CONTENTS

Preface

1 INTRODUCTION AND HISTORICAL BACKGROUND

A geographical survey of current solar energy activities and applications.

2 SOLAR RADIATION

Global direct and diffuse radiation, spectral distribution, radiation measuring instruments, data from a radiation measurement network.

3. WATER AND AIR HEATING APPLICATIONS 23

63

The basic flat plate collector, the Hottel-Whillier-Bliss equation, selective surfaces, corrosion, developments in collector design, energy storage, testing methods.

4 SPACE HEATING APPLICATIONS

Description of various solar houses and buildings in the USA, UK and other countries, analysis of space heating systems.

5 THERMAL POWER AND OTHER THERMAL 107 APPLICATIONS

Heat engines, large scale power generation, furnaces, cooking, cooling and refrigeration, heat pumps, solar ponds, distillation, process heat and transport.

METHODS OF ECONOMIC ANALYSIS	129
The present value analysis technique, marginal analysis, the effect of inflation and variable interest rates.	
7. PHOTOVOLTAIC CELLS, BIOLOGICAL CONVERSION SYSTEMS AND PHOTOCHEMISTRY	139
Types of solar cell, energy resources through photosynthesis, photochemical processes, applications.	
8 WIND POWER	151
Historical development of wind-generated electricity, wind energy potential, some recent developments and current programmes.	
9 SOME PRACTICAL HEATING APPLICATIONS	165
Swimming pool and other low temperature applications, domestic solar water heaters, collector plate designs, size, performance, economics and storage capacity, integrating the system, other energy saving methods.	
Appendices	
Some Useful Units. Definitions and Conversions	189
2 U.K. Observing Network and the Storage of Data	191
Some Reference Sources.	193
Glossary	197
List of Symbols	203

Index

205