
Preface

After many years of researching, teaching, and consulting I am firmly convinced that all problems, in order to be solved, must first be reduced to their essentials.

That does not mean ignoring or skating over some aspects, but on the contrary it means going deeply into the core of the problem to understand it completely, and then focusing on the few elements really necessary for its solution.

This is quite a difficult approach because it requires a clear comprehension of what is really important and of what is not. Engineering universities generally train students to achieve that, but during the professional career a great effort must always be made to apply these principles to practical problems.

I became engaged in the research for a unifying approach to energy management after experiences in teaching electrical machines and drives with the unified theory, which in 1976 was rather innovative for the student curriculum, but was afterwards demonstrated to be an excellent approach to an intimate and all-embracing comprehension of the related phenomena.

Professional experiences in the field of industrial energy conversion and management had stimulated me to organize a course on this subject in the Engineering Faculty of the University of Pavia in Italy and, in 1992, to write a text providing a global view of energy management in industry and in buildings.

The stream of energy, in different forms, which is transformed step by step inside any factory and building, has been considered as the unifying factor for understanding all the topics, which at first glance seem to be comprehensible only in terms of independent theories.

After 20 years I have decided to write a new book that still keeps the original approach, but which also includes the innovations that have influenced this period.

In conclusion, this new book is not just another specialized textbook or handbook and so it does not compete with those already existing which remain indispensable tools for solving technical problems in detail. Rather, it aims to help the reader by giving them the fundamental elements to simplify and tackle problems within a global vision of the production units by exploiting the correlations always present among many topics apparently distant from one another.

Having completed this work, I should like to thank university and professional colleagues who made suggestions to facilitate the comprehension of many topics. In addition, thanks are due to CSE Srl, Pavia, Italy (founded in 1983, it now belongs

to EDISON Group, Italy), from whose data bank most of the examples have been drawn.

Many thanks to all the students whom I have encountered over the years, as I have come to appreciate that teaching is the best way to deeply understand the subject you are talking about.

On a more personal note, I should like to thank my wife Marina, who helped me see the book through non-technical eyes.

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