



# 7<sup>th</sup> INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

## Academic

“CLEANER PRODUCTION FOR ACHIEVING SUSTAINABLE DEVELOPMENT GOALS”

## Life Cycle Management for Plastic Waste Management: A Life Cycle Assessment of Polyethylene Bag in Thailand

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### Abstract

This study applied life cycle assessment method for the evaluating the environmental impact of post-consumer polyethylene bag for food packaging. The system boundary was defined as the cradle-to-grave which included the production of ethylene, HDPE, LDPE and LLDPE resins and plastic bag, transportation and end-of life management. The results showed that most of environmental impact came from polyethylene resins production and raw material acquisitions including the energy consumption as well. The Strategies for mitigating the environmental impact of polyethylene bag for food packaging in order to achieve sustainability should cover the life cycle management of plastic bag product. For the raw material consumption, bio-materials and recycled plastic resins should be considered for the substitution of virgin material. For the production system, the 3Rs concept should be utilized in all production stages in order to increase the resource efficiency. For the end-of-life management, plastic waste should be recovered as a fuel for the substitution of coal instead of the incineration of municipal solid waste or landfilling method. This option can minimize the impact of global warming and non-carcinogen potential as well.

*Keywords: plastic waste management; 3Rs policy; waste management law and legislation*