

THE EMERGING REFINING CAPACITY CRUNCH: A DISCUSSION

**ICF Consulting
Fairfax, Virginia**

**Center for Strategic and International Studies
Washington, D.C.
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TODAY'S PRESENTATION

- ◆ **Headlines**
- ◆ The Demand Outlook
- ◆ Global Refining Capacity Trends
- ◆ The Shrinking Spare Capacity
- ◆ Refining Investment Patterns
- ◆ US Ramifications and Issues
- ◆ Conclusions
- ◆ Questions & Discussion

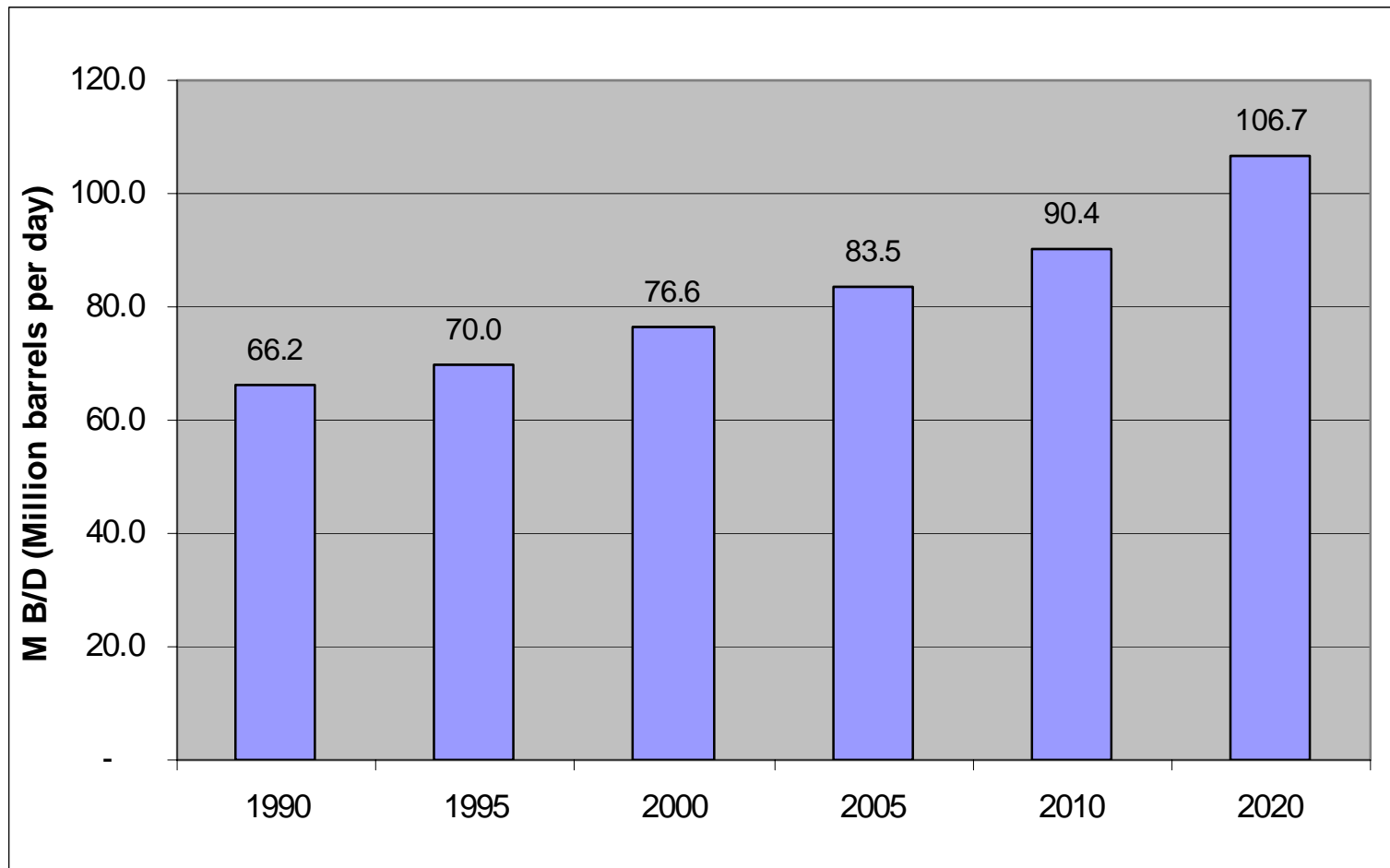
The Refining Crunch: Headlines

- ◆ Adequate refining capacity is a critical issue to oil market volatility and prices, and also essential to sustaining global economic growth
- ◆ The capacity constraint is **now** through 2010-2015, not in the “planning world” of 2020 and beyond.
- ◆ The US capacity shortage is managed by imports, which are expected to grow. This supply chain can be viable with adequate infrastructure in place. Global competition for product may create price and/or supply concerns.
- ◆ Actions to address US exposure should include reasoned market-focused short-term contingency plans as well as fundamental changes in the US environment for refining investment.

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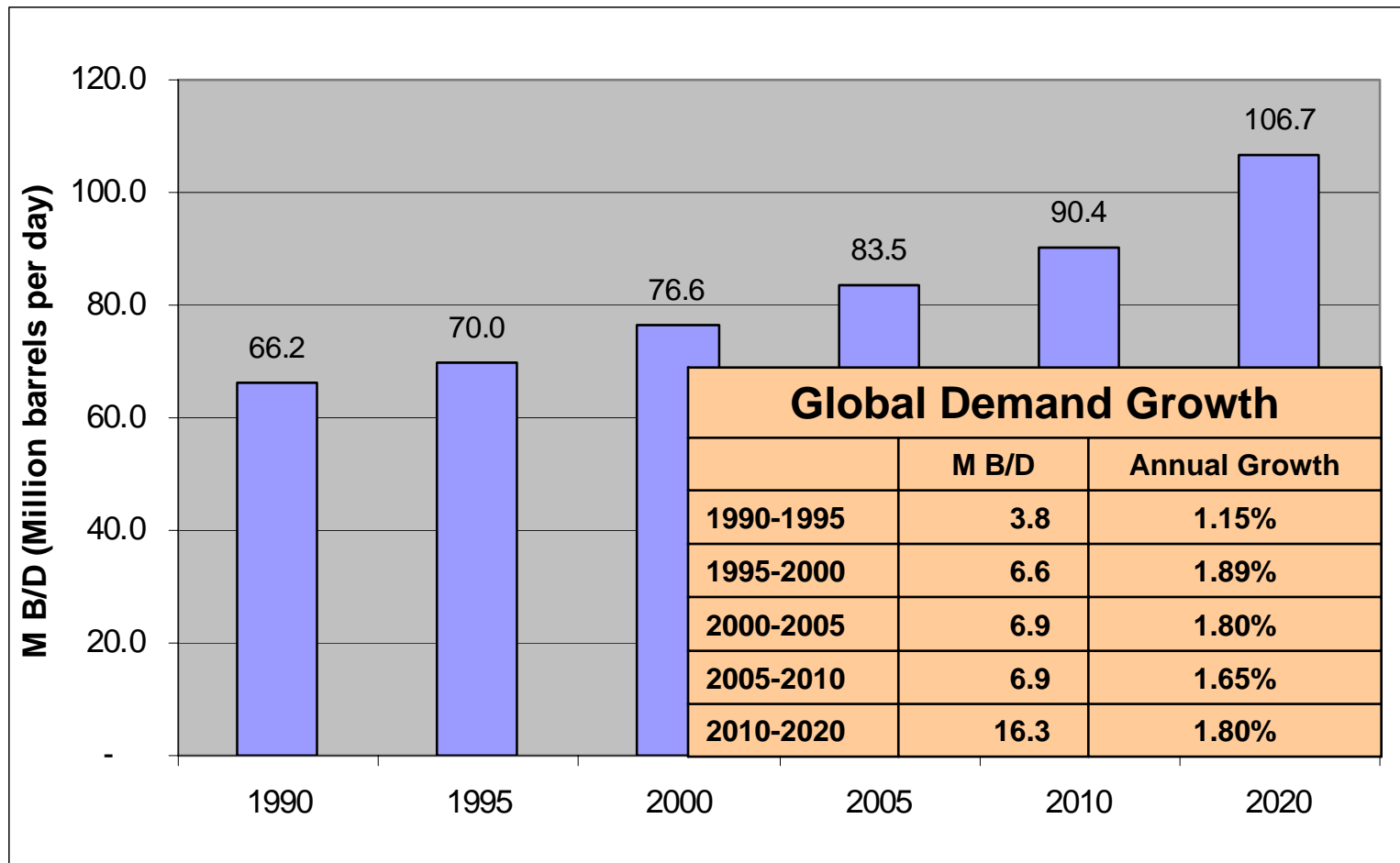
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Global Oil Demand History & Outlook



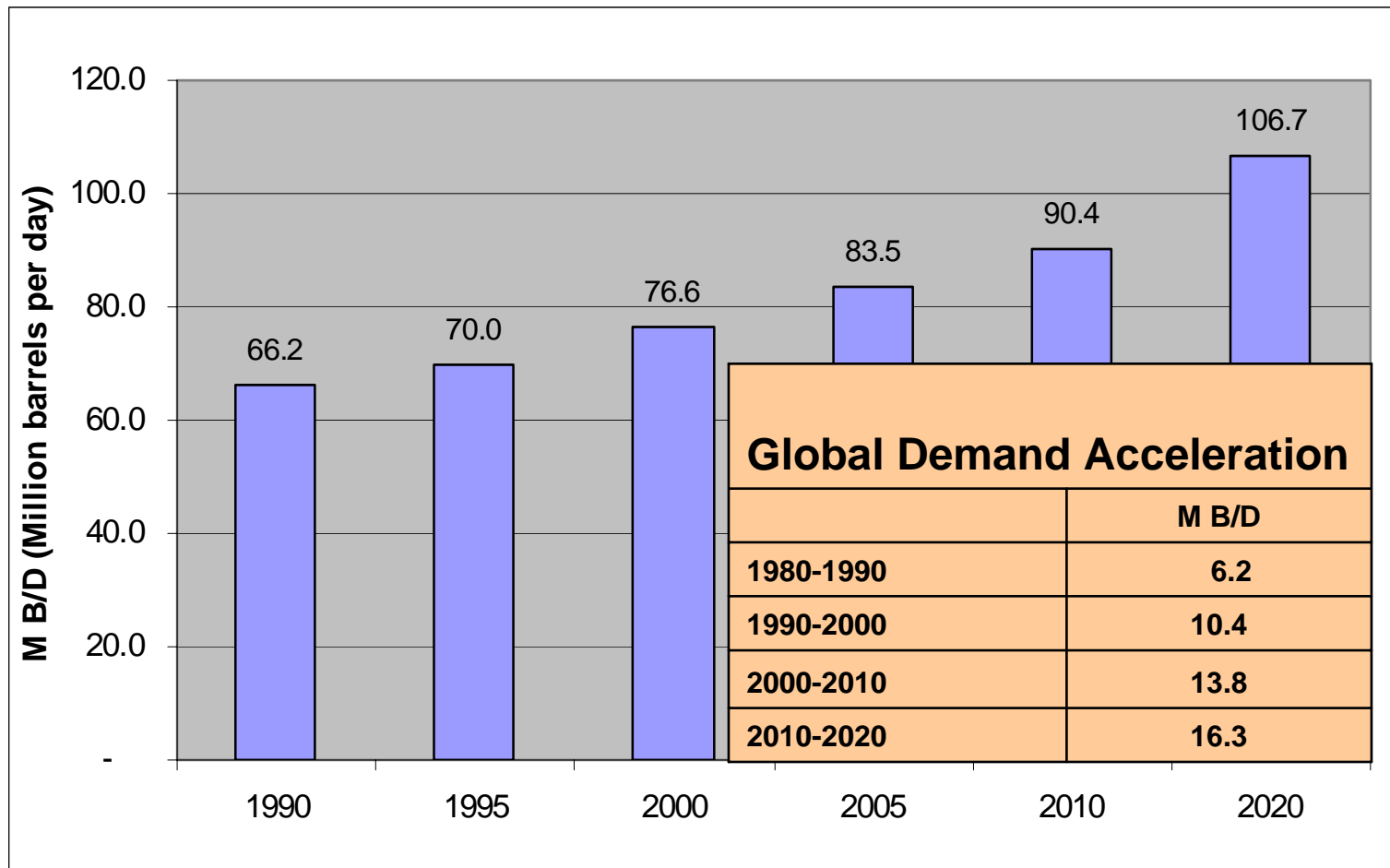
Source: IEA 2004 World Energy Outlook

Global Oil Demand History & Outlook



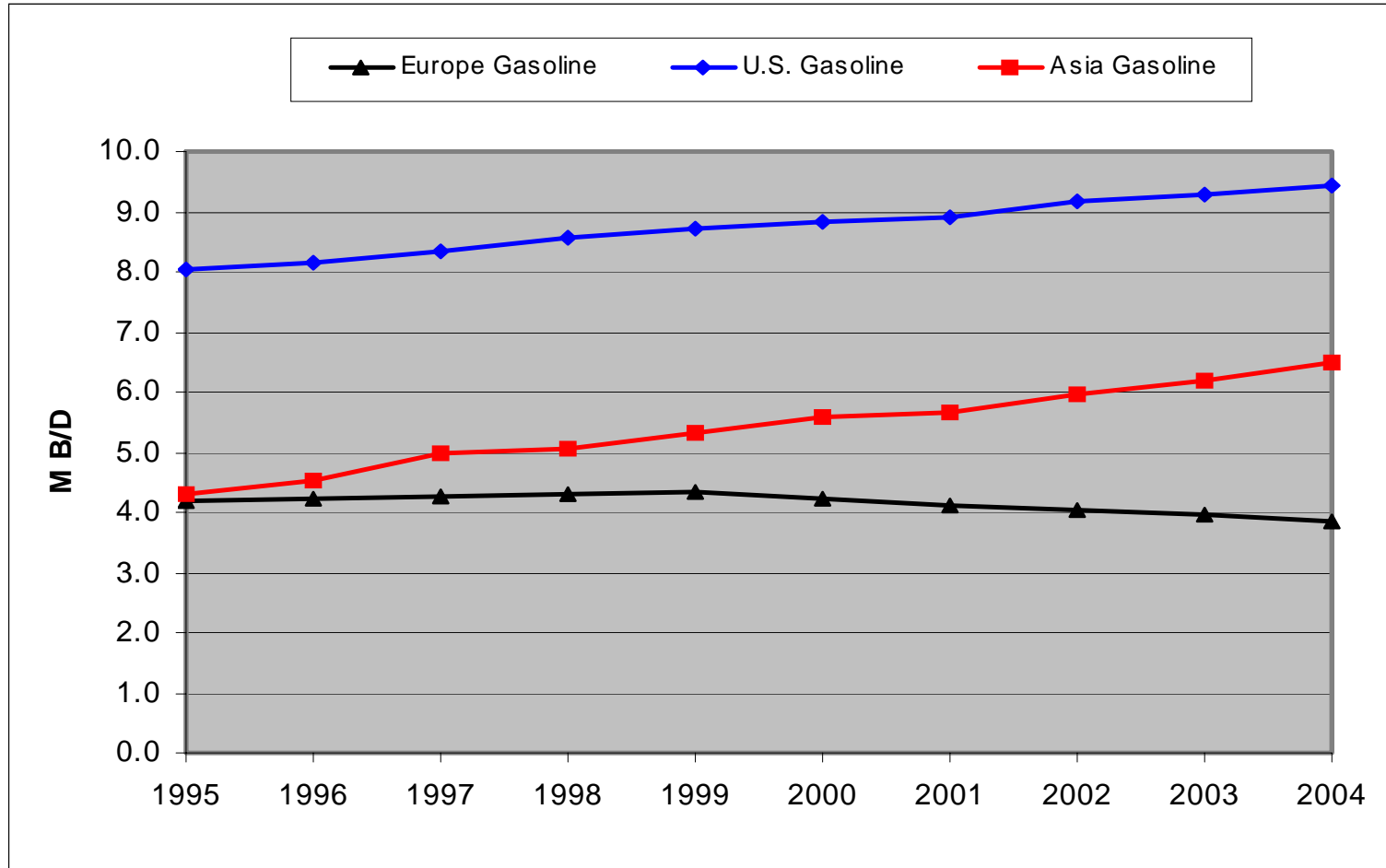
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Global Oil Demand History & Outlook



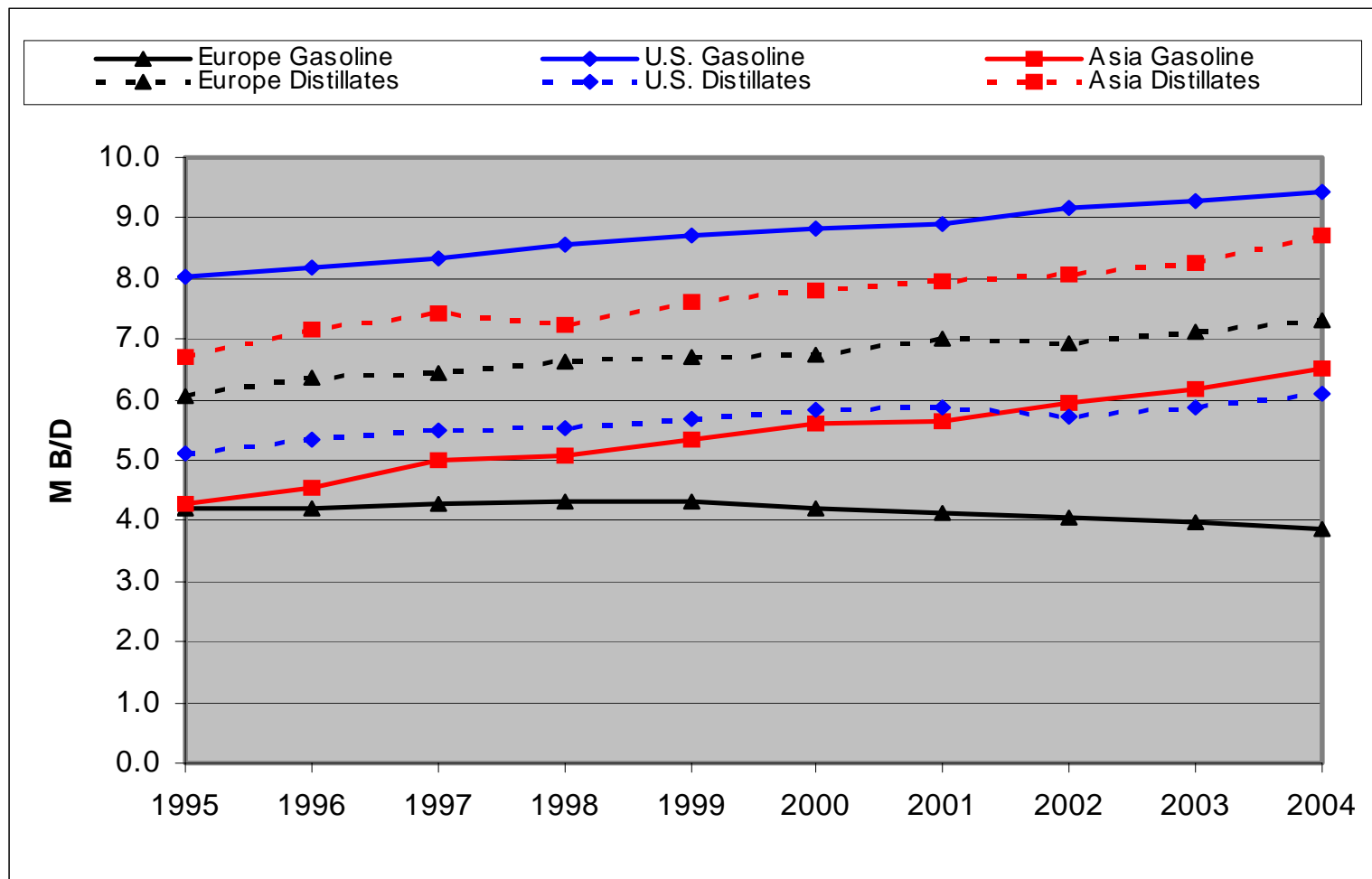
Source: IEA 2004 World Energy Outlook

Global Gasoline Demand Trends by Region



Source: 2005 BP Statistical Review of World Energy

Global Product Demand Trends by Region

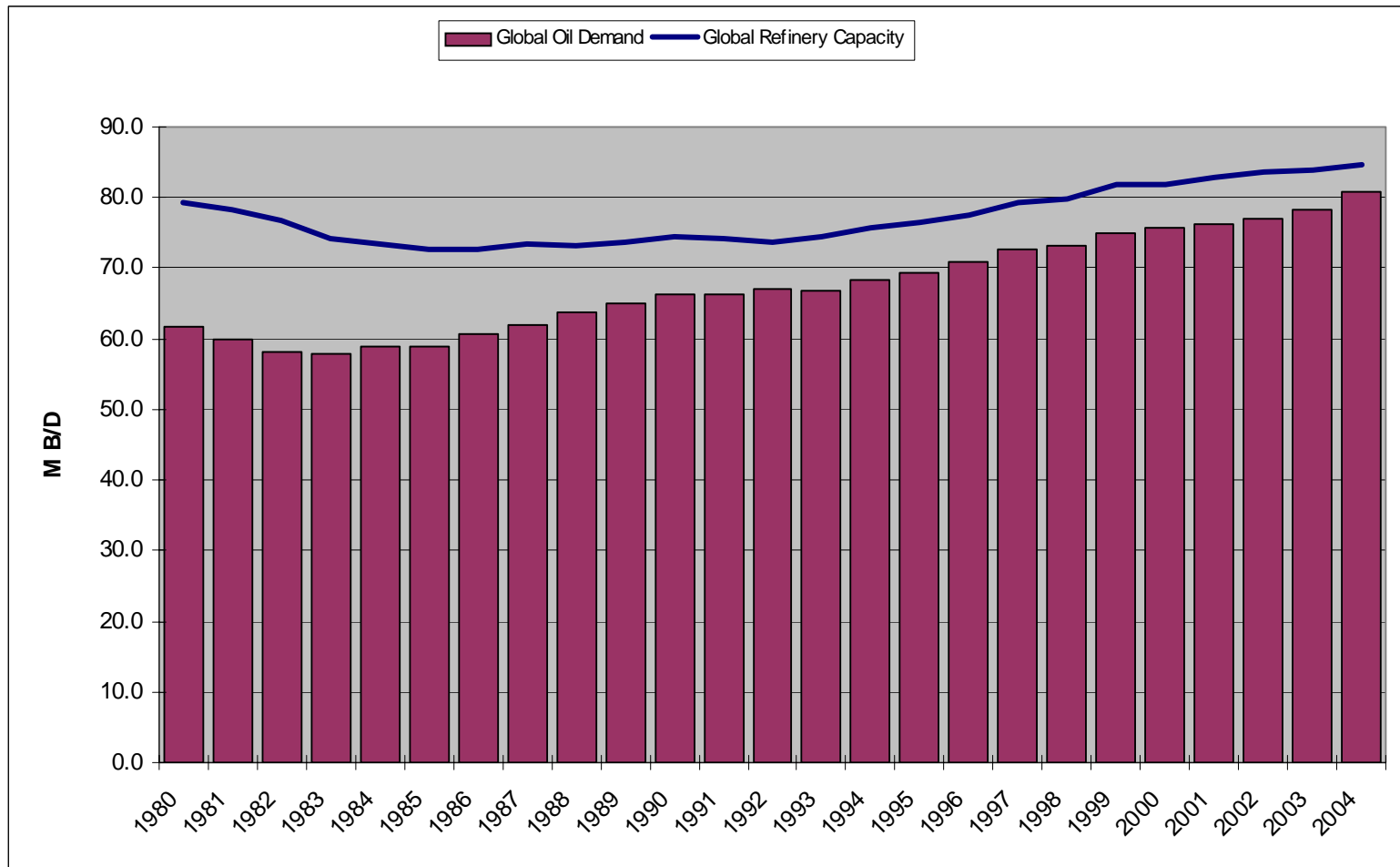


Source: 2005 BP Statistical Review of World Energy

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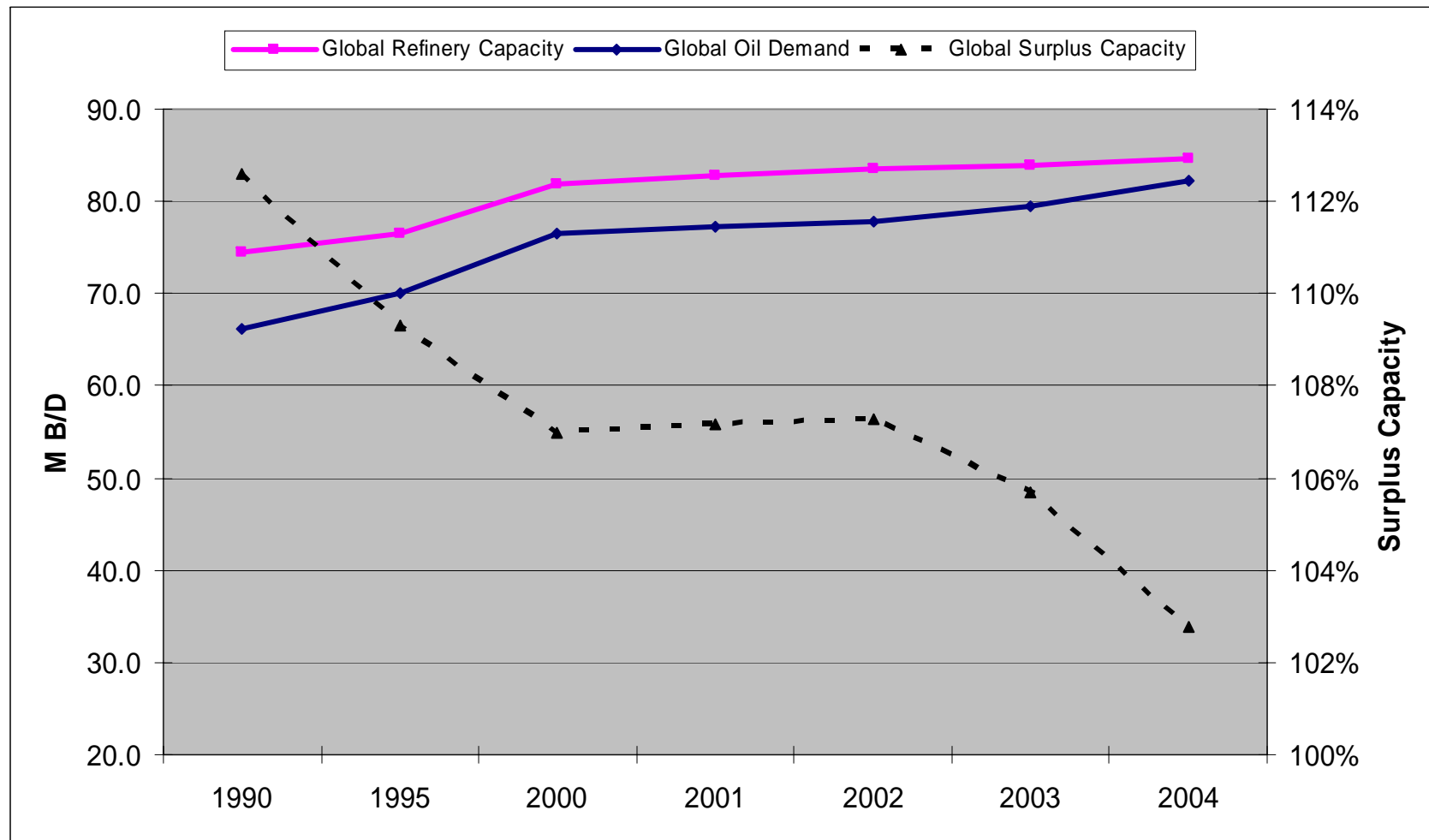
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Refining Capacity Trends



Source: 2005 BP Statistical Review of World Energy

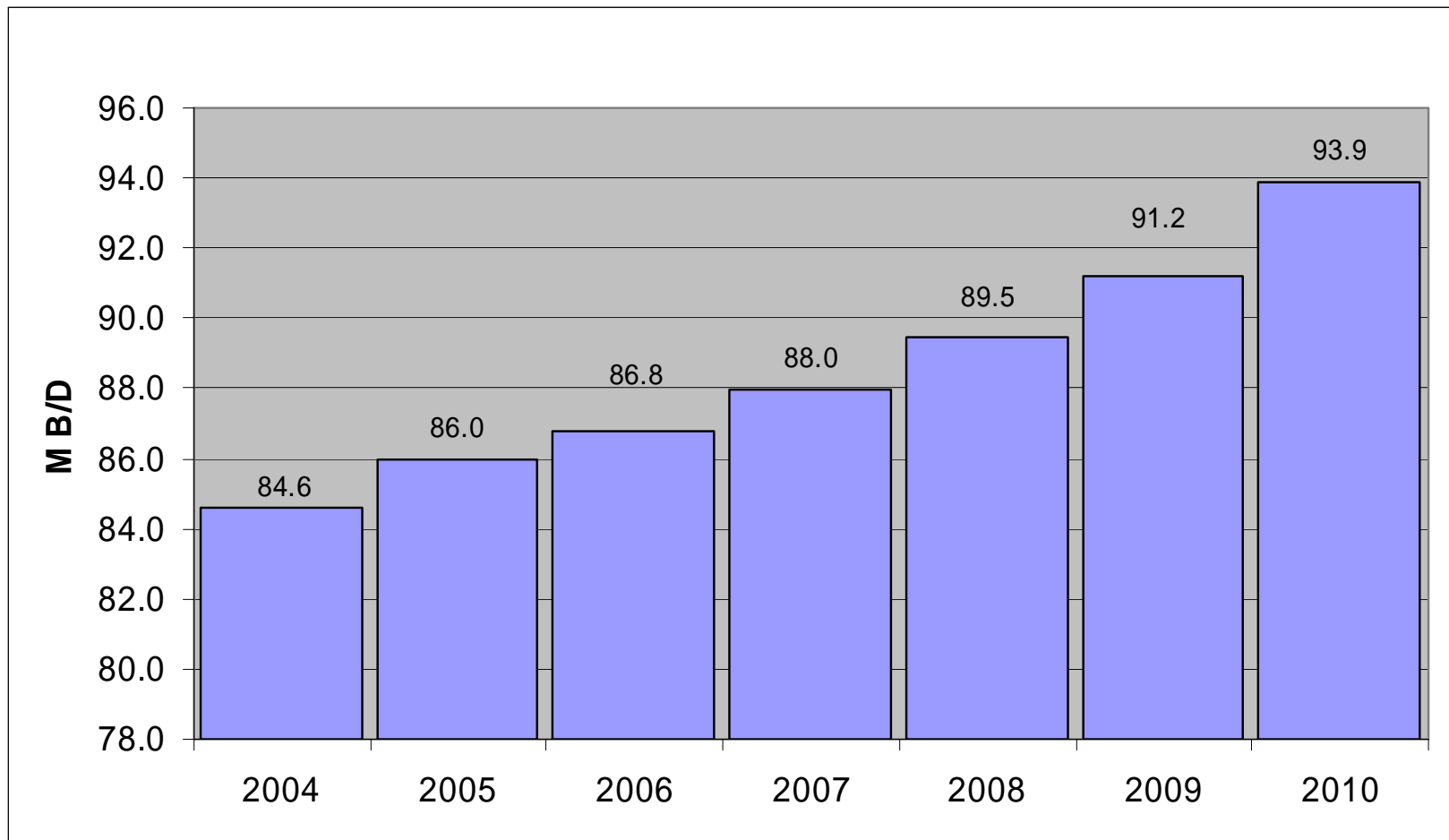
Refinery Capacity Trends 1990-2005



Note: Percentages represent the refinery capacity to demand ratio.

Sources: Capacity-BP 2005 Statistical Review of World Energy, Demand-IEA 2004 World Energy Outlook.

Estimated Refinery Capacity Growth, 2004-2010



Sources: OGJ Worldwide Refinery Construction Report,
ICF Analysis; Trade Publications and Company websites.

Estimated Refinery Capacity Growth Summary, 2004-2010 M B/D

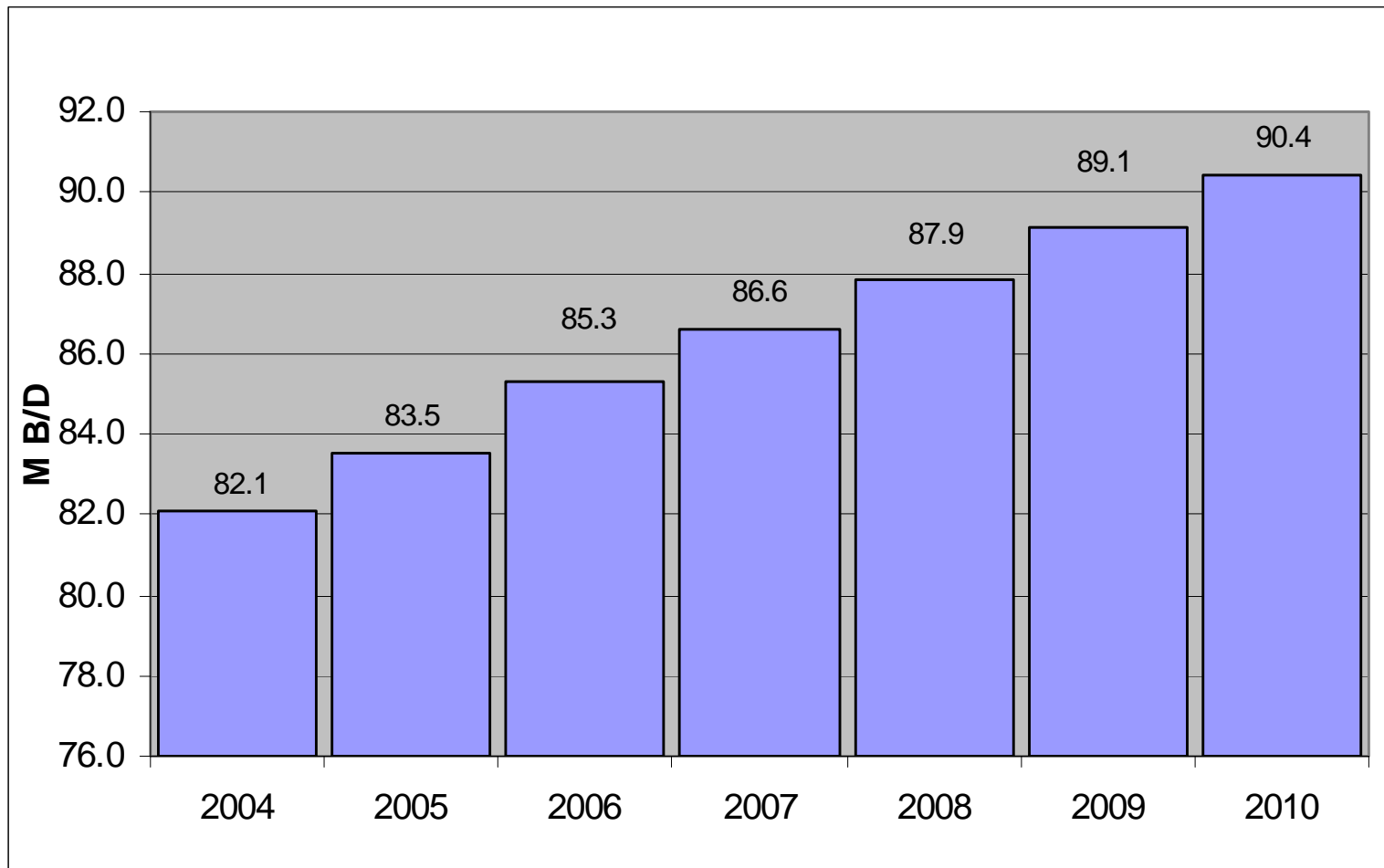
2004 End of Year Global Capacity Actual			84.6
2010 End of Year Global Capacity Estimated			93.9
Capacity Growth			9.3
New Refineries/Expansions			5.7
	Far East	2.8	
	Middle East	0.9	
	Latin America	0.8	
	United States	0.7	
	FSU	0.3	
	Other	0.2	
Capacity Creep (estimated)			4.4
Capacity Shutdown (estimated)			(0.8)
Capacity Growth			9.3

Sources: OGJ Construction Reports, ICF Analysis, Company
Websites, Other Trade Publications

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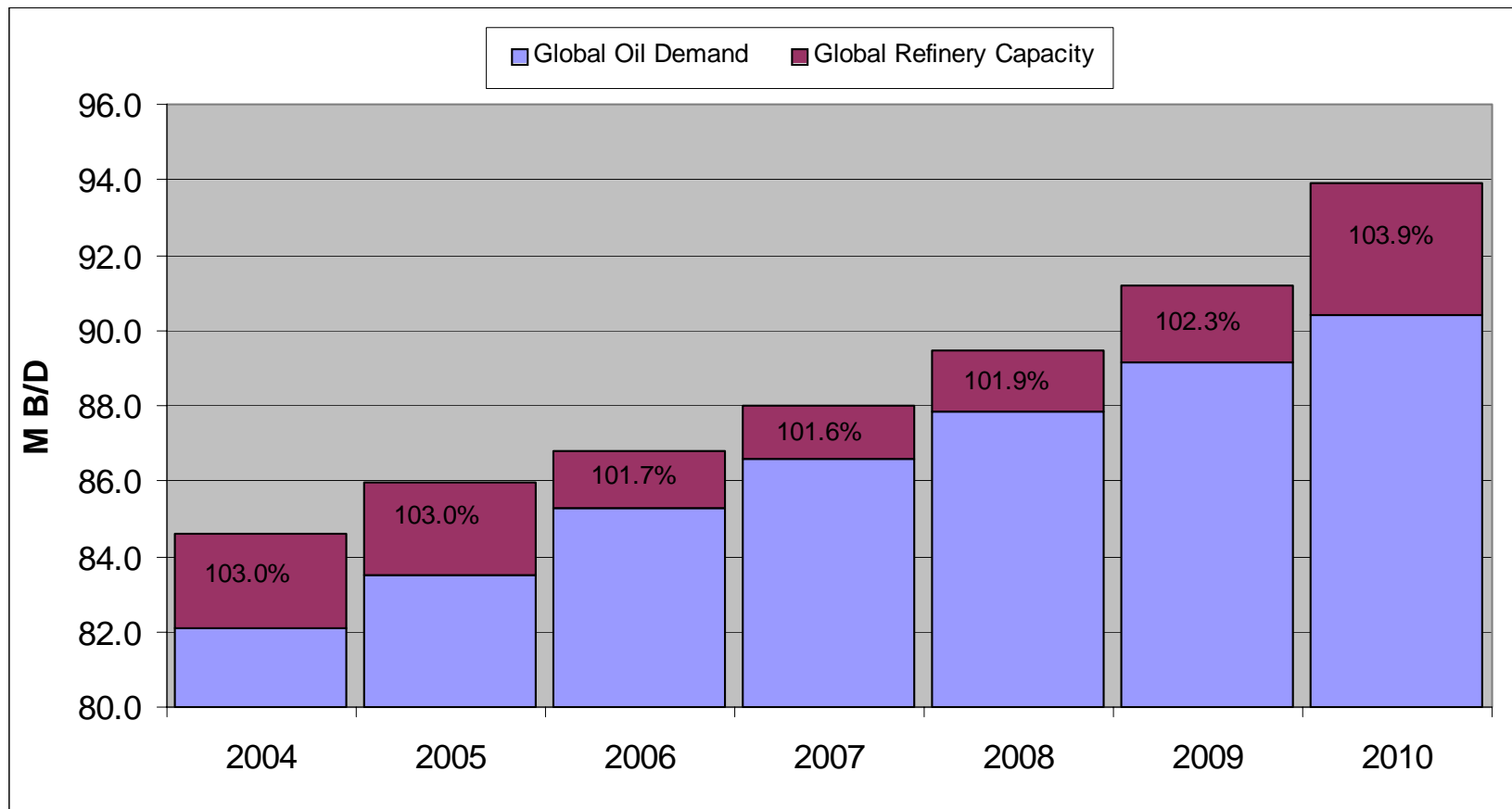
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Global Demand Forecast



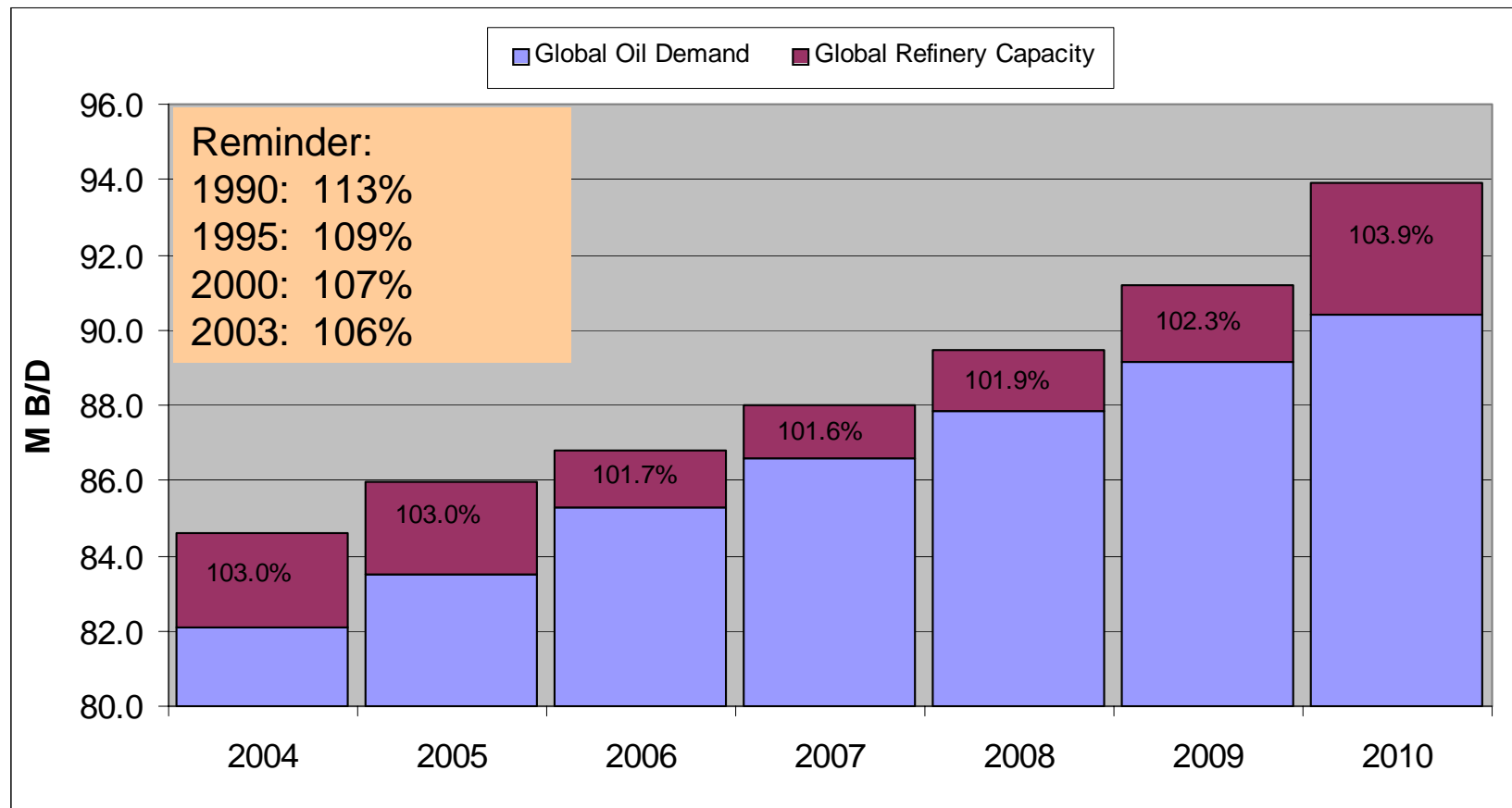
Source: IEA 2004 World Energy Outlook

Estimated Global Refinery Capacity Growth vs. Global Demand Forecast



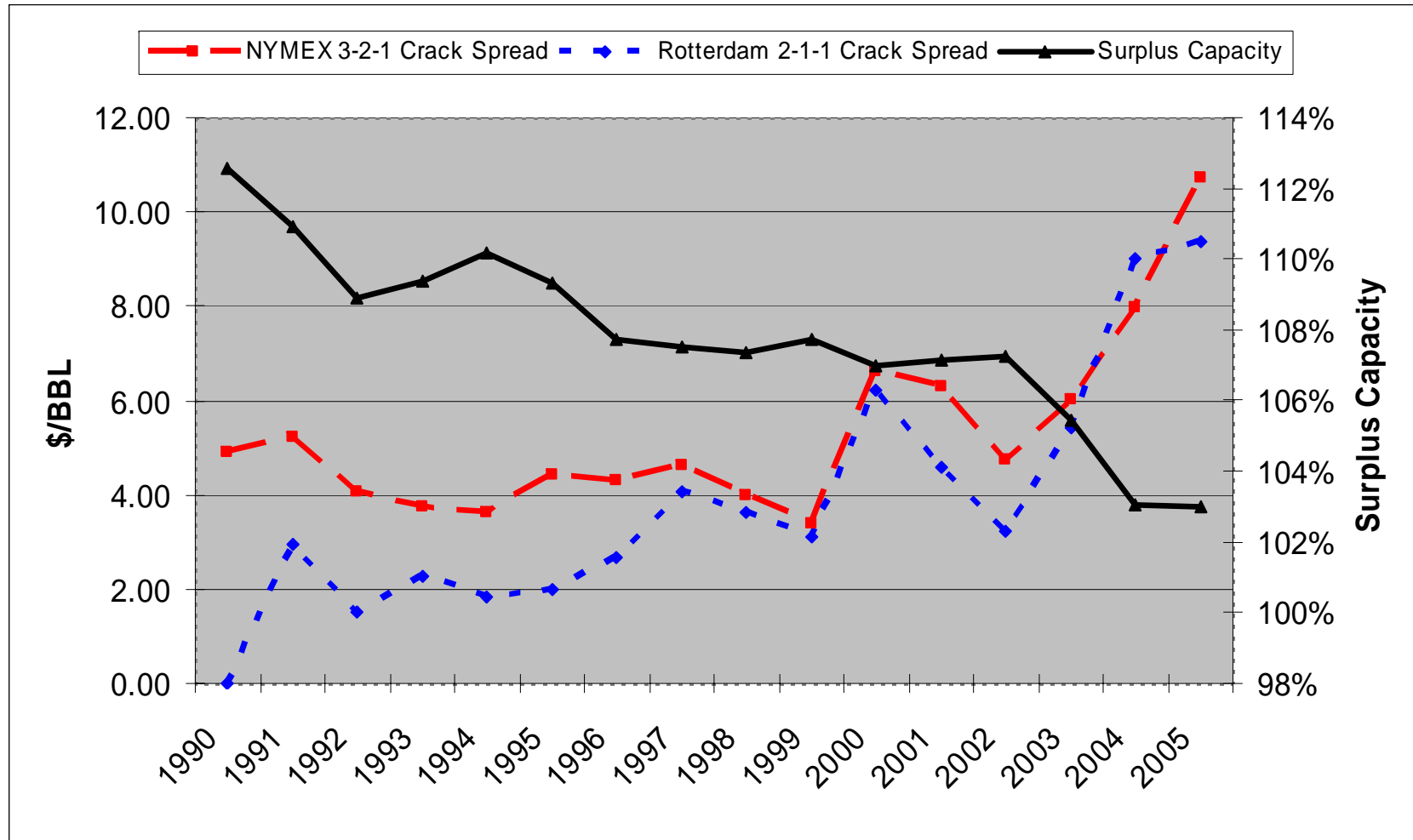
Note: Percentages represent the ratio of refinery capacity to demand. Sources: OGJ Worldwide Refinery Construction Report, 2005 BP Statistical Review of World Energy, IEA 2004 World Energy Outlook

Estimated Global Refinery Capacity Growth vs. Global Demand Forecast



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Impact of Declining Global Refining Spare Capacity on Generic Margins



Sources: Prices-EIA, Surplus Capacity-2005 BP Statistical Review of World Energy, IEA 2004 World Energy Outlook

Observations on the Emerging Capacity Crunch:

- ◆ Strong global demand growth is the primary driver
 - Demands in China/India and other markets
 - Demand accelerates as the base level of demand grows
- ◆ Refining capacity is increasing, but lagging demand
- ◆ Less refining spare capacity is driving margins higher as global competition for products grow, with no fundamental change in forward years
- ◆ The Unknowns:
 - Critical dependence on sustained capacity “creep” and timely construction & startup of announced new refineries.
 - Sustainability of demands and economic growth at elevated commodity price levels: Can price drive conservation?

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Refining Investment Patterns, 2000-2005

- ◆ Investment primarily in areas to reduce sulfur levels in transportation fuels, and to enable processing heavier and higher sulfur level crude oil
- ◆ Emphasis has been less on capacity and gasoline production, and more on diesel quality and raw material cost

	M B/D		Growth
	2000	2005	
Crude (Atmospheric)	81.5	82.4	1.1%
Crude (Vacuum)	26.7	27.3	2.2%
Coking	3.7	4.4	18.9%
Coking Tons/d	152.4	196.6	29.0%
Cracking, F/C	13.8	14.5	5.1%
Reforming	11.1	11.3	1.8%
Hydrocracking	4.0	4.7	17.5%
Hydrotreating	36.7	41.3	12.5%
Sulfur, Tons/d	56.1	71.1	26.7%

Source: OGJ Worldwide Refinery Capacity Report



Refining Investment Focus Areas

- ◆ Regulatory Requirements
 - Environmental compliance/stay-in-business
- ◆ Operating Cost Reduction Initiatives
 - Automated controls & Optimization
 - Energy Conservation
- ◆ Margin Enhancement
 - Run cheaper crudes (raw material)
 - Make more premium products

Capacity Expansions: Why Overseas?

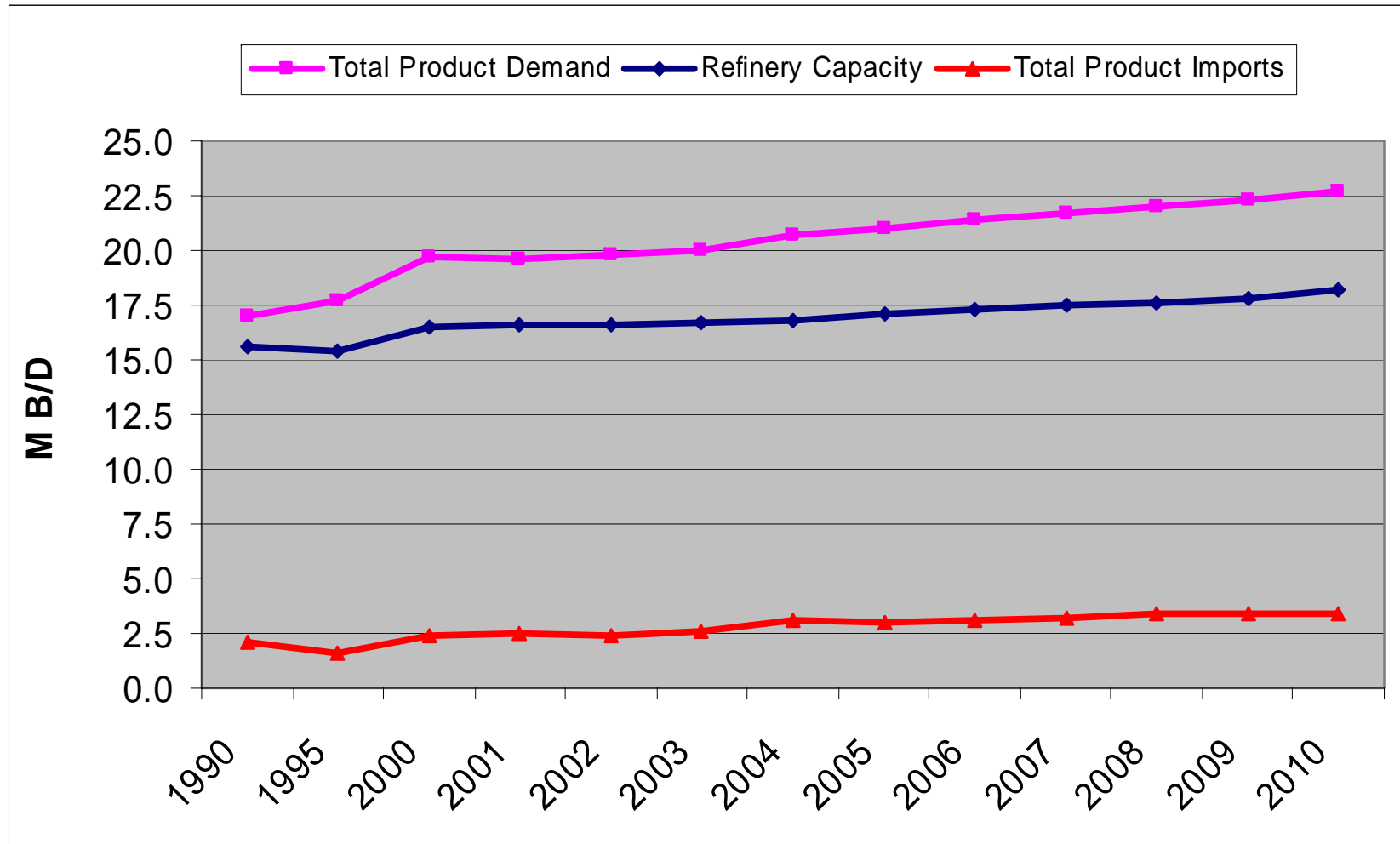
- ◆ Primary area of global demand growth (China & Far East)
- ◆ Collaboration of Governments with Industry and NOC's
- ◆ Fast-track permitting and siting approvals
- ◆ Potential integration with Petrochemical investments and demands
- ◆ Lower cost of project (less regulatory needs and lower labor costs)

Bottom Line: Better project economics than a US capacity investment

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United States Supply & Demand Outlook

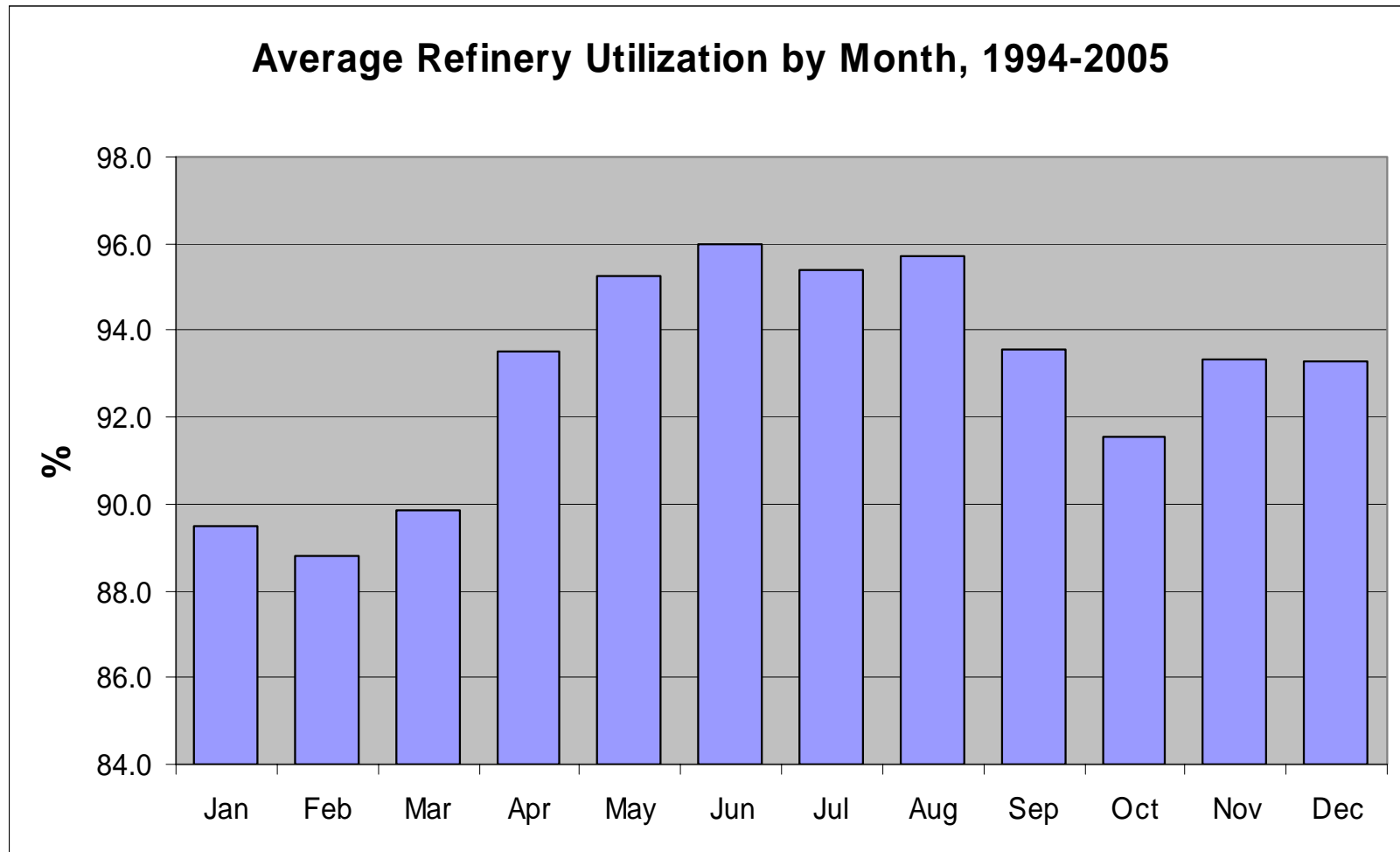


Sources: EIA Petroleum Supply Annual, OGJ Worldwide Refining, ICF Analysis

US Refining Capacity & Product Demand Observations:

- ◆ US Import levels increase from 2.4 MB/D in 2000 to 3.4 M B/D in 2010 and 4.2 M B/D in 2020 based on IEA forecast growth
- ◆ Outlook depends on Demand levels and sustained high utilizations:
 - An increase of 1% in demand growth above the IEA forecast for 2005 through 2020 raises estimated import levels to 4.4 M B/D in 2010 and 7.5 M B/D in 2020 assuming refinery capacity increases at 0.9% per year “creep” levels.
 - If actual demand begins to show some sustained price elasticity, it is possible that IEA’s forecasts may be too high, and base import levels and capacity requirements may be overstated.
 - US refining system has been pushing utilization levels to practical limits; any reduction will increase import outlook

US REFINERY UTILIZATION 1994-2005



Source: EIA Refinery Utilization

Investing in Refining Capacity in the US: The Risks and Concerns

- ◆ The capital cost (particularly for grass roots capacity) is enormous, and the timing to plan, permit, approve, and construct can be at least 5 years before any revenue flow
- ◆ The refining business is strong today, but has historically had weak margins. The sensitivity of demands to price creates exposure to domestic or global economic downturns which could create huge capacity investment risk
- ◆ Escalating fixed costs for multiple grades of fuels as well as other non-profit improvement matters require a higher margin hurdle rate to invest than overseas
- ◆ The rules in the US can (and have) changed for environmental and other considerations (timing, degree, oxygenates, emissions, etc) at Federal, State and local levels that impact decision economics

What Would Stimulate US Grassroots or Major Refinery Capacity Expansions?

- ◆ Confidence that investment decision margins are sustainable with minimal government interference
- ◆ Clear regulatory path (confidence in stable product specs, emission limits, siting approval timing, NIMBY issues, and so on)
- ◆ Confidence in sustainable demands for refinery products
- ◆ Strong regional infrastructure (pipelines, marine facilities, support services, resources) to support asset
- ◆ Potential for integration with other Industries (eg Petrochemicals)

What has the US Government done to impact supply?

- ◆ New Energy Bill Refining Impacts:
 - Provides refining investment incentives: *Good!*
 - Provisions to reduced US gasoline supply (MTBE out; Add Ethanol; Remove RVP waiver) results in 3-10% less home grown gasoline supply: *Not so Good!*
- ◆ Provided rapid decisions to provide short term supply relief post Katrina & Rita:
 - Requested and received product from IEA reserves
 - Jones Act waiver
 - SPR release as required
 - Flexibility on product specifications for imports and gasoline RVP
 - Import tariff relief for products

What is Government Proposing and Discussing Post-Katrina/Rita?

- ◆ Strategic Product Reserves for Gasoline & Jet Fuel, more Heating Oil Reserves
- ◆ Options to locate refineries on Military Bases
- ◆ A Refinery to supply Military needs
- ◆ De-centralization of refinery capacity from the Gulf Coast
- ◆ Restreaming shutdown refineries
- ◆ Additional investment incentives

What can government do that would be positive and enduring?

- ◆ Streamline the boutique fuels issue, to address the onerous impact on tankage and distribution systems while balancing environmental needs. Work with IEA and other organizations to streamline global product quality standards
- ◆ Continue to support joint Oil and Auto Industries coordination and planning on transportation fuel efficiency goals and timing
- ◆ Work with refiners, pipelines, marine & terminal companies to develop clear contingency action plans for major supply disruptions
- ◆ Continue and expand incentives for domestic refining capacity, including fast-track permitting and approvals on projects and locations, enhanced incentives
- ◆ Carefully study issues being proposed such as product SPR's before implementing at high taxpayer cost

Some Final Thoughts....

- ◆ Slowing global demand through sustained high prices is positive if it drives better energy use practices and more fuel efficiency. Consumers do have clout, and commodity investors react to changes in demand patterns.
- ◆ Slowing global demand through a recession driven by high oil prices impacts everyone, including the oil industry.
- ◆ The focus on reducing gasoline consumption is good, but diesel demand is critical to fueling global economic growth and trade, and, along with jet and heating oil fuels, are products more difficult to conserve.

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Conclusions

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For Further Information

Tom O'Connor

703.218.2768

TO'Connor@icfconsulting.com

Zeta Rosenberg

703.934.3949

ZRosenberg@icfconsulting.com

Vineet Aggarwal

703.218.2656

VAggarwal@icfconsulting.com

9300 Lee Highway

Fairfax, VA 22031

www.icfconsulting.com