

# Engineering Approaches on Sustainability



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# ENGINEERING APPROACHES ON SUSTAINABILITY

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# Introduction

## Engineering Approaches on Sustainability

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Sustainability undoubtedly is among the most critical challenges that our modern world faces today. Being aware of this fact, Marmara University International Center of Sustainability (ICS) organized an international congress between 1-3 December 2016 in İstanbul, Turkey, in order to facilitate expert discussions about recent innovations in sustainability. The main themes of the discussions were environmental, economic and social sustainability with a focus on recent innovations in these areas.

This book is prepared to present you with the selected topics of engineering approaches addressed during the congress. Each chapter in the book is dedicated to one selected engineering article. All chapters are peer-reviewed by both the editors and at least two independent scholars from fields relevant to the manuscript's subject area.

The issues discussed in each chapter deals with a different aspect of environmental sustainability. Here in this book you will find topics mainly related to

- I. renewable community power which allows communities to develop, deliver and benefit from sustainable energy,
- II. other sustainable energy aspects such as; gaining energy from waste, more efficient energy consumption, energy efficient buildings, and eco-friendly, energy efficient refrigeration systems,
- III. sustainable environmental engineering practices such as; using waste to treat wastewater, separation of valuable materials from wastewater, innovative water and wastewater treatment techniques,
- IV. sustainable production of raw materials from waste to reduce and manage solid waste
- V. environmentally sustainable management systems such as; innovative domestic wastewater management via segregated streams, rainwater harvesting, and more specific management systems such as airport deicer management, and fisheries management.

We would like to express our sincere thanks to all our contributors for their support. Without their contributions, the publication of this book would not have been possible.

*December 2016*

# Engineering Approaches on Sustainability

In general terms, sustainability is the act of meeting our own needs today without compromising the ability of future generations to meet their own needs (World Commission on Environment and Development, 1987). Obviously, the ability of natural resources and environmental systems to support our needs is limited. Therefore, the major challenge for engineers today is to design and/or operate systems that use energy and natural resources sustainably. Designing for the environment is crucial. This book presents the recent engineering approaches to sustainability from research and practice.

The chapters included in this volume are from the first International Sustainability Congress organized by International Center of Sustainability (ICS) between 1-3 December 2016 in Istanbul, Turkey. All chapters are peer-reviewed by both the editors and at least two independent scholars from fields relevant to the manuscript's subject area. ICS is a research and academic center for sustainability founded in 2015 and dedicated to build resilience of communities and ecosystems to environmental and socio-economic risks. ICS has an integrated approach and defines sustainability not only in terms of environment but also in terms of socio-economic process. Its mission is to produce information, to research and to practice at Micro and Macro levels in Sustainable Development with a holistic and cross-disciplinary approach.

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