

Competitiveness of the European Chemical Industry

1. Summary

The European chemical industry is key for economic development and wealth, providing modern products and materials and enabling technical solutions in virtually all sectors of the economy. With a workforce of 1.2 million and sales of €527 billion (2013), it is one of the largest industrial sectors and an important source of direct and indirect employment in many regions of the European Union. Traditionally, Europe has been a leader in chemicals production – as shown by a consistent export surplus which reached a record of 49 billion euro in 2013.

Despite the apparent strength of the industry, the current situation gives cause for concern. The chemical sector was severely affected by the 2008-09 global recession, and after a rapid cyclical turnaround, production is growing more slowly than global demand since early 2011. According to the Eurostat data, the sector remains 7% below pre-crisis levels.

Also with regard to investment we see a worrying trend. From a tripolar chemicals producing world in 1990 we have moved to a multi-platform chemicals producing world, where regions are competing for investment. Recognising the chemical industry's strategic importance, China, the Middle East and India have made successful efforts to build up large and increasingly sophisticated production facilities. Notably due to their energy and feedstock advantages or market growth, countries in Asia, the Middle East and more recently the US attract very high investments. Consequently, the EU's share of global chemicals production is decreasing in several segments. Over a longer time horizon, the EU's share of global production and exports has fallen considerably, suggesting a decline in competitiveness. In short, Europe's leading position cannot be taken for granted.

Oxford Economics conducted evidence-based research to bear on the following questions:

- Has the EU chemical sector gained or lost competitiveness over the last 20 years? Which subsectors are driving the changes?
- What is the quantitative relationship between sector competitiveness and its hypothesised drivers, and which ones are the most important?

Using constant market share analysis of chemical exports, a report of Oxford Economics confirms that the majority of the decrease in EU export market share observed over the past twenty years is due to declining competitiveness as opposed to slow-growing destination markets. The erosion of export competitiveness is mostly attributable to petrochemicals and to a less dramatic degree to polymers.

2. Where are we coming from, where are we going?

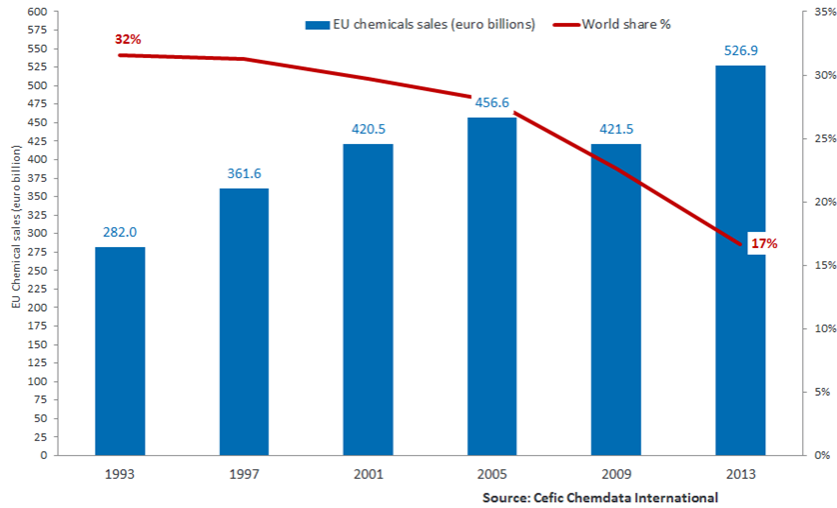
The current state of play at first sight appears to be very positive for the European chemical industry. Chemicals closely follow developments in GDP, and world GDP is expected to triple in the next decades:

World GDP = USD 49 Tn in 2010

World GDP = est USD 140 Tn in 2050

The market for chemicals and hence global production doubled in the period 2003-2013, and is expected to continue growing steadily. Europe has participated in this global growth, with chemical sales steadily rising in absolute terms in the past decade.

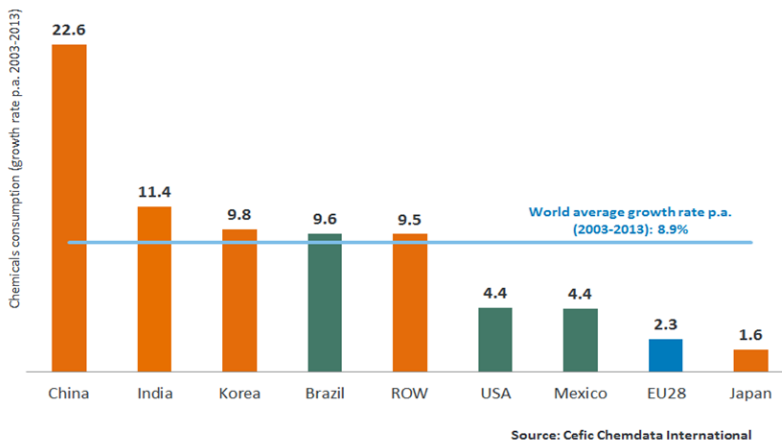
European chemical output has also grown steadily



However, as can be seen on the graph above, due to stronger relative growth in other parts of the world, the EU's share of global sales decreased significantly over the period (from 32% in 1993 to 17% in 2013). This is a "dilution effect, a trend expected to continue in the future.

In the following graph we can see strong chemical demand growth in China, India and other emerging countries and low growth in Europe and North America, where Europe sells most of its chemicals.

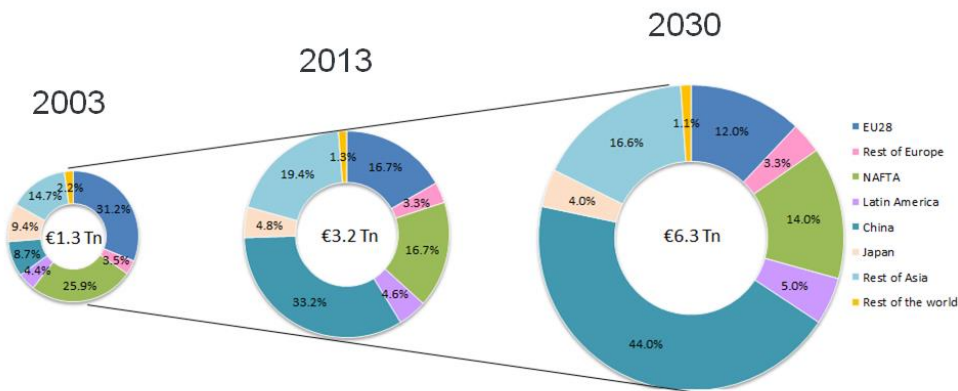
Growth has been fastest in emerging economies



Overall growth of chemicals demand and production as well as faster growth in emerging regions is a trend that is expected to continue in the future:

And this trend will continue

Global chemicals production in value (€ Trillion)



Source: Cefic Chemdata International and Cefic analysis

CAGR World 4.1 % (2013-2030)

Growth in post-recession Europe remains low, mainly due to mature markets and an ageing population. Therefore, in order to actively participate in this global, growing market and grow with it, Europe needs to be an exporting chemical region, hence needs to be more competitive than other global regions. Also, the downward trend of the sector in terms of its share of GDP within Europe can only be countered by increased external export competitiveness of the sector and industrial policies working towards this end. The European chemical industry is therefore an ardent supporter of the European Commission's endeavours regarding internationalization of European companies and for further trade liberalization,

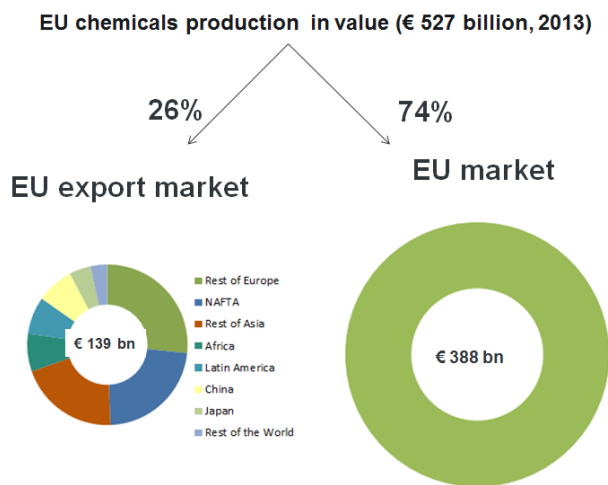
preferably at multilateral level through the WTO or via bilateral/regional trade agreements such as TTIP or EU-Japan.

However, does Europe have a strong and sustainable competitive advantage in the world to remain a key exporting region? The key question is therefore whether the decline in global share is entirely due to the “growth rates” effect or are we also losing competitiveness?

3. The importance for the chemical industry of being an exporting industry

The European chemical industry is an exporting industry, with one-quarter of its production being exported outside the EU. Our industry needs to continue to globally competitive to sustain its existing capacity and grow in line with global demand:

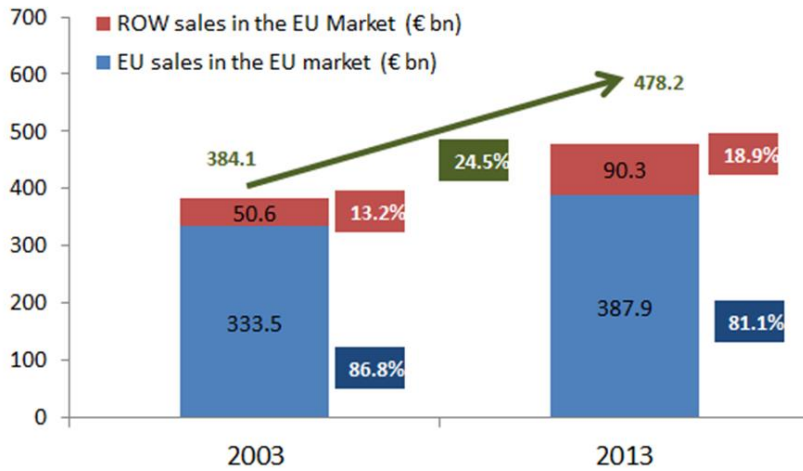
One quarter of EU chemicals production is sold outside the EU



Source: Cefic Chemdata International 2014

However, we also see a worrying decline in domestic market share over the past ten years– are we also losing competitiveness in our home markets?

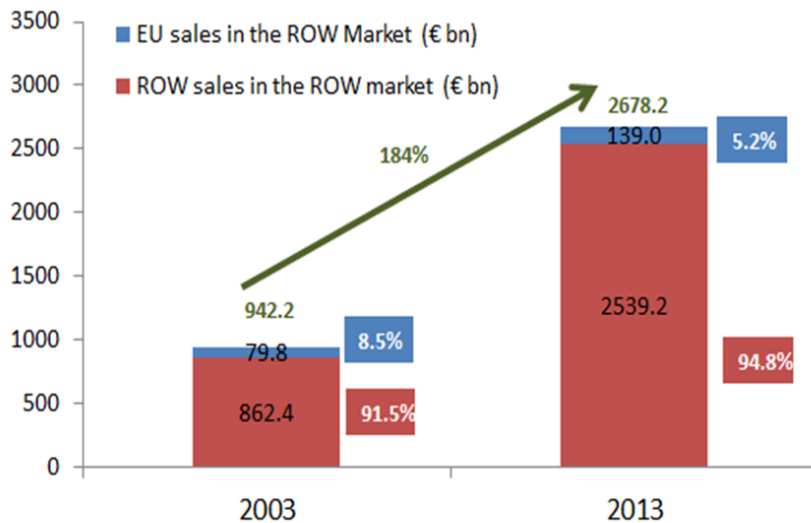
Chemicals made in Europe are losing share in the domestic EU market



Source: Cefic Chemdata International 2014

In addition, we are losing share in the Rest-of-the world market:

Chemicals made in Europe are losing share in the Rest-of-World market

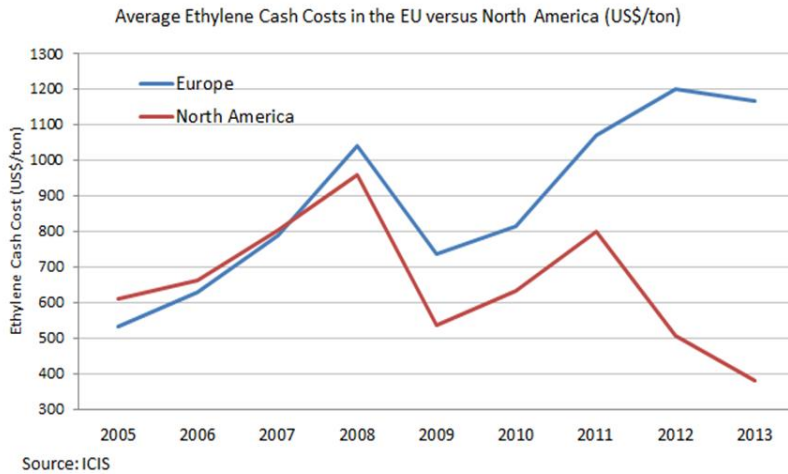


Source: Cefic Chemdata International 2014

There are several potential causes for this loss in share. Advantaged energy and feedstock prices are a clear enabler of competitiveness. The shale gas boom in the United States has reduced energy and feedstock costs greatly. A clear indicator of this situation is the cost of producing ethylene. Ethylene is the highest volume building block in the chemical industry globally. It is the foundation in the production of plastics, detergents and coatings amongst many other materials.

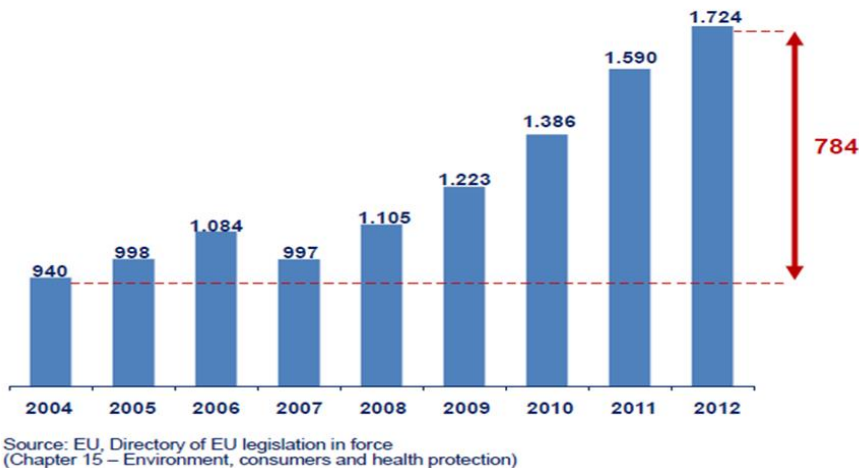
Making ethylene in Europe is about three times more expensive than in the US (thanks to the shale gas boom), or the Middle East. This is boosting profits abroad and attracting billions of dollars in investment, including from European chemical companies.

Impact of shale gas: Average Ethylene Costs in the EU versus US (US\$/ton)



Another important factor cited by companies as affecting competitiveness is the growing cumulative costs of implementing European legislation in the chemical sector. This takes both personnel and capital resources away from innovation and production and into regulatory compliance.

Cumulative number of EU regulations on Health, Safety & Environment (net of those repealed)



Another indicator pointing to a loss of market attractiveness for production is investment levels. In the EU we see declining levels of capital spending intensity compared with other regions. Capital intensity is both an indicator of loss of attractiveness as well a driver of future competitiveness, the more investment the more competitive the region becomes and vice versa.

For example, there are nearly 200 chemical investment projects in the US totalling nearly 130 billion US dollar while China remains the key target of chemical investment.

Capital spending intensity by region



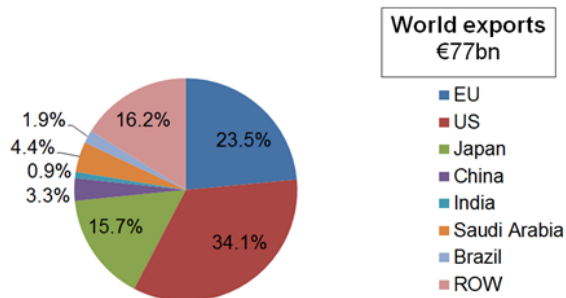
Source: Cefic Chemdata International 2014 and Cefic analysis

4. Measuring Competitiveness

In order to have a systematic approach to estimating the competitiveness of Europe and EU Members States, Cefic commissioned Oxford Economics to analyse Export Competitiveness using Constant Market Share methodology. Using constant-market share analysis of chemical exports at the aggregate and subsector level for the EU and several other large developed- and developing-country chemical producers, this report confirms that the greater part of the decrease in export market share observed over the past 20 years (including that since the 2008-09 financial crisis) is due to declining competitiveness as opposed to slow-growing destination markets. This means that the EU's export growth did not keep pace with the growth of world export growth even if one corrects for differences in export product mix and geographic distribution.

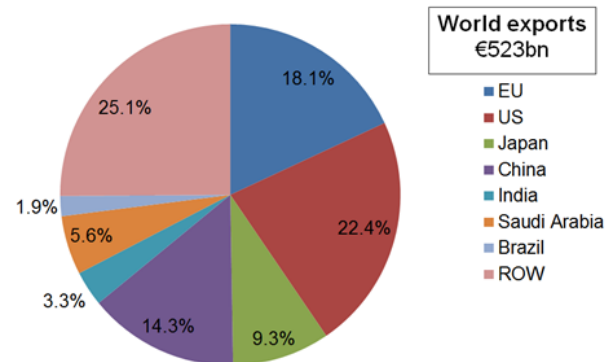
Growing Export Market, Decreasing Share of Exports for Industrial Regions

Chemical exports by country of origin, 1992
% of total



Source : Oxford Economics/UN Comtrade

Chemical exports by country of origin, 2012
% of total



Source : Oxford Economics/UN Comtrade

According to Oxford Economics, there are many potential reasons for this decline, including high energy prices, lagging innovation, currency appreciation, high labour costs, regulatory and tax burdens, among others. Oxford Economics used an econometric model that links changes in chemical competitiveness to these potential drivers, and finds that sector R&D intensity, energy prices and the exchange rate all have strong quantitative links to competitiveness. Higher labour costs are associated with declines in competitiveness, but the quantitative effect is not large.

For the EU, the most striking observation is that the vast majority of the erosion of export competitiveness since the early 2000s is attributable to the petrochemicals subsector. In some sense, this is not surprising: petrochemicals accounted for one-third of total extra-EU chemical exports, a figure which rises to 50% if we include polymers. The drop in petrochemicals' global export share has been much more severe than the chemical sector as a whole: down to just over 20% from a peak of more than 40% in the early 2000s.

Up until the global financial crisis, most of the drop in market share was due to slow growth dynamics in destination markets (the line showing expected market share based on structural growth dynamics was declining roughly in tandem with actual market share). But since then, virtually all of the drop in market share is due to ebbing competitiveness – possibly driven by lower energy and feedstock prices in places like the US and Saudi Arabia. Similar trends are present, albeit to a less dramatic degree, for polymers, which saw their global export market share diminish from 17% in the early 2000s to 13% in 2012. The huge petrochemicals investment boom in the US, expected to be destined primarily for the domestic and Asian markets, will impact further on EU petrochemicals exports to those regions, while it could also mean that Middle East petrochemicals production will increasingly be directed to its nearest market – Europe - when China's base chemicals production is built up and on stream.

5. What can Europe do to reverse the above depicted trends?

Oxford's results provide evidence-based support for two hypotheses about chemical competitiveness:

- The US shale gas boom has improved the competitiveness of US producers (particularly in petrochemicals and polymers) relative to European countries and Japan;
- Product and process innovation are a critical factor in delivering more value to the customer to compensate for cost disadvantages in developed countries.

There is opportunity for major innovation to fuel growth in Europe in the next decade, with promising prospects in several chemicals-segment areas. Sustainable technologies offer the best chance for breakthrough innovation, such as lightweight vehicles in transportation, energy storage, technologies for CO₂ avoidance and capture storage. There are opportunities to minimise use of scarce resources such as water, and new synthesis routes and platform technologies like coal-to-liquids, biotechnology and nanotechnology. Challenges remain in finding applications and innovating at points throughout the value chain. Firstly, there is a high degree of technological and business case uncertainty. Secondly, there is further need for a supportive regulatory framework that recognises the industry's role throughout the value chain, helps prepare tomorrow's future scientists and engineers, and helps join up research and innovation throughout Europe and between sectors.

The econometric results allow scenario analysis, by which alternative assumptions about the future path of the drivers in the EU can show us the implied change in export competitiveness, and hence export market share.

In terms of magnitude, a reduction in European energy prices would provide the most pronounced near-term boost in competitiveness. Encouraging more R&D investment is also critically important, in order to sustain these competitiveness gains and form the foundation for the longer-term growth of the sector. Taken together, they hold the potential of halting the secular decline of chemical export market share observed over the past decade, adding €35 billion to EU GDP and creating more than half a million new jobs over the next 15 years.

6. Conclusions and recommendations

Certain trends are unmistakably taking place. The shift of manufacturing to Asia and associated higher chemicals output growth there, an ageing population in Europe and the shift of petrochemicals production to resource-rich countries are a few examples. They all point to a declining share of the Europe based chemical industry in global sales. In absolute terms, the industry may continue to grow, but only at a low rate.

The study by Oxford Economics demonstrates that the majority of this decrease is due to declining competitiveness as opposed to slow growing export destination markets. Together with these external trends, there is additional pressure coming from inside the European Union. Highly ambitious environmental, health and climate regulation are accelerating the deterioration of European industrial competitiveness. If internal European policies continue to add to existing adverse global trends, then European industry's competitiveness is inevitably set to erode further. If these local factors could be reversed, however, there is greater opportunity for the industry to invest in Europe and to thus contribute to growth and jobs.

What can Europe do to improve competitiveness and secure growth, jobs and innovation?

Cefic supports the Commission's objective for industrial activity to contribute 20% of GDP by 2020, which should be seen as a directional rather than absolute target. The scale of the task should not be underestimated. Today, industry contributes about 15% of GDP and investment in industry is in decline. Because of decreasing investment in primary production, Europe is losing ground in terms of technological capability: and existing European value chains are at risk.

European industry has to compete in global markets. If the above trends are to be reversed, European authorities should ensure that all EU policies and initiatives take full account of, and fit with the aim of increasing, global competitiveness.

Cefic considers the following policies to be particularly important for enhancing the competitiveness of the chemicals industry:

1. Co-ordinated, Competitive Energy Policy

The chemicals industry is an energy intensive industry competing globally. Anything that increases energy costs in Europe relative to our competitors has a major impact on competitiveness.

European energy policy must aim to provide reliable supplies of energy at competitive prices. The following policies can contribute to that goal:

- The completion of a single European energy market.
- Ensuring effective competition between suppliers.
- The removal of policy driven levies and charges on industrial energy users.
- The reduction of energy cost differentials between Member States.
- Measures to facilitate investment in energy efficiency.
- Develop all possible domestic and import opportunities through swift exploration and diversification of supply
- Shale gas is a key potential source of feedstock as well as energy for our industry. Its responsible exploration and production in Europe should be accelerated.

2. Responsible Climate Policy

Too often, EU Climate Policy pursues its objectives with measures that run counter to the goal of reliable, competitive energy supplies. The goal of a competitive, low carbon economy should not be pursued “at any price”: and cannot be achieved by making the European economy less competitive. Climate policy should, therefore:

- Be redirected towards the provision of reliable, competitively priced low carbon energy, and away from measures that increase energy costs and reduce European competitiveness.
- Reform market instruments to align climate policy with the goal of reliable, competitive energy supplies.
- Avoid unilateral measures, and pursue a global solution, such that the policy does not distort competition between the EU and third country economies.

3. Innovation Policy

Meeting the many challenges facing European society will require innovation and investment in doing new things and doing things differently. These challenges will require a more substantial and focused innovation policy. In this regard:

- Implement the Horizon 2020 and Key Enabling Technologies strategy.
- Encourage inclusion of EU interests in national R&I programs: EU needs to gain critical mass to succeed in global competition; individual country-by-country R&I strategies need to be coordinated and complement each other.
- Create a competitive European manufacturing policy: European Commission and member states should use public support for initiatives on societal challenges (such as Smart cities) also to create new markets (pull) for manufacturing (materials etc.)
- Increase public and private investments in closer-to-market projects with pan-European impact: Currently other world regions invest 18 % of public money into basic research and the rest in innovation; the opposite happens in the EU. EU must decide on its strategy: knowledge creation only or reaping its benefits and turn them into European growth.
- Increase investor and public confidence in new technologies: European Commission must foster an integrated approach about benefits and risks of new technologies to increase investments and improve public acceptance.

4. Regulatory Stability and Consistency

The EU is a highly regulated society and the high cost of regulatory compliance is a burden on industrial competitiveness. This cost is made worse by frequent changes to the regulatory framework that add further to the costs, and which introduce uncertainties and ‘investor risk’, thereby driving away investment and job creation. A consistent legislative framework for the chemical industry is needed. Addressing this will require:

- A focus on regulatory efficiency, that is to say achieving the regulatory objective at the lowest possible compliance costs.
- For this, an improved Impact Assessment process is needed which includes the systematic application of “Competitiveness Proofing”, as well as the application of the “Fitness Check” process, in order to improve the quality and consistency of existing legislation.
- A stable regulatory framework, and avoidance of frequent legislative changes that add to costs and create uncertainty (e.g. ETS and Renewable energy Directive).
- REACH is the reference legislation for chemicals in Europe. A proper implementation of REACH is a top priority. The cost of compliance with REACH should be addressed: and other national and EU legislative initiatives should be consistent with this objective.
- The possible risks associated with any innovation need to be assessed and effectively managed, however an excessive application of the precautionary principle should not be allowed to inhibit their development.

5. Open Markets

The chemicals industry is a globally competitive industry and depends on free trade and open markets both for its raw materials and as outlets for its products. The industry relies increasingly on tightly interconnected clusters that in turn participate in Global Value Chains. We therefore strongly support:

- Further trade liberalization at multilateral level through the Doha Round, in particular by means of an ambitious sectoral chemical tariff liberalization agreement.
- Free trade agreements between Europe and key trading partners (especially the US and Japan). All EU Free Trade Agreements should include provisions ensuring unrestricted access to energy and feedstock. Regulatory cooperation is also key in enhancing the chemicals’ sector competitiveness.
- The further development of large, open and interconnected markets.

6. Access to Raw Materials

The Chemicals industry endorsed the EU Raw Materials Strategy in terms of mineral raw materials (rare earths and other minerals). Moreover, the chemicals industry is closely involved in the development of the bio-economy. To develop the EU bio-economy to its full potential, will require:

- Policies based on sound science and reliable data.
- Access to bio-based raw materials at global market prices.

- Access to bio-based raw materials should follow the cascading principle of priority, in order to obtain the maximum value from this scarce resource.
- Trade agreements should contain strong provisions governing distorting practices with respect to raw materials.

7. Addressing Skills and People Mobility

Due to an ageing population, our industry faces a large and increasing need to attract new talent in the field of chemistry. To help meet this need:

- The EU should step up its support for initiatives which encourage youngsters to choose a STEM education.
- The EU should fully implement the Single Market for jobs.
- The rules governing the reallocation of workers across the EU should be made more flexible.

8. First Class logistics

The greater clustering of European manufacturing, and increasing interconnections between production facilities, means that competitiveness is increasingly dependent on the EU's transport infrastructure. EU policy should:

- Promote further investment in efficient freight channels (rail, ports and inland waterways) to and through Central, Southern and Eastern Europe.
- Develop European rail infrastructure to take account of the needs of manufacturing sites, and ensure provision of adequate service to the industry (eg. single wagon services).