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## THE SCIENCE OF RENEWABLE ENERGY ON GLOBAL WARMING: A REVIEW OF GREENHOUSE GASES EMISSION

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**Abstract:** Renewable energy sources are key contributors to mitigation of greenhouse gases (GHG) emissions. Moreover, increased atmospheric CO<sub>2</sub> concentration is considered as the main factor for global warming. In this paper, specific attention is paid to understanding the life cycle of GHG emissions from a range of renewable energy technologies. Comprehensive reviews for each Renewable Energy technologies were carried out. Data show that the CO<sub>2</sub> content is the minimum for renewable energy like offshore wind, wave and tidal, while biomass energy have high greenhouse gases emission. Finally, the primary energy sources such as solar radiation, Wind, tidal and hydro-power are practically infinite on the scale of human needs.

**Keywords:** Renewable energy, Global warming, Greenhouse gases, Emission, Tidal, Wave.

### 1. INTRODUCTION

Energy is essential to improved life quality in all countries. Control atmospheric emissions of greenhouse and other gases are important and substances will increasingly need to be based on efficiency in production of energy in the country [1–3]. Every activity requires energy and we use it in many forms in our life cycle [4].

There are three major international environmental problems: acid precipitation, ozone depletion, and the global warming [5]. The alarming rate of global climate change is a major worldwide concern at environmental levels [6], which it's the result of the rapid growth in the level of greenhouse gases concentration into the atmosphere [7]. Greenhouse gases are the main driving forces behind efforts to utilize renewable energy sources [8]. Therefore, the primary GHG emitted through fuel combustion is carbon dioxide (CO<sub>2</sub>) [9].

All energy sources have some effect on our environment. Fossil fuels such as coal, oil, and natural gas do more harm than renewable energy sources such as air and water pollution and global warming emissions. This paper focuses on emissions of greenhouse gases (GHG) from a range of renewable energy.

### 2. GLOBAL WARMING AND GREENHOUSE GASES

#### 2.1 Global warming and climate change

According to the Intergovernmental Panel on Climate Change (IPCC) of the United Nations, global warming is the phenomenon where the average temperature of the Earth's near-surface air and oceans increases. Since the mid-20<sup>th</sup> century there is a increase in globally averaged temperatures that is very likely to have occurred due to the increase in greenhouse gas concentrations [10]. Thus, global warming is the reason why there is a need to avoid producing carbon dioxide (CO<sub>2</sub>) [3].

Global average temperature is rising at a rate of 0.7- 0.75 °C per 100 years during 1910- 2009 [11]. In other words, the earth has warmed after Industrial Revolution [12]. NASA reported that the hottest year was 2015. According to scientist average global temperatures could increase between 1.4 and 5.8 °C by the year 2100 [10]. CO<sub>2</sub> is considered as the main driving factor for causing the phenomenon of global warming [13].

#### 2.2 Greenhouse gases emission

The greenhouse gases (GHG) are consisting of water vapour, methane and carbon dioxide (CO<sub>2</sub>). GHG gases act as a screen to sunlight as traveling up into the troposphere. GHG allow the sun's rays for stopping the heat radiation from re-