Chapter 20
Transitioning Toward a Circular Economy Through E-Waste Management

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ABSTRACT

This chapter delves into the complexities and recommendations associated with the management of electronic waste, paving the way for a transition towards a circular economy. It underscores the significance of adopting sustainable practices, including eco-friendly product designs, extended producer responsibility, recycling, and remanufacturing. Several challenges are identified, such as the scarcity of data regarding material concentrations in specific electronic equipment and the absence of universally applicable standard methods for evaluating elemental concentrations in e-waste. The chapter underscores the value of integrating technical support and financial incentives to bolster e-waste manage-

DOI: 10.4018/979-8-3693-1018-2.ch020

ment efforts. Furthermore, it highlights the pivotal roles played by the private sector, non-governmental organizations, and government bodies in the effective implementation of these strategies. Collaboration between businesses, governments, and consumers is underscored as essential for establishing a robust circular economy.

INTRODUCTION

Electronic waste, often known as e-waste, comprises electronic devices powered by a battery or plug that have been discarded because they are no longer needed, functional, or have become obsolete. E-waste can be categorized into six main groups: lamps, small IT and telecom equipment, screens and monitors, temperature exchange equipment, large equipment, and small equipment. Among these categories, small equipment, which encompasses items like microwaves, vacuum cleaners, and kettles, represents the largest proportion of e-waste production by weight. In 2019, the global electronic waste production reached an astonishing 54 million metric tons. This surge in e-waste can be attributed to various factors, including rising disposable income and the widespread availability of electronic devices. Consequently, electronic waste has emerged as the fastest-growing waste category on a global scale. The "Global E-Waste Management Market Outlook, 2028" study report, released by Bonafide study, projects that the industry will grow from USD 60.27 billion in 2022 to USD 122.48 billion by 2028. Furthermore, from 2023 to 2028, the market is expected to expand at a 12.82% CAGR. A substantial amount of garbage has been released into the environment as a result of increased resource consumption brought on by population expansion, urbanisation, and rapid economic growth (Research and Markets, 2023). As of 2023 the total amount of global electronic waste is 61.3 million metric tons. This trajectory is expected to persist, with estimates suggesting that by 2030 it will be 74.7 million metric tons, and the annual worldwide generation of e-waste will expand by around 30 percent (statista.com, 2023). Figure 1 explains growth trend of Global E-waste till 2030.

Figure 1.