

## **Roche Position on Pollution, Prevention and Reduction: We protect Air, Water and Soil**

### **Roche's Position**

We recognize that our business activities inevitably lead to environmental impacts, in particular to harmful air emissions, effluents into water and discharges to soil. We acknowledge the limited capacity of the earth to absorb and degrade such pollutants.

In striving for continuous reduction of the environmental impact of our business operations we have established clear internal guidelines and directives and we work to implement corresponding measures in all our business activities. We verify the implementation by conducting internal environmental audits and keep our management informed on environmental programs and the performance attained. As a guiding principle we follow the well-known set of priorities "*avoid - reuse - recycle - incinerate/valorize - dispose*".

We determine the overall quantities of air emissions and discharges to water and soil. After combining these figures with those for resources consumption (energy, raw materials and water) we calculate the total environmental impacts according to a method developed by the Swiss Federal Office for the Environment (FOEN). Under this methodology each element is assigned an impact factor. These factors are multiplied by the quantities of emissions, discharges and consumed resources, yielding a numerical index for the total environmental impact, which is called the "eco-balance".

We have, over the years, been setting long-term goals for the improvement of our eco-balance result. We further calculate an eco-efficiency rate (EER), which compares environmental impacts with the cost of environmental protection and with our Group sales as a measure for value creation (see our goals and the performance against them on our webpage).

### **The global situation**

In spite of recent great improvements in certain regions, globally speaking, pollution of air, water and soil has increased continuously throughout the industrial era. The ever-increasing combustion of fossil fuels pollutes the air with soot, respirable dust, nitrogen oxides (NO<sub>x</sub>), sulfur dioxide (SO<sub>2</sub>) and is the main source of carbon dioxide (CO<sub>2</sub>) emissions. Growing industrial production (including chemicals) generates more and more problematic waste that is discharged into water bodies, the ground and the air.

Moreover the disposal of ever more goods contributes to an increase in the number and size of landfills which in turn represent secondary sources for the pollution of soil, water and air (see our separate position papers on Greenhouse Gases and Climate Change; Waste; Water; Pharmaceuticals in the Environment; and Landfills and Contaminated Soil).

The negative effects of such pollution became obvious decades ago. Polluted air is causing health disorders and water is rendered unfit for human consumption. Landfills can pose a risk of poisoning and combined effects may endanger biodiversity. The capacity of our planet to absorb this pressure is overstretched.

In reaction to this situation, environmental policies and regulations have been introduced all over the world. Concrete countermeasures have been taken to avoid or reduce emissions and discharges and to contain pollutants. In many cases this has led to marked improvements: air and water quality are now better in numerous (mainly developed) countries, contaminated soil has been cleaned up and the incineration of wastes has reduced the volumes that are landfilled.

However, pollution is rampant in many places, especially where the budgets are tight.

## **The situation at Roche**

Roche's operations contribute to emissions into air and discharges into water and soil. In order to alleviate the negative impacts of such pollution we began, already decades ago, to control and reduce emissions and discharges by means of the following measures:

**Air emissions:** Process air contaminated with problematic materials, e.g. volatile organic compounds (VOC), other gaseous chemicals and dust, is being collected and separated or directly incinerated onsite in state of the art incinerators. Emissions from burning fossil fuels, like CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>2</sub>, are being reduced through the reduction of energy consumption (see our separate position paper on Energy; CO<sub>2</sub> emissions at Roche are almost exclusively from energy use). We also switch to less polluting fuels, e.g. from heavy oil to sulfur-free light oil to natural gas, and introduce environmentally friendlier technologies, e.g. geothermal cooling and combined heat and power generation. Roche's NO<sub>x</sub> and SO<sub>2</sub> emissions are now at a very low level.

We have a goal to phase out halogenated refrigerants (CFCs and similar compounds) and strive for a 90 % reduction by 2015 (with separate timelines for newly acquired operations), because all of these materials have negative effects: they destroy the ozone layer, have greenhouse gas effects and/or are persistent in the environment.

**Discharges into the water:** The toxicity and quantities of pollutants from our production operations are reduced by the optimization of processes (“green chemistry”). Waste water from all relevant production units is cleaned in wastewater treatment plants. Special waste water treatment technologies are integrated in the processes where necessary, e.g. oxidation, filtration or incineration. Heavy metal discharges are at a very low level and are mainly caused by leaching from metal piping (e.g., zinc-coated water pipes).

**Discharges into the soil:** We generate less and recycle remaining wastes wherever feasible. This includes scrap diagnostic instruments. We have a policy not to landfill any chemical and problematic medical waste. All such waste is incinerated (landfilling of inert materials only).

We avoid leaks through proper construction, e.g. by bunding, collection drains and fire water retention, and preventive maintenance of our plants.

We support take-back programs for unused and expired medicines in order to minimize pollution by improper disposal of such products.

**Control of genetically modified organisms:** In large scale biotech production we use microorganisms or cell lines exclusively from risk group 1, which present no or a very low risk to man and the environment. In research and development, and in certain processes used for the commercial manufacture of diagnostic tests, microorganisms may be used that can cause disease. In handling these agents, Roche strictly complies with the appropriate biosafety standards recognized across the world. Organisms from higher risk groups, which are sometimes used in research, are inactivated before release to the environment (e.g. by autoclaving and incineration). See our separate position paper on SHE aspects of Biotechnology.

**Risk:** To grant marketing authorization for a new pharmaceutical product authorities in a number of countries require an environmental risk assessment (ERA). This investigation looks for environmental impacts from the intended use of the medication taking into account the market volume as well as intrinsic physical and eco-toxicological properties. Authorization is only granted when the environmental risk is deemed acceptable.

We also investigate our older products. We have found no undue environmental risk due to these products at current use levels. Beside our final products we further assess environmental hazards and risks for production intermediates and for ancillary compounds necessary for production.

Based on *our own* risk assessment we, in many cases, take measures beyond legal requirements and pro-actively minimize pollution.

**Supply Chain:** We outsource some of our production and we purchase chemicals and other products from third parties, some of which are in countries with lower

environmental standards. We request these suppliers to follow our high SHE standards and we verify their performance through questionnaires and where necessary through audits at their plants. If suppliers do not deliver to our expectations or are not willing to improve we will do no business with them.

The use of our products and their final disposal may also have a negative impact on the environment. We strive to reduce these effects by developing less polluting products. Examples are environmental friendly refrigerants in our diagnostic instruments or easily recyclable application systems for medicines. We also support take-back programs everywhere in order to avoid improper disposal of unused pharmaceuticals and diagnostic instruments. For more details on this topic, see our position papers on Product Stewardship (in preparation) and Pharmaceuticals in the Environment.

**Goals:** We have set several goals to reduce our emissions and discharges, e.g. goals for energy efficiency (and resultant CO<sub>2</sub> emissions) and, as elements of our total eco-balance goal, other emissions to the air, discharges into water and waste quantities. In addition, we plan to introduce even more sophisticated goals such as total wastewater toxicity of our production plants (see our webpage for all the environmental goals).

We regularly provide detailed reports on our achievements in reducing our emissions and discharges (see our webpage for details).

## **Further information**

Position papers on several environmental topics:

[http://www.roche.com/corporate\\_responsibility/environment/she\\_management/policy\\_guidelines\\_and\\_audits.htm](http://www.roche.com/corporate_responsibility/environment/she_management/policy_guidelines_and_audits.htm)

Environmental goals and environmental performance:

[http://www.roche.com/corporate\\_responsibility/environment/she\\_goals.htm](http://www.roche.com/corporate_responsibility/environment/she_goals.htm)

Eco-balance and Eco Efficiency Rate EER:

[http://www.roche.com/fact\\_sheet\\_eco\\_efficiency.pdf](http://www.roche.com/fact_sheet_eco_efficiency.pdf)



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