



## Acidification

Emissions from burning fossil fuels react with other gases in the atmosphere to form acids.

### Unilever's impact

Sulphur and nitrogen oxides – often referred to as SO<sub>x</sub> and NO<sub>x</sub> – from vehicle exhaust fumes, industrial boilers and power stations fall in the form of acid rain and contribute to increased acidity in rivers and lakes. Other industrial acidic effluents also contribute. Acid emissions are a shared problem because of the universal use of fossil fuels.

We use fossil fuels in our factories to provide heat and some electricity. The fuels vary in the amount of acid gas they produce. Natural gas contains only a small amount of sulphur, whereas fuel oils can contain up to 3% sulphur. Some fuels, such as coal, vary in their make up from one region to another.

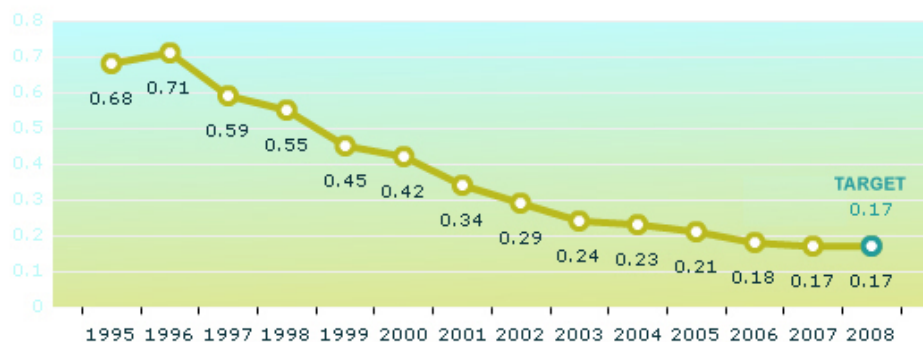
We also release some sulphur gases from the sulphonation process that converts hydrocarbons to surfactants. Indirectly, we are responsible for emissions from the operations of our contractors and suppliers, mainly in the generation of electricity, transport activities and farmers' use of fertilisers.

### Action being taken

Acidification potential is a key theme in the life-cycle assessment studies used to evaluate our products. As well as environmental factors, the choice of fuel will depend on availability, cost and ease of use. Our global supply chain network has a programme to reduce emissions from sulphonation by sharing best practice.

Most of our manufacturing sites have a boiler for generating steam. Around half of the boilers use fuel oil or coal and therefore emit SO<sub>x</sub> and NO<sub>x</sub>. In some cases diesel generators are also used for electricity generation. The SO<sub>x</sub> and NO<sub>x</sub> data are calculated from the total mass of fuel consumed, and its sulphur content and typical NO<sub>x</sub> emission factors. The data are expressed in terms of a mass of sulphur dioxide (SO<sub>2</sub>).

**Boiler/Utilities SO<sub>x</sub>**  
Kg/tonne of production





### Boiler/Utilities SOx

10<sup>3</sup> tonnes



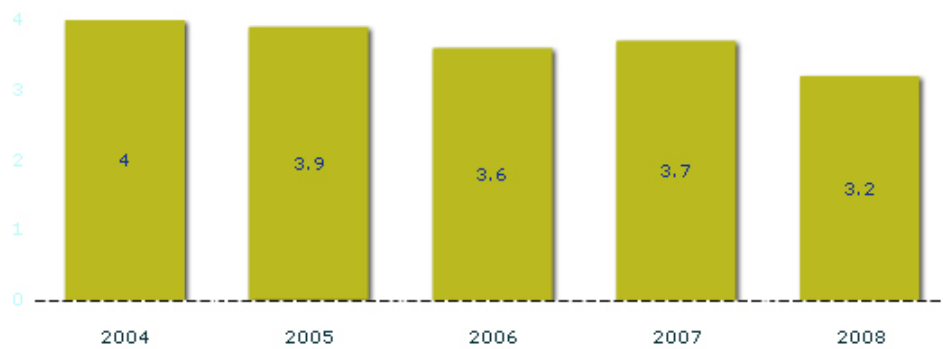
### Boiler NOx

Kg/tonne of production



### Boiler NOx

10<sup>3</sup> tonnes



In 2008, we reduced the SOx emissions from our boiler and utility operations by 5.6% load per tonne and therefore met our 2008 milestone of a 1.7% reduction.

During 2008, a 9.8% reduction was also achieved in the absolute load for Boiler/Utilities SOx. The main reasons for the decrease in SOx emissions were the increased use of low sulphur content biomass (eg





bagasse and wood) as an alternative fuel, particularly in Brazil and India, improved fuel quality, eg in Malawi and Tanzania and energy efficiency improvements at some sites, eg in Kenya, Honduras and Ecuador. Also, more accurate data was provided for fuel sulphur content by a number of sites, eg through closer contact with suppliers.

However SO<sub>x</sub> emissions were higher in Pakistan, Nepal, Nigeria and some parts of India due to problems with the stability of grid electricity supply, leading to increased consumption of higher sulphur content fuel in on-site diesel generators.

SO<sub>x</sub> emissions from sulphonation are about 0.4% of the SO<sub>x</sub> load emitted from our boilers. See sulphonation SO<sub>x</sub> in the Home and Personal Category data we collect.

