



North American Raw Material Outlook

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July, 2011

FlintGroup

FORWARD LOOKING STATEMENTS

This report contains a number of forward looking statements. Forward looking statements reflect our current views about future events and are based on currently available financial, economic and competitive data and therefore include a level of risk and uncertainty.

Raw Material Market developments & opportunities to manage ink raw materials

- Generic
 - Fundamentals
 - Crude Oil & Currencies
 - GDP
 - Key market cost developments
 - Base Chemicals
- Pigments
- Whites and Blacks
- Solvents
- Resins
 - Rosins & Phenolic Resins
 - Hydro Carbon Resins
 - Nitro Cellulose
 - Acrylics

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Raw Material Cost Developments

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Fundamentals – further bad news in the near future

Volatility – uncertainty – short term – high risk

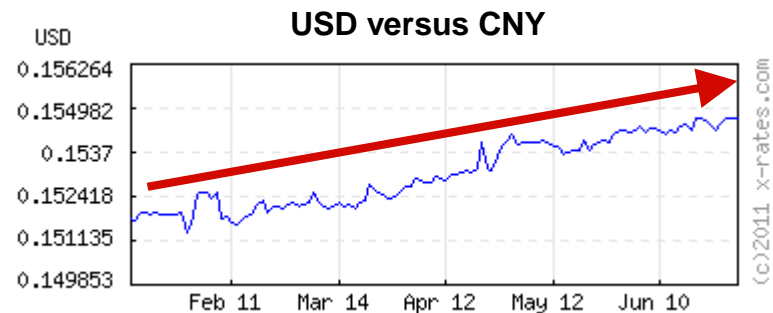


Crude Oil

- Extremely volatile movements
- Some of our materials respond quickly, some take time
- Supplier do not dare to “guarantee prices” for any longer period
- It will remain volatile, but to where?

Currencies

- CNY strengthening against USD, 5% in the last 6 months
- This will continue, economic forecasting expects the CNY to strengthen each year by 1– 2%



GDP China



GDP 15 years
Average @ 8.4

❑ China holding the key to many critical ink materials

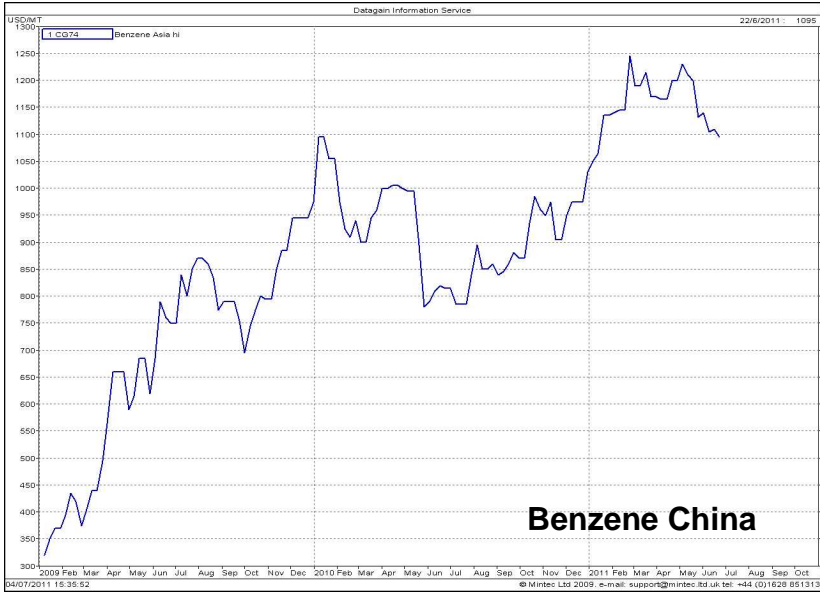
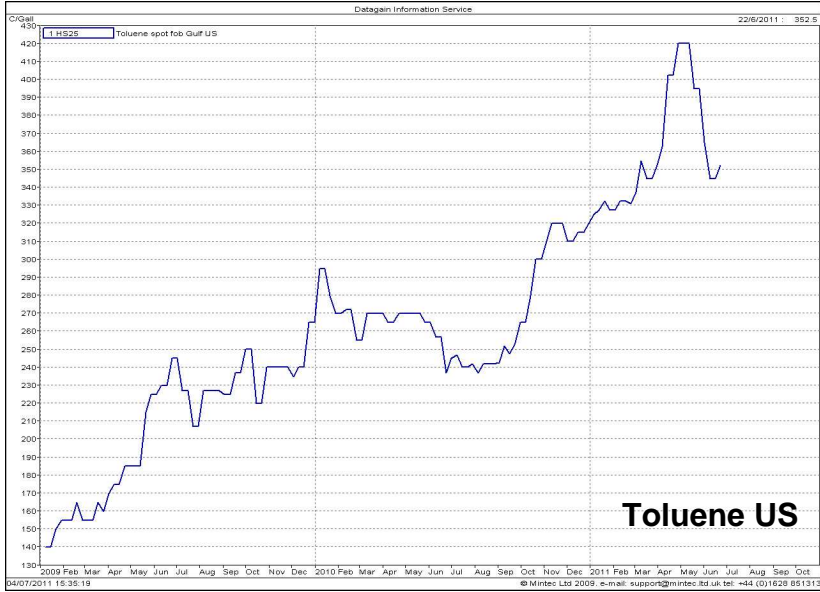
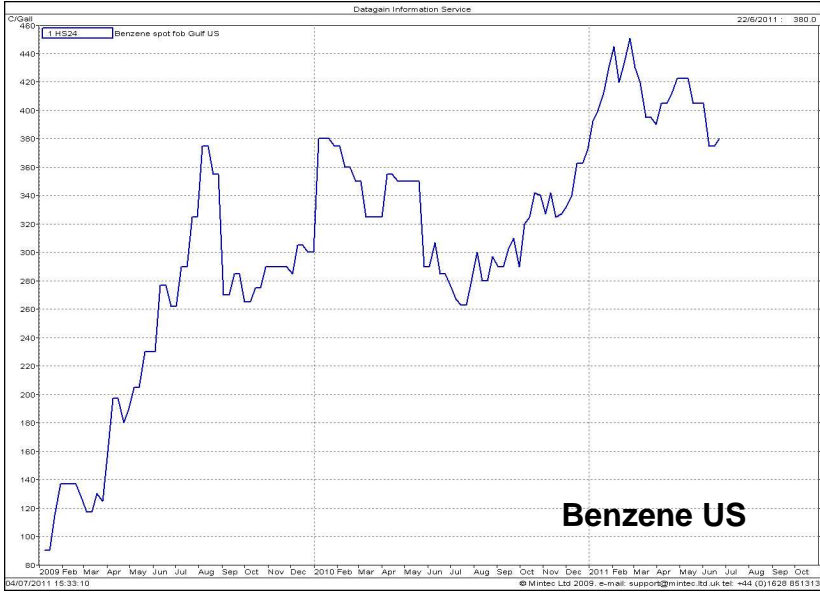
- Pigments
- Base chemicals
- Gum Rosin
- Increasing number of specialities (UV etc)

❑ China with these growth levels will need more and more materials domestically

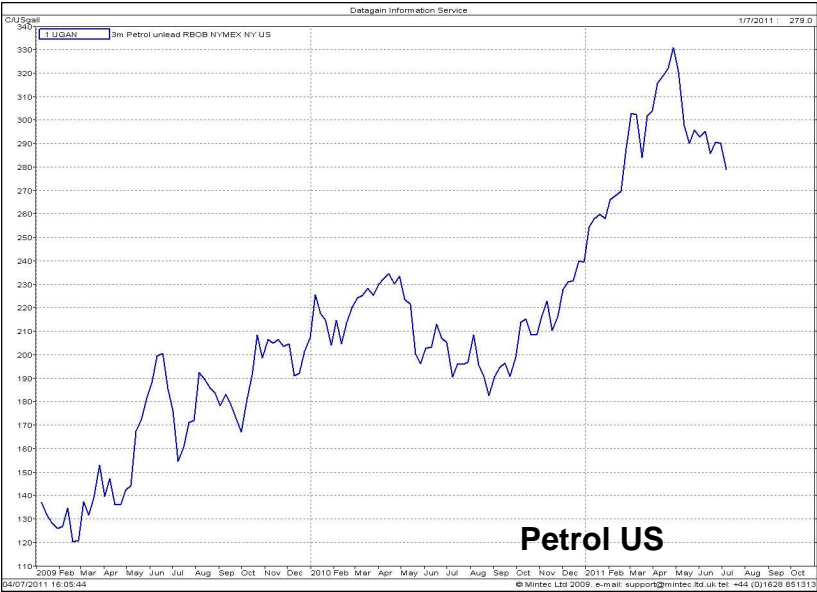
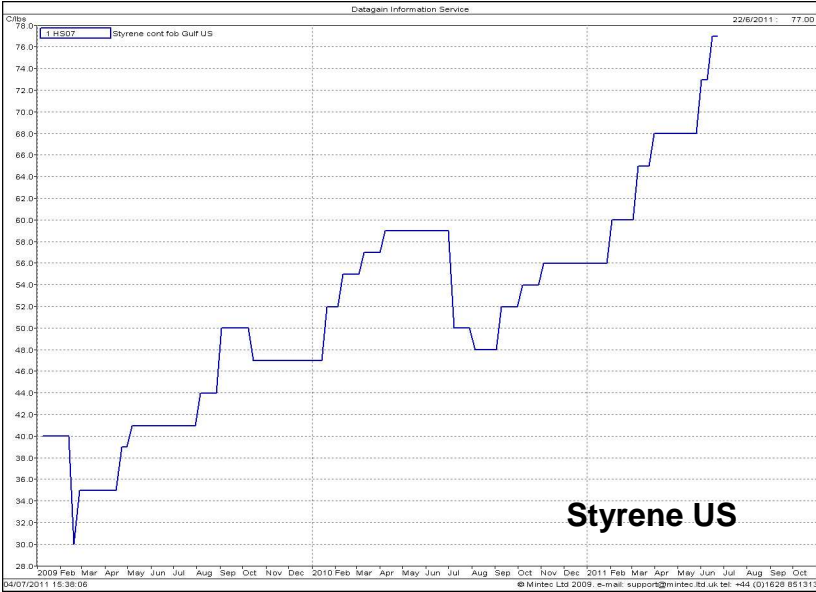
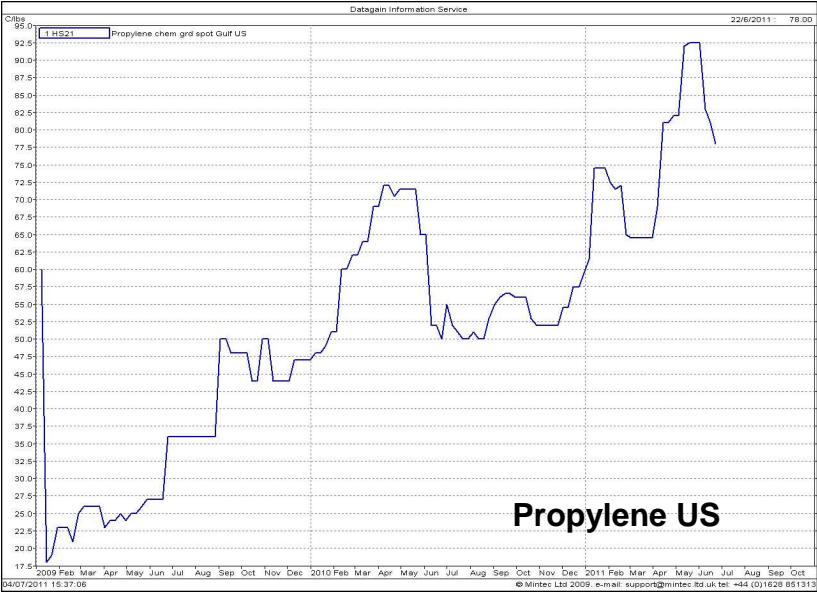
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Base Chemicals

Benzene / Toluene / Xylene



Base Chemicals



Comments on base chemicals

- ❑ 2.5 years of ongoing increases**
- ❑ Recently some first signs of weakness, but despite the drop prices remain at a very high levels**
- ❑ Pricing of products produced from these base chemicals is in many cases still increasing due to the lagging effect of cost coming through the value chain**

Pigments General

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The Pigment supply Chain

Examples:

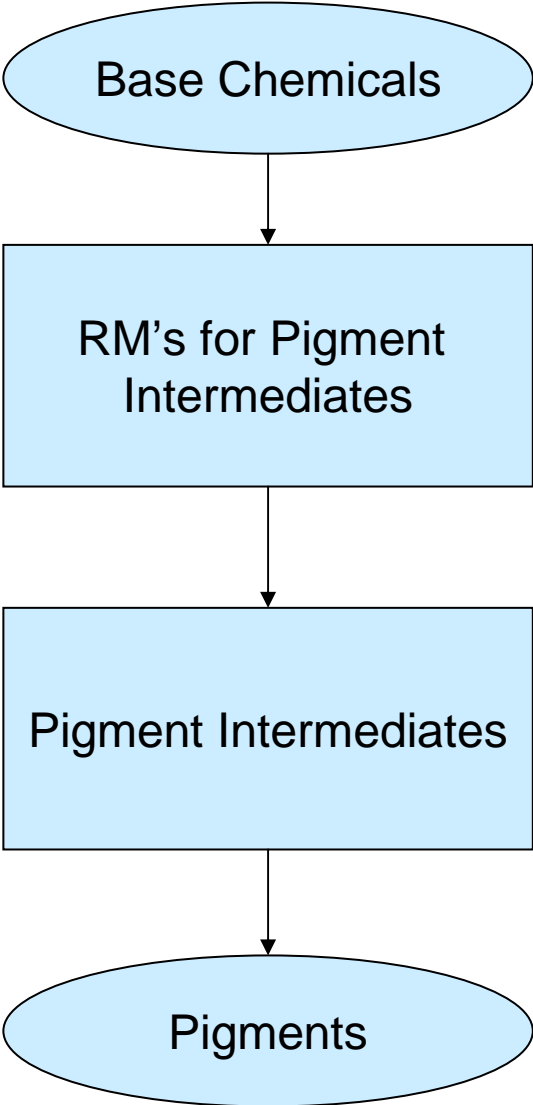
- Toluene
- Benzene
- Gum Rosin
- Copper

Examples:

- ONCB
- pT

Examples:

- DCB
- Arylides
- Bon Acid
- Copper Chloride
- 2B / 4B



Challenges:

- World Market pricing
- Isomer imbalances
- Availability / shortages
 - Demand / Supply
- Replacement markets
- Environmental challenges
- For most Intermediates installed capacity sufficient
- Environment challenges
- Ink pigment producers reducing
- Environmental challenges

Pigment key challenges

1. Environmental rules in India and China

2. The tight capacity of the Pigment Intermediate supply

- Different challenges by colour
- Large companies delivering well controlled bulk materials to “small” pigments industry

3. Increasing governmental challenges

- Pigments and inks are not considered “favourable” industries in Asia anymore → reduction or cancelation of export subsidies or worse new taxation

4. Reality

- Ink Pigment industry in North America and Europe is dependant on Asia
 - For producers in NA or Europe, key intermediates have to be sourced in Asia
 - For red and yellow the world depends on China (pigments and pigment intermediates)
 - For blue the world depends on India

Blue Pigments → Challenging supply – demand balance

Tight capacity due to forced closures in India

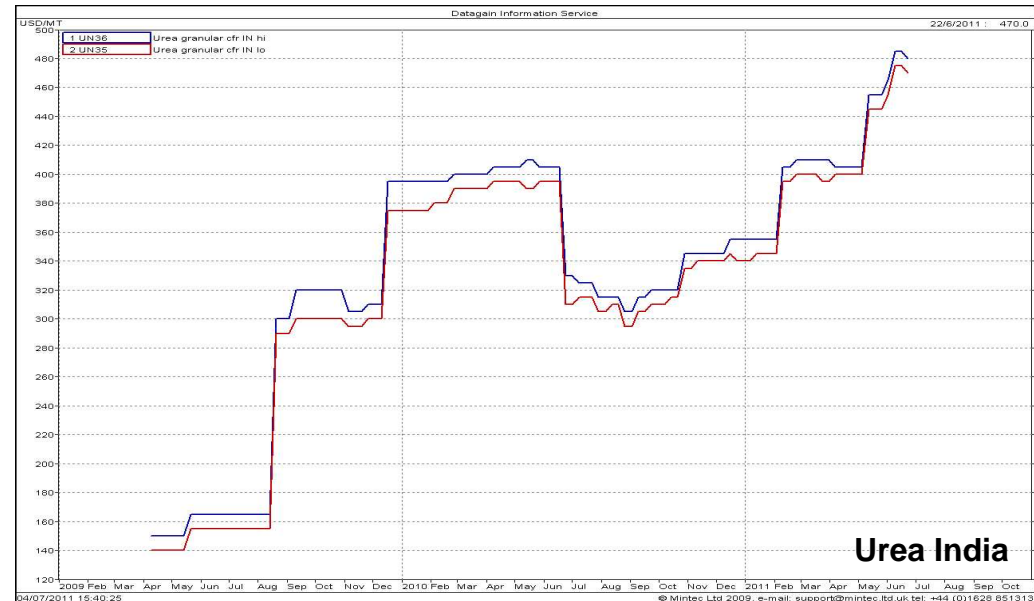


Copper

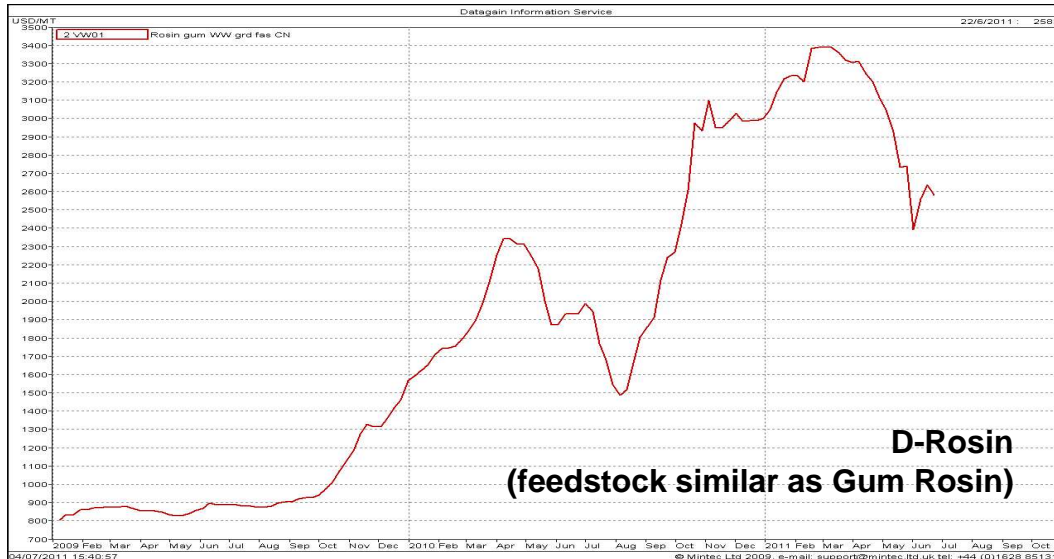
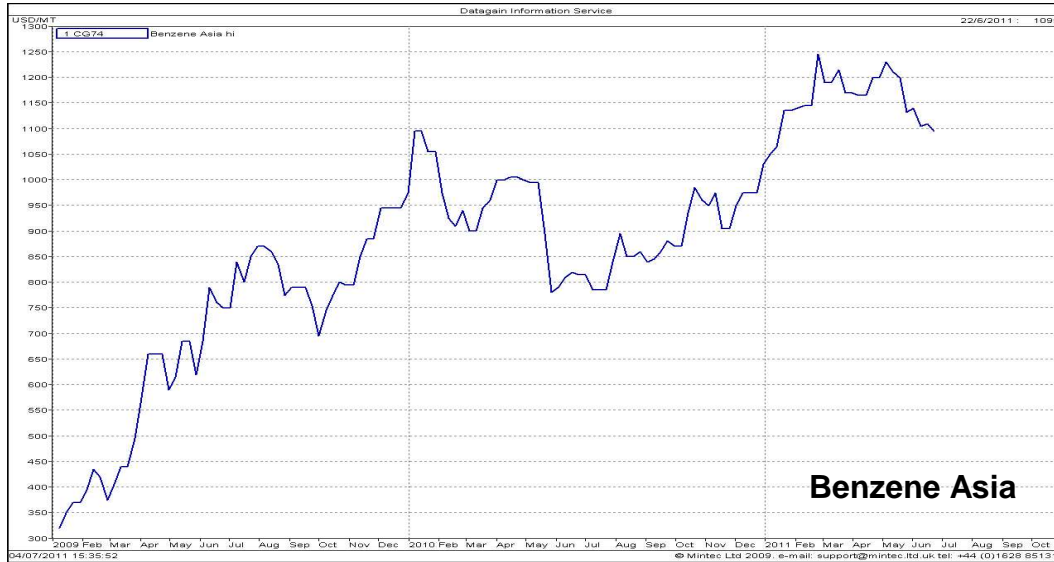
- ❑ Ongoing increases at London Metal Exchange
- ❑ Recently some relief, however the original increases are coming through now hard
- ❑ High level of speculation but also real global copper demand

Urea

- ❑ Linked to agricultural costing in India
- ❑ Challenging practices (industrial grade over agricultural grades)

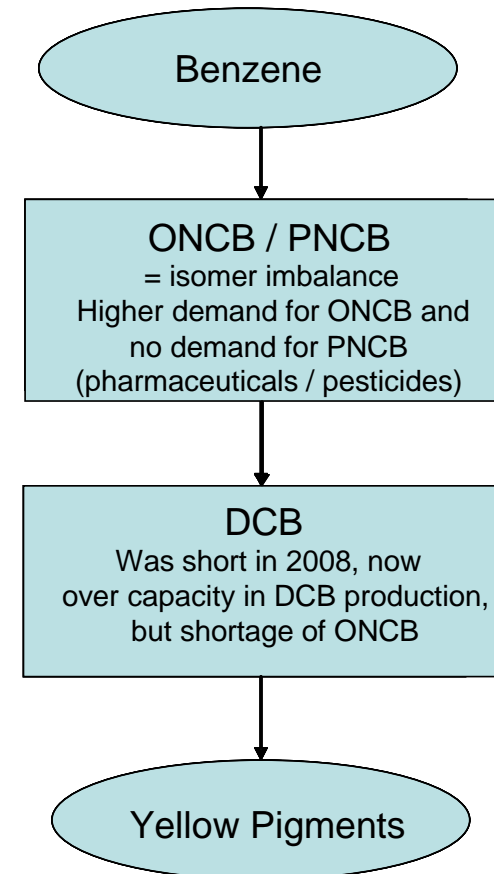


Yellow Pigments → Base costs show some improvement But isomer imbalance on ONCB / PNCB is driving cost up

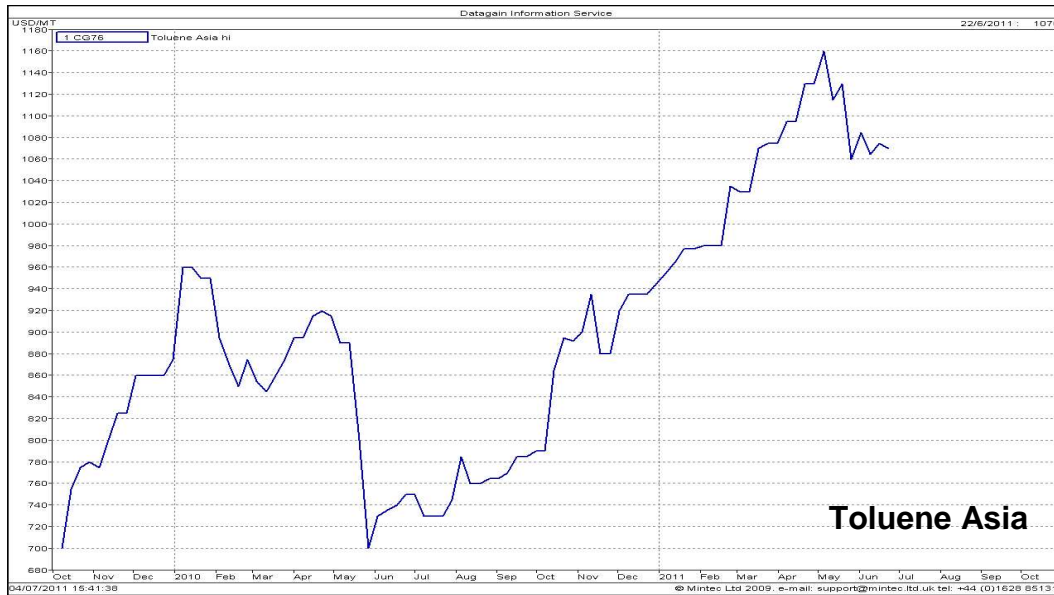


□ Benzene China

- Cost component

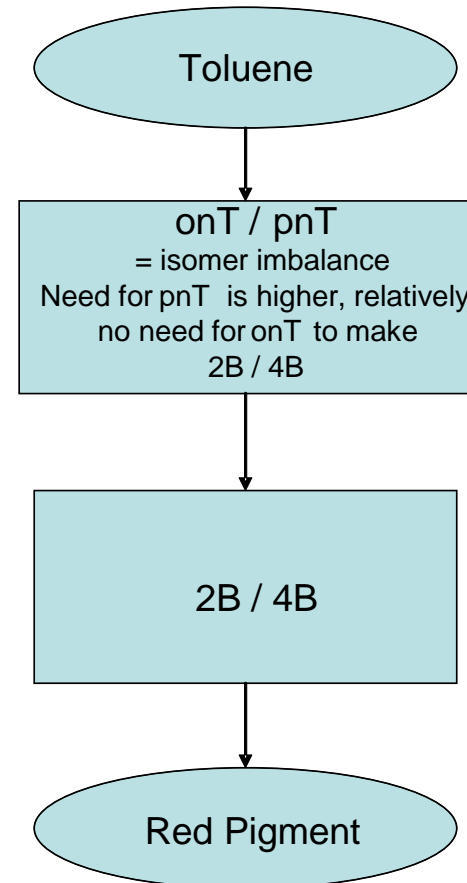


Red Pigments - Toluene drop could not support the onT / pnT imbalance and therefore some of the challenges on 2B / 4B



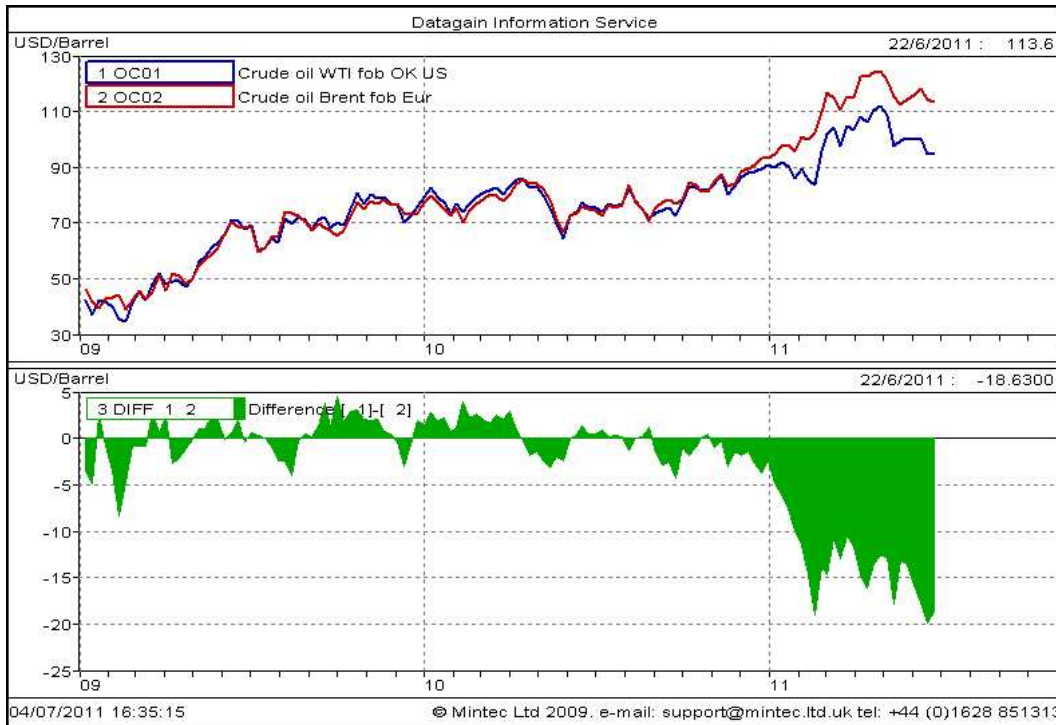
□ Toluene China

- Cost component



Red Pigments

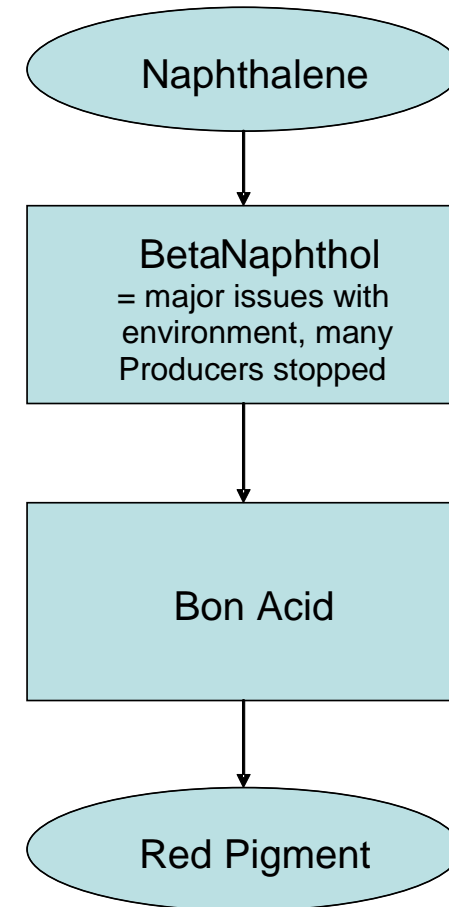
Relative small drop in crude did not translate in lower Beta Naphthol pricing



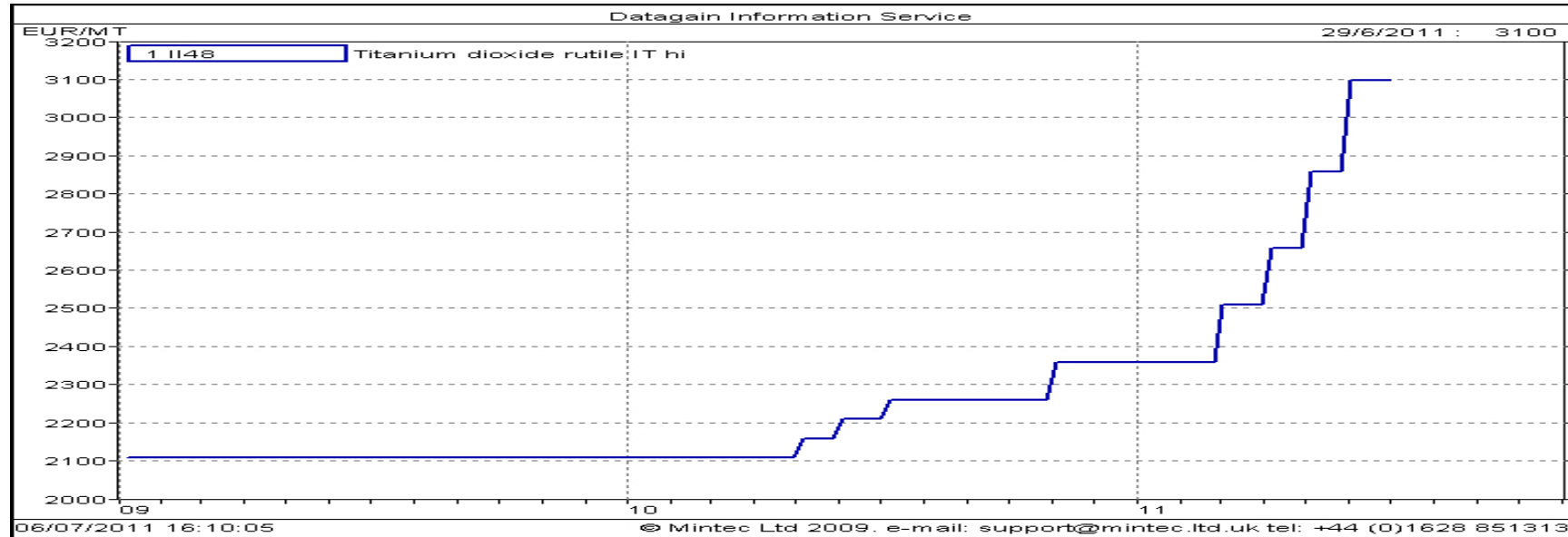
WTI / Brent Crude Oil

□ Naphthalene China

- Move with crude



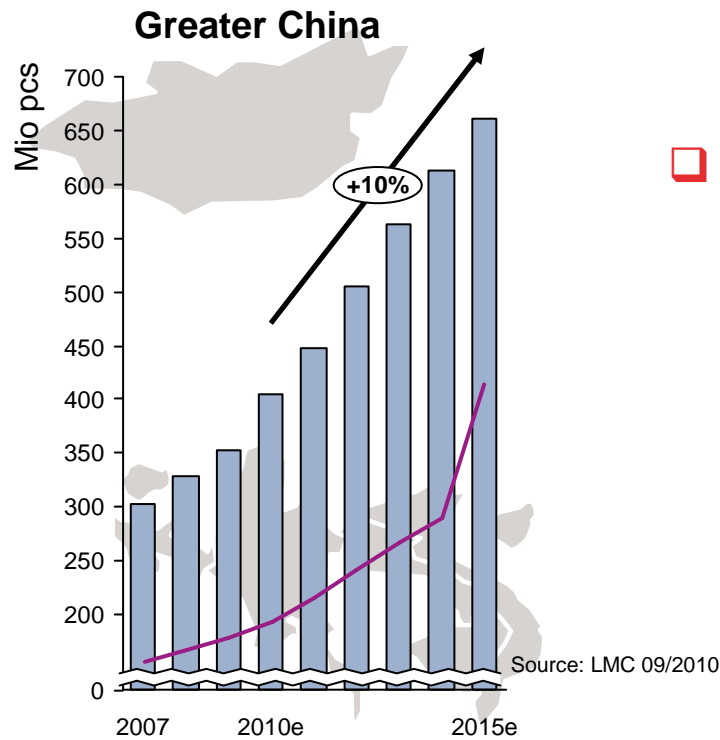
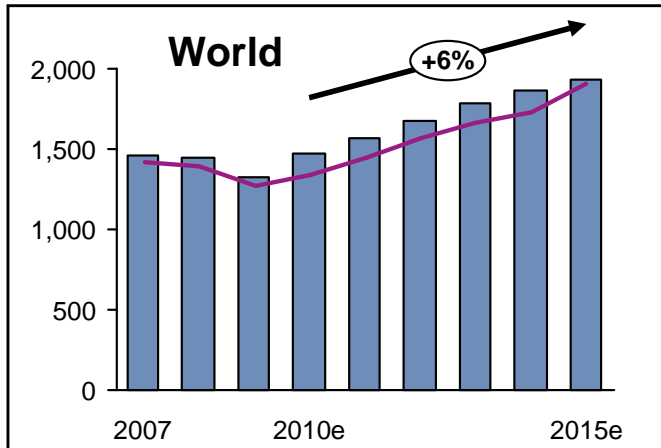
TiO2



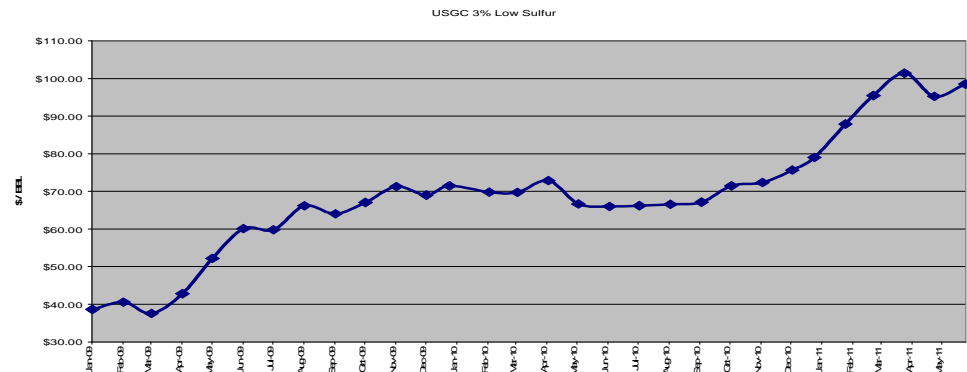
- ❑ **Crisis in paint and coating markets did drive TiO2 down**
- ❑ **Major suppliers had to take out capacity**
- ❑ **Strong return of paint and coatings now allow TiO2 producers “to select” markets**
 - Inks not preferred from a short term margin perspective
- ❑ **Costing up in the chain also are up:**
 - Energy
 - Sulphuric Acid
 - Rutile Titanium

Carbon Black

The growth / consolidation in the tire market will drive costing



- ❑ The 2008 “crisis” forced CB manufacturers to take out capacity
- ❑ The increase in volumes since then, specifically in the tire industry, is now causing upward price spiral
 - Asia (China) is driving the market
- ❑ The market is consolidating, with Birla buying Columbian and Evonik Carbon Black spinning off from the total Evonik organisation
- ❑ On top of this:
 - Crude driven feedstock increases
 - Ink pricing being historically below larger volume items for tires



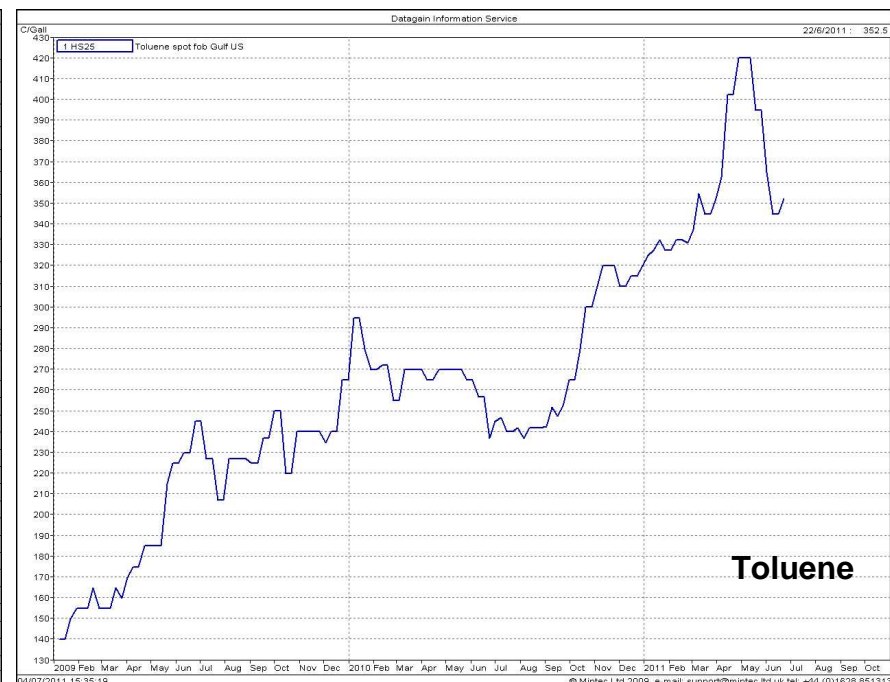
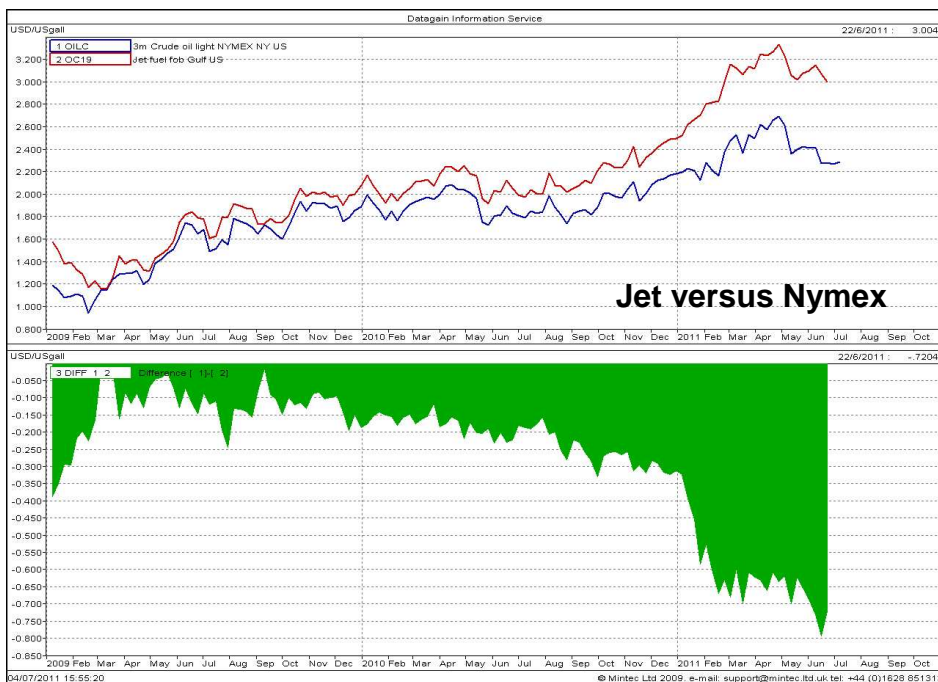
Distillates

Base and Vegetable Oils

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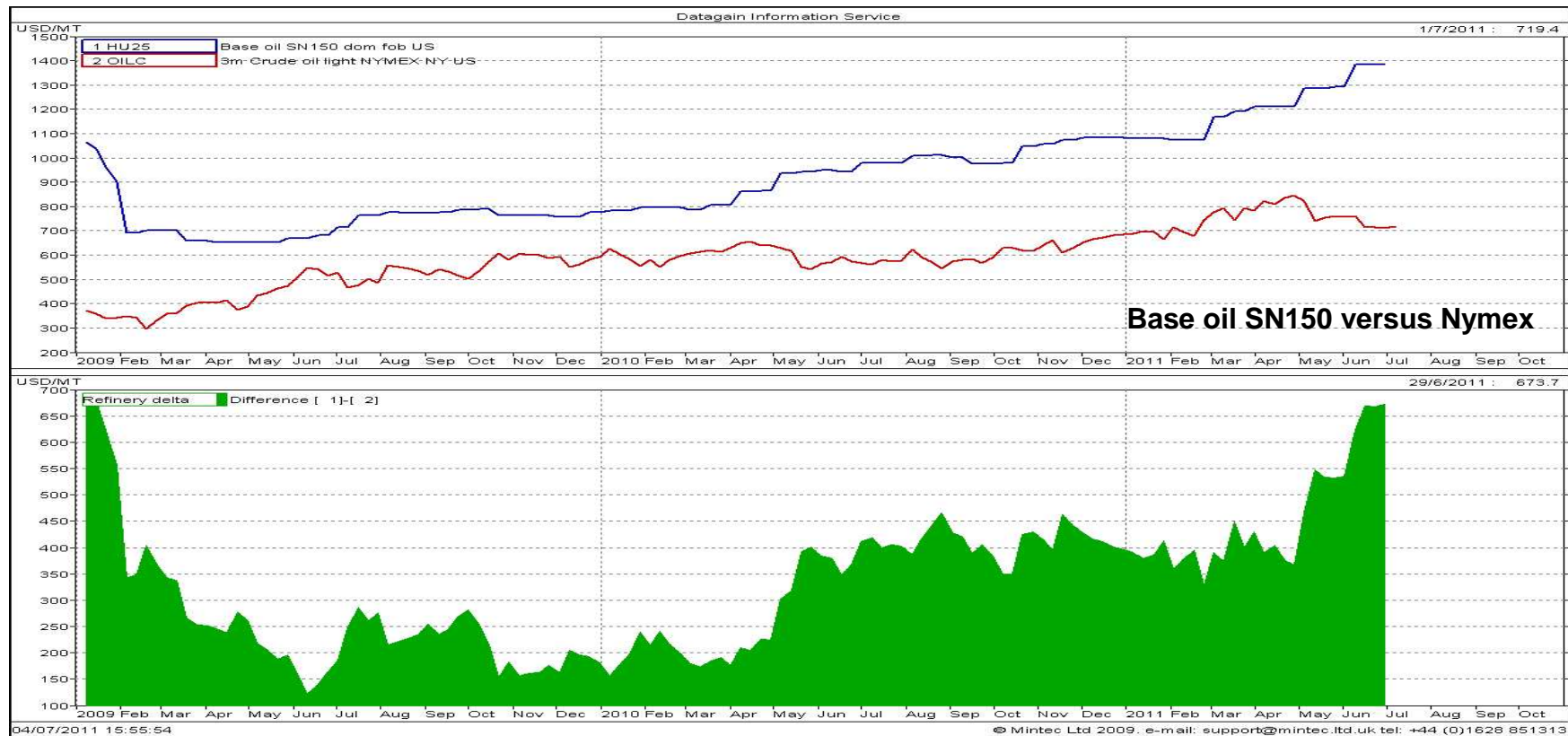
Aliphatic and Aromatic Solvents



Distillates

- Aliphatic solvent prices driven by rising crude oil prices
- Spread between crude and jet kerosene prices growing in recent months and is now at record high causing distillates to increase faster than crude and not to benefit from crude drops
- Supply / Demand in balance
- Toluene price trends with crude oil price and still at high price

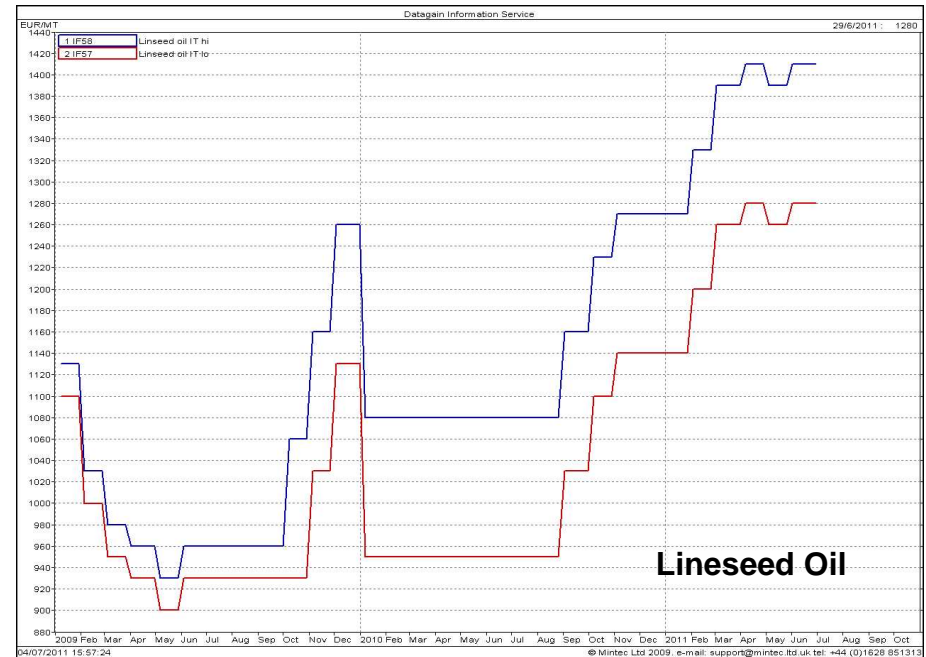
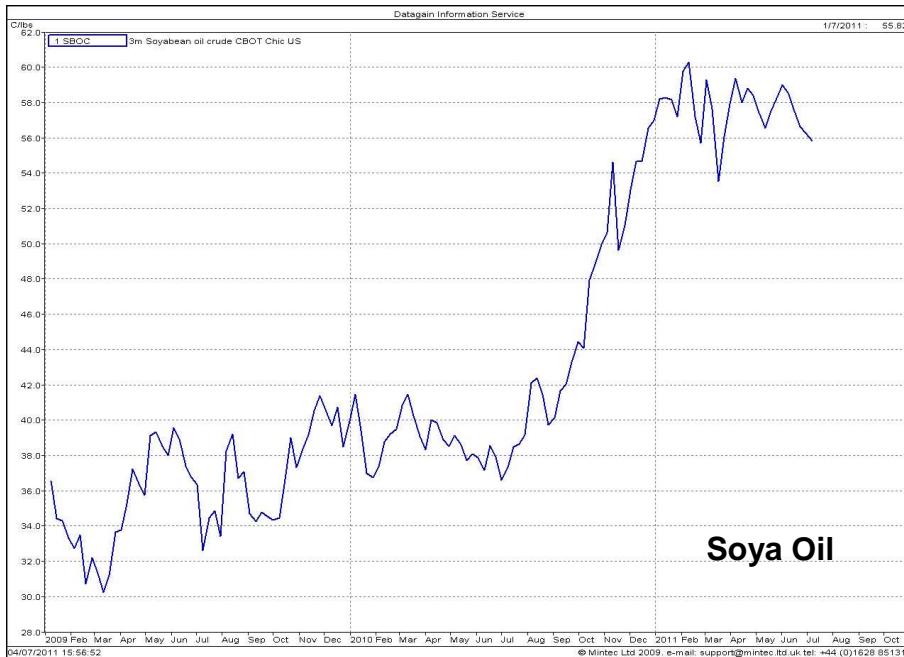
Base Oils



□ Base Oil

- Naphthenic base oil prices follow rising crude oil prices
 - But as of April 2010 with higher refinery margins
- Naphthenic refiners continue to run at capacity despite added capacity

Vegetable Oils



Vegetable Oils

- Soybean oil up dramatically, driven by continued increase in global demand, investment fund activity and higher crude oil prices
- Lately quite volatile, driven by lower crude, but less balanced demand and supply

Linseed Oils

- Difficult crop, low stocks, constant demand is driving price
- Farmers holding back on selling
- GMO challenges in Europe causing additional demand in Canada

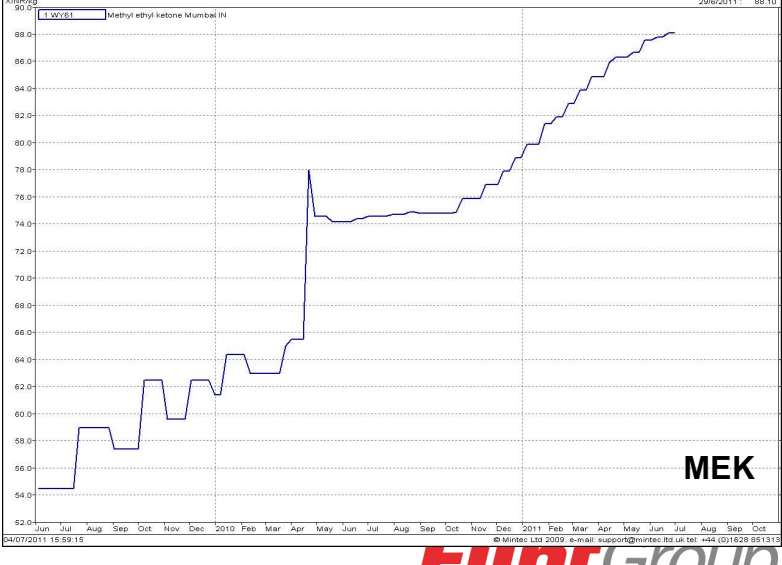
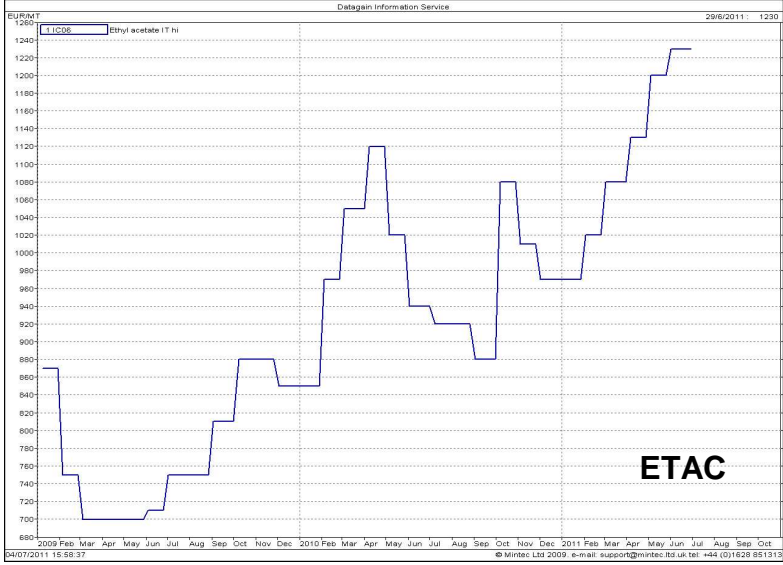
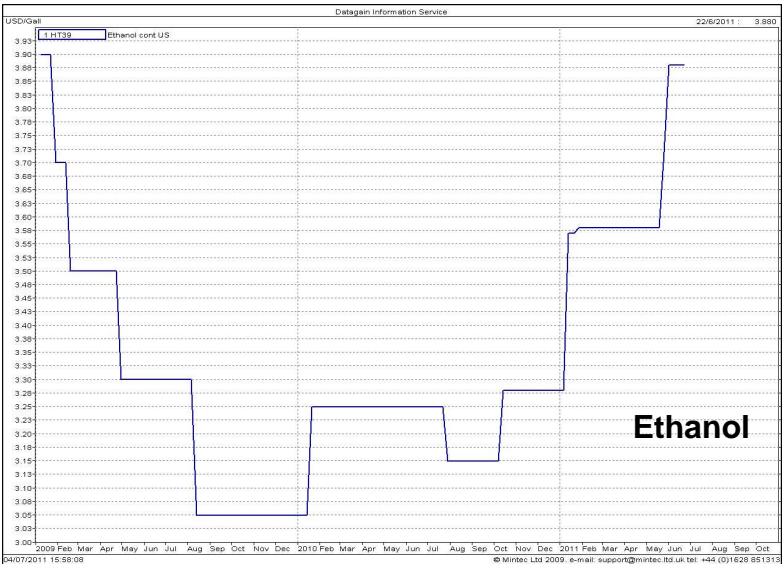
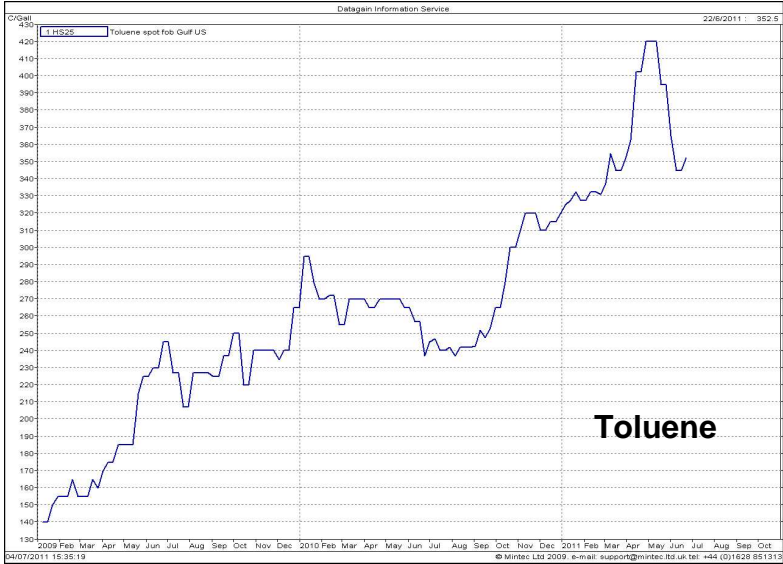
Solvents

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Solvents – One trend – It’s up

Only minor good news on the drop in Toluene – but still high



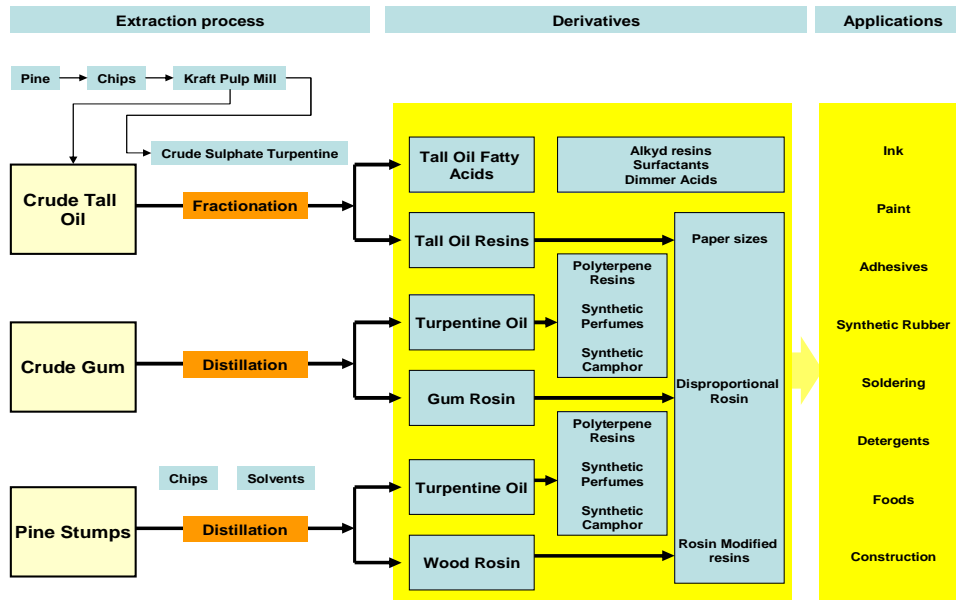
Gum Rosin & Phenolic Resins

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Gum Rosin / Tall Oil Rosin / Phenolic Rosins

The single largest cost driver of Publication inks these days



Price increased by over 400% in 1.5 year hitting the publication ink industry hard

Recently a drop in price

- But little available material for buying
- Most local Chinese buyers waiting crop results

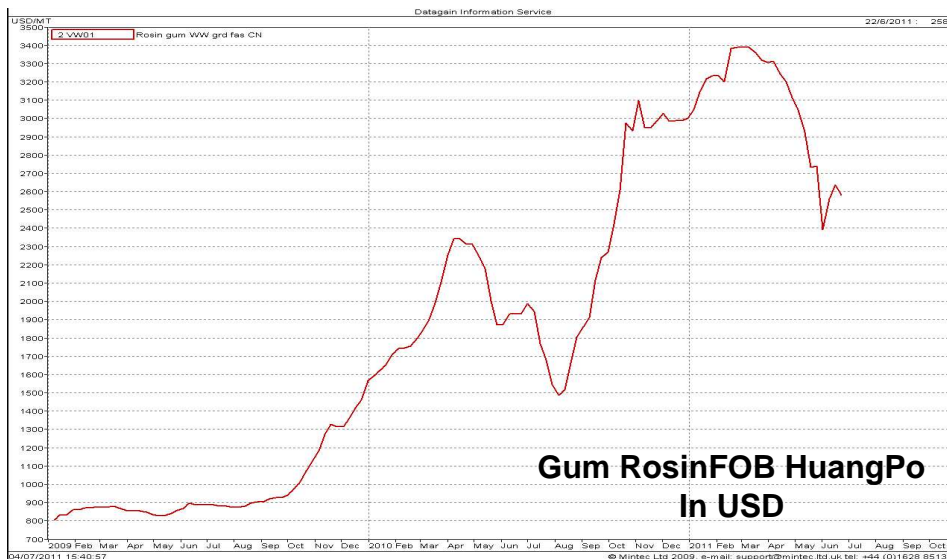
Direct effect on Gum Rosin based products, mainly Phenolic Resins

But also all tall oil based products:

- Replacement demand → producers can request “what they want”
- Reduced tall oil volumes do not help
- Subsidies on tall oil for bio fuel make situation worse
 - Already in Europe
 - Under discussion in North America

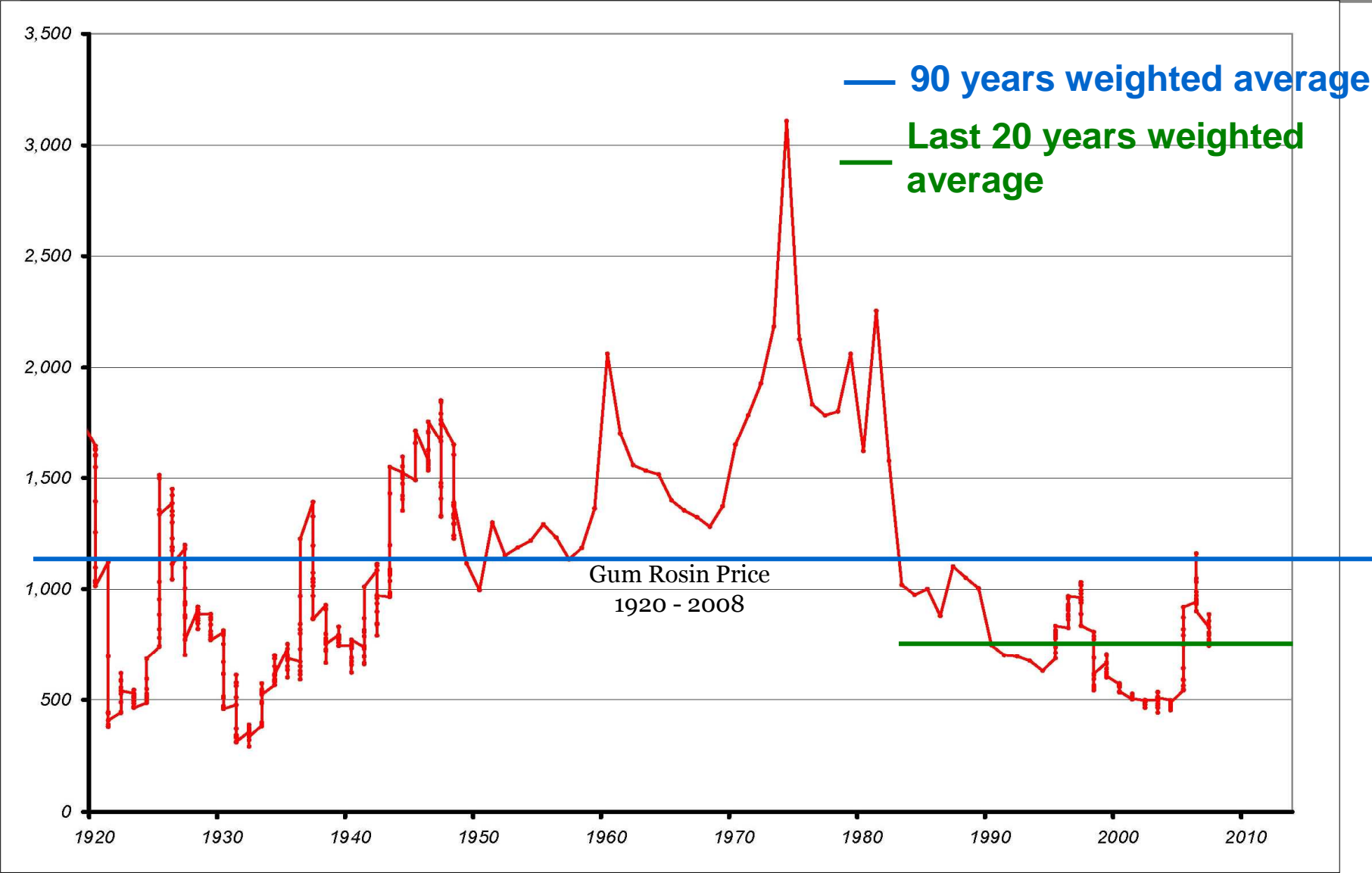
But also it effects HydroCarbon based products:

- Adhesive industry can switch → high replacement value → high volumes, limited supply
- Hybrid technology



One pricing crisis in 90 years

Linked to the 1974 oil crisis



Global CTO Supply vs. Global CTO Refining Capacity

- ❑ **On a global basis, there is 5 - 15% CTO imbalance (shortfall) vs. installed refining capacity caused by:**
 - Addition of the Sun Pine Bio-refinery for transportation fuels.
 - Shuttering of N. American paper mills
 - Offset by refinery shutdown in US and Europe.

- ❑ **North America has shifted from a net importer in the late 90's to a net exporter of CTO today.**

- ❑ **Regional and local threats of CTO being reclassified as biomass fuel or carbon neutral fuel provide additional uncertainty for the future.**

- ❑ **Still gap between tall oil and gum rosin**
 - Q3 market price of tall oil increased by 10%
 - Even after that some further increases (despite fall of GR) are possible in US market
 - Market was notorious low

Hydro Carbon Resin

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Key drivers are C-5 (DCPD) / C-9



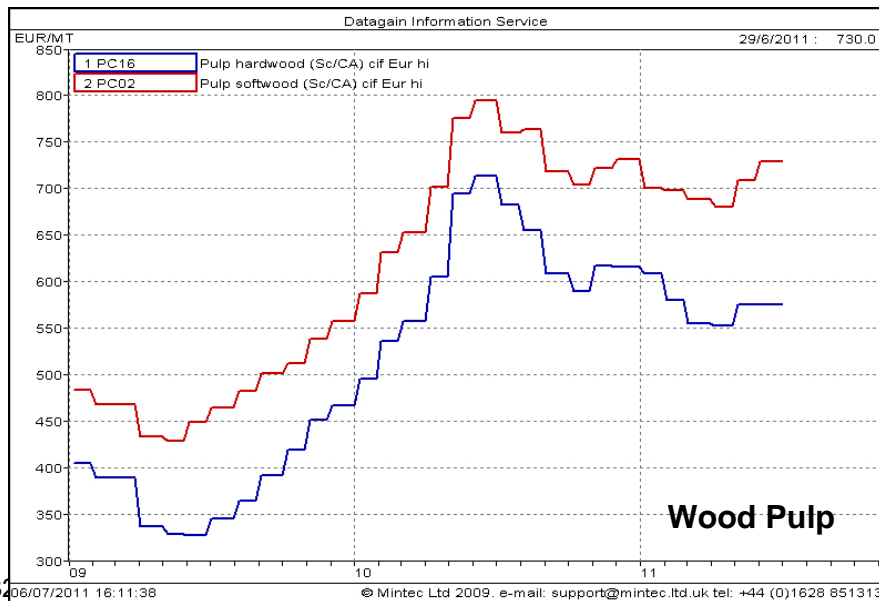
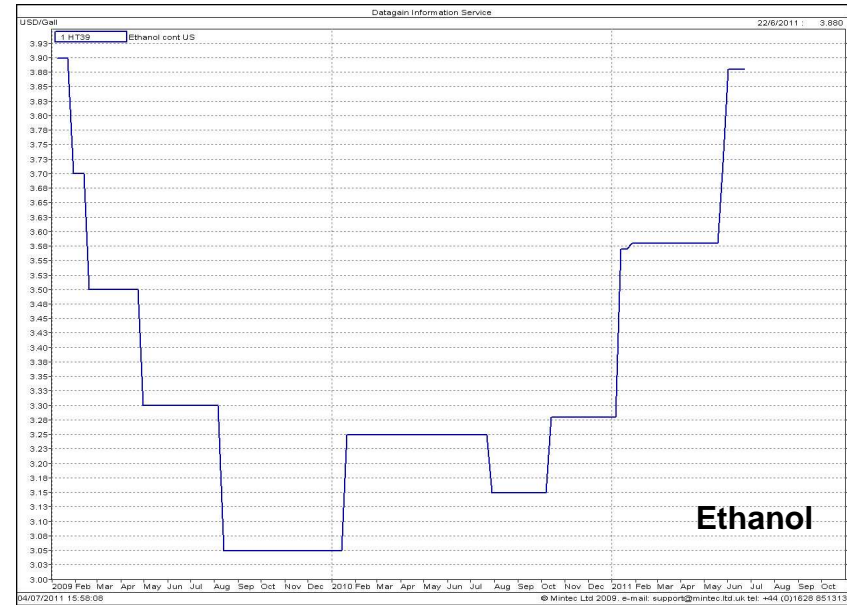
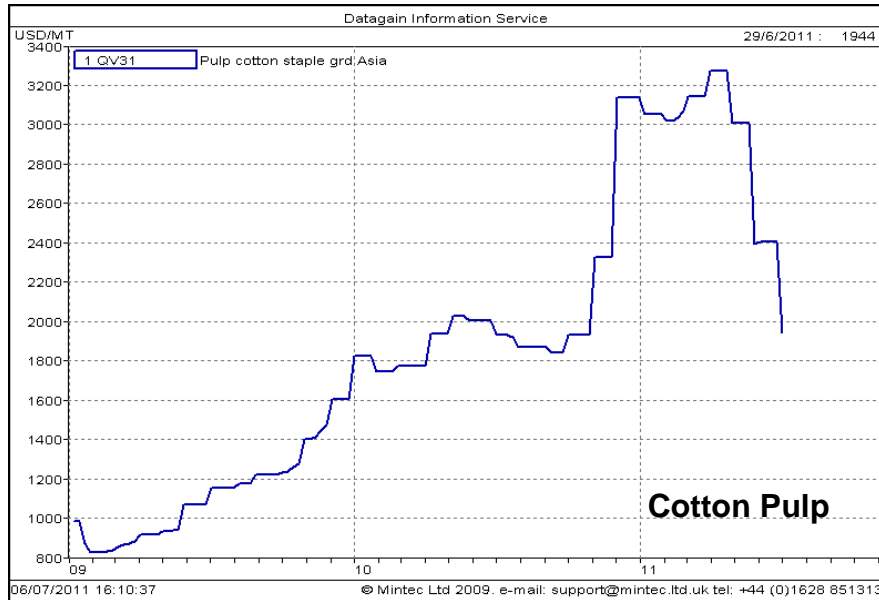
- Unleaded petrol is a key driver of cost, recently has come down
- On top of that demand and supply and cracker effectiveness / efficiency drives availability of C9 / DCPD
- Key players have not given any price relief yet as demand is stable at high levels
- Demand outlook continues to be favourable for C5 / C9 / DCPD producers (driven by China / Asia)

Nitro Cellulose

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Nitrocellulose costing and market



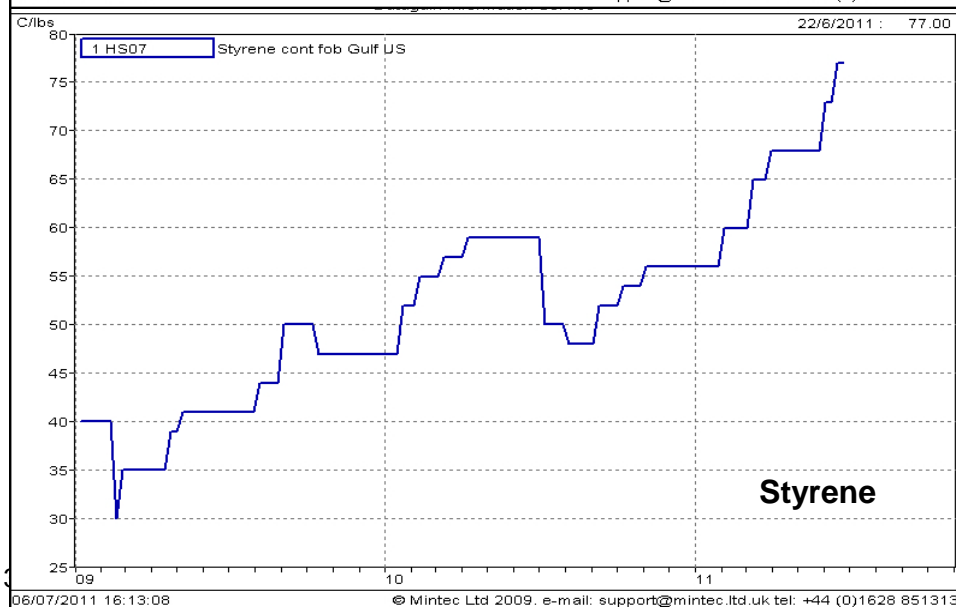
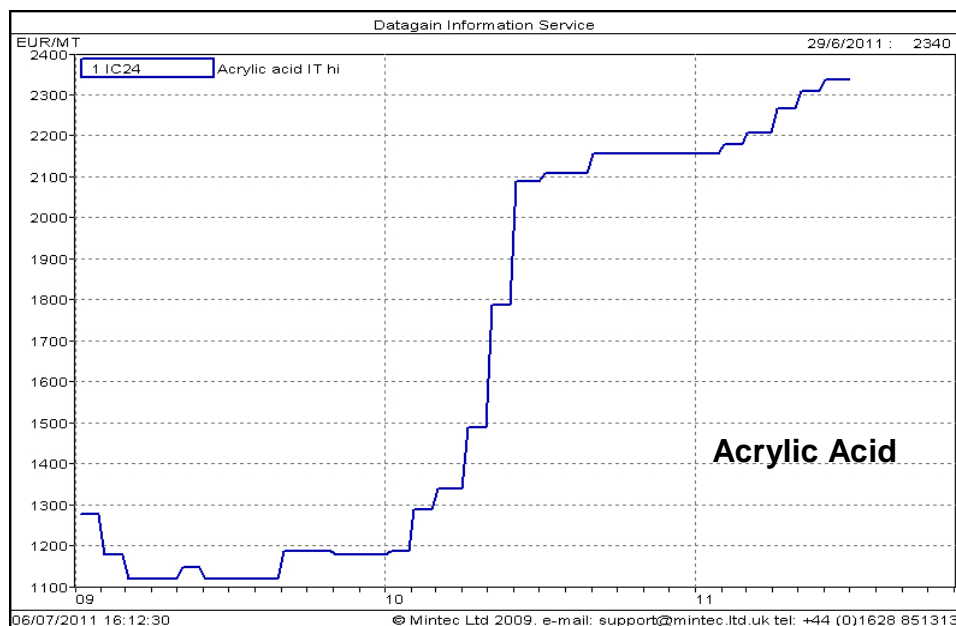
- Cost driven by
 - Demand and supply → market is short
 - Wood pulp and / cotton linter
 - Recent cotton drop will potentially reduce the increase of costs in 2012
 - Ethanol → remain strong
 - Isopropanol → remain strong
- 9,5% production capacity reduction
 - 10 KT closed China government
 - 15 KT closed in Europe in the end of 2010 (Bergerac)
- 12% increased demand from the emerging markets area (China, LA, Middle East and Asia-Pacific)
- Military application: new driver in NC volumes and profitability
- Industry consolidation
- Investments in the industry limited, process optimization at most.

Acrylics

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Acrylic Resins costing and market



- ❑ **Cost driven by**
 - Glacial Acrylic Acid (GAA)
 - Styrene
 - Polypropylene
 - Polyols
 - MMA (methylmethacrylate acid)
- ❑ **In 2010 serious issues upstream:**
 - Increased demand
 - Force majeure issues with BASF / Arkema
- ❑ **In 2011 ongoing strong demand causing prices to continue to increase**
- ❑ **Outlook 2012 remains challenging**
- ❑ **Feedstocks for GAA (benzene, propopylene) increased dramatically (over 33%)**
- ❑ **Overall shortages for GAA will continue throughout 2011**
- ❑ **Competing markets of super absorbents and water treatment which return higher margins**
- ❑ **BASF as strong consolidator drives the market**

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- ❑ **Distillates, Base & Vegetable Oils**
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- ❑ **Conclusion**

Raw Materials in conclusion An Inconvenient Truth

1

- ❑ **Perception:** We believed the crude oil crisis in 2008 caused our raw materials costs to spike
- ❑ **Reality:** Current costs and the outlook for year end 2011 is double the peak as in 2008

- ❑ **Perception:** After the recent cost increases in Q4 2010 and Q1 2011, we have seen the worse of the increases
- ❑ **Reality:** The Material cost increases in Q2 and Q3 2011 have been quite serious and although we now foresee a slow down of the speed of the increase, the outlook for the next 18 months is still upwards

- ❑ **Perception:** Supplier are very happy to supply to the ink industry as we provide a base load volume
- ❑ **Reality:** The ink industry is certainly not a favourite industry anymore to sell to, other industries pay more for the relatively low added value raw materials we require
 - Tire industry
 - Adhesive industry
 - Coatings industry
 - Construction and oil exploration industry
 - And many others

- ❑ **Perception:** Ink raw materials are always available and in over supply
- ❑ **Reality:** Many Raw Materials in the ink business will be short and market prices will continue to increase. Traditionally many raw materials used in ink production were originally seen as by products. With the increased focus on yield and efficiency in upstream production, less by product will be available or by-products need to make a reasonable return

- ❑ **Perceptions :** East Asia will provide low cost materials and therefore ink raw material costs will continue to decrease in costs
- ❑ **Reality:** Ink base products / base chemicals and Pigment pricing is increasing fast, local demand in East Asia will further increase and export focus will move to domestic requirements

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