Reflecting on the strategic sustainable development special issue of Karl Henrik Robért

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As the Editor-in-Chief of *Progress in Industrial Ecology* I am extremely pleased to write this text to comment upon the importance and the contribution of the special issue 'Strategic Sustainable Development, The Natural Step', Guest Editor Professor Karl-Henrik Robért and The Natural Step. We have worked several years together with Dr. Robért's group. This compilation of papers is a very good presentation of the main message, contribution as well as the diversity of dimensions The Natural Step (TNS) concept and the Framework for Strategic Sustainable Development (FSSD) have. What is especially exciting is the strategic business and organisational perspective TNS and FSSD bring into engineering and natural science dominated field of industrial ecology. Bridging this gap has been and will continue to be the core of the vision of our journal, *Progress in Industrial Ecology*. Below, I will raise four themes that I perceive among the most important contributions of TNS and FSSD.

Consensus on sustainability principles

Many scholars are simply getting sick of hearing how difficult sustainability and sustainable development are to define. This has been discussed intensively, for example, on the international science platform, *International Sustainable Development Research Society* (ISDRS). Robért's group has done ground-breaking work in getting pioneers of sustainability science to achieve a scientific consensus on the definition of sustainability and sustainable development. Dr. Robért was able to document this consensus in an international peer-reviewed journal, *Journal of Cleaner Production* in 2002. To my understanding, this article is already one of the most often-cited pieces in all literature on sustainable development.

The four system conditions or the sustainability principles of TNS and FSSD are, to my knowledge, the only attempt to define sustainable development in a consensus manner. The principles are simultaneously both flexible and strict. That is, they can be used as theoretical building blocks of sustainable development research and sustainability science, but also as practical and strategy relevant visions and overall objectives that are used in strategic planning and management of all organisations and communities.

Unfortunately, most industrial ecology analysis approaches focus on currently known environmental impacts. Impacts are detailed and quantified. It is impossible to reach a consensus on such a detail level of numbers. Furthermore, many of the negative impacts man has on nature are still unknown to science. But surely we have enough scientific

information and results on the basic principles and underlying mechanisms, the causes of known and also of unknown negative environmental impacts. The four sustainability principles are particularly designed with this argument.

The term 'systematically' increasing

The terminology and expression 'systematically increasing' is insightful. This is in stark contrast to many existing rather absolute and exclusive approaches in sustainability indicators, tools and criteria. Systematic violation of sustainability principles means that the system in question is not inherently built, designed and structured to violate sustainability and contribute to unsustainability. The system must not increase unsustainability again, again and again here and everywhere. This does not mean the system cannot increase contributions to unsustainability temporally or in certain spatial units in order to avoid systematic violations of the four TNS principles/sustainability system conditions continuously and everywhere.

Backcasting

Backcasting from a desired future vision to the current situation to creatively outline a sustainable path from present to future, which leads to sustainability, is an innovative method. Most planning organisations still use forecasting. Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis, for example, takes the current situation as the starting position in the building of the future vision of the plan. The weaknesses and threats derived from these weaknesses limit creativity and ambition in the development of the vision. This is very true in such a new and unfamiliar subject as sustainable development in which many organisations lack experience, skills and confidence. I believe majority of sustainability scientist share the view that the transition and change required for world to be sustainable is big, paradigmatic, fundamental and discontinuous, not incremental, small and continuous (in terms of past and present trends of the development of the global society). Therefore, forecasting alone deriving the future solutions from past and present problems cannot be the sole approach in planning.

Strategic principles for sustainable development

Many industrial ecology tools such as MFA, SFA, LCA, MIPS or ecological footprints are strong in engineering and natural science-type descriptive science. But the strategic and prescriptive suggestion for how to actually move from analysis to action and to such action that can be implemented in the everyday of all organisations and communities is missing. The social science, business, management and organisational aspects of the question have been left to too little attention.

In FSSD, three criteria are employed to make the knowledge usable in practice. First, is a certain action in line with the four TNS principles? Second, is the action or the application of a tool 'keeping the door open' also for future actions and investments? Or does the measure lead into path dependency or technological 'lock-in'? Third, does the action create enough (economic or other) return on investment, i.e. to fuel and keep the process going?

With these simple criteria one is able to make surprisingly more sense in the application and use of many industrial ecology tools. The special issue of *Progress in Industrial Ecology* 'Strategic Sustainable Development' includes articles that address the theory, tools and instruments as well as practice of FSSD. We hope you the reader will provide responses to these individual contributions as well as to the message of the special issue as a whole. We encourage your responses for publication in *Progress in Industrial Ecology*.