

CHAPTER ONE

INTRODUCTION

1.1 Overview

Commercialization of electric power began early in the 21th century. With the light bulb revolution and the promise of the electric motor .At first, small utility companies provided power to local industrial plants and private communities. Some larger businesses even generated their own power.

Smart grid technologies have emerged from earlier attempts at using electronic control, metering, and monitoring. In the 1981s, Automatic meter reading was used for monitoring loads from large customers, and evolved into the Advanced Metering Infrastructure of the 1991s, whose meters could store how electricity was used at different times of the day. Smart meters add continuous communications so that monitoring can be done in real time. [6]

1.2 Project Problem

The problem of global energy is the increase in urbanization and industrial and civil projects, which in turn requires an increase in the need for human consumption of power, whether the capacity consumed in homes such as lighting, heating, ventilation or in factories and production units, all these factors lead to crisis and lack of energy, and thus lead to depletion The traditional sources of energy through which electricity is generated, such as coal, oil, gas, as well as the steady rise in their prices, are also reasons for the world to resort to alternative and renewable energy. The government has sought to find alternative ways to exploit energy beyond the oil era, revealing an ambitious plan to produce electricity from renewable resources.

1.3 Project Objective

- Modeling and simulation of photovoltaic arrays
- Connecting photovoltaic arrays to existing utility grid
- Increasing the reliability of the public network and transmission efficiency

1.4 Project Methodology

Matlab simulink is a very good tool to simulate a smart grid system using solar energy applied in an electrical system. It shows how to connect the public network with photovoltaic arrays energy.

1.5 Project Lay-out

This Project comprised from an abstract and five chapter, where chapter one represents an introduction consist over view, Project problem and Project methodology.

Chapter two represent an electrical grid system which consists introduction, electrical power system grid, Smart grid implementation, smart grid characteristic, overview of the technology required, smart metering and smart appliances.

Chapter three represent photovoltaic system consist introduction, solar energy, advantage of solar energy, photovoltaic, photovoltaic system components and grid connected solar PV systems.

Chapter four represent modeling and simulation of grid connected photovoltaic array consists introduction, simulink code and result.

Chapter five represent conclusion and recommendations.