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**Simulation of an Energy Management System
based on Agent Technology**

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Zusammenfassung zur Veröffentlichung “Simulation of an Energy Management System based on Agent Technology” ISBN 3-8322-3716-x

The electricity supply industry is undergoing rapid and significant changes because of the liberalisation of the energy market. Recent changes in the German energy policy initiated a deregulation process from a monopolistic to a competitive market, fundamentally changing the market structure, transaction relationships and trading processes. This put the customers of electric energy in a new position, where they can shop around for the best supplier.

There is a need for new computational tools and software solutions for market participants which support open and dynamic architectures, such as the emerging competitive market environment. These novel software systems need to provide high performance in communication, negotiation, planning and learning skills. Agent technology is currently one of the most exciting research fields in computer science and provides a promising approach to realize such open and dynamic systems.

This book is divided into two parts. Part 1 deals with general issues related to deregulation and foundations of agent technology. Part 2 describes the application of agent technology to energy management systems.

The main task of this work is the development of a systematic engineering approach to complex agent systems for the simulation of energy management systems. Thereby a novel simulation system for portfolio management based on a multi-agent system has been developed. The portfolio analysis carried out by the simulation system has shown promising results, especially by comparing the results to a full supply agreement.

It is argued that agent technology is very useful for the design and implementation of simulation systems and highly applicable for the simulation of energy management systems required for electricity procurement and portfolio management. The research has shown that agents, acting autonomously, are an effective way to study the many issues that affect the electric power market as it struggles with adapting to changes caused by liberalisation.