# BIOMASS
# OUR FUTURE

Editor
Masaharu Komiyama

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**Biomass: Our Future**

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# PREFACE

Biomass has been identified as one of the major sources of fuel and materials that replace the ones based on fossil resources. The notable characteristics of biomass reside in its renewability. It has two aspects: sustainability and carbon neutrality. Both of the aspects originate from the same root: modern society's excessive dependency on fossil resources and on fuels and materials derived from them. Fossil resources are apparently not sustainable. The classic prognostication by the Club of Rome in 1972 appears to have been realised early in the 21$^{st}$ century. Looming on the horizon, at the same time, is global warming and associated climate change, most likely caused by the extra $CO_2$ emitted to the atmosphere through the combustion of fossil fuels, thereby enhancing the greenhouse effect on the earth's surface. Biomass combustion itself will not increase the amount of atmospheric $CO_2$ since the constituent carbon of biomass is the one that was fixed from $CO_2$ in the atmosphere through photosynthesis, to begin with.

Biomass has been and is one of the major research genres at the Chemical Engineering Department, Universiti Teknologi PETRONAS (UTP). Related endeavours have been further enhanced by establishing Centre for Biofuel and Biochemical Research (CBBR) as one of UTP's research centres in May 2010 under the auspices of Mitsubishi Corporation. Aspirations and efforts by the first centre head, Professor Yoshimitsu Uemura and early members of CBBR soon made the centre a UTP Centre of Excellence. In April 2019, it was awarded the Higher Institution Centre of Excellence (HICoE) status from the Ministry of Higher Education, Malaysia. The commitment to research

excellence is the backbone of our Chemical Engineering Department. Toward that end, HICoE-CBBR also continues to strive as part of UTP's research ecosystem.

The present book is a part of the review series published by the Chemical Engineering Department, UTP. It contains a collection of reviews on biomass-related research works performed in the department, which include ones executed in HICoE-CBBR and its partner institutions. The editor is grateful to those contributions from within the department, HICoE-CBBR and its collaborating partners.

Prof Dr Masaharu Komiyama
*Seri Iskandar*
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