

# Handbook of Charcoal Making

# Solar Energy R&D in the European Community

Series E:

Energy from Biomass

Volume 7

Solar Energy R&D  
in the European Community

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# Handbook of Charcoal Making

The Traditional and Industrial Methods

by

WALTER EMRICH



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## PREFACE

We are happy to introduce the Handbook of Charcoal-Making, a comprehensive survey written by a competent expert with international experience. The book was prepared by the Commission of the European Communities in the frame of its R + D programme on biomass.

In the European Community today the biomass option is only little developed: a huge resource is waiting for use.

Actually, there is ample scope for biomass utilisation as it bears promise in some of the vital sectors of modern society. Development of indigenous and renewable energy sources, creation of new employment, recycling of wastes and improvement of the environment, restructuring of European agriculture, development of the Third World, they are all concerned.

It is important to note that the exploitation of the biomass resource is largely related to its conversion into a marketable product. However, as many of the conversion technologies are not yet well established or need improvement, R + D is more than ever the critical pathway to get access to the benefits of biomass utilisation.

In the European Communities' R + D programme, thermal conversion of biomass is developed with priority. Gasification as well as pyrolysis development projects are being supported by the Commission in European industry and universities.

Pyrolysis is particularly attractive because the conversion products charcoal and pyrolytic oil are very convenient in use, technologies are relatively simple and projected pay-back times favourable.

Charcoal making is just the simplest and oldest form of pyrolysis. Charcoal is already a market product and plays an important role in the energy consumption structures of most developing countries.

As modern literature on charcoal is scarce, this book will first of all serve the purpose of a review book of the state-of-the-art. Furthermore, it is essential as a reference book for future R + D in view of technical improvements and new processes of charcoal making and pyrolysis in general.

I take this opportunity to thank Dr. Walter Emrich for having accepted the Commission's invitation to write this book. I also thank Mr. L. Crossby and Mr. J.F. Molle for reviewing the manuscript.

I wish the book great success.

A handwritten signature in dark ink, appearing to read 'W. Palz', with a long horizontal stroke extending to the right.

Dr. W. Palz

R + D Programme Biomass

Commission of the European Communities

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## FOREWORD

Owing to the widespread use of cheap fossil fuels and natural gas in industry, household charcoal has been somewhat neglected during recent decades. The development of new and improved charcoal techniques has nevertheless been advancing during this period, unknown to outsiders.

Comprehensive charcoal literature has not appeared since the late nineteen-forties; in particular, there have been no publications concerned with industrial charcoal-making. Some of the literature cited in this book exists only in specialized collections. Occasionally the public has learned about the achievements of companies active in charcoal production or equipment manufacturing, particularly in the carbonization of biomass and the formulation of long-burning charcoal fuels, but overall there has been an inadequate flow of information to potential users.

The Commission of the European Communities, Directorate-General for Science, Research and Development intends to close the information gap by publishing this handbook. However, a handbook cannot be expected to reach all the innumerable small-scale charcoal-makers, distributors and users, especially in developing countries, who do not normally acquire knowledge of improved techniques from books. At this level, information should be disseminated directly by government agencies or where appropriate, through internationally sponsored development projects.

The author has been engaged as consultant and design engineer in the charcoal and active carbon industry for more than twenty years. He has also worked on assignments as research and plant manager of charcoal and active carbon plants. During these years he became aware, through numerous contacts with Governments, Ministries of Planning and private entities that two factors frequently prevent or obstruct the promotion and realization of efficient projects:

- inadequate knowledge of the state of the art

- lack of the experience needed to develop charcoal projects.

The author's major concern in this handbook is to draw the attention of all persons involved in energy project planning to the fact that new and improved charcoal techniques are able to convert forestal and agricultural wastes and residues into energy. In countries which abound with these reserves the modern charcoal-maker can make an important contribution to the household fuel programme of his country.

For more than a thousand years, charcoal has been made from whole trees; it is time for everyone to accept recent advances in a very old industry and to adopt new ways. We should always bear in mind:

THERE IS NO WASTE IN THE WORLD  
WASTE IS AN ENERGY RESERVE

Therefore, let's use it.

The author would like to express his gratitude to the numerous organizations which have contributed valuable data. Among these are: the United Nations Industrial Development Organization (UNIDO), the Food and Agriculture Organization in Rome, and the Barbeque Industry Association in the U.S.A.

Last but not least, the author would like to thank the many charcoal producers and equipment suppliers who have volunteered updated proprietary information.

WALTER EMRICH

Neu-Isenburg, September 1984