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### **DFE – Optimizing Production Processes**

For pollution-free production, processes must be as environmentally benign as possible. Production techniques should:

- Reduce energy and ancillary material consumption.
- Avoid hazardous chemicals and their combinations.
- Reduce losses by efficient production.
- Reduce waste generation.

This strategy includes approaches to production that involve practices for "cleaner" production, i.e. the continuous use of industrial processes and products to increase efficiency, prevent pollution to all media (air, water and land), and minimize risk to human health and the environment. Production processes must aim to be 'clean and green,' reducing the effect of pollution on land, air and water. This in turn reduces the health risks for all living beings.

Clean production processes are a key component of Environmental Management Systems like ISO 14001, which although a voluntary program, requires organizations to make specific commitments to prevent pollution.

This strategy can be applied both to the production processes of the parent company and its suppliers. In fact, many companies now insist that the entire supply chain have an Environmental Management System (EMS) registered to the ISO 14001 standard.

Alternative and cleaner production techniques can benefit companies in terms of process optimization, quality control, energy conservation and preventive management. They can also lower energy and costs associated with:

- Raw materials
- Energy
- Labor
- Treatment and disposal
- Insurance and liability

A team from all functional areas should undertake the optimization of product production with respect to steps, techniques and processes. The team should:

- Analyze the possibility of satisfying several product functions through one component or part.
- Allow multiple production steps to be performed on a single part or component simultaneously.



## TenStep Supplemental Paper

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- Reduce the movement/transport distances of parts and components within the production facility.
- Use materials that do not require additional surface treatment or finishing for performance or aesthetics.

Implementing rewards-and-recognition policies can motivate employees to generate energy-saving ideas. Have them explore how to:

- Use cleaner energy sources such as natural gas in order to replace existing sources that are more polluting or inefficient.
- Introduce a system that uses production by-products, e.g., steam or heat, to provide heating, cooling or compressed air.
- Optimize the facility's space requirements. Optimization increases the efficiency of material use and decreases the amount of material sent to a landfill by reducing the "non-product output" per unit of production. To achieve this goal:
  - Select shapes that eliminate processes such as sawing, turning, milling, pressing and punching in order to reduce waste.
  - Motivate production teams and suppliers to reduce waste and cut the percentage of rejects.
  - Look for opportunities to recycle production residues in-house