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TenStep Supplemental Paper

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DFE - Impact Reduction During Product Use

Products expend considerable resources, such as energy and water, during their life span. Maintenance of products also consumes resources, which further adds to the impact on the environment. Design for Environment focuses on design of the product so that environmental impact during product use is reduced. The following measures can help implement this strategy:

- Environmental analyses of durable products such as refrigerators and washing machines show that the environmental impacts are at their maximum point during the use-phase of a product's life cycle. Hence, the operational costs over the product's lifetime can often exceed the initial purchase price. Users must be made aware of the importance of these costs through awareness programs like EnerGuide so that energy efficiency becomes an important competitive advantage.
- Energy efficiency can also lead to reduced fossil fuel consumption, which in turn lowers emissions of greenhouse gases and chemical contributors to acid rain. The use of clean energy sources can greatly reduce harmful emissions at the energy-generation stage, especially for energy-intensive products.

This strategy aims to increase the use of cleaner energy sources. Often, the source of energy for product manufacture is predetermined by context and market.

However, if the choice of a cleaner energy source, such as electricity or natural gas, is available, you should:

- Design products to use the least harmful source of energy.
- Design high-efficiency alternatives when the least harmful source of energy is not available in the target market or available at the preferred manufacturing location.
- Encourage the use of cleaner energy, such as low-sulphur energy sources like wind energy, hydro-electric power, solar energy and on-site co-generation from waste heat.

A focus on DFE will lead to more efficient use of consumables such as water, oil, filters, detergents and organic materials during a product's life span. Reducing the need for consumables can decrease maintenance for the product, reduce operating costs, and increase user satisfaction.

There is often a gap between the manufacturer's intended use and maintenance of a product and its actual use by consumers. This gap can result in waste. To control this waste, the following tips may be helpful:

- Design for easy-to-understand use and provide clear instructions.
- Design so that users cannot waste auxiliary materials, e.g. funnel-shaped filling inlets, and spring return or auto-off power switches.

- Place calibration marks so that users know exactly how much auxiliary/consumable material, e.g. detergent or lubricant oil, is required.
- Make the default position or state-of-the-product one that is most desirable environmentally, e.g. power-down or stand-by modes.

In summary, the goal of this strategy is to achieve energy efficiency and use more environmentally responsible energy sources during product use.