

CESIO Conference – Vienna, Austria

June 7th 2011

**Biomass
a New Feedstock Value Chain for Surfactants**

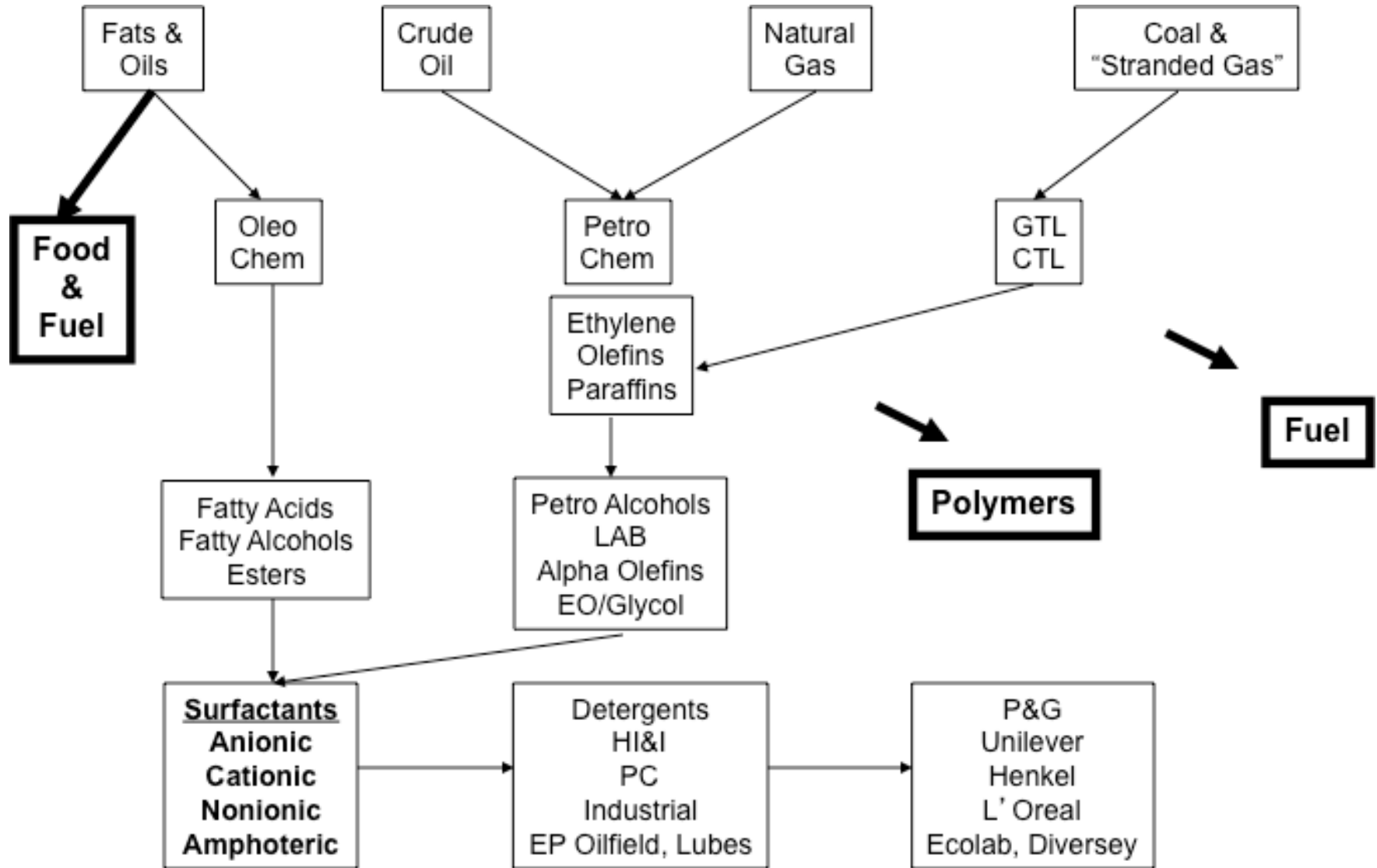
Neil Burns

NEIL A BURNS LLC

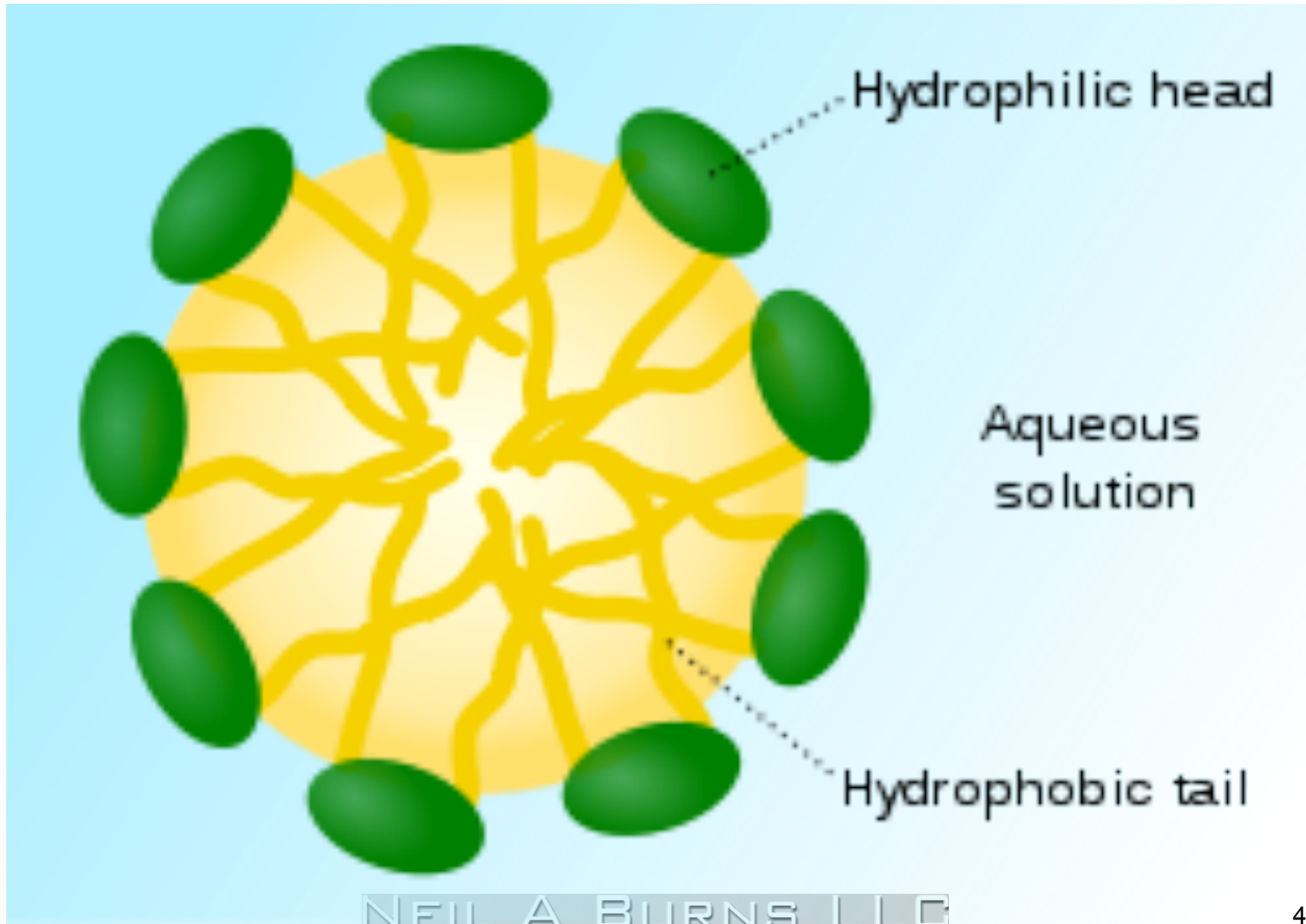
Agenda

- Surfactant Technology Framework
- Feedstock Economics
- The Sustainability Problem
- The Biomass Solution

Surfactant Value Chain



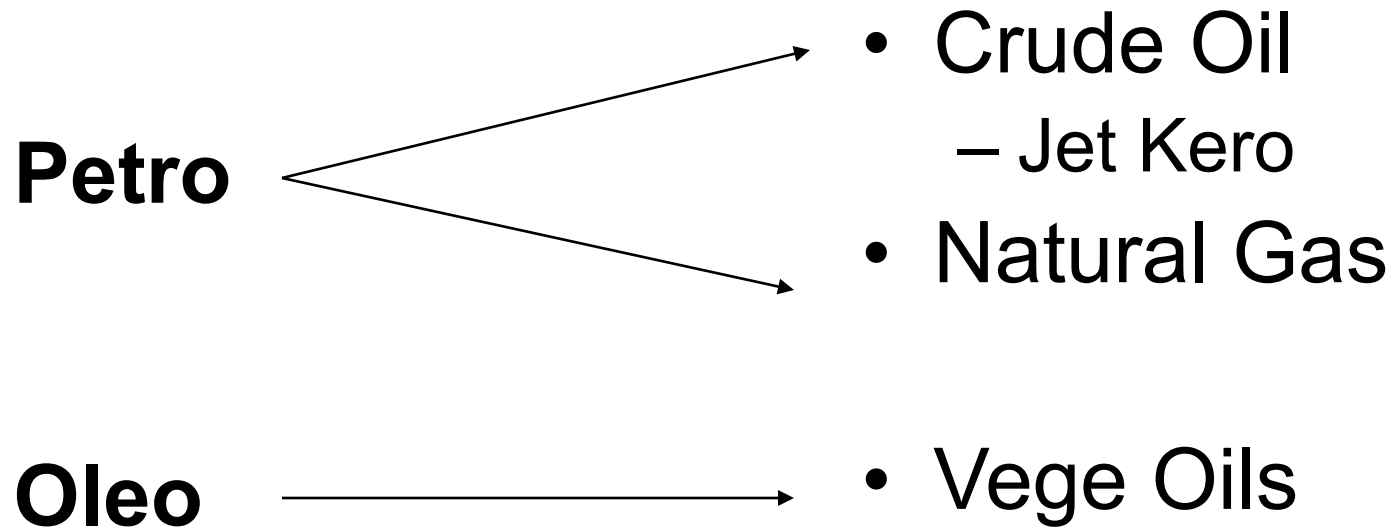
Surfactants are Simple



....Really Simple

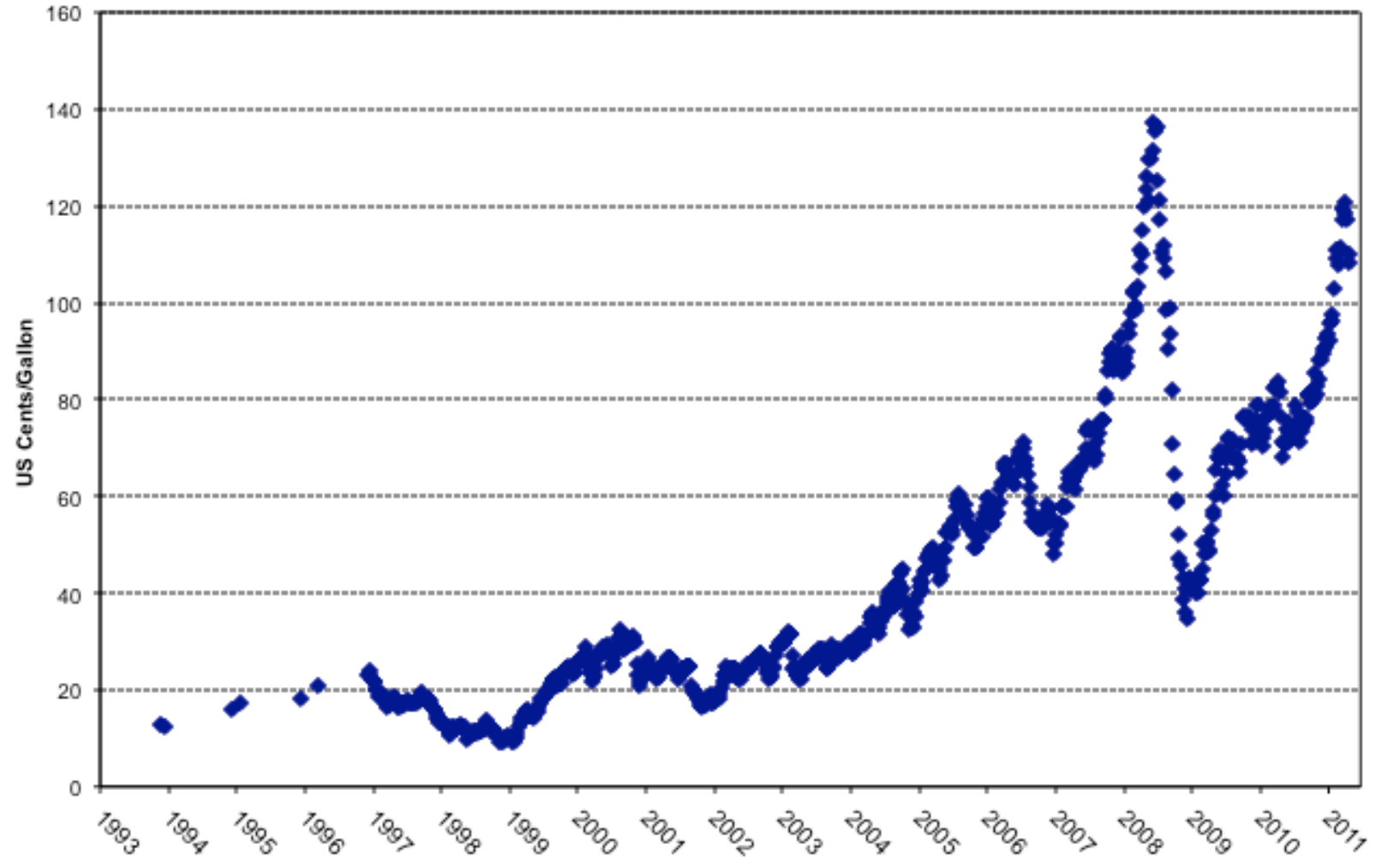
	<u>Hydrophobe</u>	<u>Hydrophile</u>
Derivation	<p>Detergent Alcohols</p> <p>LAB</p> <p>LAO</p> <p>Fats / Oils</p>	<p>SO₃</p> <p>EO</p> <p>-NH₂</p> <p>MCA & etc..</p>
Combination	<ul style="list-style-type: none"> • Sulfonation • Ethoxylation • Drying / Granulation / Pelletization • Quaternization 	

Feedstock Economics



Crude Oil

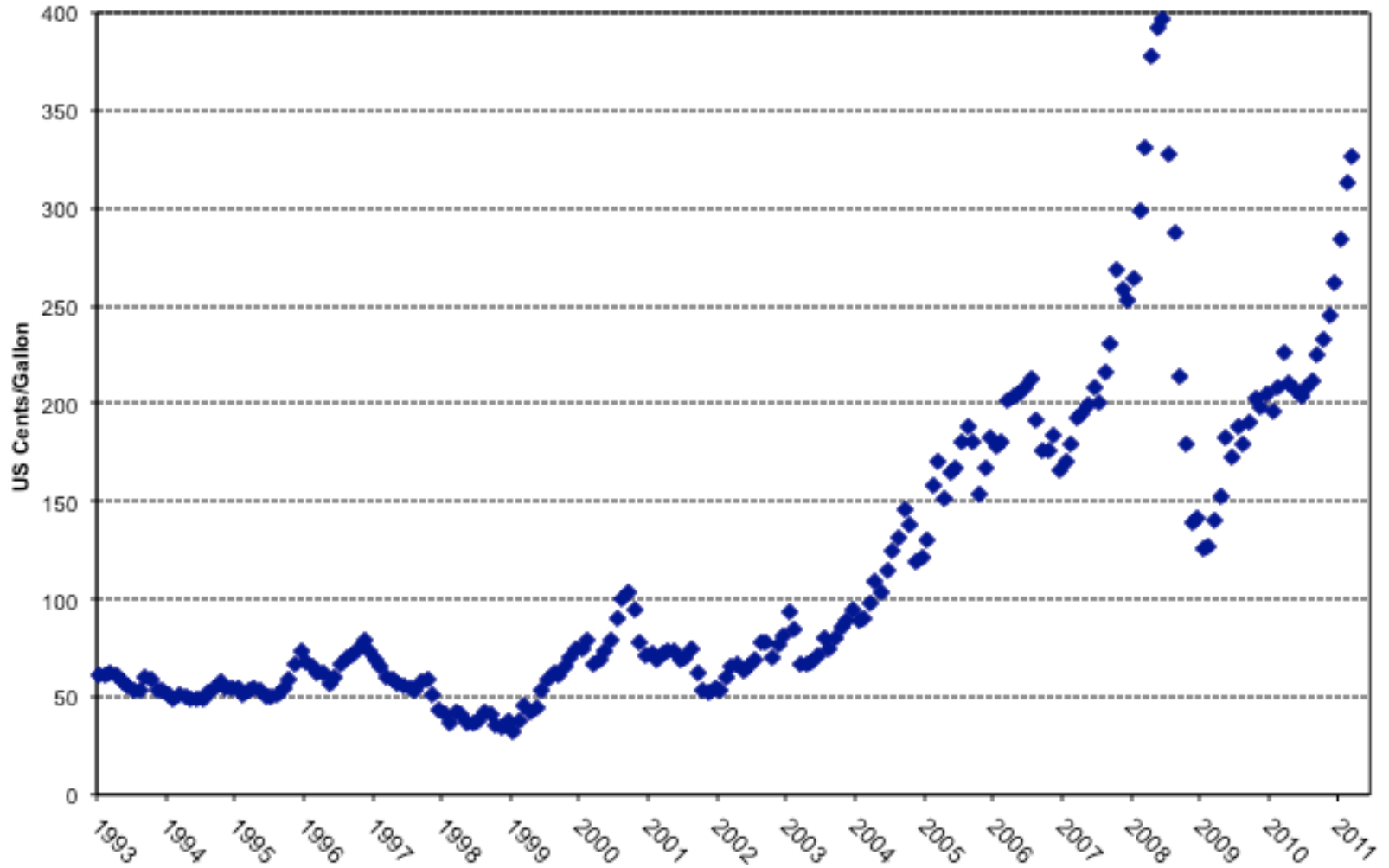
Crude Oil - World Average Price in USD / BBL



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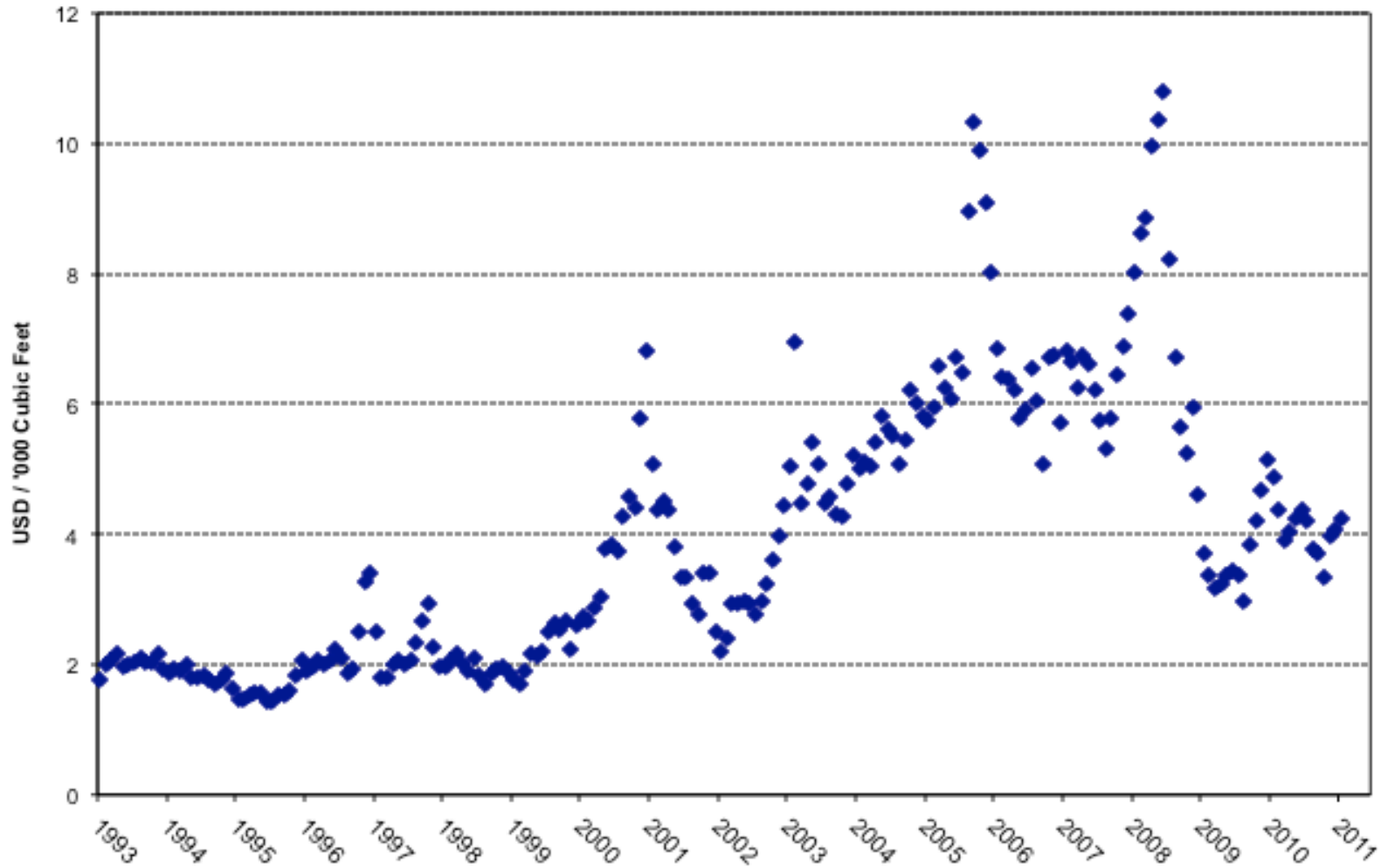
Jet Kerosene

Jet Kero (Singapore) US Cents/ Gallon



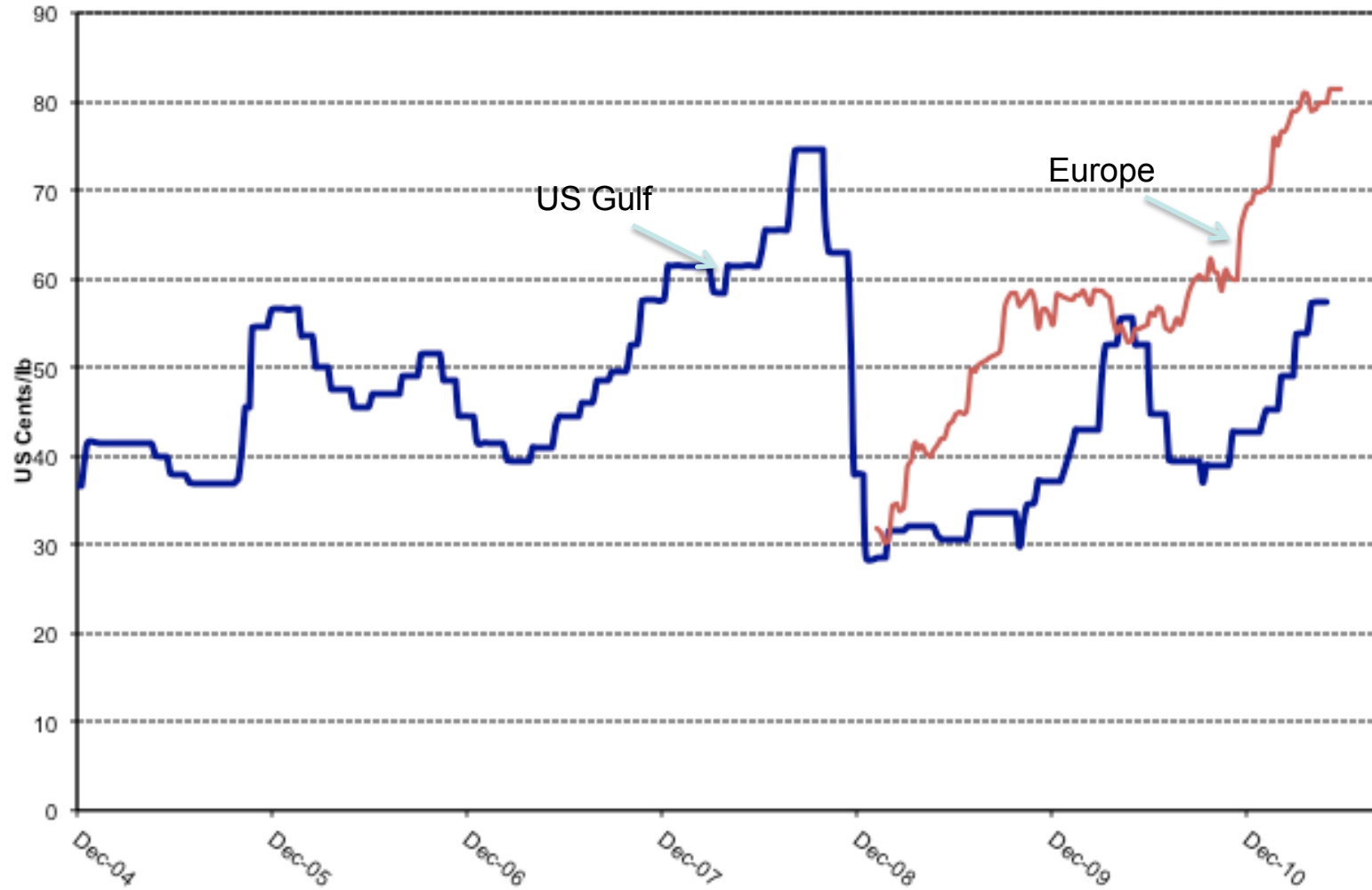
Natural Gas

US Natural Gas Wellhead Price - USD/'000 Cubic Feet

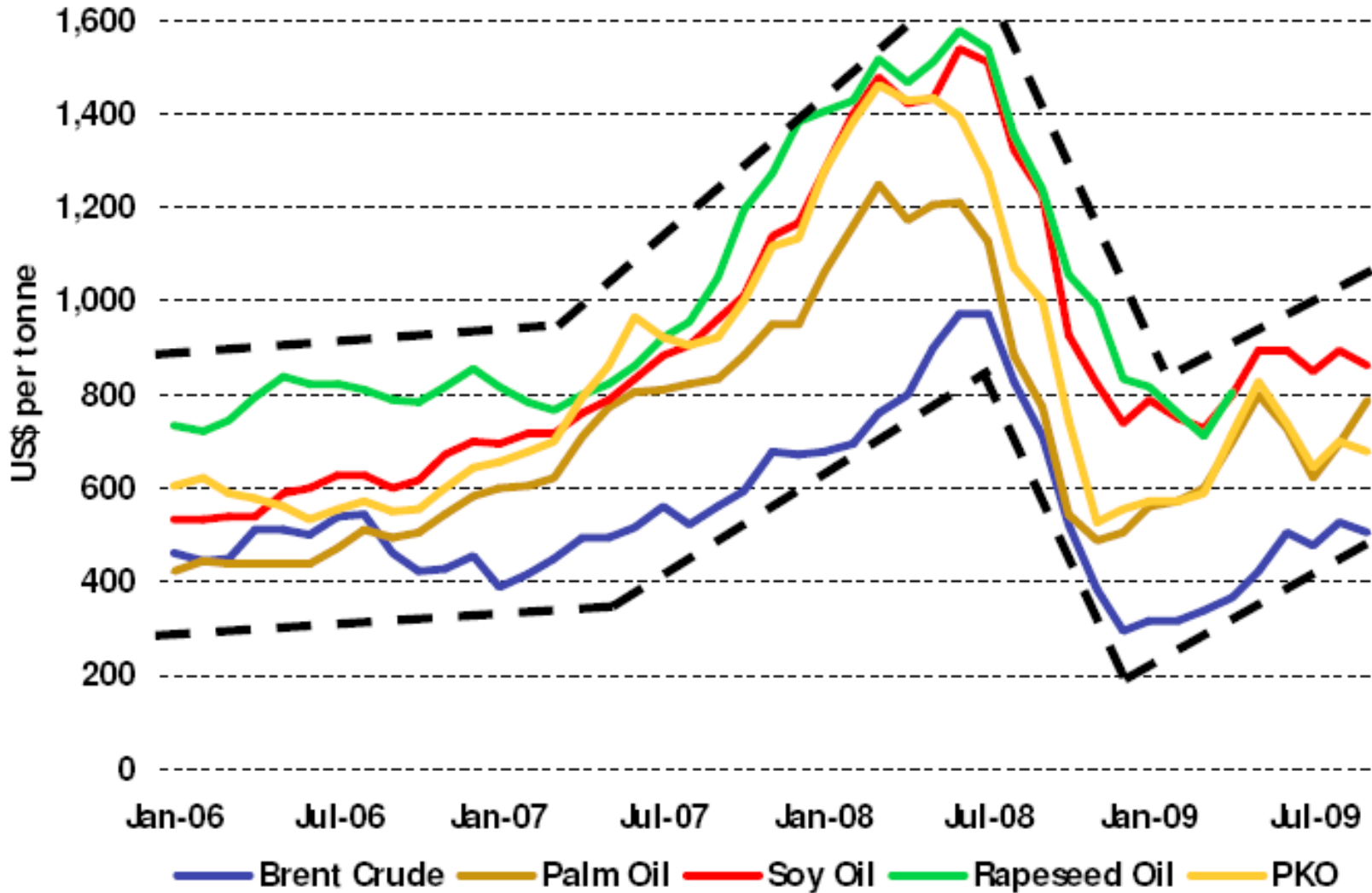


Ethylene Markets Diverged

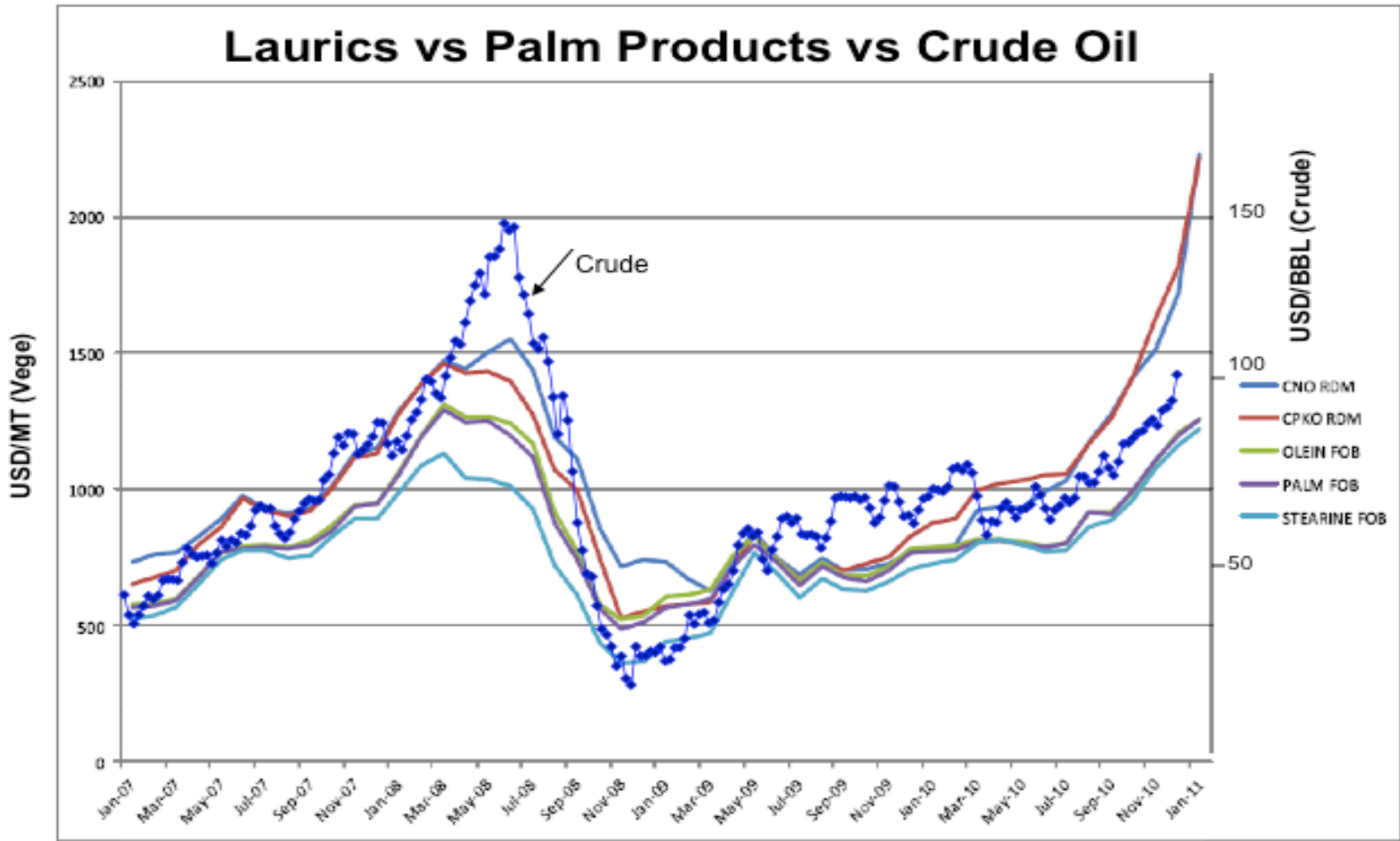
Ethylene - US Gulf and Northwest Europe Contract Price (Cents/lb)



Through '08 Crude and Vege Moved Together

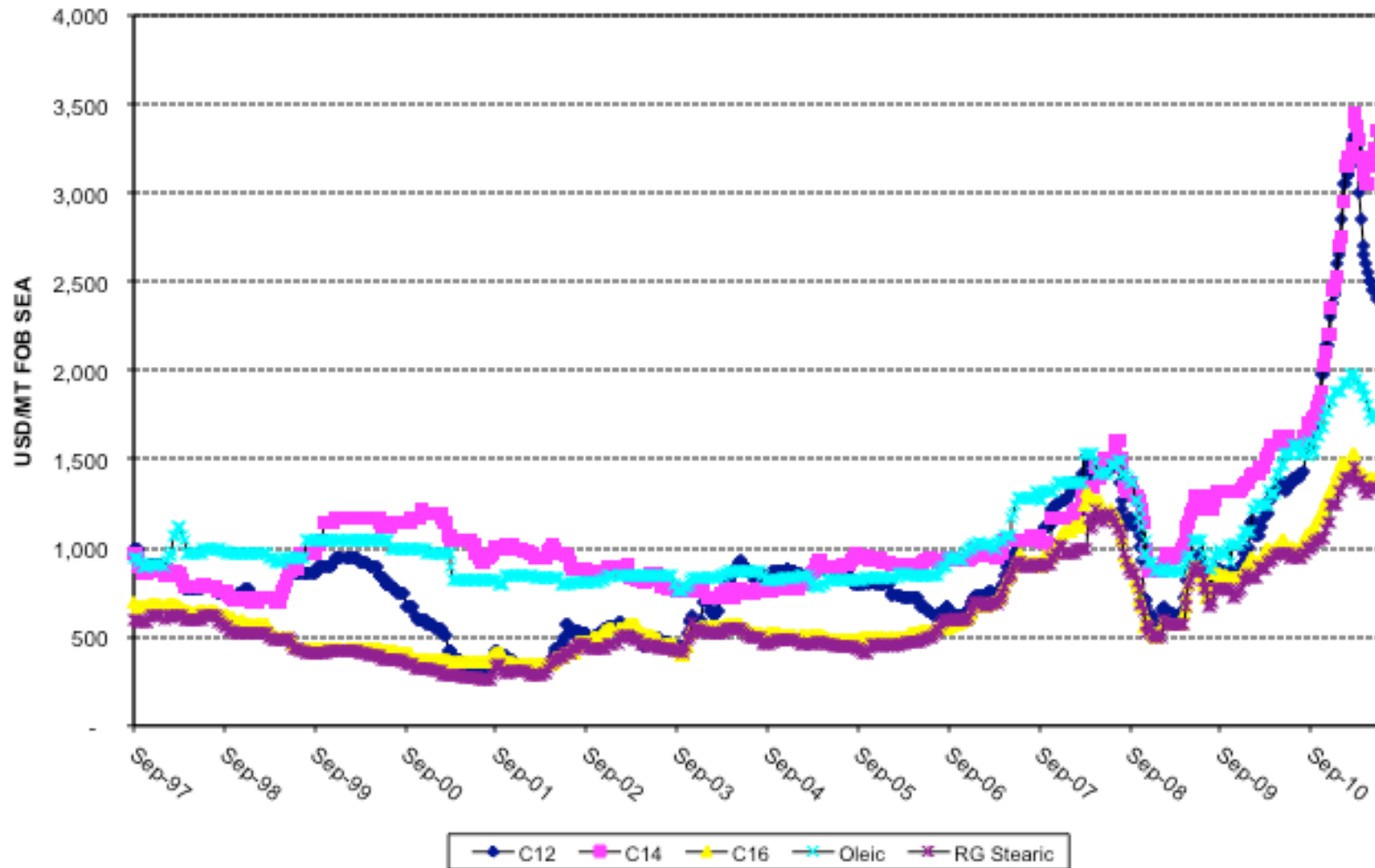


Continued volatility with Laurics out on their own



..with predictable effect on fatty acid pricing

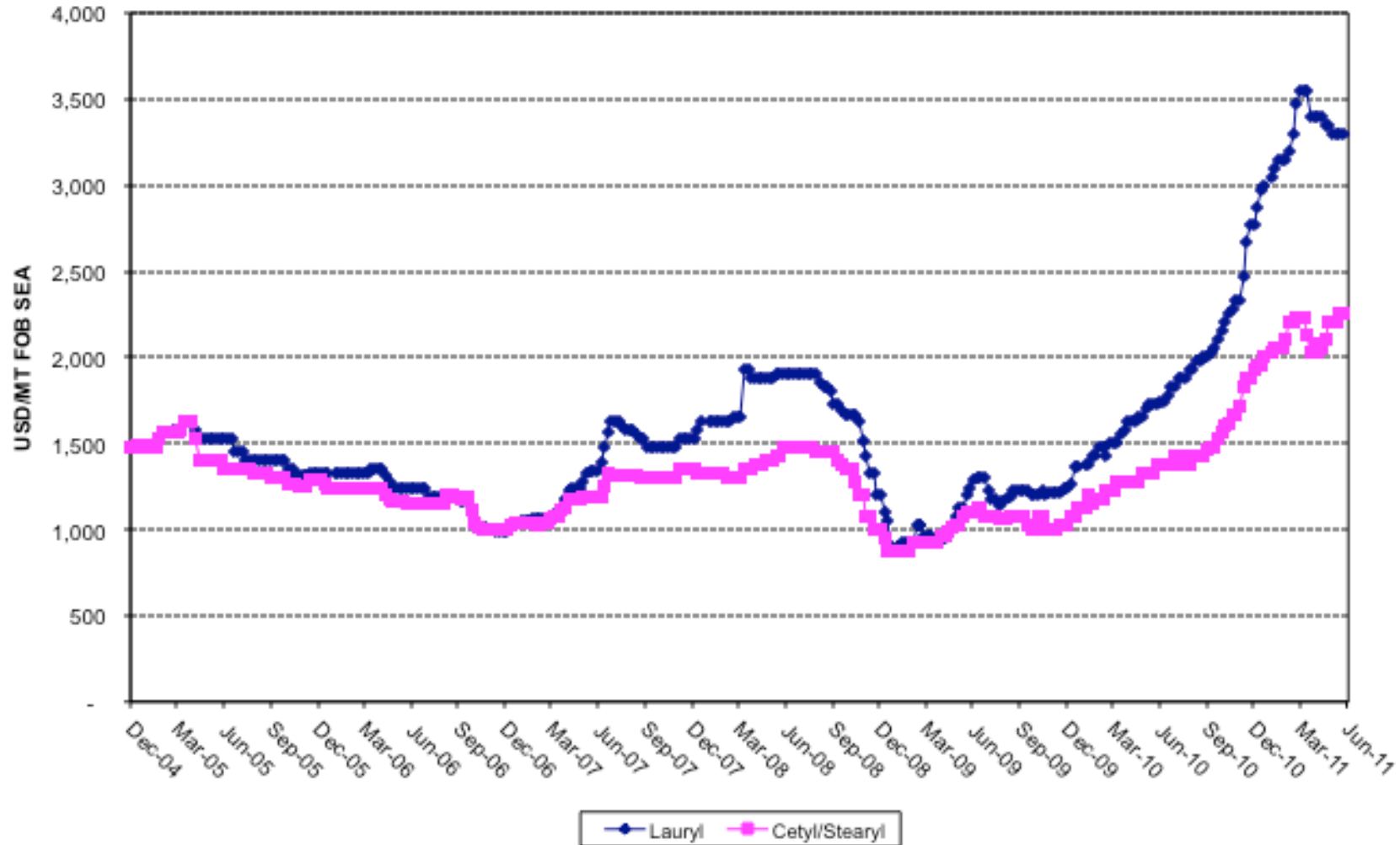
Fatty Acid Price Trends '97 - '11
(USD/MT FOB SE Asia)



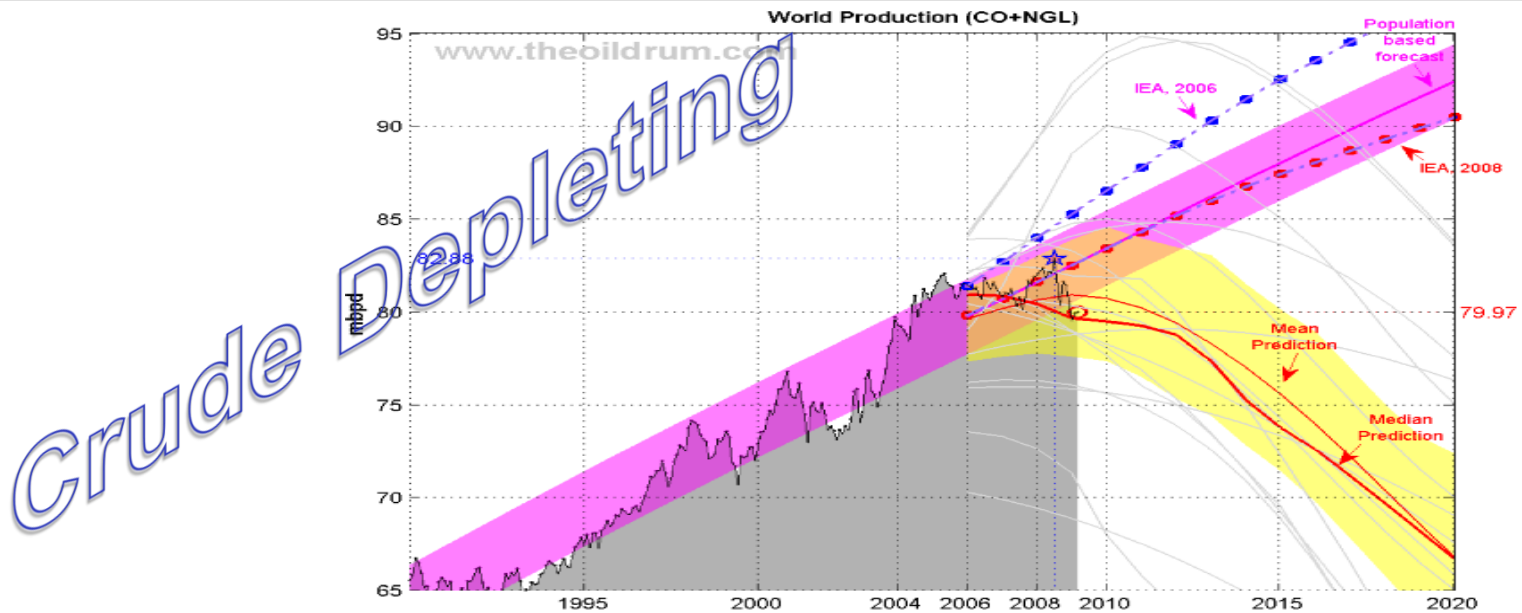
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....and on alcohol pricing

Fatty Alcohol Pricing Trends '04 - '11
(USD/MT FOB SE Asia)



Sustainability



RSPO Since 2003 and now 440 members

- Banks and Investors (8)
- Consumer Goods Manufacturers (125)
- Environmental or Nature Conservation Organisations (NGOs) (14)
- Oil Palm Growers (87)
- Palm Oil Processors and Traders (172)
- Retailers (26)
- Social or Development Organisations (NGOs) (9)

Palm under pressure

The Biomass Solution

- Non-oleo and Non-petro feedstocks
- Not correlated to food or fuel
- Genetic Modification
 - Solazyme
 - Codexis
- Metathesis
 - Elevance

Marketing Alert!

The Biomass Solution

- For further company information see:
 - Solazyme (www.solazyme.com)
 - Codexis (www.codexis.com)
 - Elevance (www.elevance.com)

Conclusions

- Feedstock sourcing is a major strategic issue
- Biomass offers an alternative
- Technology is emerging to commercial status
- If you make or use surfactants you need to be familiar with this space