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Potential Environmental Values of Waste-to-Energy Facilities in Saudi Arabia
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Abstract
Toward diversifying the sources of electricity and ensuring the sustainability of power generation, the Kingdom of Saudi Arabia (KSA) is proposing an impressive plan for renewable energy utilization including waste-to-energy (WTE) facilities. The environmental values of WTE facilities in KSA have never been investigated. This research forecasted the potential environmental values of WTE facilities in KSA in the context of energy demand, greenhouse gas emission, and landfill area in comparison with complete landfilling option up to year 2032. Two scenarios were developed: Mass Burn with Recycling and Mass Burn. The research results have shown magnificent environmental values for WTE facilities. The Mass Burn with Recycling scenario shows potential energy demand reduction of about 55.6 million barrels of crude oil, greenhouse gas emission reduction of about 15.2 million metric ton carbon equivalent per year (MTCE/year), and landfill area saving of about 95.3 % in comparison with complete landfilling. Mass Burn scenario shows potential energy demand reduction of about 9.9 million barrels of crude oil, greenhouse gas emission reductions of about 4.8 million MTCE/year, and landfill area saving of about 90 % in comparison with landfilling. This research results shall support Saudi officials' decision to develop WTE facilities in the Kingdom. © 2014, King Fahd University of Petroleum and Minerals.

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