

# **LONG TERM OIL MARKET OUTLOOK**

**PEL MARKET SERVICES**

**MAY 2003**



A division of KBC Process Technology Ltd

[www.petroleum-economics.com](http://www.petroleum-economics.com)  
[www.kbc.com](http://www.kbc.com)

## WORLD: Projected Annual Change in GDP

	<u>% p.a. Change</u>								
	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2005</u>	<u>2005-10</u>	<u>2010-15</u>
<b>USA</b>	1.8	2.7	3.8	0.3	2.4	2.5	3.5	3.5	3.2
<b>Canada</b>	0.2	2.8	4.5	1.5	3.3	3.1	2.9	2.9	2.6
<b>Latin America</b>	0.9	0.1	3.9	0.1	-1.0	2.4	3.7	3.7	3.4
<b>Western Europe</b>	3.2	2.5	3.5	1.4	1.0	1.6	2.7	2.6	2.4
<b>Eastern Europe</b>	-4.4	5.5	3.8	2.6	2.6	3.3	3.7	3.4	3.0
<b>FSU</b>	-2.0	-5.2	8.3	5.9	4.4	4.3	3.9	3.6	3.1
<b>Africa</b>	0.1	2.9	3.4	3.1	3.0	3.5	3.4	3.2	2.9
<b>Middle East</b>	3.2	4.4	5.4	2.3	1.5	3.1	3.3	3.1	2.9
<b>Japan</b>	5.5	1.7	2.4	-0.3	-0.5	0.7	2.0	2.0	2.0
<b>China</b>	3.8	10.5	8.0	7.3	7.9	7.4	6.5	6.2	5.5
<b>South Korea</b>	9.0	8.9	9.3	3.0	6.0	5.0	5.0	4.7	4.0
<b>Taiwan</b>	5.4	6.4	5.9	-1.9	3.2	3.4	3.5	3.2	2.5
<b>Australia</b>	1.8	3.5	3.1	2.6	3.6	3.3	3.5	3.2	3.0
<b>New Zealand</b>	0.0	4.3	3.8	2.5	3.0	2.9	2.5	2.5	2.5
<b>Total Asia-Pacific</b>	5.4	4.1	4.3	1.5	2.2	2.9	3.5	3.5	3.3
<b>WORLD</b>	<b>2.8</b>	<b>2.8</b>	<b>4.0</b>	<b>1.1</b>	<b>1.8</b>	<b>2.4</b>	<b>3.3</b>	<b>3.2</b>	<b>3.0</b>

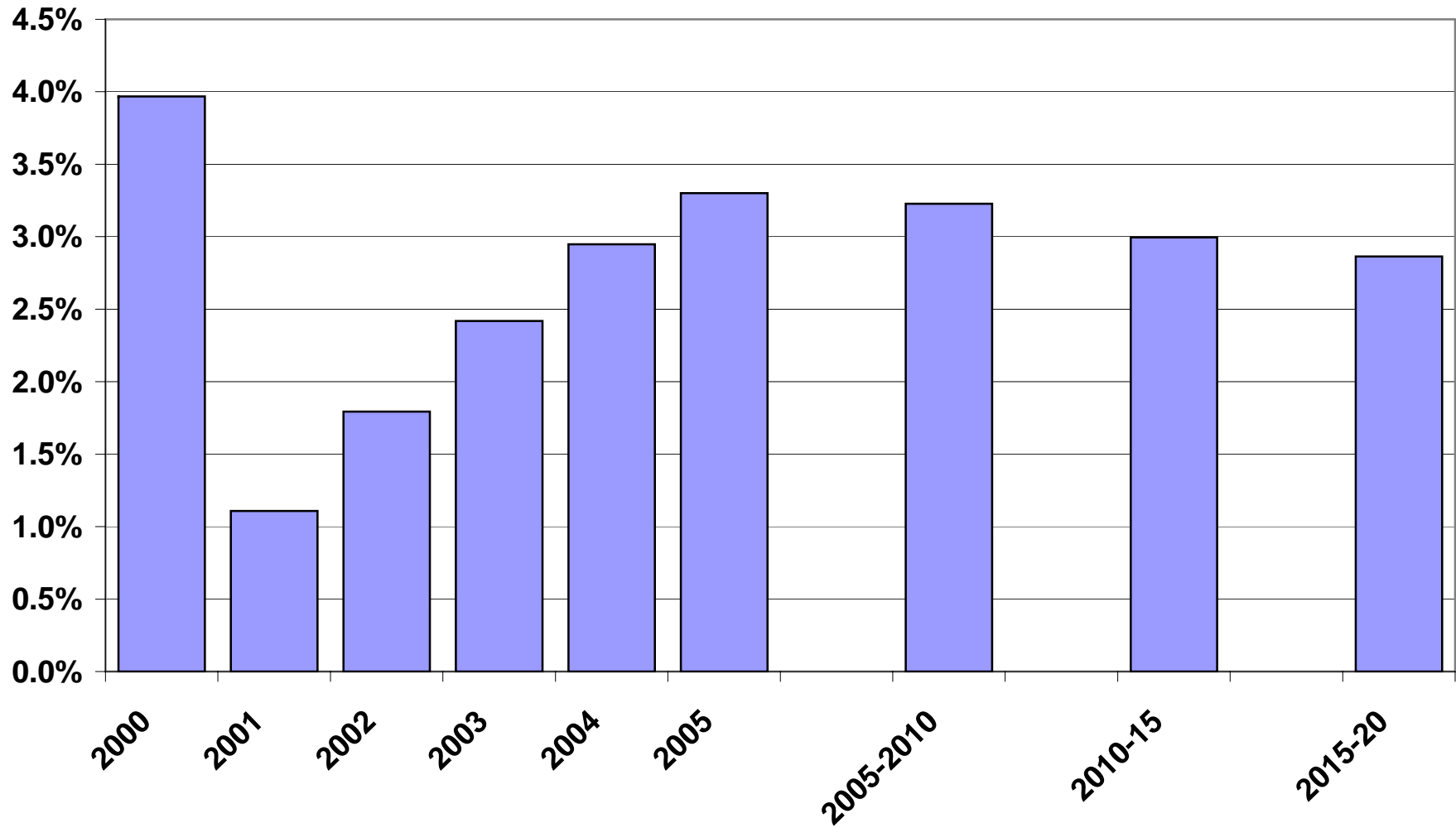


A division of KBC Process Technology Ltd

[www.petroleum-economics.com](http://www.petroleum-economics.com)  
[www.kbc.com](http://www.kbc.com)

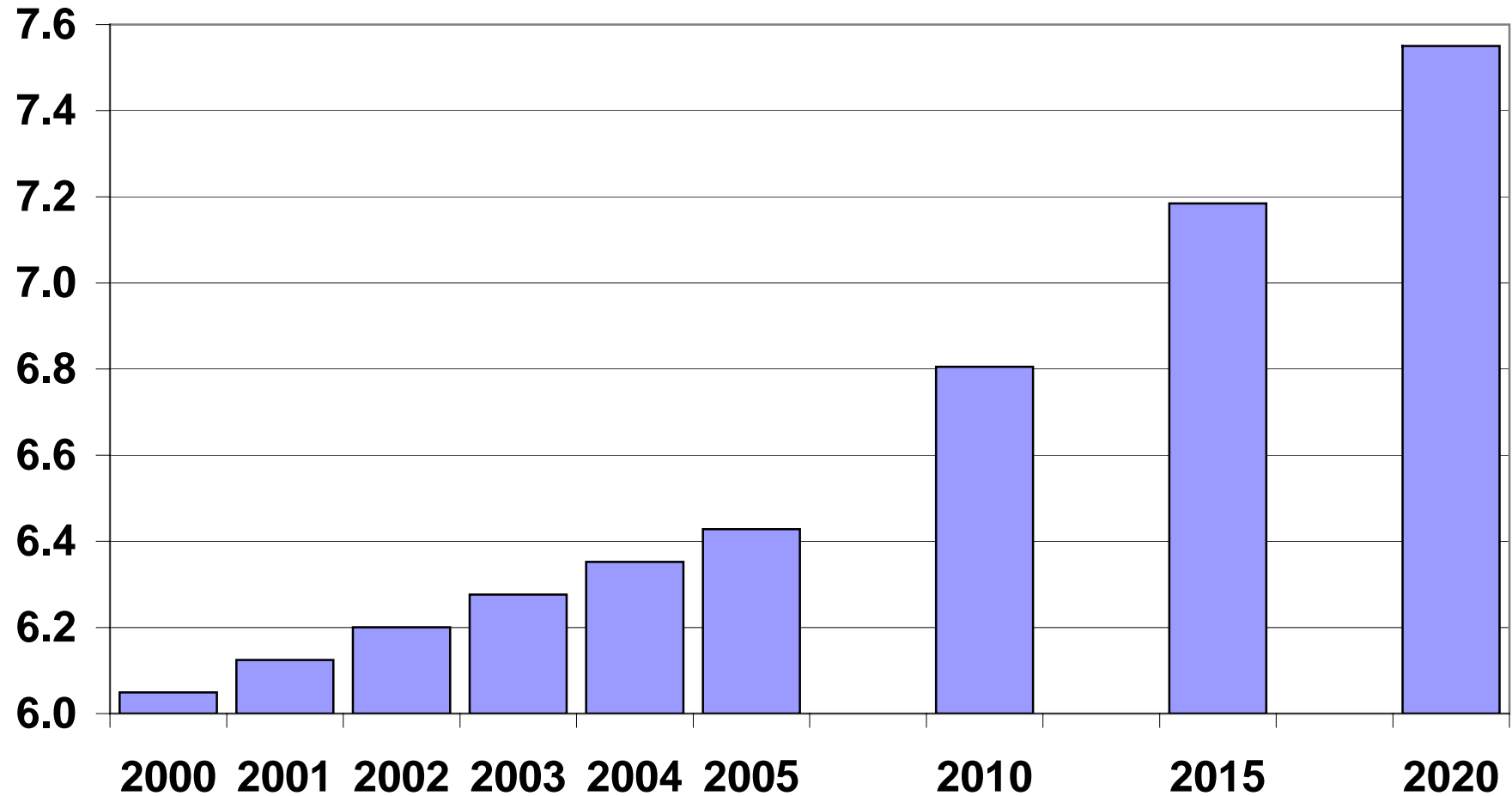
# WORLD: Summary of Projected GDP Change

% Change p.a.



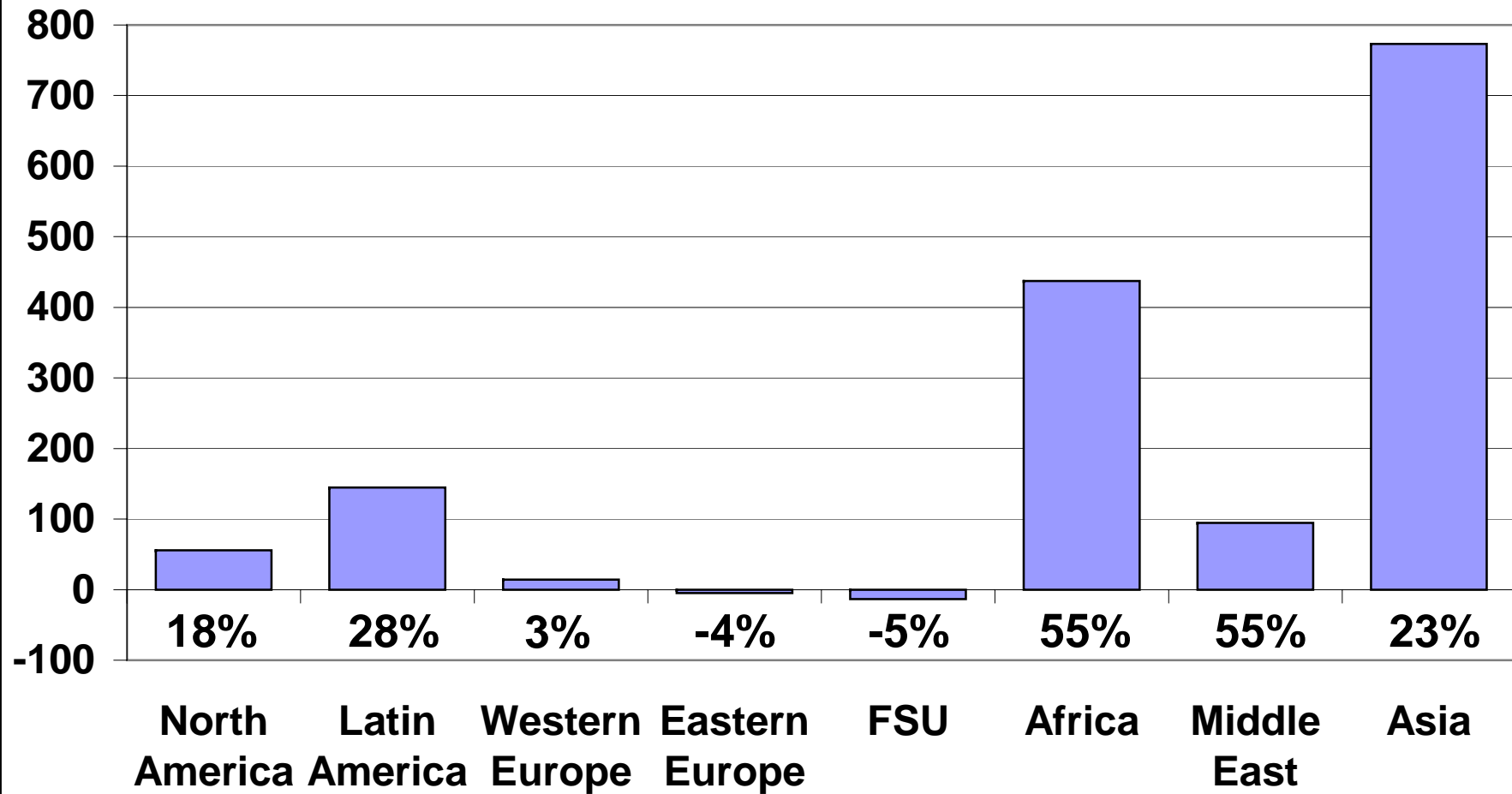
# Projected World Population Growth 2000 to 2020

Billion People



# Projected Regional Population Growth 2000 to 2020

Million People



## WORLD: Projected Energy Demand Change In World Energy Share

	Million b/d oe						% Share of Energy Market					
	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>
Oil	66.1	69.8	76.4	80.4	87.9	95.1	40%	39%	39%	38%	37%	37%
Solid Fuels	44.1	46.0	47.6	52.3	56.5	60.0	26%	26%	24%	25%	24%	23%
Natural Gas	34.6	37.8	43.6	48.7	58.0	67.7	21%	21%	22%	23%	25%	26%
Hydro / Other	12.3	14.2	15.8	17.2	19.2	21.7	7%	8%	8%	8%	8%	8%
Nuclear	9.8	11.3	12.6	13.6	14.3	13.9	6%	6%	6%	6%	6%	5%
<b>TOTAL</b>	<b>166.8</b>	<b>179.1</b>	<b>196.0</b>	<b>212.2</b>	<b>235.9</b>	<b>258.3</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>
<i>% Growth pa</i>		<i>1.4%</i>	<i>1.8%</i>	<i>1.6%</i>	<i>2.1%</i>	<i>1.8%</i>	-	-	-	-	-	-

## WORLD: Projected Regional Energy Demand

	<u>Million b/d oe</u>						<u>% Share of Energy Demand</u>					
	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>
USA	40.5	44.0	48.0	50.2	55.0	58.4	24%	25%	25%	24%	23%	23%
Canada	5.0	5.7	6.1	6.1	6.4	6.7	3%	3%	3%	3%	3%	3%
Latin America	9.5	11.5	13.4	14.0	16.1	18.2	6%	6%	7%	7%	7%	7%
Western Europe	30.5	32.3	34.8	36.3	38.1	39.7	18%	18%	18%	17%	16%	15%
Eastern Europe	6.8	6.2	5.9	6.2	6.7	7.1	4%	3%	3%	3%	3%	3%
FSU	27.4	19.8	18.9	20.0	21.7	24.0	16%	11%	10%	9%	9%	9%
Africa	4.3	5.0	5.7	6.4	7.4	8.3	3%	3%	3%	3%	3%	3%
<b>Total Atlantic Basin *</b>	<b>118.3</b>	<b>118.4</b>	<b>126.2</b>	<b>132.2</b>	<b>143.8</b>	<b>154.2</b>	<b>71%</b>	<b>66%</b>	<b>64%</b>	<b>62%</b>	<b>61%</b>	<b>60%</b>
<b>Middle East</b>	<b>4.7</b>	<b>6.5</b>	<b>8.1</b>	<b>9.5</b>	<b>11.1</b>	<b>12.7</b>	<b>3%</b>	<b>4%</b>	<b>4%</b>	<b>4%</b>	<b>5%</b>	<b>5%</b>
Japan	9.3	10.6	11.3	11.3	11.6	11.7	6%	6%	6%	5%	5%	5%
China	13.9	18.0	19.5	24.2	29.2	34.1	8%	10%	10%	11%	12%	13%
Other Asia-Pacific	12.5	17.1	21.5	24.9	29.3	33.9	8%	10%	11%	12%	12%	13%
Australia / New Zealand	2.3	2.5	2.9	3.2	3.5	3.7	1%	1%	1%	1%	1%	1%
US West Coast	5.7	5.9	6.6	7.0	7.5	8.1	3%	3%	3%	3%	3%	3%
<b>Total Asia-Pacific</b>	<b>43.8</b>	<b>54.2</b>	<b>61.7</b>	<b>70.6</b>	<b>81.0</b>	<b>91.4</b>	<b>26%</b>	<b>30%</b>	<b>31%</b>	<b>33%</b>	<b>34%</b>	<b>35%</b>
<b>WORLD</b>	<b>166.8</b>	<b>179.1</b>	<b>196.0</b>	<b>212.2</b>	<b>235.9</b>	<b>258.3</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

\* Total Atlantic Basin Excludes US West Coast

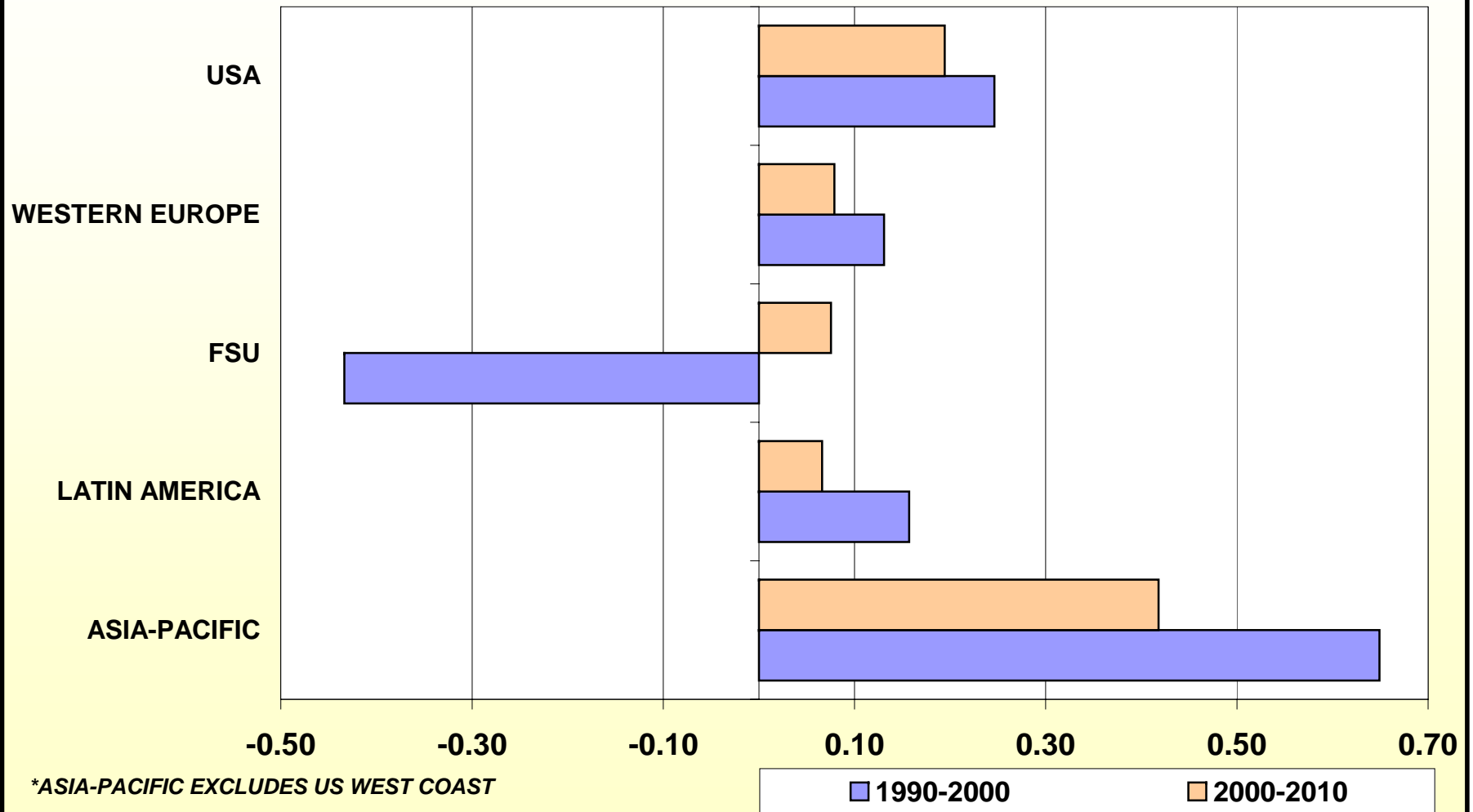


A division of KBC Process Technology Ltd

www.petroleum-economics.com  
www.kbc.com

# WORLD: Historic & Projected Oil Demand Growth (Average Growth p.a.)

MILLION B/D





# WORLD: Projected Regional Oil Demand & Annual Growth

	<u>Million b/d</u>						<u>% Per Annum Demand Growth</u>				
	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>
USA	17.0	17.7	19.7	20.4	21.8	23.0	0.9%	2.1%	0.7%	1.4%	1.0%
Canada	1.8	1.8	2.1	2.1	2.3	2.4	0.8%	2.7%	0.6%	1.1%	0.9%
Latin America	5.5	6.5	7.2	7.1	8.0	8.9	3.4%	2.1%	-0.2%	2.2%	2.2%
Western Europe	13.0	14.0	14.5	14.8	15.3	15.7	1.4%	0.7%	0.4%	0.7%	0.5%
Eastern Europe	1.7	1.4	1.4	1.5	1.7	1.8	-4.2%	1.3%	1.1%	2.3%	1.6%
FSU	8.4	4.3	3.6	4.0	4.5	5.1	-12.7%	-3.2%	1.8%	2.4%	2.8%
Africa	1.9	2.1	2.4	2.8	3.1	3.5	2.3%	2.6%	2.5%	2.6%	2.6%
<b>Total Atlantic Basin *</b>	<b>46.4</b>	<b>45.0</b>	<b>48.0</b>	<b>49.6</b>	<b>53.4</b>	<b>56.9</b>	<b>-0.6%</b>	<b>1.3%</b>	<b>0.7%</b>	<b>1.5%</b>	<b>1.3%</b>
<b>Middle East</b>	<b>3.0</b>	<b>3.9</b>	<b>4.5</b>	<b>5.0</b>	<b>5.6</b>	<b>6.3</b>	<b>5.4%</b>	<b>2.8%</b>	<b>2.2%</b>	<b>2.3%</b>	<b>2.2%</b>
Japan	5.3	5.7	5.6	5.2	5.2	5.2	1.7%	-0.5%	-1.3%	0.0%	0.0%
China	2.3	3.3	4.6	5.6	6.8	8.0	8.0%	6.7%	4.2%	4.1%	3.3%
Other Asia-Pacific	5.5	8.1	9.8	10.7	12.3	13.9	8.2%	3.9%	1.8%	2.8%	2.5%
Australia / New Zealand	0.8	0.9	1.0	1.1	1.2	1.2	2.3%	1.5%	1.7%	1.6%	0.7%
US West Coast	2.8	2.8	3.0	3.1	3.3	3.5	-0.6%	1.7%	0.5%	1.5%	1.1%
<b>Total Asia-Pacific</b>	<b>16.7</b>	<b>20.8</b>	<b>24.0</b>	<b>25.7</b>	<b>28.9</b>	<b>31.9</b>	<b>4.6%</b>	<b>2.8%</b>	<b>1.4%</b>	<b>2.3%</b>	<b>2.0%</b>
<b>WORLD</b>	<b>66.1</b>	<b>69.8</b>	<b>76.4</b>	<b>80.4</b>	<b>87.9</b>	<b>95.1</b>	<b>1.1%</b>	<b>1.8%</b>	<b>1.0%</b>	<b>1.8%</b>	<b>1.6%</b>

\* Total Atlantic Basin Excludes US West Coast

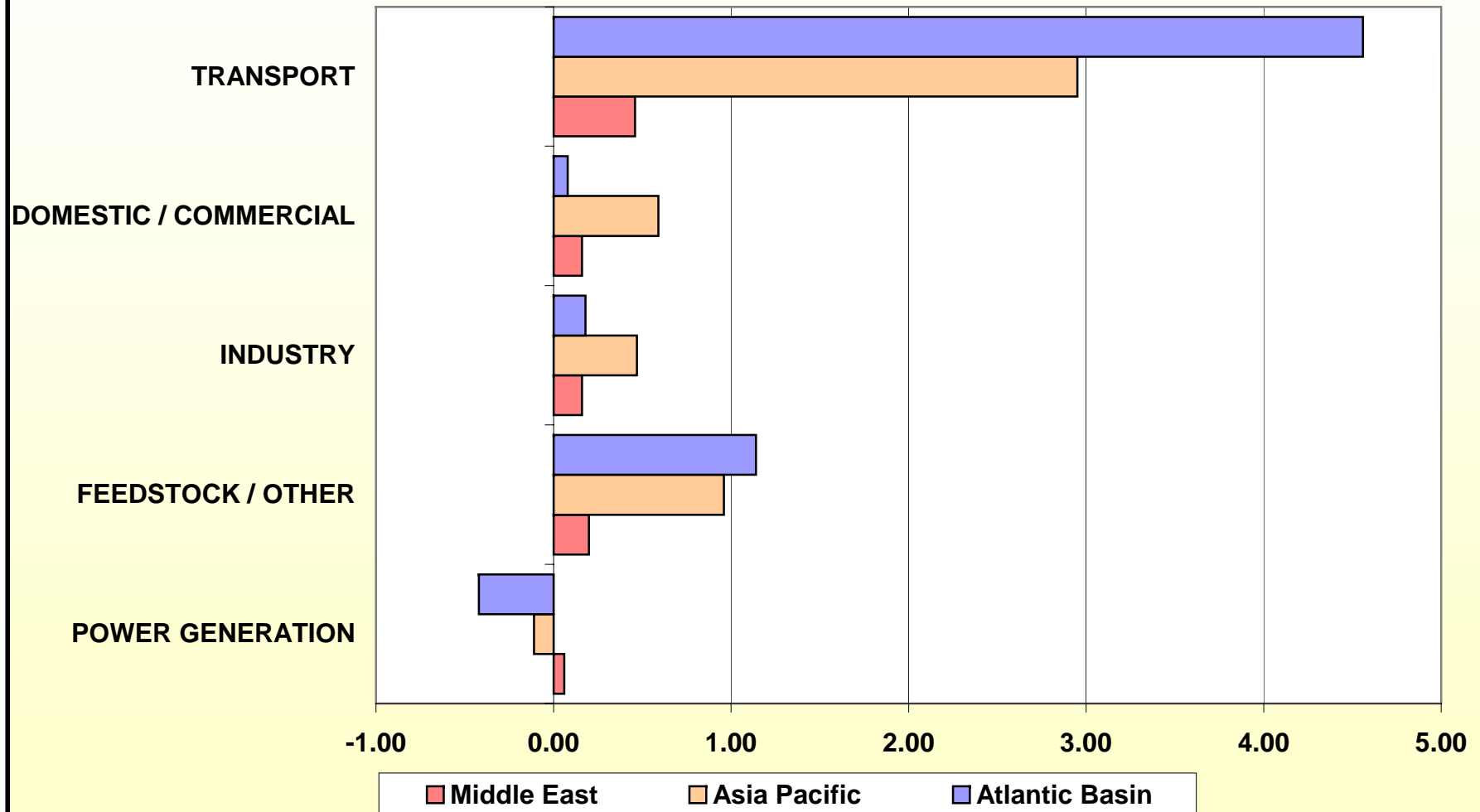


A division of KBC Process Technology Ltd

www.petroleum-economics.com  
www.kbc.com

# Projected Changes in World Sectoral Oil Demand (2002 to 2010)

MILLION B/D



## WORLD: Projected Product Demand & Annual Growth

	Million b/d						% Per Annum Demand Growth				
	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>	<u>1995</u>	<u>2000</u>	<u>2005</u>	<u>2010</u>	<u>2015</u>
LPG	5.2	6.1	7.2	7.5	8.5	9.4	3.3%	3.2%	1.0%	2.4%	2.1%
Naphtha	3.1	4.0	4.9	5.2	5.7	6.3	5.1%	3.9%	1.2%	2.2%	1.8%
Gasoline	17.6	18.4	19.6	20.9	22.3	23.4	0.9%	1.3%	1.3%	1.3%	1.0%
Kerosene	5.2	5.6	6.3	6.6	7.7	8.6	1.4%	2.4%	1.1%	2.9%	2.3%
Gas/Diesel Oil	16.1	17.8	20.2	22.2	25.1	27.7	2.0%	2.6%	1.9%	2.4%	2.0%
Fuel Oil	11.7	10.6	9.9	9.2	9.1	9.2	-1.9%	-1.5%	-1.5%	-0.2%	0.4%
Other Products	7.2	7.3	8.5	8.8	9.6	10.5	0.3%	2.9%	0.7%	1.9%	1.8%
<b>TOTAL</b>	<b>66.1</b>	<b>69.8</b>	<b>76.4</b>	<b>80.4</b>	<b>87.9</b>	<b>95.1</b>	<b>1.1%</b>	<b>1.8%</b>	<b>1.0%</b>	<b>1.8%</b>	<b>1.6%</b>

## WORLD: Oil Supply Outlook (Base Case Assumptions)

	<u>Million b/d</u>							
	<u>1990</u>	<u>1995</u>	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2005</u>	<u>2007</u>	<u>2010</u>
USA	9.0	8.6	8.1	8.1	8.1	8.3	8.3	8.4
Canada	2.0	2.4	2.7	2.8	2.9	3.2	3.3	3.4
Western Europe	4.2	6.3	6.7	6.6	6.6	6.6	6.4	5.8
FSU	11.5	7.1	7.9	8.5	9.3	10.8	11.5	12.6
Eastern Europe	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Mexico	3.0	3.1	3.5	3.6	3.6	3.9	3.9	4.1
Other W Hemisphere	2.5	3.0	3.7	3.6	3.9	3.8	4.1	4.1
Africa	2.3	2.5	2.8	2.8	3.1	3.4	3.6	3.9
Middle East	1.3	1.9	2.1	2.1	2.1	2.0	2.0	2.0
Asia	5.1	5.8	6.3	6.3	6.4	6.9	6.9	7.2
<b>Total Non-OPEC</b>	<b>41.2</b>	<b>41.0</b>	<b>44.0</b>	<b>44.6</b>	<b>46.2</b>	<b>49.1</b>	<b>50.2</b>	<b>51.7</b>
<b>OPEC Crude</b>	<b>22.4</b>	<b>24.9</b>	<b>28.0</b>	<b>27.2</b>	<b>25.4</b>	<b>25.8</b>	<b>27.3</b>	<b>29.7</b>
OPEC NGL / Condensate	2.0	2.4	2.9	3.1	3.3	3.5	3.6	3.8
GTL Projects						0.1	0.3	0.6
<b>Total Production</b>	<b>65.6</b>	<b>68.3</b>	<b>74.9</b>	<b>74.9</b>	<b>74.9</b>	<b>78.5</b>	<b>81.4</b>	<b>85.8</b>
Processing Gain	1.2	1.5	1.7	1.7	1.8	2.0	2.1	2.2
<b>Oil Supply</b>	<b>66.8</b>	<b>69.8</b>	<b>76.6</b>	<b>76.6</b>	<b>76.7</b>	<b>80.5</b>	<b>83.5</b>	<b>88.0</b>



A division of KBC Process Technology Ltd

www.petroleum-economics.com  
www.kbc.com

# Assessed OPEC Sustainable Capacity

Million b/d

	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2007</u>	<u>2010</u>
<b>Saudi Arabia</b>	10.5	10.5	10.5	10.5	10.5	10.6	11.1	12.0
<b>Iran</b>	3.7	3.8	3.7	3.8	3.9	4.0	4.2	4.4
<b>Iraq</b>	2.7	2.7	2.7	2.5	3.2	3.7	5.0	6.0
<b>Kuwait</b>	2.4	2.3	2.3	2.4	2.4	2.4	2.5	2.6
<b>UAE</b>	2.5	2.5	2.5	2.5	2.5	2.6	2.7	2.8
<b>Qatar</b>	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0
<b>Total Middle East</b>	<b>22.5</b>	<b>22.5</b>	<b>22.5</b>	<b>22.5</b>	<b>23.4</b>	<b>24.2</b>	<b>26.5</b>	<b>28.8</b>
<b>Algeria</b>	0.9	0.9	1.0	1.1	1.2	1.3	1.5	1.6
<b>Libya</b>	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.8
<b>Nigeria</b>	2.2	2.1	2.2	2.2	2.3	2.4	2.5	2.7
<b>Indonesia</b>	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.0
<b>Venezuela</b>	2.9	3.0	2.9	2.9	3.0	3.1	3.4	3.7
<b>Total OPEC</b>	<b>31.3</b>	<b>31.2</b>	<b>31.2</b>	<b>31.3</b>	<b>32.5</b>	<b>33.7</b>	<b>36.6</b>	<b>39.6</b>



A division of KBC Process Technology Ltd

[www.petroleum-economics.com](http://www.petroleum-economics.com)  
[www.kbc.com](http://www.kbc.com)

# Outlook OPEC Spare Capacity

Million b/d

	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2007</u>	<u>2010</u>
<b>Saudi Arabia</b>	2.2	2.6	2.9	2.8	3.3	3.5	3.9	4.3
<b>Iran</b>	0.0	0.1	0.3	0.4	0.6	0.7	0.9	0.9
<b>Iraq</b>	0.2	0.3	0.7	0.0	0.0	0.0	0.0	0.0
<b>Kuwait</b>	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.7
<b>UAE</b>	0.2	0.3	0.5	0.5	0.5	0.7	0.7	0.7
<b>Qatar</b>	0.0	0.0	0.2	0.2	0.3	0.3	0.4	0.4
<b>Total Middle East</b>	<b>2.9</b>	<b>3.6</b>	<b>5.0</b>	<b>4.4</b>	<b>5.3</b>	<b>5.8</b>	<b>6.6</b>	<b>7.0</b>
<b>Algeria</b>	0.1	0.1	0.1	0.4	0.5	0.6	0.8	0.8
<b>Libya</b>	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5
<b>Nigeria</b>	0.2	0.0	0.2	0.3	0.5	0.6	0.7	0.7
<b>Indonesia</b>	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<b>Venezuela</b>	0.0	0.2	0.3	0.2	0.4	0.5	0.8	0.9
<b>Total OPEC</b>	<b>3.3</b>	<b>4.0</b>	<b>5.8</b>	<b>5.5</b>	<b>7.0</b>	<b>7.9</b>	<b>9.3</b>	<b>9.9</b>



A division of KBC Process Technology Ltd

[www.petroleum-economics.com](http://www.petroleum-economics.com)  
[www.kbc.com](http://www.kbc.com)

# Summary of Projected OPEC Crude Production

## (Base Case Assumptions - 'Call' on OPEC)

	<u>Million b/d</u>							
	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2007</u>	<u>2010</u>
<b>Saudi Arabia</b>	8.3	7.9	7.6	7.7	7.2	7.1	7.2	7.7
<b>Iran</b>	3.7	3.7	3.4	3.4	3.3	3.3	3.3	3.5
<b>Iraq</b>	2.5	2.4	2.0	2.5	3.2	3.7	5.0	6.0
<b>Kuwait</b>	2.1	2.0	1.9	1.9	1.8	1.8	1.8	1.9
<b>UAE</b>	2.3	2.2	2.0	2.0	2.0	1.9	2.0	2.1
<b>Qatar</b>	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6
<b>Total Middle East</b>	<b>19.6</b>	<b>18.9</b>	<b>17.5</b>	<b>18.1</b>	<b>18.1</b>	<b>18.4</b>	<b>19.9</b>	<b>21.8</b>
<b>Algeria</b>	0.8	0.8	0.9	0.7	0.7	0.7	0.7	0.8
<b>Libya</b>	1.4	1.4	1.3	1.3	1.2	1.2	1.2	1.3
<b>Nigeria</b>	2.0	2.1	2.0	1.9	1.8	1.8	1.8	2.0
<b>Indonesia</b>	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.0
<b>Venezuela</b>	2.9	2.8	2.6	2.7	2.6	2.6	2.6	2.8
<b>Total OPEC</b>	<b>28.0</b>	<b>27.2</b>	<b>25.4</b>	<b>25.8</b>	<b>25.5</b>	<b>25.8</b>	<b>27.3</b>	<b>29.7</b>



A division of KBC Process Technology Ltd

www.petroleum-economics.com  
www.kbc.com

## Long-Term Balance Outlook (Base Case Assumptions)

	<u>Million b/d</u>							
	<u>2000</u>	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2007</u>	<u>2010</u>
<b>TOTAL DEMAND</b>	<b>76.4</b>	<b>76.6</b>	<b>77.0</b>	<b>77.7</b>	<b>78.9</b>	<b>80.4</b>	<b>83.4</b>	<b>87.9</b>
Non-OPEC Supply	44.0	44.6	46.2	47.2	48.1	49.1	50.2	51.7
Other Supply (a)	4.6	4.8	5.1	5.2	5.4	5.6	6.0	6.6
Call on OPEC Crude	28.0	27.2	25.4	25.8	25.5	25.8	27.3	29.7
<b>TOTAL SUPPLY</b>	<b>76.6</b>	<b>76.6</b>	<b>76.7</b>	<b>78.2</b>	<b>79.0</b>	<b>80.5</b>	<b>83.5</b>	<b>88.0</b>
OPEC Capacity	31.3	31.2	31.2	31.3	32.5	33.7	36.6	39.6
OPEC Spare Capacity	3.3	4.0	5.8	5.5	7.0	7.9	9.3	9.9

(a) OPEC NGL / Condensate, Processing Gains, GTL Projects & Stock Change



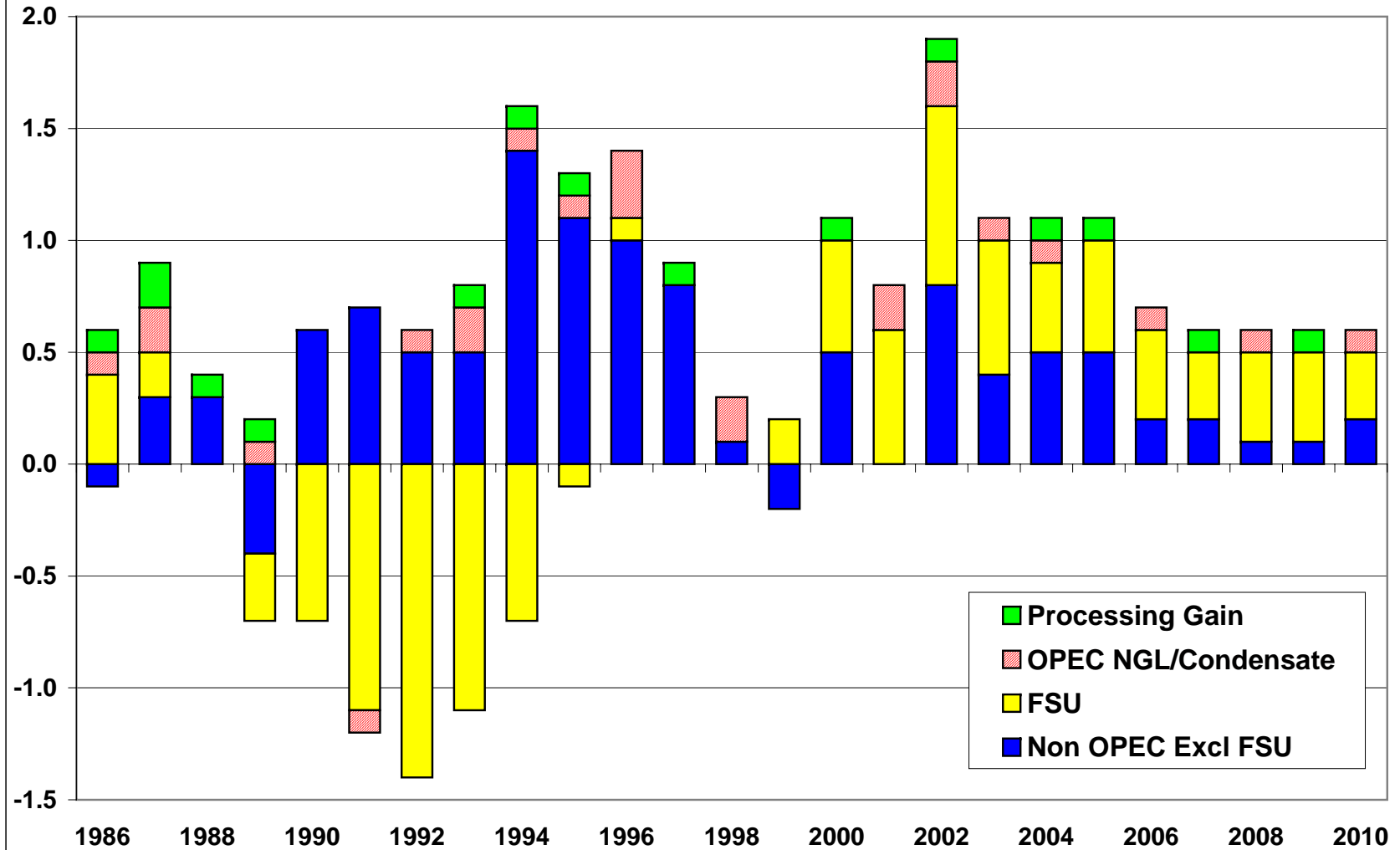
A division of KBC Process Technology Ltd

www.petroleum-economics.com  
www.kbc.com



# Annual Increases in Non OPEC Production 1986-2010

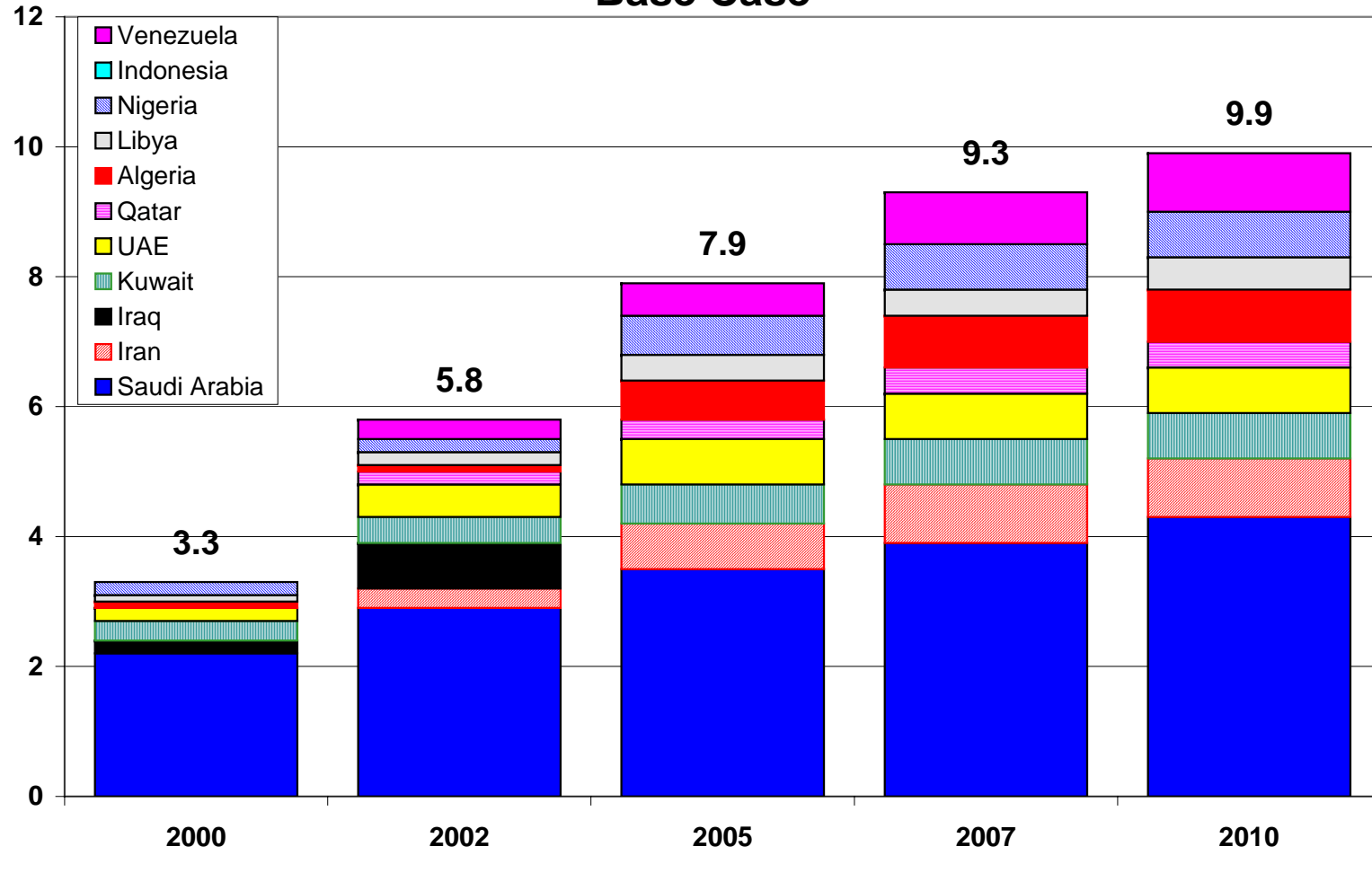
Million b/d



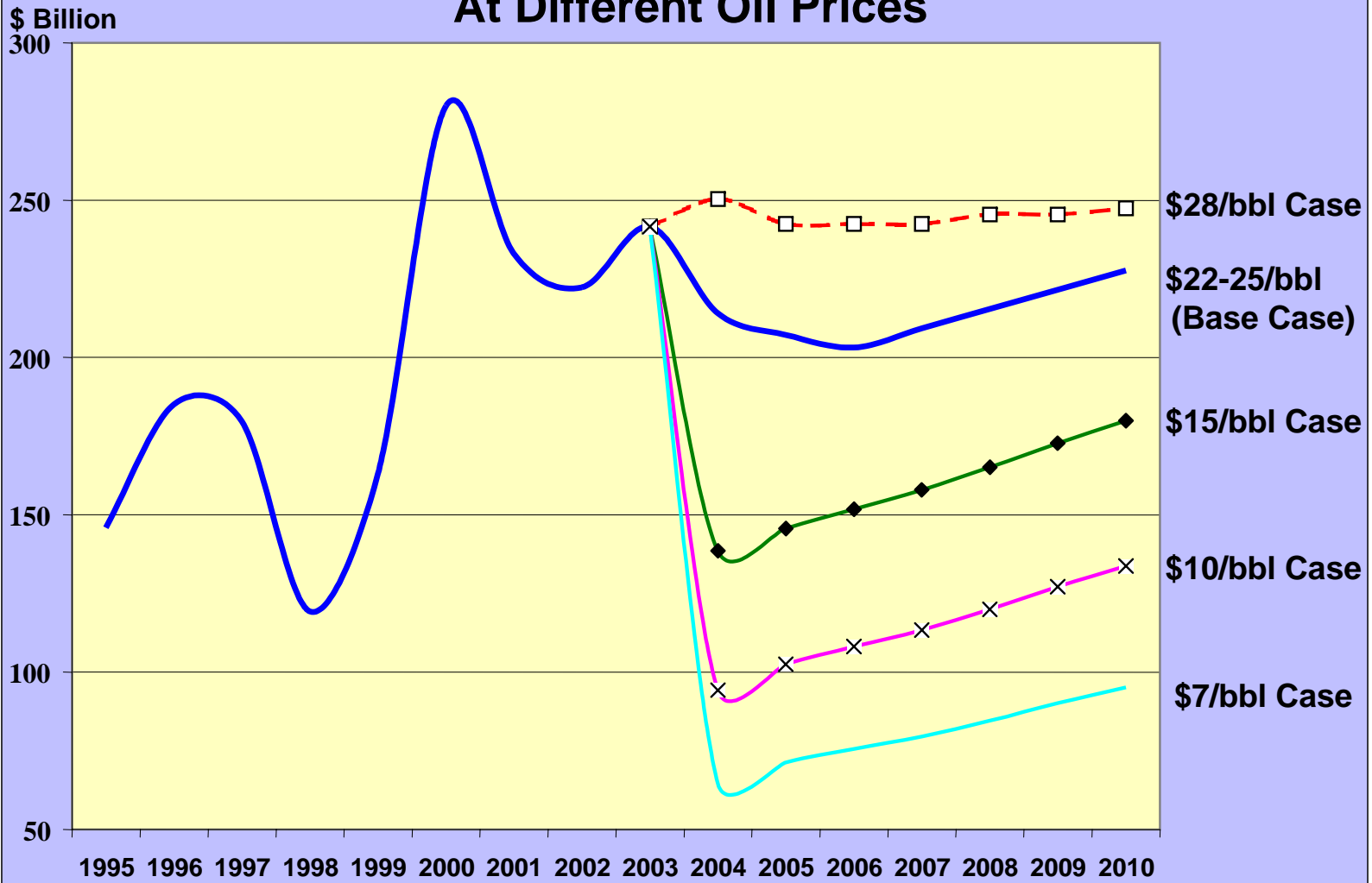
# OPEC Surplus Capacity 1999 - 2010

## Base Case

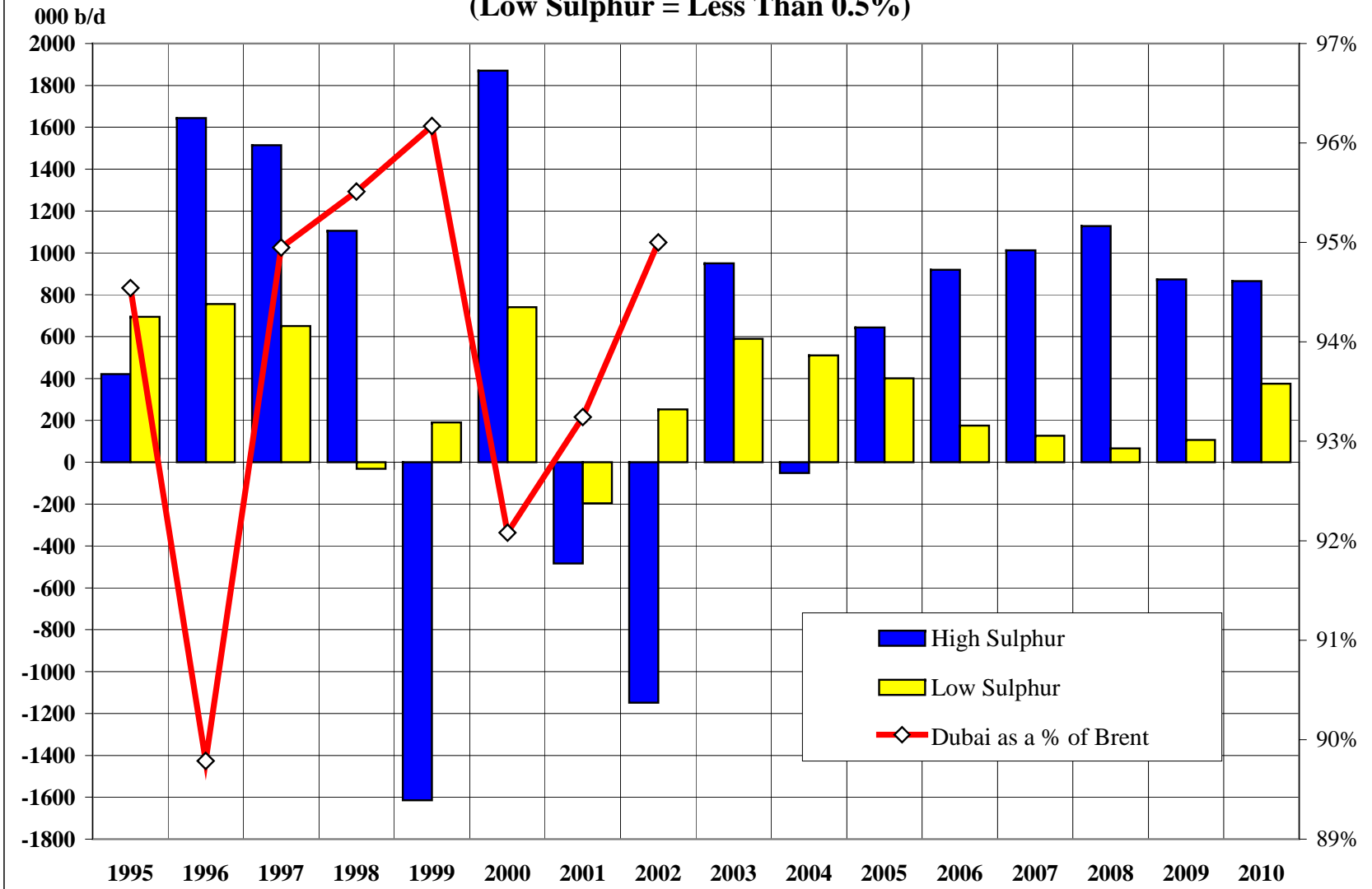
million b/d



# OPEC OIL REVENUES At Different Oil Prices



**Changes in World Crude/Condensate Production by Sulphur  
(Low Sulphur = Less Than 0.5%)**



## Potential Changes in the World Fuel Oil Balance by Quality 2002-2005

000 b/d

	<u>High Sulphur</u>	<u>Low Sulphur</u>
<b>Change in Resid from CDU Supply</b>	825	375
<b>Change in Cracking Capacity</b>	-750	0
<b>Changes from De-Sulphurisation</b>	<u>-450</u>	<u>450</u>
<b>Change in Supply</b>	<b>-375</b>	<b>+825</b>
<b>Change in Demand</b>	-450	+300
<b>Surplus/(Deficit)</b>	<b>75</b>	<b>525</b>

## Potential Changes in the Atlantic Basin Fuel Oil Balance by Quality

2002-2005

000 b/d

	<u>High Sulphur</u>	<u>Low Sulphur</u>
<b>Change in Resid from CDU Supply</b>	400	175
<b>Change in Cracking Capacity</b>	(525)	0
<b>Changes from De-Sulphurisation</b>	<u>(425)</u>	<u>425</u>
<b>Change in Supply</b>	<b>(550)</b>	<b>+600</b>
<b>Change in Demand</b>	(425)	275
<b>Surplus/(Deficit)</b>	<b>(125)</b>	<b>325</b>



A division of KBC Process Technology Ltd

[www.petroleum-economics.com](http://www.petroleum-economics.com)  
[www.kbc.com](http://www.kbc.com)

## NORTHWEST EUROPE: LONG TERM OIL PRICE OUTLOOK

	Current \$'s																
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
<b>Crude Oil Prices</b>																	
<b>\$/bbl</b>																	
Brent	15.81	17.04	20.66	19.10	12.74	17.87	28.39	24.46	24.81	25.72	22.00	22.00	23.00	23.00	24.00	24.00	25.00
HC Net Margin	2.10	1.85	2.30	2.45	2.40	1.55	3.90	2.66	1.58	2.90	2.40	3.55	3.00	3.20	3.20	3.50	3.35
Gross Product Worth	19.20	20.25	24.35	23.00	16.45	20.75	34.05	28.65	27.80	30.40	25.90	27.00	27.40	27.55	28.60	28.95	29.80
HS&C GPW	17.68	18.78	22.48	21.13	15.09	18.98	31.13	26.18	25.83	28.35	23.98	24.60	24.97	25.07	26.15	26.37	27.14
HS&C Net Margin	0.82	0.64	0.67	0.83	1.30	0.06	1.24	0.42	-0.13	1.12	0.73	1.40	0.82	0.97	1.00	1.17	0.94
HS only GPW	16.79	17.95	21.39	19.79	14.16	17.86	29.31	24.52	24.63	26.99	22.70	22.85	23.27	23.32	24.39	24.51	25.23
HS only Net Margin	0.08	-0.04	-0.27	-0.36	0.52	-0.91	-0.43	-1.10	-1.17	-0.08	-0.40	-0.20	-0.73	-0.63	-0.61	-0.54	-0.82
<b>Cif NWE Spot Product Prices</b>																	
<b>\$/ton</b>																	
Premium Unl Gasoline	169	178	207	205	151	188	303	255	247	263	232	240	243	243	252	260	265
Naphtha	155	164	195	193	133	169	264	219	223	240	208	220	223	223	230	235	242
Jet kerosene	166	174	218	195	136	176	295	245	232	256	215	232	237	240	247	247	257
Diesel 0.001%S										251	215	225	225	228	240	245	250
Diesel 0.005%S									224	250	213	225	223	227	237	230	240
Diesel 0.035%S							276	236	222	257	208	210	215	217	227	228	238
Diesel 0.05%S		158	200	184	128	163											
Heating Gas Oil 0.1%S															225	227	235
Heating Gas Oil 0.2%S	149	156	195	177	122	152	259	223	210	239	196	207	212	215	222	225	233
1%S Fuel Oil	97	107	121	106	78	100	160	129	145	154	129	115	120	118	125	125	128
3.5%S Fuel Oil	83	95	104	90	64	89	132	109	127	124	105	95	98	95	103	103	105
LPG	146	173	218	212	142	180	302	231	232	252	218	231	234	234	242	247	254
<b>Price Relationships</b>																	
Mogas-Naphtha	14	14	12	12	18	18	39	36	25	23	24	20	20	20	22	25	23
Mogas-1%S Fuel Oil	72	71	86	99	73	88	143	127	102	110	103	125	123	125	127	135	137
Jet Kero - Gas Oil	17	18	23	18	14	24	36	22	22	17	19	25	25	25	25	22	24
1%S - 3.5%S Fuel Oil	13	12	17	16	14	10	28	20	18	30	24	20	22	23	22	22	23
Gas oil - 3.5%S Fuel Oil	66	61	91	87	58	62	127	114	84	115	91	112	114	120	122	124	130
Naphtha - Gas Oil	6	8	0	16	11	18	5	-3	12	2	12	13	11	8	8	10	9
Gas oil - 1%S Fuel Oil	53	49	74	71	44	52	99	94	65	85	67	92	92	97	97	100	105



A division of KBC Process Technology Ltd

www.petroleum-economics.com  
www.kbc.at.com

# Appendix

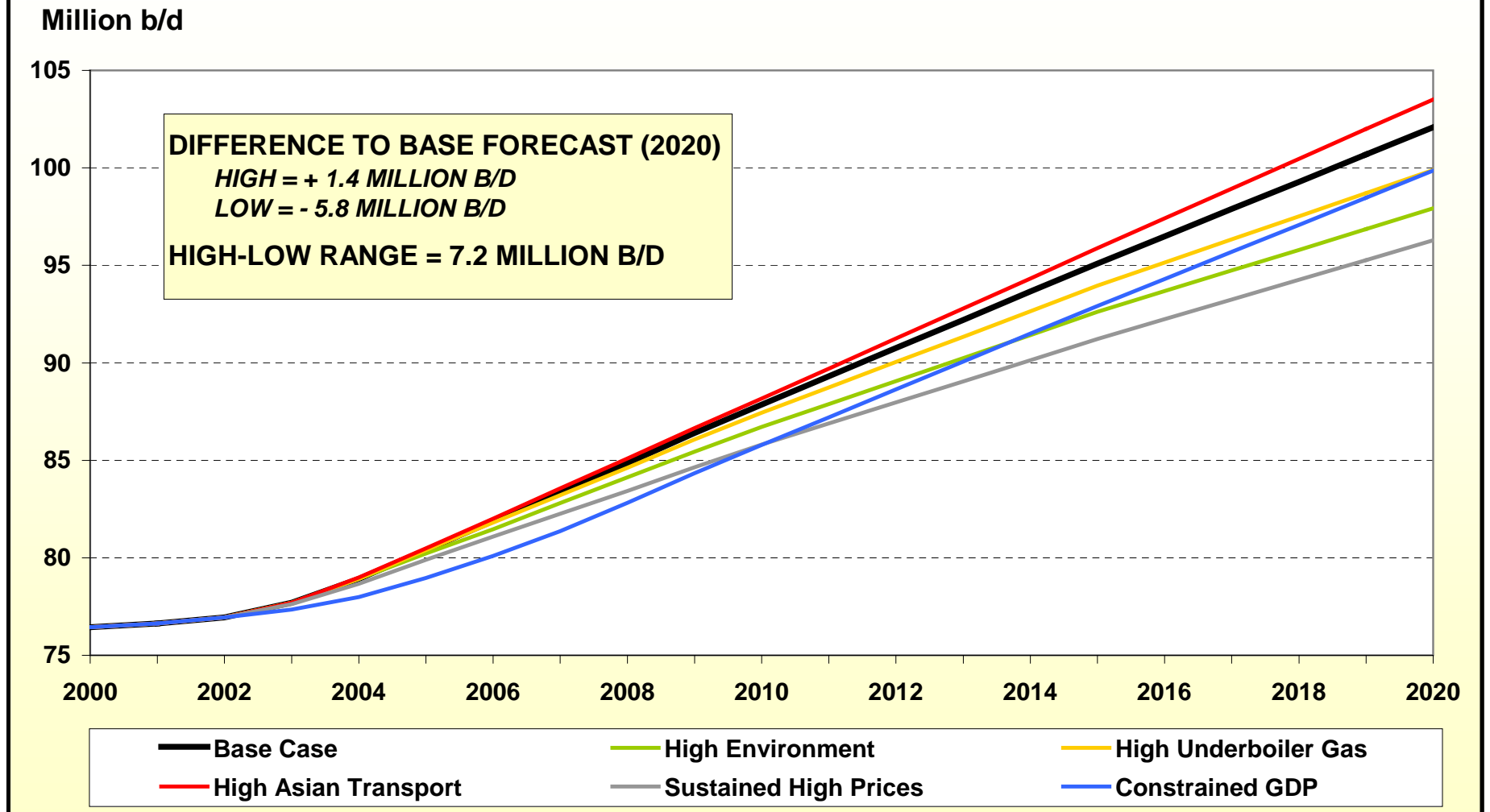


A division of KBC Process Technology Ltd

[www.petroleum-economics.com](http://www.petroleum-economics.com)  
[www.kbc.com](http://www.kbc.com)



# LONG-TERM WORLD OIL DEMAND SCENARIOS



# PRINCIPALS OF THE KYOTO TREATY

## THE KYOTO PROTOCOL

*(Signed in 1997)*

### **% Change in Carbon Emissions (Against 1990 Levels)**

European Union	-8%
Norway	+1%
USA	-7%
Canada	-6%
Japan	-6%
Russia / Ukraine	0%
Eastern Europe (a)	-5% to -8%
Australia	+8%

(a) Dependent on Country

## 7 Principals of the Treaty

1. Promote Energy Efficiency
2. Protection & Enhancement of Carbon Sinks / Reservoirs
3. Sustainable Agriculture > Methane Reduction
4. R & D on Environmentally Sustainable Technologies
5. Removal of Fiscal & Market Imperfections
6. Greenhouse Gas Reductions

# BONN AGREEMENT (July 2001)

-178 Nation Agreement on the Mechanisms for the Implementation of Kyoto

-Agreement Reached on the necessary Framework

-Market Instruments

-Emissions Trading, Joint Implementation, Clean Development Mechanism

-LDC Development Funds / Grants

-Allows Carbon Sequestration

-Carbon Sinks (Vegetation)

-Storing Underground / Beneath Sea Bed

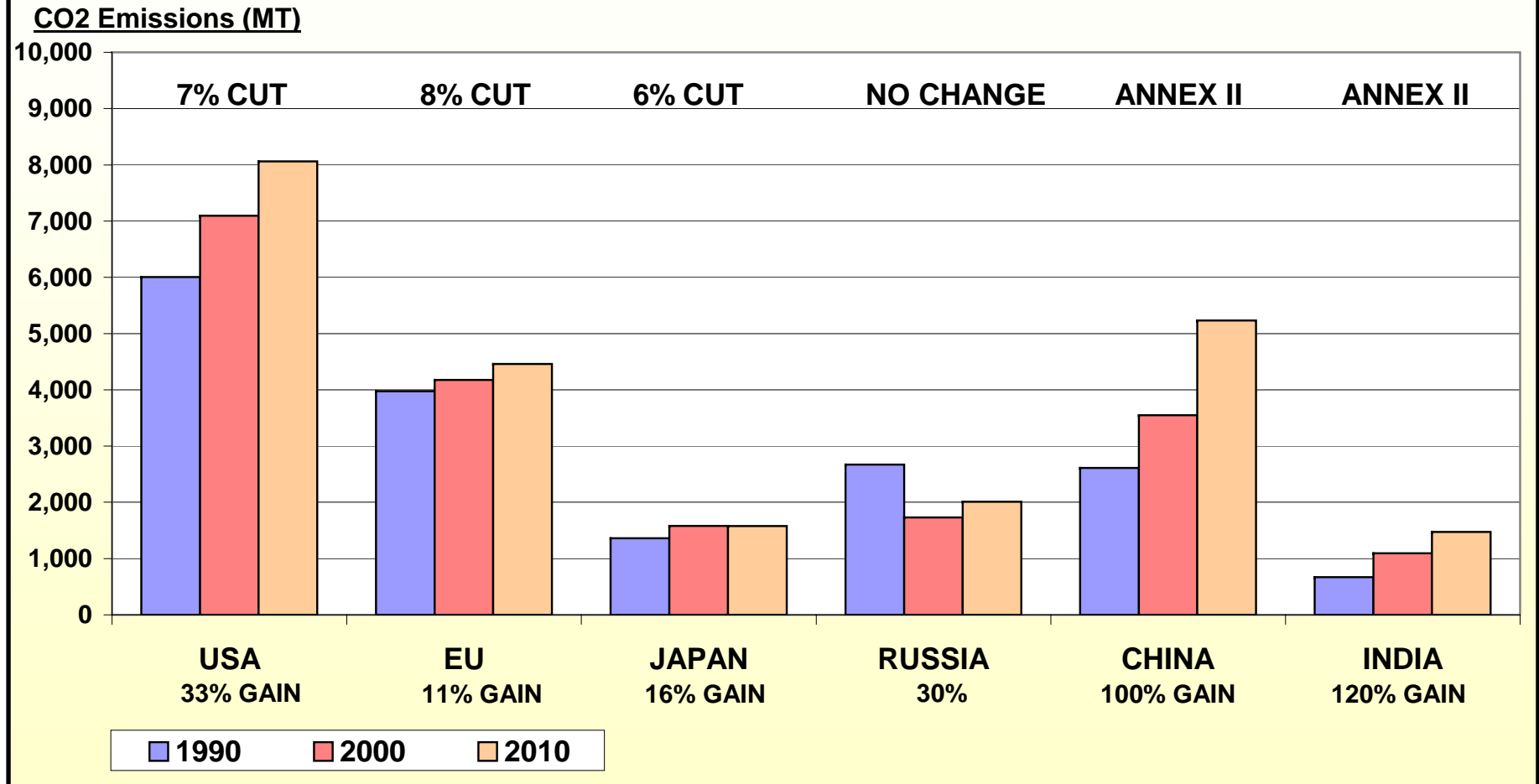
-Fertilising The Sea > Iron to Encourage Sea Plant Growth



A division of KBC Process Technology Ltd

[www.petroleum-economics.com](http://www.petroleum-economics.com)  
[www.kbc.com](http://www.kbc.com)

# Principal CO2 Emitting Regions & Change in Emissions (Energy Derived)



# ACHIEVABLE ENVIRONMENTAL LED OPTIONS

1. Post-Pone Implementation & Aim for a New Technological Threshold (2020?)
2. Monetise Externalities > (Cost Impacts)
3. Enforceable Penalties > (Increase the Costs of Pollution)
4. Mitigate Impacts (Carbon Sinks etc)
5. Adapt to Changed Environmental Conditions



A division of KBC Process Technology Ltd

[www.petroleum-economics.com](http://www.petroleum-economics.com)  
[www.kbc.com](http://www.kbc.com)