

PLASTIC TO LIQUID FUEL CONVERSION: PHITSANULOK



Phitsanulok, Thailand

Year of Initiation: 2008

Project Highlights

- Integrated waste management scheme aimed at zero landfills in the city
- The waste management scheme is one of the best example of 3R's, i.e., integration of polluter-pays principle, public participation and pre-treatment prior to landfill and pyrolysis
- Conversion of plastic into a valuable resource

Background

Phitsanulok municipality located in northern Thailand covering an area of 18.26 sq. km houses a population of ~9 million. The city had been experiencing a rapid increase in the amount of waste being generated, which forced the municipality to shift the dumping sites in the outskirts of the city leading to urban sprawl and increase in land prices. In order to address these

issues, a municipal solid waste management scheme aiming zero waste landfill in the year 2007 was adopted by the municipality of the city. The scheme was a comprehensive waste management scheme based on the ideals of 3R's, i.e., reduce, reuse and recycle. The scheme targeted all the key aspects of waste management with special focus on plastic waste.

Project Objectives

The primary objective of the initiative was to address the growing problem of plastic waste by initiating a refuse derived fuel (RDF) generation process for conversion of waste plastics to oil

Key Stakeholders

Phitsanulok Municipality; Ministry of Energy – Energy Policy and Planning Office (Eppo)

Approach

The waste management scheme was adopted to provide complete solution to the waste related issues in the city. The following specific steps were undertaken:

- Construction of a waste plastic to liquid fuel facility in the city which will be fed by the plastics being discarded as waste material
- o The plant has 2 reactors operating alternatively and in batches
- o 4-8 tons of plastic are fed per batch, which leads to the production of 2000 liters of fuel per day

Achievements



Benefits

- Conversion of plastic waste into a valuable resource
- Resource conservation leading to enormous economic benefits
- Reduction in the amount of GHG emissions being released in the atmosphere. This reduction has been done through two major pathways:
 - Fuel from plastic waste can obviate an equivalent amount of fossil fuel

- Avoidance of anaerobic decomposition of organic waste in landfills due to the co-disposal of plastic waste

Co-benefits

- Climate Change mitigation
- Increase in awareness levels towards plastic waste and overall waste management issues of the city
- Economic benefits

Success Factors

- Strong Institutional and legislative Support and capacity
- Technological Innovations for effective management of plastic waste
- Integrated approach of the waste management scheme relying on 3R's, i.e, polluter-pays principle, public participation and pre-treatment prior to landfill and pyrolysis
- Extensive awareness initiatives across the city to sensitize the issue and scheme among local residents

Future Prospects

This scheme has high replication potential, specifically in developing countries like India, where the reliance on plastics is quite high.

