



STRATEGIE E PREVISIONI DI MERCATO PER LA FILIERA DELL'IMPIANTISTICA INDUSTRIALE



The Global Downstream Market



The global picture

- The market is a challenging one for many refiners, but the picture is varied, region by region
- Significant capacity expansion is expected to come on line during the next five years
 - 2014 anticipated capacity additions of around 1.2MM B/D expected to roughly balance with refined product demand growth
- May be experiencing an “over-expansion” cycle, with capacity expansions intended to address demand growth that may be lower than expected
 - Some concern about softening of projected Chinese demand growth, as it is such a significant % of global refined product demand
- Many of the international oil companies have announced more constrained capital budgets, with increasingly stringent scrutiny of planned refining capex spend
 - Rising project costs also putting additional strain on available capex
 - Very strong competition for available capex from upstream projects in integrated oil companies



Refined Product Demand

- Global refined product demand is expected to grow on average by 1.2% per year from 2012-2035
 - Light transportation fuels demand is expected to grow fastest and account for an increasing share of the refined product market
 - Middle distillates are the driver of refinery margins in many regions
 - Gasoline demand is declining in industrialized countries but growing in developing countries. Demand will likely be impacted by fuel economy initiatives and changes in fuel subsidies
 - Heavy fuel oil demand continues to decline due to substitution by natural gas, and renewables

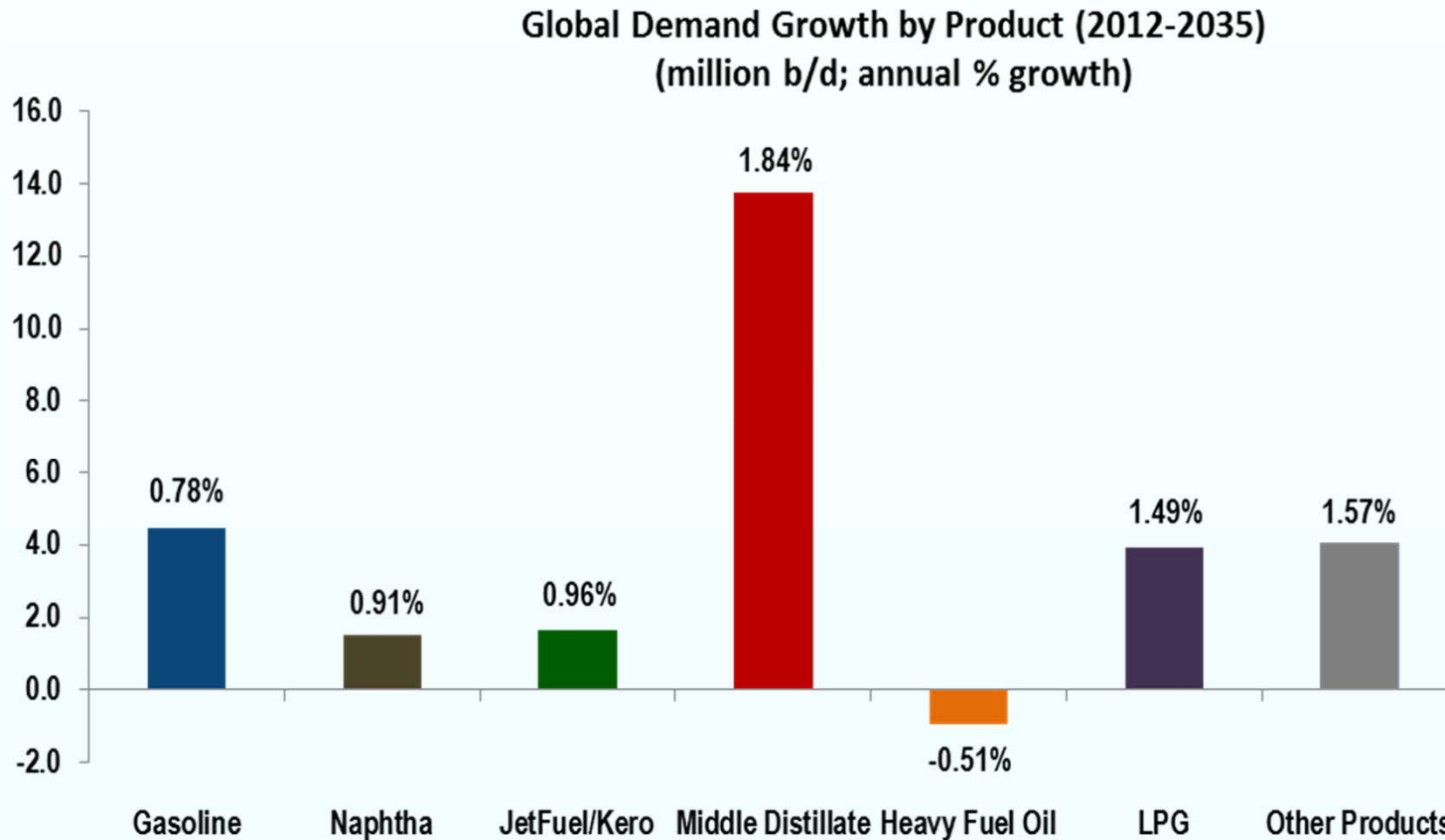


Aegean Refinery, Turkey

- Virtually every region is moving towards more stringent fuel quality standards, focusing mainly on sulphur, aromatics and benzene
 - Diesel sulphur represents the most significant challenge to refiners
 - Still some uncertainty over the timing of the International Maritime Organisation's bunker fuel 0.5% sulphur limit implementation – will impact distillate demand



Refined Product Demand Growth

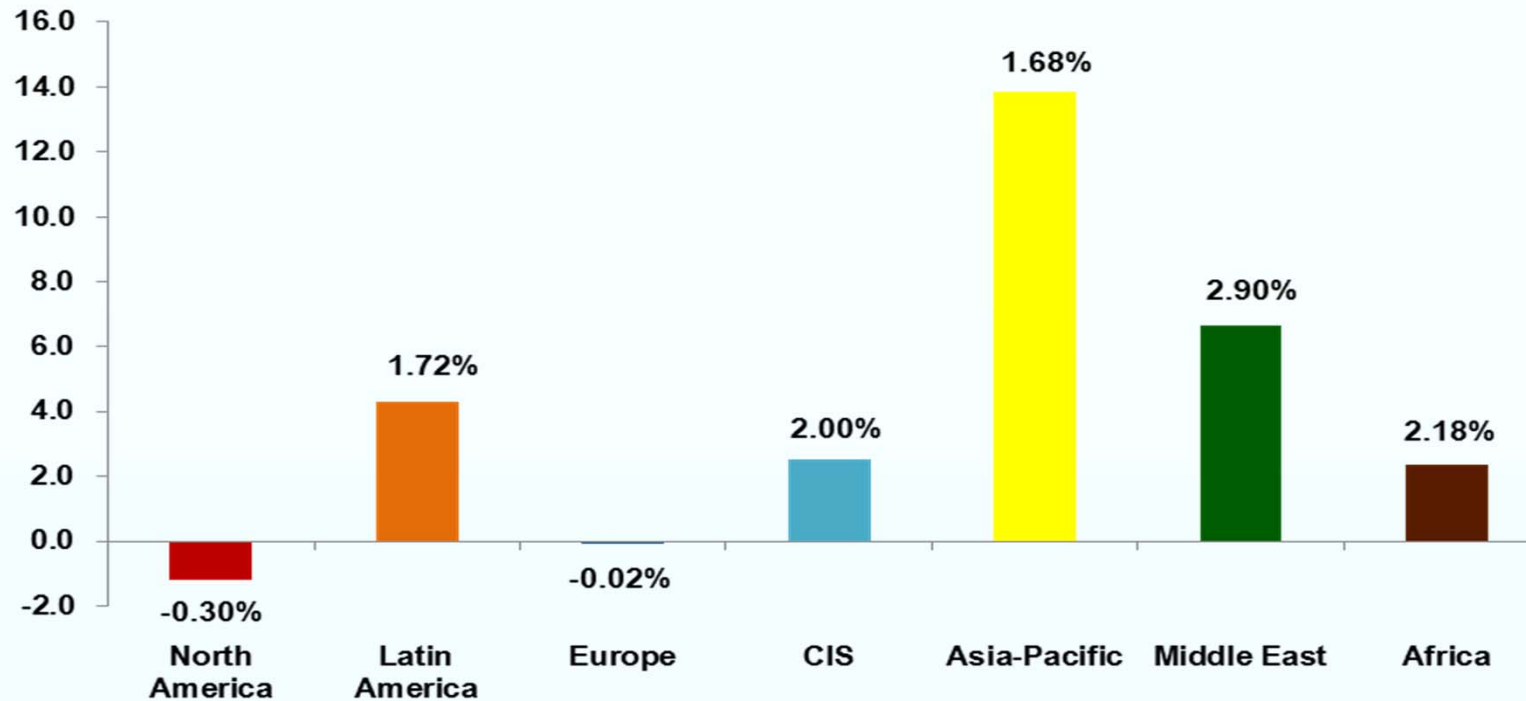


Source: Hart Energy Research & Consulting, 2013



Regional Perspective

Regional Refined Product Demand Growth (2012-2035)
(million b/d; annual % growth)



Source: Hart Energy Research & Consulting, 2013

- Asia Pacific dominates demand growth, with China accounting for >50% of expected Asia Pacific demand growth.



Regional Perspective

- North America:
 - Refiners are reaping the benefits of cheaper feedstock and natural gas prices, and strong export opportunities to Latin America and Europe
 - Increasing light low sulphur feedstock from tight oil production will add to growing naphtha surplus arising from switch to gas in steam crackers
 - US has regional tight oil surpluses relative to its refinery configurations – ability to export the crude will have an impact on refinery configuration changes
 - Gasoline demand continues to decline although still accounts for 43% of global consumption. Demand also impacted by increased contribution of ethanol: decreasing US exports to Europe but increasing into Latin America
 - US is emerging as a major diesel supplier to Latin America and also to Europe
- Latin America
 - Still reliant on costly imports, especially for middle distillates
 - Many of the planned investments in new refineries or major expansions have been delayed or cancelled, some due to financing challenges
 - Implementation of stricter fuel quality standards proceeding requiring more hydroprocessing capacity e.g. recently announced clean fuels programme in Mexico,
 - Indigenous crude is relatively low quality, which will require significant conversion capacity additions



STRATEGIE E PREVISIONI DI MERCATO PER LA FILIERA DELL'IMPIANTISTICA INDUSTRIALE



Regional Perspective

- Europe:
 - Overall demand flat to declining but large imbalance between supply and demand, with gasoline surplus and growing diesel deficit (about the only product for which demand is growing long-term)
 - Margins remain challenged, especially the older lower-complexity refineries facing high feedstock costs and with little ability to switch to higher value products such as middle distillate
 - Refineries which can produce ultra low sulphur products, especially diesel, will be strongly advantaged within the region
 - End markets for surplus gasoline are becoming increasingly competitive (from US and Middle East)
 - Diesel deficit - Russia remains a key supplier : US and Middle East will also be targeting European market
 - Additional refinery closures are likely and are required to deal with the utilization challenge



STRATEGIE E PREVISIONI DI MERCATO PER LA FILIERA DELL'IMPIANTISTICA INDUSTRIALE



Regional Perspective

- Russia/CIS:
 - Refinery utilisation rate has improved with recent rationalisation
 - Focus of investment will be on modernisation to increase depth of refining and desulphurisation to improve quality of fuels to meet European standards for domestic and export markets, especially diesel (although it is really the export markets that are driving this for now)
 - Expecting additional cat cracking capacity to be installed to meet aim of self-sufficiency in gasoline
 - IMO-related bunker fuel requirements could pose a challenge given current high sulphur content of residual fuel oil
 - Recent challenges arising from increasingly stringent sanctions imposed as a result of the Ukraine crisis
 - Western companies constrained from doing business in Russia: non-embargoed countries, such as Koreans, Chinese, are not currently facing the same constraints
 - Financing may be an issue and ECA financing may be impacted



Regional Perspective

- Middle East
 - Significant refinery expansion investment both underway and planned to meet strong domestic demand growth, particularly gasoline, and also for export markets
 - Investment also focused on substituting oil products for other products in power generation e.g. in Kuwait, looking to replace imported LNG in power generation
 - Could be some initial overcapacity which could strain margins
 - Large modern complexes will be advantaged, including those with integrated petrochemicals production to diversify income stream
 - Ability to meet low sulphur requirements in end markets will provide significant export options for light transport fuels
 - Meeting tougher heavy marine fuel specs may be more of a challenge because of high sulphur content of indigenous crudes
 - Situation with regards to Iraq and Iran will be a key factor influencing the supply picture going forward



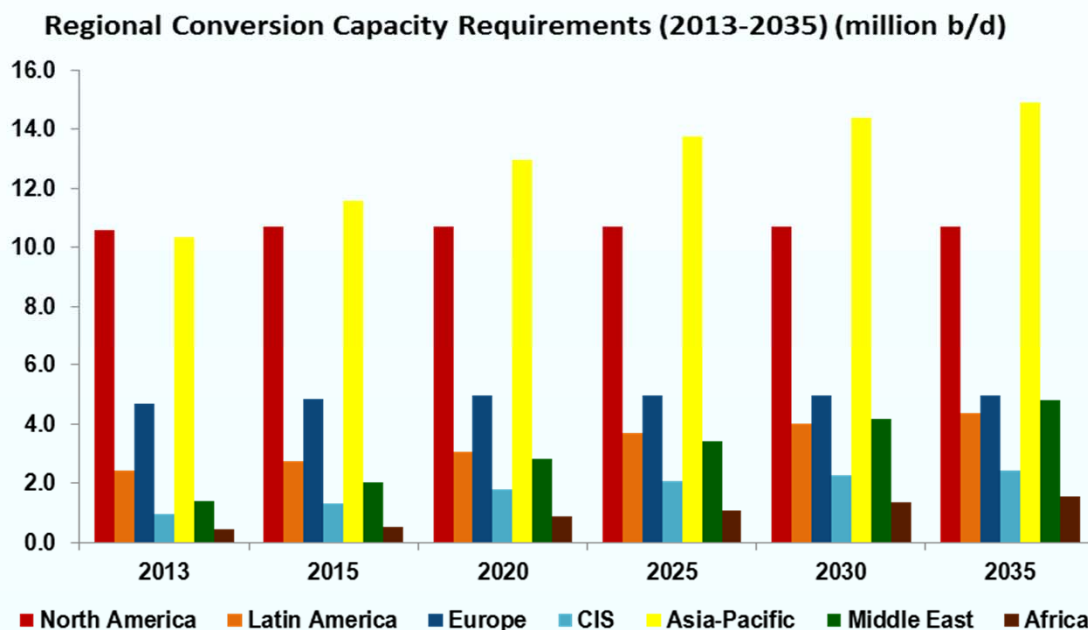
Regional Perspective

- Asia Pacific
 - Great contrast between industrialised and developing Asia Pacific countries e.g. China and India rapid capacity expansion versus rationalisation in Japan
 - Significant expansion of conversion capacity required to meet strong demand growth for light transportation fuels
 - Competitive pressures from new Middle East capacity may impact export-oriented capacity additions in Asia Pacific
 - Transportation fuel quality becoming tighter across the region but timescales differ
 - Changing government subsidies impact demand, especially for gasoline
 - US exports may be advantaged over Asia Pacific exports in the Atlantic market
- Africa
 - Facing the challenge of low complexity, and poor production performance, often with utilization of less than 50%
 - Significant imports of gasoline, middle distillates and jet fuel
 - Impact of geopolitics and security concerns on North African investment e.g. in Libya, Egypt and Algeria
 - Delays to planned introduction of new fuel quality specifications e.g. in S. Africa



Capacity Additions

- Conversion capacity requirements over the next 20 years more significant than crude distillation or light oil processing
 - 42% capacity expansion required over the period
 - Increasing shift towards hydrocracking driven by demand growth for diesel, decline in gasoline demand in developed countries and ultra-low sulphur product demand
 - 40% increase in hydroprocessing capacity required, covering all regions

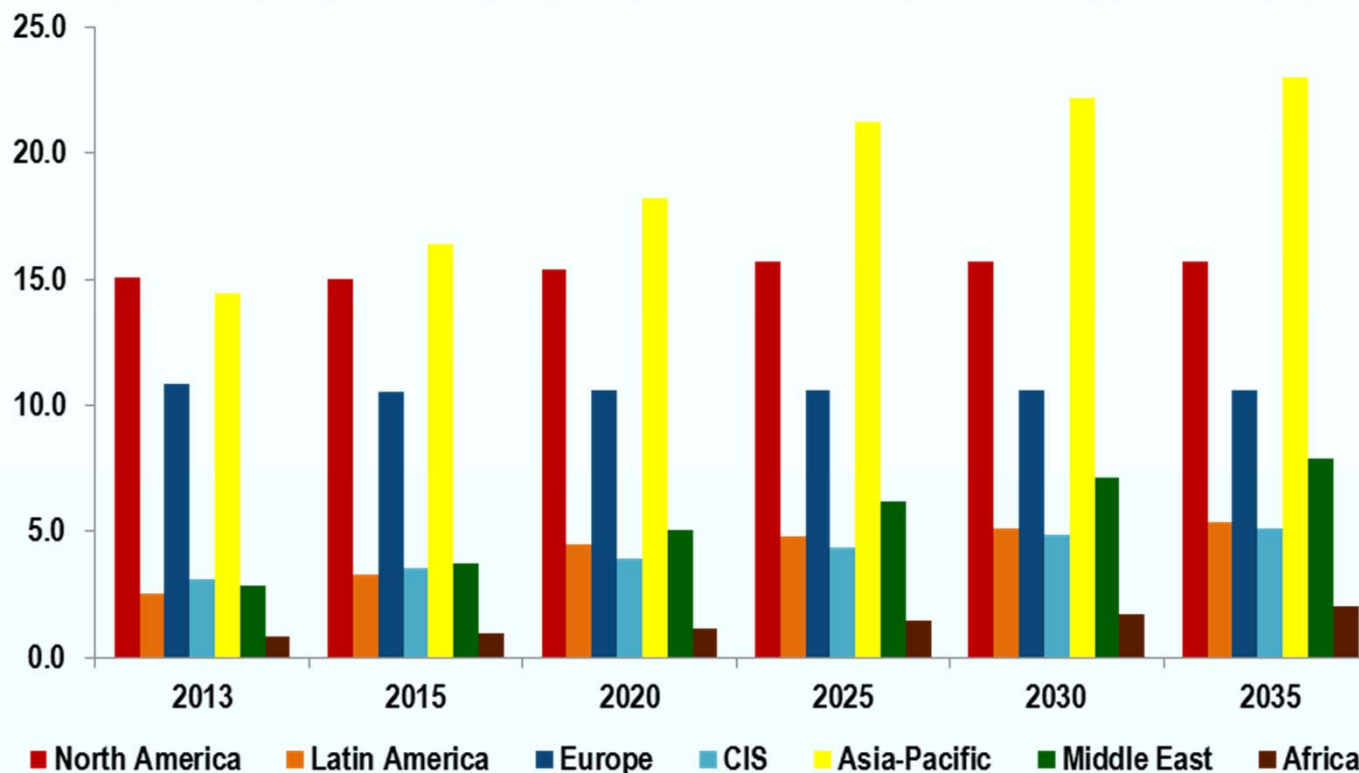


Source: Hart Energy Research & Consulting, 2013



Capacity Additions

Regional Hydroprocessing Capacity Requirements (2013-2035) (million b/d)



Source: Hart Energy Research & Consulting, 2013



The global picture

- Picture has changed over recent times: the market is challenging for many refiners, but the picture is varied, region by region
- Prime change is North America: refiners now advantaged in terms of feedstock and fuel costs
- Diesel demand is the key driver of global refined product demand growth and refinery margins
- Further capacity rationalisation required in developed countries
- Major expansions still required in developing countries
- Clean fuels legislation continues to drive investment
- May be experiencing an “over-expansion” cycle, with capacity expansions intended to address demand growth that may be lower than expected
- Upstream production rather than refining is the prime focus of capex investment for many companies

Issue is not whether investment needs to take place, but where it is best directed to generate optimal returns for refiners



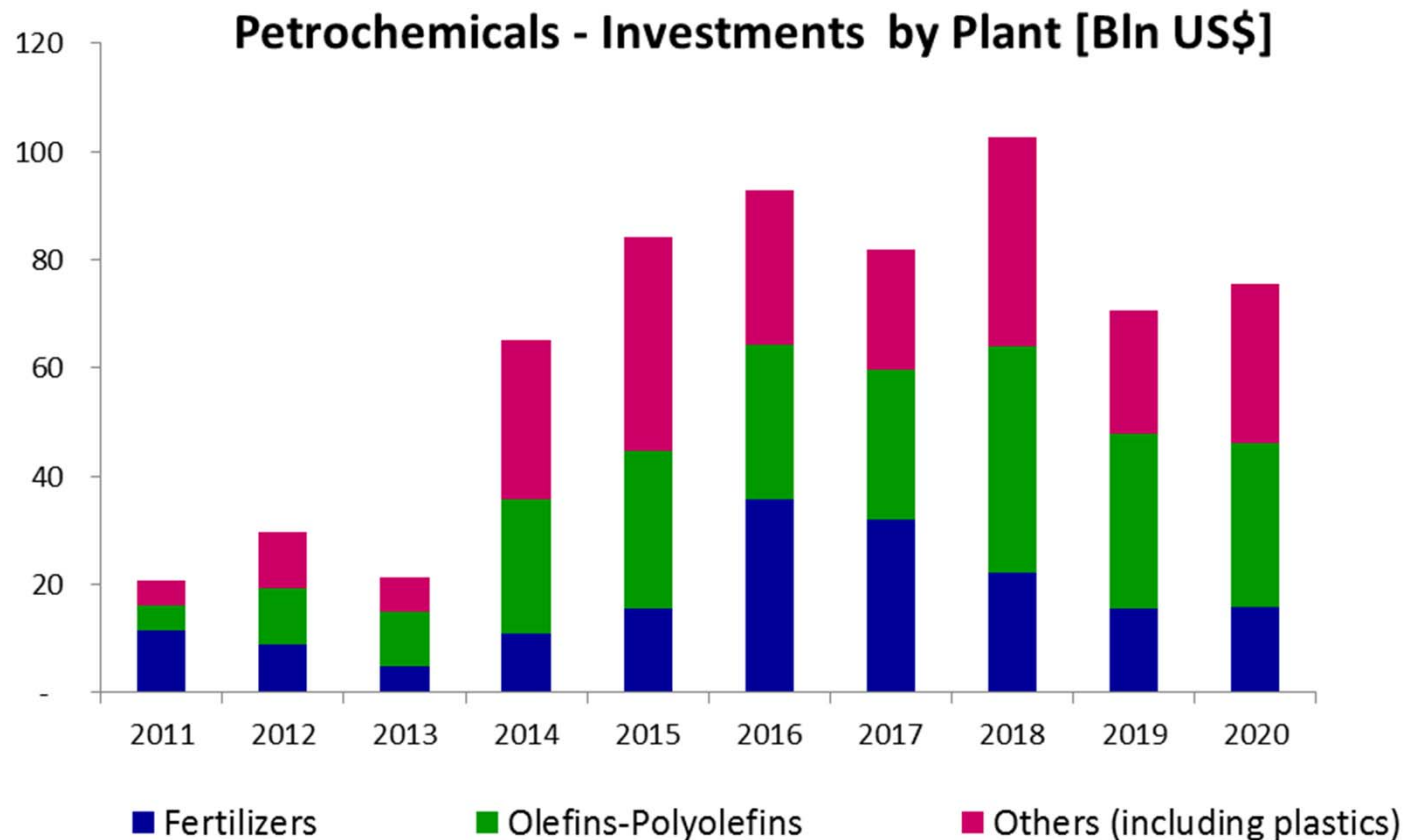
STRATEGIE E PREVISIONI DI MERCATO PER LA FILIERA DELL'IMPIANTISTICA INDUSTRIALE



The Global Petrochemical Market



Petrochemical Product Demand



Source: EIC, World Energy Outlook

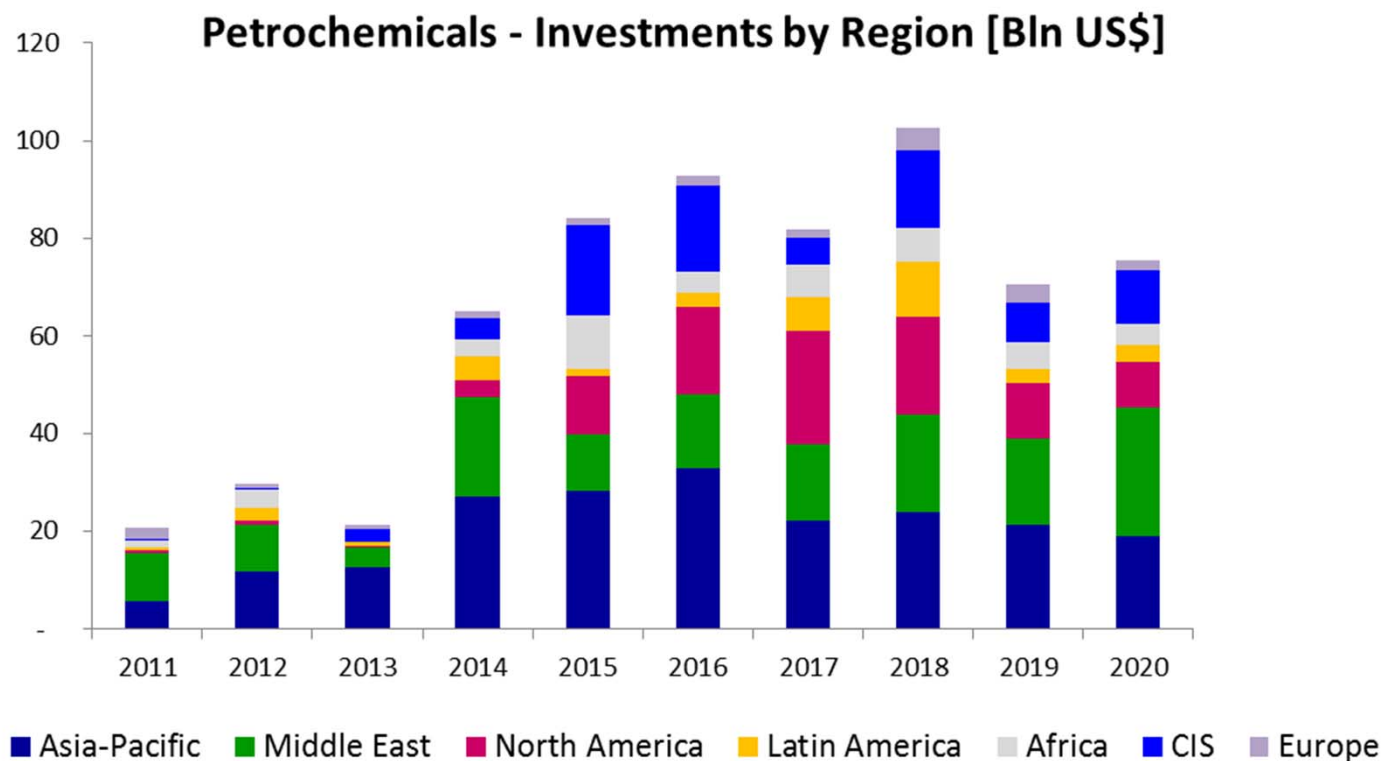


Petrochemicals - the global picture

- Petrochemicals are chemical products traditionally derived from crude oil, though some chemical compounds are nowadays also obtained from coal and biomass. The main feedstock are naphtha, LPG (propane and butane), ethane and diesel (gasoil). The choice of feedstock is determined by availability and price, as well as the desired range of products: yields vary according to the mix of feedstock.
- Petrochemical sector trend is strictly linked to oil demand and consumption trends. This sector is the second most important oil consumer after transport.
- Among energy-intensive industries, petrochemicals are expected to see the fastest growth in output over the next decade, entailing high demand for oil as feedstock. Products in high demand include plastics, fiber and rubber.
- While the overall outlook is for steady growth in the use of oil-based petrochemical feedstock, there are marked differences across regions.



Petrochemicals - Regional Perspective



Source: EIC, World Energy Outlook



Petrochemicals - Regional Perspective

- North America:
 - Among the OECD markets, the United States is the only one that is able to increase petrochemical production. As in the Middle East, this is based on the availability of ethane from increasing production of NGLs, the prospect of cheap feedstock having spurred a wave of interest in new ethylene and derivate processing plants.
 - Most of the output from the new US petrochemical plants, as well as the surplus propane and butane from NGLs, will be exported. Ethane could also be exported to Europe or Asia, but there are several obstacles to overcome: the ethane would have to be liquefied, with costs similar to those of LNG liquefaction (moreover, most of the steam crackers in Europe run on naphtha and very few on ethane). It is far more economical to transport plastics.
- South America:
 - South American petrochemical production, dominated by Brazil, sees a production increase though the region remains a minor producer. A substantial portion of the increase in petrochemical capacity is projected to be built after 2020 when Brazilian oil and gas production is expected to increase. Brazil is a pioneer in the commercial production of ethylene and plastics from biomass, with a first plant built in 2010 and a second expected to come on stream in 2015. Production costs are still high, compared with conventional technologies, which accounts for its limited growth in our projections.

Source: EIC, World Energy Outlook



Petrochemicals - Regional Perspective

- Europe:
 - Europe sees a drop in demand for oil-based feedstock, driven by weak domestic demand and relatively high feedstock prices. Production is mainly based on expensive naphtha from refineries, which makes these countries (with Japan) the highest cost producers in the world.
 - The petrochemical industry in Europe is suffering from a significant disadvantage in terms of feedstock costs and can limit the negative effects only by further increasing efficiency, considering refinery integration and moving to higher value products.
- Middle East:
 - Demand is projected to grow rapidly in the Middle East. Saudi Arabia is the dominant petrochemical producer in the region, accounting for roughly 60% of ethylene production, with Iran, Qatar, the UAE and Kuwait accounting for most of the remainder.
 - Qatar, Kuwait, UAE and Iran are expected to be the main sources of output growth, with the UAE and Qatar seeing the fastest relative increases in production.
 - The expansion of the petrochemicals sector in the Middle East is based on the availability of cheap feedstock: natural gas supply grows by almost 60%, with a corresponding increase in the volume of NGLs, providing a ready source of ethane that makes the region the cheapest global producer of ethylene.

Source: EIC, World Energy Outlook



Petrochemicals - Regional Perspective

- Asia Pacific:
 - Emerging petrochemical producers in Asia, particularly in China, Southeast Asia and India, see substantially higher oil feedstock consumption, driven by a rapidly increasing demand for plastics.
 - Globally, industrial energy use expands at 1.4% per year. China accounts for almost half of the growth to 2020, but its demand levels off thereafter.
 - Currently the region as a whole is a net importer of petrochemical intermediate products, but the anticipated increase in domestic production capacity reduces this dependence on imports over the coming decades. Under the 12th Five-Year Plan, China is targeting an increase in ethylene production capacity of 27 million tons (Mt) by 2015, an addition of 11Mt compared with 2011, equivalent to the entire capacity of Germany and the Netherlands combined.



STRATEGIE E PREVISIONI DI MERCATO PER LA FILIERA DELL'IMPIANTISTICA INDUSTRIALE



Thank you