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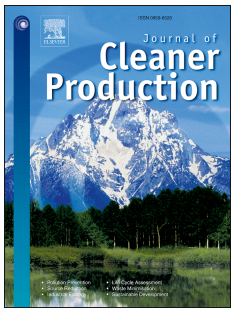

Measuring the generation and management status of waste office equipment in China: a case study of waste printers

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Measuring the generation and management status of waste office equipment in China: a case study of waste printers

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Abstract: E-waste has become one of the fastest growing waste streams in the world, and has attracted worldwide attention. However, very little research on e-waste has focused on waste office equipment. In this study, we chose waste printers as the typical waste office equipment, to investigate the generation and management status of this type of e-waste in China. Using the Stanford and Gompertz Curve models, we estimated the generated volume of waste printers to be 39.15 million units in 2014; this volume can be expected to increase to 57.15 million units in 2025. Twenty private enterprises and public institutions, 4 small retailers, 7 second-hand recyclers, 3 producers, 4 informal dismantling points, and 4 formal recycling enterprises were investigated, to understand the life-cycle flow of waste printers, from usage into collection channels, to treatment. Similar to other e-waste in China, at present storage is still the most common disposal method, accounting for about 54% of the discarded printers. For the remaining 46%, small retailers and second-hand markets are still the primary collection channel in China. Although formal recycling enterprises and producers have also set about recycling waste printers in China, the informal sector still dominates the treatment market for waste printers. The EPR management system of e-waste has now been established in China, and some producers have also attempted to collect and recycle their own waste printers, but the EPR principle is still not the primary model for recycling waste printers. More effective measures are still needed to further promote waste printer recycling in China.

Keywords: Waste printers; Generation; Management status; E-waste; China

1. Introduction

Since the 1980s, a massive volume of electric and electronic equipment has been produced, used and consumed worldwide (Afroz et al., 2013; Ongondo et al., 2011). Furthermore, the rates of usage and disposal are increasing, while at the same time most of these products' life cycles are known to have decreased significantly (Duan et al., 2009; Gibson and Tierney, 2006). In Western Europe, 6 million tons of e-waste were generated in 2003, and the amount of e-waste is increasing by at least 3-5% per year (Torretta et al., 2013). The European Union (EU) has recognized e-waste as one of the fastest growing waste streams in the region, with estimates of up to 20 kg per person being dumped every year (Darby and Obara, 2005), accounting for roughly 8 % of the total solid waste in EU member countries (Torretta et al., 2013). In 2011, the world's production of e-waste was estimated at 40 million tons per year, with most e-waste being produced in Europe, the United States and Australia (Breivik et al., 2014; Song et al., 2014).

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