Preface

With limited natural resources and ever-increasing energy demand, the energy sector all over the world is facing the formidable challenge of maintaining the living standard of increasing population. The human civilization observed rapid growth through industrial revolution. The key input for this growth was energy, and the source of that energy was mostly fossil fuels. With the threat of climate change, the use of this convenient form of energy also has to be compromised. Thus, finding sustainable options for future energy is an imperative need of the present. However, the use of energy in modern world is so diverse that each sector has to address this challenge of energy sustainability in a sector-specific but integrated way. Transport for mobility is a sector that consumes significant energy. Moreover, existing technologies in this sector have also several limitations regarding environmental impact. Developing sustainable energy solutions for transport is an area of significant current interest. Transformation from the existing to a sustainable option for energy conversion and use involves not only new technology developments but also suitable policy support for this transformation through transition. Energy policy thus plays a critical role for the success of implementation of sustainable energy options in real life. Several socio-economic issues have to be accessed and addressed with proper policy. In this volume, current developments of sustainable transport and energy policy have been included. The volume will be useful for postgraduate students, industry professionals as well as administrators and policy makers at different levels who are involved in implementing possible future sustainable options in the transport sector. Different policies that are either adopted or may be adopted to support sustainable transition are also included in this volume.

This work is an attempt of putting down the integrated thought process for ensuring fulfilment of energy requirements in a sustainable manner by giving consideration to various energy usage sectors and applicable technologies in those sectors. This book covers the sustainability issues in diverse fields such as smart city planning, design of transport systems in transport cities, sources of energy for mobility, thought on individual consumption for ensuring the sustainability of energy needs, technologies for emission reduction for both mobility and stationary applications. For stationary applications, it deals with case studies related to energy

consumption in the manufacturing sector as well as domestic energy requirement. Along with description of technology choices, it also discusses various distribution and policy aspects related to power sectors and sources of energy such as coal and biomass.

While there are several books on smart cities or on renewable energy, or sustainability, there is hardly any comprehensive book covering topics related to technological details, planning and case studies of sustainability issues such as pollution reduction and various renewable energy options in a single book. 'Sustainability' means improving our ability to move faster and safer in such a way that it does not compromise the ability of our children to do so in future. Sustainable transport focuses mainly on conservation of resources and provision of pollution-free and safe environment. With increasing pollution in the environment, there is a need of sustainable generation and utilization of energy. Alternative renewable energy sources in the form of vegetable oil, biodiesel, biogas, producer gas and alcohols have good prospects to replace or supplement fossil fuel. Stressing the importance of alternative fuel sources for diesel engines, the present book focuses on identifying some of these arrangements on engine performance and emission characteristics.

This is a state-of-the-art book focusing on technological, managerial and policy aspects of sustainable energy production and consumption, which deals with issues such as need and planning of smart cities, alternative transport fuel options, planning of sustainable power production, pollution control technologies. Chapters focus on the changing face of transportation towards sustainability, sustainable transport solutions for the concept of smart city, role of electric vehicles in future road transport, comparative evaluation of different fuels for transports, various energy policies related to waste heat recovery, investment in clean energy and need for integration of multidimensionality and co-benefits.

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