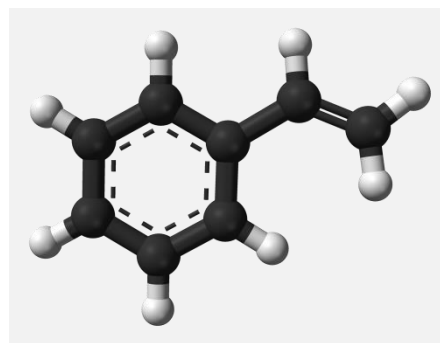
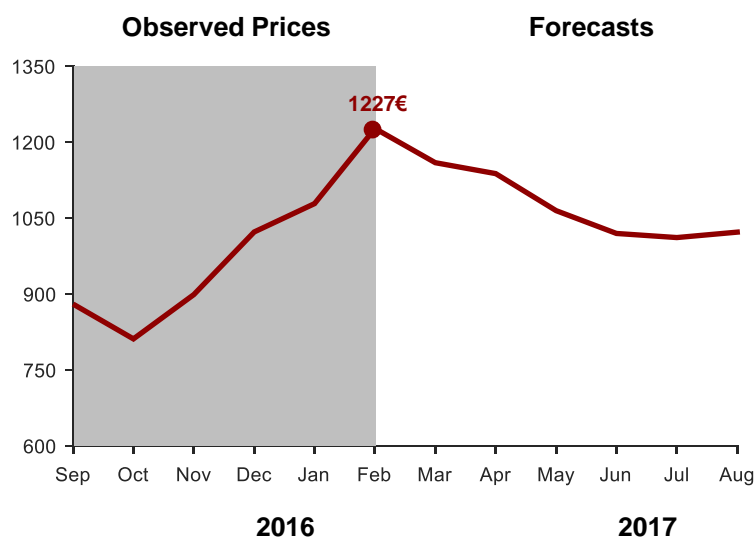


# Forecasting the Price of Styrene

<b>Commodity</b>	Styrene (Spot FOB Rotterdam)
<b>Forecast Period</b>	March 2017 – August 2017
<b>Currency</b>	€
<b>Unit</b>	Metric Tonne
<b>Observations</b>	Monthly forecasts of the spot price in the first day of the month



## Forecasts



Month/Year	Forecast	Prob. Of Raise
Mar. 2017	1159€	34%
Abr. 2017	1138€	40%
Mai. 2017	1065€	29%
Jun. 2017	1020€	25%
Jul. 2017	1011€	28%
Aug. 2017	1022€	33%

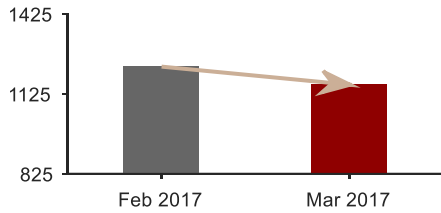
## Suggested Action for Procurement

Purchase Limit Month	Suggested Action
March 2017	Buy in March
April 2017	Wait
May 2017	Wait
June 2017	Wait
July 2017	Wait
August 2017	Wait

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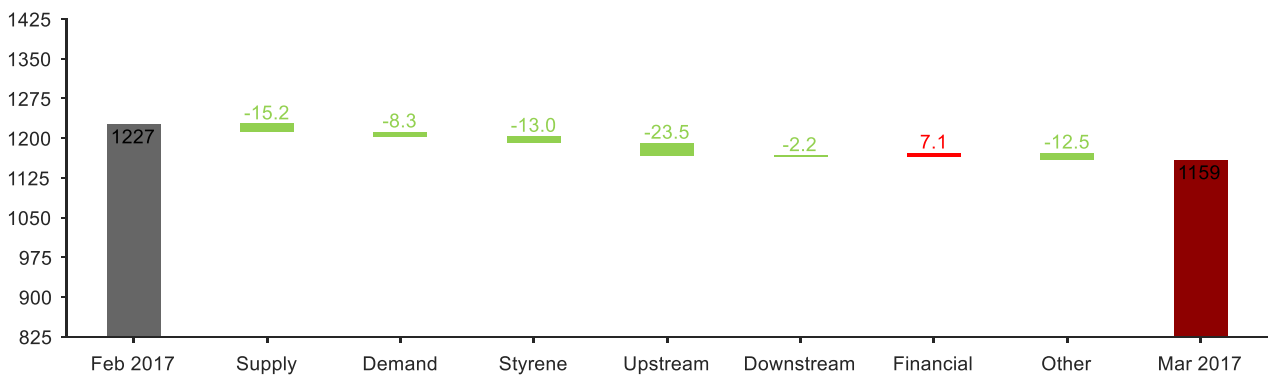
# Forecasting the Price of Styrene

## Impact Analysis: One Month Forecast



Our algorithm forecasts a lower price of Styrene in one month: it is expectable that the price decreases 5,51% from 1227€ to 1159€ until the beginning of March.

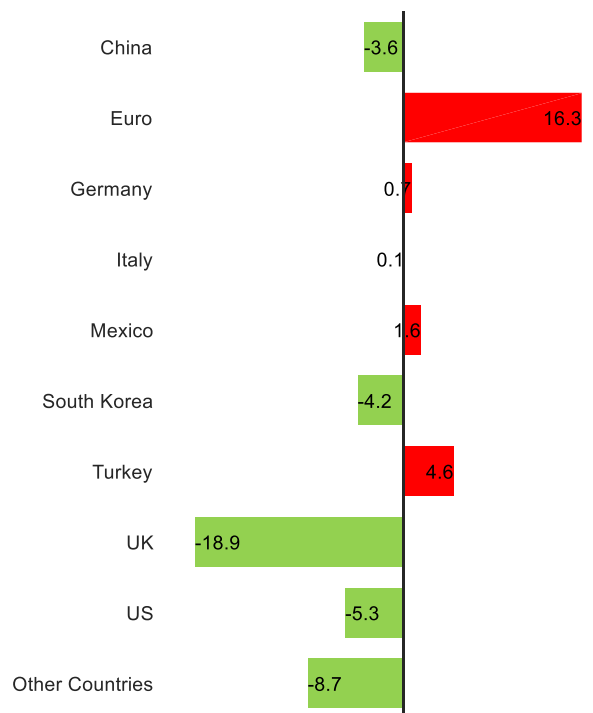
## Indices of Factors



### Interpretation

- **Increase of Supply:** Negative pressure of the Supply index
- **Decrease of Demand:** Negative pressure of the Demand index
- Negative pressure of the index of Styrene
- **Considerably negative pressure of the index of variables representing the market upstream**
- Slightly negative pressure of the index of variables representing the market downstream
- Positive pressure of the financial index
- Negative pressure of other commodities and other factors
- Focus on UK, Euro, and Singapore

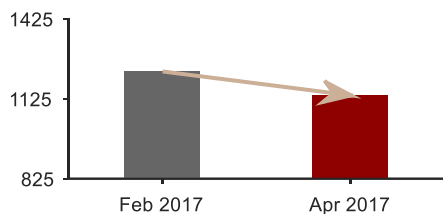
### Impact per Country



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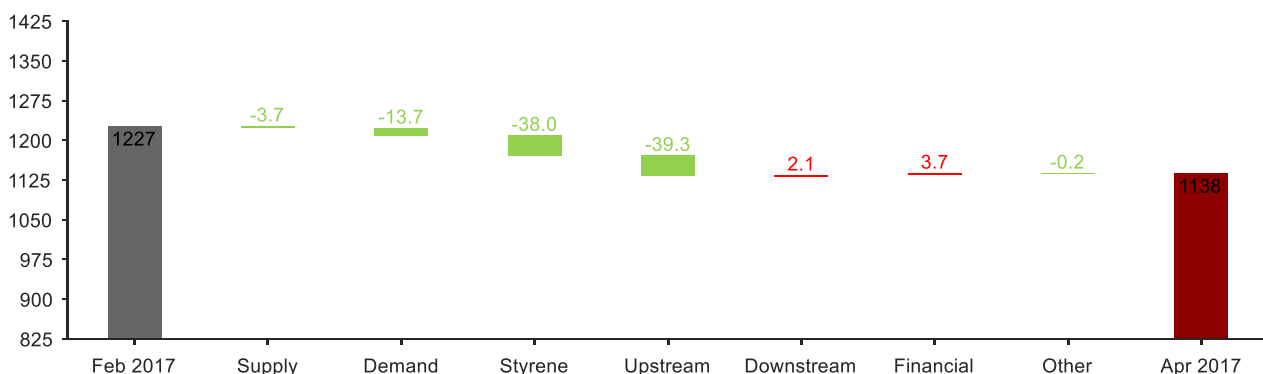
# Forecasting the Price of Styrene

## Impact Analysis: Two Months Forecast



Our algorithm forecasts a lower price of Styrene in two months: it is expected that the price decreases 7,26% from 1227€ to 1138€ until the beginning of April.

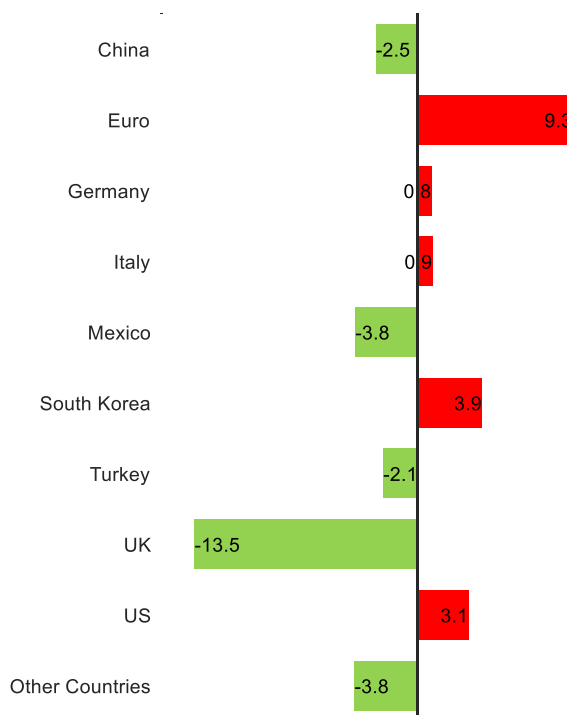
## Indices of Factors



### Interpretation

- **Increase of Supply:** Negative pressure of the Supply index
- **Decrease of Demand:** Negative pressure of the Demand index
- **Considerably negative pressure of the index of Styrene**
- **Considerably negative pressure of the index of variables representing the market upstream**
- Slightly positive pressure of the index of variables representing the market downstream
- Positive pressure of the financial index
- Slightly negative pressure of other commodities and other factors
- Focus on UK, Euro, and Japan

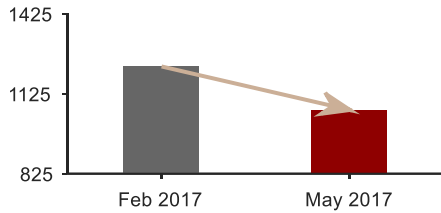
### Impact per Country



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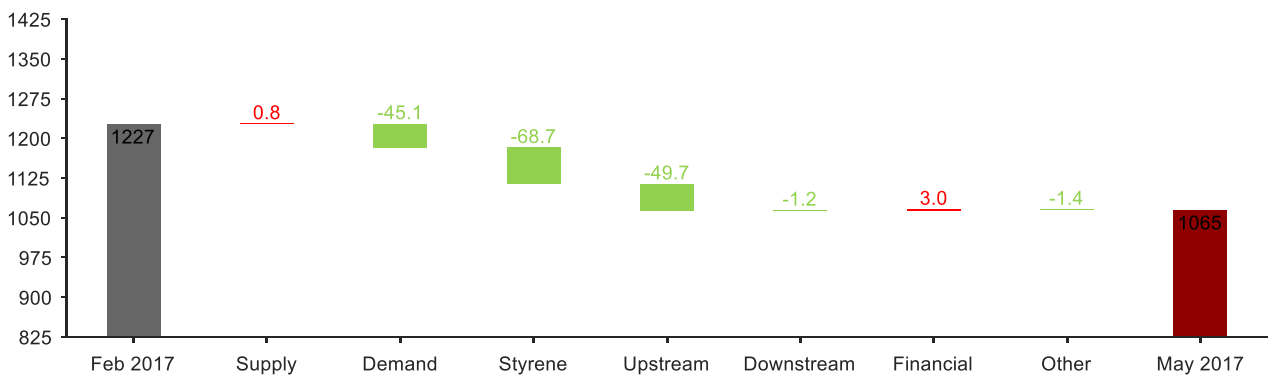
# Forecasting the Price of Styrene

## Impact Analysis: Three Months Forecast



Our algorithm forecasts a lower price of Styrene in three months: it is expectable that the price decreases 13,22% from 1227€ to 1065€ until the beginning of May.

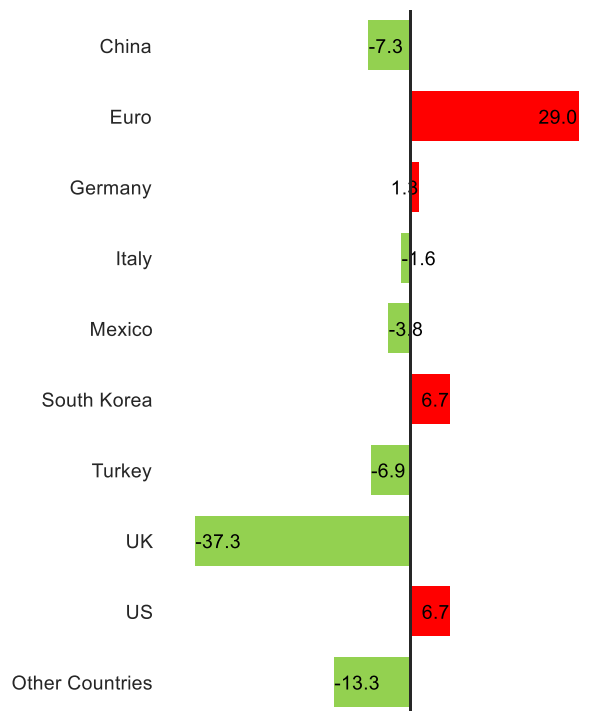
## Indices of Factors



### Interpretation

- Slight decrease of Supply: Positive pressure of the Supply index
- **Decrease of Demand:** Negative pressure of the Demand index
- **Considerably negative pressure of the index of Styrene**
- **Considerably negative pressure of the index of variables representing the market upstream**
- Slightly negative pressure of the index of variables representing the market downstream
- Slightly positive pressure of the financial index
- Slightly negative pressure of other commodities and other factors
- Focus on UK, Euro, and Canada

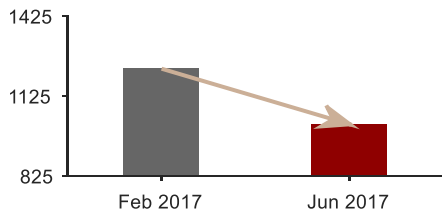
### Impact per Country



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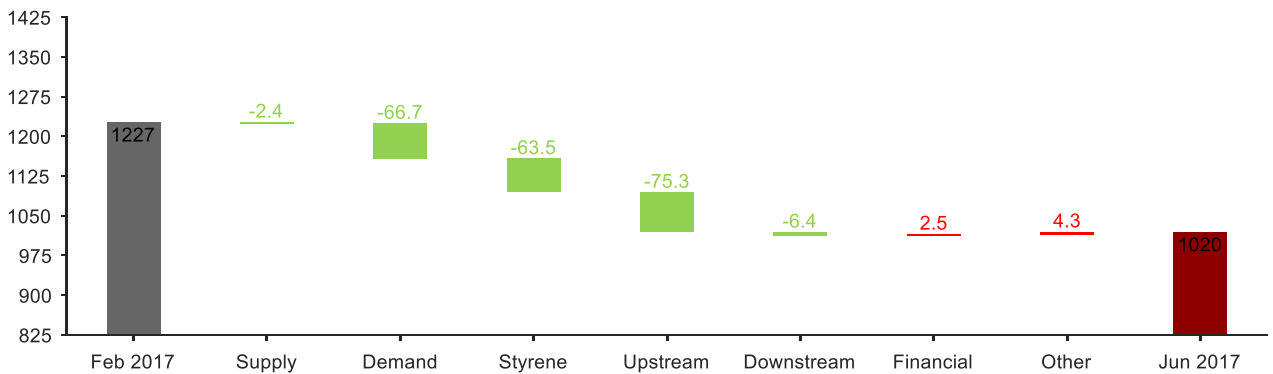
# Forecasting the Price of Styrene

## Impact Analysis: Four Months Forecast



Our algorithm forecasts a lower price of Styrene in four months: it is expectable that the price decreases 16,90% from 1227€ to 1020€ until the beginning of June.

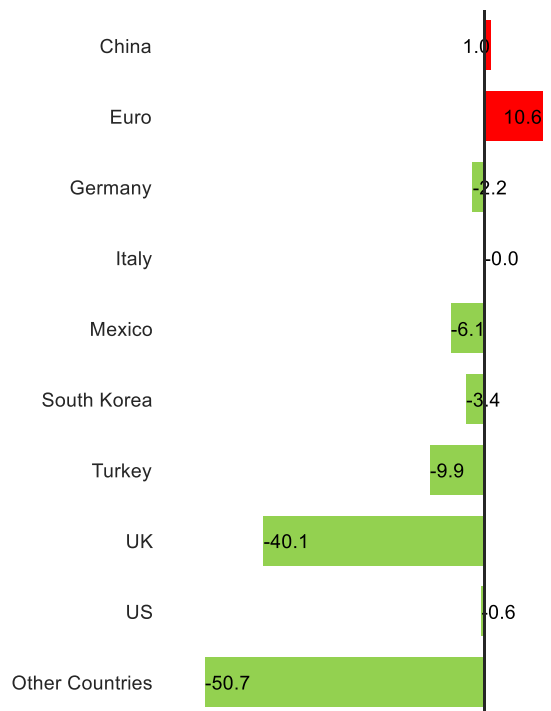
## Indices of Factors



### Interpretation

- Slight increase of Supply: Negative pressure of the Supply index
- **Considerable decrease of Demand:** Negative pressure of the Demand index
- **Considerably negative pressure of the index of Styrene**
- **Considerably negative pressure of the index of variables representing the market upstream**
- Slightly negative pressure of the index of variables representing the market downstream
- Slightly positive pressure of the financial index
- Slightly positive pressure of other commodities and other factors
- Focus on UK, Canada, and Euro

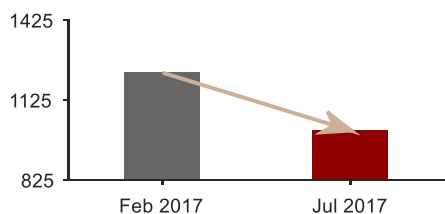
### Impact per Country



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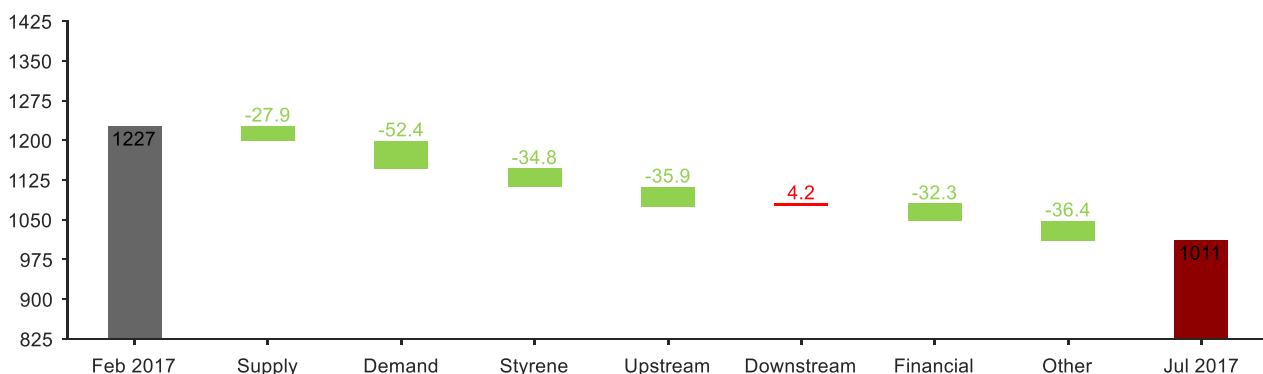
# Forecasting the Price of Styrene

## Impact Analysis: Five Months Forecast



Our algorithm forecasts a lower price of Styrene in five months: it is expectable that the price decreases 17,56% from 1227€ to 1011€ until the beginning of July.

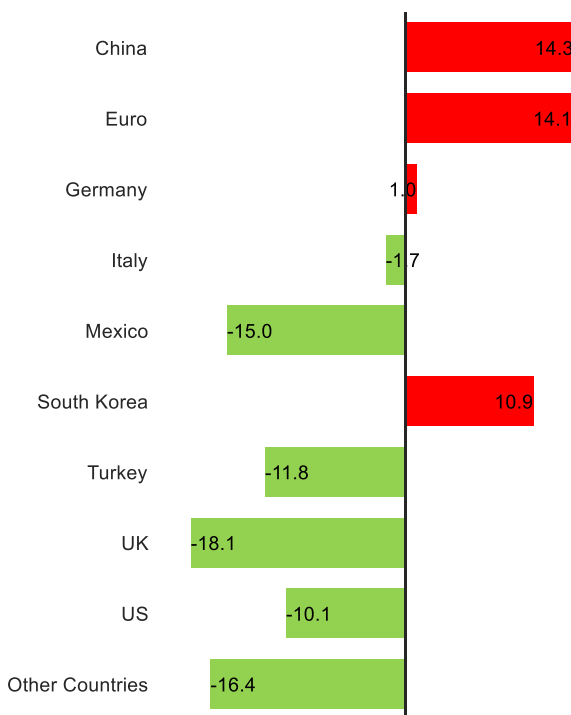
## Indices of Factors



### Interpretation

- **Increase of Supply:** Negative pressure of the Supply index
- **Considerable decrease of Demand:** Negative pressure of the Demand index
- Negative pressure of the index of Styrene
- Negative pressure of the index of variables representing the market upstream
- Slightly positive pressure of the index of variables representing the market downstream
- Negative pressure of the financial index
- Negative pressure of other commodities and other factors
- Focus on Singapore, Canada, and Japan

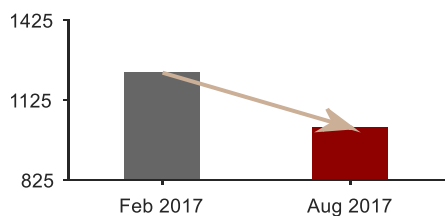
### Impact per Country



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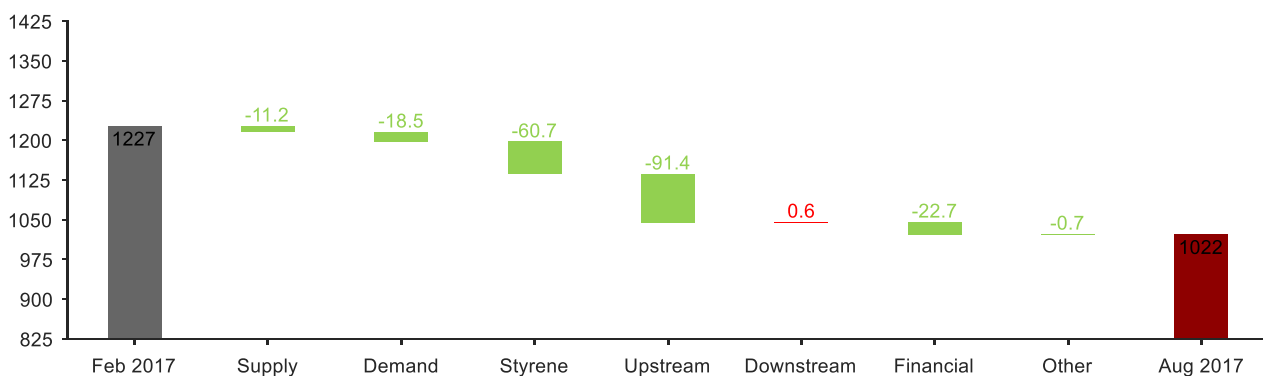
# Forecasting the Price of Styrene

## Impact Analysis: Six Months Forecast



Our algorithm forecasts a lower price of Styrene in six months: it is expectable that the price decreases 16,69% from 1227€ to 1022€ until the beginning of August.

## Indices of Factors



### Interpretation

- **Increase of Supply:** Negative pressure of the Supply index
- **Decrease of Demand:** Negative pressure of the Demand index
- **Considerably negative pressure of the index of Styrene**
- **Considerably negative pressure of the index of variables representing the market upstream**
- Slightly positive pressure of the index of variables representing the market downstream
- Negative pressure of the financial index
- Slightly negative pressure of other commodities and other factors
- Focus on Singapore, UK, and US

### Impact per Country

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# Forecasting the Price of Styrene

## APPENDIX I – Technical Explanation of the Impact Analysis

In this appendix, we explain the impact analysis of the factors that most contribute for our forecasts.

This Impact Analysis is conducted individually for **each time horizon**, allowing for a distinction between the indices of variables that contribute for our forecasts at short and medium run.

For each time horizon, our analysis has **two components**: first, we present the impact of variables grouped by **indices of factors**; second we present the impact of variables grouped by **indices of countries**.

### Indices of Factors

**Indices of factors** are indices of the weighted contributions of the variables grouped in those factors.

**Supply Index**: composed of macroeconomic variables of the producing and exporting countries. It includes variables such as production, exchange rates, inflation, monetary policy, and wages. For example, an increase in wages implies higher production costs which should (in linear, general, and *ceteris paribus* terms) generate an incentive to increase prices;

**Demand index**: composed of macroeconomic variables of the consuming and importing countries. It includes variables such as production, exchange rates, inflation, monetary policy, and wages. For example, a decrease in a consumer confidence index should (in linear, general, and *ceteris paribus* terms) increase savings and decrease demand, leading to lower prices;

**Styrene Index**: composed of variables related to Styrene. It includes variables such as the price of Styrene in different regions of the world and exports, imports, and producer prices of Styrene in some countries. For example, an increase in the price of Styrene in other region may imply an increase in the price of Styrene in Europe due to arbitrage movements;

**Upstream index**: composed of variables related to other commodities such as Benzene. It includes variables such as the price and exports, imports, and producer prices of the inputs in some countries. For example, an increase in the price of Benzene should (in linear, general, and *ceteris paribus* terms) generate an increase in the price of Styrene;



# Forecasting the Price of Styrene

## APPENDIX – Technical Explanation of the Impact Analysis

**Downstream index:** composed of variables related to Polystyrene and downstream industries, such as Packaging. It includes variables such as the exports, imports, and producer prices of Plastic Industry in some countries. For example, an increase in the demand of Plastic should (in linear, general, and *ceteris paribus* terms) generate an increase in the price of Styrene;

**Financial Variables Index:** composed of financial market variables. It includes the share price of companies that produce Styrene. It also includes financial indices related to this sector. For example, a positive change in the share price of a Styrene producer should (in linear, general, and *ceteris paribus* terms) imply an increase in expected profitability of the firm. This may signal an expectation of increase in the price of Styrene;

**Other Variables Index:** composed of variables related to other commodities, such as Coal and other monomers. It includes the price, exports and imports of these commodities. For example, a positive change in the price of a substitute commodity, should (in linear, general, and *ceteris paribus* terms) imply an increase of demand of Styrene, and thus, of the price of Styrene.

### Country Indices

**Country Indices** are indices of the weighted contributions of the macroeconomic variables of each country. The countries we present are the most relevant countries in the production, consumption, and international commerce of Styrene.

### Interpretation Warning

It is important to note that the contribution of individual variables and indices of variables is not linear. The interaction between variables and between variables of different factors may not be neglectable, which means that the importance of each variable and indices of variables is determined together with the importance of all other variables.

Furthermore, the analysis of changes in variables is not linear. This means that the same variable with the same change in different moments of time may have different impacts given its previous evolution. For example, the algorithm contrasts the change in a variable with its expected change. A positive change but inferior to the expected change may originate an effect of price correction.