Guidelines for CP implementation

Cleaner production demonstration site program in China

Cleaner production eliminates pollution throughout the entire production process. It is a way of reducing pollution damage to both the environment and the human population by increasing the efficiency of resource use - decreasing pollution discharge by improving management and technology.

In order to promote cleaner production throughout the country, NDRC (formerly SETC) has decided to implement a demonstration site program.

Aims and missions

- Raise public awareness of cleaner production, particularly with government officials and sectoral industry managers, with particular attention to shifting the emphasis from end-of-pipe pollution treatment to pollution control throughout the entire industrial process.

- Encourage factories to increase their economic benefits and their competence, rather than simply reducing effluent discharge to meet pollution standards. Also to improve the environmental and economic quality in the demonstration cities.

- Establish demonstration projects and gain experience from their implementation. These demonstration sites will become the models for implementing cleaner production in China.

- Explore and establish systems and mechanisms for the management, policy making and running by the government of CP promotions which are suitable for a socialist market economy. To gradually establish an effective system for the factories to promote CP voluntarily.

Scope of the demonstration sites

- Ten cities were identified as national cleaner production demonstration sites. The ten cities are Beijing, Shanghai, Tianjin, Chongqing, Shenyang, Taiyuan, Jinan, Kunming, Lanzhou and Fuyang.

- Five industrial sectors have been designated demonstration industries. They are the petrochemical industry, metallurgical industry, chemical industry (nitrogen fertilizer, phosphate fertilizer, chlor-alkali and sulphuric acid), light industry (pulp and paper, fermentation and beer brewing) and ship building.

Criteria for the selection of demonstration sites

- Cleaner production is implemented at the factory level. The factories get both economic and environmental benefits from implementing cleaner production. The factories should realize the importance of cleaner production and undertake cleaner production voluntarily.

- Implementation of cleaner production will be within the relevant government guidelines.

- The implementation of cleaner production involves a combination of reorganization, improved technology in the factories, power saving and decreasing consumption, improved management and competent resource use. System engineering enables cleaner production to be integrated into the entire production process.

- Cleaner production implementation is combined with the establishment of environmental management systems. This ensures that factories implement cleaner production continuously. Cleaner production helps to promote a positive image of the factory.

- The promotion of cleaner production is carried out by building demonstration sites at which efficiency is increased, and low cost/high return modifications are carried out first. CP is promoted throughout the whole process.

Requirement for demonstration sites

- The cities should build management institutes to promote cleaner production under the direction of government, the local Economic and Trade Commission (ETC) and with the cooperation of the environmental and sectoral industry departments.

- Based on the research, all relevant governmental offices and industrial management institutes should prepare a cleaner production plan which is suitable for the current situation.

- The implementation of cleaner production requires careful organization by factory management before actual implementation is begun. The implementation of cleaner production is an exercise in systems engineering and requires good management.

- Develop cleaner production policies and regulations at the local level.

- Awareness raising and training. Make government officials and the general public more aware of cleaner production.

Life cycle analysis

Main steps and applications

Thai LCA Network, Thailand

Most products require a large variety of production, distribution, use and disposal processes. Each process can produce a large variety of emissions, and each emission has a very specific effect on the environment. The complex interaction between a product and the environment is dealt with in a Life Cycle Assessment (LCA) method. There are two main steps in an LCA:

- Describe which emissions will occur and which raw materials are used during the life of a product. This is usually referred to as the inventory step.

- Assess what the impacts of these emissions and raw material depletions are. This is referred to as the evaluation step.

The LCA methodology is described in more detail in the work of SETAC and CML (University of Leiden). In Setac's Code of Practice, it is recommended that the LCA be split into five stages:

1. Planning
   - Statement of objectives
   - Definition of the product and its alternatives
   - Choice of system boundaries
   - Choice of environmental parameters
   - Choice of aggregation and evaluation method
   - Strategy for data collection
2. Screening
   - Preliminary execution of the LCA
   - Adjustment of plan
3. Data collection and data treatment
   - Measurements, interviews, literature search, theoretical calculations, database search, qualified guessing.
   - Computation of the inventory table
4. Evaluation
   - Classification of the inventory table into impact categories
   - Aggregation within the category (characterization)
   - Normalization
   - Weighing of different categories (valuation)
5. Improvement assessment
   - Sensitivity analysis
   - Improvement priority and feasibility assessment

It is generally recognised that the first stage is extremely important. The result of the LCA is heavily dependent on the decisions taken in this phase. The screening LCA is a useful step to check the goal-definition phase. After screening it is much easier to plan the rest of the project. SimaPro can be a very convenient tool for both screening LCAs and full LCAs. With a software tool like SimaPro the border is actually rather vague. A screening LCA gradually becomes a full LCA as more data is entered.

Applications of LCA

Life cycle assessment is a concept that can be applied in many ways. Each application poses specific demands on the way the concept is used. This means there is no one single straightforward method that can be used in the same way under every circumstance. In the SETAC Code of Practice much attention is given to the goal-definition phase. Only if the goals and the procedure of an LCA are clearly described in advance, the LCA can yield useful results.

Examples

If a company wishes to improve a production process, specifically since it wants to reduce energy consumption and BOD emissions, there is no need to use an evaluation technique. It also does not make any sense to use general average data, since it is the specific data from a specific process that count.

If a plastic bag manufacturer wants to compare all environmental impacts of his product with a paper bag, it does make sense to use an evaluation method since there will be many impacts that have to be taken into account. However, if he wants to use the LCA to communicate with the authorities it might be more useful to concentrate on solid waste and, for instance, energy use or any other theme the authority is interested in. The data might be specific data or general data depending on whether the plastic bag of general or a specific make is to be evaluated.

A product designer is usually unable to select suppliers. If he has to make a decision on whether to use steel or aluminum it is necessary to use average data on these metals.

These examples show why it is so important to pay great attention to the goal-definition phase.