



METHANOL FOR ENERGY

Singapore, May 2006



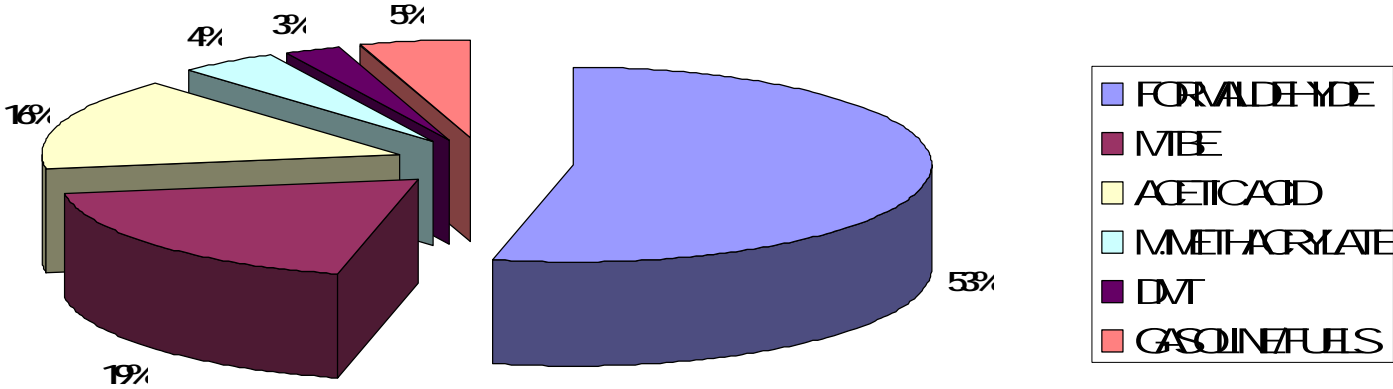
Methanol For Energy

OVERVIEW

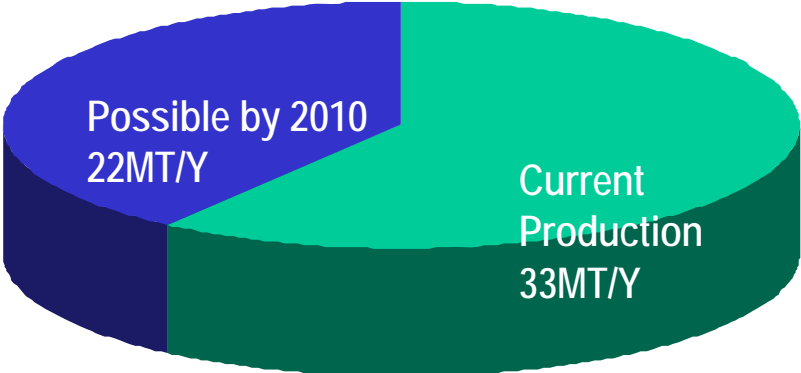
- Current global supply / demand. Potential future Global supply.
- Price analysis – BTU comparison versus conventional fuels.
- Attributes of Methanol within the Energy Matrix.
- Bridging the demand gap / new potential growth markets for Methanol – with a focus on
 - » Transportation
 - » Power generation
 - » Domestic fuel market
- Supply management - the hybrid approach
- Summary and questions

Methanol's Traditional Markets

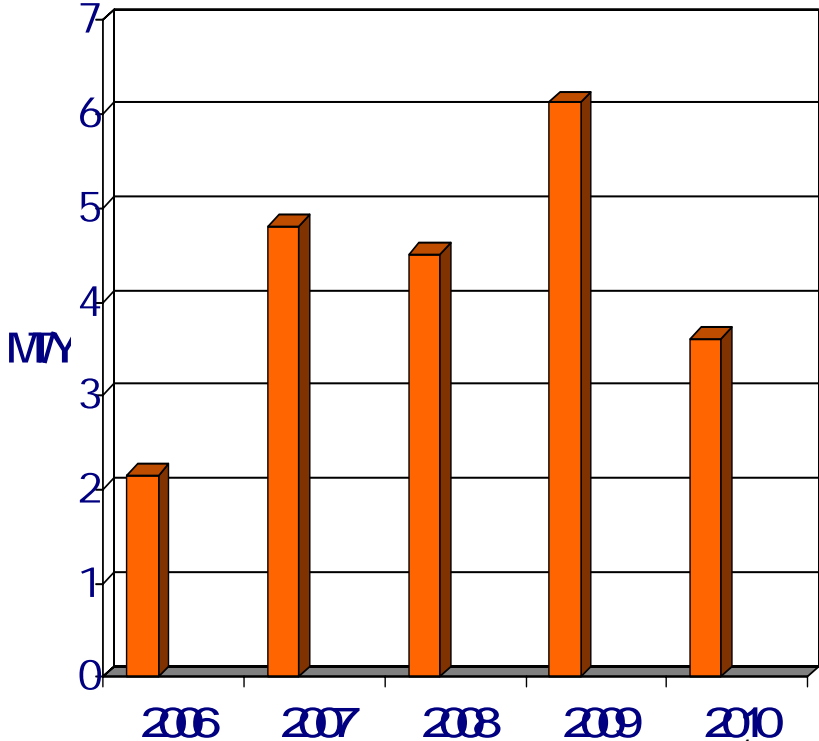
When we look at new or incremental methanol demand we tend to look at the following:



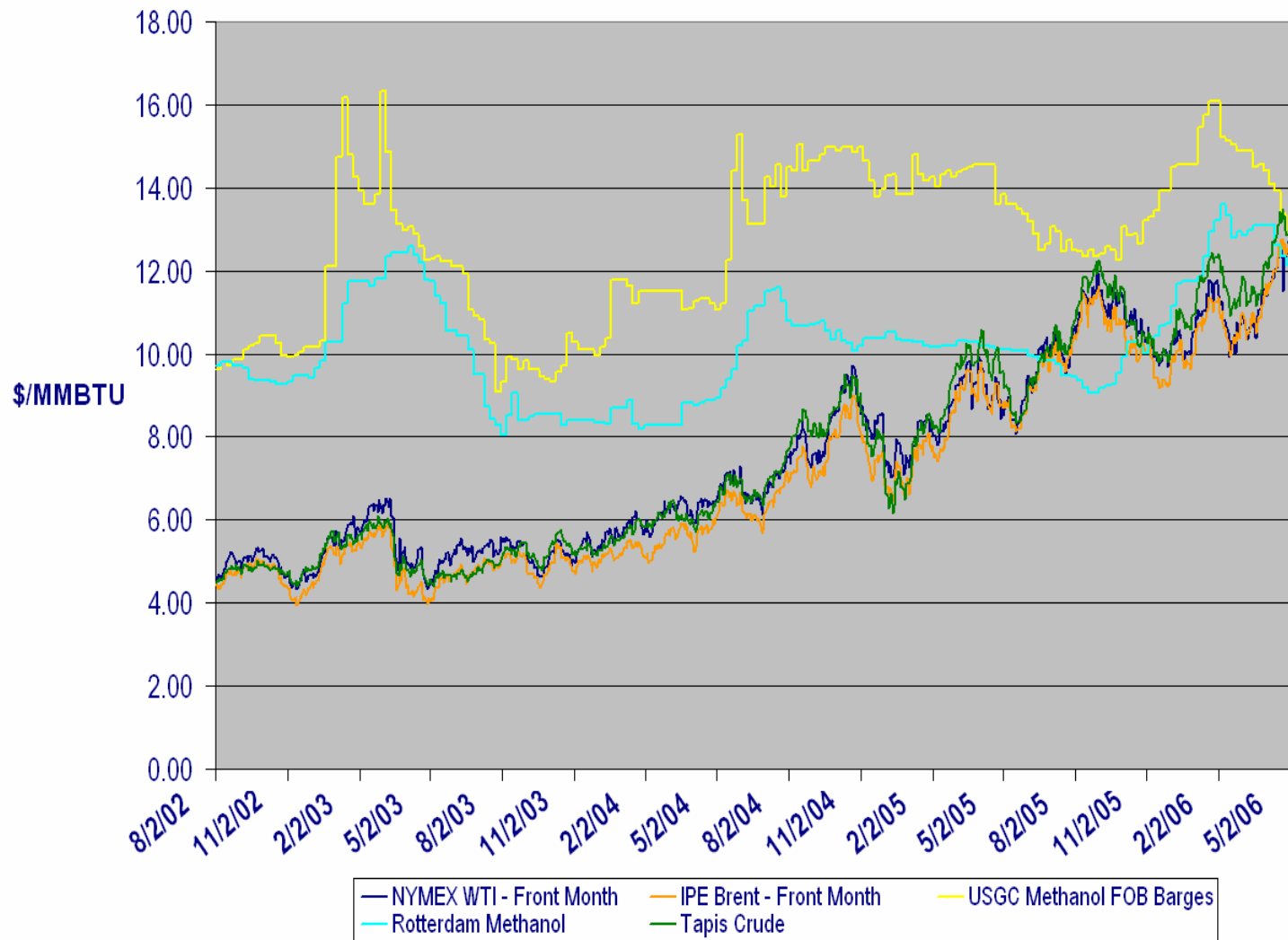
Methanol's Production – Current and Future



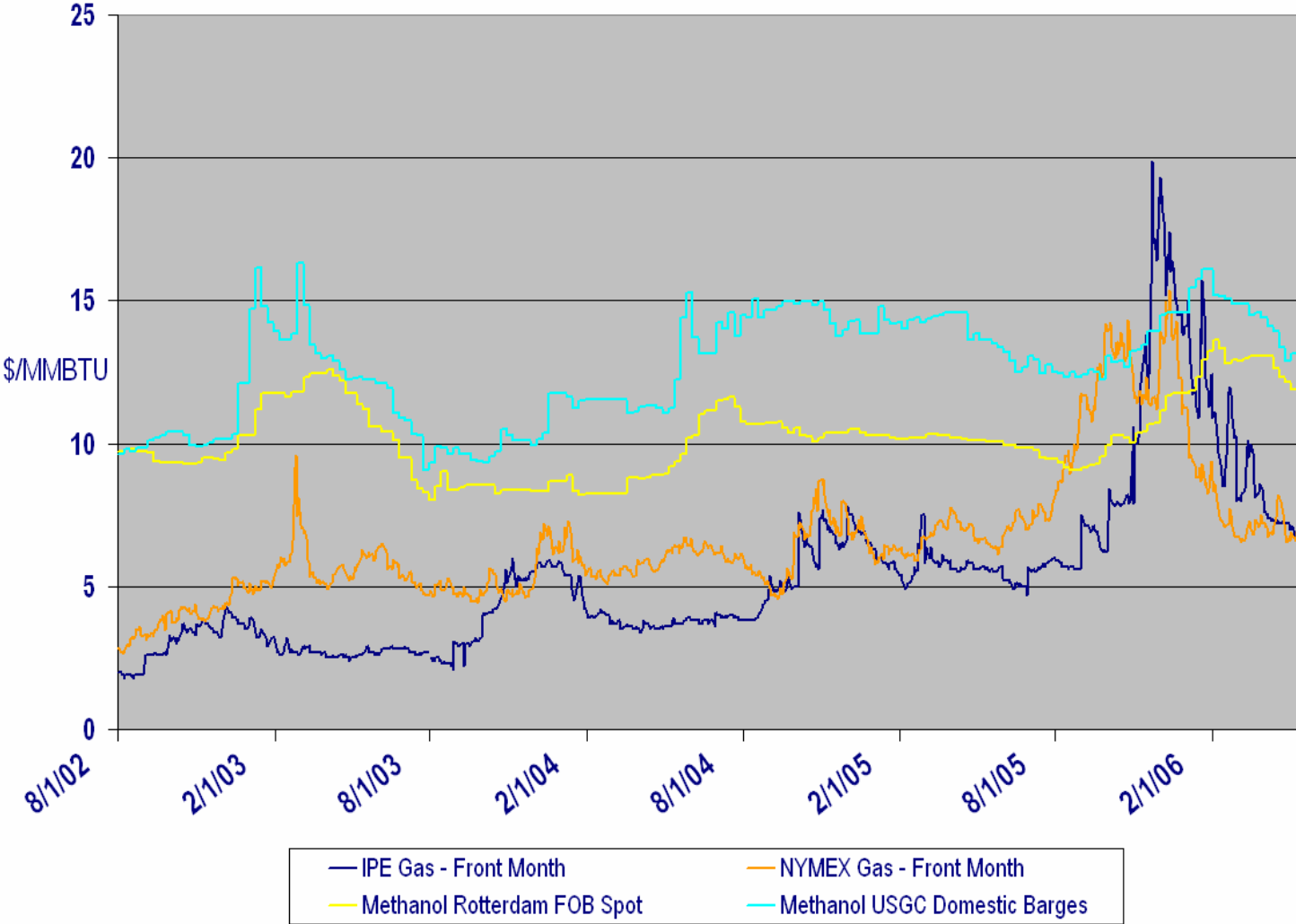
Incremental Global Methanol Supply



Methanol Price Versus Crude Benchmarks in MMBTU

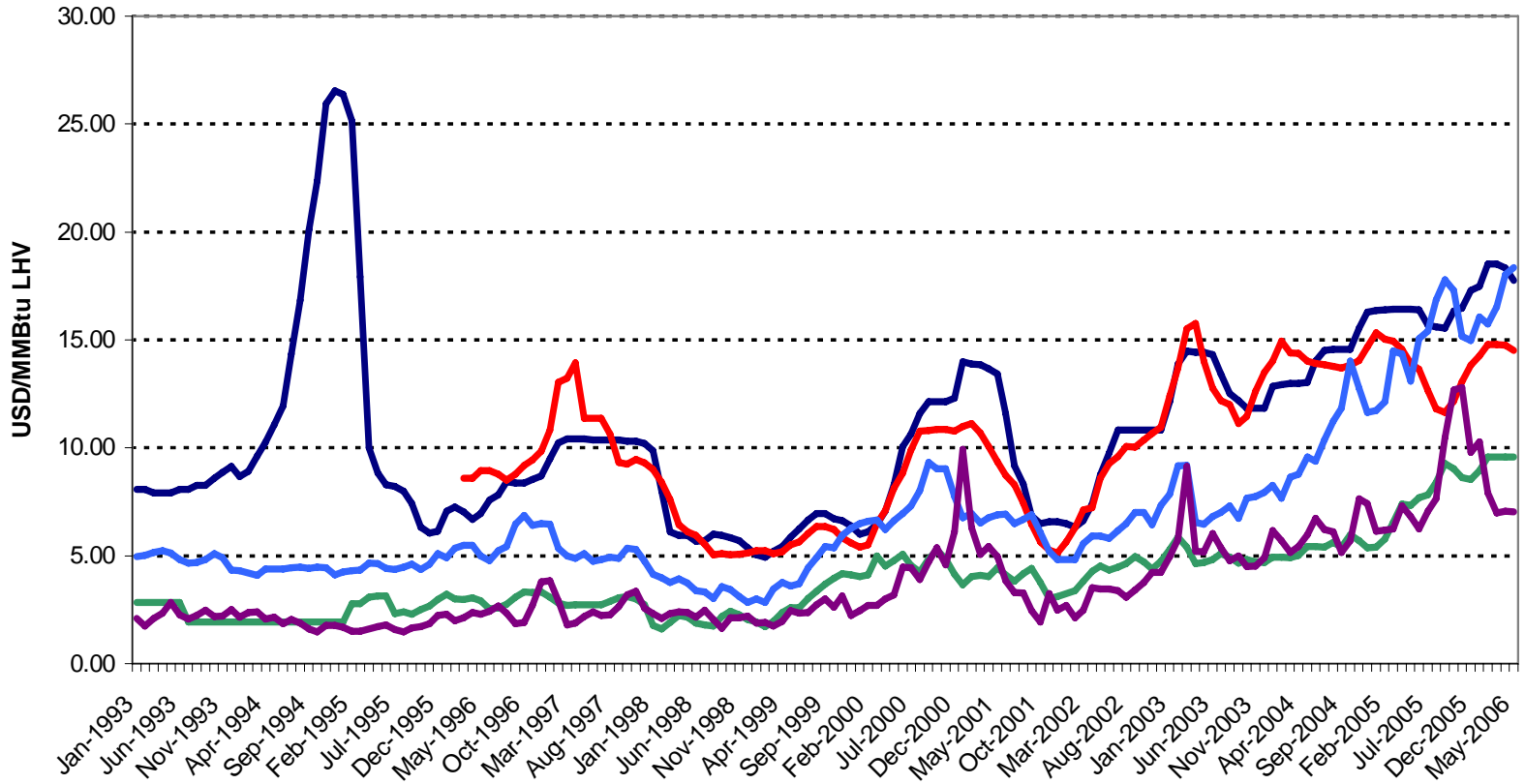


Methanol Price Versus Natural Gas Benchmarks in MMBTU



Comparative Heat Values - MeOH vs Fuel Oil

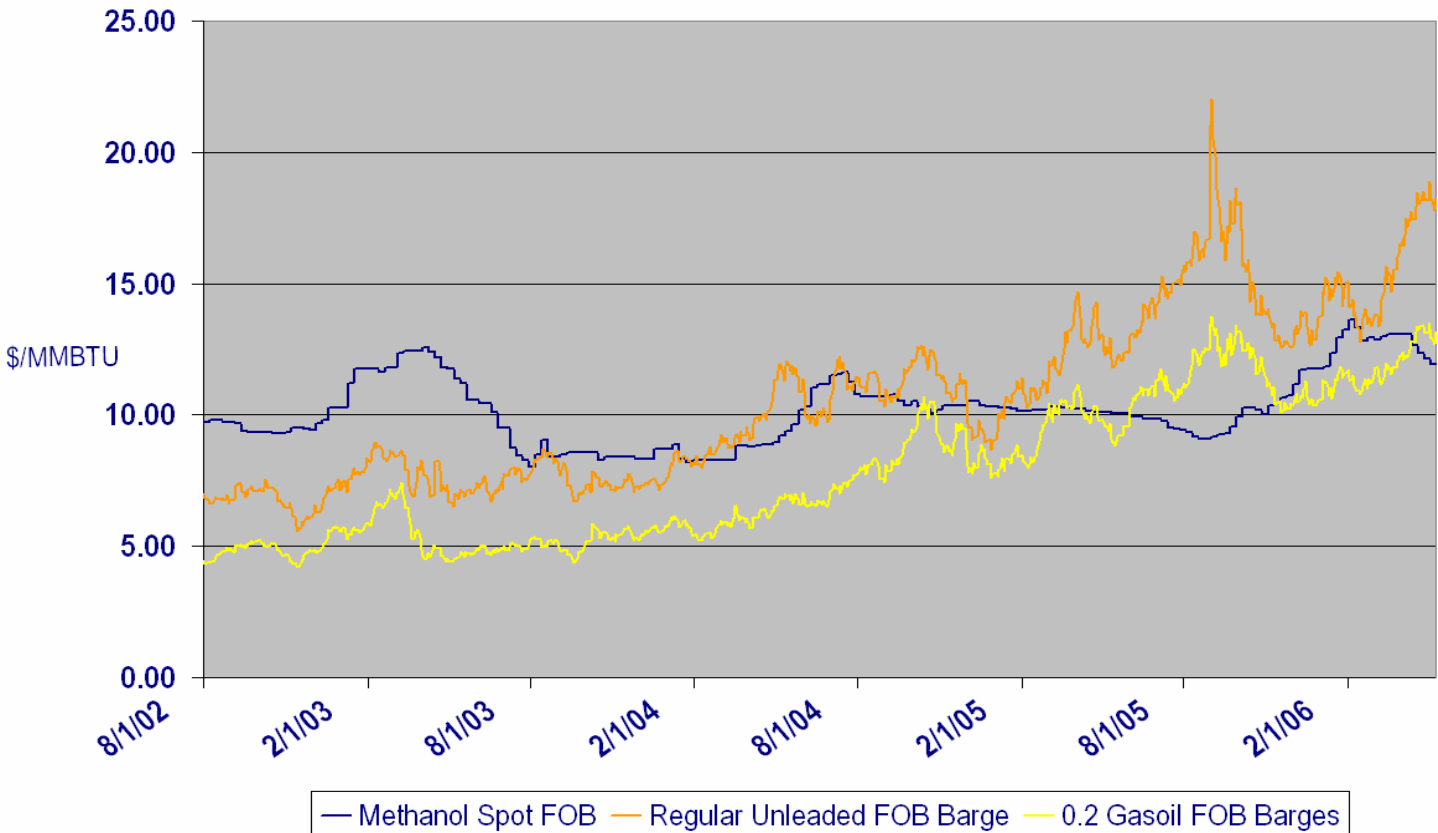
(Monthly, Jan 1990 - Feb 2006, Estimated)



- Methanol US Gulf Coast Contract US\$/MMBtu LHV FOB
- Methanol Northeast Asia Spot US\$/MMBtu LHV CFR S. China
- Fuel Oil 0.2% Sulfur West Europe Spot Average US\$/Metric Ton CIF NW Europe
- Fuel Oil 3.5% Sulfur, 180 cst Northeast Asia Spot Average US\$/Metric Ton FOB Singapore
- Natural Gas USA Burner Tip US\$/Million BTU Delivered US Gulf Coast



Price per MMBTU of Methanol, Gasoline and Gasoil FOB Rotterdam



1. Bridging The Energy Gap

**2. Bringing Methanol
into the Energy Matrix**

Methanol's Fuel Characteristics Compare Well With Alternative Fuels at the Clean End of the Barrel.

Physical State	Gasoline	LPG	Compressed Natural Gas	Methanol	Ethanol
Net Energy Content (BTU/lb)	19,000	19,800	21,300	8,600	11,500
Octane (R+M) / 2	87 – 93	104	120	99	100
Sulphur (W+%)	0.02 – 0.045	Negligible	Negligible	Zero	Zero

Source; Steering a New Course; Transportation, Energy & the Environment

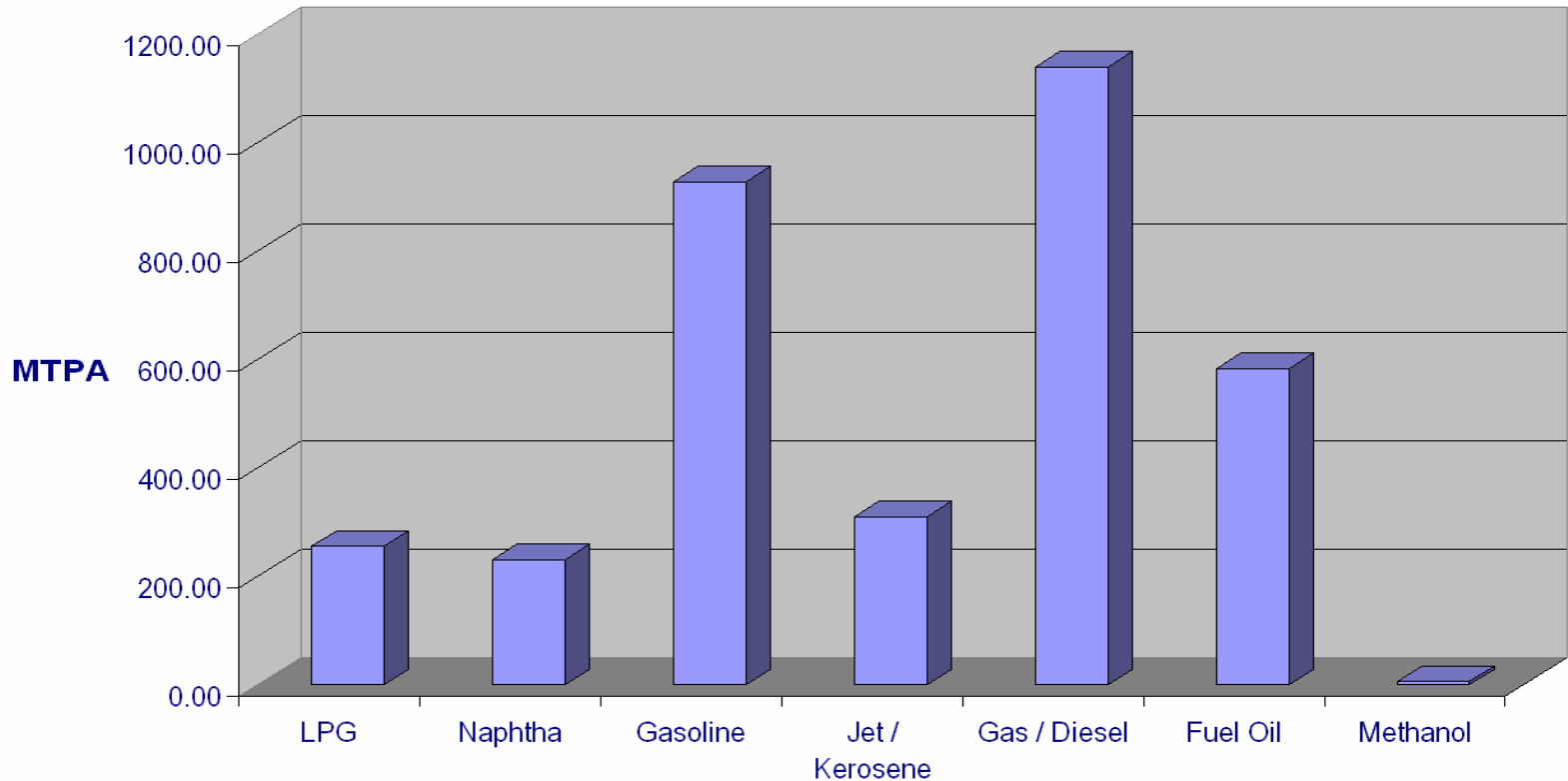
Advantages of Methanol as a Fuel Within The Energy Matrix

- It's a liquid
- Ease of transportation
- Emissions of sulphur and sulphur compounds are non existant
- Low carbon emissions per MMBTU
- Clean burn
- Power, acceleration and payload are comparable to gasoline
- High octane quality
- Methanol prices today have disconnected from crude, crude derivatives and natural gas prices. Driven by alternative feedstock cost base and current supply demand balances in the chemical market, rather than Energy markets.

Pricing edge ?

The Potential Market For Methanol As A Fuel Is Massive!

The Relative Market Demand of Selected Fuel Products in 2005



Key Components for Methanol Within The Energy Matrix

- In today's market it can compete on a BTU basis
- Relationship between natural gas as a feedstock versus Methanol as a fuel.

Need for market lead flexible Pricing, Not Fixed!

Supply Begets Demand!

- In a world with higher valued crude oil and refined products, excess methanol capacity will facilitate the development of new market applications.
- As the supply of product grows so the possibilities to seek alternate markets without dislocating supply from existing markets also grows.
- *....if we could develop a appropriate fuel home for methanol.. there is on a RELATIVE basis an infinite role for methanol within the energy matrix!*

Methanol has a long history in the fuel market

- Methanol has been used as a fuel at various times during fuel shortages.
- Flex fuel cars have already been produced and successful trials have been conducted by G.Motors, Ford, and Daimler Chrysler.
- Transportation fuel, M85/M100
- Fuel Cells
- DME (synthetic propane)

Specific areas to touch on

- 1. Transportation Fuels
 - Bio Fuels
 - Blend Component
- 2. Power Generation
- 3. Home Fuels

Methanol use in the Transportation Fuel sector

- In Europe, methanol is increasingly being used in the production of biodiesel, which can replace refinery-based diesel for use in transportation. (2005 market approx 2.5m MT/Y, market potential 2010: >12m MT pa.)
- In China, methanol is used directly as a blending component of gasoline, driven by the shortage of gasoline and the need to extend the octane pool.

Continued strong demand for light products leading to continued strong crude oil prices and a requirement for additional cleaner burning fuels in the global market are likely to result in a significant growth in methanol blending.

Methanol For Power

- General Electric various levels of support for Methanol as a fuel for power generation units.
- Methanol for power - remote areas without a regional gas grid or LNG network or electrical grids for that matter !
- Micro-Generators
- < 10% of Sub-Saharan Africa is served by any form of electrical power.
- Previously unlikely to appeal to a single user – today that's changes, spike in gas prices are forcing CC Turbines to have liquid fuel supply alternatives.
- 500 MW / 250 KT /YR METHANOL
- Emission credits

Emissions Trading

- Involves companies which can make greenhouse gas emission reductions for a relatively low cost selling the rights to those reductions, or carbon credits, to an organization which would find it more expensive to achieve the same level of reduction through in-house activities.
- **Certified Emission Reductions:** These certificates were created under the Kyoto Protocol, an international agreement to cut greenhouse gasses, when poor nations build energy projects like wind farms and manure burners.
- Such projects emit less carbon dioxide than oil, natural gas or coal.
- The difference can be sold in the form of certificates to power producers that are emitting more gas than they're allowed to under the protocol.
- **Clean Development Mechanism (CDM)**, is a flexibility mechanism that oversees emission reductions in projects carried out in developing nations, investors from Annex I states (most of Europe for example) CERs for the actual amount of greenhouse gas emissions reduction achieved, subject to host country agreement.

An incentive to replace oil fired power plants with methanol?

Methanol For Domestic Fuels

- Dirty household fuels are the major contributor to the 4th largest killer of adults and the largest killer of young children under the age of 5 in the Developing World (IAP) !
- In India more than 2 million tones per annum of Kerosene is consumed by government subsidized home fuel scheme.
- There are at least 500 million families in the developing nations of the world who would benefit from a better fuel for cooking. If only 10% of these families switched to methanol stoves, they would consume 40kt of methanol per day, 365 days a year, equivalent to eight 5,000-ton-per day plants producing over 14 million tons per year.
- If Methanol stoves achieved a 20% market penetration then global methanol demand would be almost double the size of the current market.

Methanol For Domestic Fuels

- Project Gaia are just finishing their 850-stove pilot study in Ethiopia including four refugee camps administered by the UN High Commission for Refugees
- In Ethiopia, the project is initially using Ethanol, as a “proving ground for methanol” Project Gaia is also currently commencing a 150-stove pilot study in Delta State, Nigeria.
- *Project Gaia has amassed over 75,000 stove test days without a single accident, whether fire, explosion, burn or other mishap.*

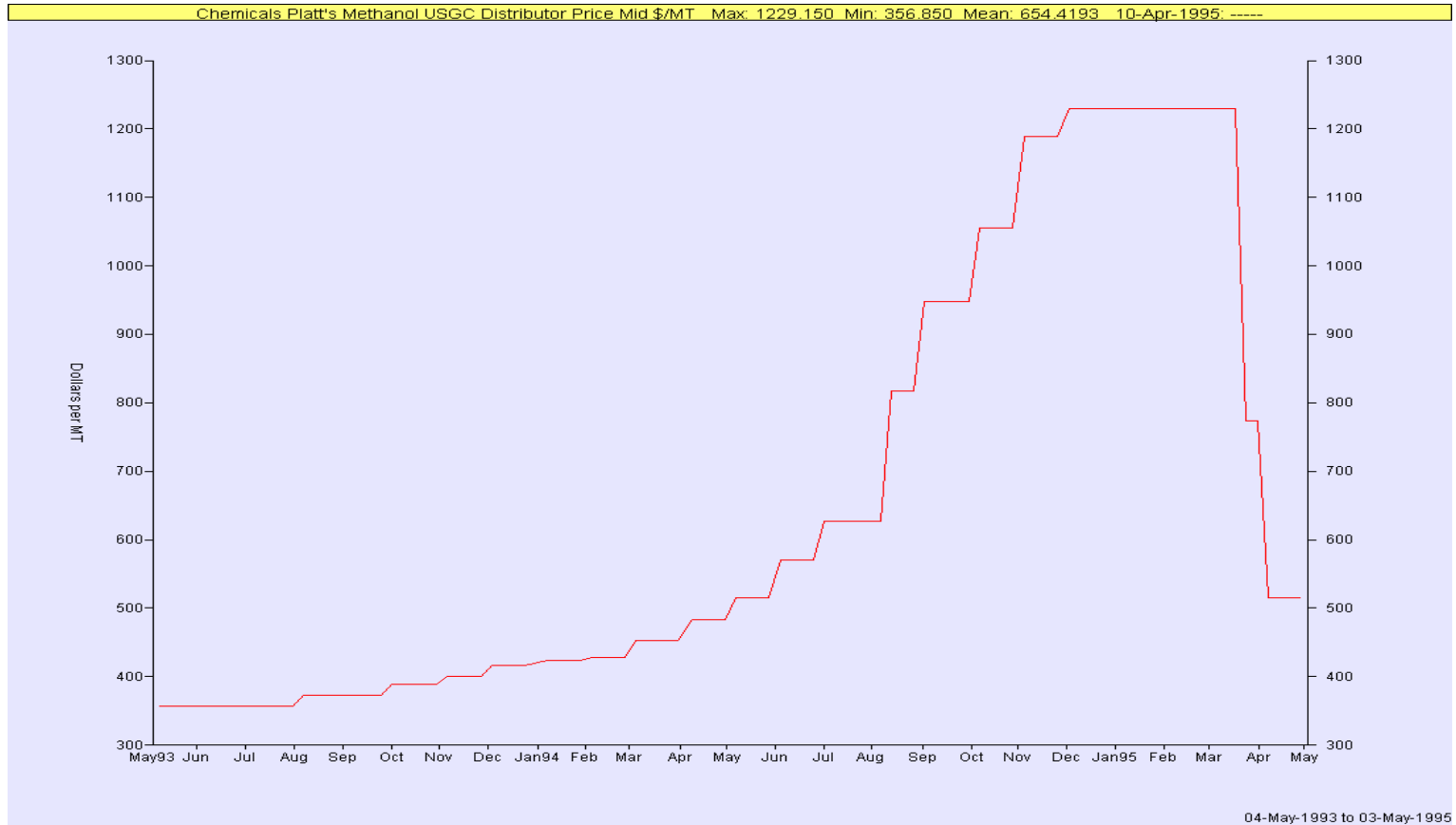
THE ECONOMICS

US\$/Gallon	E Africa	W Africa
Cost to Import Kerosene	1.73	2.49
Actual Cost to Consumer	1.34	3.84
Cost of Methanol	0.85	0.85

Key Issue to Using the Fuel in the Energy Matrix is Flexibility of Supply! A hybrid approach

- Traditionally proponents of Methanol into the energy sector have argued that you will have to sell Methanol on a fixed price This cannot work!
- We see that failure when Methanol was sold as a fuel into the Los Angeles Transit System in the early 1990s.
- The program was rapidly scrubbed when petrochemical demand for methanol outstripped the value of methanol as a fuel and no alternative was provided .
- With flexibility to supply alternative BTU we can manage price volatility in the market
- Without that

You may get repeats of this scenario



Summary

- Methanol has a huge potential market in the fuels market we as the marketers need to determine where and how the best fits for Methanol may be.
- Historically Methanol has been viewed solely as a petrochemical feedstock. Use of Methanol within the Energy Matrix has been sporadic – Methanol in the Energy Matrix will change traditional supply demand analysis and significantly the pricing basis for methanol
- The marginal demand will set the relevant price, or the value within the energy pool being the marginal demand will set the floor price
- In this pricing environment the substitution ability of various fuels makes sense depending on their relative values to each other.
- As Methanol becomes viewed as a hybrid product that could cater to the traditional petrochemical markets and to Energy Market the scope for additional methanol production would be considerable.
- Against fixed gas prices or even indexed gas prices, the market now provides the opportunity to lock in a forward Methanol price on a BTU basis that would provide a comfortable returns for the producer and competitive prices for the consumer.