE SCENARIOS FOR OIL, 2.9%, 3.9%, 4.9%.**

**ACTUAL GROWTH RATE 1973-1996 LESS THAN HALF OF “CLUB OF ROME” LOW SCENARIO FORECAST.**



**“CLUB OF ROME” PREDICTED RESOURCE CONSTRAINT BY END OF CENTURY.**

**WORLD RESERVES:**

**1973: 600 BILLION BARRELS,**

**1996: 1 TRILLION BARRELS.**

**CUMULATIVE WORLD PRODUCTION 1973-1996:  
500 BILLION BARRELS**

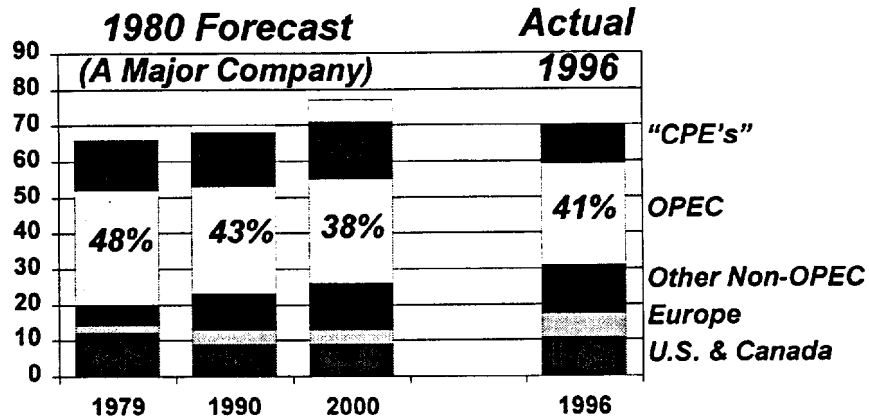
## Looking at 1980 from 1970-71

Forecast of	By	1970 Actual	1980 Forecast	1980 Actual
U.S. Supply	Oil Import Task Force	9.6	11.1-12.7	8.6
Price	Oil Import Task Force	Constant Real		
U.S. Demand	Nat'l Petroleum Council	14.7	22.3	17.1
"NCW" Demand	Nat'l Petroleum Council	40.1	72.1	49.6
Price	Nat'l Petroleum Council	"Moderately higher"		

**REAL PRICE TRIPLED 1970-1980.**

**ACTUAL OIL VOLUMES IN 1980  
APPROXIMATELY ONE THIRD BELOW  
FORECASTS.**

## A 1980 Projection for 2000: Right and Wrong SUPPLY



**Price**

+50% Real

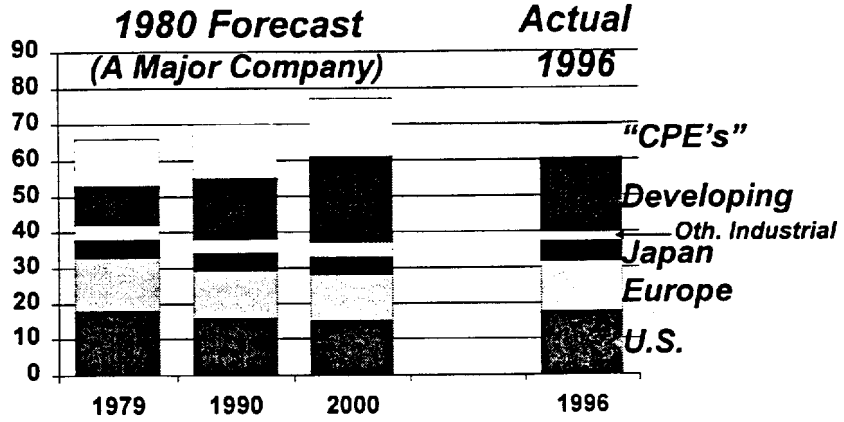
-45% Real

+1% Nominal

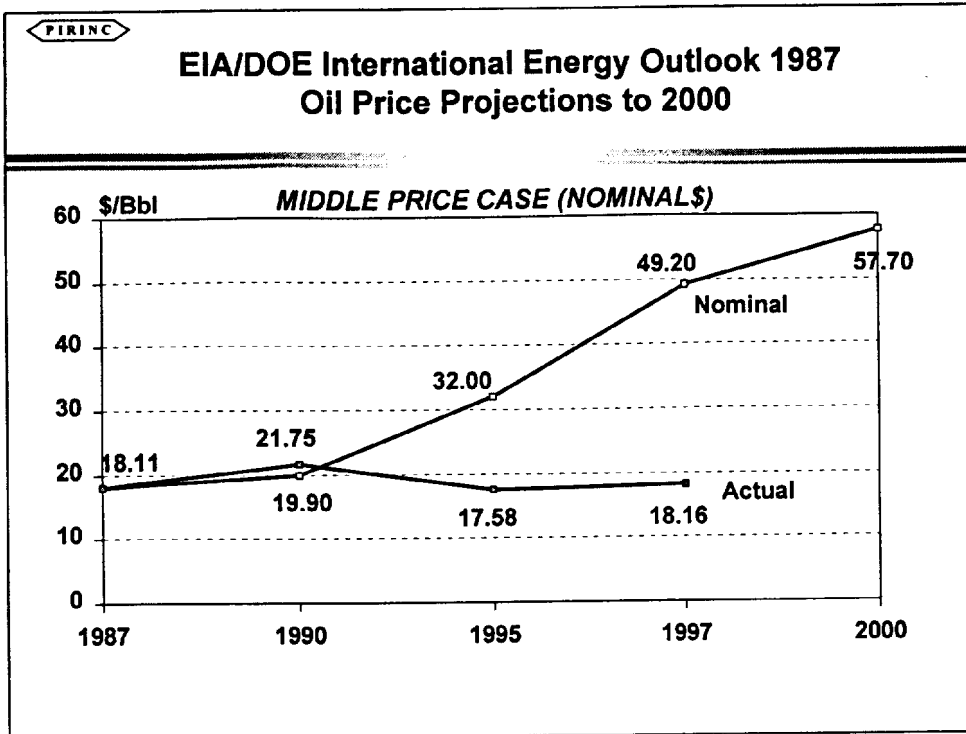
**VOLUME PROJECTION CLOSE TO ACTUAL (SO FAR).**

**PRICE PROJECTIONS IN WRONG DIRECTION.**

# A 1980 Projection for 2000: Right and Wrong DEMAND



<b>Price</b>	<b>+50% Real</b>	<b>-45% Real</b>
		<b>+1% Nominal</b>



**1986 PRICE COLLAPSE VIEWED AS  
UNSUSTAINABLE. REVERSAL FORECAST IN  
1990'S. ACTUAL PRICES FLAT IN NOMINAL,  
DOWN IN REAL DOLLARS**

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**World Demand Increase**  
(Excl. FSU, China, E. Europe)

**1986-1995**

**4.8 MMB/D EIA ENERGY OUTLOOK 1987**  
**10.0 MMB/D ACTUAL**

**PROJECTED HIGH PRICES... PROJECTED LOW  
DEMAND GROWTH. ACTUAL PRICES MUCH  
LOWER...DEMAND GROWTH MUCH HIGHER.**