Cleaner Production

Co-Editors-in-Chief

J.J. Klemeš

Brno University of Technology, Brno, Czechia. E-mail: j.klemes.JCLEPRO@outlook.com

C.M.V.B. Almeida

Paulista University, São Paulo, Brazil.

E-mail: cmvbag@unip.br

Executive Editors

Kathleen Aviso, De La Salle University Department of Chemical Engineering, Manila, Philippines

Bin Chen, Beijing Normal University, Beijing, China

Kannan Govindan, University of Southern Denmark, Odense, Denmark

Mingzhou Jin, The University of Tennessee Knoxville Institute for a Secure and Sustainable Environment, Knoxville, Tennessee, United States of America

Assistant Editor

C. Wang, Tsinghua University School of Environment, Beijing, China

Founder and Editor-in-Chief Emeritus

D. Huisingh, The University of Tennessee System, Knoxville, Tennessee, United States of America. E-mail: donaldhuisingh@comcast.net

Associate Editors

L. Rigamonti, Polytechnic of Milan, Milano, Italy

G. Baiocchi, University of Maryland at College Park, College Park, Maryland, United States of America

S. Bandyopadhyay, Indian Institute of Technology Bombay Department of Energy Science and Engineering, Mumbai, India

G. Besagni, Polytechnic of Milan Department of Energy, Milano, Italy

J. Bi, Nanjing University, Nanjing, China

S. Caeiro, Open University, Lisboa, Portugal

H. Cai, Purdue University, West Lafayette, Indiana, United States of America

C. J. C. Jabbour, University of Lincoln, Lincoln International Business School, Lincoln, United Kingdom

J.-L. Fan, China University of Mining and Technology Beijing Campus, Beijing, China

Y. V. Fan, Brno University of Technology, Brno, Czechia

 $N.\ Holden,$ University College Dublin, School of Biosystems and Food Engineering, Dublin, Ireland

B. Huang, The University of Tennessee System, Knoxville, Tennessee, United States of America

J.-K. Kim, Hanyang University College of Engineering Department of Chemical Engineering, Seongdong-gu, South Korea

C. T. Lee, University of Technology Malaysia, Skudai, Malaysia

W. Li, Wuhan University of Technology, Wuhan, China

M. Lindahl, Linköping University, Linköping, Sweden

G. Liobikiene, Vytautas Magnus University, Kaunas, Lithuania

Y. Liu, Linkoping University Department of Management and Engineering, Linköping, Sweden

Y. Liu, Chinese Academy of Sciences Institutes of Science and Development, Beijing, China

S. Luthra, Ch. Ranbir Singh State Institute of Engineering and Technology, Department of Mechanical Engineering, Jhajjar, Haryana, India

T. Majozi, University of the Witwatersrand, School of Chemical & Materials/ Metallurgical Engineering, WITS, South Africa

Honorary Board Members

N. Ashford, Massachusetts Institute of Technology, Cambridge, Massachusetts, United States of America

X, Bai, Australian National University Fenner School of Environment and Society, Canberra, Australia

M. Brown, University of Florida, Gainesville, Florida, United States of America

D. Coffman, University College London, London, United Kingdom

N. Duan, Tongji University, Shanghai, China

G. Finnveden, KTH Royal Institute of Technology Department of Sustainable Development Environmental Science and Engineering, Stockholm, Sweden

B. F. Giannetti, Paulista University - Indianópolis Campus, Sao Paulo, Brazil

O.J. Hanssen, Ostfoldforskning AS, Kråkerøy, Norway

K. Hubacek, University of Groningen, Groningen, Netherlands

G. Huppes, Leiden University, Leiden, Netherlands

Academic Board Members

F. Agostinho, Paulistana University, SAO PAULO, Brazil

J. Bacenetti, University of Milan Department of Environmental Science and Policy, Milano, Italy

R. Baumgartner, University of Graz Institute of Systems Sciences Innovation and Sustainability Research, Graz, Austria

V. Blok, Wageningen University & Research Social Sciences, Wageningen, Netherlands N. Bocken, Maastricht University School of Business and Economics, Maastricht, Netherlands

Y. Wang Fudan University, Shanghai, China. E-mail: vutaowang@fudan.edu.cn

Zhen Leng, The Hong Kong Polytechnic University, Hong Kong, Hong Kong

Zhifu Mi, University College London, London, United Kingdom

Maria Teresa Moreira University of Santiago de Compostela School of Engineering Department of Chemical Engineering, A Coruña, Spain

Panos Seferlis, Aristotle University of Thessaloniki, Thessaloniki, Greece

J. Meng, University of Cambridge, Cambridge, United Kingdom

H. Mikulčić, University of Zagreb Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia

B.-J. Ni, University of Technology Sydney School of Civil and Environmental Engineering, Broadway, New South Wales, Australia

S. Nižetić, University of Split, Split, Croatiaa

P. Ocłoń, Tadeusz Kosciuszko Cracow University of Technology, Faculty of Environmental and Energy Engineering, Energy Department, Krakow, Poland

A. I. Papadopoulos, Centre for Research and Technology-Hellas, Thessaloniki, Greece

S. Qu, Beijing Institute of Technology, Beijing, China

T. Ramos, New University of Lisbon Center for Environmental and Sustainability Research, Lisbon, Portugal

K. Salonitis, Cranfield University Cranfield School of Aerospace Transport and Manufacturing, Bedford, United Kingdom

E. S. Gonzalez, University of Talca, Department of Industrial Engineering, Maule, Chile

L. Shi, Tsinghua University, Beijing, China

B, Silvestre, University of Manitoba Asper School of Business, Winnipeg, Manitoba, Canada

M. Tabatabaei, Universiti Malaysia Terengganu, Institute of Tropical Aquaculture and Fisheries (AKUATROP), Terengganu, Malaysia

J. T. Heinonen, University of Iceland School of Engineering and Natural Sciences Faculty of Civil and Environmental Engineering, Reykjavík, Iceland

X. Tong, Peking University, Beijing, China

S. R. W. Alwi, University of Technology Malaysia Process Systems Engineering Centre, Johor Bahru., Malaysia

R. Wood, NTNU Department of Energy and Process Engineering, Trondheim, Norway

J. Yang, China University of Geosciences School of Economics and Management, Beijing, China

Z. Zhang, Southern University of Science and Technology, Shenzhen, China

J. Zuo, The University of Adelaide, Adelaide, Australia

C. Luttropp, Royal Institute of Technology, Stockholm, Sweden

D. Reeve, Cleaner Production Australia, Eltham, Australia

H. Schnitzer, Graz University of Technology, Graz, Austria

W. Q. Tao, Xi'an Jiaotong University School of Energy and Power Engineering, Xian, China

C. Teodosiu, Gheorghe Asachi Technical University of Iasi, Iasi, Romania

A. Tukker, Leiden University, Leiden, Netherlands

S. Ulgiati, University of Naples Parthenope, Napoli, Italy

P. Vergragt, Tellus Institute, Boston, Massachusetts, United States of America

 $\it X.-M.$ Wei, Beijing Institute of Technology, Center for Energy and Environmental Policy Research, Beijing, China

Z. Yang, Guangdong University of Technology Institute of Environmental and Ecological Engineering, Guangzhou, China

F. Boons, The University of Manchester, Manchester, United Kingdom

 $Y.\ Cai,$ Guangdong University of Technology - University Town Campus, Guangzhou, China

A. S. F. Chiu, De La Salle University, Gokongwei College of Engineering, Industrial Engineering Department, Manila, Philippines

M. Constantino, Universidade Católica Dom Bosco, Campo Grande, Brazil

S. DeVito, US Environmental Protection Agency, Washington, District of Columbia, United States of America

- X. Deng, US Institute of Geographic Sciences and Natural Resources Research Chinese Academy of Sciences, Beijing, China
- K. Fang, Zhejiang University Library, Hangzhou, China
- K. Feng. University of Maryland at College Park, Department of Geographical Sciences, College Park, Maryland, United States of America
- J. Fresner, STENUM Environmental Consultancy and Research Company, Graz, Austria
- S. Gheewala, King Mongkut's University of Technology Thonburi, Bangkok, Thailand
- S. Gold, University of Nottingham, Nottingham, United Kingdom
- R. Heijungs, VU Amsterdam, Amsterdam, Netherlands
- G. Hilson, University of Surrey Faculty of Business Economics and Law, Guildford, United Kingdom
- B. V. Hoof, University of the Andes, Bogota, Colombia
- V. Kafarov, Industrial University of Santander, Bucaramanga, Colombia
- E. Katsou, Brunel University London, Uxbridge, United Kingdom
- D. Kukulka, University at Buffalo, Buffalo, New York, United States of America
- F. Li, Chinese Academy of Sciences, Beijing, China
- S. Liang, Guangdong University of Technology University Town Campus, Guangzhou, China

Junior Board Members

- S. A. A. S. Bokhari, Universiti Teknologi PETRONAS Department of Chemical Engineering, Bandar Seri Iskandar, Malaysia
- C. B. P. Chien, University of Technology Malaysia, Skudai, Malaysia
- I. Bozhikin, University of National and World Economy, Sofia, Bulgaria
- L. Bulgariu, Gheorghe Asachi Technical University of Iasi, Iasi, Romania
- L. F. Chuah, Marine Department Northern Region, Gelugor, Malaysia
- L. Coscieme, The University of Dublin Trinity College, Dublin, Ireland
- X. Jia, Brno University of Technology, Brno, Czechia
- H. Kamyab, University of Technology Malaysia Razak Faculty of Technology and Informatics, Kuala Lumpur, Malaysia
- J. S. Lim, University of Technology Malaysia School of Chemical and Energy Engineering, Johor Bahru, Malaysia

- W. Liao, Sichuan University, Chengdu, Sichuan, China
- G. Liu, University of Southern Denmark Department of Green Technology, Odense, Denmark
- G. Liu, Beijing Normal University, Beijing, China
- Z.-Y. Liu, Hebei University of Technology, Tianjin, China
- G. Mao, Tianjin University, Tianjin, China
- J. Quist, Delft University of Technology, Delft, Netherlands
- M. A. Rajaeifar, Newcastle University, Newcastle Upon Tyne, United Kingdom
- M. Song, Anhui University of Finance and Economics, Bengbu, China
- $\it M. Sun$, Institute of Geographic Sciences and Natural Resources Research Chinese Academy of Sciences, Beijing, China
- $\label{eq:continuous} A.\ Trianni,\ University\ of\ Technology\ Sydney\ -\ City\ Campus,\ Ultimo,\ New\ South\ Wales,\ Australia$
- P. S. Varbanov, Brno University of Technology, Brno, Czechia
- Z. Wang, Beijing Institute of Technology, Beijing, China
- X. Zeng, Tsinghua University, Beijing, China
- Y.-J. Zhang, Hunan University, Changsha, China
- S. Northey, Monash University, Clayton, Victoria, Australia
- P. Pérez-López, Engineering College Paris Observation, Impact, Energy (OIE) Center, Sophia Antipolis, France
- Y. Qiao, Shandong University Institute for Studies in County Development, Qingdao, China
- Y. Shan, University of Groningen, Groningen, Netherlands
- W. Wei, University of Shanghai for Science and Technology, Shanghai, China
- M. Xie, Chinese Research Academy of Environmental Sciences, MEP Key Laboratory of Eco-Industry, Beijing, China
- Q. Zhang, University of Victoria, Victoria, British Columbia, Canada