Editorial

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It is with great pleasure that I am writing the editorial for this issue of *Waste and Resource Management*. This is my first year on the editorial panel and I have been fascinated by the breadth and scope of the interdisciplinary research that is published by the journal. The papers in this issue may at first appear unrelated; however, they share many characteristics in terms of their recognition of the need to build firm evidence for planning and decision making in waste and resource management.

The first paper (part one of a two-part paper) by Cox *et al.* (2015a) identifies the challenges presented by specifying waste and material composition when moving from waste classification systems derived from traditional waste-management planning to the classification and specification systems required to facilitate industrial symbiosis and the transition to a circular economy. This is an area of particular interest to myself, as I was involved in the UK National Household Waste Analysis programme in the 1990s. As the authors state 'Using the term 'waste' to classify material streams arising from households is understandable, but it represents a mind-set that is potentially closed to the opportunities they present as a potential resource'. We do have a standardised waste classification system in the UK, which was developed in the 1990s, that is comprised of broad primary and secondary waste descriptors that represent more specific wastes or materials. However, the authors have identified research need: 'The creation of a composition specification that presents waste streams as a resource in material-based categories allows for a better understanding of the opportunities available to local authorities'. This derives from the recognition that, as we move from waste management to resource management and ultimately to the circular economy, classification systems for waste need to reflect the needs of the end users rather than the waste-management industry. The authors set out their proposed standardised specification and conclude by setting out three basic principles for production of a standardised specification for resource composition.

In the second paper by Cox *et al.* (2015b), the authors correctly point out that 'Easily separated materials such as paper, card, metals and glass are correctly recycled (almost) as a matter of course. However, some parts of the residual resource stream, for example, absorbent hygiene products (AHPs),

mattresses, wood and white goods, are a complex mix of materials and their management remains problematic'. They apply their proposed standardised specification to a case study on AHPs, with the aim of developing a decision-making framework to assist with the management of the residual municipal solid waste stream in general and AHP waste in particular. 'Absorbent hygiene products' is an umbrella term for nappy, incontinence and sanitary products, and the authors correctly identify that, as recycling levels continue to increase, such products will constitute an ever larger proportion of the residual waste stream. They begin by reviewing the management options available for AHPs and then based on the case study area of Surrey County Council, apply the specification system to calculate material availability. This is followed by the assessment of costs and environmental feasibility, using a life-cycle approach to quantify the reduction in greenhouse gas emissions, measured in tonnes of carbon dioxide equivalent associated with each of the management options. As a result of the analysis using the new composition specification, the authors conclude that the optimum solution is the separate collection of AHPs and subsequent sterilisation and recycling.

The third paper by Shirley *et al.* (2015) continues this theme of improving the evidence for planning and decision making in waste and resource management by considering the implications of variability in the composition and therefore properties of air pollution control (APC) residues from waste incineration and the implications for the treatment opportunities for these materials. The focus of the work was the residues resulting from typical dry or semi-dry scrubber systems, which include fly ash. The aim of the current study was to investigate the implications of waste variability when using stabilisation/solidification (s/s) as a treatment option for APC residues. This was achieved by first characterising residues resulting from five different energy from waste facilities throughout the UK and applying the same s/s treatment to each of the residues, followed by performance testing. The results of this rigorous analysis are of great practical relevance, demonstrating that 'Differences in the residues' mineralogy and morphology resulted in clear differences in properties of the s/s products, including workability, reaction kinetics, setting time and the magnitude of chloride release during regulatory testing'. As the authors clearly identify, this has implications for the engineering properties of any products derived

from s/s and this will have implications for waste-management planning and decision making, for example, when comparing the full life-cycle environmental impacts and costs of different waste-management options.

Finally, the fourth paper by Sanders (2015) leaves the field of traditional solid waste management to bring an interesting perspective on the potential for the use of human waste (faeces and urine) as fertiliser. The author characterises the traditional approach to wastewater treatment as having ‘focused on the recirculation of water through the environment over the past 200 years, failing to recognise the importance of the recirculation of nutrients throughout our environment, which is an integral aspect of environmental security’. Describing this as the ‘flush and discharge’ approach, the author correctly points out that, whether using combined or separate sewer systems, ‘both systems require high energy consumption at wastewater treatment facilities and the provision of water to facilitate waste conveyance’. As a sustainable alternative, the author suggests the sanitisation and reuse of human waste via source separation. The paper describes how this can be achieved through the use of urine-diverting toilets (UDTs) and the benefits of the use of urine and faeces as fertiliser once source separation has been achieved. This principle is applied to a case study from Haiti, managed by a US non-governmental organisation, Sustainable Organic Integrated Livelihoods (Soil). The case study looks at the provision of UDTs in Haiti and the collection, transportation and treatment of the wastes collected. The author concludes by stating that a ‘focused agenda must be developed towards updating the civil engineering approach to sanitation and the treatment of human waste’, which recognises the potential that human waste has to play in the recirculation of nutrients throughout the environment.

This volume of *Waste and Resource Management* has presented some fascinating research that contributes to improving the evidence base for planning and decision making in waste and resource management. In the move from waste management to

resource management and the circular economy, we will increasingly need evidence on the availability of materials and the performance of treatment and reprocessing options that are of a higher quality than that which is currently available to us. In their different ways, these papers have made substantial contributions to the development of a more rigorous and robust evidence base.

I hope that you will enjoy this issue of *Waste and Resource Management*. Waste and resource management is fascinating, interdisciplinary subject area that is evolving rapidly and I would encourage both practitioners and academics to submit examples of your work for publication in the journal. I hope that this issue contributes to your knowledge of the field and possibly inspires you to submit a paper to our journal.

REFERENCES

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