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Solutions and Opportunities

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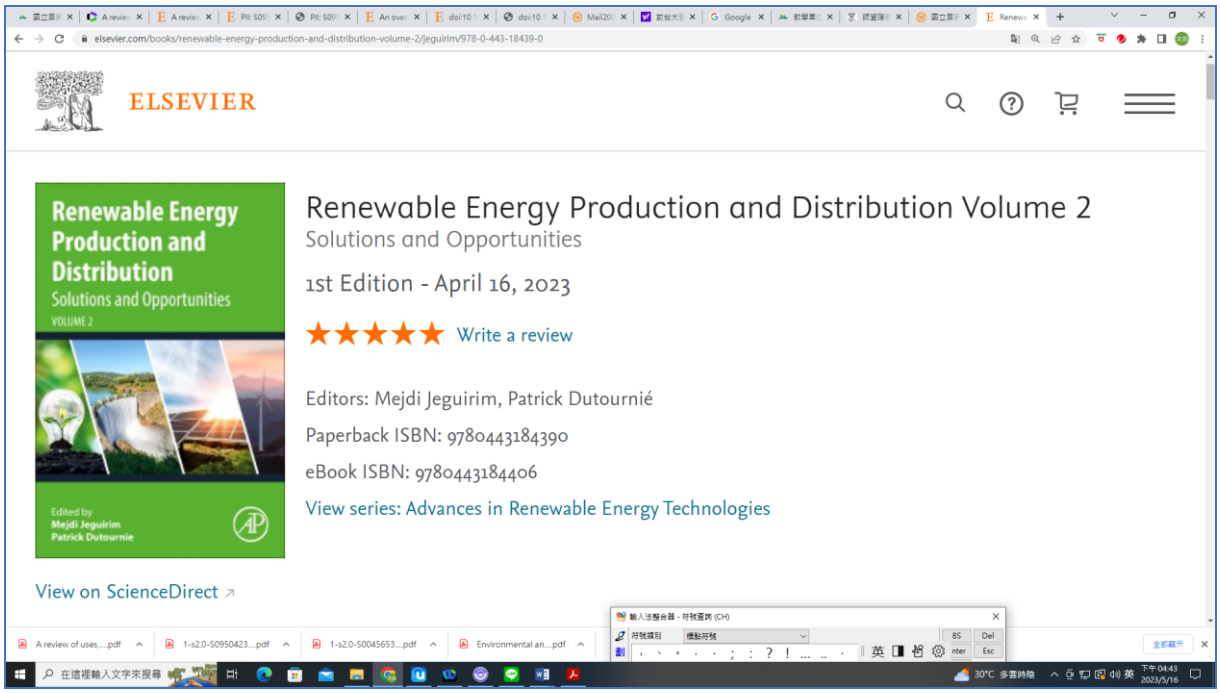
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Sustainability policies and regulations for renewable energy development in Taiwan

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1. Introduction

Taiwan is a country even though it is not a member of the United Nations (UN). Geographically, it is located in the East Asia with the People's Republic of China (PRC) to the northwest, Japan to the northeast, and the Philippines to the south. Therefore, the East China Sea lies to its north, the Philippine Sea to its east, the Luzon Strait to its south, and the Taiwan Strait to the west. In addition, Taiwan featured its high population density in the world based on the population of about 23.45 millions) and the total land area of 36,200 km^2. The main island of Taiwan, formerly known as *Formosa* ("Beautiful Island") since the 16th century, has an area of about 35,800 km^2. This island has mountain ranges in the eastern two-thirds and plains in the western third. Over the past decades, the rapid industrialization and high economic growth of Taiwan have resulted in the gross domestic product (GDP) per capita of over US$ 33,000 in 2021 [1]. However, its dependence on imported energy is as high as about 98% [2]. Furthermore, the imported energy supply in Taiwan rapidly went from 55.13 million kiloliters of oil equivalent (KLOE) in 1990 to 140.70 million KLOE in 2021 [3], thus resulting in significant emissions of greenhouse gas (GHG) from the fossil fuel combustion. To reduce the dependence on external energy supplies and also mitigate GHG emissions, the Taiwan government has been actively promoting renewable energy (RE) development and energy-saving since the late 1990s because the Kyoto Protocol was adopted on December 11, 1997 [4–10].

It is well known that the concentrations of carbon dioxide (CO_2) and other greenhouse gases in the tropospheric atmosphere were increasing since the beginning of the Industrial Revolution. This enhancement is attributable to anthropogenic activities, especially in the combustion of

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