

SOLAR WATER HEATER

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PREFACE

As a traditional sources become more scare, it is only natural for us to look upward, to the sun, for an alternative sources of energy. The sun is largely responsible for almost all of our conventional energy sources. Photosynthesis of plant and algae supported ancient life that later become fossils fuels. Even hydroelectric power would not be possible without the evaporation of water. Yet solar energy itself has not been fully accepted as safe, efficient, and understandable energy source. Until recently the unrestricted availability and low cost of traditional energy source have precluded much practical application of solar energy. The time has come, however, for all of us to become more aware of the direct contributions solar energy can make to our lives and our economy.

I. SOLAR ENERGY AND EARTH

1.1 INTRODUCTION

In a sense, we already have a solar economy, the sun is responsible for most of our most easily accessible energy resources including oil, coal, hydroelectric power, and others. Use of the sunlight directly as an energy source has proved in the past to be less economical than use of these other source of 'concentrated sunshine'. Direct use of solar energy means using light, which is an electromagnetic radiation. Electromagnetic radiation is a wavelike phenomenon that moves energy across distance. Not only light but radio wave, microwaves, X-rays, Gamma rays are all forms of electromagnetic radiation.

From the earth the sun appears to move across the sky in an arc, roughly from east to west, owing to rotation of the earth around its north-south axis. In the northern hemisphere sunrise and sunset occur farther toward the south during the winter, but more northward in the summer as the sun travels in a higher arc across the sky and days become longer. The seasonal motion is due to the slight tilt of the earth's axis and the earth's revolution around the sun.

Those who familiar with trigonometry can calculate the position of the sun in the sky at any time of the day, and day of the year.