europia european petroleum industry association

Complying with a revised IMO Annex VI

A Fuel Supplier View

Chris Beddoes

IMO Decisions – a supply view

europia european petroleum industry association

- MEPC-58 endorsed proposals will lead to a large increase in the demand for distillate fuels, pure or as blending components
- A relaxation of the criteria for declaring ECAs (Emission Control Areas) could amplify and accelerate this development

- How can or will the suppliers react?
- What are the potential impacts?

Sulphur limits in endorsed by MEPC 58 in October 2008

europia european petroleum industry association

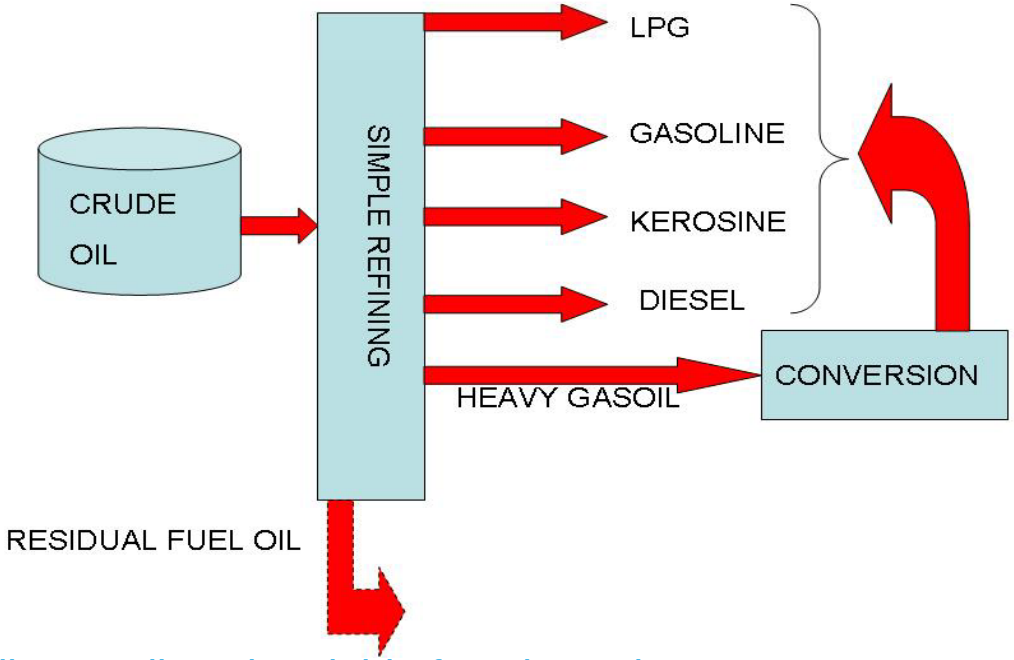
- ✓ 1 March 2010: Sulfur Emission Control Area (SECA) level 1% S.
- ✓ 1 January 2012: Global Cap 3.5% S.
- ✗ 1 January 2015: SECA Level 0.1% S.
- ✗ 1 January 2020: First possible date for Global Cap at 0.5% S, subject to fuel availability review to be completed by 2018.
- ✗ 1 January 2025: Second date for change to Global Cap if not possible in 2020.
- ✓ Absolute cap of 4.5% will no longer apply
- ✓ Global cap of 0.5% does not specify distillates.
- ✓ Alternative technologies will be allowed meet S levels

Fuel availability – driven by market forces

europia european petroleum industry association

- Fuel specifications can be set by regulation.
- But availability/production will be driven by economics.

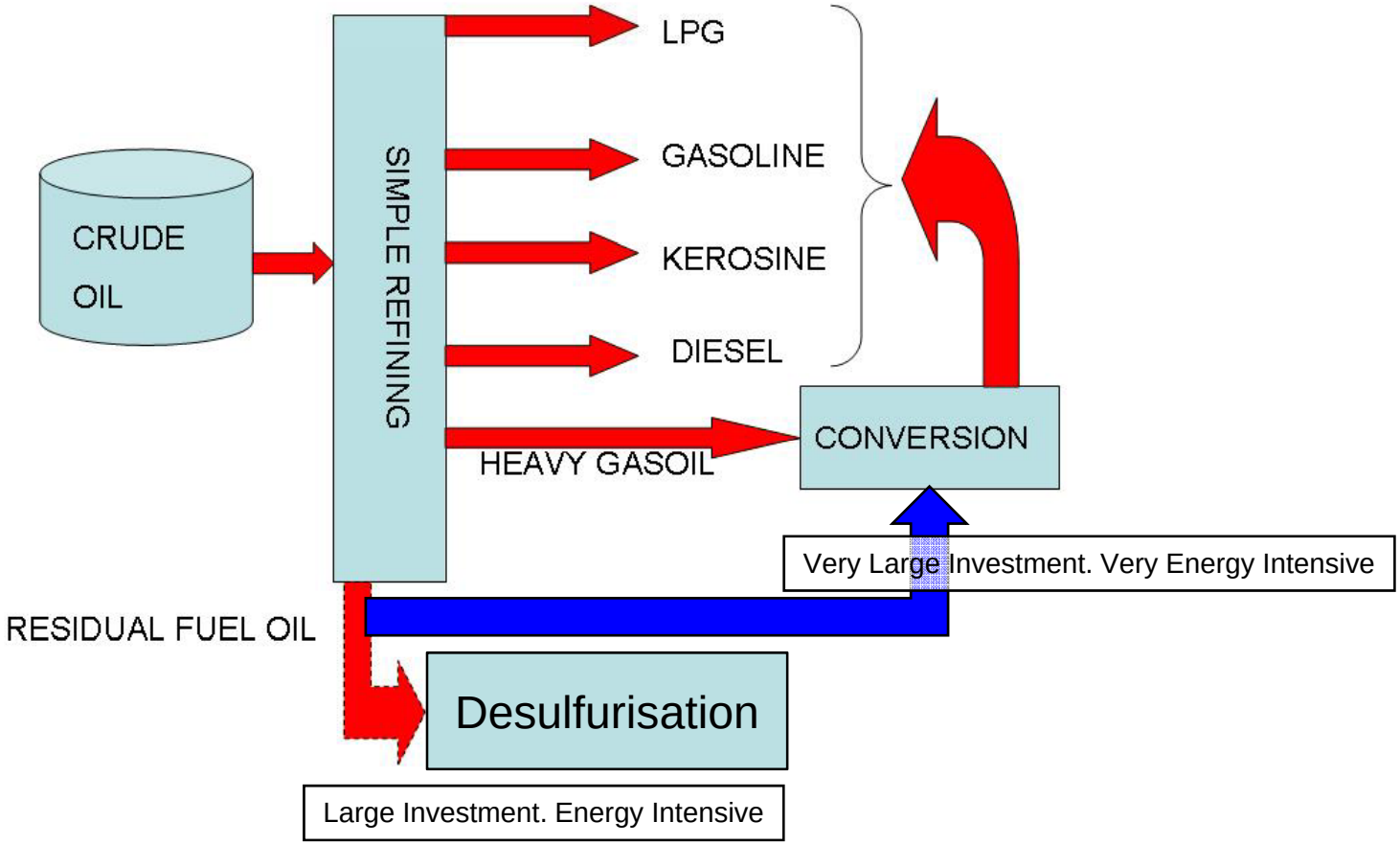
Refinery production



- Limited ability to adjust the yield of each product.
- Product properties and yields are functions of refinery configuration and the crude oil properties (origin).
- Low sulfur residual fuel can be made by selecting low sulfur crude oil – up to a limit

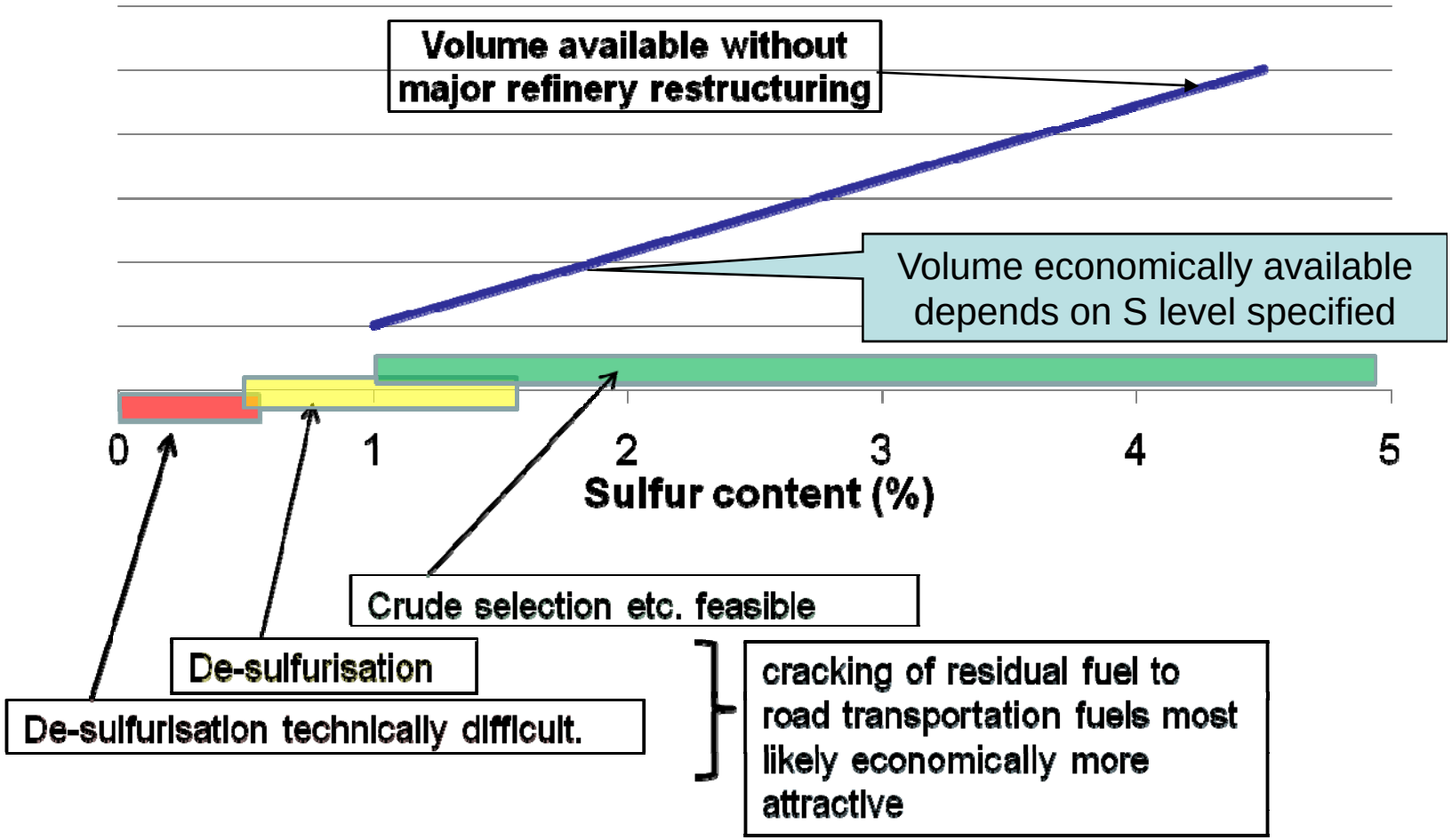
Producing very low sulfur marine fuels

europia european petroleum industry association



Low Sulfur marine fuels
Means and availability

europia european petroleum industry association

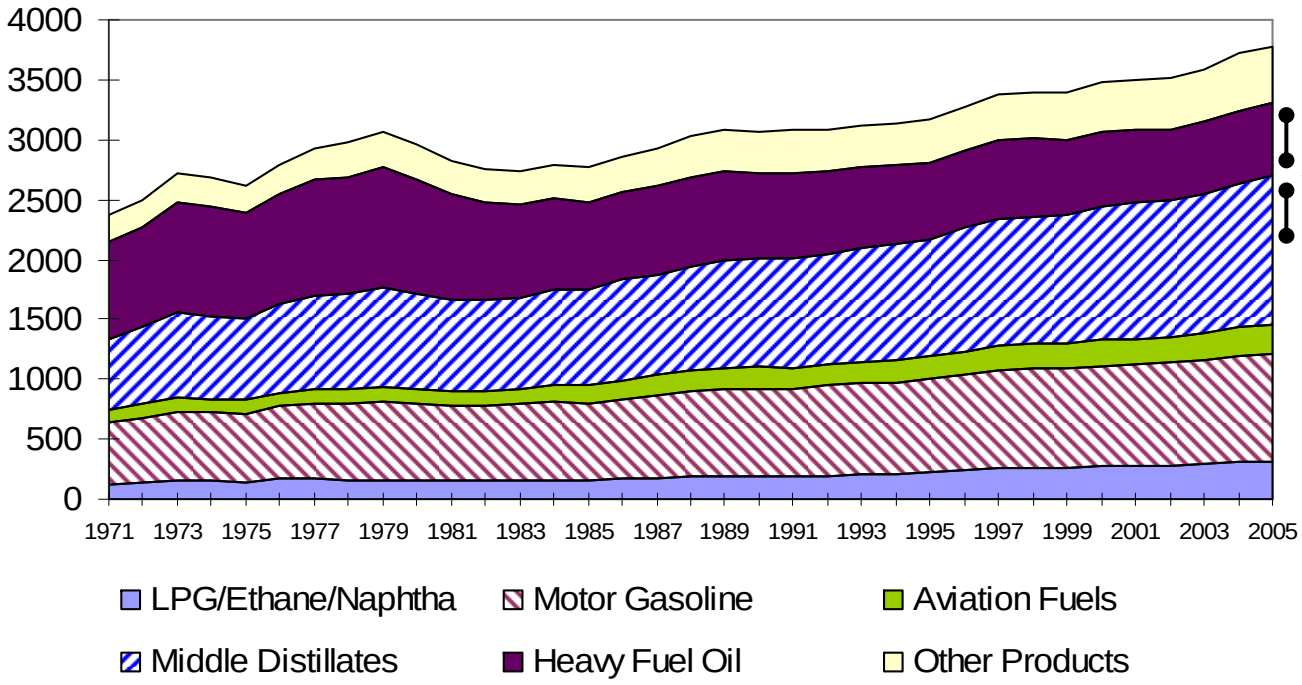


Marine Fuels demands in global context

europia european petroleum industry association

- The Refining/supply industry has gradually adapted to relatively slowly changing market demands.
- The supply challenge to meet the needs of shipping depends on the combination of quality and volume needed and the time-scale.
- Significant changes from status quo will require investment in the refineries.
  - » Maybe mainly outside EU (CO2 prices, environmental legislation, market growth)

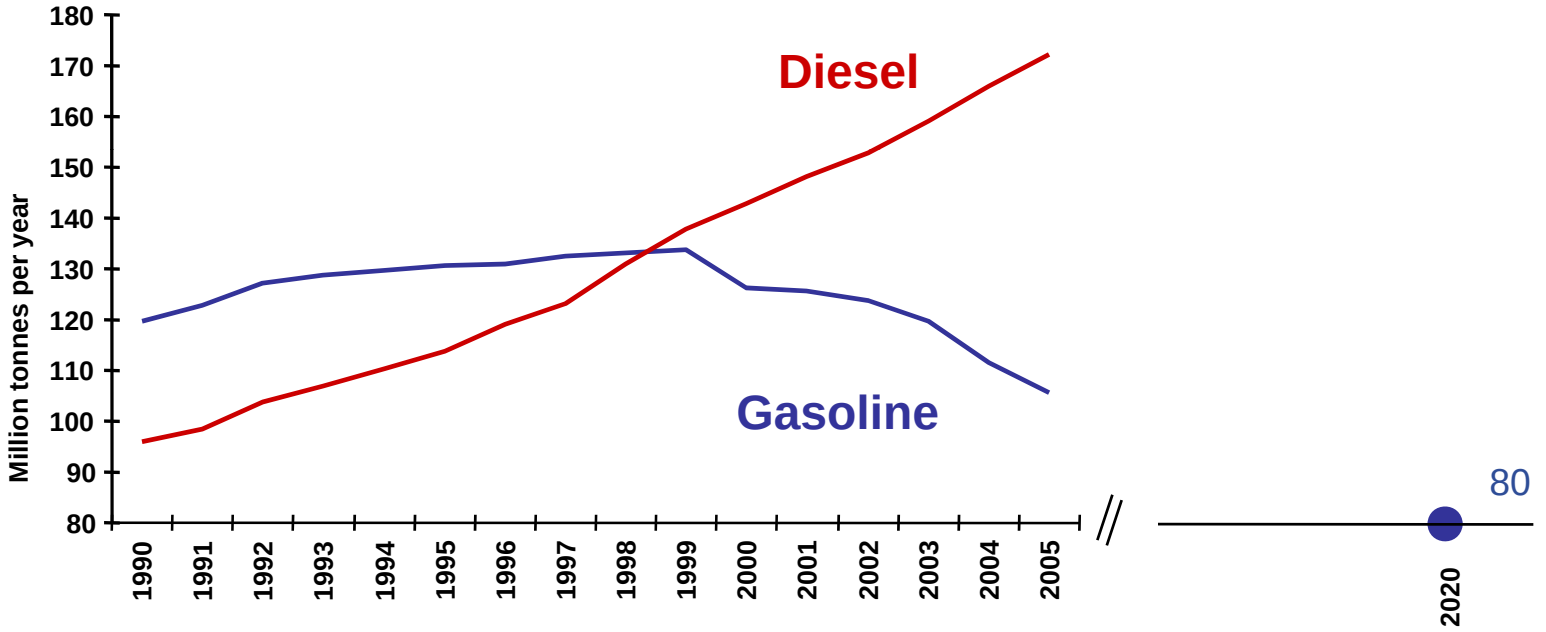
Evolution from 1971 to 2005 of World Refinery Production by Product (Mt)



300 MTe pa from Residual fuels to Distillate fuels: Equivalent to 10-15 years of normal demand growth.

Current EU legislation and taxation schemes generate growth in diesel demand

europia european petroleum industry association

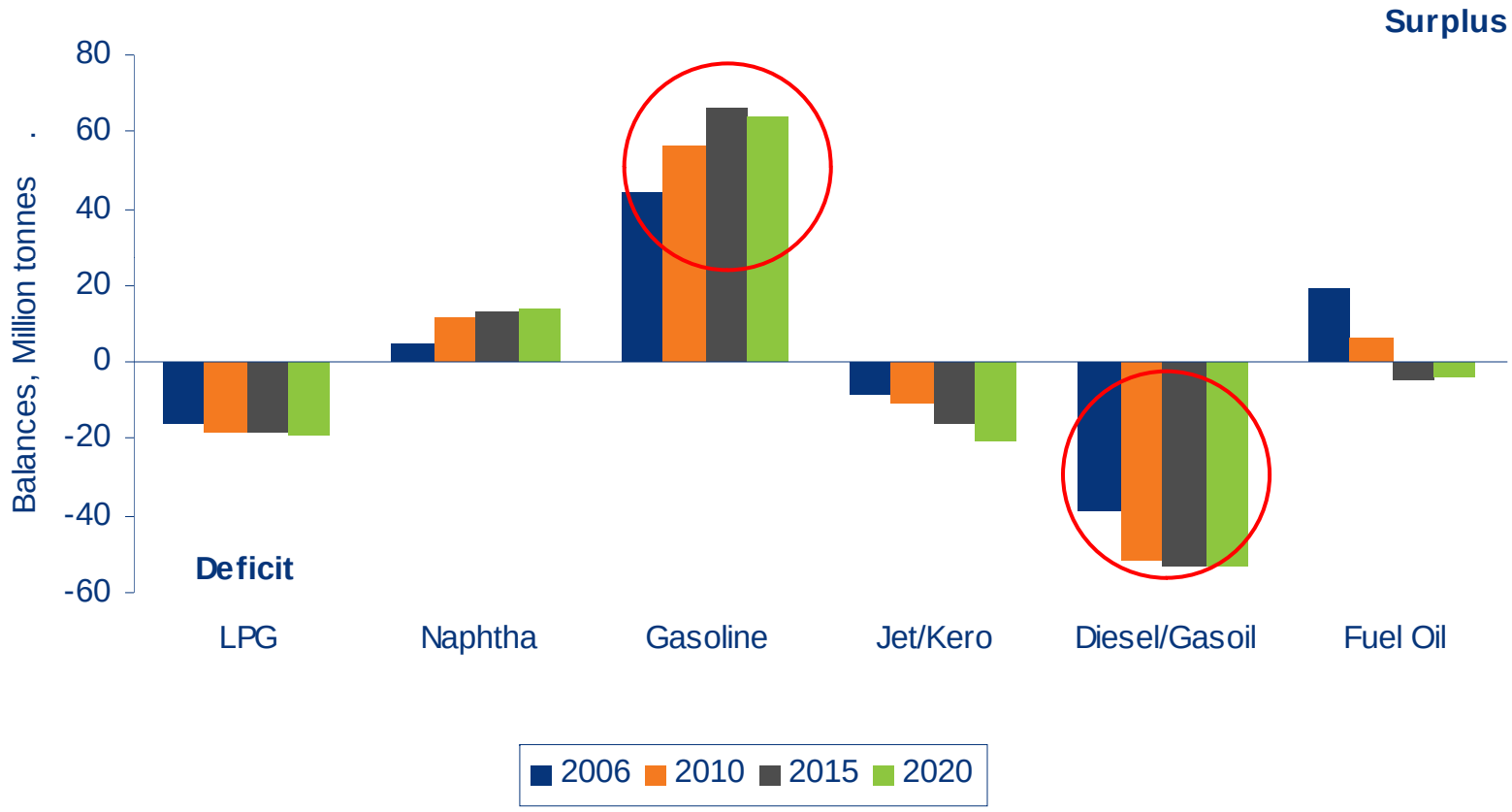


Source: Eurostat

Source: Purvin &Gertz

Additionally, ~60 million tonnes per year of diesel would be needed in the EU (300-350 million tonnes globally), if the marine sector switched to diesel fuel.

The EU supply/demand imbalance for both diesel and gasoline will continue to grow



Source: Wood Mackenzie, 2006 (whole Europe)

Refining already faces challenges to meet diesel demand growth, particularly in Europe.

europia european petroleum industry association

- There is little flexibility to switch production to distillates without major investments.
- Intercontinental trading has been a more attractive option than investment to balance EU demands: :
  - Importing diesel from Russia
  - Exporting surplus gasoline to US.
- Each single investment is very large – even for many oil companies ($100Ms to $1000M).
  - Destruction/desulphurisation of fuel oil complex process.
  - Major decision point for any Refinery.
- Project time scale – 4/5 years from conception to production.

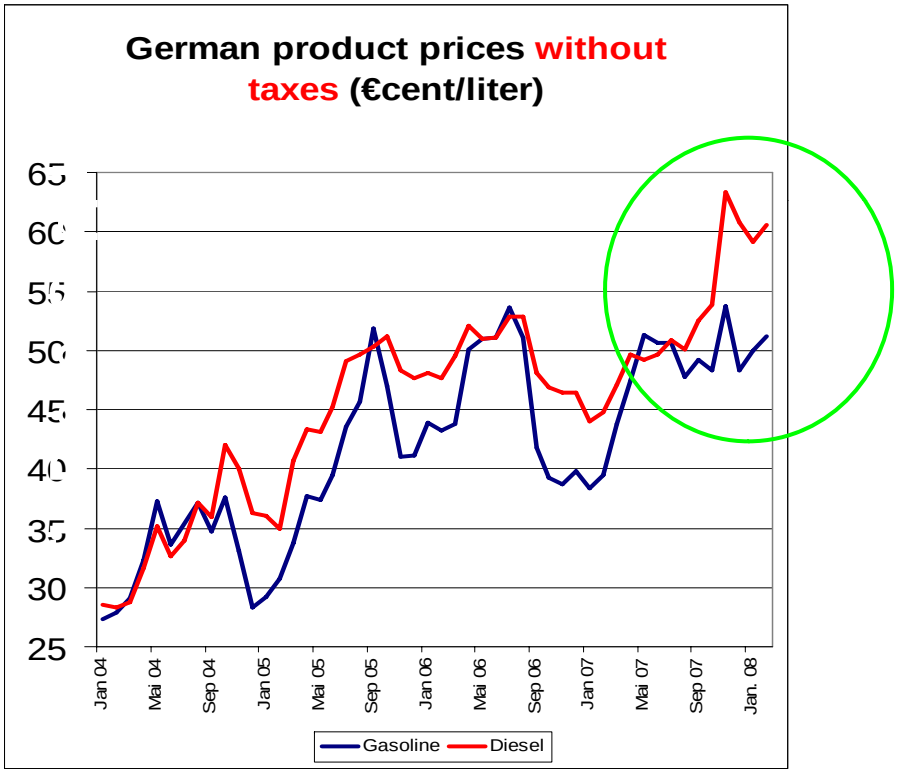
Factors in the investment decision

europia european petroleum industry association

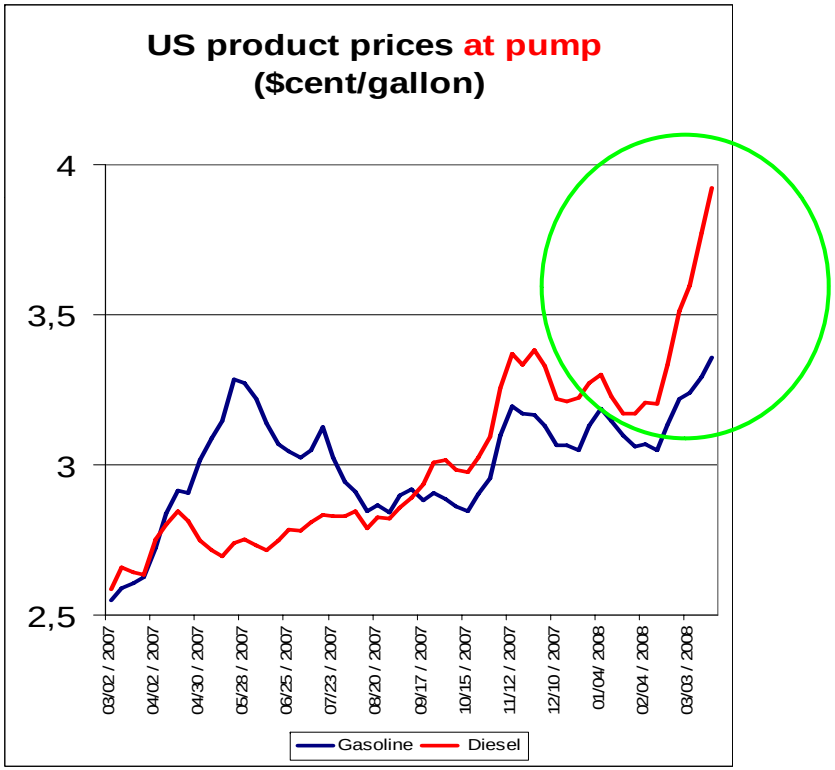
- What is confidence in market demand?
  - Times scale – can we see 15+ years?
  - Is market demand driven by fundamentals, or temporary situations, e.g. tax breaks or incentives?
  - Could demand be replaced by technology, product substitution?
- What are likely margins?
  - If demand is sure, possibly good
  - BUT, may be eroded by technology developments (e.g. abatement, changes in legislation)
- Alternatives to investment for marine fuels
  - Is there another outlet for the residual fuel to industry, power generation, export markets?
  - Invest in upgrading to road use – diesel, heating oil?
  - Other opportunities for capital – eg upstream for Integrated Co.s

Recent price signals reflect the changing dynamics of diesel supply/demand relative to gasoline

europia european petroleum industry association



Source: MWV (Mineralölwirtschaftsverband)



Source: EIA (Energy Information Administration)

What could be the market implications?

europia european petroleum industry association

- Individual refiners will make their own assessments to invest or not . But, there are some potential concerns if the incentives to invest are either not attractive enough or carry too much perceived risk.

- Marine distillates will probably compete with diesel or heating oil
  - Cost of marine fuels could approach automotive diesel.

- Supply situation would become more uncertain
  - Availability of marine fuels at all locations?

- Demand increases would also impact other distillate products
  - Automotive diesel, jet, home heating oil.

In summary, the 0.1% S SECA and global 0.5% could lead to significant supply challenges

europia european petroleum industry association

- Not clear if supply will meet future demand:
  - Uncertainty about both demand and capacity to supply on sudden specification change.
  - Potential cost increases for marine fuels as they compete with land fuels.
  - Potential cost impacts on other distillate fuels (diesel, jet).

And the reductions might not be justified for health benefits:

- With existing regulations, EU land-based and IMO:
  - In 2010, shipping in the Mediterranean will be the second largest source of SOx emissions in EUROPE
  - But only be ranked number 24 as source of sulphur deposition in sensitive areas- proximity matters!