



# ***OIL PRICES***

## ***Developments and Effects***

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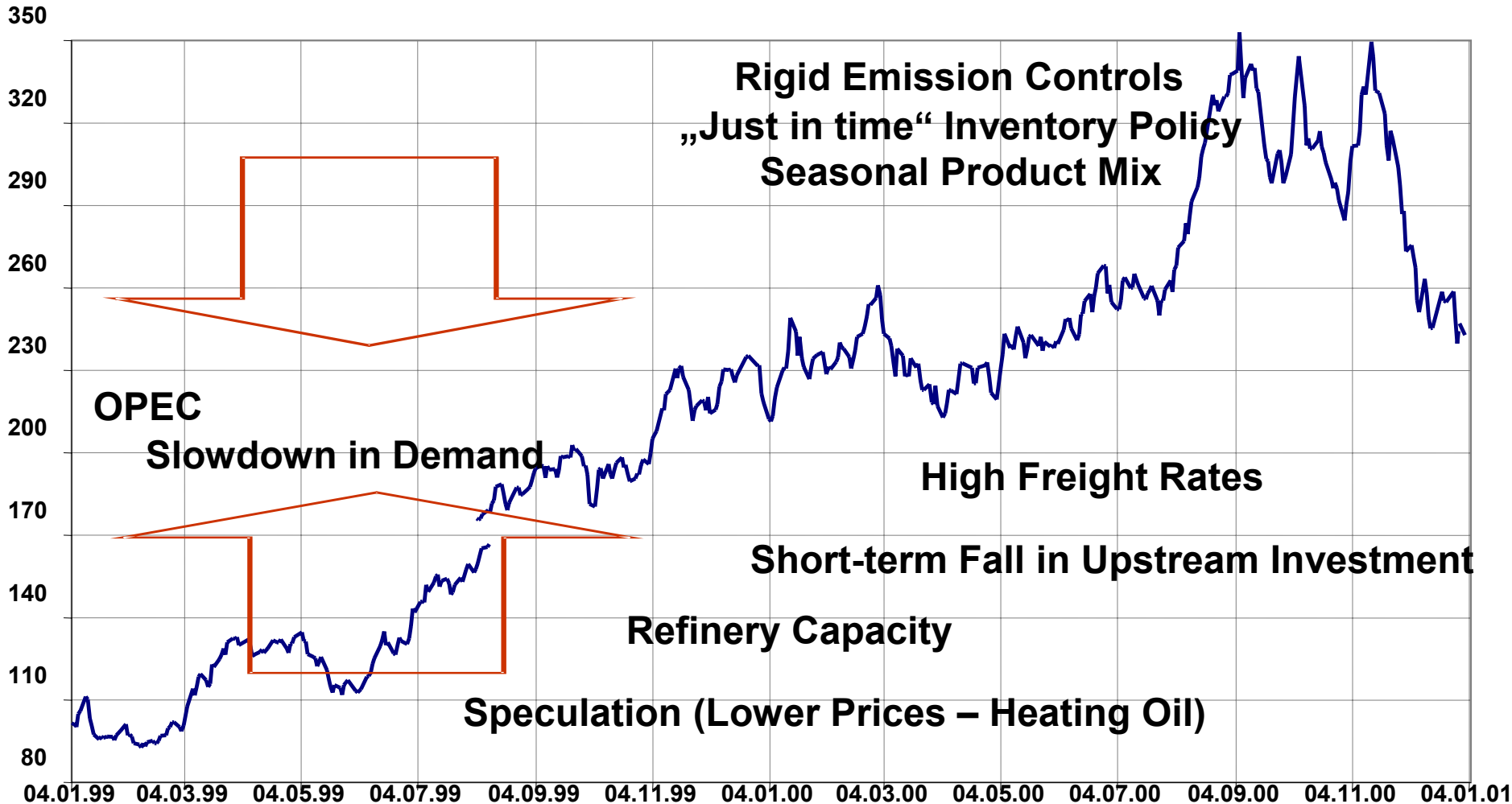
**Mag. Johannes Benigni, January 2001**

**PVM Oil Associates - Vienna**

**Strategic Energy Services**

# PRICE MOVERS

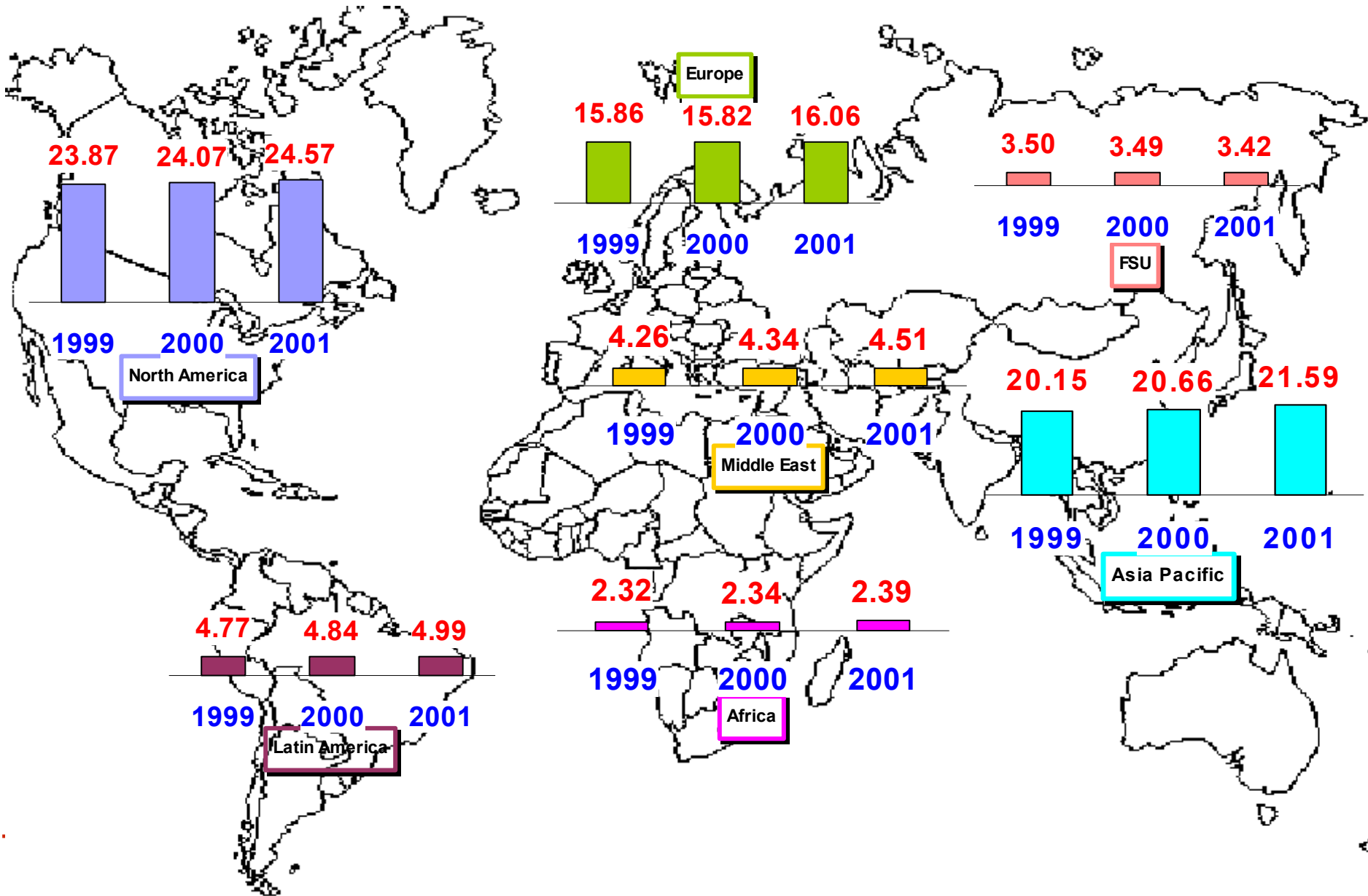
**Gasoil 0.2 FOB Barges [USD/mt]**



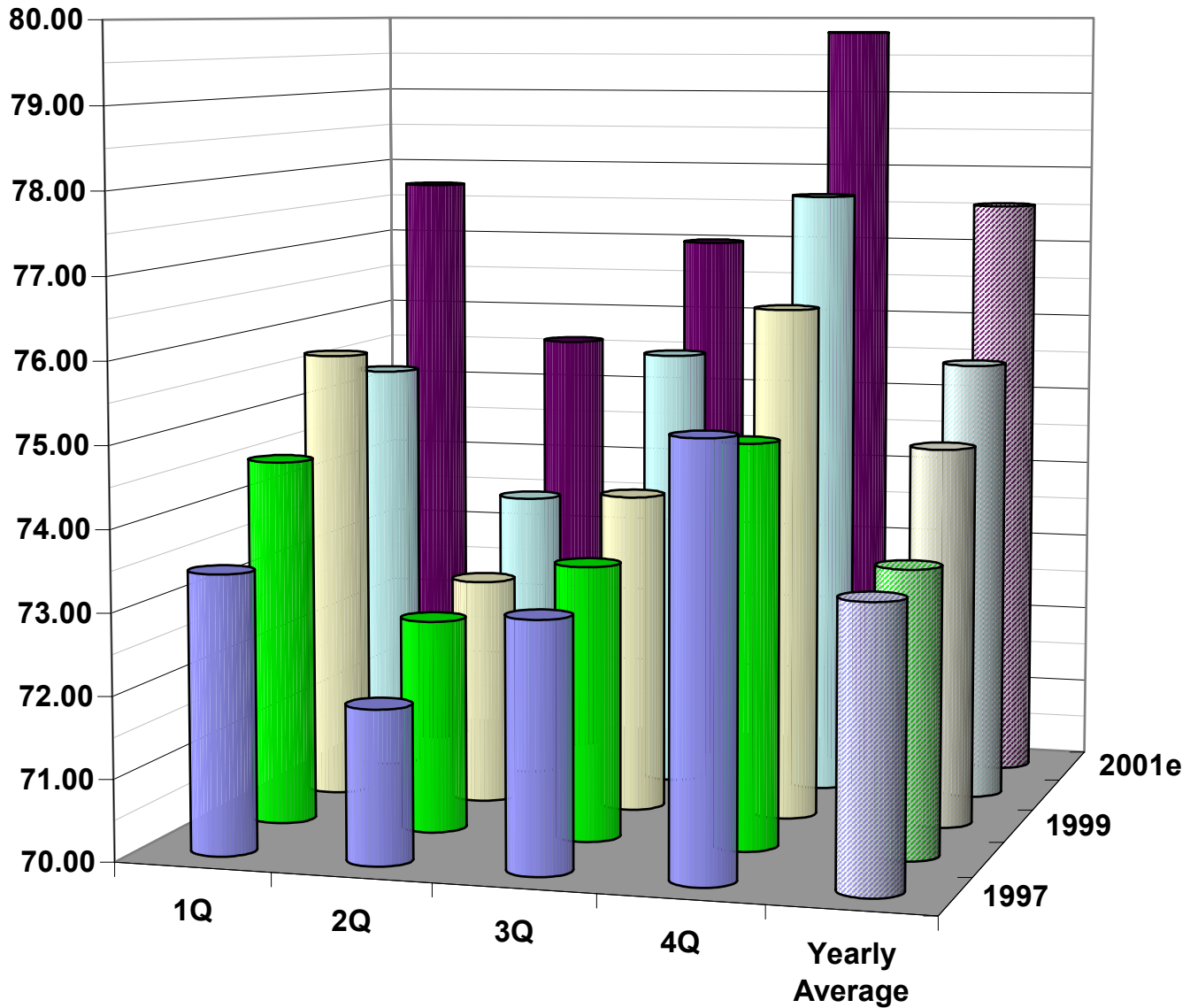
# ***SUPPLY & DEMAND***

- ***Demand increase continues to slide mainly due to slow down in US economy.***
- ***OPEC Supply: For first time in history remains below its quotas. Production cuts a proactive decision. Real Output Curbs less than on Paper.***
- ***Non-OPEC Supply: Increase does not correspond to rising prices.***
- ***S&D Data accuracy***

# Worldwide Consumption



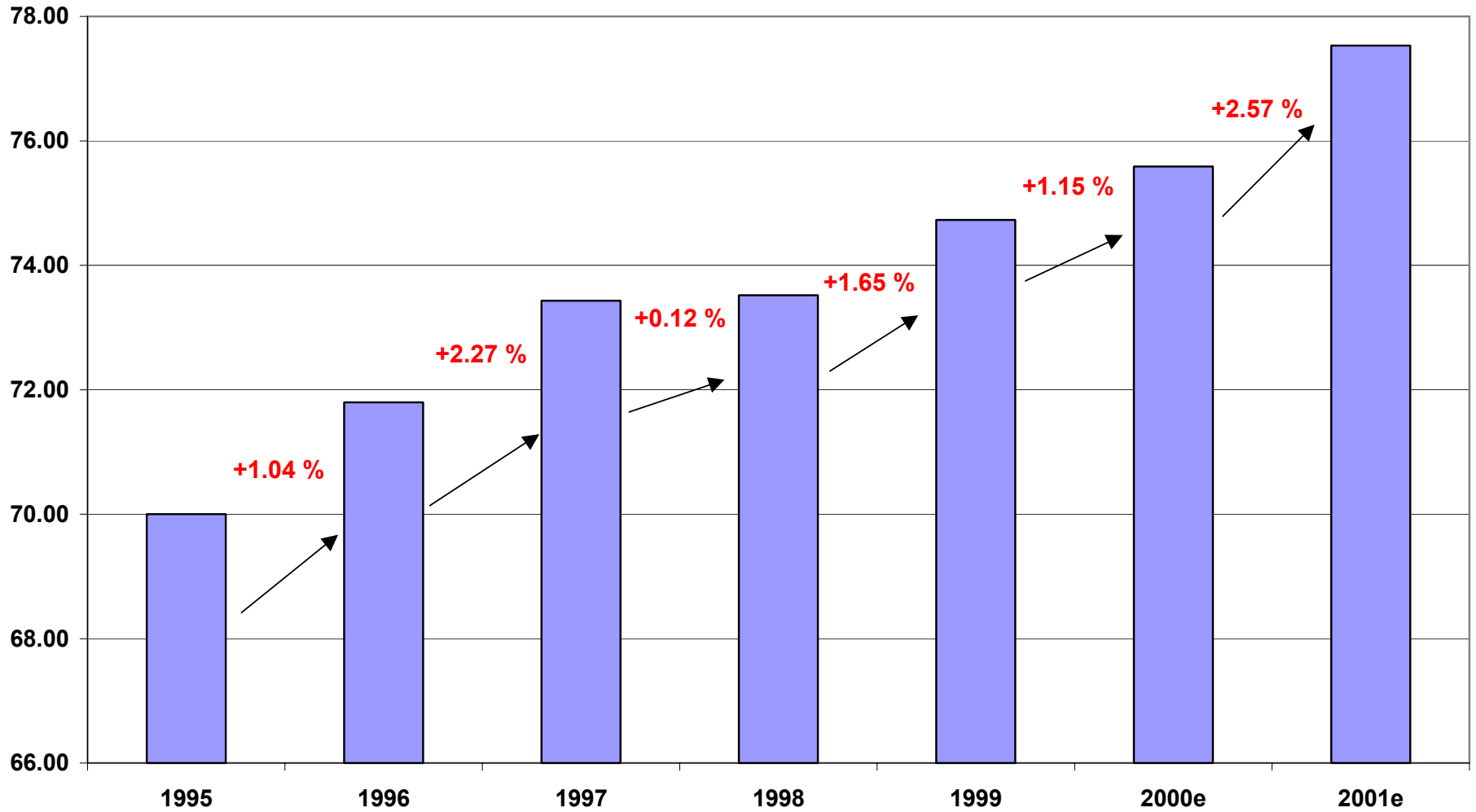
# Global Oil Demand [mbpd]



## Oil demand per region [mbpd]

	Oil demand (mbpd)						Annual change (%)				
	1996	1997	1998	1999	2000	2001	1997	1998	1999	2000	2001
North America	22.20	22.70	23.13	23.87	24.07	24.57	2.25%	1.89%	3.20%	0.84%	2.08%
Latin America	4.50	4.42	4.76	4.77	4.84	4.99	-1.78%	7.69%	0.21%	1.47%	3.10%
Europe OECD	14.90	14.99	15.28	15.12	15.07	15.30	0.60%	1.93%	-1.05%	-0.33%	1.53%
Europe non-OECD	0.80	0.77	0.76	0.74	0.75	0.76	-3.75%	-1.30%	-2.63%	1.35%	1.33%
Pacific	8.80	8.97	8.41	8.63	8.65	8.93	1.93%	-6.24%	2.62%	0.23%	3.24%
FSU	4.40	4.27	3.73	3.50	3.49	3.42	-2.95%	-12.65%	-6.17%	-0.29%	-2.01%
China	3.70	4.08	4.19	4.48	4.79	5.08	10.27%	2.70%	6.92%	6.92%	6.05%
Other Asia	6.40	6.73	6.75	7.04	7.22	7.58	5.16%	0.30%	4.30%	2.56%	4.99%
Middle East	4.00	4.19	4.17	4.26	4.34	4.51	4.75%	-0.48%	2.16%	1.88%	3.92%
Africa	2.30	2.32	2.35	2.32	2.34	2.39	0.87%	1.29%	-1.28%	0.86%	2.14%
<b>World</b>	<b>71.80</b>	<b>73.43</b>	<b>73.52</b>	<b>74.73</b>	<b>75.59</b>	<b>77.53</b>	<b>2.27%</b>	<b>0.12%</b>	<b>1.65%</b>	<b>1.15%</b>	<b>2.57%</b>

# World Oil Demand [mbpd]



Source: IEA

## World Oil Demand 2001 [mbpd]

in mbpd	Demand as expected in	Demand as expected in	Net Change	Change in %
	July 2000	November 2000		
<b>N. America</b>	24.54	24.07	-0.47	-1.92%
<b>OECD Europe</b>	15.36	15.07	-0.29	-1.89%
<b>OECD Asia-Pacific</b>	8.95	8.65	-0.30	-3.35%
<b>FSU</b>	3.42	3.49	0.07	2.05%
<b>Non-OECD Europe</b>	0.75	0.75	0.00	0.00%
<b>China</b>	5.05	4.79	-0.26	-5.15%
<b>Other asia</b>	7.71	7.22	-0.49	-6.36%
<b>L. America</b>	4.98	4.84	-0.14	-2.81%
<b>Middle East</b>	4.51	4.34	-0.17	-3.77%
<b>Africa</b>	2.42	2.34	-0.08	-3.31%
<b>World</b>	<b>77.71</b>	<b>75.59</b>	<b>-2.12</b>	<b>-2.73%</b>

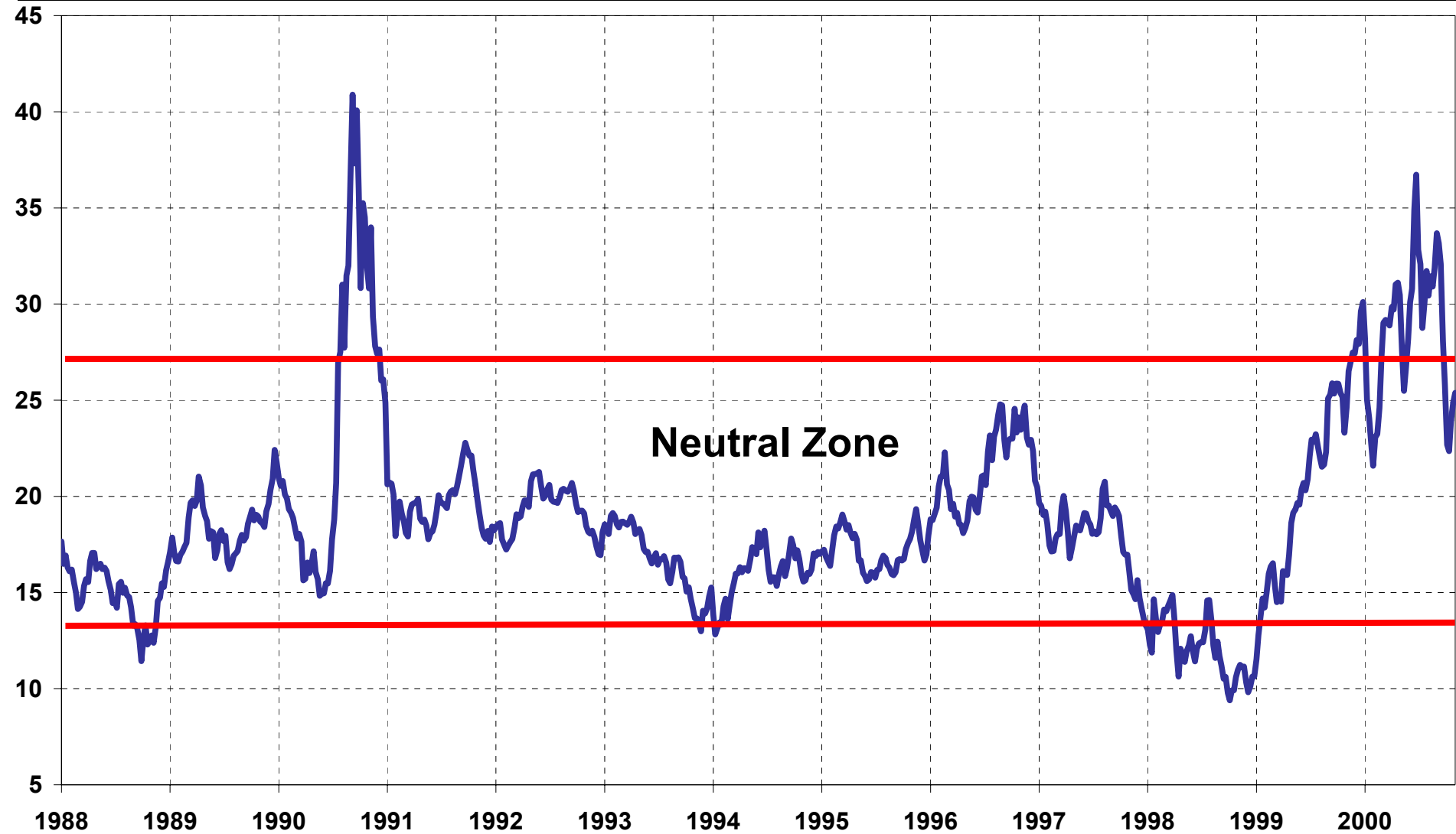


# ***HISTORICAL PRICE DEVELOPMENT***

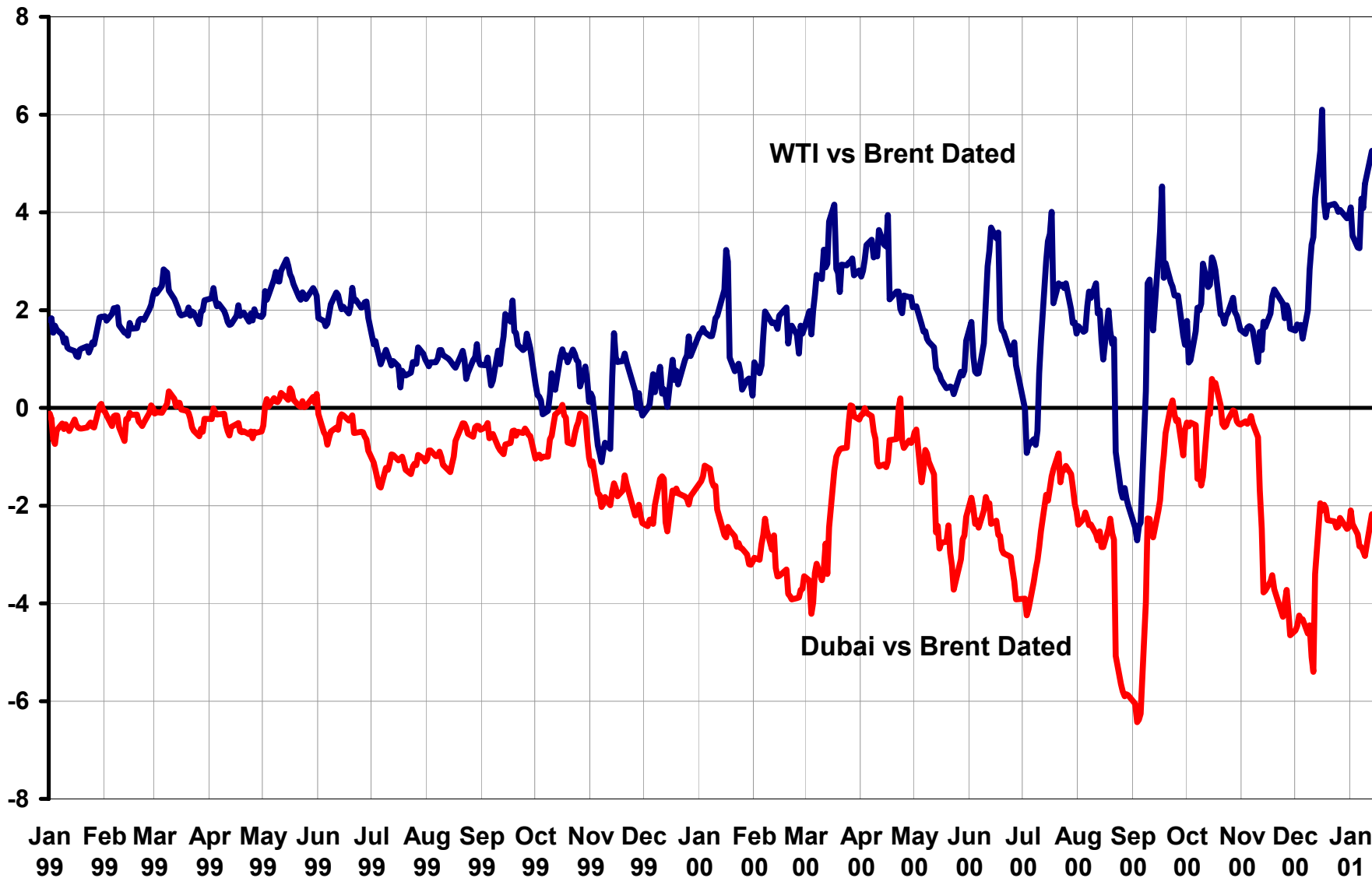
- ***US\$ 15 - 25 price neutral zone***
- ***Sweet – Sour Differentials***
- ***International Oil Flows***
- ***Increasing US Dependence on Foreign Oil  
(56.6% of the crude consumed by  
Americans in 2000 foreign)***
- ***Sharp Drop in the US Gasoline Production  
due to high MTBE prices (Dec 2000: minus  
600,000 bpd, RFG: minus 50%)***

# Historical Crude Price Development

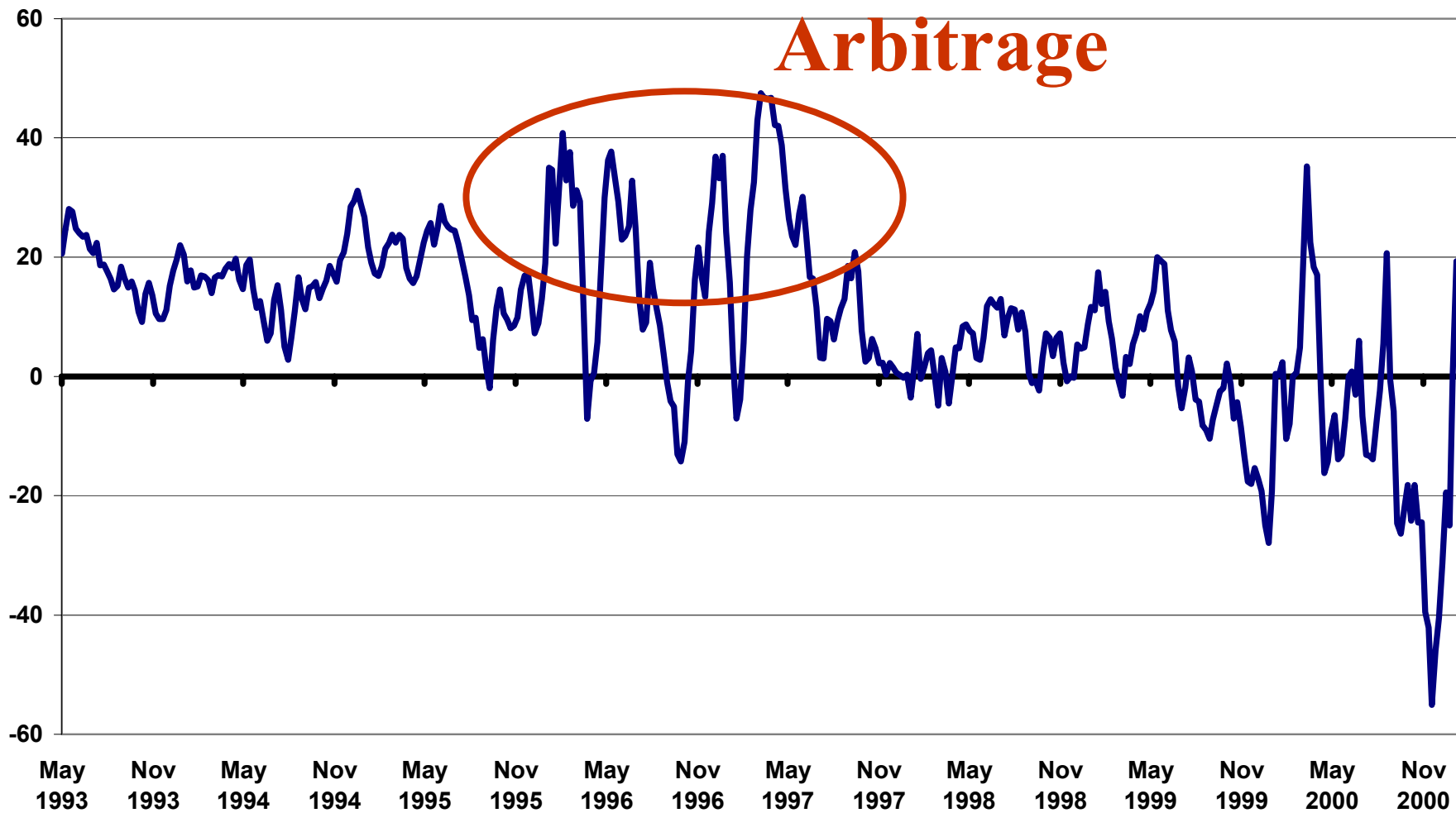
**Brent Dated [USD/bbl]**



# NYMEX WTI and Dubai FM vs Dated Brent [US\$/bbl]



# Gasoil 0.5 Singapore vs FOB MED [US\$/mt]



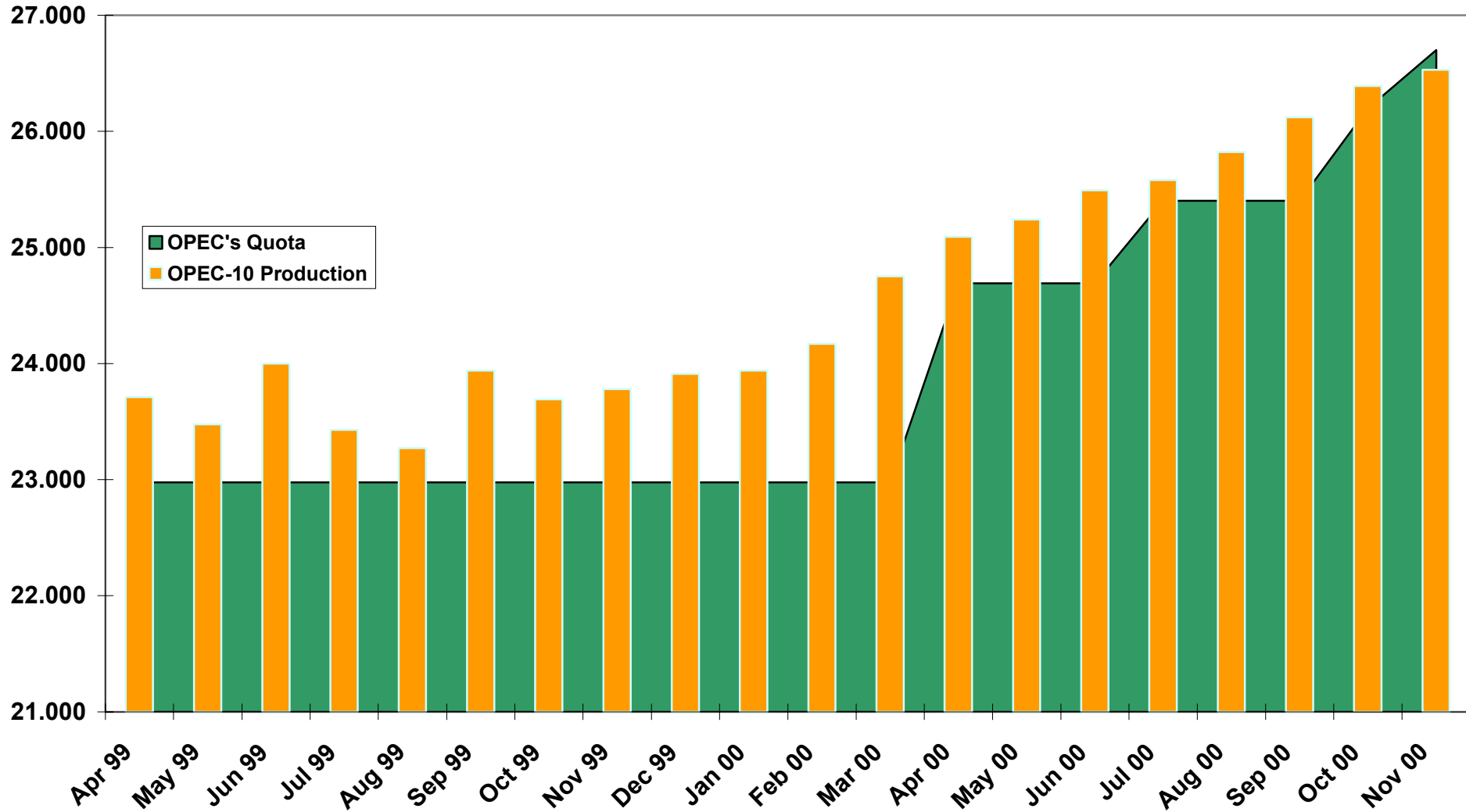
# **OPEC**

- ***OPEC reached its limits in 2000***
- ***Real expected production cuts less than announced.***
- ***Iraq remains a wild card.***
- ***Mulling Changes in its Price Band***
- ***OPEC as Swing Producer***

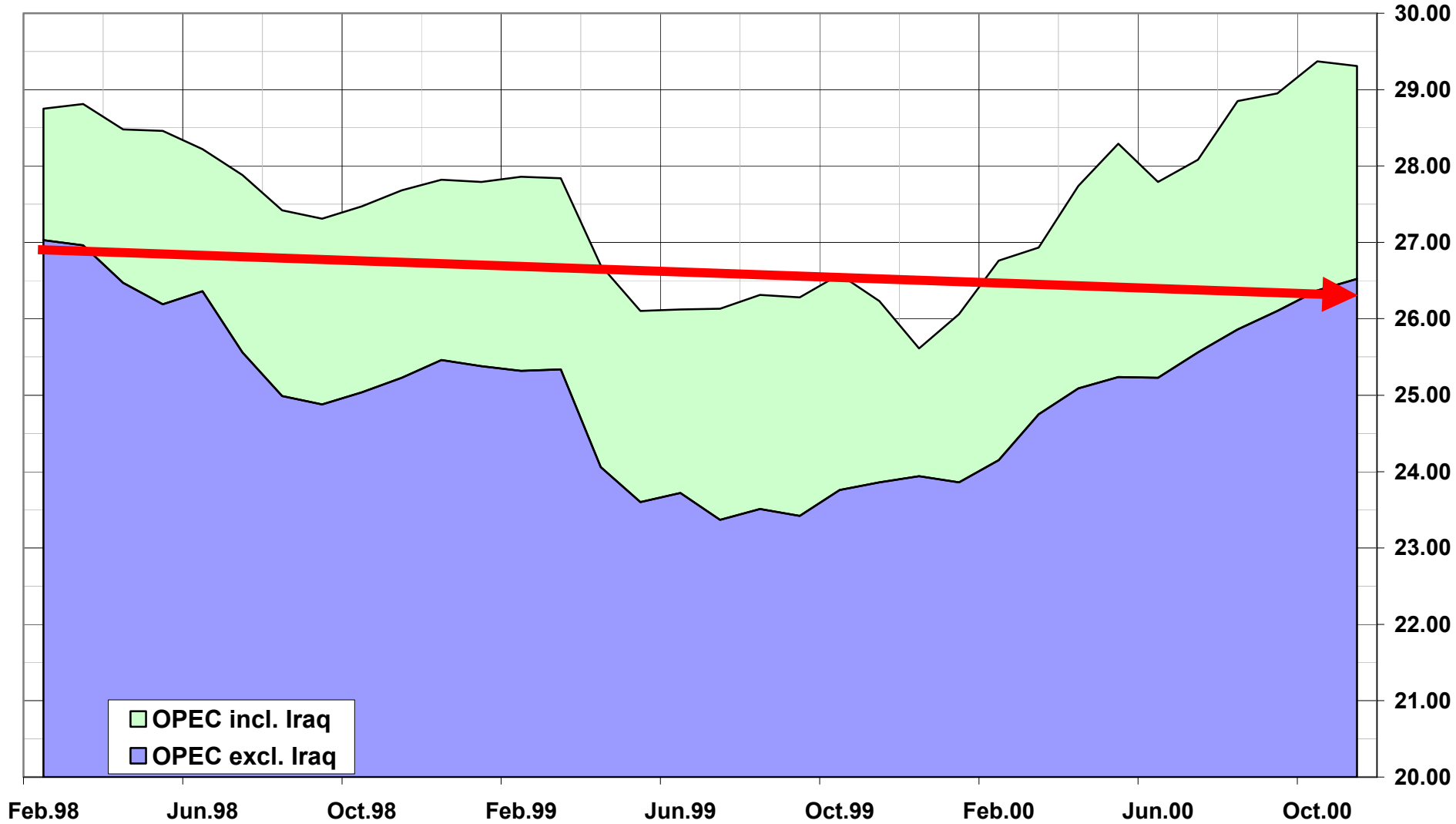
## OPEC's Production 2000 [mbpd]

in mbpd	Quota Jul 00	Sep 00	Quota Oct 00	Oct 00	Quota Nov 00	Nov 00
Algeria	0.811	0.810	0.836	0.840	0.853	0.850
Indonesia	1.317	1.310	1.358	1.290	1.385	1.320
Iran	3.727	3.900	3.843	3.810	3.917	3.750
Kuwait	2.037	2.225	2.101	2.210	2.141	2.220
Libya	1.361	1.430	1.404	1.440	1.431	1.450
Nigeria	2.091	2.000	2.156	2.130	2.198	2.140
Qatar	0.658	0.690	0.678	0.710	0.692	0.740
Saudi Arabia	8.253	8.595	8.512	8.680	8.674	8.790
UAE	2.219	2.230	2.289	2.340	2.333	2.290
Venezuela	2.927	2.930	3.018	2.940	3.077	2.980
<b>OPEC excl. Iraq</b>	<b>25.401</b>	<b>26.120</b>	<b>26.195</b>	<b>26.390</b>	<b>26.700</b>	<b>26.530</b>
Iraq	2.555	2.850	2.900	3.000	2.900	2.790
<b>Total OPEC incl. Iraq</b>	<b>27.956</b>	<b>28.970</b>	<b>29.095</b>	<b>29.390</b>	<b>29.600</b>	<b>29.320</b>

# OPEC's Quotas and Production [mbpd]

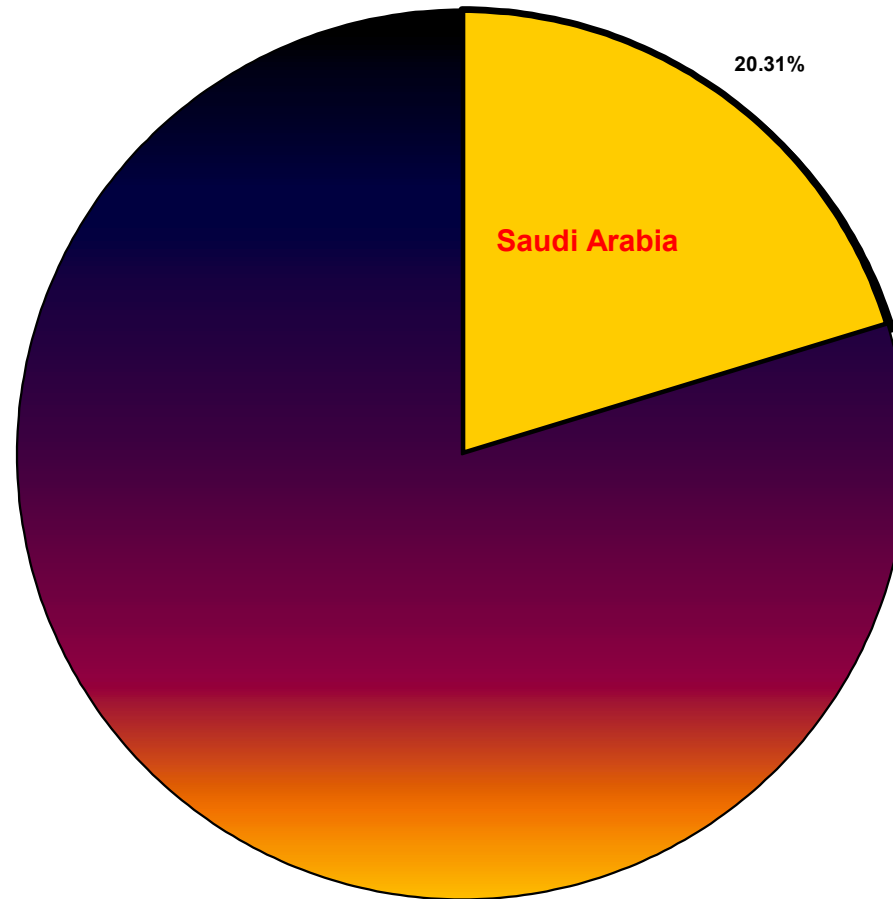


# OPEC Oil Production excl. NGLs [mbpd]





## Saudi and World Oil Reserves



# ***NON-OPEC PRODUCTION***

- ***Upstream Spending:***

***1998 = -9 %                      1999 = -18 %***  
***2000 = +15-20 %              2001 = +15-20 %***

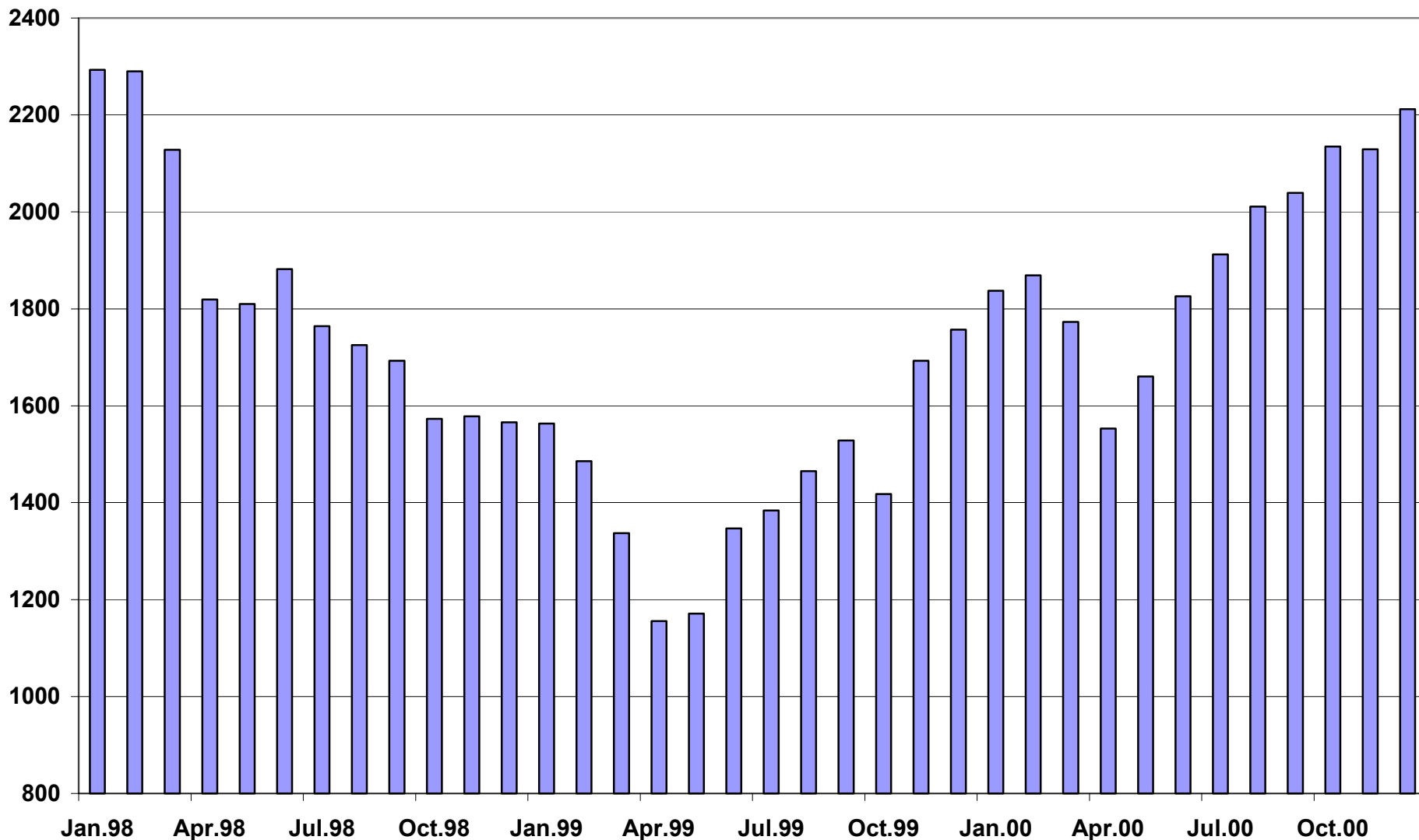
- ***Lack of skilled workers putting brakes on non-Opec production increase.***

- ***Non-Opec Production Increase***

***2000 = 1.2 %                      2001 = 0.7 %***

- ***Increase in 2001 < Increase in 2000***

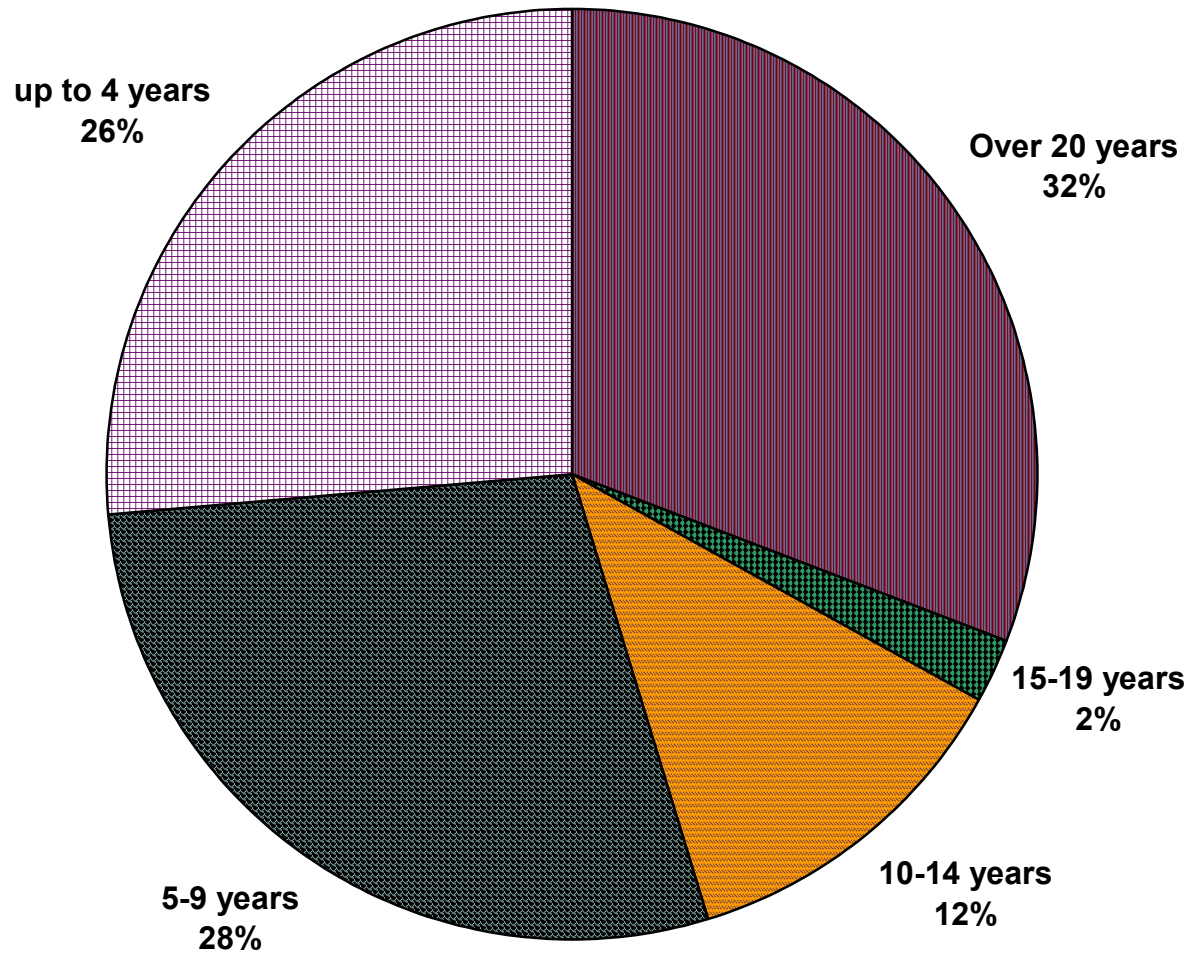
# Worldwide Rig Count



# ***FREIGHT RATES***

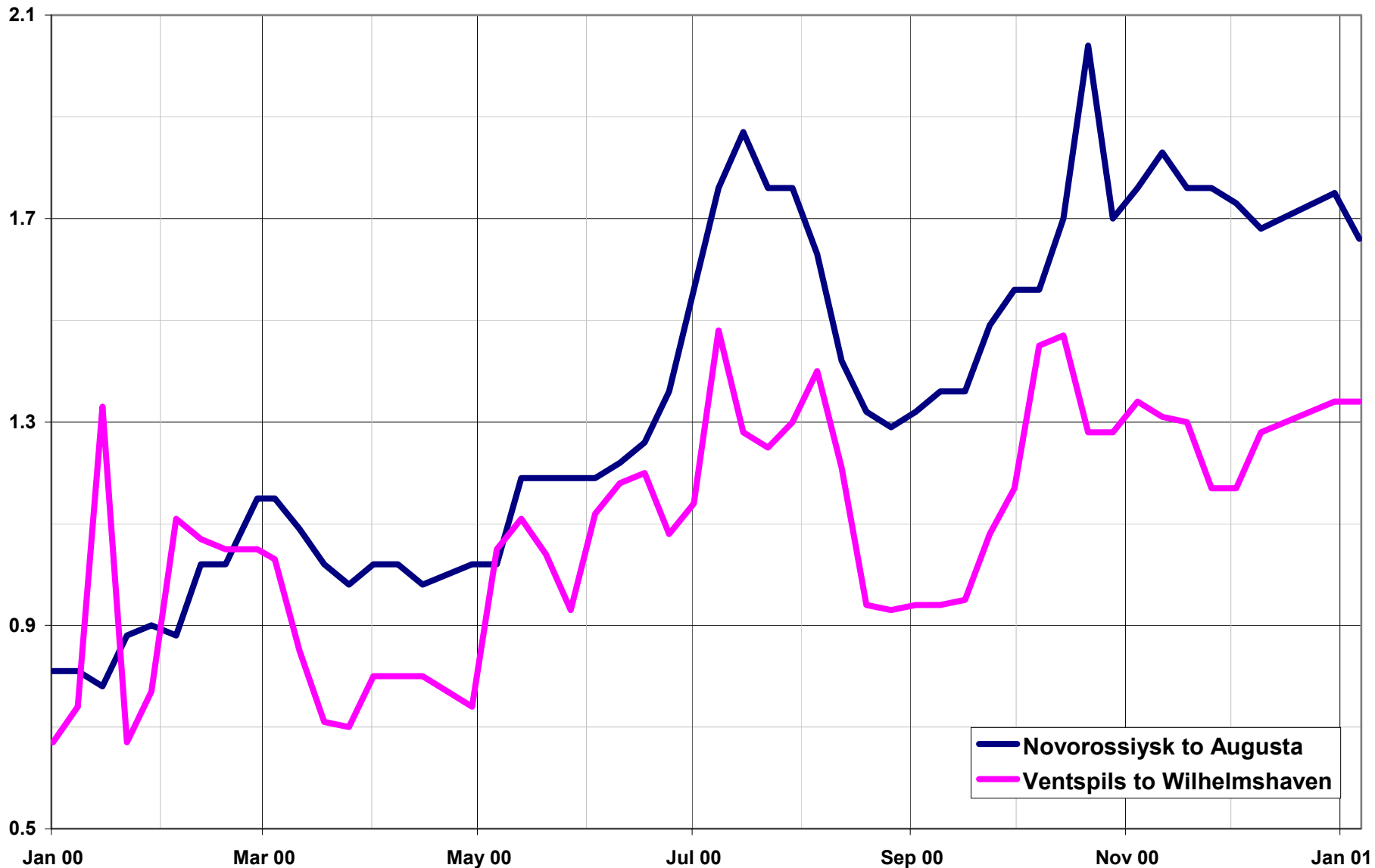
- ***One third of total fleet over 15 years in 2001.***
- ***38 new VLCCs likely to be delivered this year.***
- ***About 35 VLCCs expected to be scrapped.***
- ***Crude Freight Rates might go down due to lower OPEC production but no dramatic fall in prices expected.***

## World VLCC Fleet - Age Profile

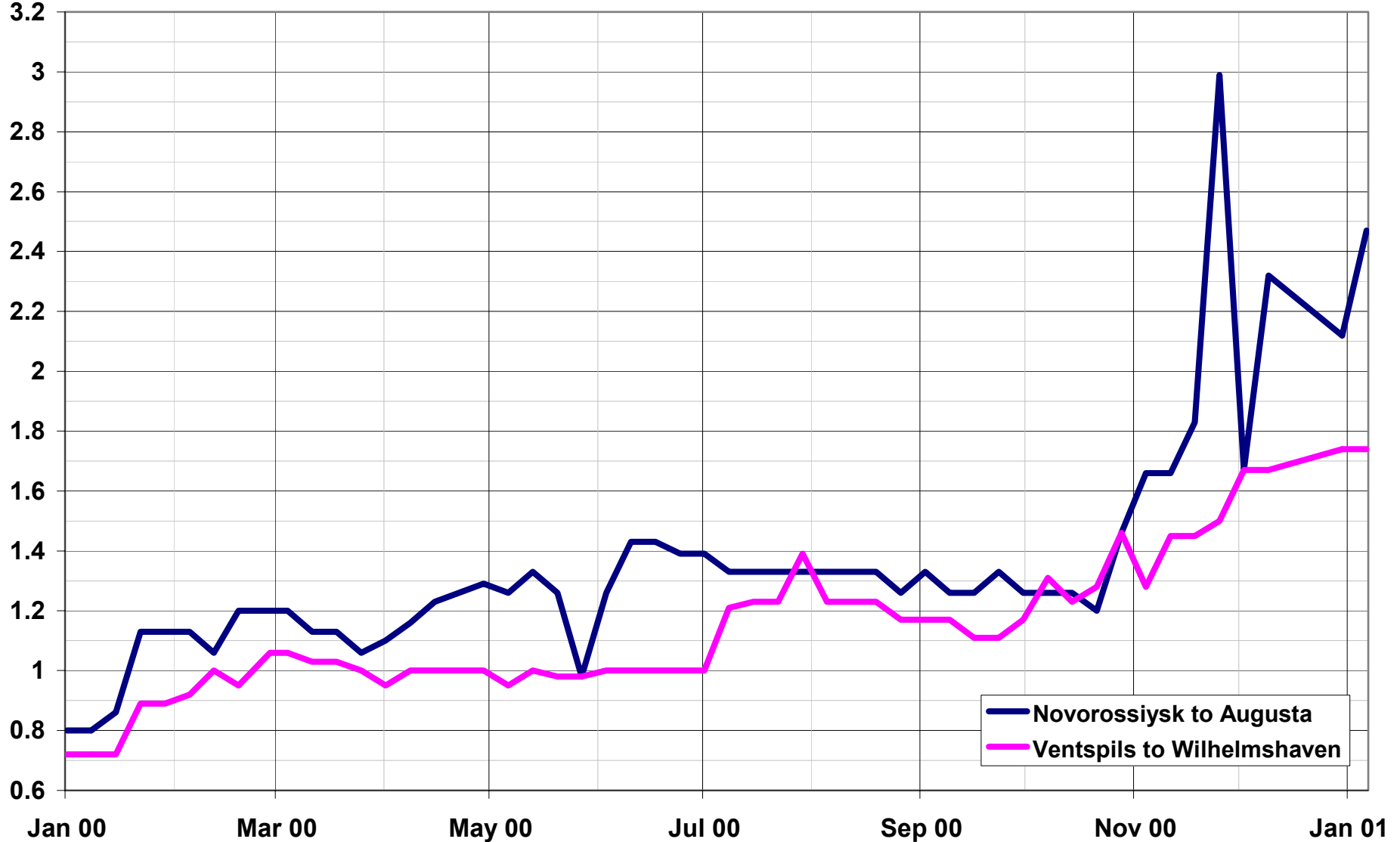


Source: Petroleum Argus

# Freight Rates for 80,000 Crude Carriers [US\$/bbl]



# Freight Rates for 30,000 Clean Product Carriers [US\$/bbl]

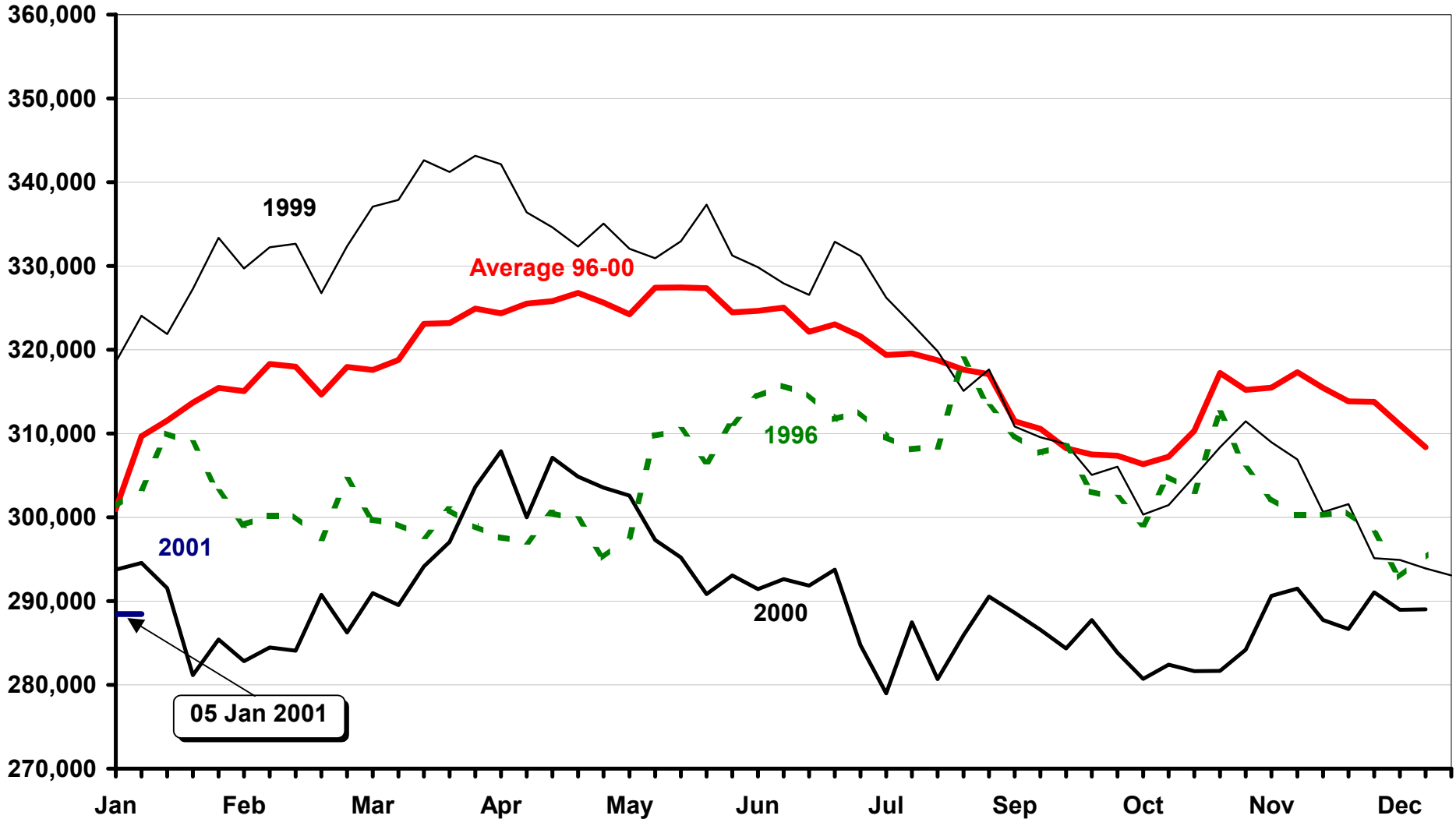


# ***INVENTORIES***

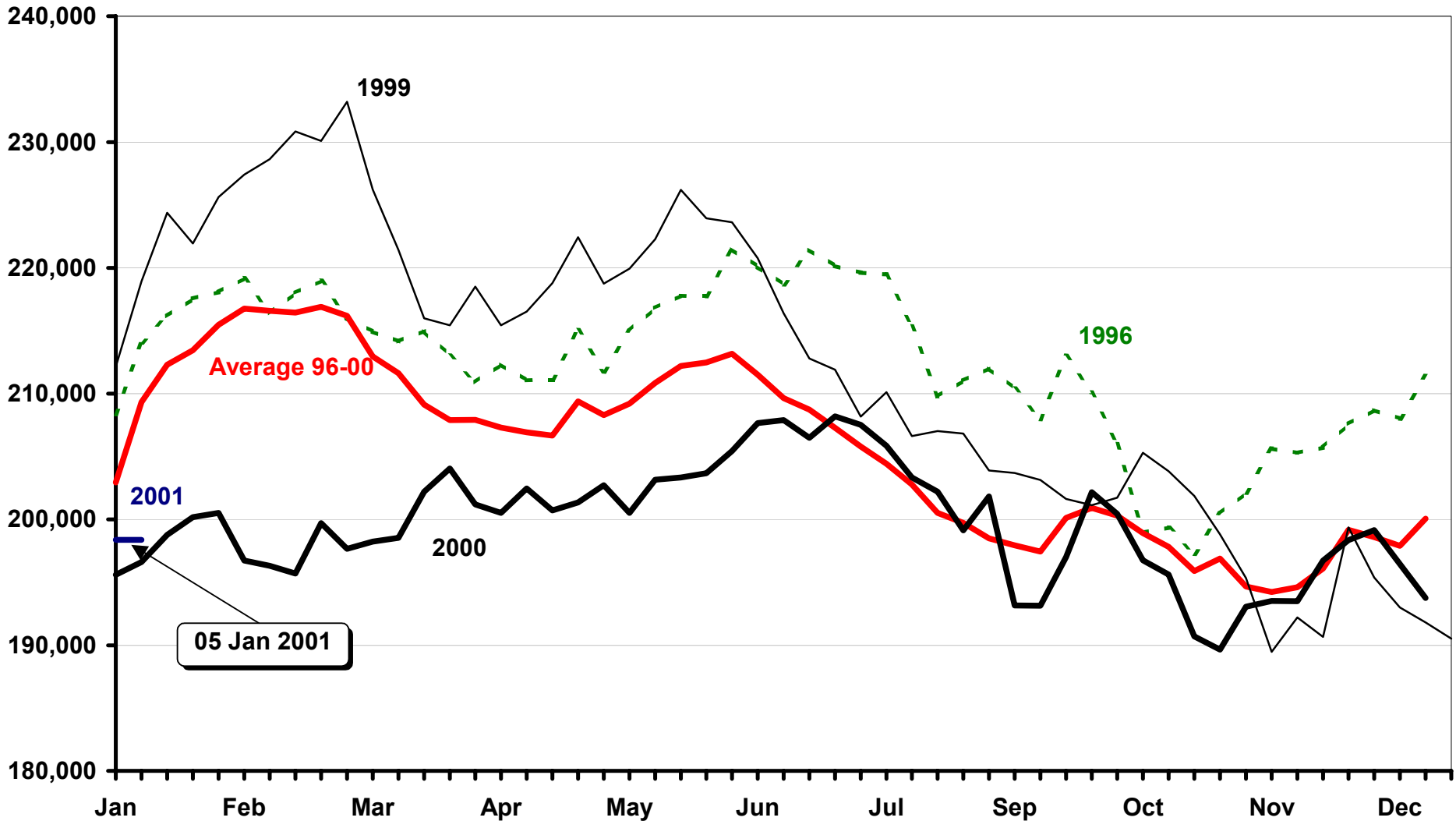
- ***OECD-Stocks more comfortable but we are not out of woods.***
- ***European Inventories improving.***
- ***Oil prices dependent on total US-Inventory levels.***
- ***Distillate inventories still 8.4 mb below the previous year's level.***
- ***Gasoline stocks higher than last year's levels but MTBEs tight market likely to fuel prices in summer.***



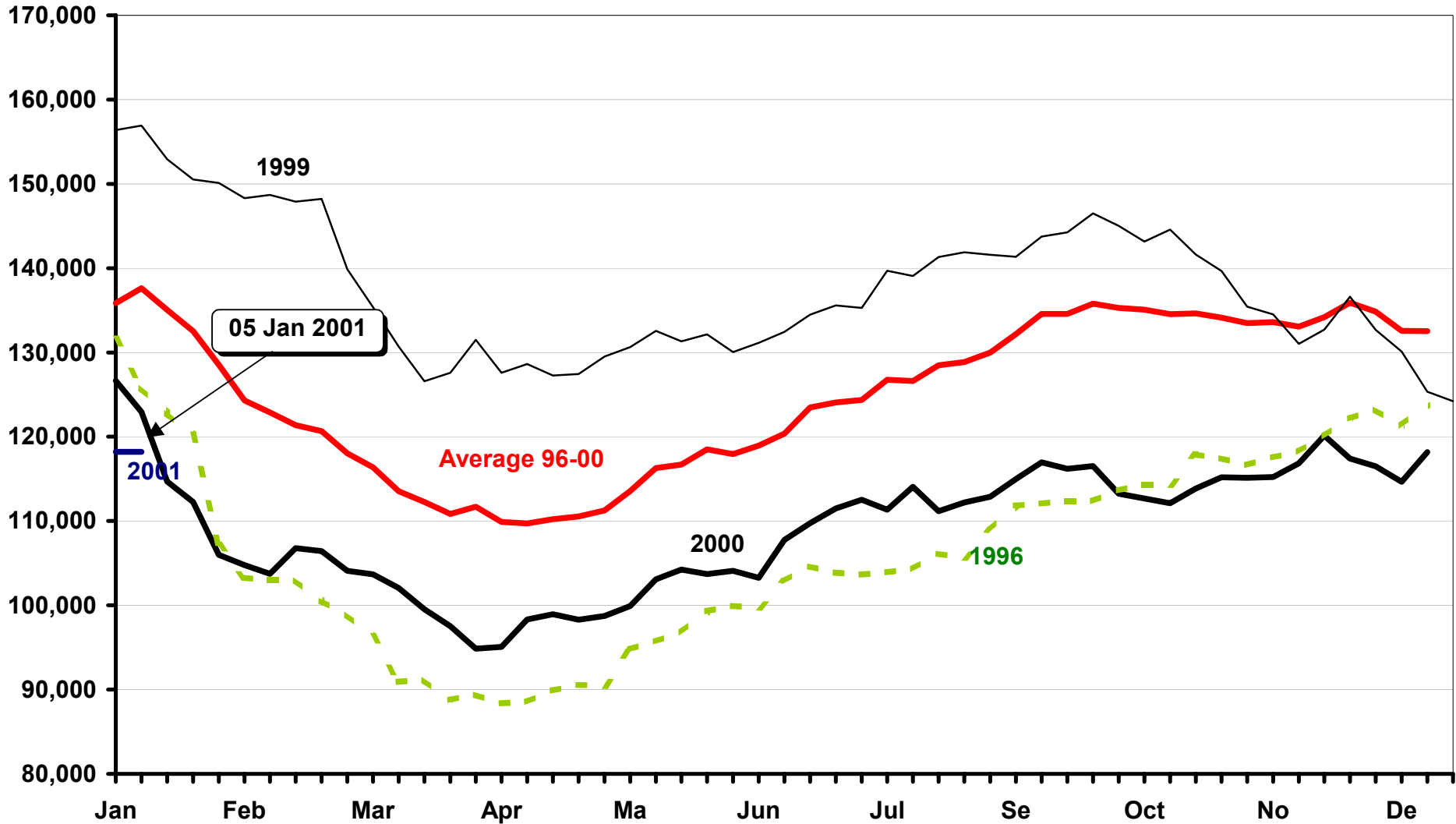
# U.S. Crude Oil Inventory Levels ['000 bbls]



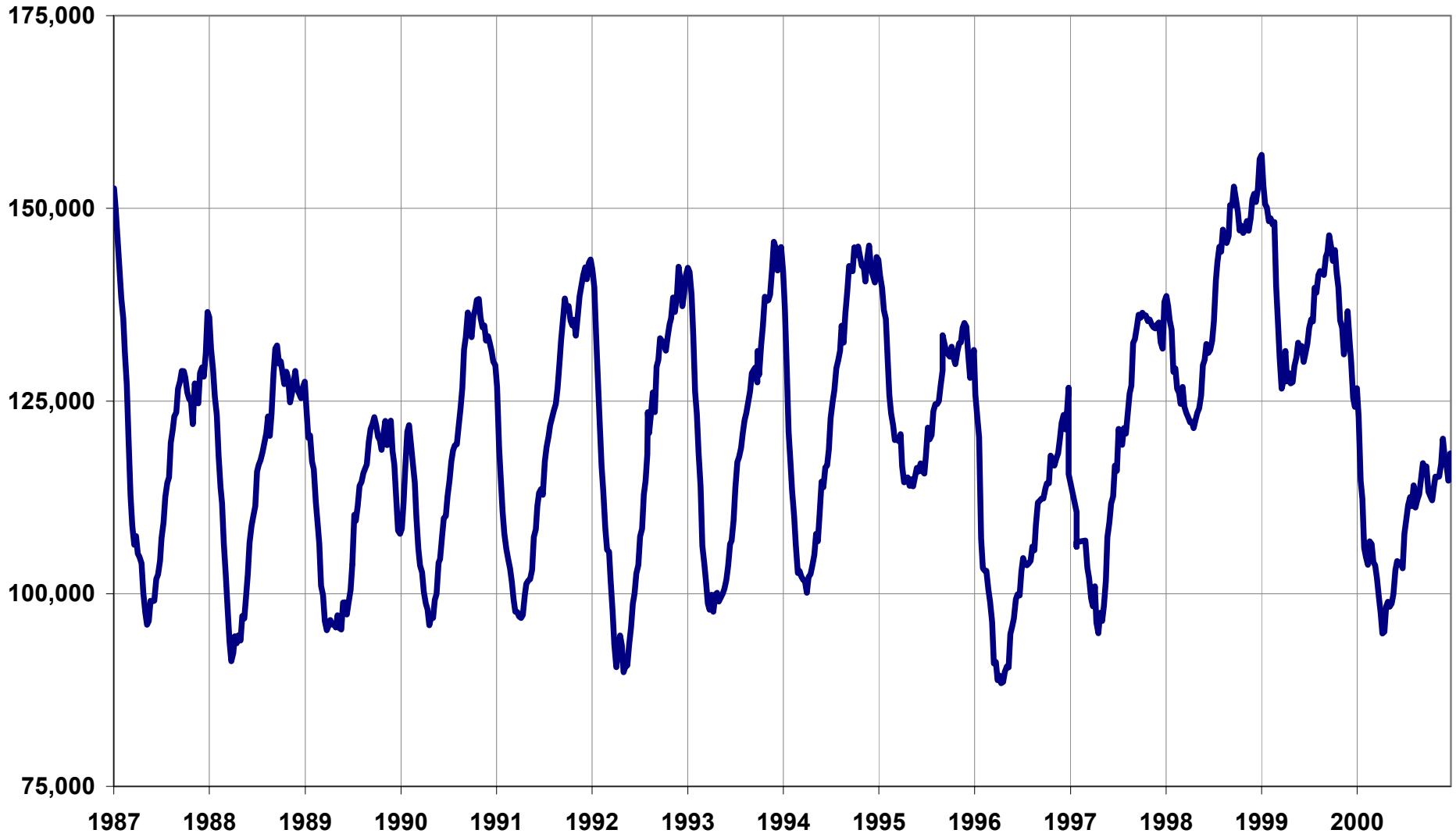
# U.S. Mogas Inventory Levels ['000 bbls]



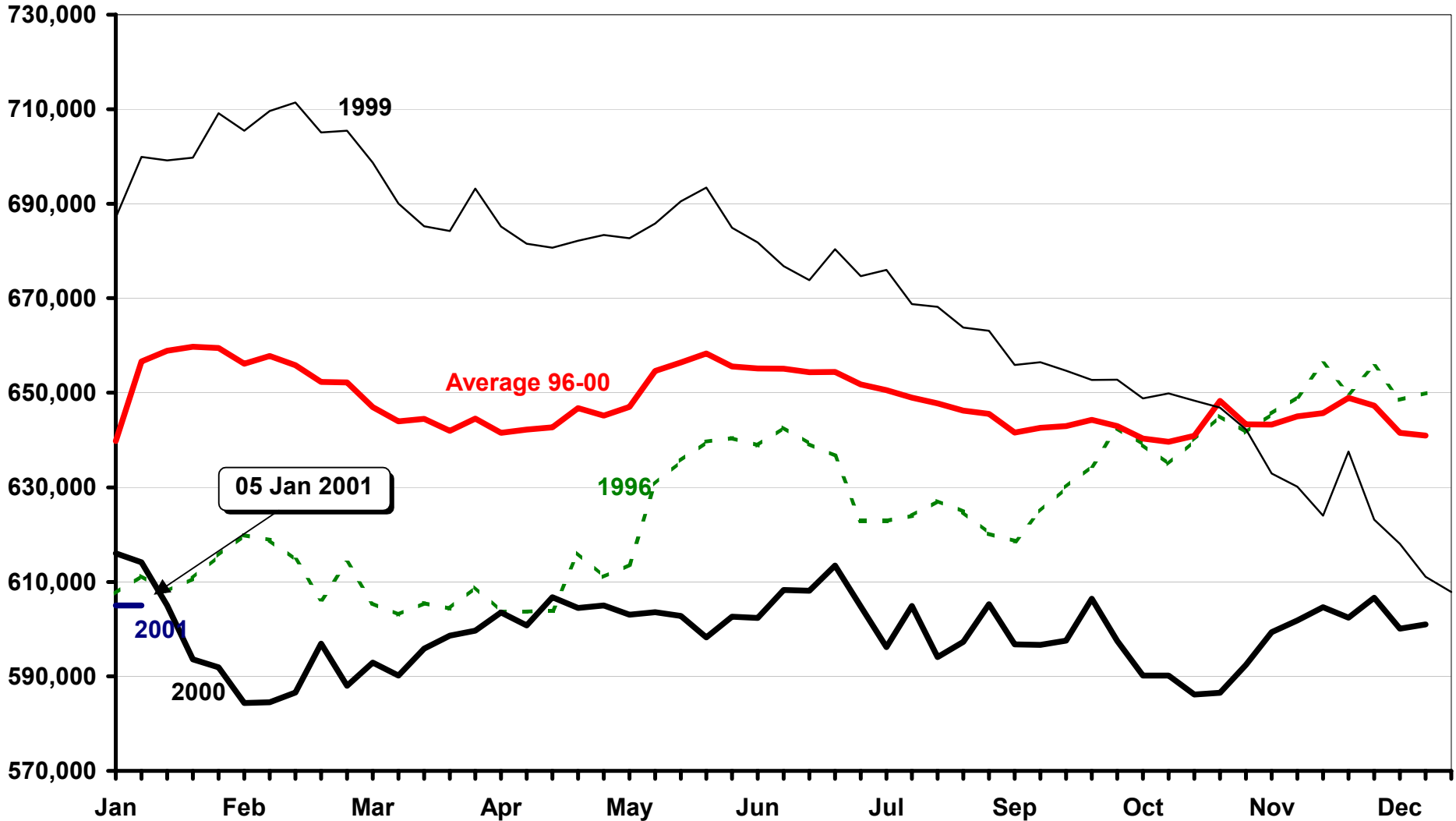
# U.S. Distillates Inventory Levels ['000 bbls]



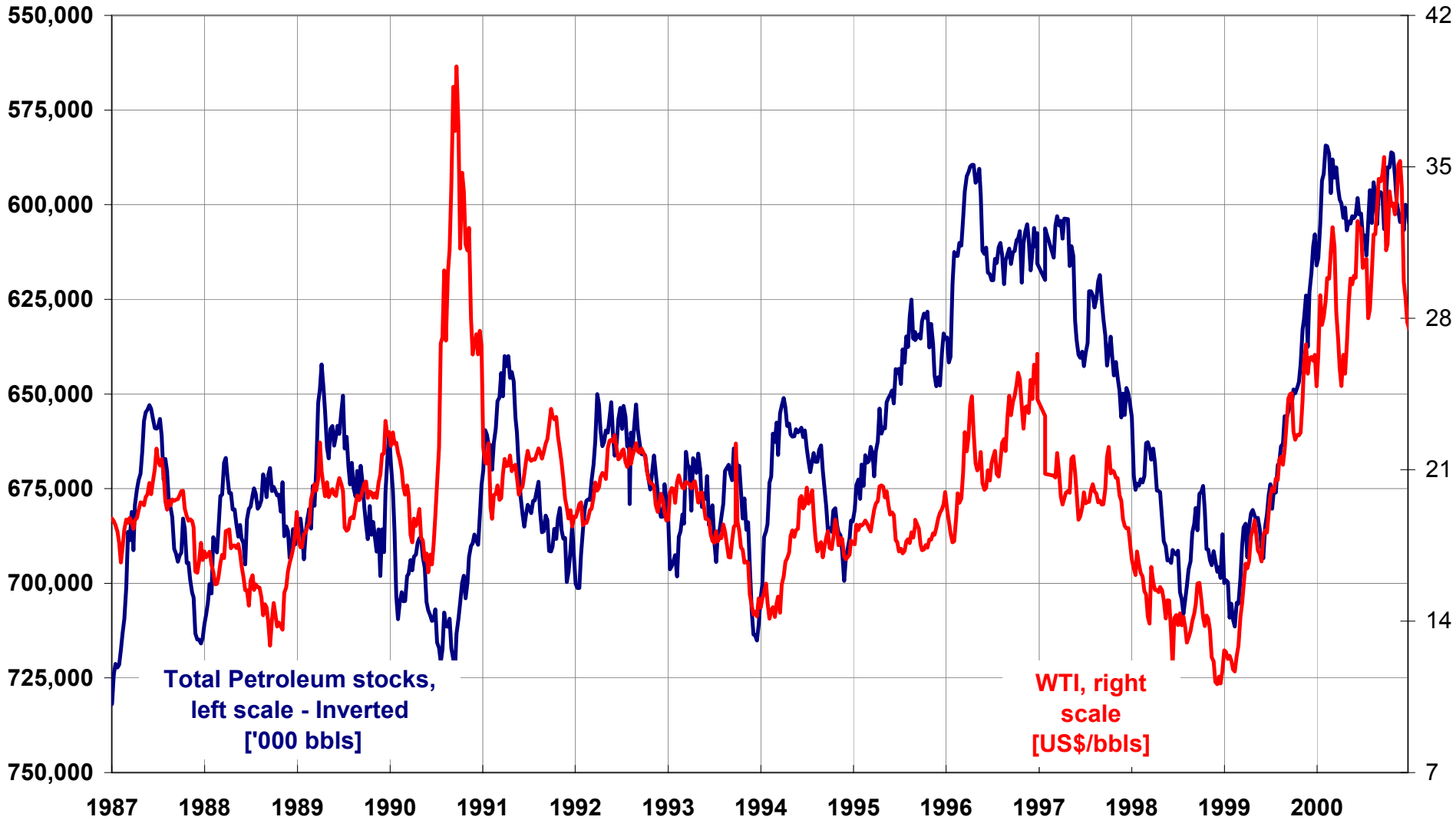
# U.S. Distillates Inventory Levels ['000 bbls]



# U.S. Total Inventory Levels ['000 bbls]



# U.S. Total Petroleum Inventory Levels and WTI FL [weekly]

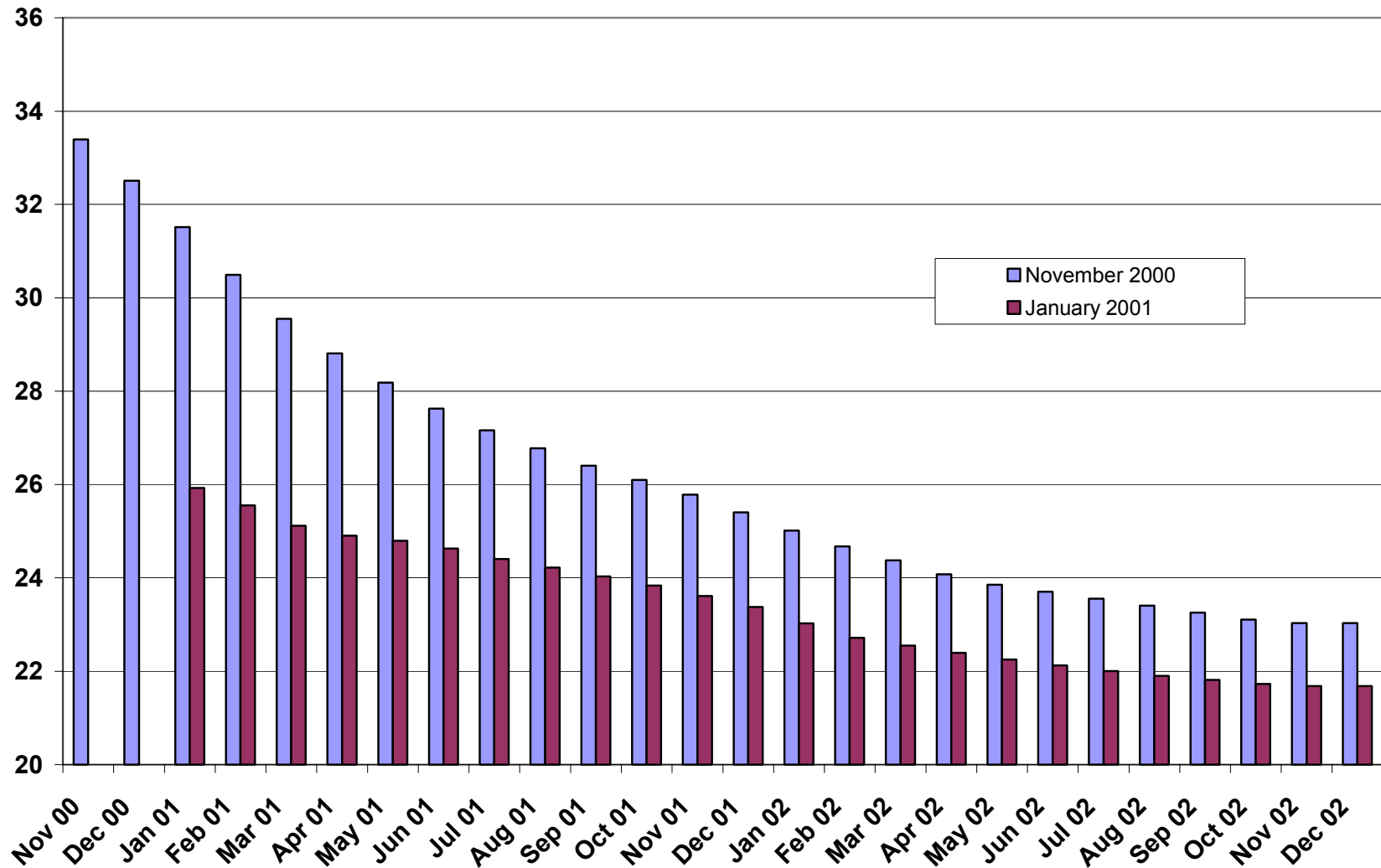


# ***MARKET STRUCTURE***

- ***Cash & Carry Arbitrage 1998***
- ***Backwardation 1999-2000***

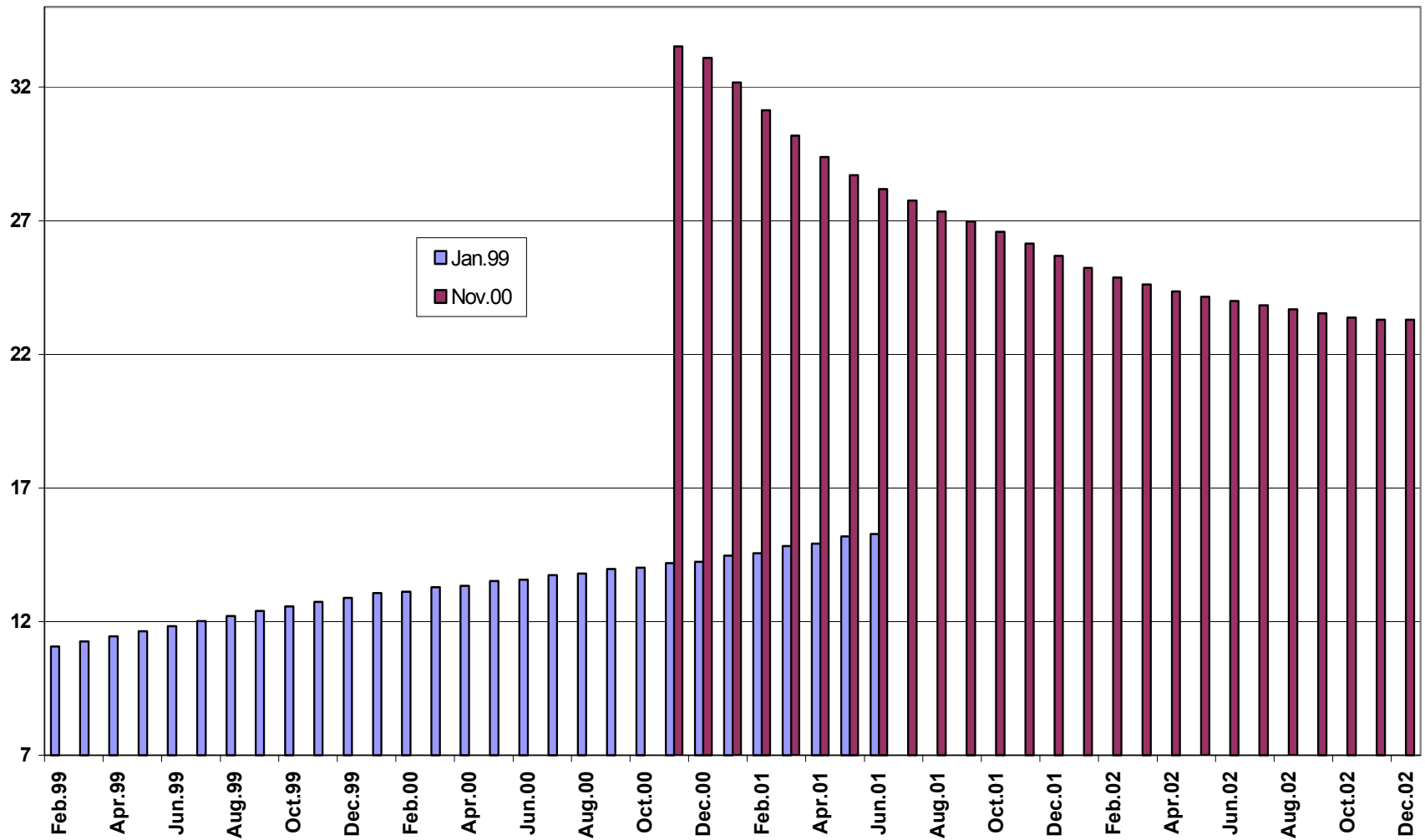
# Market Structures

## Forward Values of Dated Brent (IPE Strip) [US\$/bbl]





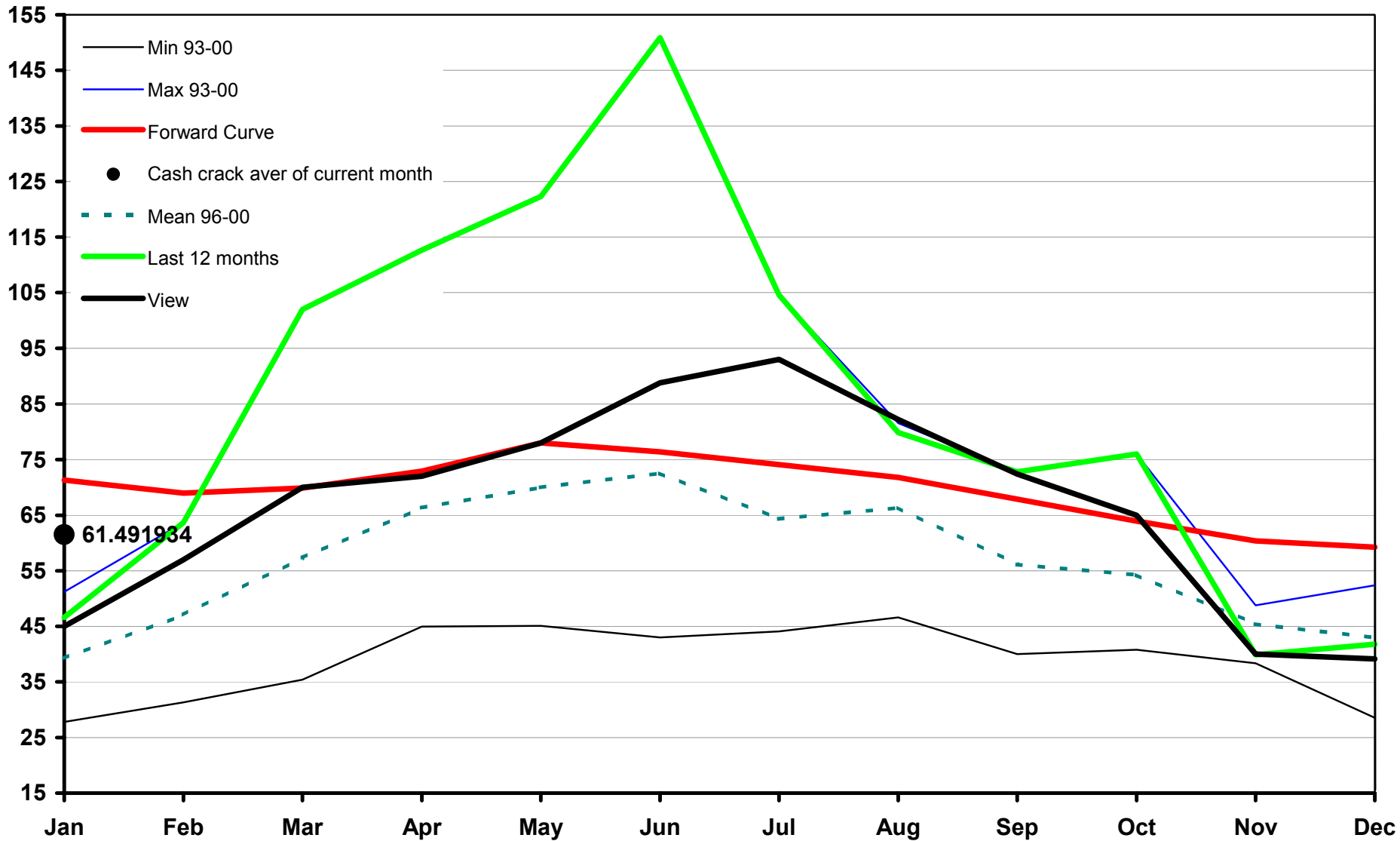
# Forward Values of Dated Brent (IPE Strip) [US\$/bbl]



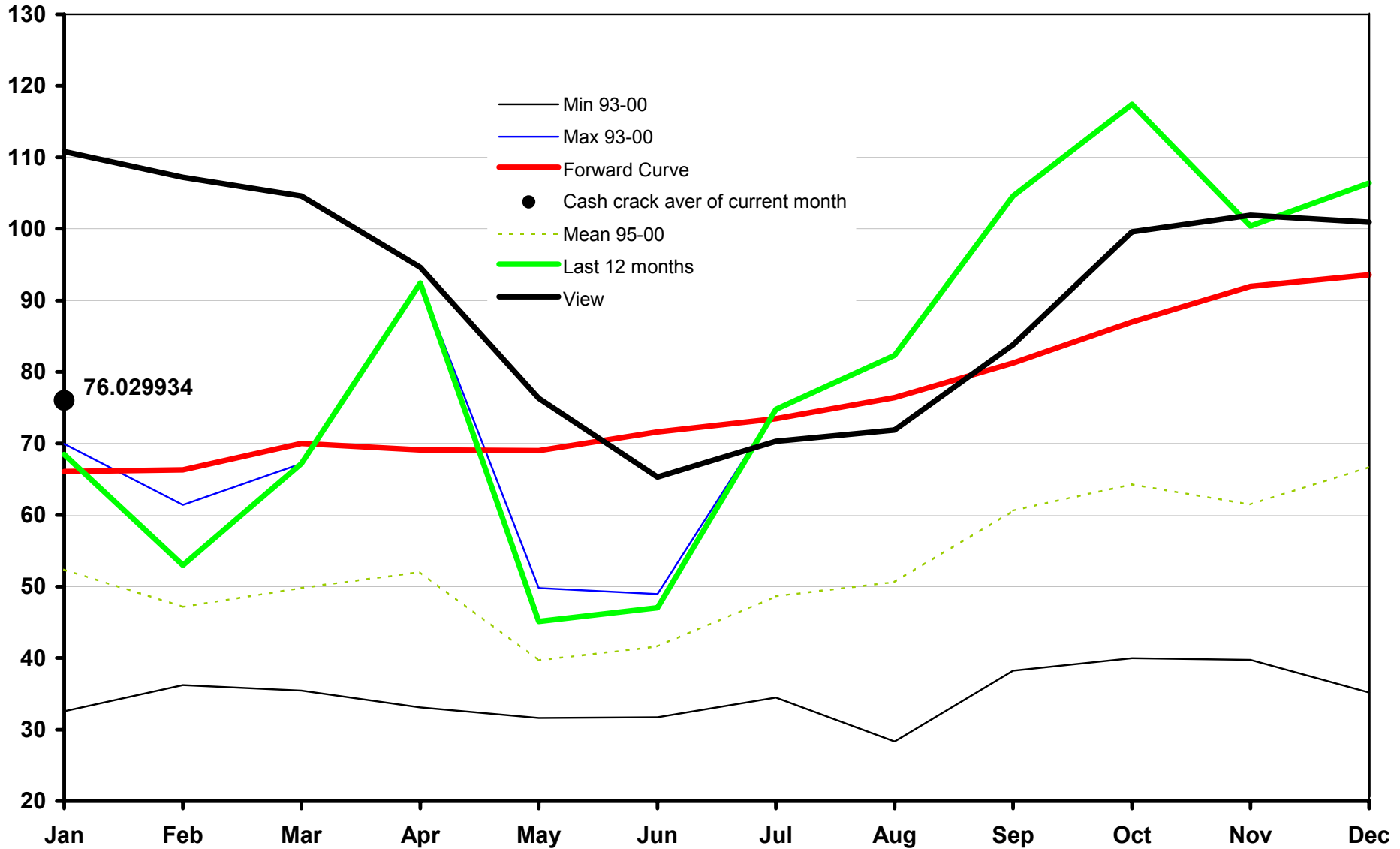
# ***REFINING MARGIN***

- ***Increased Volatility in Refining Margins***
- ***Seasonality in Margins***
- ***Healthy margins in North America due to high product demand***
- ***Product Specification Changes***
- ***European Margins being driven by US***

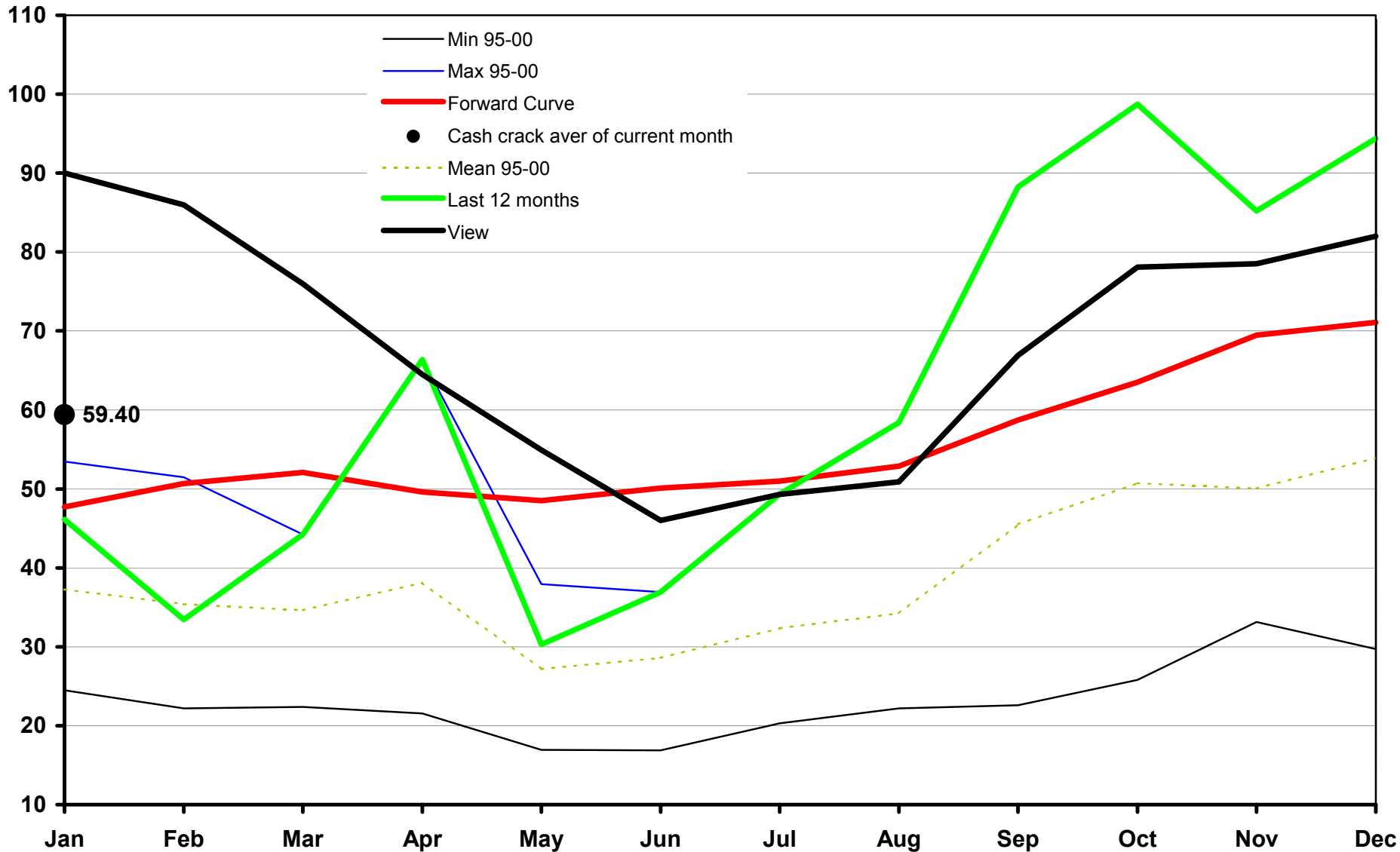
# Crack [US\$/mt] - Prem Unl FOB Barges vs. Brent Dated



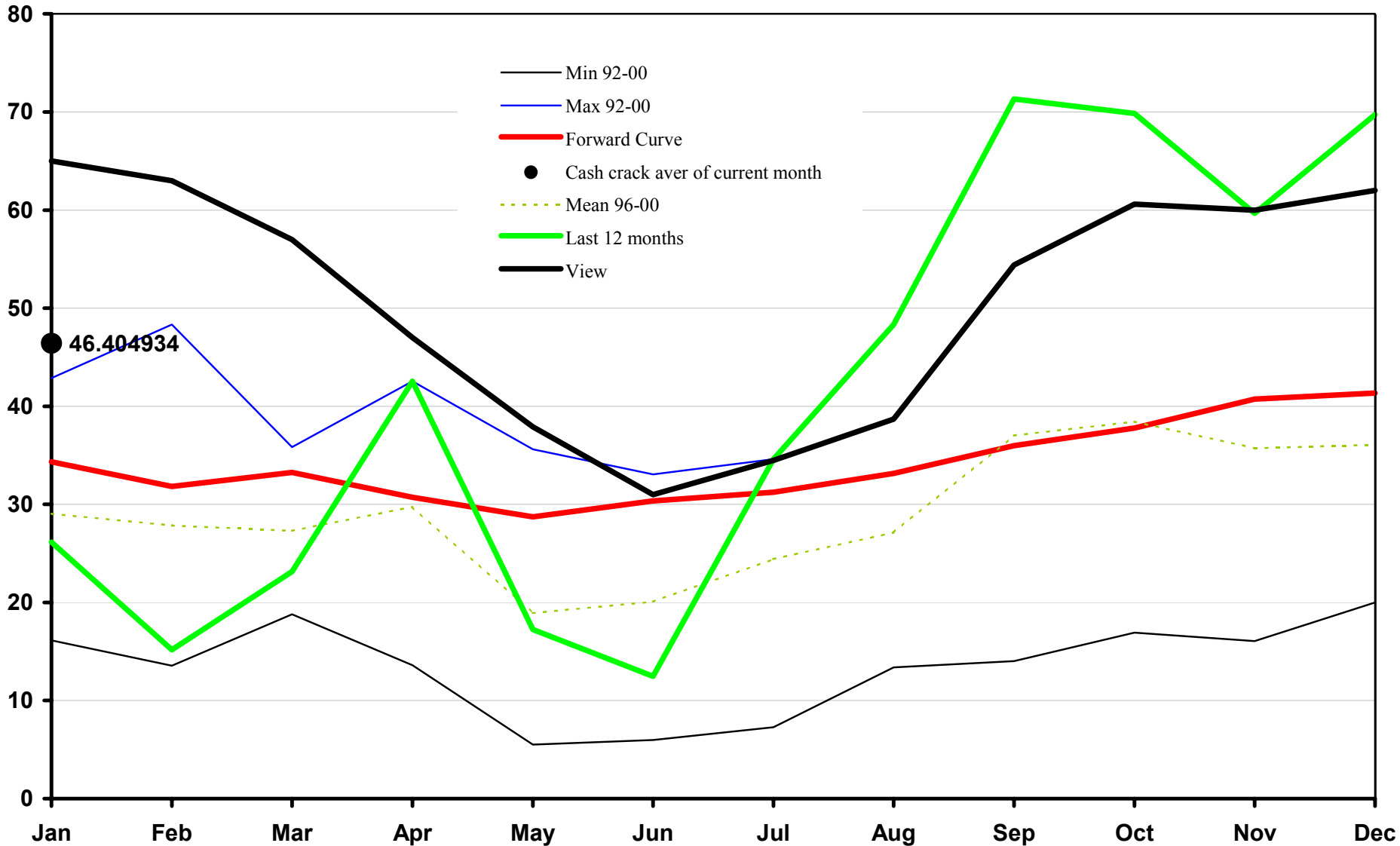
# Crack [US\$/mt] - Jet CIF Cargoes NWE vs. Brent Dated



# Crack [US\$/mt] - EN590 Cargoes CIF NWE vs. Brent Dated



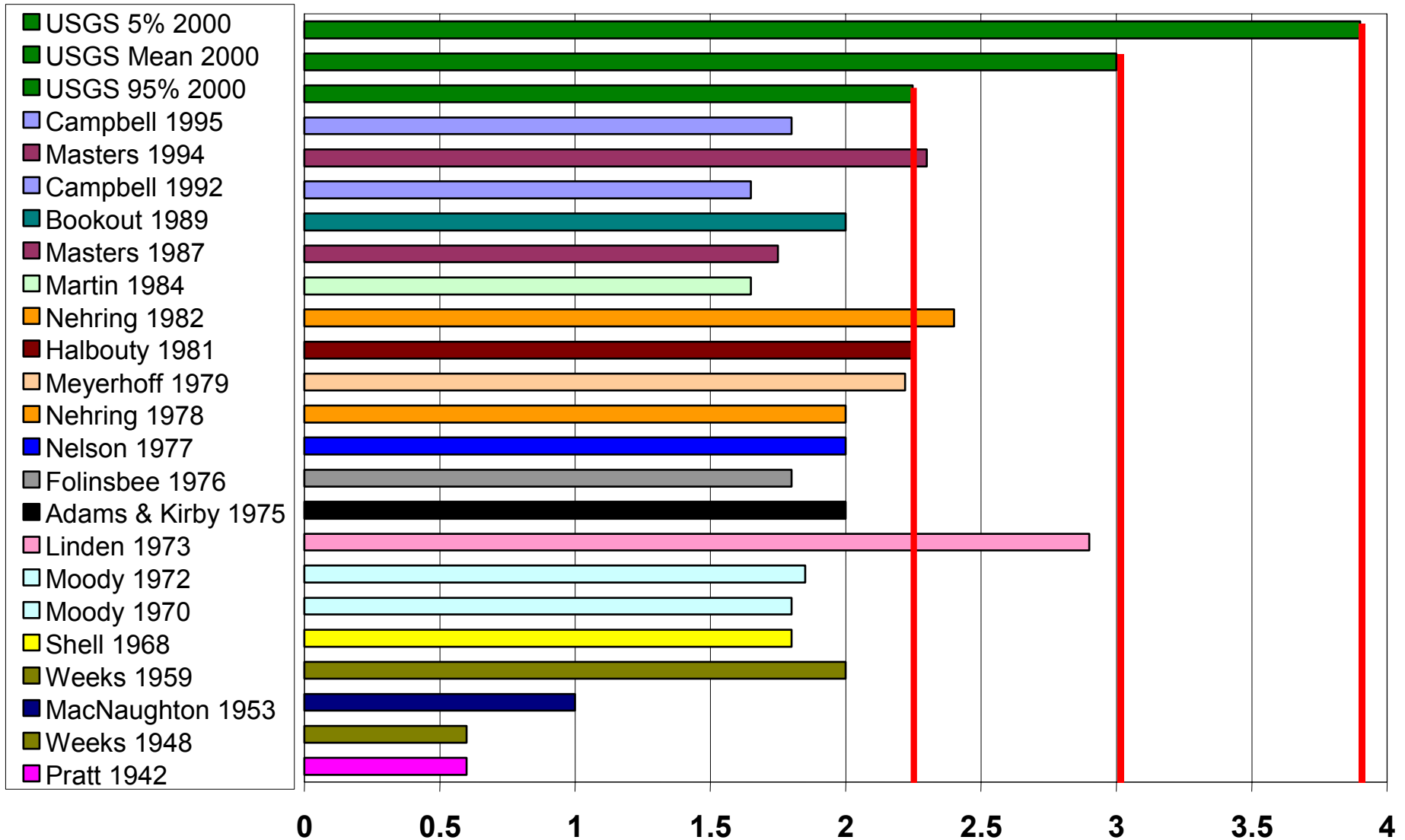
# Crack [US\$/mt] - Gasoil .2 FOB Barges Rotterdam vs. Brent Dated



# ***Long Term World Oil Supply***

- ***Peak Years range from 2021 to 2112  
depending on different scenarios***
- ***EIA / DOE scenario expects peak later than  
other analysts***

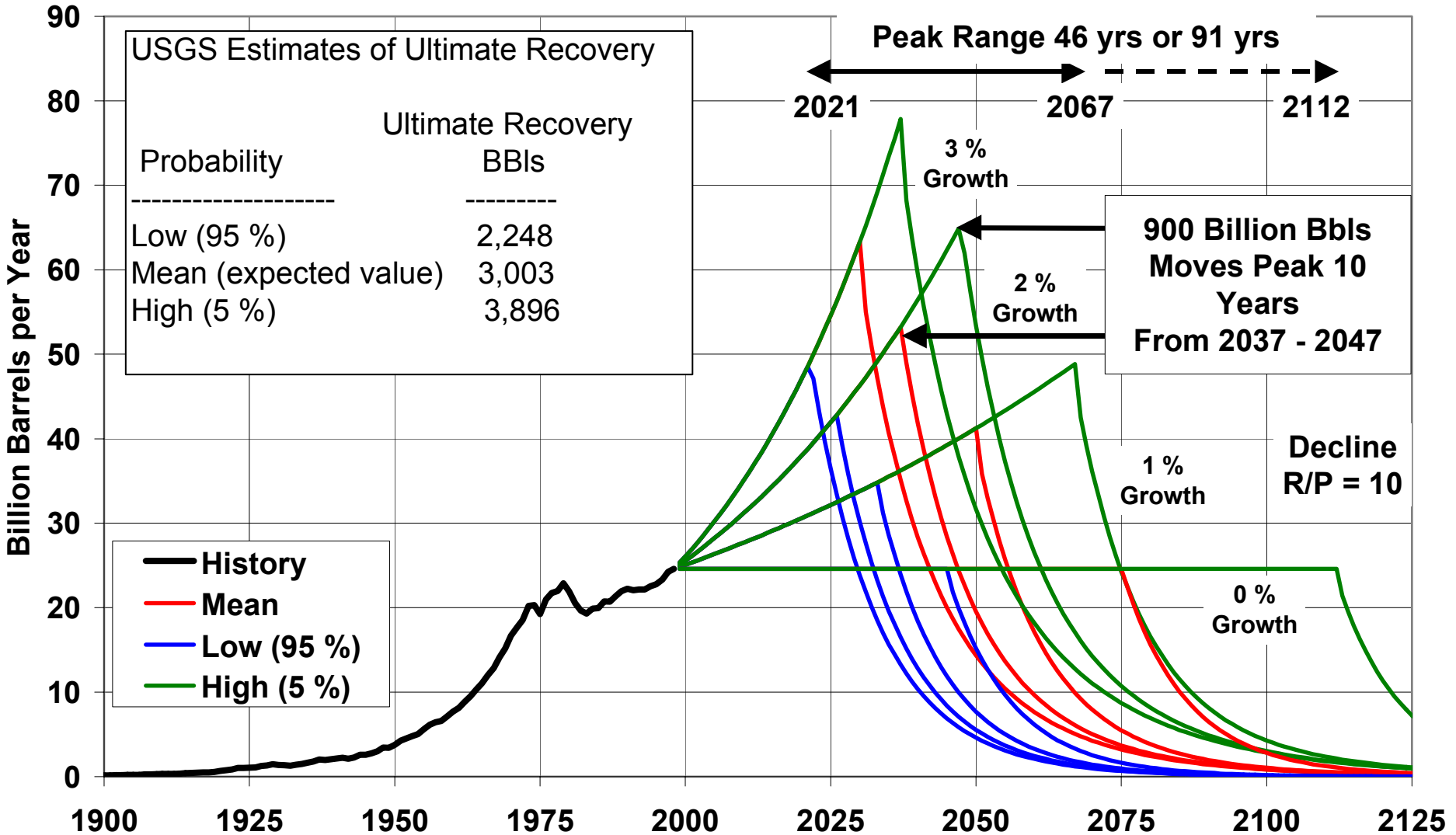
# Published Estimates of World Oil Ultimate Recovery



Source: USGS and Colin Campbell



# 12 EIA World Conventional Oil Production Scenarios



Note: U.S. volumes were added to the USGS foreign volumes to obtain world totals.

# WORLD OIL PRODUCTION SCENARIOS

Probability of Ultimate Recovery	Ultimate Recovery (Billion barrels)	Annual Production Growth Rate (Percent)	Estimated Peak Year	Estimated Peak Production Rate	
				(Million barrels per year)	(Million barrels per day)
95 Percent	2,248	0.0	2045	24,580	67
	2,248	1.0	2033	34,820	95
	2,248	2.0	2026	42,794	117
	2,248	3.0	2021	48,511	133
Mean (expected value)	3,003	0.0	2075	24,580	67
	3,003	1.0	2050	41,238	113
	3,003	2.0	2037	53,209	146
	3,003	3.0	2030	63,296	173
5 Percent	3,896	0.0	2112	24,580	67
	3,896	1.0	2067	48,838	134
	3,896	2.0	2047	64,862	178
	3,896	3.0	2037	77,846	213

**If you have any further questions about energy price development, please do not hesitate to contact us.**



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