

Preface

The annual Global Conference on Sustainable Manufacturing (GCSM) sponsored by the International Academy for Production Engineering (CIRP) is committed to excellence in the creation of sustainable products and processes. These conserve energy and natural resources, have minimal impact upon the natural environment and society, and adhere to the core principle of considering the needs of the present without compromising the ability of future generations to meet their own needs.

To promote this noble goal, there is a strong need for greater awareness education and training, including dissemination of new knowledge on principles and practices of sustainability applied to manufacturing. The Global Conference on Sustainable Manufacturing grants international colleagues opportunity to build effective relationships, expand knowledge, and improve practice globally.

The conference has previously been held at different countries and locations: at the Indian Institute of Technology Madras, India in December 2009, at the Pusan National University, Korea in October 2008, at the Rochester Institute of Technology, Rochester, USA in September 2007, at the University of Sao Paulo, Brazil in October 2006, at the Jiao Tong University, Shanghai, China in October 2005, at the Technische Universität Berlin, Germany in September 2004, as well as in the form of the Environmentally Benign Manufacturing workshop held in Birmingham, Alabama, USA, in January 2003.

In November 2010, Masdar Institute of Science and Technology and Abu Dhabi University in the United Arab Emirates (UAE) hosted the 8th Global Conference on Sustainable Manufacturing under the patronage of His Excellency Sheikh Nahayan bin Mubarak Al Nahayan, Minister of Higher Education and Scientific Research of the UAE.

The Welcoming Address was given by President of Masdar Institute Prof. Dr. Fred Moavenzadeh, and by the Chancellor of Abu Dhabi University Prof. Dr. Nabil Ibrahim. Participants came from all over the world to share the results of their sustainable engineering research. Fruitful exchanges of ideas ensued on the potential of renewable energy, on value adding by sustainable manufacturing, education for sustainability engineering, green supply chain and transportation, microelectronics

and resource efficiency and technology driven startups, and how to cope with the key challenge of achieving greater functionality with fewer resources.

Visits to the Masdar City, Emirates Aluminium (EMAL), Anabeeb, and Emirates Steel Industries presented valuable opportunities to appreciate novel approaches in value creation beyond pure resource extraction.

This book includes revised and extended versions of selected papers presented at the 8th Global Conference on Sustainable Manufacturing. These contributions are well-structured in eight chapters covering topical areas: Engineering Education; Entrepreneurship; Manufacturing Processes; Product Design and Development; Remanufacturing, Reuse and Recycling; Renewables and Resource Utilizations; Sustainability Assessment; and Logistics Management and Green Supply Chain.

The Editors wish to thank all authors for their contributions and the reviewers for their time and effort in realizing this book. We especially thank Ms. Dipl.-Ing. Pinar Bilge and Mr. M.Sc Engg Sadiq Abd-Elall. Both are PhD students at Technische Universität Berlin. Thanks are due also to Ms. Sara El Hage from Masdar Institute of Science and Technology. Their outstanding efforts and tremendous support ensured the success of both the conference itself and the publication of this book.

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