Centre for Sustainable Chemical Technologies; University of Bath

Project Title:	Chemical Recycling of Plastics: A Life Cycle Approach.
Lead Supervisor and co-supervisors:	Professor Marcelle McManus (Lead Supervisor, Department of Mechanical Engineering) Professor Matthew Davidson (Co-supervisor, Department of Chemistry)
Partner:	EPSRC UK Catalysis Hub

Project Summary

The most effective method to deal with plastic waste and associated impact is a significant challenge. Once collected, either mechanical or feedstock-based recycling can be undertaken. Mechanical recycling is time consuming and the resultant polymer is low grade and has limited applications. Feedstock, or chemical, recycling instead considers the waste as a source of valuable chemical products. However, there are different approaches to feedstock recycling: depolymerisation, partial oxidation and cracking. This PhD research will undertake an LCA of mixed plastic waste (MPW) feedstock recycling. Initially the work will explore all options in order to determine major potential process "hot spots". Working in conjunction with others in the Hub the work will enable the optimisation of carbon, energy (and potentially cost) benefits in plastics recycling. The work will not only enable the process to be optimised, but will be used to help policy makers determine incentives and legislation.

Based in Bath's Centre for Sustainable Chemical Technologies (www.csct.ac.uk), the project will be supervised by Professors Marcelle McManus (Mechanical Engineering) and Matthew Davidson (Chemistry) at Bath. It will be a key component of a larger multidisciplinary research team involving Bath, Manchester and Cardiff as part of the recently funded £14M EPSRC UK Catalysis Hub (www.catalysishub.co.uk) which is focused on building the UK economy through designing new catalysts and processes for clean water, sustainable energy and low carbon, resource efficient manufacturing of fuels, plastics and chemicals.

Sustainability issues addressed

The project aims to contribute to the optimisation of carbon, energy (and potentially cost) benefits in plastics recycling. The work will not only enable the process to be optimised, but will be used to help policy makers determine incentives and legislation for plastic waste.