

# RECYCLING & WASTE MANAGEMENT

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## Exploring new horizons and sustainable technologies for recycling and waste management

Philip C W Cheung<sup>1</sup>, Daryl R Williams<sup>1</sup>, Donald W, Kirk<sup>2</sup>

<sup>1</sup>Imperial College London, UK

<sup>2</sup>University of Toronto, Canada

The intricate relationship between recycling and waste management is explored afresh and the clean technologies to propel these fundamentally important strategies forward, and render them sustainable, are introduced and given a new impetus. Despite the global strive towards a “zero waste” economy, the potential of many types of wastes as a valuable resource has yet to be fully realized but they will be addressed in this work. For examples, the reusing of waste heat to raise the temperature of process streams in a factory if need be; the use of gaseous carbon dioxide to be a raw material in commercial manufacturing; the extraction of useful metals from aqueous effluents into a form which can be fed into ore smelters and the related deliberations in the choice of treatment agents; refuse to fuel; and the redeployment of a country’s stock of plutonium to produce electricity in civil nuclear power plants are all topics of discussion. The good management of reprocessing facilities is intrinsic to their success and salient features of

plant operations are highlighted. Moreover, to mitigate or eliminate their carbon-footprint, their powering by renewable energy resources are encouraged. Traditionally, policies that guide environmental chemical engineering centre on technical feasibility, cost-benefit-risk analysis and ecological impact, all built upon the implicit bedrock of deontological ethics expressed explicitly under the glossy title “Duty of Care”. Nonetheless, the advocacy of recycling and improvements in waste management should not stop here. The authors envisage that a new dawn will witness an innovative pedagogy in an educational curriculum which encompasses the universal concept of “loss prevention” of energy and materials, environomics and a paradigm shift in industrial manufacturing methodologies which are known to cause prolonged depreciation of the health, functionality and aesthetics of this planet.

e: [philip.cheung@imperial.ac.uk](mailto:philip.cheung@imperial.ac.uk)