

CEFIC RESPONSIBLE CARE® KEY PERFORMANCE INDICATORS - 2017



Performance reporting is at the heart of Responsible Care[®].

Responsible Care is the global chemical industry's initiative towards improving health, environmental performance, enhance security, and to communicate with our stakeholders. Until today, the voluntary programme has been implemented by 62 chemical associations across more than 70 countries around the globe.

Within the Responsible Care programme, chemical companies report openly on performance, achievements and shortcomings based on Key Performance Indicators (KPIs).

Data Collection

Companies practicing Responsible Care submit KPI data on an annual basis to national associations of the countries in which they operate. The data is then compiled and reported to the International Council of Chemical Associations (ICCA). For its European members, Cefic converts national level data into a European overview, reflecting the overall performance of companies operating across Europe. KPI reporting is published by Cefic showcasing industry progress.

Performance reporting is at the heart of Responsible Care. While the initiative is voluntary, open reporting enables companies and associations to promote best practices and therefore help each other drive continuous improvements across the industry.

Data Analysis

The latest data shows improvements in safety and an overall reduction of the industry's environmental footprint between 2008 and 2017 by Responsible Care companies participating in the survey.

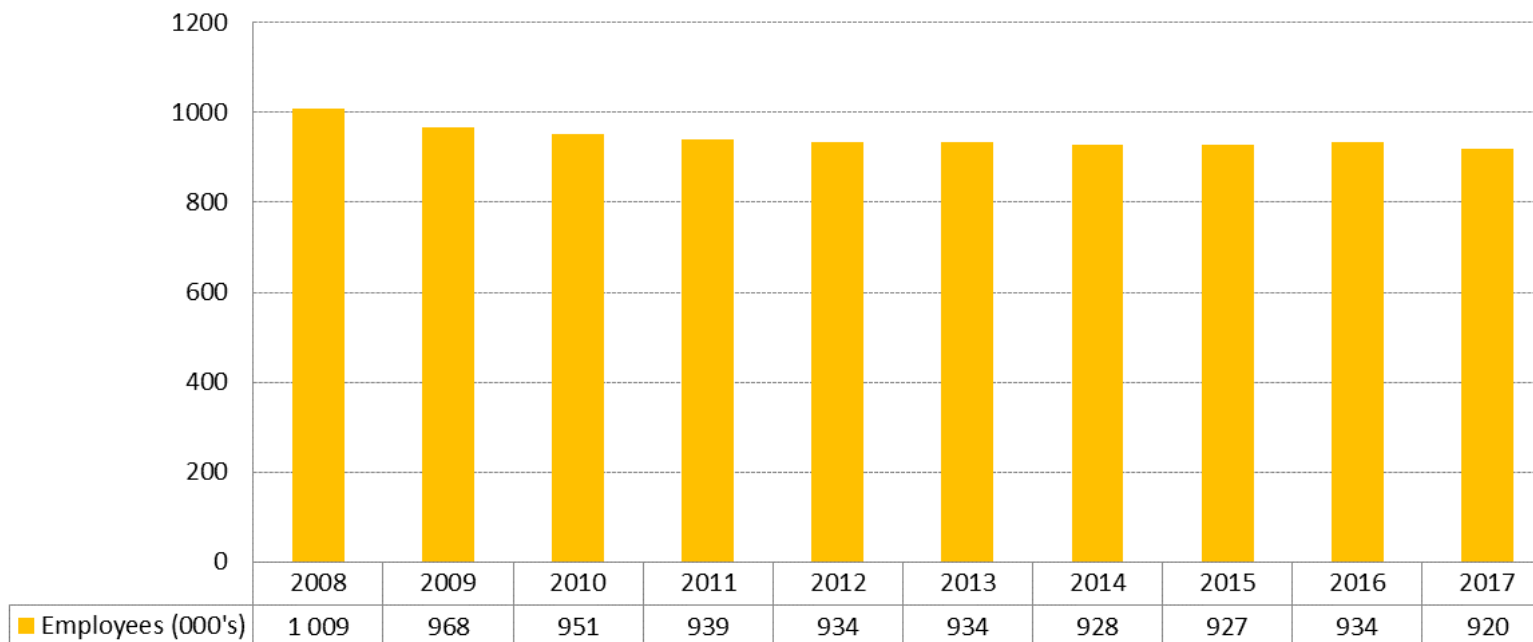
The annual data collection is the result of a lengthy and complex process. We strive to provide the most complete data for our industry, and we are committed to continuously improving the way we measure, report and engage in dialogue about our performance.

Employees

The diversity of our sector is reflected by the variety of the skilled employees in the chemical sector. According to Eurostat data (2012), employment in the EU chemical industry is particularly high across five subsectors – petrochemicals, printing ink and mastics, plastics in primary forms, perfumes and toilet preparations, and in soaps and detergents.

Chemical Sector Employees

Employment figures for the chemical sector were impacted by the economic crisis in 2008. Since 2009 the total number of employees has remained relatively stable, standing at 920,000 in 2017.



This figure represents the sum of employees in Responsible Care companies across Europe participating in the survey.

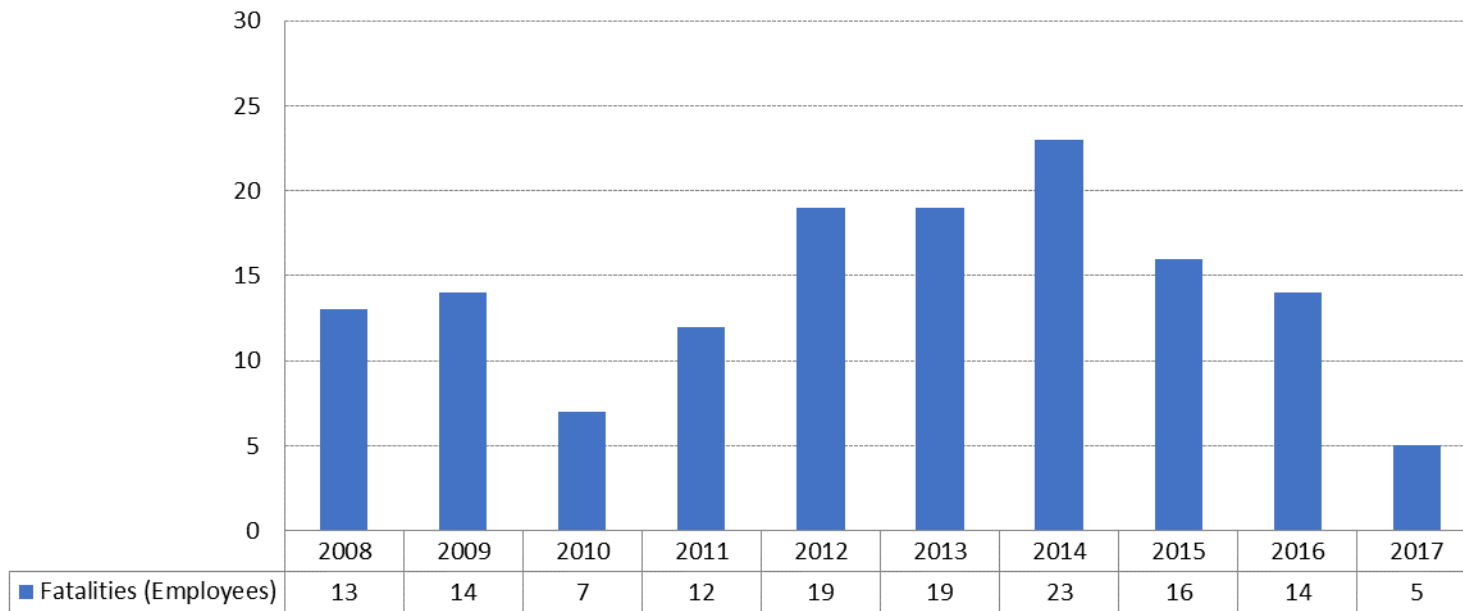
Safety at Work

Employee Fatalities

The safety of workers is an utmost priority for the chemical industry and the only acceptable target is zero; safety is the number one concern ahead of everything else.

Employee fatalities

In 2017, three accidents occurred in three different countries resulting in five fatalities. This figure has gradually fallen over the last three years.



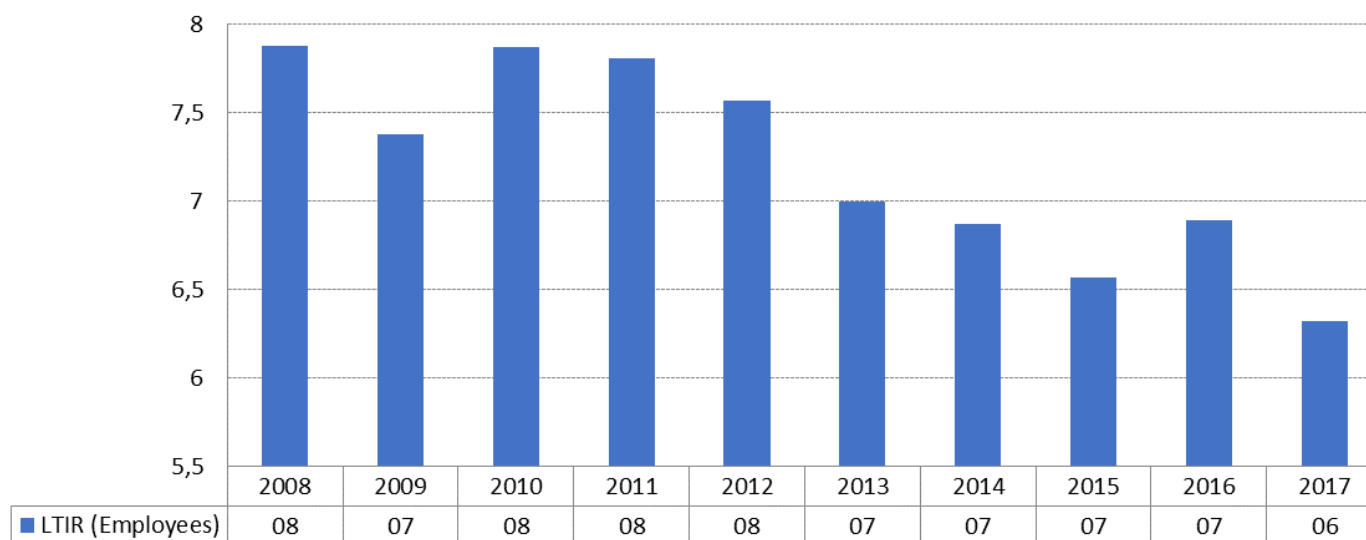
This figure represents the sum of fatalities in Responsible Care companies across Europe participating in the survey.

Lost Time Injury Rate (LTIR)

For chemical industry, safety in general - and safety of workers in particular - comes first. There is no sustainable business without safe operations. To further embed safety practices in company culture, monitoring and reporting of a new, harmonised Process Safety KPI began worldwide in early 2017.

Lost Time Injury Rate for Employees

The lost time injury rate is expressed as the number of lost time incidents per million working hours. A lost time injury is a bodily injury that renders the person physically or mentally unable to work or complete the shift, resulting in at least one day off work. The data collected over the last ten years indicates a steady decline in the LTIR for employees of the chemical sector, which has fallen by 20% since 2008.



This figure shows the weighted average of lost time Injury rate using the number of employees in companies across Europe practicing Responsible Care in this survey.

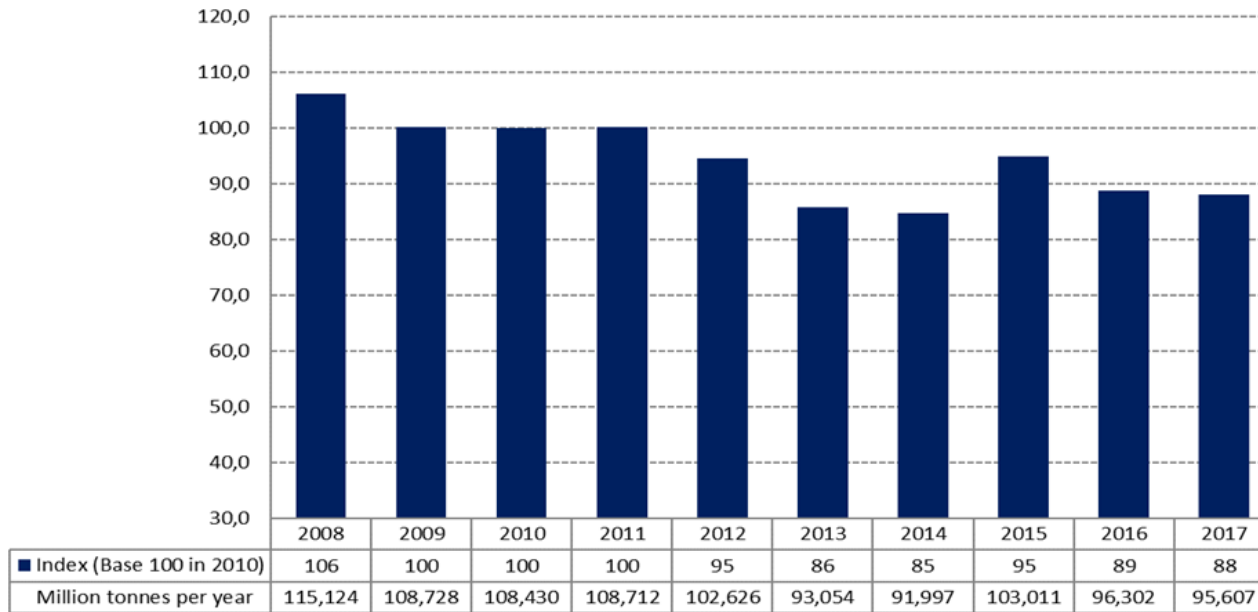
Environment / Air

Emissions of Greenhouse Gases (GHG) (CO₂-eq.)

Carbon dioxide, nitrous oxide and hydrofluorocarbons are the three major gases emitted by chemical plants with Global Warming Potential (GWP), as listed in the Kyoto Protocol. CO₂, which is primarily released from burning fossil fuels as energy sources, is by far the most important GHG by quantity.

GHG direct emissions in Carbon Dioxide equivalent

Over the last 10 years, companies' GHG direct emissions in CO₂ equivalent have steadily fallen by 17%.



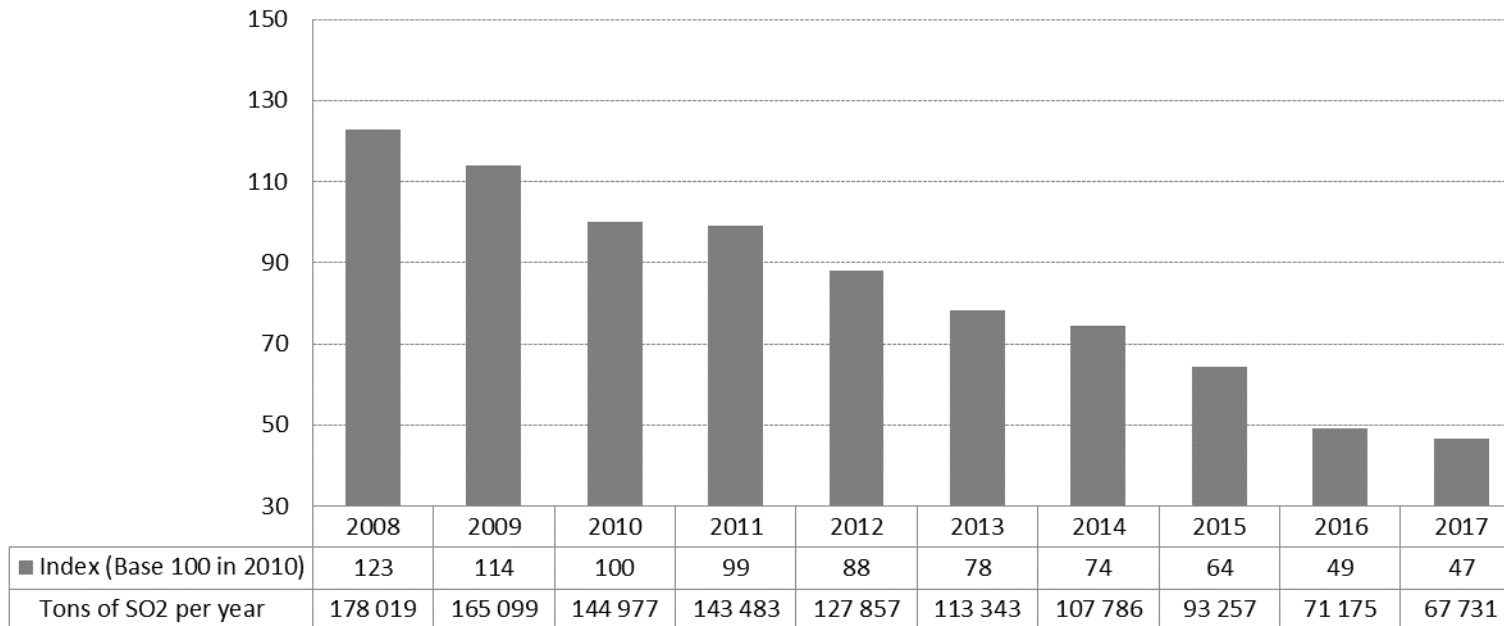
GHG direct emissions in CO₂ are reported in million tonnes and illustrated as an index comparing the yearly emissions to the level of 2010 (2010=100). This figure represents Responsible Care companies across Europe participating in the survey.

Sulphur Dioxide (SO₂)

Sulfur Dioxide (SO₂) is a major atmospheric pollutant responsible for acidification. The main emitters are combustion plants and refineries.

SO₂ emissions

Over the past ten years, companies have reduced their SO₂ emissions to the atmosphere by around two thirds. The reduction continues today.



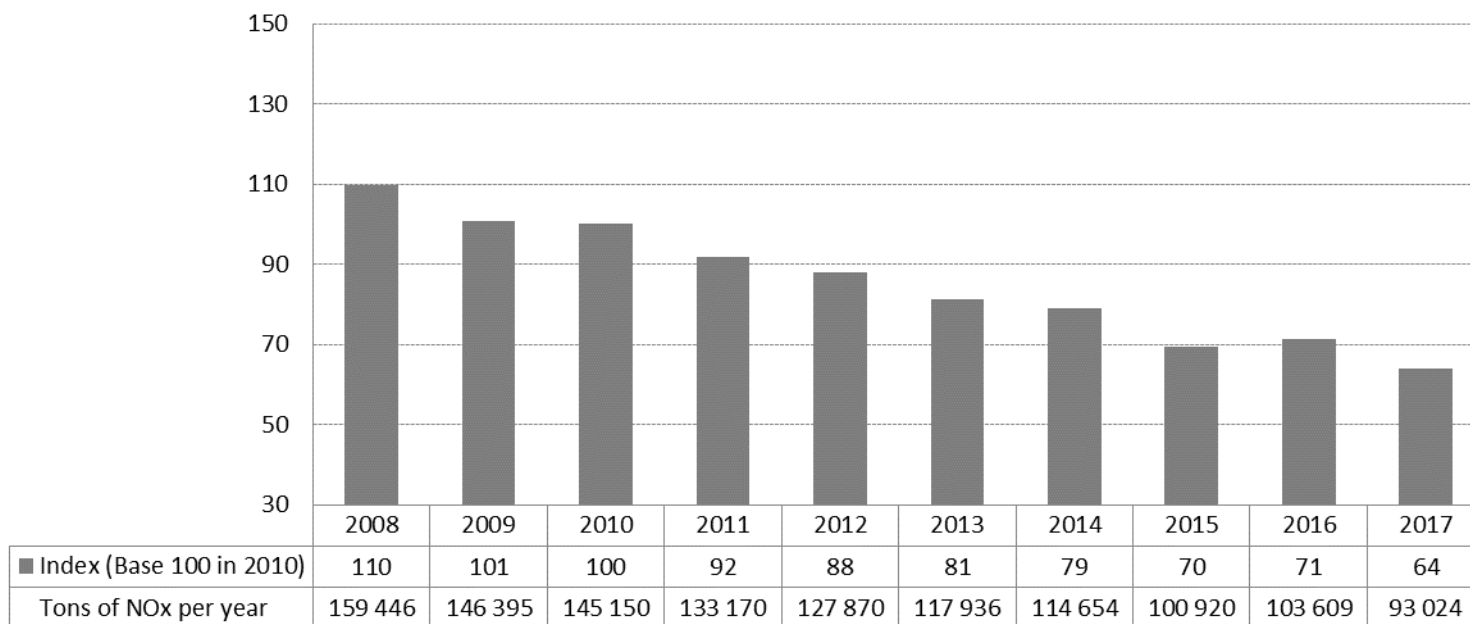
SO₂ emissions are expressed in tons and illustrated as an index comparing the yearly SO₂ emission levels to that of 2010 (2010=100). This figure represents Responsible Care companies across Europe participating in the survey.

Nitrogen Oxides (NOx)

Nitrogen Oxides (NOx) are responsible for atmosphere acidification and have the potential to contribute to photochemical ozone creation that may cause respiratory problems for people living in highly urbanised areas, as well as ecological damage to nature.

NOx emissions

Over the past ten years, companies have reduced their NOx emissions to the atmosphere by around 42%.



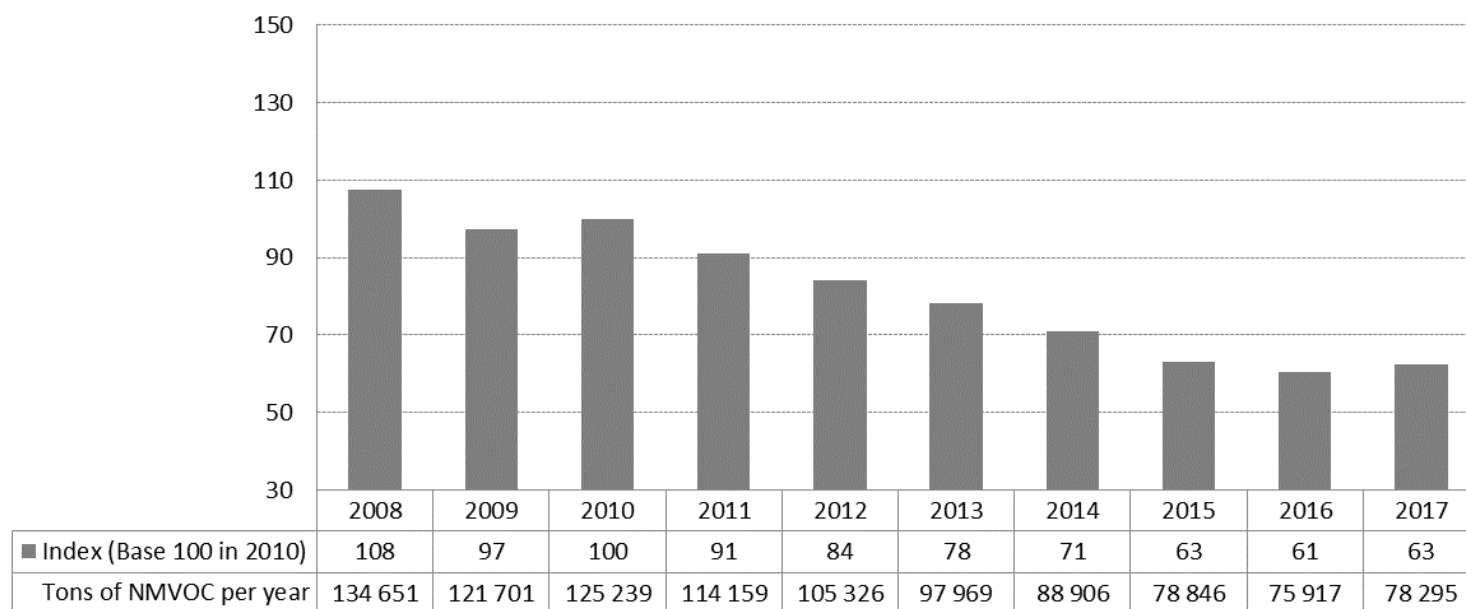
Both NO and NO2 are combined in this measurement and reported as a single number. NOx emissions are expressed in tons and illustrated as an index comparing the yearly NOx emission levels to that of 2010 (2010=100). This figure represents Responsible Care companies across Europe participating in the survey.

Emissions of Non-Methane Volatile Organic Compounds

Non-Methane Volatile Organic Compounds (NMVOC) can contribute to photochemical ozone creation that may cause respiratory problems for people living in highly urbanised areas, as well as causing ecological damage to nature.

NMVOC emissions index

Companies have reduced their NMVOC emissions to the atmosphere by around 42% over the past ten years. This reduction appears to have stabilised over the last three years.



NMVOC emissions are expressed in tons and illustrated as an index comparing the yearly NMVOC emission levels to that of 2010 (2010=100). This figure represents Responsible Care companies across Europe participating in the survey.

Environment / Water

Nitrogen and phosphorus

Nitrogen and phosphorus are nutrients that are natural parts of aquatic ecosystems. However, when too much nitrogen and phosphorus enter the environment, usually from a range of human activities, the water can become polluted.

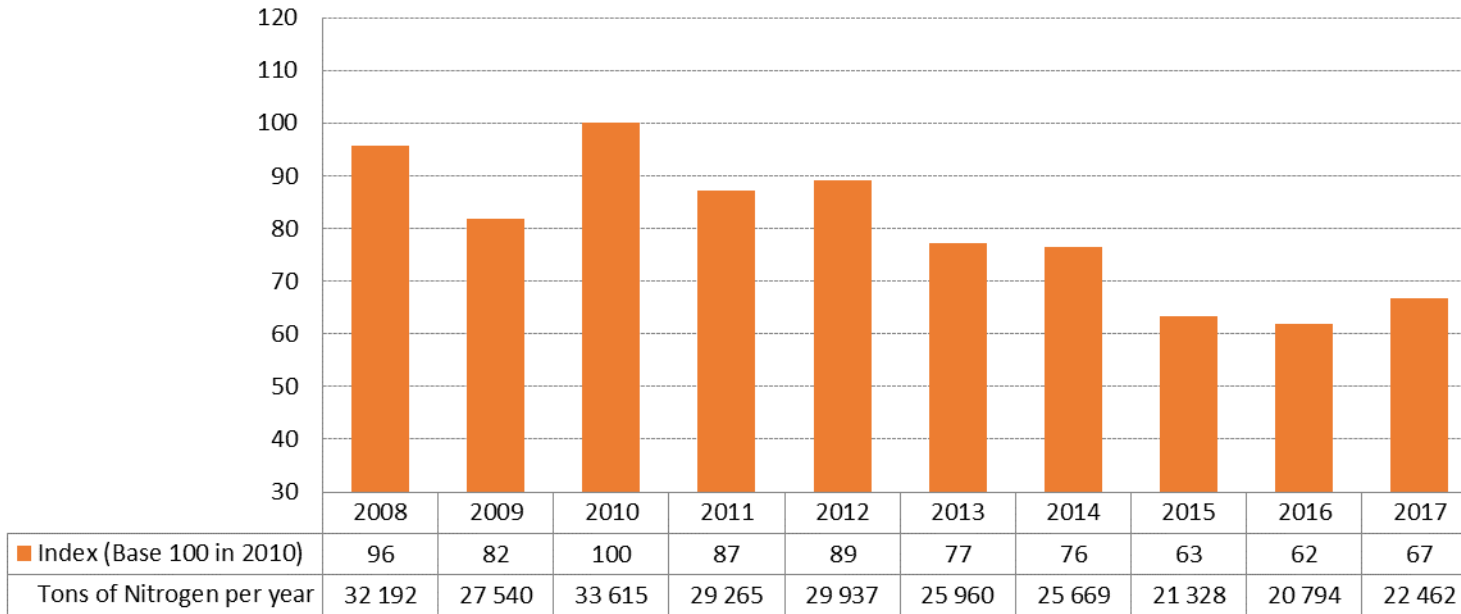
Too much nitrogen and phosphorus in the water causes algae to grow faster than the ecosystems can handle. Significant increases in algae harm water quality, food resources and habitats, and decrease the oxygen that fish and other aquatic life need to survive.

Some algal blooms are also harmful to humans because they produce elevated toxins and bacterial growth that can make people sick if they come into contact with polluted water, consume tainted fish or shellfish, or drink contaminated water. Nutrient pollution of water resulting from excess nitrogen and phosphorus is widespread.

Companies continuously monitor the quality of water they return to the environment after the removal of impurities, by measuring the quantity of nitrogen and phosphorus compounds present in the water.

Nitrogen present in the water returned to the environment

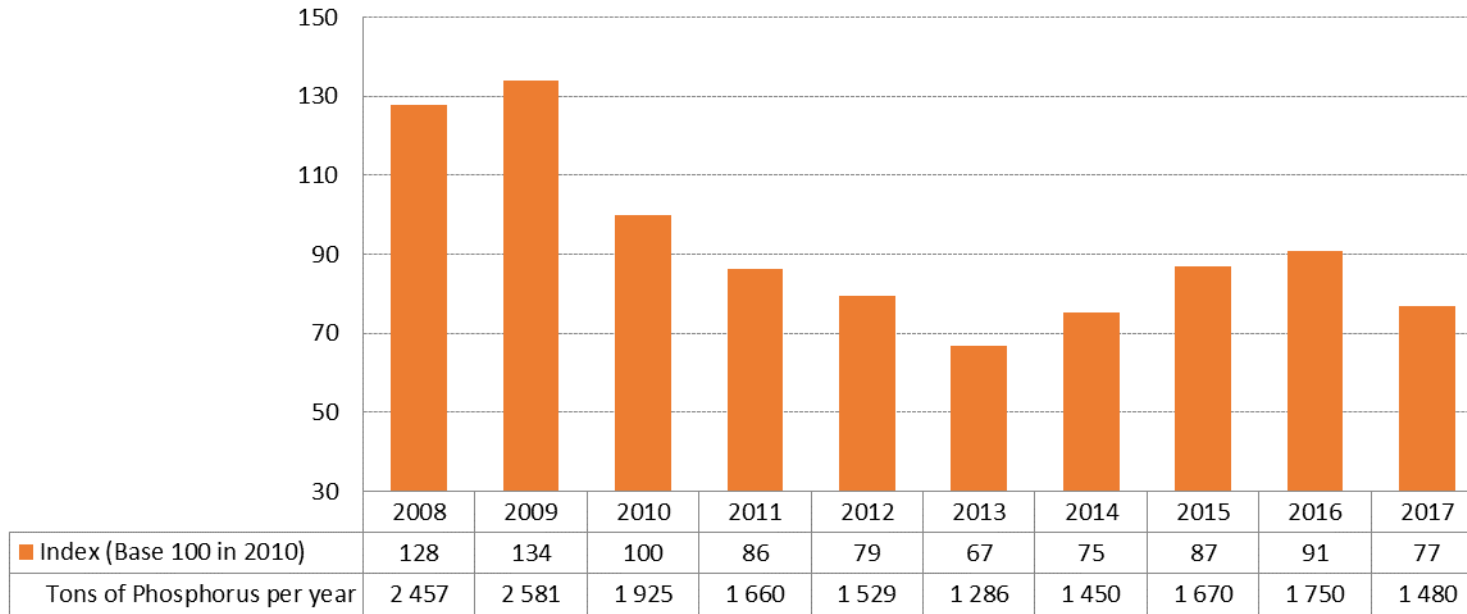
Over the past ten years, companies have reduced the quantity of nitrogen in water by 30%.



Nitrogen is expressed in tons and illustrated as an index comparing the yearly nitrogen level to that of 2010 (2010=100). This figure represents Responsible Care companies across Europe participating in the survey.

Phosphorus present in the water returned to the environment

Over the past ten years, companies have reduced the quantity of phosphorus in the water by 40%.



Phosphorus is expressed in tons and illustrated as an index comparing the yearly Phosphorus level to that of 2010 (2010=100). This figure represents Responsible Care companies across Europe participating in the survey.

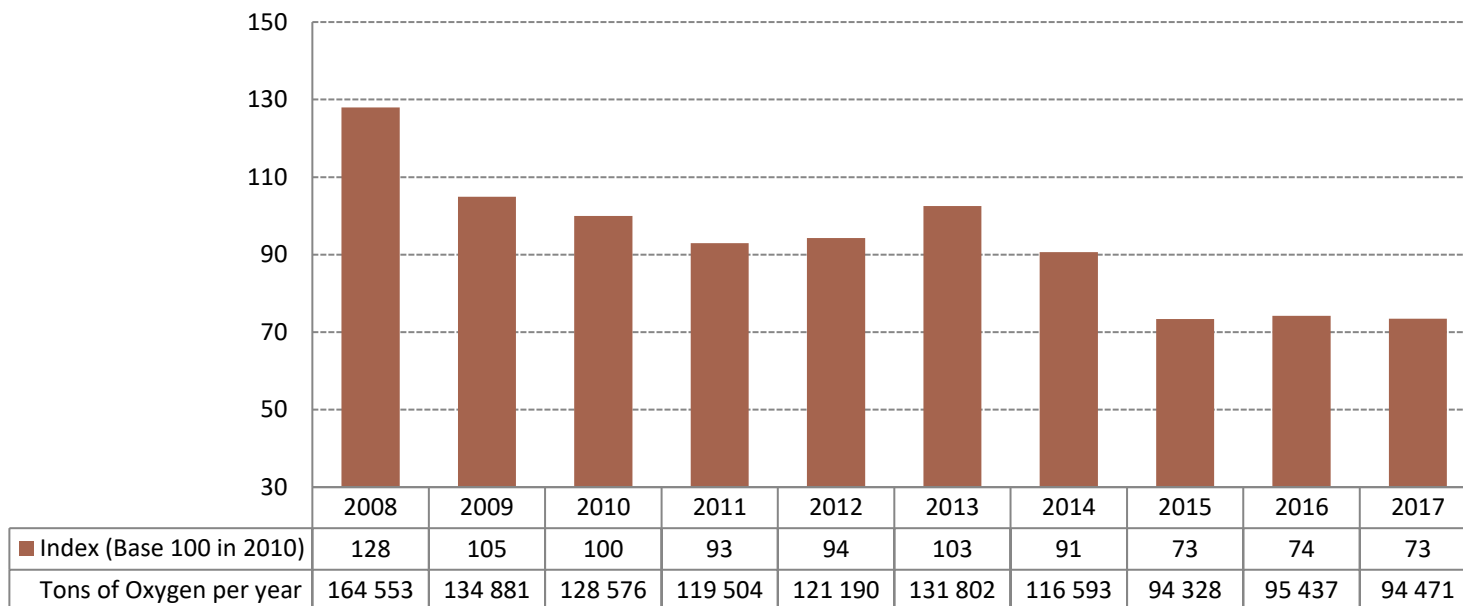
Chemical Oxygen Demand (COD)

Oxygen is vital for underwater life. As described above, the quality of the water companies return to the environment can impact the environment and human health in different ways. That is why companies measure the Chemical Oxygen Demand (COD) of the water they return to the environment with COD measurement.

COD gives an indirect indication of the amount of organic compounds in water.

COD in the water returned to the environment

Over the past ten years, companies have reduced the COD by about 43%. The reductions appear to have stabilised over the last three years.



COD is expressed in tons and is illustrated as an index comparing the yearly COD level to that of 2010 (2010=100). This figure represents Responsible Care companies across Europe participating in the survey.

Participating Associations

Overall, 21 European countries are covered in the latest Cefic Responsible Care performance data, including: Austria, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom. The environmental reporting of some associations is now based on data published by authorities in the European Pollutant Release and Transfer Register (E-PRTR), rather than gathered through member surveys.

In some indicators, the data from several countries has not been used because the national industry may not have such information or national associations have yet to report KPI data for a sufficient number of years. Since last year report:

- Belgium has been included in the GHG index
- Czech Republic has been included in the Sulphur Dioxide (SO₂), Nitrogen Oxides (NO_x), Emission of Non-Methane Volatile Organic Compounds (NMVOC) and Nitrogen and Phosphorus in the water indexes
- Bulgaria has been included in the Nitrogen in the water index.