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Director General, EUROPIA

**“Key challenges and opportunities ahead for EU refining”**

2nd Meeting of the EU Refining Forum

# EUROPIA represents 43 Member Companies ≈ 100% of EU Refining



# EUROPIA's views on the Refining Forum: Where from?



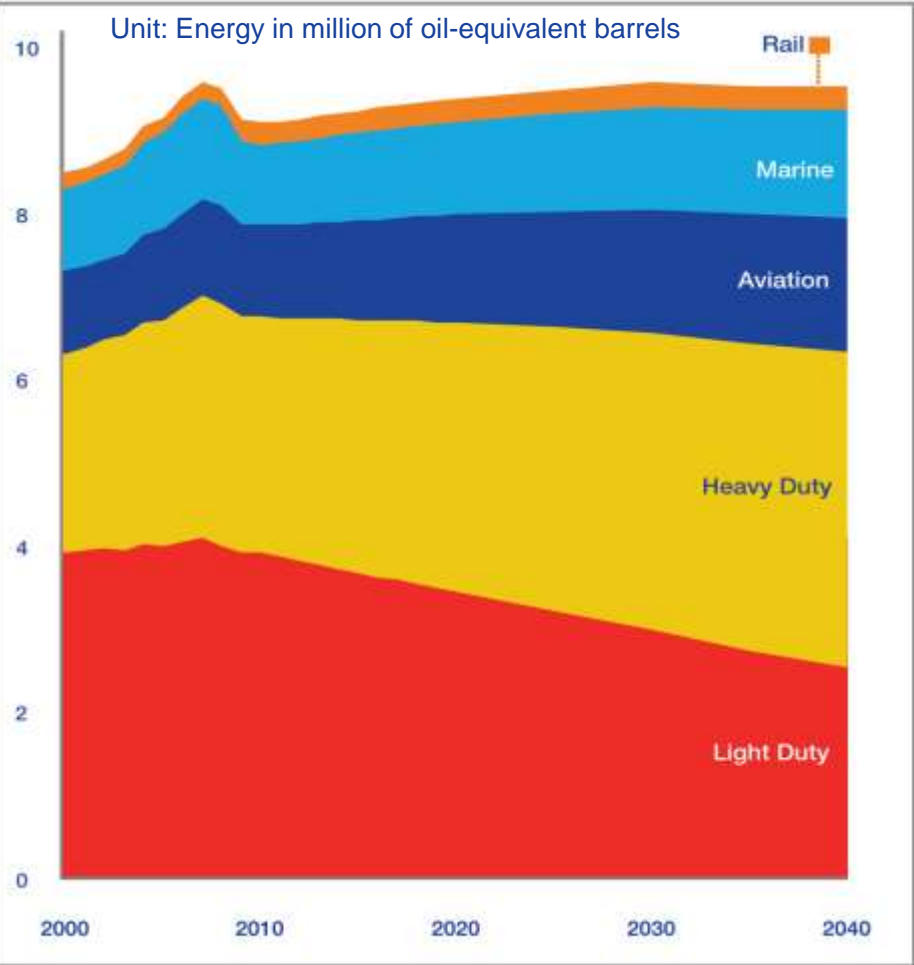
- **May 2012: First Round Table called by Commissioner Oettinger following bankruptcy of Petroplus( at time largest independent refiner).**
  - All MSs expressed some concerns about the pressures facing EU refining, many from EU legislative measures.
  - Commissioner concluded that there was sufficient concern expressed to continue discussion.
- **Nov 2012: Refining Conference:**
  - MSs, analysts and industry representatives discussed the external to EU and internal pressures affecting competitiveness.
  - Commissioner Oettinger stresses need for a strong EU industrial policy to encourage regrowth of manufacturing in EU.
  - Refining Fitness Check announced by DG Enterprise.
- **April 2012: First Refining Forum:**
  - New challenges from a re-emergent US sector highlighted.
  - Commission presented status of Fuels Quality Directive, Industrial Emissions Directive and scope of refining Fitness Check. Discussion followed with MSs, industry analysts and industry representatives.

# HOW HAS INDUSTRY SITUATION EVOLVED IN RECENT PAST?

# EU fuel demand profile changing: Big fall in total demand from 2007, but continuing decline in gasoline, growth in distillate. Result is growing trade imbalance

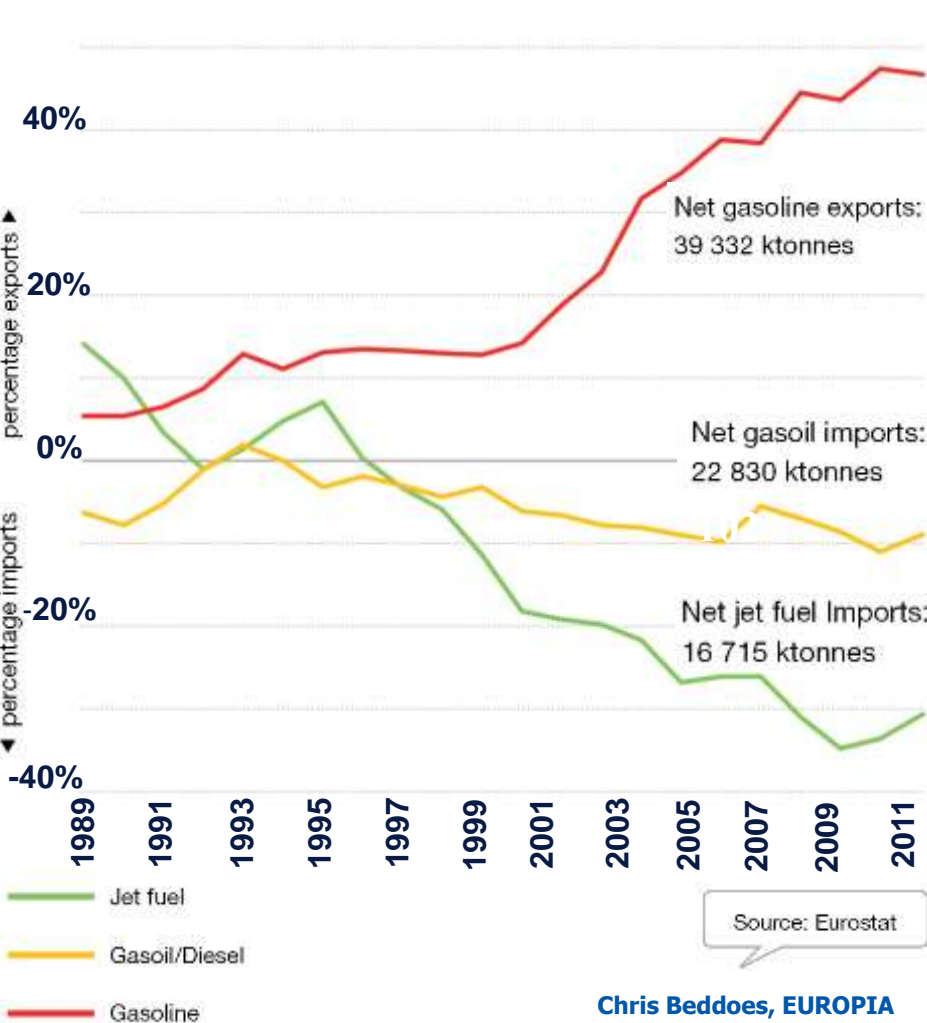


Transport fuel demand in the EU ; total energy including renewables flat, oil use declines

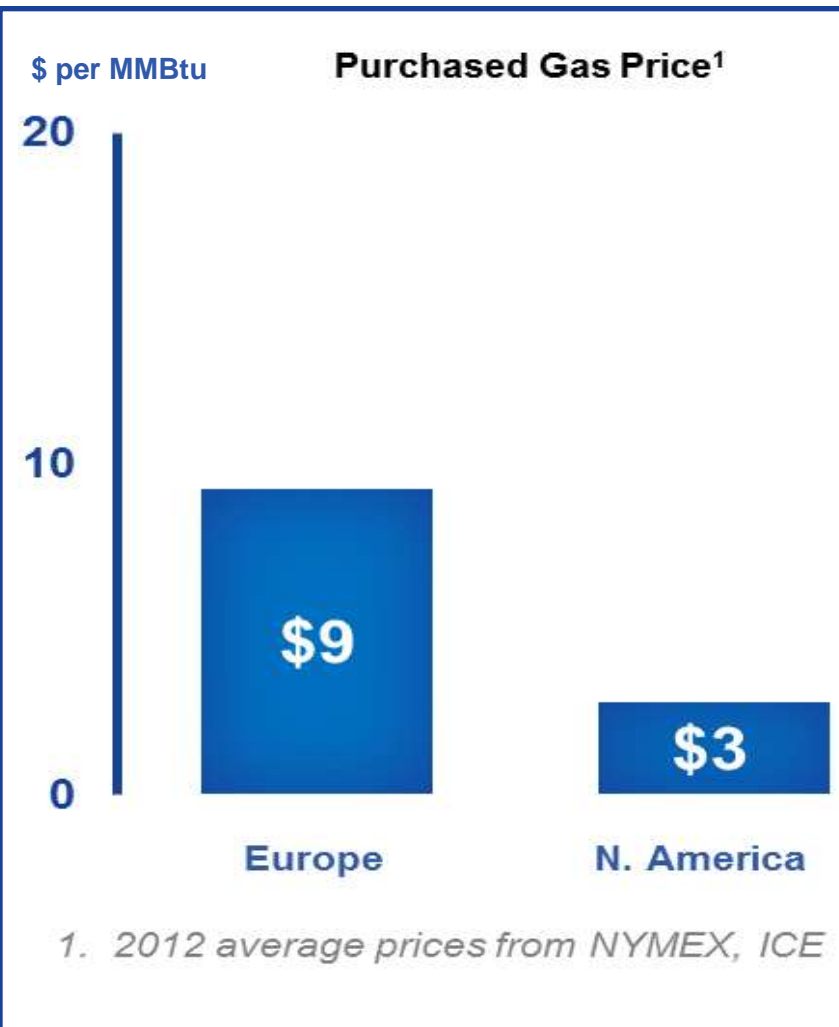


Source: ExxonMobil 2012 Outlook for Energy 5

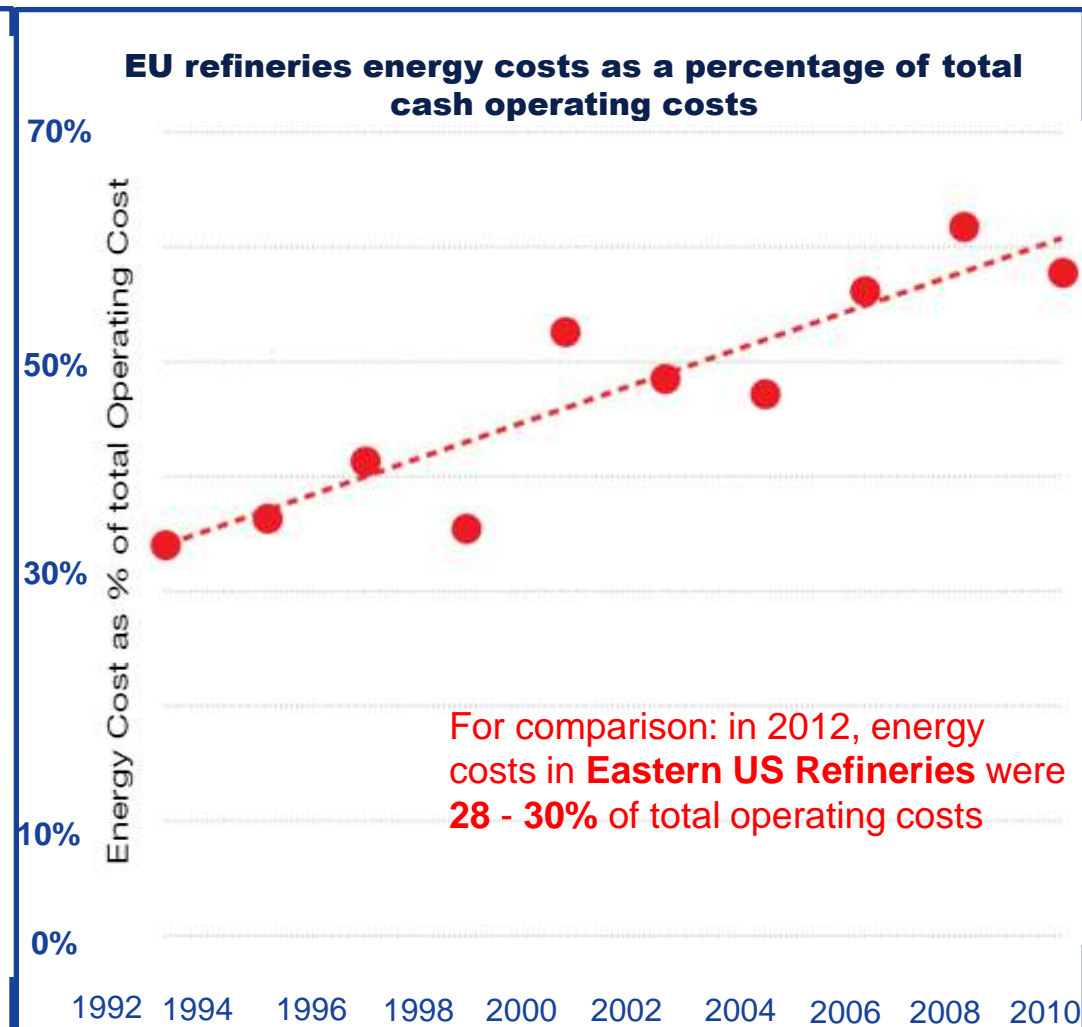
EU's foreign trade as %of demand demonstrates the trend of growing gasoline surplus&gasoil deficit



# Energy and raw material costs also becoming a significant factor in competition with other regions



Source: ExxonMobil



Source: Solomon Associates

# EU refining utilization and capacity have been reducing

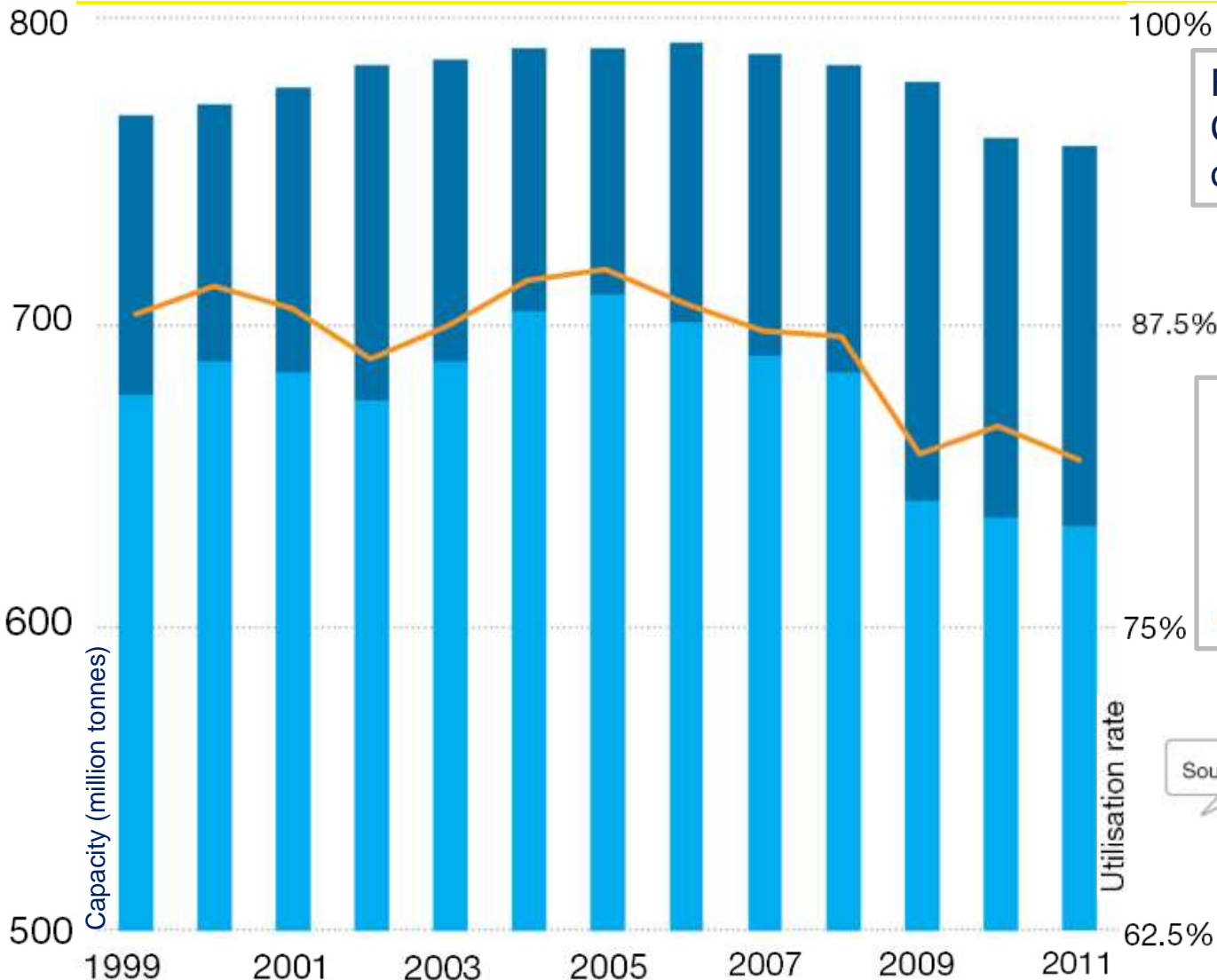
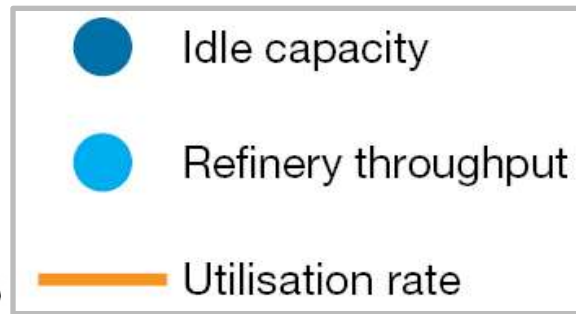


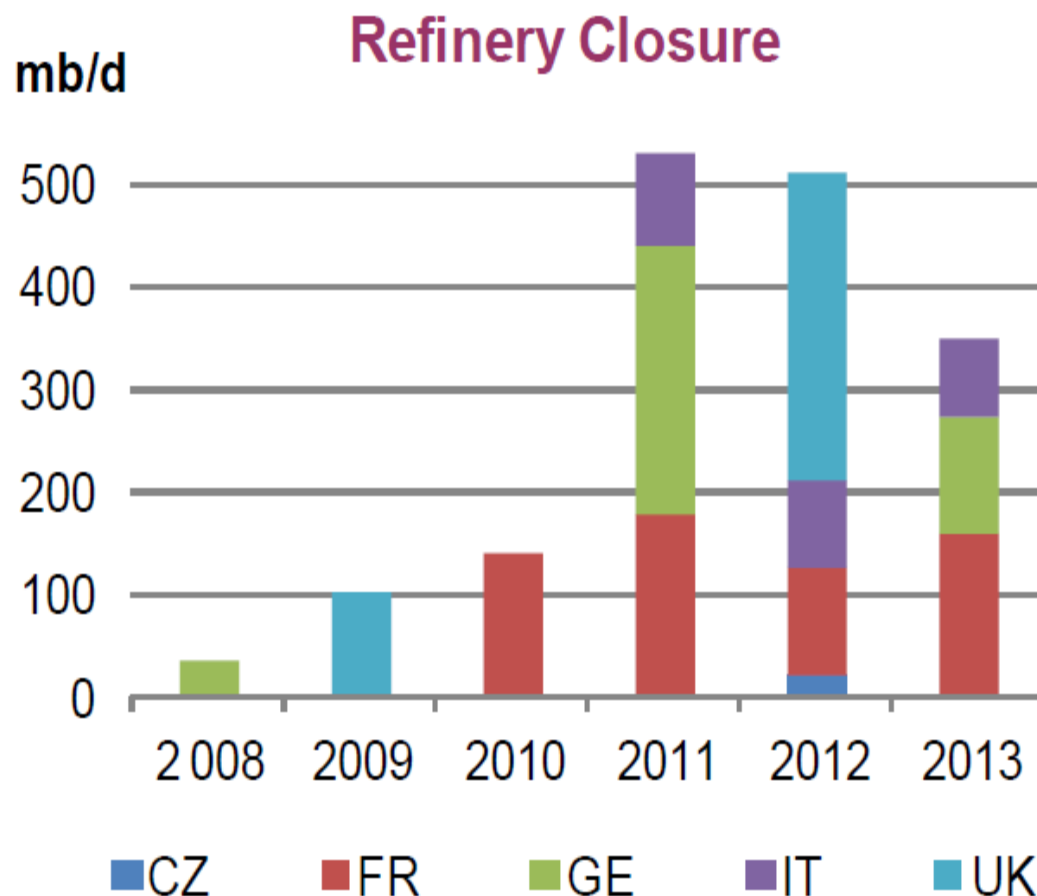
Figure: Capacity and utilisation rate of European refineries



Source: BP Statistical Review of World Energy 2012

# And the capacity has continued to reduce in 2012/13 EU refining industry is under severe pressure!

**15 refineries (102-87) shut-down 2008-2013 → 8% capacity decline**  
**Estimated 10 000+ direct skilled jobs, at least 40 000 indirect jobs.**



Sources:  
Capacity: IEA, Employment:  
CWE safety figures

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# WHAT ABOUT LEGISLATIVE PRESSURE?

# Current and impending environmental and climate legislation creates additional burden for EU Refining



## ■ EU Emission Trading System:

- Back loading with expectation of firming of C price looks likely.
- Recent Commission decision on Cross Sectoral Correction Factor :
  - Increases allowances to be bought by EU refining sector -- from 29-37%
  - **Unexpected cost increase by 28% or 1.4 B€ to 6.6 B€ over 2013-2020 (15 €/T CO2)**
- **To come in 2014: carbon leakage list review.**

## ■ Industrial Emissions Directive:

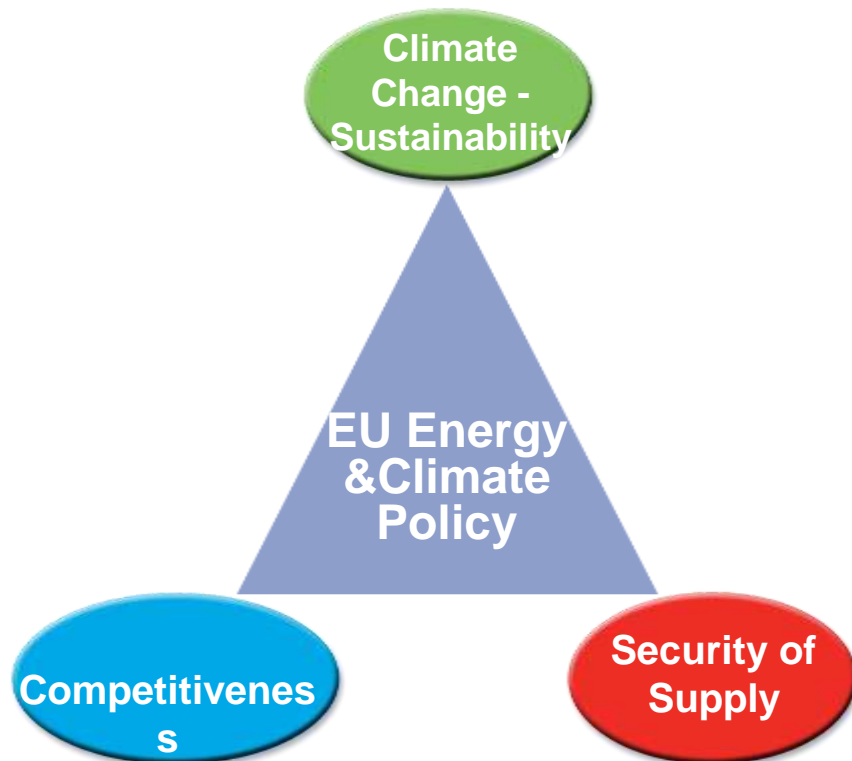
- Compulsory application of best practices by the Refining BREF could cost about 7-30 bln € investment, depending on the AEL ranges selected by the authorities.
- **BREF still to be finalized:** Use of “bubble” technique and “economic applicability” are critical.

## ■ Fuel Quality Directive Art 7A:

- Impact assessment and study not yet shared by Commission.
- **Still to be finalized:** latest proposal would limit EU access to competitive crudes, damage EU refining competitiveness, reduce EU access to products from certain feed stocks – and not reduce global GHG!

# Conclusion: the EU Refining sector is still under significant pressure

- Oil products will still be needed in EU economy for decades to come.
- Refining plays a vital role in secure and cost effective EU supplies.
- Combination of external competition and EU legislative burden are major problems for the industry.
- Despite major investments in recent years to meet legislation, EU Refining industry faces further massive investment to remain competitive.



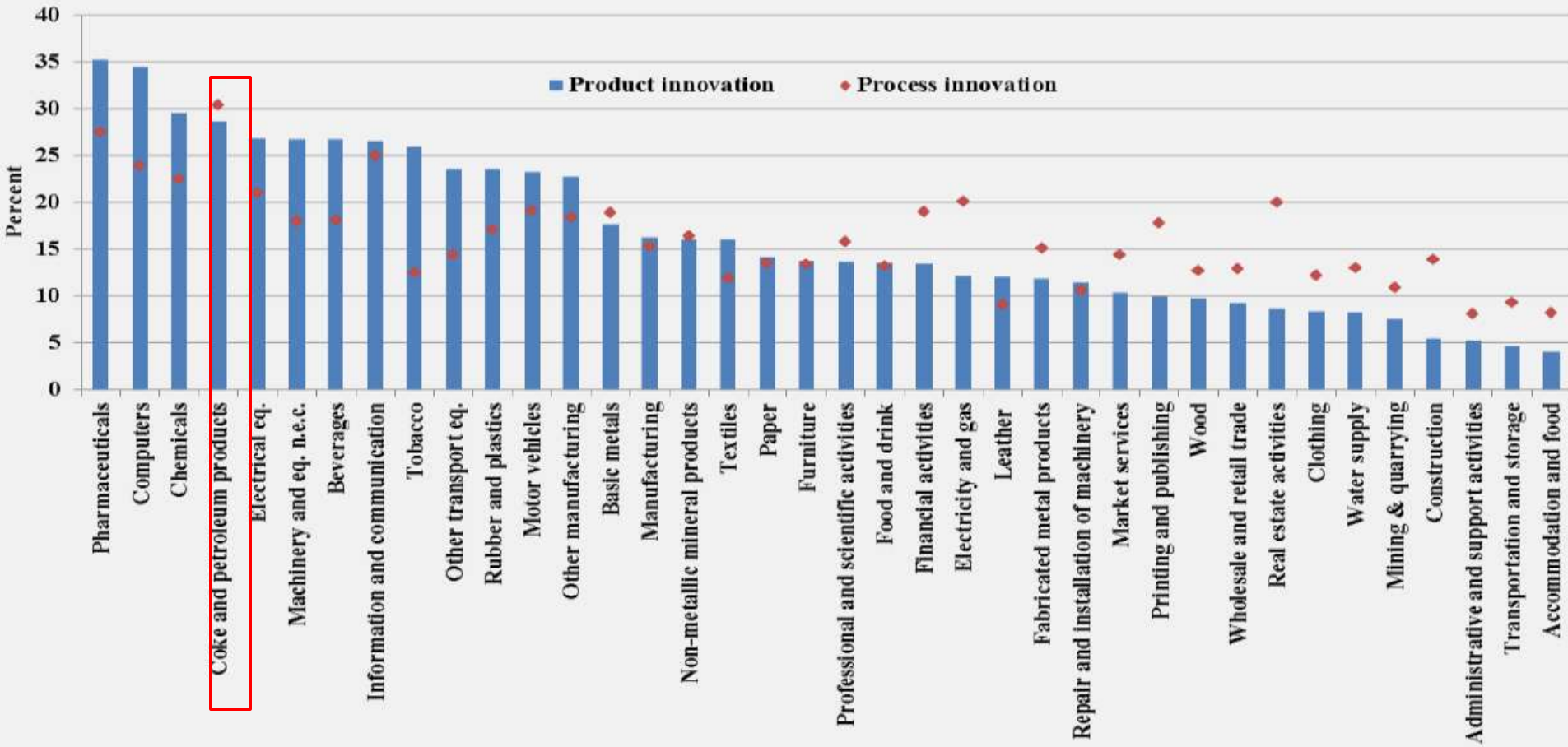
**The Bottom line. If EU is to retain a competitive refining sector it needs realistic policies, with a better balance between industrial competitiveness and energy, climate and environmental goals.**



representing  
the european  
petroleum  
industry

# WHAT NEXT? IS THERE ROOM FOR OPTIMISM?

# EU Refining industry # 1 process innovation and among most innovative industries for products

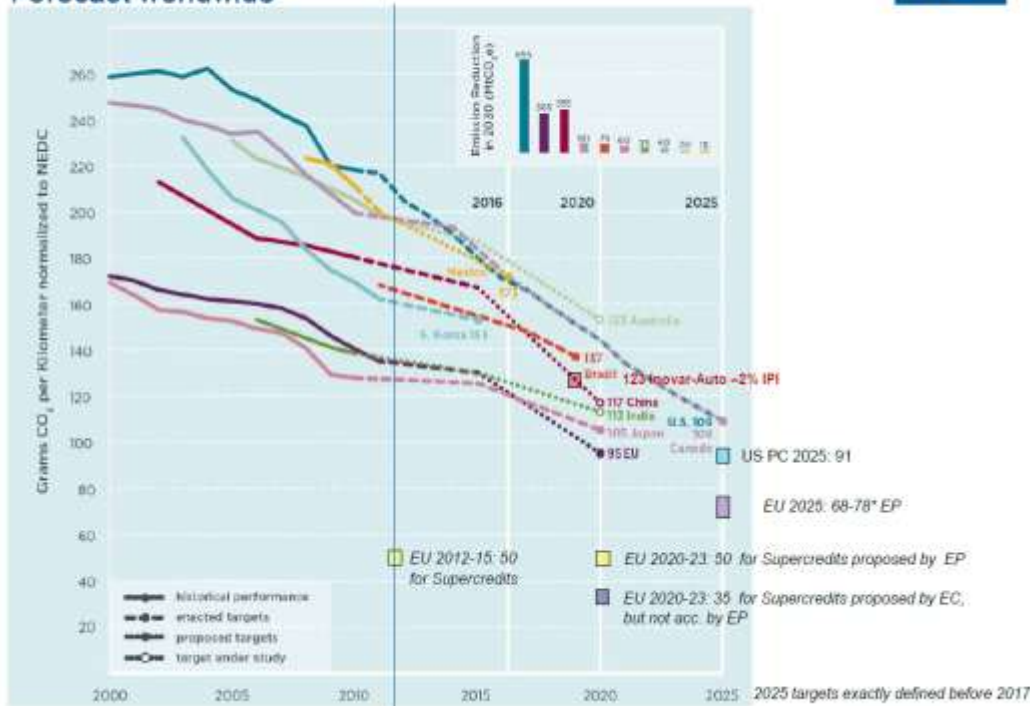


Source: European Commission; European Competitiveness Report 2013

# Technology development in Internal Combustion Engines: still significant and cost effective progress available

Source: Ricardo (2013)

## CO<sub>2</sub> Limitation Forecast worldwide



## Technology Overview for Light Duty Gasoline



- Engine concepts** include: Downsizing, down-speeding and energy recovery
- Combustion** includes: Homogeneous DI, Stratified GDI, EGR and biofuels
- Engine Design** includes: cooling, lubrication and weight reduction



- Air handling** includes turbochargers and cylinder deactivation
- Emissions control** includes: TWC, LNT and GPF

## Technology for HDV engines

- High Pressure Fuel Injection System** (Common Rail architecture) Electronic control of injection timing, fuel pressure & number of injections
- TC System** single-stage turbochargers i-air charge coolers cania /DAF/ Iveco) use VGTs stage TC systems



- Future HD engine technologies**
  - Waste Heat Recovery Systems
  - Turbocompound (mechanical) – already used in a few applications
  - Turbocompound (electrical gen.)
  - Organic Rankine Cycle

- Exhaust Aftertreatment System** Diesel Oxidation Catalyst, Diesel Particulate Filter Urea- SCR (Selective Catalyst Reduction of NOx) Ammonia Slip Catalyst
- Exhaust Gas Recirculation** EGR for NOx reduction Most engines use cooled EGR. Some Volvo engines have no EGR cooler Iveco does not use EGR Some Scania engines do not use EGR

- Future HD engine technologies**
  - Double overhead camshaft enabler for VVT / VVA
  - Advanced cooling strategies
  - Variable displacement oil pumps
  - Hybridisation

The future could allow EU refining to work closely with existing and emerging technologies as part of combined flexible manufacturing platforms.



Technological advances are allowing EU refining to continue to evolve; for example to :

- Build on existing technological EU leadership - adapt existing fuels to the changing demands of engine technology and other end uses.
- Accept different feedstocks - oil-based and sustainable biomass. Co-process or blend them in an effective, quality controlled manner.
- Use the molecules in mixed processes - refining, chemical or bioprocess - where they add most value to the consumer.
- Further improve the efficiency of refining processes, through technology advances: e.g. in catalysis, lower energy separation processes, more efficient pumps and compressors , more advanced control systems.
- Integrate manufacturing processes to create synergies and efficiencies, both in resource and energy efficiency: e.g. economic high efficiency cogeneration, heat integration, creating “critical mass” for the potential use of developing technologies such as CCS.

**But.....Refining needs to stay in Europe for this to happen in Europe!**

# So EUROPIA's views on the Refining Forum: where to next?



## ■ Nov 2013: Second Refining Forum today:

- Update on competitive pressures from IEA and MSs.
- Progress on Commission led work: energy costs, Fitness check, ETS carbon leakage review.
- Industry input: TTIP, value chain refining- petrochemicals, refining costs analysis

## ■ Future Fora:

- A critical success factor is broad and active participation of MSs, EU Institutions, industry analysts, value chain partners and industry itself.
- Ideas for topics over next 18 months:
  - Fitness check progress and follow up
  - Impact on sector of decisions made for implementing measures: FQD 7A, IED BREF, ETS C leakage.....
  - Review and impact of EU 2030 proposals.
  - Requests to the new Commissioners and Parliament: what would it take for the industry to remain sustainable in Europe?

**We hope that the Forum will address and propose practical solutions to the issues facing the refining sector.**



# Thank you for your attention

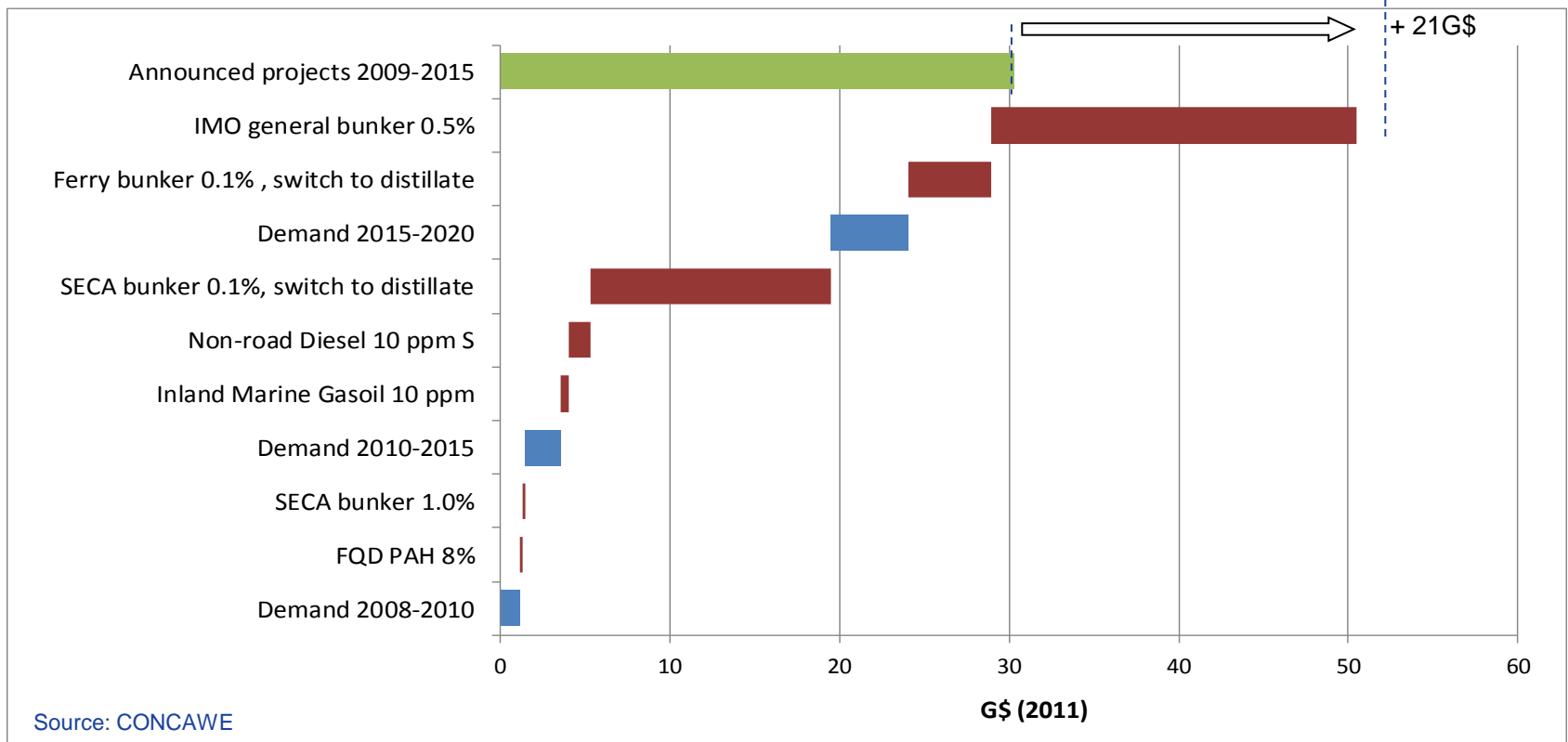


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# Despite vast improvements in recent years the EU Refining faces further substantial investment requirements



- ▶ Additional 21 G\$ of investment required above the estimated 30 G\$ for announced investment projects by 2020= 51 G\$
- ▶ 51 G\$ equates to about 1 \$<sub>2011</sub>/bbl of crude processed over the 2008-2020 period, compared to typical historic EU refining margins of 1-5 \$<sub>2011</sub>/bbl.
- ▶ **But, declining demand post-2020 would lead to under-utilisation of new-build capacity - doubt on investment decisions prior to 2020?**

# Current draft Refinery BREF could lead to sector investment costs from 7 to 30 b€:



- Could cost an “average” EU refinery from 70-300m€ just to stay in business.
- EUROPIA has two major concerns with the BREF:
  - BAT standards are extremely demanding: economic applicability for the most expensive techniques is not included in Refining BREF.
    - Not the approach taken in other BREFs (Iron & Steel, Glass, Pulp & Paper) therefore discriminatory against Refining.
  - The “Bubble” concept would allow cost effective compliance with standards but is not currently in the BAT conclusions
    - DG ENV discussion paper proposed an application of the bubble but with severely limited scope, a punitive “correction factor” and variable targets impracticable to apply.
    - The bubble is supported by a large majority of MSs, which also rejected the recent proposal for a restrictive bubble.
- EUROPIA therefore requests
  - A cost effective bubble in BAT with economic applicability criteria for 6 key conclusions.
  - An Impact assessment on draft BREF for the inter-service consultation.

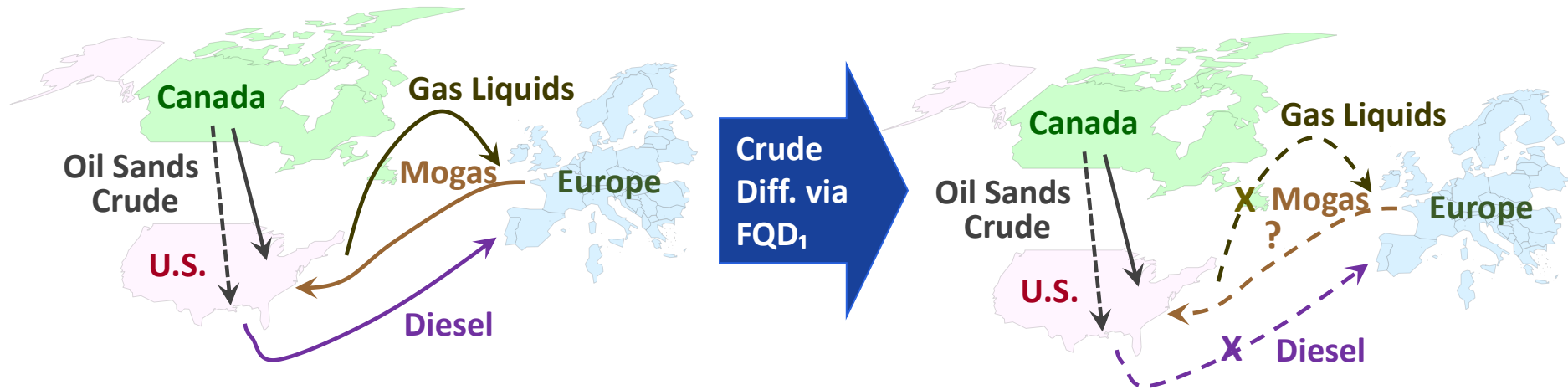
## Fuel Quality Directive Art 7A:

EUROPIA recommends single EU wide “default” values:  
one for diesel and one for gasoline



- Single values for diesel and gasoline will allow compliance with the objective of the Directive – 6% reduction in GHG content of EU road fuels – in an effective verifiable and lowest cost manner.
- The proposal of DG CLIMA for multiple values has a number of problems:
  - **Effectiveness:** regulating products sold in EU will not reduce emissions from upstream producers - they will simply find other markets.
  - **Competitiveness:** restricting EU access to certain feedstocks will threaten competitiveness of some EU refineries.
  - Trade and supply security: hindering supplies from reliable supply partners will undermine security of supply for EU and possible WTO problems may jeopardise €20G of trade with N.America.
  - **Verification:** obligation falls on final fuels suppliers - including 2000 SMEs – accurate tracking will be unreliable, difficult to verify and hugely complex.
  - EU views on and access to so called “unconventional” energy sources should be decided after a broad discussion not through a Comitology provision.
- EUROPIA requests support to adopt single values whilst this thorough debate and evaluation takes place.

# Likely Impact of DG Climate Proposal for Crude Differentiation via Fuel Quality Directive



- U.S. – EU Fuels Trade: \$32B/year<sup>2</sup> in 2012
  - EU imported 340 KBD of diesel from the U.S.<sup>3</sup>
  - EU exported 350 KBD of mogas to the U.S.<sup>3</sup>

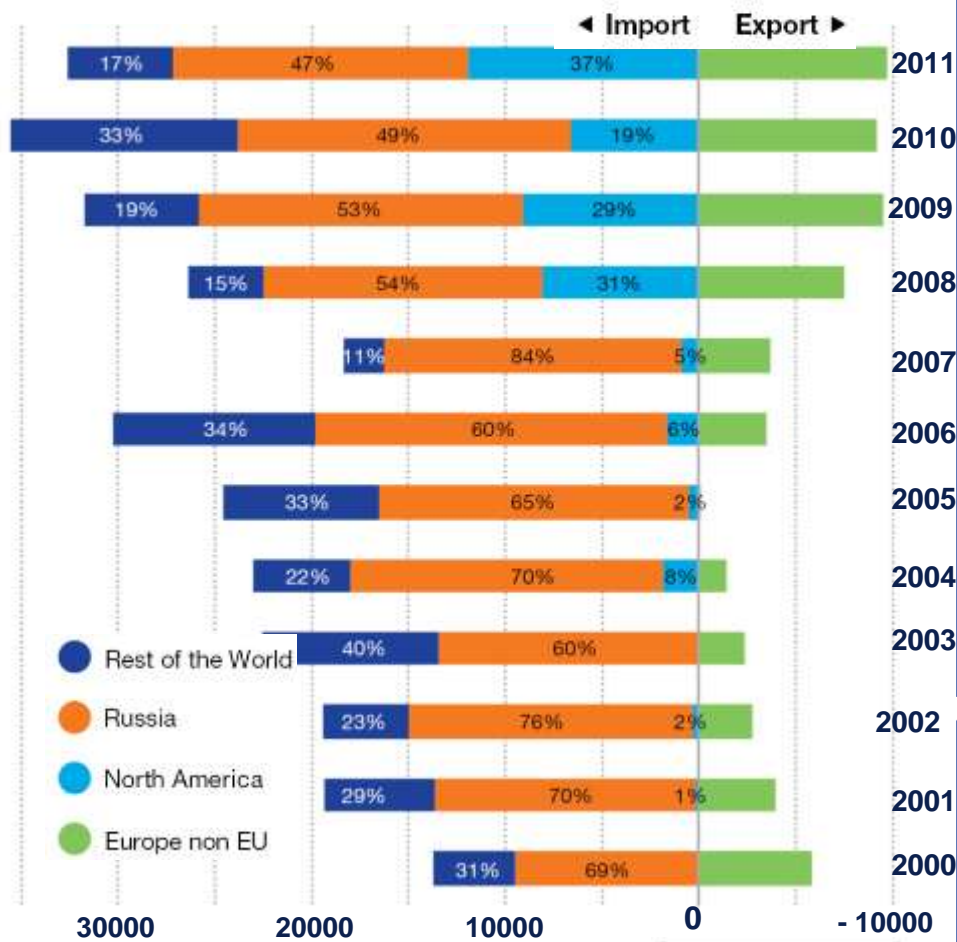
- Crude Differentiation could eliminate the U.S. as a source of diesel imports for the EU
- Unlikely to impact oil sands crude production
  - Likely result: increase in global crude/fuel shuffling

1. FQD = Fuels Quality Directive  
 2. AFPM estimate  
 3. From US Energy Information Agency (EIA)

# Increasing import dependency

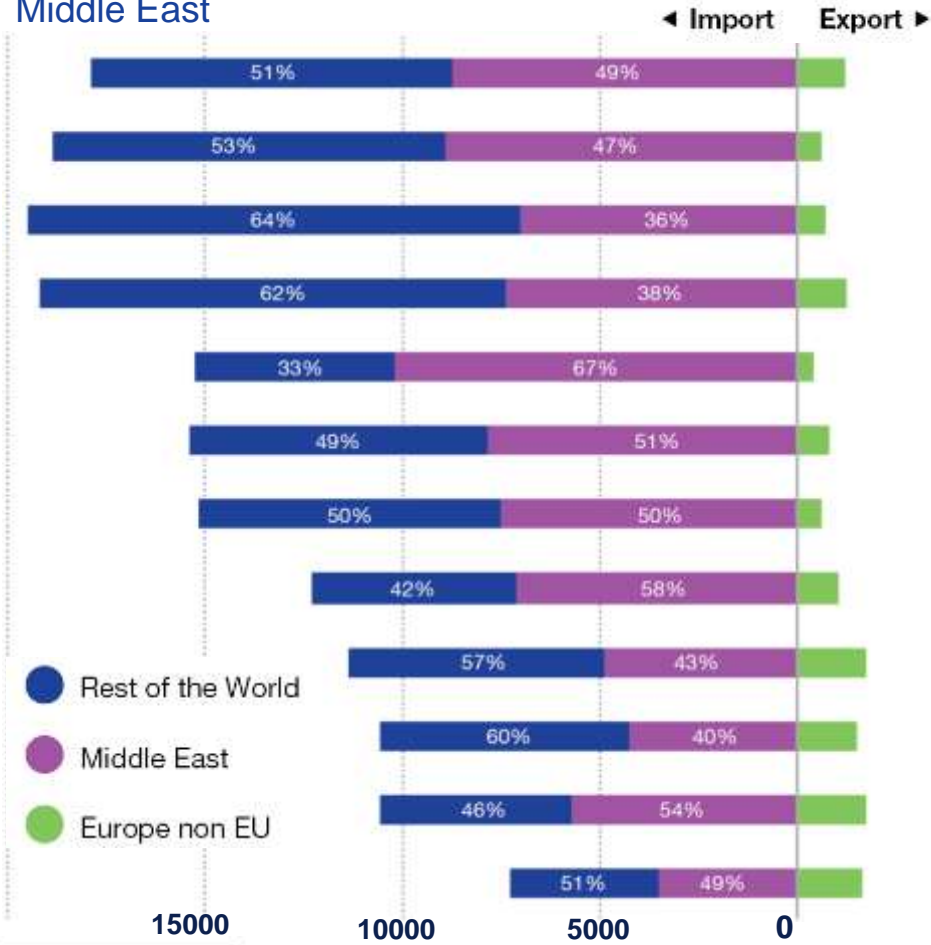
## EU Gasoil trading balance:

Russia is a leading exporter of gasoil to the EU



## EU jet fuel trading balance:

EU continuously increases its import of jet fuel from Middle East



Source: Eurostat

Chris Beddoes, EUROPIA  
EU Refining Forum, Nov 2013