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# Biomass and Bioenergy

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## Preface



It is a great pleasure to introduce the fifth special issue in Biomass & Bioenergy, derived from work presented in Amsterdam at the 24<sup>th</sup> European Biomass Conference & Exhibition (EUBCE). After a careful reviewing procedure, 21 out of the 31 submitted papers for publication could be accepted, which almost equals the situation of the previous year.

Amsterdam 2016 was one of the most successful EUBCE conferences ever, with 1572 registered participants mostly from Europe but also in significant numbers from e.g. the US and China. Almost 60 % of them came from universities, national research institutes or industrial R&D departments. From all their contributions (almost 800), the Scientific Committee, in collaboration with the journal editors, had to select those being potentially suitable for peer review. This resulted in a limited number of invitations for preparing and submitting a full scientific article to Biomass & Bioenergy. Such a manuscript differs substantially from the paper delivered for the Conference Proceedings with respect to its length, completeness and scientific depth.

This time, the twenty-one accepted manuscripts are from Germany (5), Austria (3), Sweden (2), Denmark (2), The Netherlands (2), China (2), France (1), Spain (1), Portugal (1), Italy (1) and Canada (1). They are dealing with greenhouse gas reduction, biogas scenarios, costs of biofuels, cultivation of perennial grasses and sorghum in the Mediterranean, drying and storage of wood, dewatering of microalgae, co-digestion of food waste and sludge, digestion of dairy waste water, wood torrefaction, wood combustion emissions, fluidized bed (steam) gasification and the product gas cleaning, supercritical water gasification and, finally, the conversion of lignin to aromatic hydrocarbons. The variety in subject matter, but with some more emphasis on the thermochemical conversion, is indeed a good reflection of the Conference program with topics varying from biomass production up to its utilization, including the various issues of support and management.

Fossil resources including coal, oil, gas but also the various minerals and metals, may get scarce if not completely depleted when at the end of the century the world population has grown to over 11 billion. Before that, accumulated waste on land and in the oceans, as well as the polluting and climate affecting emissions from industry and traffic, may have caused already irreparable damage to the human society system. Conference chairman Andre Faaij, in his opening address, emphasized the need for immediate action and the possible contribution of biomass to the goals of the Climate Agreement of Paris (2015) for a limitation of global warming to well below 2 °C. A mix of advanced fuels, power with CCS, heat, biomaterials and biochemical could be derived from the economically sustainable biomass potentials, well available if forestry, agriculture and land management are further modernized. The chairman also pointed at the opportunities for rural development in relation to the required biomass production. The efficiency and sustainability of future biomass utilization demands for a cascading, zero-waste approach with a focus on residues and organic waste materials.

Although the interest in green chemicals and green carbon based materials is growing notably in particular amongst scientists, the potential impact of renewable energy production on greenhouse gas emissions is still much larger due to its higher volume. Currently there is a strong support for the implementation of wind and solar systems producing electricity against ever decreasing prices. Electricity for free is not entirely utopian and very cheap electricity, if well storable and transportable, could change the world's view drastically. However the time period to reach this ideal situation of a worldwide carbon free power supply needs to be bridged. During a transition period of several decades, bioenergy should be exploited to its full extent if carbon dioxide emissions and global warming are to be stopped rapidly. Eventually, biomass always remains the exclusive resource of green carbon to be exploited in advanced processing schemes (based on a new type of chemistry), which still have bioenergy as a significant by-product. And even when transportation on earth will be driven largely by electricity, biomass derived hydrocarbon aviation fuel may still be required because of its high energy density. These days, the above considerations are widely appreciated in science and have led to investigating new production concepts represented by terms like "bio-economy", "bio-refinery", "low carbon economy" and more recently "circular economy".

Four earlier special issues in Elsevier's journal "Biomass & Bioenergy", composed of contributions to the 20<sup>th</sup>, the 21<sup>st</sup>, the 22<sup>nd</sup> and the 23<sup>rd</sup> EUBCE in Milan (2012), Copenhagen (2013), Hamburg (2014) and Vienna (2015) respectively, have already been published. At the time of writing, a selection of about 35 papers presented at the 25<sup>th</sup> EUBCE in Stockholm, are being submitted to the Journal for a possible publication in the sixth special issue. For the 26<sup>th</sup> EUBCE, announced to be held next year (2018) in Copenhagen, there will again be a special issue composed from the best contributions.

Indeed, the first initiative in 2011 to publish a special issue has gradually grown into a real scientific series which may extend for a very long time.

Elsevier and the editors of Biomass and Bioenergy are delighted to have the privilege of publishing annually a special issue of the very best contributions to this Conference. We gratefully acknowledge the help of the Scientific Committee, the excellent administrative support of Anna Salimbeni, the encouragement by the program Chairman David Baxter and the organizers Angela Grassi and Peter Helm and, last but not least, the many independent manuscript reviewers from all over the world. We particularly wish to thank all the authors for their collaboration in producing this fifth special issue for Biomass & Bioenergy.

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