

Preface

The world population is growing very rapidly over the past decades, which in turn, increasing the number of people aspire to higher standard of living. As prosperity continues to grow, we all need more and more energy and effective engineering solutions and technological innovations to have a better life, which eventually can only be produced in a sustainable way, i.e. creating less waste and lowering CO₂ emission. Renewable energy sources allows the reduction of the dependency on fossil fuel resources, and hence, increases the world energy security. Therefore, opportunities for technologies improvement have become significant issues to be challenged by researchers, scientists and engineers around the globe.

Department of Mechanical Engineering, Institut Teknologi Sepuluh Nopember (ITS), Surabaya, Indonesia, has been an important player in developing and promoting sustainable technologies in mechanical engineering and energetics. One way of promoting these issues by actively provide means to share and disseminate research findings and knowledge in this particular area. Therefore, the Department is organized **the 2nd International Conference on Mechanical Engineering**, ICOME 2015, with its theme "*Mechanical Science and Technology for Sustainable Energy*". ICOME 2015 that was held in Bali on 3rd-5th September 2015, offers a great opportunity to bring together researchers, scientists, and industrial professionals around the globe to foster an environment conducive in exchanging new ideas and information. It also provides a forum to discuss the most recent development and trends in mechanical science and engineering related fields.

The conference and publication can only be conducted and made available due to the hard work and supports of many contributors. In this opportunity, we would like to thanks the authors and reviewers who have spent their time to contribute and made suggestions such that the published papers met the international journal standard. Our sincere gratitude also goes to Ir. Lukman Mahfoedz, Prof. Jyh-Chen Chen, Prof. Katsuhiko Sasaki and Prof. Volodymyr Yartys for their willingness to be the keynote speakers at this conference. We would also like to thank ITS, Ministry of Research Technology and Higher Education and sponsorship companies for their support and contribution in ICOME 2015. Special thank goes to all committee members who have dedicated their time and effort to ensure everything runs as planned. We believe that this book can serve as a high quality archive of research findings and establish future directions of research in the related topics.

Editor in Chief

Bambang Arip Dwiyantoro

Committees

Details affiliation of the organizing committee with emails:

- Bambang Arip Dwiyanoro, PhD (Chairman, email: bambangads@me.its.ac.id)
- Unggul Wasiwitono, PhD (Co Chaiman, email: unggul@me.its.ac.id)
- Vivien Suphandani, PhD (Co Chaiman, email: vivien_s@me.its.ac.id)
- Suwarno, PhD (Co Chaiman, email: warno@me.its.ac.id)

ICOME 2015 Secretariat

Department of Mechanical Engineering

ITS Campus, Sukolilo, Surabaya

INDONESIA, 60111

Telp. +62-31-5946230, 5922941

Fax. +62-31-5922941

Email: icode@its.ac.id

Website: <http://icode.its.ac.id>

Main Sponsors

Ministry of Research, Technology, and Higher Education of Republic of Indonesia

Title of conference:

International Conference on Mechanical Engineering 2015 (ICOME 2015)

Theme: Mechanical Science and Technology for Sustainable Energy

Location, date:

September 3rd - 5th, 2015, Kuta, Bali, Indonesia

Conference website: www.icode.its.ac.id

Book title:

Achievements of Mechanical Science and Current Technological Innovations for Sustainable Development

Proceedings editor's name

- Prof. Sutardi

Mechanical Eng. Dept., Institut Teknologi Sepuluh Nopember - ITS, INDONESIA

Website: www.me.its.ac.id

Email: sutardi@me.its.ac.id

- Bambang Pramujati, PhD

Mechanical Eng. Dept., Institut Teknologi Sepuluh Nopember - ITS, INDONESIA

Website: www.me.its.ac.id

Email: pramujati@me.its.ac.id

- Prof. Rickey Dubay

Mechanical Eng. Dept., University of New Brunswick, CANADA

Website: www.unb.ca

Ema: dubayr@unb.ca

- Mamoun Abu-Ayyad, PhD

Mechanical Eng. Dept., Pennsylvania State Univ., USA

Website: www.psu.edu

Email: maa21@psu.edu

- Prof. Lai, Jiing-Yih

Mechanical Engineering, National Central University, TAIWAN

Website : <http://www.me.ncu.edu.tw/eng/>

Email: jylai@ncu.edu.tw