

# SUSTAINABILITY AT CEPE: PRE-COMPETITIVE COOPERATION RESULTING IN AN INDUSTRY STANDARD COATINGS LCI DATABASE

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## ABSTRACT

An increasing environmental awareness within the global construction industry has led to a demand for LCI data. In response, a number of European coating companies, gathered within CEPE (the European coatings trade association), have initiated a pre-competitive LCI project. The results a coatings industry standard LCI database containing almost 300 raw materials and an Eco footprint tool - are accessible to CEPE members for use in the preparation of LCAs, EPDs and eco footprints. Since the deliverables of the CEPE LCI project provide LCI data common for the entire industry, they allow for the fair comparison of the environmental impact of different products and product groups over the life cycle.

## INTRODUCTION

Product stewardship and regulatory compliance have been key interests of the European coatings industry for decades. The European Council for the Paint, Printing Ink and Artists' Colours Industry (CEPE) has stimulated and supported its members' compliance with legal frameworks such as the VOC Regulation (European Commission, 1999) and REACH (European Commission, 2006). Further, for over twenty years, it has actively implemented global environmental programs such as Coatings Care® (IPPIC, 2013).

To date, most of the environmental regulations and initiatives have focused on environmental impacts that are specifically associated with the production and the use of paints and printing inks. However, an increasing environmental awareness within the global construction industry challenges the coatings industry to get involved in the developments regarding sustainability. This is particularly true in Europe, where sustainability is high on the agenda. Increasingly more architects work according to green building schemes that contain requirements on material efficiency and indoor air quality. To acquire green building certifications, information is required regarding the environmental impacts of the used materials. Additionally, in France, Environmental Product Declarations (EPDs) are part of the Grenelle II (Gouvernement français, 2010) legislation. Both developments have led to an increased demand for Life Cycle Inventory (LCI) data. As a sector involved in the construction industry, the coatings industry has been confronted with the call for LCI data. In response, CEPE has established a Sustainability Taskforce. To enable member companies to identify, analyze and evaluate the broader environmental effects of their products over the



product's full life cycle, the CEPE Sustainability Taskforce has initiated a pre-competitive LCI project to resolve the lack of standard LCI data for raw materials.

# PROCESS

## Goal and scope

The CEPE Sustainability Taskforce consists of member company representatives responsible for sustainability, as well as the directors of national coatings associations. In 2010, the Sustainability Taskforce made the decision to set up a Sustainability Working Party responsible for the content of the LCI project. The Working Party comprises of a selection of Taskforce members and Life Cycle Assessment (LCA) experts of the CEPE member companies (which include both coatings manufacturers and associated companies such as raw material suppliers).

As a starting point, the Working Party focused on reviewing different software packages and LCI data available in Europe for the computation of singular environmental indicators such as carbon footprint and the water utilization. However, as the discussion of the goal and scope progressed, a consensus was reached that in order to support wider sustainability initiatives like the Green Public Procurement (European Commission, 2008) and Green Building (USGBC, 2013; BREEAM, 2013), a shift should be stimulated towards Life Cycle Thinking. To this end, CEPE set the goal to establish a fully transparent methodology for collecting consistent LCI data, and to subsequently develop a fully open LCI database covering both raw material and coating manufacturing. The scope of this project was agreed to be cradle-to-gate. The types of process within this scope are common for all sector groups in the coating industry; the LCI data for raw materials include the extraction of feedstock and production and transport of the coating raw materials (cradle-to-gate), whereas the LCI models for coating production are restricted by the boundaries of the production plant (gate-to-gate). The Swedish Environmental Research Institute (IVL) was selected as a consultant to create the LCI database and models.

#### Coatings life cycle inventory

In the first phase of the LCI data collection, each CEPE sector group was asked to list the main raw materials in their industry sector, and indicate the relative importance of each of the selected compounds. The lists were then aggregated and common items were replaced. Ultimately, the final list contains ~ 300 raw materials. Due to time and budget constraints, data were collected using a pragmatic approach. High priority was given to substances that are either used in large volumes or that are of environmental concern, whereas compounds constituting merely a small fraction of the final product mass and posing no risk to the environment were given low priority. The obtained data quality was chosen to be proportional to the status of the raw material, where data of high quality were substance-specific, while low quality data were obtained by modelling an 'average mixture' of representative substances.

The data were acquired in several ways. First, the European raw material associations have been contacted. This yielded some information, but mostly demonstrated that the majority of supplier organizations currently do not have this data readily available. The inquiry however, induced a great interest, suggesting that the LCI project not only fulfils a need at the level of the manufacturer, but at the level of the supplier as well. Further, pre-existing databases where reviewed. As the use of public data was preferred for its transparency as well as from a



cost perspective, data sets were mainly extracted from Ecoinvent. As a result, an Ecoinvent licence is required to access the full database. Finally, in cases where a high data quality was required and no specific data were available elsewhere, raw material experts and suppliers where consulted and a raw material LCI model was created.

Further, three LCI models for the manufacturing of coating products were produced; one for water-borne, one for solvent-borne and one for powder coatings. Since many coatings producers where involved in the data acquisition process and for each coating manufacturing process data were included of at least three production sites, the resulting models are highly representative.

Finally, a methodology report and reference manual have been written, in which all assumptions, hypotheses, rationale for the selection of datasets, and source of selected datasets are justified. All background information required for a full LCA study can be retrieved from these documents. The intention is to make the LCI models for coating production available to the larger LCA community at a later stage.

#### Deliverables

To communicate the industry's position relative to sustainability, CEPE launched the Charter for Sustainable Development in the Paint and Printing Ink Industry (CEPE, 2012). In this charter it sets forth the intention to encourage and support the company members to gain insight into the environmental impact of their products throughout their life cycle. Herewith, CEPE intends to enable its members to identify opportunities for innovation. A significant contribution to this support is formed by the first deliverable of the LCI project: the industry standard LCI database, in accordance to the latest LCA standards and freely usable by LCA experts from members companies.

However, during the project an additional need was identified. The LCI data obtained in this project is of high complexity and will typically be used in combination with of LCA software. Due to often limited (financial) resources, small and medium-sized enterprises (SMEs) might be prevented from enjoying the benefits of these results. To also enable SMEs to utilize the data and have their first experience with LCA, CEPE decided to provide them with an Eco footprint tool. By means of this web-based tool CEPE members can calculate their products' eco footprints, comprising an overview of environmental indicators such as energy and resource consumption, and emissions to air and water. This information may subsequently be used as the main source of impact information when compiling Environmental Product Declarations (EPDs).

The Eco footprint tool, developed by Ecomatters, is based on the coating manufacturing models and the raw material LCI database. It provides a quick and easy method to adjust the main model inputs and extract an overview of the most important environmental impacts of a product in a document in MS Word or MS Excel format. After initial testing, the convenience provided by the Eco footprint tool does not only seem to fulfil the need of SMEs, but also seems to generate great interest from the larger member companies.

#### Further development

The deliverables of the CEPE LCI project, that is, the industry standard LCI database and the Eco footprint tool, will be available for further use by sector groups, national organizations and individual companies. Next to this direct use, a number of follow up projects aimed "after the gate" are currently being investigated at CEPE level.



## CONCLUSION

Due to its proactive attitude and initiation of the LCI project on a European level, CEPE has taken the position of frontrunner. As a result, rather than several dissimilar and mutually unmatchable systems originating from individual national initiatives, one standard database has been developed that provides LCI data common for the entire industry. This is expected to be great value to the European community of coating and paint manufactures, for it allows for a fair comparison of the environmental impact of different products and product groups over the life cycle.

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