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## **Closing the Loop through Green Technologies**

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### **Abstract**

Human consumption has led to depletion of resources and huge environmental impacts. High ecological rucksack of products causes industries to generate vast amounts of resource wastes and all the products end up as post -consumer wastes. Unless we decouple economic development from resource use and environmental impacts the long term survival of humans is threatened. The key strategies for decoupling are reducing the resource intensity in products, Recovering resources from wastes, product redesign to eliminate wastes and responsible consumption. Green approaches and technologies can be our salvation in decoupling. Practicing Cleaner Production in industries will enhance eco efficiency. In Cleaner Production waste is defined as misplaced resources. Using resources diligently through source reduction, recycling and product modification are key techniques for industries to improve eco efficiency. Achieving high material efficiency, energy efficiency and water efficiency needs green technologies. Resource efficiency cannot be achieved looking at the product alone. This needs a broader approach of life cycle thinking. Addressing the negative impacts from extraction of material to post consumer management of products is the basis of life cycle thinking. Elimination of fossil based fuels a major step in decoupling and using green technologies. Most of the renewable energies eliminate emission of obnoxious gasses to atmosphere. Zero liquid discharge (ZLD) of water will ensure no wastewater flows to environment. A range of green technologies are required to achieve ZLD. Solid waste can be made into useful raw materials through industrial symbiosis. None of these can be achieved by industries using the same business model. Decoupling needs a paradigm shift to an environmental sustainable business model through Eco Innovation. These green approaches will lead us to a low carbon, resource efficient world where we and the future generations are safe.

**Keywords:** Decoupling, Cleaner production, Life cycle thinking, Industrial symbiosis, Eco innovation