Nasrul Hadi Johari
Wan Azmi Wan Hamzah
Mohd Fairusham Ghazali
Herma Dina Setiabudi
Sudhakar Kumarasamy Editors

# Proceedings of the 2nd Energy Security and Chemical Engineering Congress

Selected Articles from ESChE 2021, Malaysia



## **Lecture Notes in Mechanical Engineering**

### **Editorial Board**

Francisco Cavas-Martínez, Departamento de Estructuras, Construcción y Expresión Gráfica Universidad Politécnica de Cartagena, Cartagena, Murcia, Spain

Francesca di Mare, Institute of Energy Technology, Ruhr-Universität Bochum, Bochum, Nordrhein-Westfalen, Germany

Mohamed Haddar, National School of Engineers of Sfax (ENIS), Sfax, Tunisia

Young W. Kwon, Department of Manufacturing Engineering and Aerospace Engineering, Graduate School of Engineering and Applied Science, Monterey, CA, USA

Justyna Trojanowska, Poznan University of Technology, Poznan, Poland

### **Series Editors**

Fakher Chaari, National School of Engineers, University of Sfax, Sfax, Tunisia Francesco Gherardini, Dipartimento di Ingegneria "Enzo Ferrari", Università di Modena e Reggio Emilia, Modena, Italy

Vitalii Ivanov, Department of Manufacturing Engineering, Machines and Tools, Sumy State University, Sumy, Ukraine

**Lecture Notes in Mechanical Engineering (LNME)** publishes the latest developments in Mechanical Engineering—quickly, informally and with high quality. Original research reported in proceedings and post-proceedings represents the core of LNME. Volumes published in LNME embrace all aspects, subfields and new challenges of mechanical engineering. Topics in the series include:

- Engineering Design
- Machinery and Machine Elements
- Mechanical Structures and Stress Analysis
- Automotive Engineering
- Engine Technology
- Aerospace Technology and Astronautics
- Nanotechnology and Microengineering
- Control, Robotics, Mechatronics
- MEMS
- Theoretical and Applied Mechanics
- Dynamical Systems, Control
- Fluid Mechanics
- Engineering Thermodynamics, Heat and Mass Transfer
- Manufacturing
- Precision Engineering, Instrumentation, Measurement
- Materials Engineering
- Tribology and Surface Technology

To submit a proposal or request further information, please contact the Springer Editor of your location:

**China:** Ms. Ella Zhang at ella.zhang@springer.com

India: Priya Vyas at priya.vyas@springer.com

Rest of Asia, Australia, New Zealand: Swati Meherishi

at swati.meherishi@springer.com

All other countries: Dr. Leontina Di Cecco at Leontina.dicecco@springer.com

To submit a proposal for a monograph, please check our Springer Tracts in Mechanical Engineering at https://link.springer.com/bookseries/11693 or contact Leontina.dicecco@springer.com

Indexed by SCOPUS. All books published in the series are submitted for consideration in Web of Science.

Nasrul Hadi Johari · Wan Azmi Wan Hamzah · Mohd Fairusham Ghazali · Herma Dina Setiabudi · Sudhakar Kumarasamy Editors

# Proceedings of the 2nd Energy Security and Chemical Engineering Congress

Selected Articles from ESChE 2021, Malaysia

