

ADVANCES
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VOLUME 1



EDITED BY

Grigorios L. Kyriakopoulos

New Energy and Future Energy Systems



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Proceedings of NEFES 2022, online conference,
China, 25-28 October 2022

With energy prices at an all-time high worldwide and the climate crisis making the need to replace fossil fuels an increasingly urgent issue, the development of new energy systems for the future has never been more important.

This book presents the proceedings of NEFES 2022, the 7th International Conference on New Energy and Future Energy Systems, originally scheduled to take place in Nanjing from 25 to 28 October 2022, but ultimately held as a fully virtual event as a result of ongoing pandemic restrictions. The NEFES conferences are dedicated to promoting scientific interchange among researchers, developers, engineers, students, and practitioners from around the world, providing participants with an opportunity to share their latest achievements and discuss the possible challenges of new energy and future energy systems. A total of 170 submissions were received for the conference, of which 34 papers were ultimately selected for presentation and publication after careful review and checking for plagiarism by means of the iThenticate tool. Topics addressed at NEFES 2022 included all aspects of energy, including solar and wind energy, smart grids, power transmission and distribution, electric vehicles, biomass, biofuels, bioenergy, new energy materials, energy-saving materials, energy storage materials and technology, energy and nanotechnology, hybrid energy systems, advanced energy technologies, energy generation and conversion, clean coal technology, renewable technology, fuel cells, hydro-energy, and geothermal energy.

Providing a current overview of the latest developments in many energy technologies, the book will be of interest to all those working in the field.

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Interdisciplinary contributions covering technical, managerial, environmental and policy aspects of energy are encouraged as these match the questions our society asks and the solutions it demands from research.

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Preface

The 7th International Conference on New Energy and Future Energy Systems (NEFES 2022) was held from 25 to 28 October as an online conference (virtual conference without any physical participation). NEFES 2022 was originally planned to be held in Nanjing. Considering the health and safety of all the participants, pervasive travel restrictions as well as most authors' appeals under COVID-19, it was finally changed into a full online conference. The technical program included Keynote Speeches, Invited Speeches, Oral Presentations and Poster Presentations.

Previous editions of the NEFES were held in Beijing (2016), Yunnan (2017), Shanghai (2018), Macao (2019), and online in 2020, 2021 due to the restrictions caused by the COVID-19 pandemic.

NEFES 2022 was co-organized by the School of Mechanical Engineering, Southeast University, China and it provided a platform for researchers, scientists, engineers and professionals from all over the world to present their latest research results and new ideas in terms of new energy and future energy systems. This volume records the proceedings of NEFES 2022 and it contains 34 peer-reviewed papers, selected from more than 170 submissions.

The topics of NEFES 2022 covered all aspects of energy, including solar thermal energy, smart grids, power transmission and distribution, electric vehicles, solar and wind energy, biomass, biofuel, and bioenergy, new energy materials, energy-saving materials, energy storage materials, energy and nanotechnology, energy storage technology, hybrid energy systems, advanced energy technologies, energy generation and conversion, clean coal technology, renewable technology, fuel cells, hydro-energy, geothermal energy.

The Organizing Committee would like to thank all the keynote and invited speakers, the authors who contributed to NEFES 2022, the anonymous reviewers who provided their valuable comments and suggestions, as well as the technical program committee members who devoted their time to the assessment of the papers submitted for publication in the NEFES 2022 proceedings.

Editor

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About the Conference

The 7th International Conference on New Energy and Future Energy Systems (NEFES 2022), co-hosted by the School of Mechanical Engineering, Southeast University, took place from 25 to 28 October 2022 as an online conference. Considering the health and safety of all the participants, pervasive travel restrictions as well as most authors' appeals under COVID-19, the conference organizer was forced to convert NEFES 2022 into a full online conference. It is very regrettable that the conference could not be held in Nanjing as originally planned. Following the successful NEFES 2021, and NEFES 2020 online, NEFES 2019 in Macau, NEFES 2018 in Shanghai, NEFES 2017 in Yunnan and NEFES 2016 in Beijing, the 7th NEFES conference is dedicated to promoting scientific interchange among researchers, developers, engineers, students, and practitioners all around the world. The participants gathered to share their latest achievements and discuss the possible challenges in terms of new energy and future energy system.

All the papers were reviewed by Technical Program Committee members and reviewers, who evaluated the paper quality and the research topics falling under the scope of NEFES. The tool iThenticate was used for plagiarism checking. 34 papers were selected and accepted from among 170 submissions.

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