Chapter 5

Pollution and Renewable Energy: Advanced Issues and Aspects

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ABSTRACT

This chapter presents the overview of pollution; the issues of soil pollution, water pollution, and air pollution; the aspects of renewable energy; energy security and energy imports; and renewable energy policy and renewable energy policy instruments. Pollution is one of the most important environmental, social, and health issues in the world. Pollution creates many diseases and causes death of many people across the globe. The environmental damage caused by pollution can reach catastrophic proportions and destroy entire ecosystems leading to the death of many species and a big biodiversity loss. Renewable energy is a critical part of reducing global carbon emissions and the pace of investment has greatly increased as the cost of technologies fall and efficiency continues to rise. Renewable energy offers a wide variety of different options to choose from as countries can choose between sun, wind, biomass, geothermal energy, and water resources.

INTRODUCTION

The industrialization of society and modernization of society’s way of living have resulted in the introduction of a large number of man-made substances in the environment, many pollutants can be harmful to both human health and other species (Voulvoulis & Georges, 2016). Industrial pollution is one of the largest
environmental and livelihood issues faced by the developing societies (Charuvilayil, 2013). Achieving a sustainable urban environment requires accounting for the economic, environmental, and social impacts of the development to reduce the pollutions of air, soil, water, odor, and noise (Hammad, Akbarnezhad, & Rey, 2016) toward obtaining a green environment (Fagbenro, 2016).

Entry of toxic heavy metals and minerals in human systems mainly through contaminated water, food, and air, leads to health problems (Rathoure, 2016). Toxic effects of heavy metals are dependent on the concentration of metals, reactivity of metal species, and duration of exposure (Sharma, Kaur, Katnoria, & Nagpal, 2016). Companies using hazardous materials in their production have started to consider the environmentally integrated manufacturing systems to effectively decrease their impacts on environment and to prevent the environmental pollution at source (Kasap, Demirer, & Ergün, 2013) through ecotechnology focusing on minimizing the consequences of pollution by manipulating ecosystem-internal processes (Benndorf, 2008).

Global warming problem caused by greenhouse gas emissions (Kuang et al., 2016) from burning fossil fuels has caused wide public concern all over the world (Zhang et al., 2015). In recent years, renewable energy (e.g., wind energy, geothermal energy, solar energy, biomass energy, and hydropower) has increasingly become the world’s strategic choice to solve environmental pollution, to address the energy crisis, and to achieve social sustainable development (He, Xu, Pang, Tian, & Wu, 2016). Depletion of fossil fuel resources, fluctuation in the crude oil prices, and emersion of new environmental problems due to the greenhouse gasses effects of fossil fuel combustion have convinced many governments to invest in the development of power generation based on renewable and sustainable energy (RSE) resources (Hosseini & Abdul Wahid, 2014).

Local governments around the world pursue a wide range of activities to reduce local greenhouse gas emissions, to increase energy efficiency, and to promote the locally generated renewable energy (Radzi, 2015). Renewable energy development is influenced by regulatory institutions, the party affiliations of both governor and legislators, and the professionalism of the legislature, accompanied by the effects of various policy instruments (Yi & Feiock, 2014). Government support and commitment are of particular importance for renewable energy technology innovation activities, which are highly contingent on policy and market uncertainty (Liang & Fiorino, 2013). The development, transfer, and use of renewable energy technologies are the promising ways toward sustainable development (Pueyo & Linares, 2012).

This chapter is based on a literature review of pollution and renewable energy. The extensive literature of pollution and renewable energy provides a contribution to practitioners and researchers by presenting the advanced issues and aspects of pollution and renewable energy.
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