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Waste-to-energy and recycling value for developing integrated solid waste management plan in Lahore
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Abstract
This paper aims to determine the waste-to-energy (WTE) and recycling value of municipal solid waste (MSW) for developing an integrated solid waste management (ISWM) system for Lahore, the second largest city in Pakistan. The overall generated waste in Lahore contains 58% organic waste, 25% recyclables, and 17% others. The recyclable materials including glass, paper, and plastic are generating US$ 15.3 million per year mostly by informal sector. An estimated production of 0.45 m3 CH4/kg volatile solids with total energy value of 8747.3 TJ or 2.43 TWh can be achieved if the total organic waste stream (0.57 million ton/year) dumped at Saggian landfill site is processed using anaerobic digestion technology. The estimated refused derived fuel (RDF) value for MSW, excluding metals, glass, and other inorganic waste is about 7.71 MJ/kg with total energy potential of 6191.13 TJ or 1.72 TWh/year. The presence of high volatile organic carbon and fixed carbon in textile and paper-related waste confirmed their suitability for incineration process. A significant reduction in the final volume of waste reaching to landfill can be achieved if these WTE technologies and recycling practices are in place. This will make a premise for ISWM system in Lahore based on reduce, reuse, recycle, and recovery principles. The recovered materials and energy will not only generate revenue to fund waste management activities in Lahore, but also protect the River Ravi from waste pollution. © 2016 Taylor & Francis Group, LLC.

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