Editorial

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Progress in Industrial Ecology (PIE) is pleased to publish this second issue of Volume 6. The sustainability challenges addressed in this issue of the journal reflect the current debate and the intensive negotiation process on global climate change mitigation. These papers are published at a time when the world is undergoing the biggest ever and most difficult international decision-making process in sustainable development in Copenhagen, Denmark.

Industrial ecology has rapidly emerged into a new field of sustainability science that provides important input materials for international policies on climate change mitigation. Many researchers in the field are involved in the preparation, implementation and after-management of the Copenhagen proceedings. The interdisciplinary study of physical flows of materials and energy in economic systems, ecosystems and between these interdependent systems is the essence of the science needed to understand, measure and mitigate climate change.

But the natural science and engineering aspects of industrial ecology need to be bridged to business and management aspects affecting and affected by the physical flows of materials and energy. This issue of the journal also includes contributions addressing this challenge. PIE and its associate research society, the International Sustainable Development Research Society (ISDRS), will continue to work to effect progress in industrial ecology for global sustainable development.

In the following, the peer-reviewed articles accepted for this issue of the journal are briefly introduced. Again, we take this opportunity to thank the authors and the reviewers for their quality work and for their patience.

Kurup and Stehlik continue from the previous triple special issue of PIE on industrial symbiosis. They focus on the potential benefits of industrial symbiosis with case studies from Europe and Asia. The authors want to develop a model that studies not only the existing effects of industrial symbiosis, but also the long-term opportunities that may become achievable through an industrial symbiosis-type organisation decades before the actual benefits are visible and quantifiable. The concept of social capital is integrated into the analysis of eco-industrial parks.

Dr. Brunklaus recently published her PhD thesis at Chalmers University in Sweden. This PhD concentrates on the concept of 'environmental assessment of organising', coined by Professor Baumann. In this PIE contribution that was part of the article

collection dissertation, Brunklaus argues that industrial ecology needs to be linked to organisational studies and studies of business and management, *i.e*., too little work has been done in our field that seriously takes into account the potential of social science aspects of materials and energy flows.

Two housing estates and their management practices provide the case materials for this contribution. The author finds that the organisational cultures and the characteristic management styles have a visible and direct link to and influence on the tangible environmental performance of the studied organisations and activities. The methodological challenges, *e.g*., what research methods can be employed when investigating environmental management of organising, are also considered in this article.

The article by Hsiao *et al.* bring in an interesting experience from Taiwan. It is important for the development of our field and of this journal to publish a diversity of experiences covering all continents of the world. Rarely have we seen cases from Taiwan in the field of industrial ecology.

Hsiao *et al*. show that Material Flows Analysis (MFA), one of the most commonly used tools of industrial ecology, has relevance for policy making in Taiwan. The case study comes from the rapidly emerging construction industry in Taiwan. Generally in Asia, the importance of construction activities and industries for sustainable development is very high. The authors attempt to model material flows with static, but also with dynamic models, including temporal changes in the analysis. They argue that the modelling exercise can be useful in the national dematerialisation programmes of the Taiwanese government.

Eco-Efficiency (EE) is one of the central concepts of industrial ecology. Both PIE and *Journal of Industrial Ecology* (JIE) have published special issues on the concept. EE is addressed in the article by Hoffrén and Apajalahti. The metals industry of Finland is analysed for its development over time. Large companies in Finland are compared. The results are reflected upon based on the often-cited Factor targets, *e.g*., Factor 10 and Factor 4. The authors adopt a critical view on EE and acknowledge it as a relative ratio, different from absolute quantities that, in the end, decide the sustainability or environmental impacts of policy and management.

Seebaluck and Seeruttun consider the utilisation of sugarcane residues of agriculture as renewable fuels. That is, wastes can be reduced, energy can be produced and greenhouse gases minimised simultaneously if the hypothesis is implemented. This work draws from experience in Mauritius, therefore adding to the diversity and depth of the vision of the journal to consider sustainability and industrial ecology as a global challenge. The article develops 'what if' scenarios for assessing the carbon dioxide implications of different fuel solutions.

Kirkinen *et al.* continue the debate on and the modelling of climate change mitigation of different fuels and energies. The Global Warming Potential (GWP) method and the Radiative Forcing (RF) method are placed under a comparative analysis. Further, interesting examples are given from India and from Finland. Jatropha biodiesel utilisation in India and forest residues (derived from cuttings) use in Finland are calculated for their greenhouse impacts. The authors have been closely involved in the Intergovernmental Panel on Climate Change proceedings and their insight has inspired the motivation to undertake the methodological and Asia-Europe comparative analyses published in this important article.

We invite the readers to respond to these contributions in the journal and we encourage critical papers for publication in PIE.