

# Executive Summary

## of the Eco-profile and Environmental Product Declaration of the European Chlor-Alkali Industry

### What are Eco-profiles?

**Eco-profiles** are detailed published environmental data on plastic and chemical materials. They consist of **life cycle inventory (LCI)** datasets that entail a long list of material and energy inputs as well as emission and waste outputs associated with the production of plastic and chemical materials covering their life cycle from cradle (i.e. extraction of raw materials) to gate (of the manufacturing company).

This detailed environmental data is then transferred into **environmental product declarations (EPD)**, which show potential environmental impacts through various **key environmental indicators** such as global warming potential (i.e. the total amount of greenhouse gas emissions or 'carbon footprint'). The datasets are in widespread use among life cycle practitioners and other stakeholders all around the world.

### Results of the chlor-alkali process eco-profile of the

The Eco-profile deals with the European chlor-alkali process which includes the products chlorine, sodium hydroxide, hydrogen and sodium hypochlorite. Additionally, the potential environmental impacts associated with sodium chloride production were quantified.

These potential environmental impacts for chlorine, sodium hydroxide, hydrogen, and sodium hypochlorite by chlor-alkali electrolysis are dominated by electricity use and – to a lesser extent – by sodium chloride production.

Looking at the chlorine production closely, you can see that 62% of Total Primary Energy is used by electricity, followed by sodium chloride production with 21%. Electricity causes 83% of the Global Warming Potential (GWP), 8% of GWP are caused by sodium chloride production. A detailed overview of the results can be obtained in the Eco-profile.

Consequently, the country-specific production of electricity has a great influence on the results, especially with respect to the carbon footprint. It should be noted, that in this study countries with low specific GWP per kWh of electricity produced, such as France and Belgium, are significantly underrepresented, whereas countries with a comparatively higher GWP per kWh of electricity produced are over-represented. This leads to higher GWP results in comparison with the last Eco-profile published in 2006. In contrast, the Primary Energy Demand from renewable resources significantly increased compared to the previous study due to the fact that in the present study the solar energy used for the production of solar salt was taken into account.

Therefore, it would be desirable to increase the representativeness of the data by collecting primary data from a greater number of chlor-alkali production sites. An alternative approach is described in the Eco-profile report. At the moment, the resulting datasets are considered best available data and good quality with respect to the goal and scope. These Eco-profiles serve as a best-practice building-block for environmental assessments of products based on the materials within the scope of this project.

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