DETERMINING THE CO_2 EMISSION FROM PHOTOVOLTAIC MANUFACTURE AND ITS EFFECTS IN THAILAND

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This thesis entitled "Determining the CO_2 Emission from Photovoltaic Manufacture and Its Effects in Thailand", submitted by Wirongrong Mongkonthum in partial fulfillment of the requirements of the Master of Science Degree in Renewable Energy is hereby approved.

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PREFACE

Solar energy is one of the cleanest energy sources suitable for replacing the use of fossil energy which is causing the greenhouse effect. The greenhouse effect is an environmental problem which is caused by an accumulation of greenhouse gases in the atmosphere especially carbon dioxide. This effect increases the temperature of the earth's atmosphere and changes the global ecosystem. One of the most important sources of carbon dioxide is the energy sector, particularly fossil fuels. Many strategies are being used to decrease the amount of CO_2 emission from the energy sector. Renewable energy, such as solar, wind and hydrogen, is useful increasingly because it is clean energy, which releases no CO_2 and other pollutants, and it provides unlimited sources of energy.

One of the most interesting renewable energy sources is solar energy. Solar cells, or photovoltaic (PV) cells, were developed to convert solar radiation to electricity over 40 years ago. The CO_2 emission from the use of photovoltaic electricity is zero because a PV system requires little or no maintenance or oversight and uses no fuel in the production of electricity. However, some CO_2 emission can be release during manufacturing of PV units because it takes energy to manufacture a module. Therefore, solar energy is not totally clean and if it is not perfectly clean many questions need be answered about just how clean solar electricity production really is. Are there some adverse environmental effects from the use of solar energy? What type of pollution comes from solar panel manufacture and use? Moreover, how much does it affect the environment? These questions must be clearly and carefully answered to determine whether or not the solar energy really is one of the best choices to replace fossil energy when considering greenhouse gas emission.

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