Global Pet-Chem Market Outlook
Impact on Naphtha and LPG Demand

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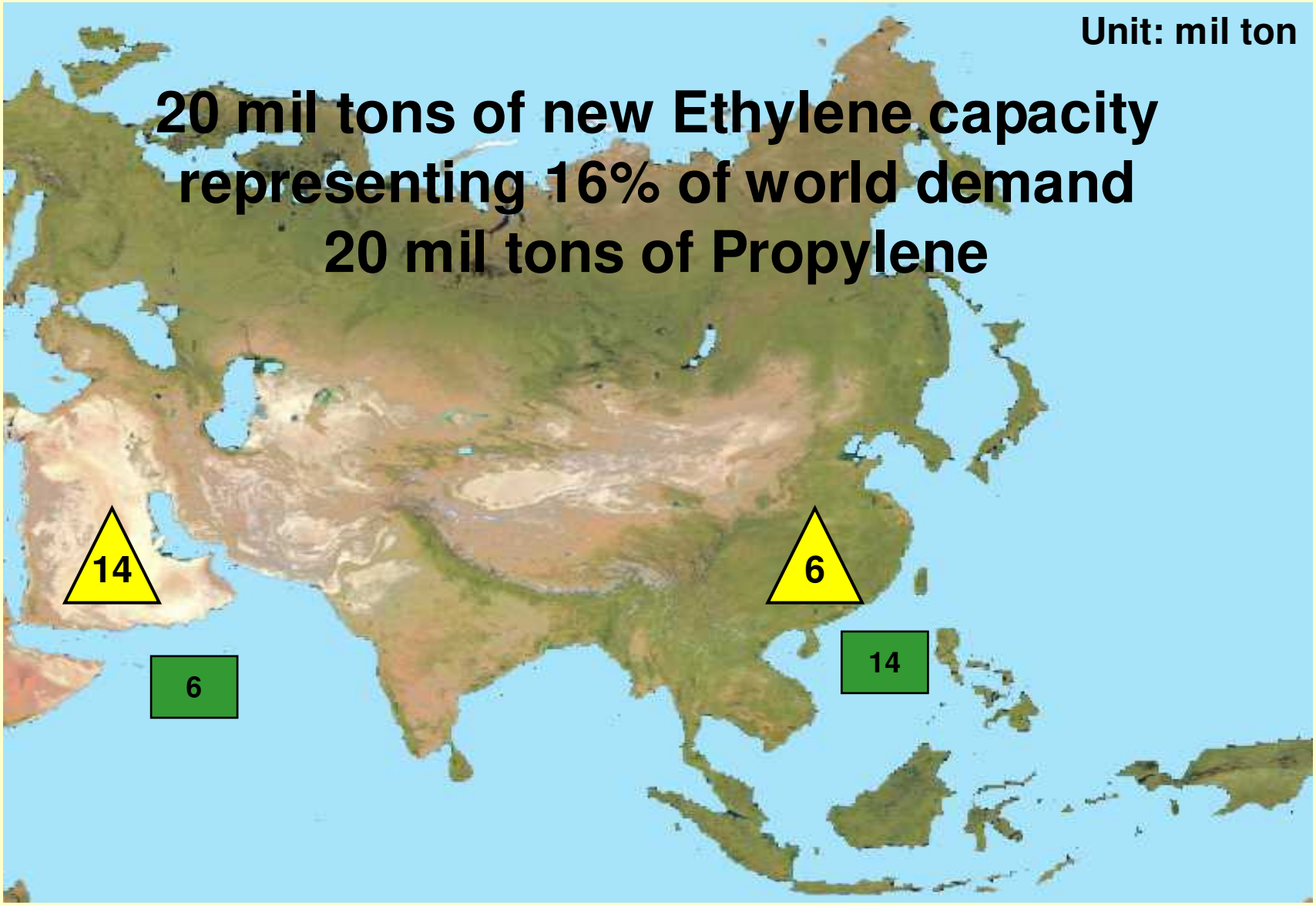
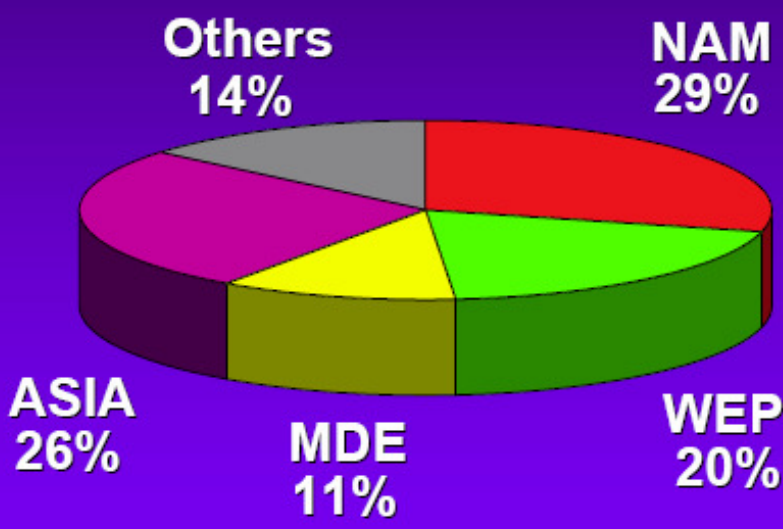
Asia and ME New Capacities From 2009~2012



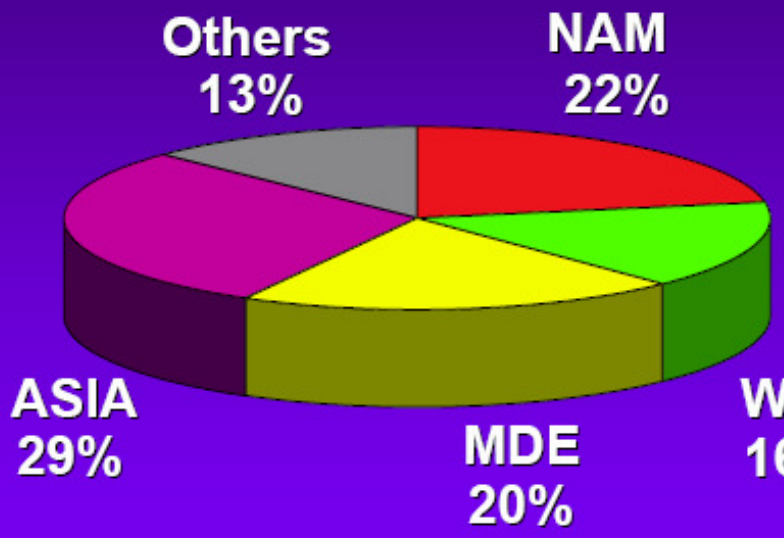
Asia & Middle East Will Own Half Global Ethylene Capacity

2006



121 Million Metric Tons

2011



156 Million Metric Tons

Petrochemical Cracker Feedstock

	2008	2012
Naphtha	45%	42%
Ethane	14%	18%
Mixed	24%	23%
E/P	15%	15%
Heavy Liq	2%	2%

Most of the Middle East cracker will use ethane, while new crackers in Asia, predominantly in China, will use naphtha.

Crackers in US converting to Ethane/propane.

China expansions may create some naphtha shortage in China.

Condensate splitters generate additional naphtha.

Gas crackers enjoy big advantage above $60/bbl crude.

Naphtha is expected to be long due to reduced Naphtha cracker operating loads in 2010.

China and ME Capacity Growth

Rapid expansion of Petrochemical capacity in China and middle east creating a huge surplus. Most of this does not result in net naphtha supply demand.

China 2009/2010

Key Crackers	KTA	Time
Fujian	900	3Q 09
Huajin(Panjin)	875	3Q 09
Dushanzi	750	3Q 09
Tianjin	800	1Q 10
Zenhai	1000	1Q 10
Baotou (CTO)	520	3Q 10
Shenhua(CTO)	500	2Q 10
Datang (CTO)	500	3Q 10

(CTO total olefin capacity)

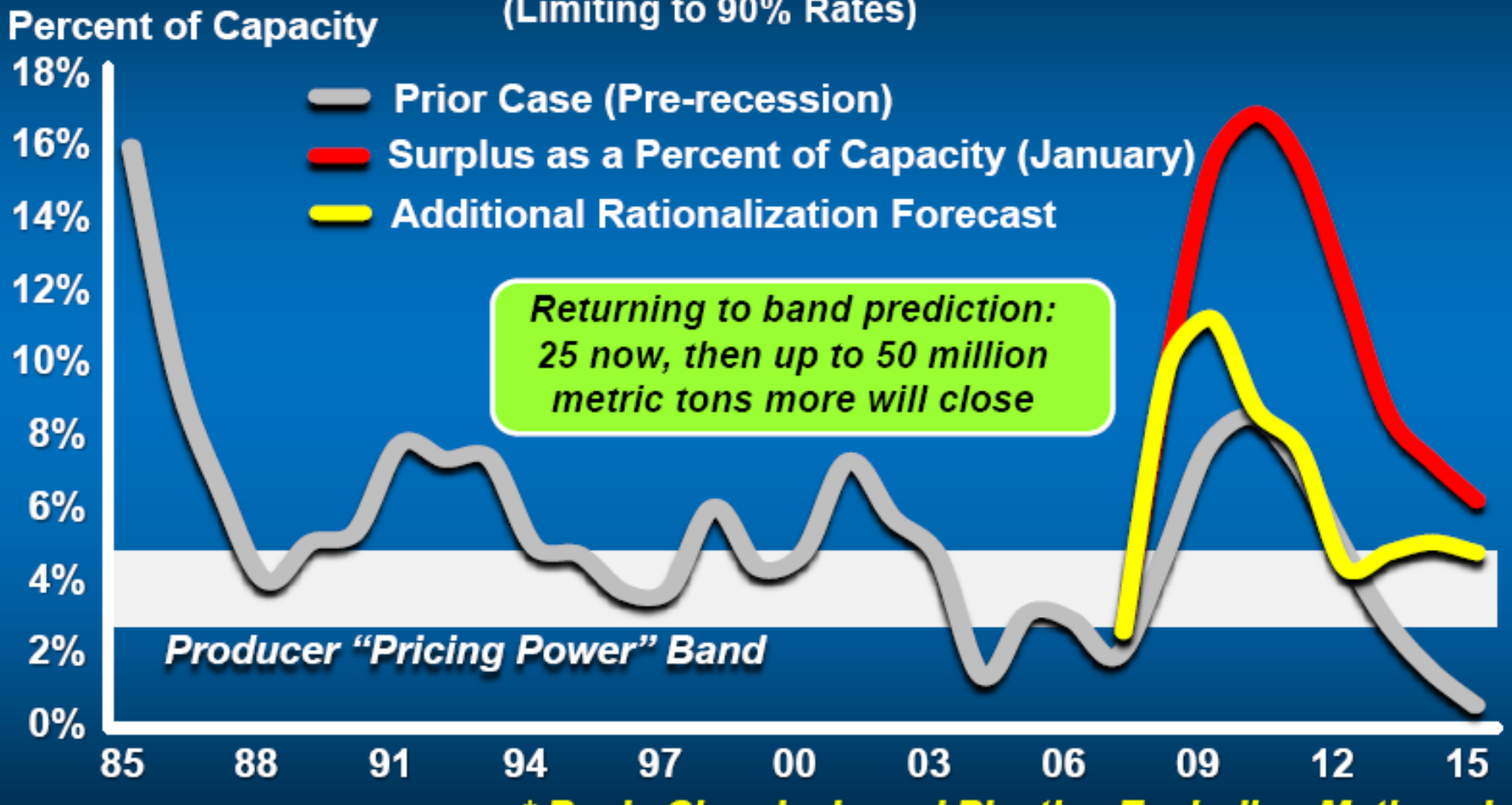
Middle East 2009/2010

Key crackers	KTA	Time
Saudi PetroRabigh	1250	2Q 09
Saudi SEPC	1000	2Q 09
Saudi Yansab	1300	3Q 09
Kuwait Equate-2	850	3Q 09
Qatar RLOC	1300	1Q 10
Iran No 5	500	1Q 10
Saudi Sharq	1200	1Q 10
UAE Borouge	1400	2Q 10

KTA ethylene capacity

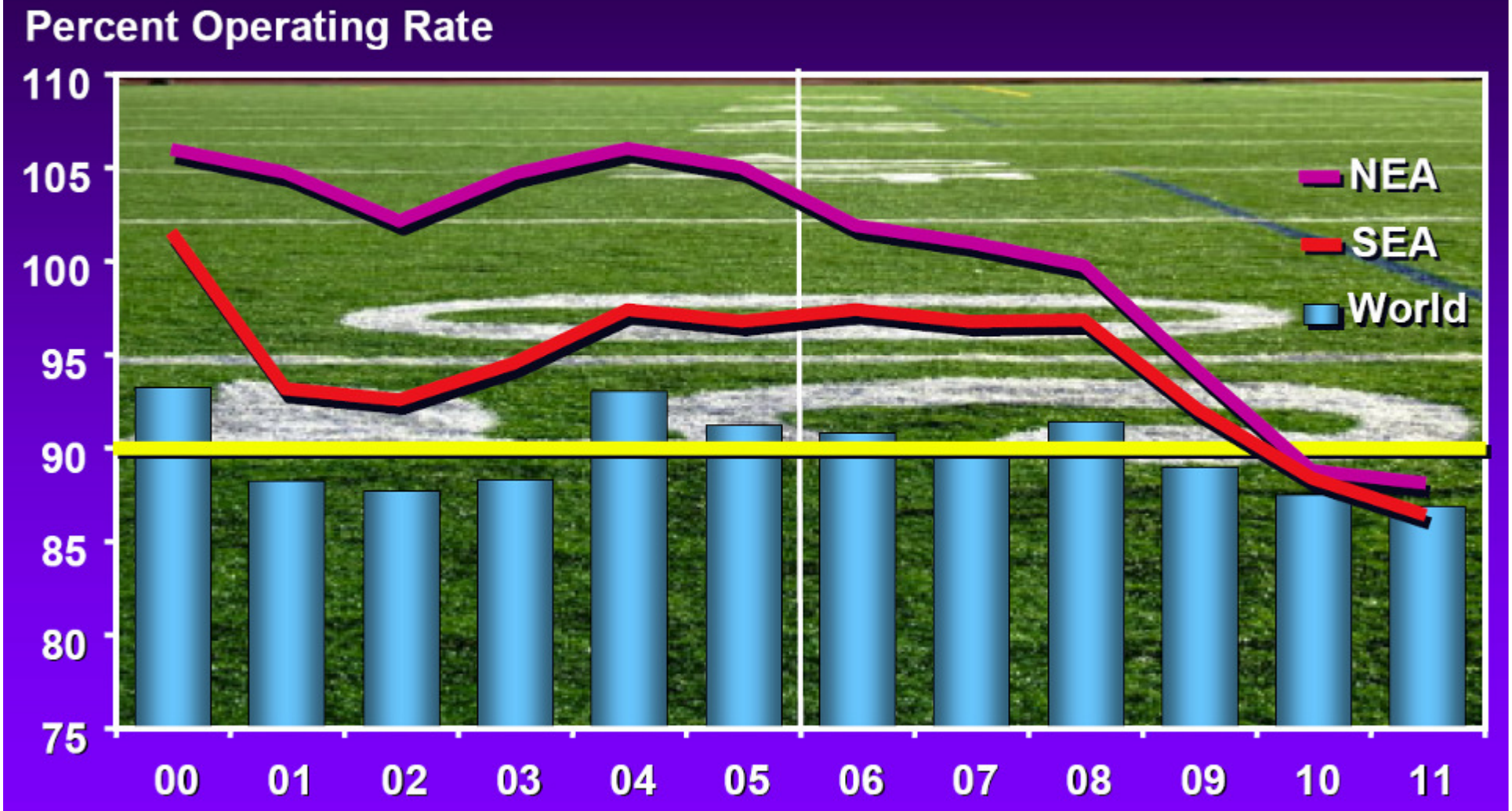
How Bad Could This Down Cycle Become?
Impact Of Recession and a Scenario
Effective Global Operating Surplus*

(Limiting to 90% Rates)

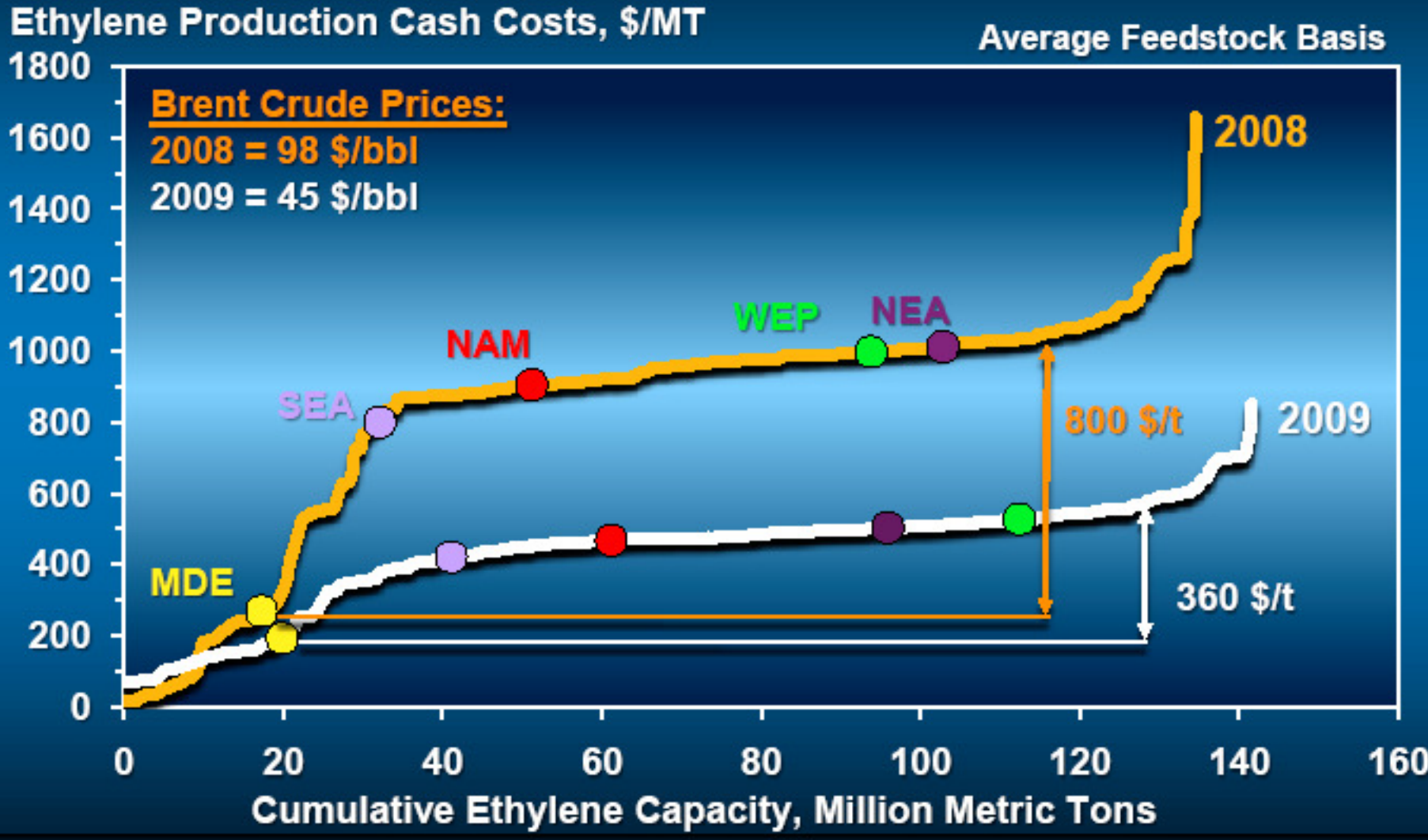


* Basic Chemicals and Plastics Excluding Methanol

Asia Rates Could Take Hardest Hit



Middle East Advantage Significantly Reduced at Lower Oil Prices



Asian Pet Chem Crackers
Issues/Opportunities

-Middle East (cost advantage) and China (near the market) will run at full capacity while others in Asia, EU and US will run at reduced rates.

-Feedstock Diversification is a key strategy.

Primary short term opportunity is with C4 and C3 LPG.

LPG is expected to be long 2008-2012.

Year round LPG cracking may be possible.

-Middle East running out of ethane for new projects and will have to depend on more mixed feed.

-Growing condensate production will add to the naphtha supply.

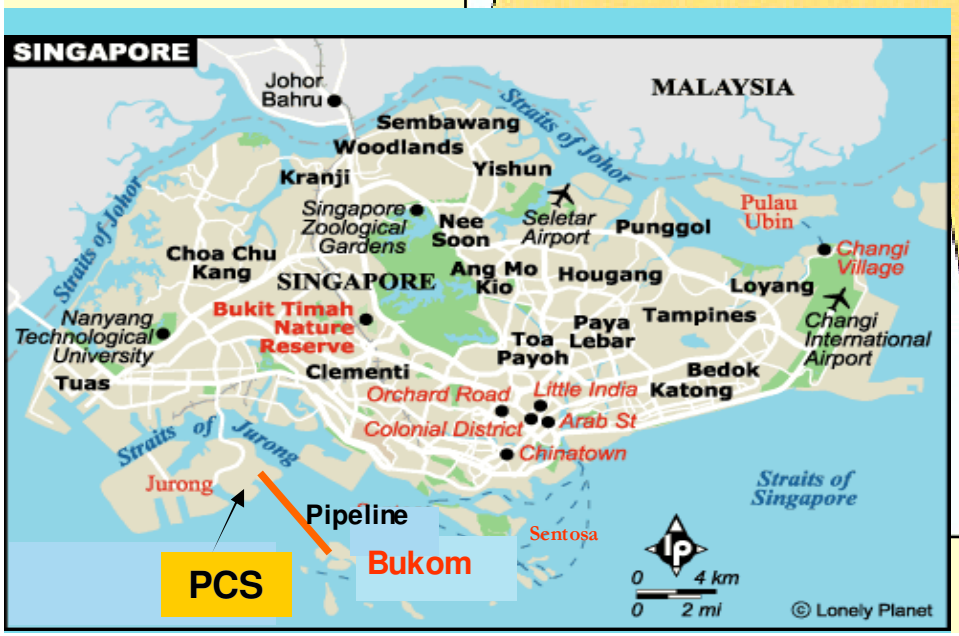
-Poor Aromatics product margins will encourage pygas sales into MOGAS pool.

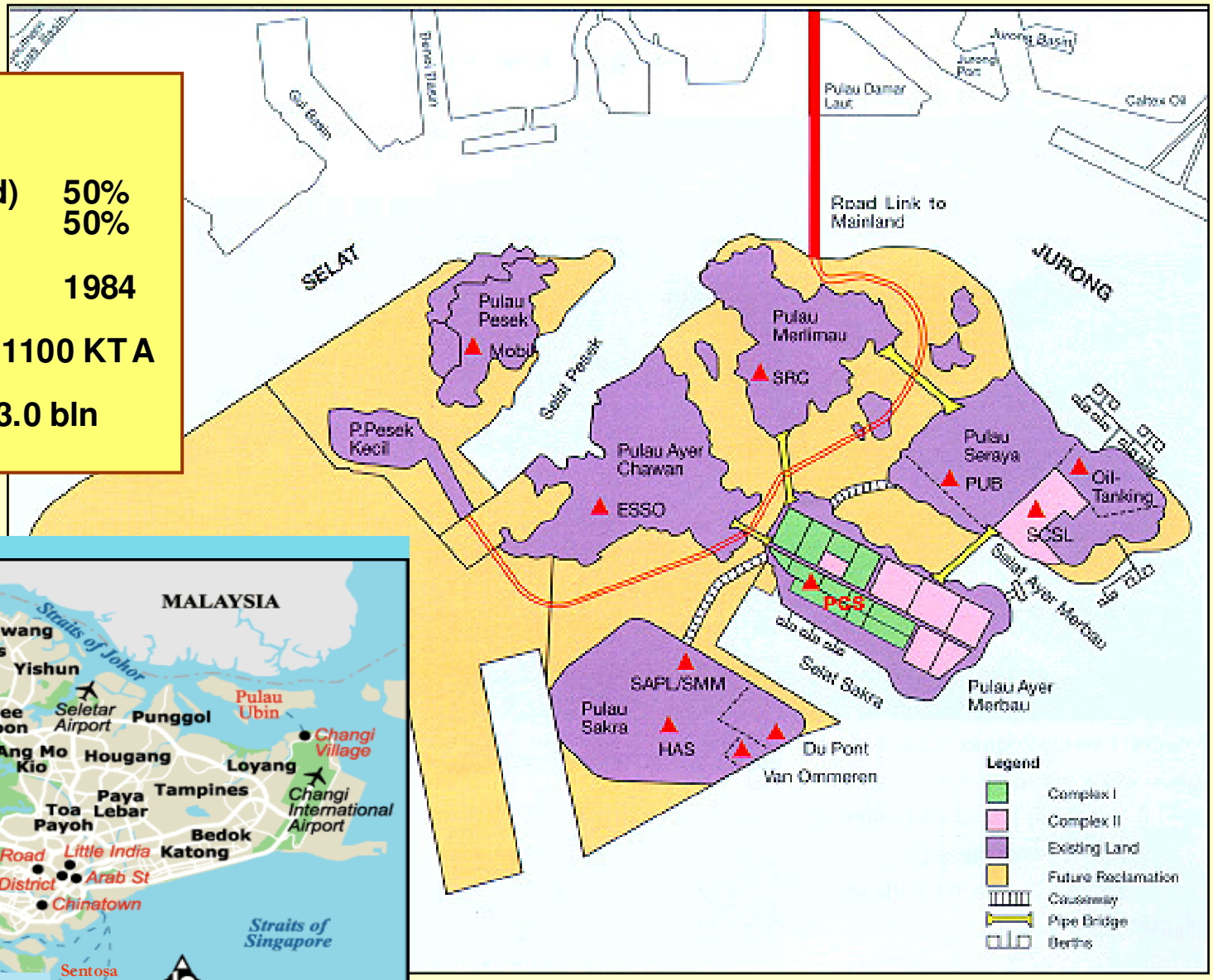
-C4 chain may stay strong as new gas based ME capacity lack C4.

Introduction to Petrochemical Corporation of Singapore

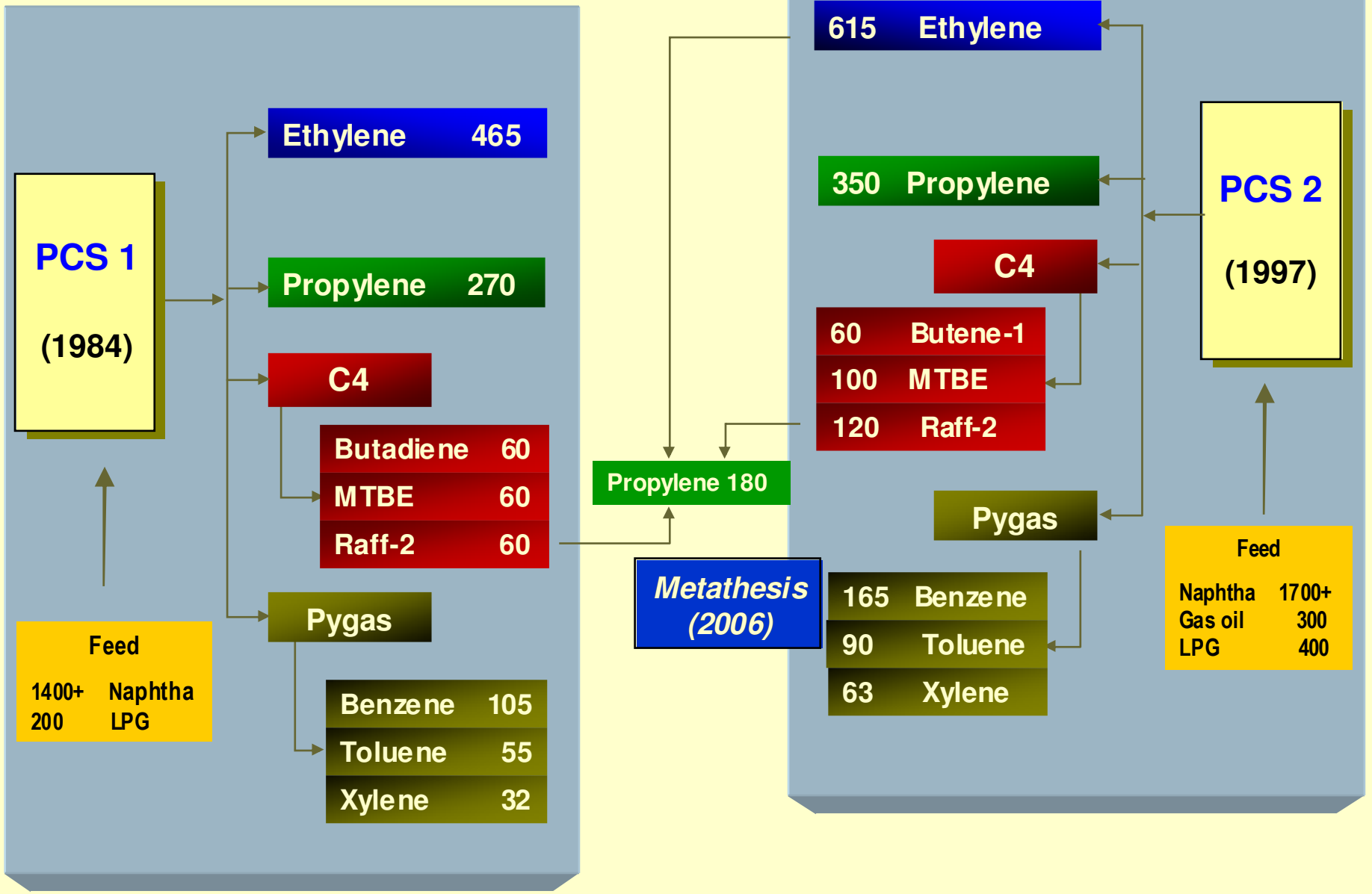
Corporate Data

Shareholders	
JSPC (Sumitomo led)	**50%**
Shell	**50%**
Start-up	**1984**
Capacity	**1100 KTA**
Turnover (2008) USD	**$3.0 bln**

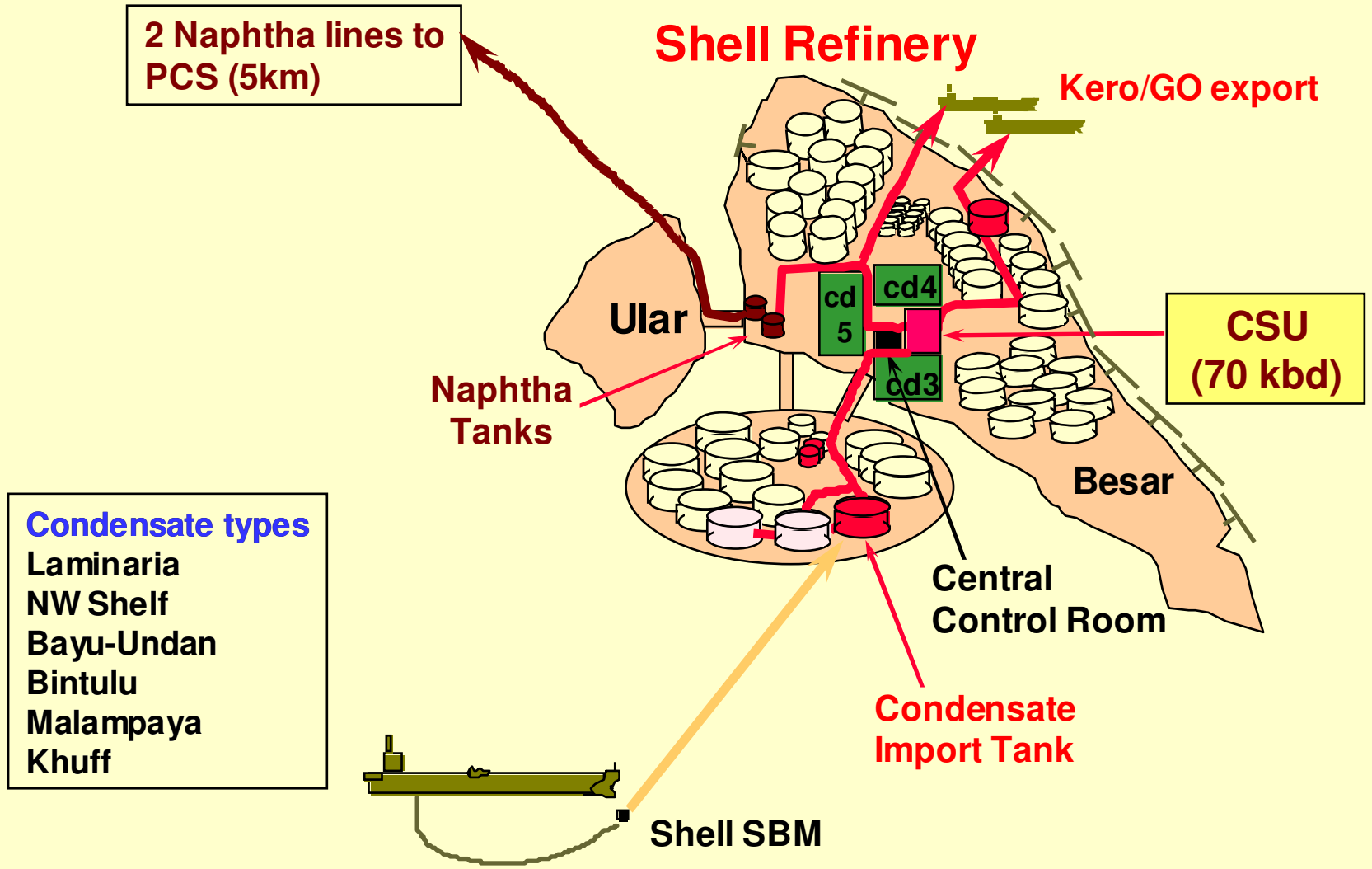




PCS - Two Cracker Complexes...



... and a condensate splitter at Shell Bukom refinery as JV between Shell/PCS



Naphtha supply from CSU for up to 1.5 million tonnes

Refinery Integration

Refinery-PetChem Integration Can creates “win-win”

Refinery to Pet-chem

- Feedstock (LPG, Gasoil, naphtha, Kerosene, Dry Gas)
- Propylene
- C6 heart cut (benzene rich stream)
- Benzene
- Utilities

Pet-chem to refinery

- BTX raffinate for gasoline (PCS : RON 80-83, RVP 5-7)
- C4 raffinate for alkylation
- Pygas for Gasoline blending.
- Propane for LPG
- Fuel gas
- Hydrogen
- Light FO ----> Gas Oil /Kerosine blending
- Heavy FO -----> HSFO pool (esp.. viscosity cutting)

Condensate splitting

- Locate in refinery to maximise middle distillate synergies
- Option to split naphtha for steam cracking (light) and reforming (heavy)

APME PetChem NAPHTHA SUPPLY 2008~2010

-1.6
-4.0
+4.0

Arbitrage Cargoes

S Arabia
Kuwait
Qatar
UAE
Other AG

Middle East
+30
+30
+36

Indian/Pakistan/ Bangladesh
3.4
5.0
6.0

S. Korea
Japan
Pacific Russia
1.1
1.2
1.3
--18.7
-18.9
-18.3
-14.2
-17.1
-16.2
Taiwan
-8.7
-8.7
-8.3
-0.4 China
-0.7
-1.0

North Asia
-32
-34
-32

S'pore
- 1.1
- 1.4
- 1.1
Other ASEAN
0.8
0.7
0.5.

SE ASIA
-0.9
-0.7
-1.5

Australia/NZ
0.8
0.7
0.7

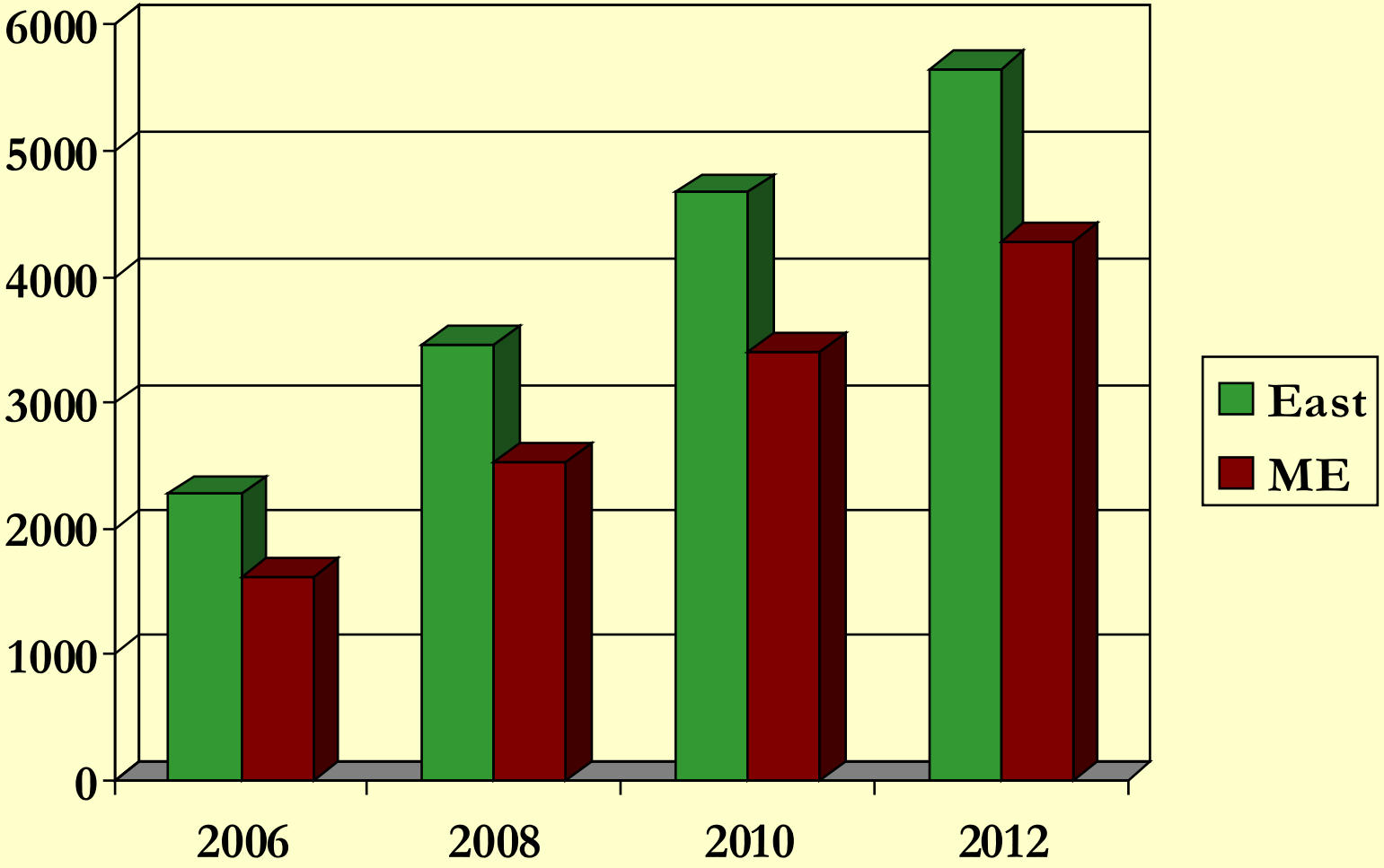
REGION
1st Number: 2008
2nd Number: 2009
3rd Number: 2010

Unit: Million MT/yr

Naphtha Markets 2009/2010

- Merchant Supply grows from 90 mln tons in 2008 to 94 mln tons in 2009.
- 1H of 2009, East was short and imported from Europe.
- More Indian and AG barrels now available 2H 2009.
- Mid East cracker products will depress naphtha demand starting 4Q 2009.
- More LPG use also reduced naphtha demand.
- Weak refining markets may reduce some naphtha supply.
- Europe's length increases in 2010 as local PetChem demand weakens and Algeria adds additional 3.5 mln tons (Sonatrach).
- Middle East NGL/GTL/Splitting yields additional 9 mln tons of naphtha in 2010.
- Overall East switches from short to long in 2H 2010.
- Where will excess naphtha from ME/Europe go? US is natural choice, but will not be PetChem feedstock.
- The naphtha crack spread over crude will be weak in 2010.

Condensate Production (kbd) East of Suez



Condensate production is showing an increasing trend driven by Middle East gas production.

Condensate Trade Considerations

- Condensate is processed in the Middle East primarily for local gasoline demand. This in turn generate more paraffinic naphtha for export. No new greenfield refinery in ME except Rabigh till 2012.

- Asia-Pacific condensate splitters are mainly focused on petrochemicals.
  -N+A used for aromatic and paraffinic for olefin production.

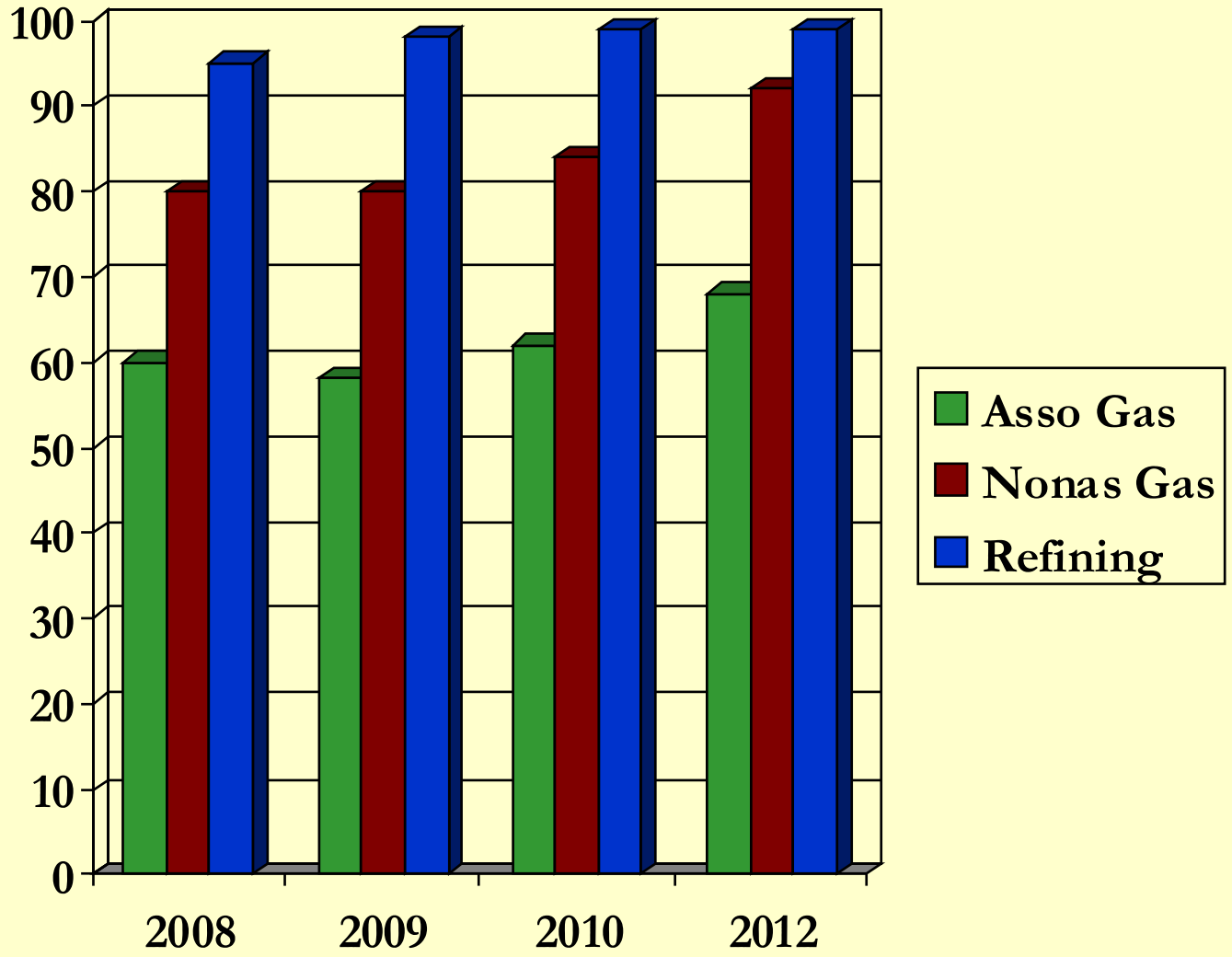
- Condensate splitter can be built much quicker than a refinery or a petrochemical plant (i.e.18 months).

LPG Outlook

More LPG use will depress naphtha demand.

- **Both gas field developments in Middle East and refinery expansions lead to excess LPG production.**
- **Global LPG supply will rise 20-30 mln tons (2008-2012).**
- **Pet Chem crackers can absorb 5-10 mln tons if pricing incentives exist.**
- **This excess supply may change the historic pricing relationships to crude and may offer year round cracking opportunities.**
- **LPG logistics and infrastructure may hamper higher utilization by Pet Chem producer in short term.**
- **Sustained pricing incentives will allow more LPG investment (furnace, logistics, etc.)**

Global LPG Supply Growth (mln tons)



Conclusions

Huge Petro-Chemical build in China/Middle East starting-up in 2009-2012

- Much bigger capacity build than demand.
- Some capacity shutdowns in EU, NA and NEA.
- Industry operating rates and margins will be under pressure.

Refiners may not enjoy the high naphtha crack spread in 2010 due to excess naphtha supply.

- Much of the excess naphtha supply is NGL/Condensate driven not refining.
- Excess supply seen in LPG as well.

Economic recovery and industry rationalization will help.

- Key polymers (PE/PP) growing at higher than GDP.
- Middle East is running out of ethane capacity.

Thank You