Industrial Fuels

**Mechanical
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And where it matters that we're small, we're small.

Industrial Fuels

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Foreword

This book discusses the currently conventional solid, liquid, and gaseous fuels which are used as a source of heat or in prime movers (chapters 1, 3, 5–8). Electricity may also be regarded as a fuel for industry (chapter 11), whether supplied by the power-generating industry or in the form of stored electricity (chapter 13).

Although there are vast known and potential reserves of fossil fuels (coal, petroleum, gas) that could meet projected demands for the foreseeable future, their production is becoming more costly and technically more difficult as sources become more remote and grades lower. Nuclear energy has great possibilities as a major contributor to the world's energy requirements, although there are still problems to be overcome before efficient and reliable systems are readily available (chapter 15). Another relatively new field of technology is that of the fuel cell, which converts materials via electrochemical reactions directly into a source of electrical energy (chapter 14).

The fossil fuels are burned mostly to release their energy as heat of combustion. The types of equipment in which solid, liquid, and gas fuels are burned are described in chapters 2, 4, 9. The design of the equipment for maximum efficiency depends on fuel characteristics and the end-use to which it is applied. Related to the efficiency of combustion processes are several factors which are discussed in this book: metering of fluid fuels (chapter 10); measurement and control of heat (chapter 16); and the materials used in combustion equipment (chapter 17). Efficiency is essential if industry is to make the best use of available fuels, and much work has been done in the field of 'total energy'—making use of all the energy that is theoretically available in a fuel (chapter 18).

Electricity as a fuel for industry is itself generated principally via fuel-combustion processes, and is therefore related economically to the efficiency of those processes. For many practical reasons, electricity is widely used as a source of heat for industrial operations; chapter 12.

The combustion of fuels, including nuclear fuels, results in the production of waste materials that can cause serious problems of pollution of the general environment, a subject currently of widespread interest. Some of the problems, and what can be done about reducing them, are dealt with in chapter 19.

Modern industry has survived by learning how to cope with practical engineering problems, and how to operate economically and efficiently. This book presents a comparative outline of the industrial fuels that are available or are being developed. When considering the relative merits of the different types of fuel, one must remember that now and in the foreseeable future there is a basic problem that cannot be solved by technology. That problem is the instability of the cost of any fuel to the consumer because of political and other pressures that can lead to illogical taxation and artificially inflated prices.

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