Chapter 1
Circular Economy and Sustainable Models

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ABSTRACT

Recently, sustainability has become a topmost priority agenda for policy analysts, and the globe has compelled all stakeholders to work jointly on sustainability issues. The present study focuses on circular economy (energy recovery from wastage), recycling technology, economic complexity index, urban population, green energy, and green finance as environmental determinants for 10 selected OECD economies covering the period of 2011-2022. In order to investigate the study's objective, it utilizes the fully modified ordinary least square (FMOLS), dynamic ordinary least square (DOLS), and instrumental variables two-stages least square (IV-2SLS). Resultantly, outcomes show a decline in emissions except for the economic complexity index. Moreover, the mediating effect of green finance on green energy shows a positive and significant role in deteriorating sustainability. Besides, the mediating effect of

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green finance on recycling technology & circular economy brings a negative but insignificant association with emissions level. Green implications are suggested to be cleaned shortly.

1- INTRODUCTION

Recently, the globe has faced numerous challenges indirectly connected with social well-being (Mouratidis, 2018). Due to a considerable decline in overall well-being, the world has compelled policy analysts to suggest green solutions to decline in such issues. Undoubtedly, the change in environmental quality has become a headache, and the globe has introduced numerous solutions to fight for sustainability (Balsalobre-Lorente et al., 2025). Still, there has been ambiguity, and environmental problems remain intact. There is an urgent need to introduce a proper mechanism in front of the globe that defines the issues behind ecological sustainability. Thus, this study presents the key problems and best alternatives, which may guide the situation well. Since the Industrial Revolution, rapid growth activities have been the leading cause of negative externalities. Resultantly, they have achieved their desired growth level and brought massive pollution to atmosphere (Shah et al., 2023). For the first time, an unexpected connection between growth activities and emissions levels was introduced Grossman and Krueger, (1995), and they claimed that rising growth has become a leading threat to environmental sustainability. Later on, this theme was validated by numerous practitioners, and they classified this effect into U-shaped & Inverted U-shaped Environmental Kuznets Curve (EKC-hypothesis) [refers: (Charfeddine and Kahia, 2019; Katircioglu et al., 2020; Shah et al., 2022)]. Besides the economic factor, this study cannot ignore the role of social factors such as urbanization, which has become a leading sign for modern economies. There has been a massive migration for better health, education, and job opportunities in recent years. Such an abrupt rise in urbanization not only depletes the natural resources but also contribution to environmental stress (Wang et al., 2021). Such ecological issues have compelled practitioners to bring some green solutions for sustainability.

Furthermore, practitioners have focused on different themes, but this study tries to include only the most important solution that may contribute to sustainability. An increase in overall human & economic actions has promoted the garbage share, eventually increasing greenhouse gas emissions (Mawutor et al., 2023). Thus, practitioners have familiarized recycling technology (RT) that has two leading purposes: firstly, it significantly helps to reduce the share of greenhouse gas emissions; secondly, it transforms garbage into productive output such as green energy generation and other solid materials (Khalid et al., 2023). However, its importance under the Sustainable development Goals (SDGs), particularly SDG 12, cannot be ignored because the