Market Study: Ethylene (2nd ed.)

Ethylene is the most important feedstock in the petrochemical industry. About 130 million tonnes were processed worldwide in 2013. Applications include the three polyethylene plastics (HDPE, LLDPE, and LDPE) as well as petrochemical intermediates: Ethylene oxide, ethylene dichloride and ethylbenzene. With this study, Ceresana offers transparency regarding the development of the market for ethylene and ethylene-derived products.

US Fracking Boom Affects Global Market

The shale gas boom in the US has considerable influence on the global market for ethylene: The strong decline of prices for ethane has led to a number of new ethane crackers being built. This is of consequence for the global market: Several European manufacturers have announced to either close their crackers or to change over to using imported ethane as feedstock. Should the current downward slide of oil prices continue, however, the US fracking industry might lose its foothold.

Increasing Self-Sufficiency Proclaimed Goal in China

Right now China not only imports large amounts of ethylene, but also increasingly HDPE, LLDPE, and LDPE. Many producers of ethylene and polyethylene are dependent on these exports to China. The government, however, is trying to significantly increase self-sufficiency in regard to ethylene and its derivatives. In addition to a rising number of naphtha crackers, the use of coal in the production of olefins is supposed to be stepped up.

Slow-down of Revenue Growth

Ceresana forecasts ethylene revenues on the global market to increase by 3.2% p.a. between 2013 and 2021 and thus at lower rates than before. According to our analyses, this development goes in line with the fact that the partly resource fuelled, massive increase of production capacity will proceed faster than the increase of demand. Consequently, capacity utilization is likely to fall, which has a negative influence on the price of ethylene.

Polyethylene Application Nr 1

The PE industry will continue to consume the majority of all ethylene produced. In 2013, about 63% of global demand for ethylene was accounted by producers of these plastics. While demand for LDPE is anticipated to increase only moderately, we forecast high growth rates for the products HDPE and LLDPE. Asia-Pacific and the Middle East in particular are expected to notably increase capacity.

Growth Impulses for EO

Another application area of huge growth potential is ethylene oxide (EO). EO is mainly used to produce ethylene glycol which is a pre-product for polyester. The production of textile fibers is growing significantly, especially in Asia. In addition, producers of EO have been able to profit from the growing substitution of glass by PET bottles and containers. We forecast global demand for ethylene in the production of EO to increase by 3.2% per year.

Regional Development differs

Between 2005 and 2013, the Middle East has become one of the most important regions in regard to the global ethylene industry following a growth of 9.1% per year. Output is likely to rise by up to another 10 million tonnes until 2021. After production had largely stagnated between 2005 and 2013, the US are significantly increasing output, capitalizing on cheap shale gas. Eastern Europe, dominated by Russia, and Africa are also expecting to see a high relative increase of production volume.
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1.1.2 World – Revenues
Global revenues generated with ethylene rose from US$ X billion (€X billion) in 2005 to US$X billion (€X billion) in 2013. This development translates into an average increase of X% per year.
Market value will increase at notably lower growth rates in the future. One reason is the massive increase of ethylene capacity. Demand will not rise as strongly as will supply. Accordingly, prices will increase much more slowly. Besides, we also expect the good situation in regard to the feedstocks ethane and crude oil to have positive effects on the pricing pressure producers of ethylene are facing. This effect, however, will become weaker on the long term. While prices for crude oil fell to less than US$85 per barrel in the last quarter of 2014, we forecast a price level of about US$X per barrel within the next years.
We forecast global revenues earned with ethylene to increase by X% p.a. to approx. US$X billion (€X billion) in 2021.

Graph: Worldwide revenues generated with ethylene between 2005 and 2021 in billion US$ and billion €

1.6.1 Asia-Pacific - Demand
In 2013, Asia-Pacific processed about X million tonnes of ethylene. Since 2005, market volume rose at an AAGR of X%. This region was the worldwide largest consumer of ethylene in 2013.
China is the largest individual market in this region; in 2013, its market volume of X million tonnes accounted for about X% of total regional demand. South Korea and Japan ranked second and third at a considerable distance, followed by India. Aggregated consumption in the remaining major countries of Asia-Pacific (Vietnam, Australia, the Philippines, Bangladesh) amounted to X million tonnes in 2013.
We forecast demand for ethylene to increase by X% p.a. between 2013 and 2021 and to amount to approx. X million tonnes at the end of this period.

Graph: Demand for ethylene in Asia-Pacific from 2005 to 2021
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4.1.5 Italy (1)
4.1.6 Spain (1)
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4.1.9 United Kingdom (1)

4.2 Eastern Europe
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4.3 North America
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4.4 South America
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4.6 Middle East
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4.7 Africa
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Financial Key Data
(in billion €)

<table>
<thead>
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<th>Year</th>
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<tr>
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<tr>
<td>2012</td>
<td>200</td>
<td>10.8</td>
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<tr>
<td>2013</td>
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<td>8.66</td>
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General information about the company
The company is divided into 3 business units:

- **Upstream**: Oil exploration and production, activities in natural gas and new energies (mainly solar and biofuels)
- **Refining & Chemical**: Refining, petrochemicals, fertilizers, specialty chemicals (rubber, resins, adhesives, electroplating); oil and gas trading; shipping activities
- **Marketing & Services**: Supply and marketing of petroleum products, activities of new energies

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- **North & South America**: 60 sites

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- Automotive Plastics - World
- Bags & Sacks - Europe
- Bags & Sacks - World
- Biocides - World
- Bioplastics - World
- Bitumen - Europe
- Butadiene - World
- Butadiene Rubber (BR) - World
- Caps & Closures - Europe
- Carbon Black - World
- Catalysts - World
- Chelating Agents - World
- Composites (CFRP & GFRP) - World
- Construction Plastics - World
- Corrugated/Solid Board/Carton - Europe
- Engineering Plastics - World
- Ethylene - World
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- Flame Retardants - World
- Flexible Packaging - Europe
- Food Packaging - Europe
- Hydrofluoric Acid & Fluorochem. - World
- Insulation Material - Europe
- Insulation Material - World
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- Masterbatches - World
- Paints & Varnishes - Europe
- Paints & Varnishes - World
- Pigments - World
- Pipes - Europe
- Plastic Additives - World
- Plastic Bottles - Europe
- Plastic Caps & Closures - Europe
- Plastic Caps & Closures - World
- Plastic Containers - Europe
- Plastic Extrusion - World
- Plastic Films - Europe
- Plastic Films - World
- Plastic Injection - World
- Plastic Pipes - Europe
- Plastic Pipes - World
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- Plastics - World
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- Polyethylene (PE) Pipes - World
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- Polystyrene - World
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- Printing Inks - World
- Propylene - World
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- Rigid Metal Packaging - Europe
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- Solvents - World
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- Styrene - World
- Styrene-Butadiene Rubber (SBR) - World
- Surfactants - World
- Synthetic Rubber - World
- Thermoplastic Elastomers - World
- Titanium Dioxide - World
- Windows & Doors - Europe