Preface

The aim of this book is to provide the current status and development in the biomass energy research field and report new and highly innovative technology concepts to provide green/clean energy and control climate change. It will point out the potential benefits of these new technology concepts and the technical challenges that we need to overcome to achieve the mission. This book could be helpful to a wide audience including not only energy and environmental scientists and engineers but also industry and academia, teachers and students, and the general public including the policy makers across the world. The book will address a variety of topics and technology concepts ranging from the latest development in smokeless biomass pyrolysis, Fischer–Tropsch hydrocarbons synthesis for biomass-derived syngas to liquid transportation fuels, catalytic and selective pyrolysis of biomass for production of fuels such as biodiesels and special chemicals such as levoglucosan and phenolic compounds, biomass hydrothermal processing, biomethane and naturally occurring hydrocarbon gas hydrates, to "cellulosic biofuels," "electrofuels," and photobiological production of advanced biofuels (e.g., hydrogen, lipids/biodiesel, ethanol, butanol, and/or related higher alcohols) directly from water and carbon dioxide. Advanced bioproducts such as biochar that could bring significant benefits in helping control climate change and sustainable economic development will also be covered. Each chapter typically will describe a specific technology including its fundamental concept, potential benefits, current status, and technical challenges. Therefore, this BioEnergy sciences book will enable readers to quickly understand the up-to-date technical opportunities/challenges so that the readers may also be able to somehow contribute to this mission, since currently energy and environment (climate change) are such huge and urgent issues to human civilization on Earth. Together, we can help overcome the challenges and build a sustainable future with clean renewable energy of tomorrow.

Norfolk, VA, USA — James Weifu Lee