TRENDS AND FUTURE OF SUSTAINABLE DEVELOPMENT

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BOOK OF ABSTRACTS

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WORKSHOP 1. SUSTAINABILITY INDICATORS

Chair: Jarmo Vehmas, Finland Futures Research Centre
Time: Thursday, 9th June, at 13-15
       Friday, 10th June, at 10.30-12.30 & 14.30-15.30
Venue: Lecture room B4115

1A. THURSDAY JUNE 9th

Cluster Analysis and Ranking of EU27 Countries Based on Selected Environmental, Economic and Social Sustainability Indicators

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This paper will present the main results developed within the Task 3.7 of the project SMILE. This task included a study where EU27 countries were grouped in terms of their sustainability performance, assessed by using a set of sustainability indicators belonging to the environmental, social and economic sector.

The grouping of the countries considered was carried out by applying hierarchical cluster analysis to the selected indicators, thus obtaining clusters for the environmental, social and economic dimension. The same cluster analysis was carried out also on a matrix which summed up the data of the three dimensions.

Sustainability performance was evaluated also through the calculation of aggregate indicators for the three different dimensions of sustainability, so that it was possible to rank the countries in terms of their performance.

The aim of this paper is therefore to present both the methodology used and the results of this cluster analysis, as well as those of the aggregate indicators created.

Climate Indicator with Stakeholder Assessments of Future Desired Emission Paths

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Norway’s sustainable development indicator for climate change displays historical emissions in relation to the Kyoto target. However, as we argue in this article, the climate change issue also involves other important aspects with respect to sustainability that would be relevant to include in the indicator. We present a climate change policy indicator that in addition to historic data are forward
looking by including business as usual scenarios, different assessments of recommended or desired future domestic emissions, and national or international commitments and agreements. We included data from a broad group from the Norwegian society. In this way, the indicator is inclusive and involves different interests and opinions on the desired future development that exist in society. This may increase legitimacy and acceptance for policies, and contribute to more discussions and processes on this issue. It may also contribute to make the Government’s sustainable strategy even more scrutinized by a broader public specter than what is the case today.

**Sustainable Development Evaluation Culture in the New EU Member States: Scope and Significance**

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*Purpose of the paper.* The aim of the paper is to investigate the development of the sustainable development evaluation culture of European Structural Funds in Lithuania, Poland and Bulgaria.

*Design/methodology.* The objectives of the research were achieved by using the following methodology. Two variable were identified: the coordination of the evaluation process and evaluation scope/significance. The indicators for the first variable are evaluation capacities and evaluation institutional structure. The indicators for the second variable are evaluation use and market. The on-sites visits were organized to the Poland and Bulgaria. The qualitative interviews were taken from the officials, academics and evaluators in both countries. In total 40 persons were interviewed. Secondary data was collected from the papers published by local scientists, official documents available at the government ministries and agencies web sites, other printed materials, e-mails to some experts from international organizations, who’s were not available during the on-sites visits.

*Findings.* There is lack of research about sustainable development evaluation culture of EU Structural Funds in new EU member states. The review of recent literature showed few dimensions that were analyzed during the last few years. Olejnizcak (2003) analyzed the development of evaluation culture in the context Polish regional policy development. Ferry and Olejnizcak (2008) provided useful insights about the use of evaluation in the management of EU programmes in Poland. Bienias, Gapski, Jakalski et al. (2009) examined the evaluation process of EU Cohesion Policy Funds. Nakrošis and Vilpišauskas (2005) provided the baselines for the evaluation function adoption in Lithuania. Knott (2007) made first contribution to understanding evaluation capacity perception in the Bulgaria.

The research findings are varied between the countries. Poland had made strong efforts in the development of evaluation function as tool for decision-making and better governance. Starting from the pre-accession programs PHARE as legal obligation, nowadays evaluation is used not only as tool for accountability and knowledge production but evaluation findings are used in the decision making on the different level of the government. By the same time Poland made significant endeavors in implementing decentralization of EU Cohesion policy that outcome to decentralize evaluation function. Although system is not working properly yet due to the different implications as lack of qualified human resources, quality of evaluation research, lack of relevant monitoring data but Poland can be good example for the future EU members how to make that evaluation really work for the decision-making and citizens well being.
Bulgaria is making her first steps in the development of evaluation function. Main experience was gained during the pre-accession PHARE program. Unfortunately the evaluation is still considered as legal obligation and there is not internal demand to broader use of the evaluation in the decision-making. There is evaluation infrastructure but the diffusion of evaluation knowledge was limited. The public servants have limited knowledge and evaluation still not so good acknowledge in the academic sphere.

_Research limitations/implications._ The research has limitation as evaluation field in the new member states is very dynamic and situation may change during the short period due to external pressure from European Commission or internal from government initiatives for result-oriented public management. However this paper has practical implication as can serve as practical guide for other member states or Poland benchmark for the Bulgarian civil services.

**Evaluation of Agricultural Systems across Time and Spatial Scales - An Extended LCA Approach**

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The overall goal of the present study is to find integrated patterns for and synergies among different approaches to complex system evaluation. In order to take into proper account the different methodological, spatial and time-scale perspectives, an extended LCA framework (SUMMA, _Sustainability Multi-scale Multi-method Assessment_), was developed and tested, with focus on the dynamics and performance of the agricultural sector. The study was carried out within the EU funded SMILE project, aimed at developing an integrated evaluation tool capable to take into account LCA, economic and social aspects and the identification of drivers for change and synergies. To better understand a productive system, the development of an integrated model able to take into account all the different aspects is crucial: energy and material flows, land use, rate of resources use, interrelations of socioeconomic and natural systems, among other parameters should be taken into account. In general, the economic performance is the aspect that policy makers and managers consider with more interest, due to its links to the employment and social parameters (economic and social sustainability). Nevertheless, a comprehensive evaluation cannot disregard the resource use and environmental aspects, that also contribute to shed light on the sustainability of the investigated sector or process by focusing on crucial factors such as energy consumption, material resource use and environmental integrity.

In order to fully test and validate the evaluation method, a complete LCA/SUMMA study of the agricultural sectors of Scotland and Italy at national scales was performed, and performance indicators calculated and compared. The same evaluation framework was applied to the agricultural sector of Lao People’s Democratic Republic (Lao PDR) in order to compare the production dynamics in a rural country (Lao) versus the performance of more industrialized ones (Scotland, Italy). Finally, national results were compared with results obtained by analyzing agricultural systems at regional and local scale and their time evolution in the last two decades was assessed, with focus on the major supporting resources and drivers of change.

_**Keywords:**_ life cycle assessment, agriculture, integrated evaluation
Biorefinery Implementation in Marginal Land - A Focus on the Multifunctional Use of Regional Agriculture

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The search for new sources of energy is leading to intensified use of available land for energy cropping most often in competition with food production. Recent studies showed that the land conversion from forest, savannah, grassland and abandoned land into biofuels crops leads to significant CO2 emissions from few to several hundred times. These evidences gave rise to a much deeper debate about pros and cons of such a business and its consequences on world agriculture, land management and food supply. The environmental, energetic, economic, technological and social aspects involved in cropping for energy were checked for feasibility and profitability within the EU funded SMILE project by means of an expanded LCA approach, named SUMMA, based on the consistent application of different assessment methods to the input and output inventory of local processes.

An alternative design for marginal land use in central-southern Italy was hypothesized by assuming marginal land to be cropped with Brassica carinata, a non-food crop, for biodiesel production from seeds and, at the same time, biochemical isolation from residues. A biorefinery concept based on traditional biodiesel generation and conversion of lignocellulose into chemicals through the so-called Biofine process (Bio Development Corporation, USA) was applied. In fact, the energy and environmental performance of Brassica biodiesel and heat generation from residues were found to be hardly suitable at the level of Campania regional agriculture, due to the fact that the economic cost of the whole process largely exceeded the value of the saved fossil fuels. If straw and oilseed cake meals are accounted for, in addition to the biodiesel production, then the performance results to be higher from an energetic point of view, but the economic and environmental performance (most of all the total emissions per ha) still make the process not fully satisfactory. Instead, if agricultural residues are exploited for the extraction of chemical building blocks (e.g. levulinic and formic acid) and biomaterials in general both the energy and the economic balance are improved, due to the high added value of biochemicals. The entire utilization of agricultural residues in order to extract both bioenergy and bioproducts within a biorefinery concept definitely improves the environmental and economic performance of biobased feedstocks.

Keywords: biorefinery, marginal lands, life cycle assessment, brassica carinata

Beyond the Indicator Industry? Use and Potential Impacts of Sustainable Development Indicators in National and EU Level

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Various sustainable development indicators and indicator sets have been developed in order to assess the progress towards sustainability at multiple levels and sectors. While most of the research and
development has concentrated on identifying, developing and refining indicators, relatively little research exists on whether and how the indicators are actually used and what influences and impacts may follow. The results so far suggest that the use is relatively scarce. We examine the use of indicators in assessing national and EU level sustainable development strategies based on document analysis and interviews of developers, practitioners, civil servants and other expected end-users. The results show that the previous practices of indicator development and institutionalized reporting mechanisms largely determine the current direct (instrumental) use of sustainable development indicators. This type of direct use of indicators appear to be confined inside the so called the indicator industry formed by indicator developers and actors obliged to use the indicators. Based on the results, key barriers of the use and possibilities to generate wider influences to the society are identified and discussed. This research is a part of EU FP7 project POINT (POlicy INfluence of Indicators).
1B. FRIDAY JUNE 10th

Finnish Food Sector Developing Methodology for Carbon and Other Footprints

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MTT in collaboration with Finnish food industry and retail are proactively developing national life cycle assessment (LCA) methodology and communication of environmental impacts of food products. Many international standards and guidelines are published but no common approved standard nor communication method are available.

The Foodprint -research programme aims to harmonise and develop calculation methods of footprints in the food sector taking into account current international development and best practices. The most challenging issues in the LCA methodology and inadequate requirements in the present international standards are looked into and developed further. Examples are specific data quality requirements for each life cycle stage, allocation rules in different situations, methodology to calculate climate impact of land use changes, and developing new updated emission factors for important emission sources, such as, energy production and denitrification of N2O from arable land. These issues are critical as they remarkably affect comparability and magnitude of LCA results.

In the closely related Climate Communication – research project different communication methods of environmental impacts are evaluated and the food industry is brought together for discussions to gain a shared view of product level environmental communication and labels.

Multi-Scale Integrated Analysis for Sustainable Policies: Romanian Socioeconomic Metabolism

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Multi-Scale Integrated Analysis of Societal and Ecological Metabolism (MuSIASEM) is a method developed in relation to the field of science for governance and it can be used to check the robustness and the relevance of models, datasets, and forecasting using integrated biophysical, economic, social and demographic analyses across different hierarchical levels and scales. The paper discusses Romanian exosomatic metabolism over a period of seven years (1999-2006) on five hierarchical levels with the focus on the analysis of industry-level data presented in correlation with microeconomic changes. The industry-level disaggregates the productive and commercial and public services sectors in specific industries. For example, we consider the following subsectors for the productive sector: mining and energy and manufacture and building. Similarly for the services and government sector we consider as subsectors: transport, public administration and other sectors. Each of these subsectors (except for public administration and other sectors) can be split further at a lower level. Structural changes in each economic sector, due to the transition from a centrally planned economy to a free
market with European Union membership, can be related to socioeconomic metabolic variations and the paper provides microeconomic details for specific industries to support this statement.

**Trends and Driving Factors in Finnish Forest Sector**

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The Finnish economy depended primarily on forest products as recently as 1980s. In the 1990s there was a remarkable transformation in the industrial structure, from a resource-based economy into a knowledge-based one, due to the growth of diversified electronics and ICT-related industries. Today Finnish forest industry companies are among the world’s largest forest companies.

Within SMILE project (Case Study 3.4 The Finnish Case Study: Analysis at the sectoral level of a developed economy) the Finnish forest sector was analysed extensively by using the DECOIN/SMILE toolkit prototype. The results obtained by the toolkit go deeper to the changing trends that the Finnish forest sector and especially the pulp and paper industry face today. SUMMA and MuSIASEM models suggest that the Finnish forest sector is shifting from local to global markets, they question the overall sustainability of Finnish forest sector and suggest that increasing efficiency increases the use of wood (Jevons Paradox situation). ASA model suggest that the environmental effects of forest industry were caused by increasing production volumes and other driving factors had decreasing effects.

**Supporting Sustainable Development: Using the SMILE Toolkit with Stakeholders in Scotland**

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The SMILE project explores how the DECOIN tool kit can support decision making for sustainable development. The SUMMA (Sustainability Multi-criteria Multi-scale Assessment) and MuSIASEM (Multi-Scale Integrated Analysis Societal Ecosystem Metabolism) tools were introduced to members of the Cairngorms National Park Authority (CNPA) to support their statutory duties under the National Park (Scotland) Act 2000. The CNPA are the ‘enabling authority’ that oversees the actions of government, agencies, non-governmental organisations, voluntary organisations, and private land owners who together manage the Cairngorms National Park, Scotland. The paper uses qualitative and quantitative data collected between 2008 and 2011. The initial barriers to using the tools were the staff time commitment; availability of, and access to, data; whether the CNP was a suitable exemplar for Scotland; and difficulties in understanding the technical language used. The evaluation of the tools once applied suggests that the main difference between SUMMA and MuSIASEM was that MUSIASEM was more transparent but SUMMA could answer particularly salient policy questions. The results illustrate how the social context influences the perceived utility and salience of the outputs from the tools. These results suggest certain preconditions for using these tools as part of sustainable development governance processes.
Sustainability Criteria and Indicators – A Tool for Strategic Urban Planning

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Urban planners work in the midst of many requirements and expectations. Not the least is the need to bring forth sustainable environment. The process of planning is often busy and the planner lacks tools to assess sustainability of different planning options. To enable this assessment sustainability criteria and indicators were developed in an interdisciplinary research project. The criteria were designed to be used for strategic decision making and impact assessment in middle sized urban regions in Finland.

Criteria enable discussion among stakeholders regarding questions:

• Which services and sustainability goals are prioritized and why (target setting)?
• How indicator values will change with certain scenarios and alternatives (scenario-working, comparison of planning options)?
• Have strategic objectives been obtained or is the development going to the desired direction (monitoring)?

Sustainability criteria comprise ecosystem services criteria as well as social and economic criteria. All three criteria sets together include 16 main criteria, 50 second order criteria, and 95 indicators. 47 of all indicators represent more than one pillar criteria, e.g. describe both social and economic sustainability. The indicators have been tested in two urban regions, Lahti and Oulu.

The criteria will be published in 2011 as a Finnish guidance book.

Trends of Finnish MFA and Future Prospects

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The unsustainable trends leading to overexploitation of environmental and natural resources that accelerate environmental hazards are a key challenge for EU environmental policy. A reduction in the quantitative exploitation of nature to levels, that ensure viability of ecosystems, is needed. An economy’s materials use can be monitored by economy-wide Material Flow Accounts (MFA) and it’s main aggregate indicators that act as proxies of the environmental effects of economic activities on nature.

To promote EU directive that tasks member countries to compile such MFA accounts during this decade, Statistics Finland conducted a Eurostat funded “Pilot study on economy-wide material flow accounts with hidden flows in Finland” project in 2009. Within the project methodological and practical working methods for compiling reliable Finnish Material Flow Accounts (FIN-MFA) were established. According to results in 1945, Finnish DMI was some 29.4 million tonnes, whereas in 2007 it was over 250.6 million tonnes. Likewise, the TMR grew from 51.2 million tonnes to 407.3 million
tonnes during the same period. Trends in both indicators have been constantly upward, no indication of dematerialization or immaterialisation.

“Walking in Other’s Shoes” – Experiences of Using the DECOIN Tools to Characterise Sustainability Trade-Offs in Scotland and the Cairngorms National Park

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The paper presents the experiences of using two of the DECOIN tools, SUMMA (Sustainability Multi-criteria Multi-scale Assessment) and MuSIASEM (Multi-Scale Integrated Analysis Societal Ecosystem Metabolism), to characterise sustainability trade-offs in Scotland and the Cairngorms National Park (CNP). The paper reflects on the strong theoretical basis of the two tools that provide for complex eco-social systems a coherent conceptual and methodological frameworks within which to understand better sustainability trade-offs. Translating theory into practice, particularly using tools and methods developed by others, however, remains a key challenge. The paper sets out the key challenges that were overcome in applying the tools and the compromises that had to be made both in terms of scope and depth of analysis. The paper reports the progress of the analysis of changes in the sustainability of the agriculture sector for Scotland and the CNP (1991 to 2007 using SUMMA) and the inclusion of land as a key intensity or extent variable within MuSIASEM analyses. Approaches to the communication of the SUMMA and MuSIASEM outputs for policy and practice audiences are also presented. The paper concludes that the DECOIN toolkit has significant utility in conducting theoretically coherent, practical for implementation and policy relevant assessments of sustainability trade-offs but that “walking in others shoes” is not always comfortable.

The Multi-Scale Integrated Analysis of Societal and Ecosystem Metabolism (MuSIASEM) Grammar: Theoretical Relevance and Practical Applications within Different Environmental Realms

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The MuSIASEM approach is a multi-purpose grammar capable of generating quantitative post-newtonian (no differential equations) characterizations of sustainability issues. It can represents a given issue of sustainability adopting a definition of “what the system is” and “what the system does” - chosen ‘a la carte’ by social actors - across different scales and dimensions of analysis, by keeping coherence in the quantitative results (Sudoku effect). Several applications developed in the SMILE project, are presented:

(i) a comparison of the evolutionary trend of a large sample of countries 1980-2007 showing the existence of a clear attractor in the trajectory of economic growth;
(ii) a comparison of EU14 1992-2005 showing the existence of clear benchmarks in the values describing the metabolic patterns of functional compartments of society;

(iii) examples of analysis of urban metabolic patterns using GIS;

(iv) examples of analysis of material metabolic pattern (water and waste).

UK Energy Sector Indicators – A Tool for Evidence-Based Policy in the Service of Sustainable Development?

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This paper presents the results from a case study on the role in policymaking of UK Energy Sector Indicators (ESI), launched in 2003. The case study was part of the EU-funded research project POINT – Policy Influence of Indicators (2008-2011). The findings are reflected against the conclusions from the other POINT-project case studies, and lessons are drawn concerning the design and the role of indicators in fostering sustainable development.

The findings show that 1) the ESIs constitute a very minor element within the broader evidence-base used by policymakers, and the ESIs and their objectives were poorly known even central players in the sector. Despite their very modest direct, instrumental use, the ESIs have produced impacts indirectly, through the processes of dialogue and argumentation both during the preparation of the indicators and after their publication as part of the annual reporting by the UK energy department. The findings highlight the multiplicity of partly mutually exclusive forms of influence from indicators, the potentially productive impacts of conflict in generating indirect influence, and the absence of a direct link between the influence and the scientific quality of the indicators. More attention is called to matching the “supply and demand” of the indicators, and to the general political and institutional context in which indicators are being produced and used.

How and How Much Can Forest Ecosystems Support a Sustainable Living in Industrialized Societies?

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Can forest ecosystems play an important role in support of the sustainable living of populations day-by-day more addicted to fossil fuels, in times of declining non-renewable resources? What is their carrying capacity concerning bioenergy and biomaterial supply as well as their ability to provide ecosystem services? Forests are claimed to be able to provide not only food, fibers, chemicals, construction materials, but also biomass as an alternative energy source as well as services of climate regulation, support to water cycle and uptake of emissions, not to talk of biodiversity protection.

Environmental protection is sometimes considered as competing with human activity and economic development. On the contrary, innovative concepts recommend environmental protection to be
achieved without banning human activities but instead developing appropriate management practices aimed at joint economic, social and environmental sustainability. The suitability of such practices must be assessed by means of appropriate evaluation methods that go beyond mono-dimensional measures and criteria.

In this study, we apply an extended LCA approach, SUstainability Multimethod Multiscale Assessment (SUMMA) to investigate the interplay of forestry and nature conservation activities, in order to explore the resource use patterns and the existence of biophysical constraints to economic development, if any. The SUMMA approach allows the parallel implementation of both “upstream” (Material Flow Accounting, Embodied Energy Analysis, and Emergy Synthesis) and “downstream” (Economic Analysis, as well as airborne, waterborne and solid waste generation and release) evaluation methods. The study was carried out within the EU funded SMILE project, aimed at developing an integrated evaluation tool capable to take into account LCA, economic and social aspects and the identification of drivers for change and synergies.

Our study deals with a selection of forest management practices and forestry activities in Europe in order to identify the resource investment needed for, and the benefits achieved from, joint environmental conservation and economic activity implementation, within the frame of a decreasing reliance on fossil fuels and the search for sustainable production and consumption.

**Keywords:** life cycle assessment, forest, integrated evaluation

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**Ecological Assessment of Developing Carbon Sequestration in Urban Terrestrial Ecosystems: Using Ecologically- Based Life Cycle Assessment and Geographical Information System (GIS) to Analyse the City of Shenyang, China**

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Carbon sequestration in urban ecosystems is becoming an international climate change initiative for sustainable development. This research reports upon the natural process of carbon sequestration from the atmosphere into urban ecosystems. The risks associated within carbon sequestration in urban ecosystems will be investigated utilising the analysis of ecological balance status and integrated climate policy with reference to the sustainable development of urban planning. The primary method of this paper is the ecologically-based life assessment of urban ecosystems relevant to tackling barriers for developing carbon sequestration. A Geographical Information System (GIS) tool will be used in the analysis of risk appraisal from the field of ecological distribution in urban areas. The collected data from a series of calculations related to urban ecological footprint, human appropriation of net primary productivity (HANPP) and industrial metabolism analysis prove that the risks to develop carbon sequestration are caused by ecological deficits, human activities and urban carbon cycle imbalance. The results from data show that a large amount of carbon dioxide will continue accumulating in the atmosphere. Consequently, the current urban terrestrial ecosystems are inadequate for reducing air pollution and achieving environmental sustainable development in the urban area of Shenyang, China. In conclusion a climate policy is proposed for ultimately reducing carbon emissions.
Keywords: Carbon Sequestration, Ecological Balance, Geographical Information System (GIS), Ecological Based Life Cycle Assessment, Ecological footprint
WORKSHOP 2. SUSTAINABILITY IN NORTH-SOUTH PERSPECTIVES

Chair: Hanna Kaisti, Mira Käkönen & Jyrki Luukkanen, Finland Futures Research Centre

Time: Thursday, 9th June, at 13-15
      Friday, 10th June, at 10.30-12.30 & 14.30-15.30

Venue: Lecture room B3110

2A. THURSDAY JUNE 9th

Sustainability in a Multipolar World

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The Club of Rome and the Brundtland Commission on Development and Environment have initiated an international momentum to secure the needs of both present and future generations through a joint policy agenda for sustainable development. Institutions such as the United Nations played a key role in developing multilateral agreements. However, the international landscape has gradually changed. More and more it appears to be characterized by national interests rather than multilateralism. In such a multipolar world the role of international bodies, such as the UN, is weakened and cooperative policies for common good issues become more difficult to pursue.

This paper raises the question what room exists for co-operative sustainability strategies. It offers an international comparison of sustainability policies of six countries (the Netherlands, China, India, Russia, South Africa and Mexico). The comparison reveals on what points there is international divergence or convergence in these countries’ visions and strategies regarding economic, environmental and social sustainability. Furthermore, it presents a meta-analysis of foresight studies in answering the question whether an internationally shared concept of sustainability is likely to emerge in the future. The paper concludes with recommendations for European policy-makers on how to effectively pursue a sustainability agenda in a multipolar world.

Copenhagen Failure and North-South Dynamics

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The North-South clash plays a crucial role in climate negotiations, forming agreement-preventing obstacles between developed and developing countries. These barriers contain eg. questions about South's right to financial compensation and fair burden-sharing in emission mitigation. In this paper, I
present the main results of my master's thesis in which I analyzed the most important Copenhagen Climate Convention's speeches, in relation to the mentioned obstacles and the clash between North and South. Analyzed speeches include the United States, China, the Climate Group, the African Union and Zimbabwe. I will argue that the tension concerning development issues is evident in the speeches and that the "Copenhagen failure" was built already in these speeches. In conclusion I shall discuss how this kind of rhetorical analysis provides understanding that can help the opposite sides to converge in their opinions and researchers to approach the North-South dynamics from rhetorical viewpoint.

Prospects of Deliberative Global Governance

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Global governance is often equated with international institutions such as the United Nations and the World Bank that were established after World War II to address problems transcending national borders. While these institutions incorporate norms of representative democracy that evolved in national societies, their legitimacy is often questioned on grounds of limited effectiveness and remoteness from the citizens they purportedly serve (Bexell 2010). The arguments of many democratic theorists (e.g., Dryzek 2006) that deliberation among ordinary citizens can generate unique opinions and legitimize policies that heed these views thus bear important implications for global governance.

The world’s first global deliberation, World Wide Views on Global Warming, was held in 38 countries on all inhabited continents in 2009. In this paper we address: (1) the main successes and challenges of this project based on case analyses from WWViews sites around the world (Rask, et al., 2011); (2) the picture of democratic expectations that emerges from the 488 recommendations that citizens developed using their own ideas and words and that were submitted to their national delegates to the 2009 UN climate summit in Copenhagen; and (3) the factors that are critical in the future shaping of global deliberation practice.

References

Sustainability of Solar Power: Objectives and Implementation of World Bank’s Off-grid Program in Laos

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Current trends in energy supply and use are unsustainable – economically, environmentally and socially. Without decisive action, energy-related emissions of CO2 will more than double by 2050 and increased oil demand will heighten concerns over the security of supplies. Alternative energy solutions replacing fossil fuels are needed. At the moment solar power meets only a tiny fraction of the world’s electricity needs, but International Energy Agency (IEA) has predicted that this could change in the next decade. According to the IEA solar power could produce nearly 25% of global electricity by 2050. Solar energy is considered to be extremely promising, especially in countries with optimal access to the sun’s rays – and very little other resources. As a result, several development assistance organizations and multilateral development banks are funding solar panel programs in developing countries. It has been argued that solar power is the best choice for sustainability and renewable energy in developing countries, especially in the very remote locations where electricity grid extension is unlikely in the near future. Unfortunately solar panels have not always been proven a panacea as it was hoped for. This paper is a case study of one solar panel program, and it explores the objectives and implementation of the World Bank’s solar panel program in Laos, Southeast Asia. Based on expert interviews and village-level fieldwork, the paper analyses the gap between the electrification and poverty reduction objectives defined by the World Bank, and the challenges of the actual implementation of the program.

Keywords: solar panels, renewable energy, Laos, World Bank

Integrated Water Resources Management (IWRM) – A Paradigm to Sustainable Development in Lao PDR?

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There is a growing consensus that an approach of Integrated Water Resources Management (IWRM) which includes elements of equity, participation, coordination, sustainable development and inclusiveness can act as the way forward for efficient and sustainable development and management of the limited water resources and for coping with conflicting demands. The Lao PDR among many other countries faces a challenge in improving the planning and management of water resources, in line with the approach of Integrated Water Resources Management at the same time as strong water resource development by various sectors is taking place. The aim of the paper is to analyze the IWRM processes in Lao PDR using the recently developed Management and Transition Framework (MTF) which can provide an improved and interesting framework to analyzing water resources management processes and complex multi-level governance regimes building on and integrating institutional
analysis, adaptive management, as well as social learning and governance. The paper also discusses about the challenges and problems concerning the IWRM implementation towards sustainable development in Lao PDR.
2B. FRIDAY JUNE 10th

The Role of Legislation and Policies in Promoting Ecological Sanitation: Case Zambia

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The aim of this paper is to analyse how ecological sanitation (ecosan) is considered in Zambian legislation and policies and the prospects of ecosan in the current political environment. The term ecosan means sanitary methods which facilitate the recycling of human excreta back into the soil preferably in the form of fertiliser.

Zambian legislation does not mention ecosan specifically in any way. The sanitation legislation is written rather generally, and the legislation on fertilisers does not specifically disallow utilisation of human waste. On the policy level, sanitation is often seen as a housing and health issue, while environmental and sustainability perspectives are left out entirely. Overall, the ministries have varying interests, which leads to uncoordinated and conflicting policies.

In practice ecosan is used by communities, though the method is not widely accepted. Theoretically, ecosan is supported by authorities but because the decision making process is widely decentralised, the responsibilities have become unclear. Ultimately, the result is a continuous cycle of policy and practice affecting each other without change and with little regard to the multidisciplinary nature of governance. To break the cycle, the policies ought to conform to the practices in order to promote and ensure safe and sustainable sanitation.

Keywords: ecological sanitation, legislation, Zambia

Developing Tibet into a Special Sustainability Zone of China?

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China has developed many Special Economic Zones (SEZs), such as Shenzhen, Xiamen, Shantou and Zuhai, and several countries (e.g. Brazil, India, Pakistan, South Korea, North Korea and Russia) have followed its example. China could also take a lead in developing Special Sustainability Zones (SSZs). Sustainability integrates economic, social, cultural and environmental sustainability. China is already experimenting the integration of economic and environmental sustainability in Jilin where a Low Carbon Zone (LCZ) is piloted. Becoming one of the world’s superpowers China needs to address also the social and cultural aspects of sustainability in addition to its economic and environmental aspects. What could be a better place to start than Tibet, the focus of global interest and yardstick of China’s willingness to cooperate internationally? Turning Tibet into a Special Sustainability Zone would enable the meeting China’s and Tibetan people’s needs simultaneously: (1) physiological needs: water, food and energy; (2) safety needs: sovereignty and peace; (3) social needs: good relations and cooperation with others; (4) esteem needs: respect by/of others; (5) self-actualization needs: morality and
creativity; and (6) self-transcendence needs: united consciousness. This paper drafts a plan for developing Tibet into a Special Sustainability Zone, which attempts to ease the politically charged situation.

Gendered Impacts of Conservation Agriculture among Smallholder Farmers in Zambia

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Conservation agriculture (CA) is claimed to potentially optimise crop yields and profits while maintaining a balance between agricultural, economic and environmental benefits. Several donors are supporting CA in developing countries like Zambia. Few studies have addressed gendered effects of CA. The paper assesses gender dimensions among smallholder farmers under CA Project (CAP) in Zambia. Focus group discussions, key informant interviews and questionnaire survey were used. Results indicate that women and children have experienced reduction in labour with respect to clearing of fields before tillage, reduced labour during weeding where herbicides were used and an improvement in household food security. Men’s labour increased with herbicide use. Digging of conservation basins is labour intensive and the chaka hoe is heavy for women. CA increases labour for women more than men during weeding without herbicides use. Results suggest that herbicides are necessary but several constraints contribute to their low usage. Use of Atrazine in CA raises concerns as to what extent CA is environmentally sustainable. Interventions on CA approaches need to be both gender sensitive and eliminate tradeoffs between socio-economic benefits and environmental sustainability by using environmentally friendly herbicides and weed control methods.

Keywords: gender, smallholder farmer, conservation agriculture, Atrazine, Zambia

“Just Begin”: A Case Study in Creating Experimental Spaces in a Time of Transition

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The Barbets Duet (named after tropical birds that sing in duet) is a twenty-year experiment to create the market mechanisms and institutional arrangements that will support people who support the natural world. The founding partners are working with two knowledge systems – African and Western, traditional and modern – to create the social/ecological institutions they need to adapt to a changing world. This engagement has already redefined the North/South relationship and its underlying assumptions and throws new light on this difficult issue.

The experiment began in seven learning sites in five countries (five in East Africa, one each in the United Kingdom and USA) and was started by a small group of people who first worked together to create future scenarios stories for East African societies.
This case study will describe the evolution of the Barbets Duet idea from futures work in East Africa to the early progress of the learning sites. The results of these initial experiences will be used to see what policy proposals might be emerging from the experience of developing the concepts and practices of the Barbets Duet.

**Global Governance of Water Security in Agro-Food Value Chains and Networks**

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This study investigates the sustainability of water security and the global political economy of agro-food value chains and networks. As agriculture is the biggest water user sector, it is emphasized that crucial decisions regarding water security are made by farmers managing irrigation efficiency with different techniques and water endowments, by traders sourcing from farmers in different parts of the world, by processors branding their products, by retailers setting value standards to their brands and by the consumers buying the products.

However, as power in the global value chains and networks is concentrating in the hands of few conglomerates of transnational corporations and state-led enterprises especially from China, there are stark asymmetries in decision making between different parts of the agro-food system in the global “South” and “North”. The findings of the study suggest that the growing water security risks may further change the dynamics of the agro-food system for the benefit of the powerful bargaining actors. Hence, in order to ensure sustainability of water security from local to global level, actors of the agro-food supply chains and networks need to be brought under greater stakeholder scrutiny and interaction in the context of global water governance and just international trade.
WORKSHOP 3. SUSTAINABLE CONSUMPTION

Chair: Markus Vinnari, University of Eastern Finland
Time: Thursday, 9th June, at 13-15
Friday, 10th June, at 14.30-15.30
Venue: Lecture room B3109

3A. THURSDAY JUNE 9th

How to Revise the Concepts of Economy?

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As the topics of the conference suggest, we should find contents for what ‘development’ is within the context of ‘sustainability’. Following the Critical Theory tradition, adjusted into the present, I would like to contribute with a somewhat ‘dissident’ presentation.

At first, the connection between the terms ‘development’ and ‘growth’ should be cut: the former does not mean the latter, nor vice versa. Another distinction to be made concerns the terms ‘GNP’ and ‘welfare’. GNP measures all (material and immaterial) things on the basis of their exchange value in the market, not their use value in the practices of the final consumer. At worst, more and more things produced do not increase (local and/or global) welfare, but rather decrease it.

Worldwide ability to produce enough is no problem any longer. In consequence, we should concentrate on demand as the main issue, instead of supply. I will suggest some theoretical novelties within the context of consumer behavior theory. Self-critical consumers are the potential agents of social change in the consumer society. The following questions should be asked (and finally answered): How to change practices that are too consumption intensive? How to reject the ‘Veblenian effect’ in the practices of consumption and, instead, enlarge (social) usability of goods?

Sustainable Consumption, Citizen-Consumer Positions and Farm Animal Issues

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The discussion concerning sustainable development has tended to focus on environmental, social and economic dimensions of sustainable development, while less attention has been given to what sustainable development can mean in terms of humans’ ethical relations with animals. However, as human societies are increasingly based on the utilisation of growing amount of animals in ever more intensified ways, there is a need to discuss how more ethically sustainable futures could be created. Consumption has become a pertinent issue in both the areas of environmental protection and animal
ethics as there has been a growing acknowledgement of the major environmental and ethical impacts of current consumerist lifestyles. At the same time consumption has become a strengthening public arena of activism and a form of political participation.

Based on a nation-wide survey study carried out in Finland (n = 1896), we analyse in this paper what kinds of citizen-consumer positions can be identified in farm animal welfare/rights issues. It will be shown that although the majority of Finnish respondents do not define consumption as an active political arena through which to influence farm animal welfare, there are one fourth of citizens that express willingness to act on animal welfare issues through consumption practices. We conclude the paper by discussing how different citizen-consumer positions should be taken into account in the societal endeavours to promote pro-animal consumption practices.

Towards Sustainable Society - Transforming Materialistic Consumerism

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The mankind has faced three regimes: hunter-gatherers, agrarian societies and industrial society. Transition towards sustainable society will be the next regime. It means a fundamental re-orientation of society and the economy which is based on knowledge, thinking, value, attitude and behavior changes. Finnish university students (n = 198) assessed their attitudes and achievements in implementation of Sustainable Development (SD) in their daily life. The data were collected using a theory-grounded semantic differential technique that is an improvement of the semantic differential rating scale. A measurement instrument was created by balancing 33 variables of ecological, economic and social sustainability. The variables were indicators of attitudes and behavior. Post-materialistic behavior was operationalized as follows: (a) importance of owning is decreased, (b) services are used instead of owning goods and (c) renewal of goods is motivated by real needs. Performing of logistic regression analysis found that the difference with the most and less post-materialistic way behaving groups was statistically significant in the following attitudes: health-promoting lifestyle, recycling, organic food, water conservation, maintaining of civil society, favoring the eco-labeled products and using renewable energy resources. These themes are discussed in the paper and the model of sustainability promoting lifestyle is created.

Maximum and Minimum Consumption – Two-Dimensional Approaches in Defining a Decent Lifestyle

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A decent, or sufficient, lifestyle is largely considered an important objective in terms of a sustainable future. However, there can be strongly varying definitions of what a decent lifestyle means. From a
socio-economic sustainability point of view, a decent lifestyle can be defined as the minimum level of consumption ensuring an acceptable quality of life. From an ecological sustainability point of view, a decent lifestyle can be defined as a lifestyle that as a maximum consumes an amount of natural resources without exceeding the long-term carrying capacity of nature.

The paper presents the natural resource consumption calculated for a number of decent lifestyles defined by a consumer panel of the Finnish National Consumer Research Centre for people of different age and gender. The natural resource consumption is calculated on the basis of the MIPS concept (material input per service unit). The results show that the natural resource consumption based on the decent lifestyles is lower than the one of the average consumer. However, the resource consumption is still higher than long-term ecological sustainability would require. The paper discusses this discrepancy and suggests steps for making future lifestyles more sustainable both from an ecological and a socio-economic point of view.

**Sustainable Consumption Policy – Real Life Impact, Ambition and Potential**

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Sustainable consumption is not a new field for political action in itself – in fact, it has been on the political agenda since at least the Rio Earth Summit in 1992. However, sustainable consumption has rarely been examined as a separate policy field with very specific ambitions and characteristics that require an integrated policy response across several governmental scales if the problems linked to (over) consumption and production are to be successfully tackled.

The paper presents the empirical results of a three-year European research project which has examined current consumption trends, conducted a comparative analysis of a large range of case studies covering all regions of the EU, and developed scenarios for future impacts of integrated instrument bundles in the field of sustainable consumption. The paper discusses factors of success and failure that explain limited success in promoting sustainable consumption so far and draws lessons for future policy design and implementation in the EU. In conclusion, the article suggests ways in which we might have to reshape our ambitions and assumptions as regards sustainable consumption policy if steering consumers towards more environmentally premised and socially equitable behaviors is to be at all possible.
3B. FRIDAY JUNE 10th

Nudging Consumers towards Sustainable Consumption

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A recent and widely acclaimed book by Thaler and Sunsten (2008), *Nudge*, presented a new approach to promoting more sensible consumer choices – in the authors’ words, “Improving Decisions about Health, Wealth, and Happiness”. This approach was not totally unknown in the field of social marketing for sustainable consumption, but the publicity gained by the book made “Nudge” the new catchword for promoting sustainable consumption. The key argument is that many decisions are made automatically, without much reflection, and consumer choices can be improved by better “choice architecture”, i.e., by reorganizing the way choices are presented to the consumer.

We examine the key concepts and recommendations of *Nudge* in the light of two case studies of policy instruments to promote sustainable consumption in Finland: Sustainable Public Catering and Energy Expert. These are both schemes that aim to reframe the decisions of consumers – albeit in very different ways. Drawing on extensive interview, focus group and documentary data, we examine what features of “Nudge” policies are visible in these instruments, to what extent they go beyond merely “nudging”, and thus contribute to a discussion on the opportunities and constraints to using “Nudge” as general approach to promoting sustainable consumption.

Household Food Waste in Finnish Food Production Chain

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Minimizing food waste is a part of food chain responsibility. The reduction of the amount of food waste is crucial for mitigating the environmental impacts of the entire food chain. According to several researches conducted in Europe and USA consumers produce more food waste than any other actor in the food chain. However the amount of food waste in Finnish production chain has not been studied much yet. This paper presents the results of Finnish household food waste study.

The research data was collected by monitoring the actual amounts of food waste occurring in 380 Finnish households. Households kept two weeks food waste diary where the amount and the type of food waste as well as the reason for the generated waste were written down. The data was analysed using descriptive statistics, crosstabs, and bar charts. Linear regression model was applied to find statistically significant results and dummy and dichotomous variables were formed to include qualitative information into the model.

According to the results an average person produces annually 23 kilos of food waste. The main food waste categories were vegetables (19%), homemade food (18%), dairy products (17%), bread and
other cereal products (13%) and fruit and berries (12%). The main reasons for food waste were: food was spoiled/mouldy, best before date was expired, plate leftover, or too much food was prepared. According to the statistical tests, the following background factors affected the amount of food waste: the size of the household, gender of the grocery shopper, daily recycling of organic waste, appreciation of low food prices and potential to reduce food waste. Moreover, storing food in right temperature and opening new packages after finishing the old ones were valued as the most concrete food waste prevention methods.
WORKSHOP 4. SUSTAINABILITY AND THE SOCIETY

Chair: Francesca Allievi, Finland Futures Research Centre  
Time: Friday, 10th June, at 10.30-12.30 & 14.30-15.30  
Venue: Lecture room B3111

Sustainability as a Goal and Outcome in Finnish Basic Education

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Sustainable development is widely recognized as a prior task for societies in the 21st century. Education once again seems to serve as a prior vehicle to reach the ambitious goals of sustainability. Such goals can also be found in Finnish National Core Curriculum for Basic Education. The Core Curriculum is a frame for local municipal and school level curricular processes. This study is based on field research material collected during last curriculum renewal process in 2001-2005 and resent outcomes in the city of Oulu. Local education strategy emphasized the importance of student participation in school and in community. Participation was also one of the key values in organizing the process. Members of school staff, pupils and parents were seen as stake holders in future oriented school improvement process. In the written output of the process, the local curriculum, sustainable development was seen as combination of environmental education and education for citizenship. Resent outcomes, such as childrens’ city council and school certificates of sustainable development show that the values of sustainability were not just empty words. This is a remarkable result of a process where strong neo liberalistic values like individualism and short term economic outcomes were identified.

Governance and Institutions for Sustainable Agricultural and Rural Development in Bosnia & Herzegovina

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Governance analysis focuses on institutions and structures dealing with decisions making and implementation. Governance influences agro-rural development policies impacts on rural livelihoods. Rural economy in Bosnia & Herzegovina (BiH) is increasingly diversified but still has a strong agricultural character. This paper aims at identifying the main public and civil society institutions dealing with agro-rural development policies in Republika Srpska (RS) and BiH and at analyzing relationships and linkages between them and with international organizations. Recommendations have been made to improve coordination between involved institutions. Paper is based on primary
information collected by questionnaires and semi-structured interviews carried in summer 2010 with representatives of public and civil institutions as well as an extended secondary data analysis. Vertical coordination between State level institutions with entities, cantons, regions, municipalities and non-state actors, especially civil society ones, is still particularly challenging in BiH. Coordination between the State Ministry of Foreign Trade; Ministries of Agriculture, Forestry and Water Management (MAFWM) of RS and Federation of BiH and the Department for AFWM of Brcko district is crucial. Participation of civil society organizations in rural development policies design and evaluation should be encouraged. Effectiveness of vertical coordination also depends on horizontal co-ordination at RS and FBiH levels.

**Key words:** governance, rural development, Republika Srpska.

**Wrong Policies and Negative Development: Anti-Sustainability**

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After the Islamic revolution in Iran 1978, the motto of justice for all became the rubric of governments in different aspects of life. As most of the population lived in rural areas having suffered from poverty, ignorance and lack of facilities, the attention was paid more and more to these areas to balance the distribution of wealth and resources. In the first attempts, there were built roads from the cities towards the village to facilitate the transportation and transmission of agricultural goods and products. Meanwhile, the focus on education necessitated the governments to establish rural schools and send teachers from cities to villages to teach. The establishment of health centers and local hospitals in the villages was among the initiatives performed nation-wide to spread health for villagers. Everything on the paper was straight and true. After a decade, there appeared great problems for all of the population and the government. In fact, the policies of government in the realm of sustainable development for rural areas became destructive and the trend of development became reversed. Most of the villagers found the village intolerable and tried to find a position in the cities in the hope of a higher status. On the other hand, allocation of university seats for remote area dwellers and villagers pushed a lot of students toward the cities. These persons never dreamt of returning to their village to continue their parents’ occupation and practically the farms and villages became deserted. Supportive policies of governments in medicine and education could not solve the problem and the trend of migration from villages to the cities grew faster than ever. Rural population became less and less and agricultural system underwent a great harm. The only thing which could be in favor of development was a transition from rural architecture toward luxurious life and buildings which had no compatibility with traditions. This paper scrutinizes the trend of social development toward the sustainability in rural areas of Iran in three decades.

**Keywords:** agriculture, development, education, facilities, villagers
Land Use for Energy and Food Production – Challenges of Case Studies Analysis

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Global land use is becoming increasingly competitive because of population growth, economic growth and climate change mitigation actions. More agricultural land is required to produce food for the growing populations, while rising living standards increase the demand for meat. At the same time vast tracts of land are reserved for bioenergy production to fight climate change. Land is becoming a scarce resource and integrated land use planning becomes increasingly important. However, food and energy production are not always competing for the same land resources and also synergies exist. Profound understanding about the patterns of land use for food and energy production at different spatial and temporal scales is needed in order to develop sustainable land use planning methods and tools. This paper analyses the role of practical case studies in the development of Spatial Decision Support Systems based on GIS (Geographical Information System). The selection criteria for different kinds of cases of land use and the challenges of case study selection are discussed. The framework derived from these criteria is also presented.

Policy Reforms for Sustainable Development Implementation

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In 1987, the World Commission on Environment and Development put the concept of sustainable development on the international agenda. However, more than 20 years later, in spite of significant scientific contribution to the theories of sustainable development, there is still a Huge Gap between theory and practice of Sustainable development that is confirmed by accelerating environmental and socio-economic problems worldwide.

This research is focused on analyzing the contemporary environmental (climate change, natural resources depletion, biodiversity loss) and socio-economic problems (gap between rich and poor) on the global scale to identify their major systemic socio-cultural roots (e.g. inadequacy of institutions, global economic, ecological and cultural injustice, quantitative economic growth and over-consumption of natural resources). However, the present policy making is still giving priority to economic growth (that is unsustainable ecologically due to the natural thermodynamical laws) to solve socio-economic and environmental problems instead of limiting economic growth and more fair income distribution.

Therefore, the specific institutional (eco-villages and settlements), economic (eco-taxation, full cost pricing, changing consumption and production patterns), technological (eco-efficiency, “green” energy) and socio-educational policy reforms are developed to reduce the gap between theory and practice of Sustainable development.

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As society continues its pursuit of sustainable development, the importance of resource efficiency and waste management has become increasingly recognised. As a consequence, a number of European policies implement the concept of life cycle thinking in order to reduce the negative environmental impact of waste management systems. The benefit of life cycle thinking is that its holistic perspective allows one to account for the environmental impacts/benefits of not only the waste system but connected systems, such as energy and material production. However, the current use of life cycle thinking in waste management policy and long-term strategy has been called into question regarding its ability to facilitate a transition toward sustainable waste management.

This paper presents a conceptual framework for the use of life cycle thinking as a tool in sustainability transitions. It draws on the multi-level perspective (transition theory) and the concept of conventional regimes (economics of conventions) in order to give a new perspective on the relationship between life cycle thinking and sustainable waste management.
WORKSHOP 5. SUSTAINABLE CULTURE

Chair: Katriina Siivonen, Finland Futures Research Centre
Time: Thursday, 9th June at 13-15
Venue: Lecture room B3118

Conditions of Cultural Sustainability: Cultural Creativity and Collective Culture

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Basically all human activities with their material and immaterial products are culture. One central tension between different definitions of culture exists because, culture is seen on the one hand as individual, free and creative self-expression and on the other hand as responsible and collective order.

According to current definition, the creative, individual based interaction process is one basic quality of culture. Thus it can be seen as the primary object for safeguarding in culturally sustainable development. In addition, common value based cultural constructs are to be safeguarded. These constructs can be for example elements of distinctive local culture. In definition and selection of these, empowerment of all people is a central principle in terms of culturally sustainable development.

Concerning cultural sustainability, I will have empirical examples from the project ‘Storm’. It is a Finnish national project where artistic activities are considered as a source for empowerment for especially marginalized young people. How cultural creativity and collective cultural order support well-being and positive futures images of young people in their own localities?

Drivers and Barriers to Sustainable Development: An Historical-Futures Perspective (Case Study)

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This paper is based on research done at the University of the Sunshine Coast, Australia in 2009-2010 on cultural learning at times of environmental and social stress. The focus of this research was on how adaptive capacity was enabled or constrained by social and cultural dynamics at work in any historical context. Culture is framed as a human adaptation to the insecurities present in the environment.

I propose that there is a lot of evidence that cultures and their traditions can respond positively to environmental stress. Climate change is just another of many challenges that humanity has faced. However history also demonstrates that there have been catastrophic failures to adapt so we should not be comfortable in the present but we can be hopeful.
The paper will identify a set of drivers identified from a survey of 33 historical cases and make an argument for using historical experience in the form of historical scenarios in workshops that engage with stakeholders, particularly those who are resistors.

**Design and Implementation of Sustainable Development Program for Trade Union of Education in Finland**

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Trade Union of Education in Finland (OAJ) represents teachers at various school levels and educational institutes, ranging from day-care center teachers to lecturers in universities and vocational school teachers. In Finland the education is considered as one of the most important assets for handling the future challenges such as sustainable development. Therefore OAJ is taking an active role as a promoter of sustainable development in field of education. As a practical measure OAJ is now creating a sustainable development program which will be implemented in its activities and policies. The program is divided into three different sections or sub-programs which are **Organization activities**, **Education and salary politics** and **Sustainability** support for the teachers and the local teachers’ unions.

The aims of **Organization activities** are a) to reduce the ecological footprint of the organization to a sustainable level and b) to transform (or to strengthen) the organization to be a socially strong and innovative workplace.

The aim of **Education and salary** politics is to transform the national education politics to promote and empower schools and educational institutes to be socially, culturally and ecologically sustainable societies.

**Sustainability** support will provide the teachers and the local teachers’ unions guidance, advice and education for social, cultural and ecological development of their own work places and local societies.

**Measuring Environmental Sustainability among Universities**

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Purpose: To measure implementation of environmental sustainability concept and commitment to declarations for Higher Education and sustainability among universities. To analyze the current status and trend and providing a set of indicators for institute to assess environmental sustainability in their own institutes.

Design/ Methodology: Based on university’s function model, declarations for Higher Education and Sustainability and previous studies, 50 indicators have been designed to measure the commitment to environmental sustainability in 25 universities all around the world.
Findings: The matrix shows the assessment of implementation of environmental sustainability in different universities. Finding shows different trends in main functions of universities with regard to environmental sustainability. It address the issue within Governance, Education, Research, Operation and other related activities.

Practical Implications: This project has provided a set of indicators which can measure environmental sustainability in any university, to benchmark sample universities and provide best practice in order to implement Environmental sustainability at the universities.

Keywords: environmental sustainability, higher education, sustainability measurement, benchmarking

Designing Sustainability Together – Disciplinary Competences in Transdisciplinary Knowledge Building

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In Sustainable Design transdisciplinarity has become "a label for collaborative research" that crosses over disciplinary boundaries and sectors of society (Bruun et al 2005), gradually deepening the integration in communication and knowledge between the participants (Hukkinen 2008). In this process the ability to understand disciplinary frameworks for problem setting and analysis becomes important, because without a mutual understanding and agreement on visions and scenarios true progress cannot be made (Kohtala and Marttila 2010).

This paper looks into how students in design, engineering and business approach sustainability, and explores the differences between disciplinary approaches and understanding. Data is gathered with questionnaires and interviews from students and professors in a new multidisciplinary masters’ programme called Creative Sustainability (CS), which started in Fall 2010 in Aalto University. The programme’s curriculum has strong emphasis on collaborative courses and real-life cases, and as such it represents a good case to study transdisciplinary knowledge building.

According to earlier research, the key elements in collaborative design process can be found from the ability to balance between different dimensions, issues and roles that are related to the problem context, and between hybrid and disciplinary identities, requiring collaborative and synthetic skills. This text seeks to further define the necessary emphases and focus points, to improve transdisciplinary collaboration.

References
Innovative Fiscal Policy in the Context of Sustainability

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This contribution addresses the question of what are the main constituents of an innovative fiscal policy in the context of sustainability. We apply the concept of sustaining and disruptive innovation to fiscal policy. On the one hand, innovative fiscal policy is able to be sustaining whereby public finances will incrementally improve without leaving its decisive structure. On the other hand, innovative fiscal policy should be disruptive as well in the context of long term sustainability, whereby the structure of public finance can be profoundly restructured as a reaction to future challenges. We use Finland’s past-experience in order to ravel out the major characteristics of such fiscal policy behaviour. This behaviour might be regarded as innovative characterised by the necessary holistic vision and the ability of the coalition government to intelligently intervene. We also shed light on the key sources of the expansionary consolidation that emerged in the aftermath of the fiscal adjustment in the early 1990s. We emphasise that innovative fiscal policy is more likely to be associated with sustainability in the future.

Impact of Fiscal Policies Changes on the Budgetary Revenues and Sustainable Economic Growth

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This paper presents the theoretical background of a Social Accounting Model for the Romanian economy, used for estimating and forecasting the main indicators of the NIPA system, Balance of Payments, Government Accounts and Monetary Survey.

In particular, the paper focuses on various scenarios concerning the budgetary revenue forecasts and economic growth in the Romanian economy for 2011-2012 in relation with the fiscal policies.

For each of the alternative scenario the direct effects of the fiscal policy (budgetary) and the indirect effects (economic growth) are measured. If the direct effects are purely accountancy results of the new taxation quotas, the indirect effects consist in the influences of the new fiscal policy on the new macroeconomic indicators and the impact of such changes on the budgetary revenue.
Analysing Drivers of and Barriers to the Sustainable Development: Hidden Economy and Hidden Migration

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The actual global crisis seems to influence negatively the sustainable development in EU countries. At least partially the informal economy escapes from the official registered GDP and hidden migration from the official demographic statistics. This can affect in a significant way the measurement of sustainable development and consequently policies in this field. Coming from general accepted findings of the theory, we concentrate on evaluating the reasons of agents to be involved in hidden economy and estimating the size of this part of economy. Today, there are evidences of a tendency to extended hidden migration together with an increasing official migration usually from eastern EU members to western countries. In a sense, hidden migration could be in relation with informal economy. Using some indirect procedures, we try to estimate the size of hidden migration and the overall impact of the hidden economy and migration phenomenon on the official side of economy and its potential growth in the future. The main application of the developed methodology in this way will be in case of Romania. However, in order to extent certain conclusion, other EU countries are investigated.

Key words: informal income, inactive population, emigration potential, hidden migration

Future Trends of Genuine Welfare in Finland

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The fact that the growth of world population is set to continue connected to calculations that the exploitation of natural resources and environment already exceeds greatly the carrying capacity of the global ecosystem, means that available environmental assets per capita is rapidly declining in near future. Thus, we should be able to increase the eco-efficiency of material commodities production in an extent that guarantees at least current level of wellbeing for everyone. Due to fact that the current economic and political systems still foster unsustainable extensive economic growth, we need new societal goals and relevant measures for steering societies and economies towards this goal.

In Statistics Finland we have adopted The Genuine Progress Indicator (GPI) to Finnish data for period 1945 -2009. The results show that the economic growth measured by Gross Domestic Product (GDP) has not improved the economic well-being of people in Finland since mid 1980’s. Results imply that GDP is today a poor indicator of welfare in post-industrialised countries. There exists a need to develop new measures to guide economic and social policy making.
Microsimulation as a Tool in Developing Interregional Input-Output Tables; a Case-Study of the Cairngorms National Park in Scotland

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Input-output analysis is a tool that is used all over the world. It focuses in general on monetary flows within an economy to get a better understanding of relationships and interconnections. Almost every country develops national input-output tables on a regular basis. Increasingly, we are interested in inter-regional relationships, for example between countries, but also between regions. Modelling flows of products, in terms of imports and export at a national level is generally not very difficult because data from customs can often be obtained. However, collecting data of trade flows between regions is much more difficult. In general, either statistical information or a combination of survey and statistical information (hybrid methods) is used to get an idea of interregional relationships. In this paper, we propose microsimulation as a tool in simulating local trade, as well as local flows of labour that is necessary to develop a local interregional input-output table. In addition, we also include environmental data in our models, such as land-use and CO2 emission. We will use micro-data collected through questionnaires to simulate both the households and the firm population in a spatial explicit way. Our aim is to develop a three-region interregional input-output table for the Cairngorms national park, Scotland and the UK.
WORKSHOP 7. CORPORATE RESPONSIBILITY

Chair: Marileena Koskela, Minttu Jaakkola & Salla Laasonen, Finland Futures Research Centre
Time: Thursday, 9th June, at 13-15
Friday, 10th June, at 10.30-12.30 & 14.30-15.30
Venue: Lecture room B3117

7A. THURSDAY JUNE 9th

Stakeholder Dialogue for Sustainable Development? An Analysis of Corporate Statements

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The significance of stakeholder dialogue continues to strengthen its role as a key component of corporate responsibility. This implies that stakeholder dialogue is a tool through which a company can ensure that corporate actions are aligned with the goals of sustainable development. Stakeholder dialogue has proven to be a useful tool for gaining information on business environment from a range of stakeholders, and thus protecting against future legitimacy risks. This holds especially for non issue-specific and ongoing stakeholder dialogue. Closely related to this, the focus in this paper is on dialogue around a specific issue, a foreign direct investment. For this purpose, the focus is on how the investing company refers to stakeholder dialogue. Documents consisting of annual reports and press releases during 2003-2010 are analyzed in order to assess what role is given to stakeholder dialogue. The company perspective is then reflected against the NGO and other actors’ perspective on dialogue in the case (Laasonen 2010). The findings indicate that the roles and meaning placed on dialogue vary considerably depending on the actor.

Global Dispute on Sustainable Business: Analysing MNE-Stakeholder Relationships in Local Media Texts

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The purpose of this paper is to examine how multinational enterprise (MNE) - stakeholder relationships are presented in local media texts in a case of global dispute on sustainable business. The stakeholder literature has made a strong claim that business logic based on serving only one stakeholder, the owners, narrows the potential for value creation and imparts a false sense of security. In this paper, we study MNE-stakeholder relationships in an empirical setting where Europe’s second largest pulp producer, Metsä-Botnia (hereafter Botnia) invested in a pulp mill in South
America. Despite good planning targeted to build a sustainable plant, a disagreement arose regarding its location. The conflict burgeoned into a public issue, which attracted various sets of stakeholders. The paper starts by discussing earlier research on MNE-stakeholder relationships to explain our main theoretical starting point. After that we explicate the methodological choices and describe the process of empirical data collection and analysis targeted at local media texts in Argentina. Then, the events of the case are described and the results of the media text analysis presented. At the end, we discuss the theoretical and managerial contributions of the research as well as its limitations.

**Environmental Reporting Practises in the Finnish Forest Industry**

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Environmental reports, corporate social responsibility reports and sustainability webpages are ways for companies to report their environmental issues. There is no strict format of reporting which means that companies select to report environmental performance in a way most suitable for them. This paper describes the environmental reporting practises in the Finnish forest industry. The analysis combines two sets of data. First, an expert survey (response rate 32%) defined issues needed to be measured in the Finnish forest industry. Use of wood, recycled fibre and non-renewable fuels, emissions to water and air, solid waste and transportation of raw material and products were named as environmental aspects and fossil fuels and eutrophication as environmental impacts needing to be measured. Second, the environmental reporting of three Finnish forest industry companies was content analysed by using the before mentioned aspects and impacts as analysing criteria. The results were further categorised into company’s quantitative results, company’s qualitative description of activities and general information.

The companies provided most information on the use of wood and the emissions to air. The least information was provided on eutrophication but also information provided on the transportation of raw materials and products was concise. Most often companies reported company’s activities. Company’s results are reported nearly often as general information.

**Implementation of Total Responsibility Management into Corporate Strategy**

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This contribution reports about relationship and potential synergies between the total quality management (TQM) and total responsibility management (TRM) as well as corporate citizenship. TRM principles and standards reflect the raising public expectations about corporate social responsibility. Many companies develop TRM as requisitely holistically and hence successfully manage their responsibilities toward their stakeholders and natural environment. The evolution and implementation of TRM in companies includes three main components/approaches: inspiration/vision, integration and improvement/innovation. The improvement/innovation elements
of TRM create a significant demand for companies to broaden measuring of their performance. TRM indicators focus on stakeholders (together with triple-bottom-lines) of economic, social and environment issues (‘cost-benefit’ approach).

Gorenje Group represents a successful case of implementation of TRM into corporate strategy (including sustainable indicators). The synergies also lead (socially) responsible companies to long-term competitiveness by contributing to requisitely holistic management of (innovative-responsible) enterprises/companies. CSR and sustainability could be promoted through transparency, good governance, concern for the environment and good relations with company’s stakeholders. Morally proactive leadership is critical for successful TRM and corporate citizenship. The proactive companies focus on the importance of CSR and its management inside and outside the global company (case Gorenje Group). Introduction of TRM may hence be a management innovation.

**Keywords**: corporate social responsibility (CSR), total quality management (TQM), total responsibility management (TRM), corporate citizenship (CC), ecology, sustainable indicators, leadership, competitiveness, Gorenje Group

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**Corporate Governance, Sustainable Development and Value Creation – Some Evidence from Italian Listed Companies**

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Modern corporate situations, characterised by the globalisation of the markets and of the information, highlight the need to link the potential of a not transient growth to the adequate reconciliation of all the expectations converging around the entrepreneurial formula and not only of those attributable to shareholders.

In such a defined context, corporate governance tends to evolve from a situation of primary care for the expectations of shareholders (shareholder view) and for the correlated financial responsibility, to a wide consideration of all the stakeholders (stakeholder view) and related responsibilities (financial, environmental, social, administrative).

The correct carrying out of governance processes requires, therefore, a clear focus on sustainable development and on the related assumption of a concept of global responsibility. The decisions made by the governing bodies must be driven by the purpose to create value in the long term according to conditions of fairness and sustainable development.

To sum up, this research aims to deepen the existing connections between corporate governance, sustainable development and value creation on the basis of the empirical analysis of a limited number of listed Italian companies.
7B. FRIDAY JUNE 10\textsuperscript{th}

Mirror, Mirror on the Wall, What is the Most Sustainable Company of All? Assessing Corporate Sustainability Performance by Using the Corporate Sustainability Map

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As it could be demonstrated that meanwhile corporate success is affected by the response to the topic of sustainability to some extent, companies have recognized this as a crucial strategic issue. Accordingly, sustainability is put on the top of the agenda by many business executives. However, to succeed in the challenge of sustainability, appropriate instruments are required that support the development of sustainability strategies.

We, therefore, introduce the Corporate Sustainability Map (CSM), a novel approach to assess and compare the sustainability performance of companies supporting decision-making processes. In contrast to pre-existing approaches, the underlying methodology relies on quantitative and publicly available data exclusively, ensuring traceability as well as applicability. The methodology is further based on well-established approaches that have been merely modified and allows for back calculation. Due to the fact that the CSM utilizes a portfolio illustration results can be interpreted easily as well. Finally, all these issues lay the foundation for a broad acceptance in business practice.

To demonstrate the CSM’s practicability, an assessment of companies belonging to the chemical industry will be carried out providing valuable contributions for decision makers regarding the derivation of sustainability strategies.

Stakeholders and Corporate Social Responsibility in Corporate Responsibility Disclosure

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Corporate social responsibility (CSR) consists of the responsibility of economic, social and environmental issues. Companies collect CSR data from the various parts of the company. Companies also publish many different types of reports, magazines and webpages that focus at least partly on CSR. These reports are targeted to the stakeholders. Stakeholders can be defined as persons that have an influence on the company or are influenced by the company.

The results presented here are part of an on-going project that focuses on the feasibility and utilisation of CSR information in the anticipatory decision making. Three Finnish companies are used as case studies. The CSR disclosure, e.g. annual reports, CSR reports, policies, media releases, stakeholder magazines and sustainability webpages, will be analysed. Also, several interviews will be made in order to evaluate the process of dissemination of CSR information inside and outside the company.
The material of this analysis are the sustainability webpages (autumn 2010), CSR reports (year 2009) and the press releases (year 2009). Content analysis is used in order to find out which stakeholders the case companies mention and under which part of the corporate social responsibility the stakeholders are mentioned. The material is analysed by phrases and the analysis is done in Finnish.

Several different stakeholders are mentioned by the case companies, most often mentioned being customers, cooperative partner companies and employees. In economic responsibility, customers, cooperative partner companies, companies from own business sector and employees are mentioned most often. Whereas, in environmental responsibility, employees, customers, non-governmental organisations (NGOs) and cooperative partner companies and in social responsibility, cooperative partner companies, NGOs, customers and companies from own business sector are mentioned most often. In webpages, the most often mentioned stakeholders are customers, employees, NGOs and cooperative partner companies. The most often mentioned stakeholders in the press releases are cooperative partner companies, customers, companies from own business sector and employees and in the CSR reports, employees, customers, NGOs and cooperative partner companies. The differences between companies are discussed in the full paper.

**Purpose of Sustainability Contractual Clauses**

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Present paper develops a conceptual framework for legal research of sustainability contractual clauses (SCCs) in business contracts concluded within international supply chains. Several tools were developed by companies to ensure that their business partners observe the same social and environmental standards; inclusion of SCCs into contracts is one of them. From the perspective of contract law and legal theory, SCCs have been addressed only by a limited number of academics. A reason may be sought in the inadequate theoretical foundation and uncertainty, what the actual intent of SCCs is. This paper provides a classification of SCCs according to their purpose. Based on literature review, analysis of existing hard and soft law and empirical desk research, the factors influencing the objective of SCCs are identified and the four main purposes of SCCs are established: defensive, motivating, regulatory and enforcing. The framework serves as a ground for future research of sustainable international contracts, under which various aspects of SCCs (e.g. incorporation into contracts, content, interpretation and enforceability) may be examined in context of their specific purpose. Further, understanding the purpose of sustainability concerns’ inclusion into contracts is essential for choosing the optimal regulatory approach and contract management.

**Integrating Sustainability into Strategy and Innovation - A Foresight-Inspired Systematic Approach for Businesses**

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What is necessary is an approach which encompasses the integral and participatory identification and evaluation of environmental developments and the integration of the results into day-to-day business. A good basis are participatory processes. They make it possible to integrate the necessary actors at an early stage and to reduce opposition. At the same time they strengthen foresight capabilities and promote a holistic view on the organisation and its activities. During these processes, internal perceptions of corporate frameworks and external environments can be reconciled with the insights of external experts. Thus, the most influencing and most influenced general developments, blind spots, and company-specific trends can be identified. Subsequently, the results can be mapped in trend landscapes and rated in a trend radar. The latter are fundamental for developing strategies, assessing risks, identifying business opportunities and initializing innovation processes. In a critical final stage, the results have to be communicated, transferred to existing structures and processes and continually updated, e.g. in the shape of additional layers in road maps, project management and product planning. An accompanying evaluation returns to the start by detecting successes and changes and by providing a fresh perspective on inner and outer environments.

Disruptive Innovations at the Bottom of the Pyramid - Can They Impact on the Future Sustainability of Today’s Companies?

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Due to the different dynamics required to serve the emerging market that contains billions of people at the bottom of the pyramid (BOP), organizations need to innovate. However, the tendency for large and established companies to ignore the BOP market and rather focus on existing markets implies that, there exists a vulnerability that potentially disruptive innovations from the BOP will not be recognized on time. This paper examines the possibilities of disruptive innovations arising from the BOP, and their associated impact on the sustainability of companies operating in the developed world that primarily targets the top of the pyramid (TOP).

Additionally, we evaluate the possible scenarios that could emerge from the interplay of innovations by different pyramidal market level. This paper further proposes a recommendation to limit a catastrophic impact resulting from disruptive BOP innovations.

The Interaction Between Mandatory and Voluntary Reporting of Corporate Social Responsibility Related Information by Listed Companies in the EU and the US

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Present paper analyses how Corporate Social Responsibility (CSR) information should be disclosed as part of the ongoing disclosure obligation for listed companies in the EU and the US. Current regulation of CSR in the EU and the US manifests itself principally in mandatory disclosure of certain pieces of CSR information. However, these requirements are rather limited and ambiguous. Despite of the limits of
the mandatory disclosure requirements, listed companies disclose a significant amount of CSR information voluntarily. However, they are using different vessels and channels for the disclosure thereof, than for the fulfillment of the mandatory disclosure requirements. The duty for listed companies to disclose material information will as a starting point not require the mandatory disclosure of all CSR related information. The issue, however, is debatable, and so far the debate in the US seems to have advanced further than the debate in the EU. However, it is not unthinkable that voluntarily disclosed CSR information is posteriorly deemed to belong to the category of mandatory information.

The Role of Leaders’ Cognitions, Memetic Change and Innovation in Building Sustainable Organisations: A Conceptual Model

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In striving toward building models that promote sustainable organisational practises and sustainable organisations generally, this conceptual paper focuses on the nexus of the decision-making capabilities of leaders of organisations and the organisations’ innovations in creating sustainable futures. An organisational sustainability practises conceptual model depicting the relationship between leadership, innovation and sustainability is proposed within the context of leader decision-making cognitions, memetic change paradigms and innovation.

What leader abilities and characteristics are required to create an enabling environment supporting innovation for sustainability, and how does foresight competence and strategic thinking feature within this framework? Organisational sustainability is hypothesised to result initially from decision makers characterised as being anticipatory, vigilant and reflexive. This is proposed as a necessary pre-cursor to innovations that enhance organisational sustainability. Leaders’ temporal reflexivity, foresight ability and strategic thinking are linked and are reliable indicators of where companies are situated in terms of prospective thinking, and understanding the pathways of creating an enabling environment for the sustainability development of organisations.

The role of decision-makers identifying and fostering the growth of new memes (Inayatullah 2008) that leads to developing an enabling environment where memetic change supports innovation as a necessary pre-condition of sustainability is featured in the model. Advanced multivariate data analysis techniques (SEM) support the main constructs of the model.
Acting as an Outside Vendor in a Futures Process - Four Ways of Doing the Job

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Expectations about the future are drivers of many actions in the corporate as well as the public sector. The futures processes in these institutions should start with the recognition of futures knowledge needs and be continued with the evaluation of information collection methods. In this article we analyze how the collection of the information process can be done when an outside vendor process is selected. We use selected publications of the largest academic futures research organization in the Nordic countries, Finland Futures Research Centre (FFRC), as the material of a case study. The processes are identified in order to highlight the methods used to detect new information about the future and especially to highlight in which cases this information is called weak signals. In the first process, the expert futures researcher gathers a group of subject matter experts (SMEs) which delivers most of the information. The outcome in the first process is often called “factors of change”. In the second process, an SME with some knowledge of futures research methods gathers data to detect possible factors that could influence future conditions and this information is used as a basis for the futures information. In the third process, the futurist or generalist uses his or her own expertise to gather possible factors that could influence the future. These factors are often called weak signals. In the fourth process, an SME uses heuristic reasoning to outline the future development of a specific field. We argue that the information gathered in the first and second processes can be ratified by another group of experts, which is not the case with the third and the fourth process. We argue that subject matter expertise is always needed when interpreting signals of change that could be utilised by others than the collectors of the information.

Keywords: futures studies, methodology, weak signals
The History of the Future: Envisioning for Resilient and Sustainable Cities

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During the decades ahead, worldwide cities will have to cope with major ‘landscape’ pressures/trends that will them to consider major transformative processes or ‘transitions’ (resource depletion, energy cost/use/dependency, sufficient/healthy food production, mobility needs/limits, further greenhouse gas emissions, climate adaptation…). It may only be expected that this challenging complexity will only continue to increase, and will ask for different/additional approaches in change processes than the ones in use today. Where forecasts and prognoses typically extrapolate and build on linear and well-known working mechanisms of the systems in routine, scenario methods handle a set of possible future evolutions (determined by different combinations of major drivers) and tend to compose a preparative portfolio of available response trajectories. Probably the least applied future strategic approach is the one of envisioning. Visions are narratives/images of a desirable (sustainable) future state, established in explicitly transdisciplinary and creative settings; inspired by basic principles and building on a set of explicit values/norms.

In our presentation, we will attempt to indicate how the concepts of ‘vision’ and ‘envisioning’ add value to forecast/prognosis and scenarios as tools for the design and the dynamic process of change towards resilient/sustainable cities. In a philosophy of “be the change you want to see”, we envisage a presentation (and eventually paper) in which we involve a designer/artist (active in future city design) and with which we creatively activate the conference audience.

Increasing the Pace of Sustainable Development in Countries: The Need for Foresight Champions, Policy Architects and System Builders

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The use of futures studies has been shown to support processes inherent in moving societies towards more sustainable practices, such as: the development of shared goals and commitment to change; appreciation of barriers to and facilitators of change; identification of contradictions in goals and strategies; understanding of the content and timing of critical steps in realising preferred futures; and defining the nature of and trade-offs between social, technological, economic, legal and political aspects of sustainable development. Research conducted as part of a recent PhD study (Fawkes, 2009) found no examplar countries with an organised, multi-level, multi-sector approach to the conduct of futures studies. While key elements exist in many countries in and outside of Europe (e.g. institutions with a standing brief to monitor trends, training programs in futures studies techniques, nationally commissioned futures studies projects), they were not joined up to form a high performing foresight system. This paper argues that the quest for sustainable development would be strengthened considerably if futures thinking were to occur regularly, at multiple levels and engage civil society, government and business sectors. It proposes an integrated national foresight system framework and calls for ‘foresight champions’ to drive the development of such systems in countries.
Sustainable Futures: The Future Choice of Stakeholders

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This study aims to express the opinions of stakeholders in terms of future sustainable development. In order to do so, this study uses the ideas from 172 stakeholders located in five different case study being part of the EU-project SMILE. The differences between the five case-studies enable us to address sustainability as well as its stakeholders in different situations. This way we can encapsulate different sustainability approaches and different needs for sustainable development. To analyse the trade-offs and synergies that exist between different objectives (opinions of different stakeholders) to sustainable development, four scenarios, viz. competitiveness; continuity; capacity and coherence reflecting the different dimensions of sustainability are developed and investigated with the use of a multi-criteria analysis, i.e. Regime analysis. The analysis is carried out to rank different dimensions of sustainable development, i.e. social, economical, ecological, institutional and physical, from the perspective of different stakeholders. These stakeholders were differentiated by their gender, education level, occupation, institution and also geographical information. This study is successful in bringing up the different dimensions of sustainability in relation to the opinions of different stakeholders. The results show that the most important sustainable future is the coherence scenario, in which ecological and social dimensions are the most important ones.

Need and Usefulness for Future Foresight – Finland’s Rescue Services’ Environmental Scanning: Trend Analysis and Future Scenarios 2025+

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This exploration and developing project was carried out during spring 2010 in four workshop sessions and in one seminar. The workshop sessions were participated by the Finland’s Rescue Service's Future Foresight Council, which is a networking coalition anticipating future changes in Rescue Service's operational environment and having members from the Ministry of Interior, Regional State Administrative Agency, Rescue Departments, The Finnish National Rescue Association and Emergency Services College. The seminar was participated by the Executive Committee of the Forum of the Rescue Services’ Administration.

In the project two aspects of the challenge strategic developing were studied. On the one hand the challenge of strategic developing was seen as a problem of interpreting change in rescue services’ operational environment. On the other hand it was seen as a leadership problem when the operational environment is in a turning point or quickly changing.

The central part of the project was the trend and scenario analysis. Earlier, at 2008, the rescue services aimed at understanding the changes of its operational environment through trend analysis and scenario planning. The events in the world and the in 2010 starting rescue services’ strategic planning process gave a reason to re-evaluation.
The following trends affecting the operational environment of Finland’s rescue services were discovered: ageing of the population in Finland, urbanisation, marginalisation and polarisation development, technology development, increasing importance of data networks, emphasising of neo-helplessness and desire for safety, growing need of energy, increasing importance of ecological aspects and the environment, growing need of skills and innovation abilities, tightening competition of skilled persons, growth of foreign labour force as well as the overload and the growing pressure of efficiency of the public sector.

In relation to the updating of the earlier (2008) scenarios of the rescue services the names of the three scenarios (The World of Sustainable Development, The Market-Based World and The World of Closed States and Blocks) were maintained the same in the updated scenario model. Also some fairly clear similarities to the scenarios of the Finnish Business and Policy Forum (EVA) were found although the perspective in these two models is inherently different. Only the scenario name The World of High Capitalism was decided to be changed to The Capitalist Word in Crisis as it was considered that it would better describe the world for possibly unsuccessful recovery measures after the year 2008’s economic recession. Of the four scenarios the two first mentioned were thought to be positive from the perspective of sustainable development and the others two negative. Each of these four scenarios was thought to bring their own kind of opportunities and threats to the rescue services of Finland.

In the end of the project the work on trends and scenarios was discussed from two viewpoints. On the one hand the benefits of the scenario approaches for future foresight were described. On the other hand connecting the trends and scenarios integrally to the strategic planning process was introduced.

**Keywords:** the trends of the operational environment, scenarios, strategy, scenario based strategic work

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**Get a Life: A Simulation Tool of Future Working Life for University Students**

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The paper aims to discuss the future working life simulation as a pedagogical tool in university students’ career guidance. Students as well as career counselors in universities need modern tools to anticipate and assess the future directions of working life and society. Get a Life project has produced a web based tool for an individual student to reflect on the future of working life and career progress. The objective of the tool is to produce safe, yet exciting experience on the future of work.

The main methodological focus is on simulating complex phenomena such as the work and social life of an individual. In building the futures orientation - with a time scale of 20 years up to 2030 - five background scenarios depicting as many possible futures societies have been created for the simulation tool. The methods used to produce the content for the tool have been mainly scenario building and futures workshops with futures researchers, students and employers.

Two of the focal points of the paper are how to build and create content for a user-friendly career planning product with futures orientation and how to use futures studies and simulations as tools for personal futures orientation and proactive thinking.
Significance of Wild Cards and Weak Signals for Sustainability – Case of Water Services

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Sustainable development is a complex and dynamic concept (Newman, 2005), that is by its very basic definition future-oriented (WCED, 1987). It combines the complex human and environmental systems, and as complex systems are filled with uncertainty no amount of precaution will eliminate all risks. The authors maintain it would be useful to identify weak signals and wild cards (see Hiltunen, 2010) which could become major future developments. Based on this information, systems could be better prepared and adapted to future changes enhancing the resilience, and thus, the sustainability of systems.

This paper examines weak signals and wild cards in the case of sustainability of water services. Water services provide an interesting case as the sustainability of the services is one of the key issues in human well-being. Furthermore, the life cycle of water services infrastructure is remarkably long, putting additional pressure on the decisions made today (Katko et al., 2006). In this research, weak signals were scanned in textual sources: newspapers, books and journals (Hiltunen, 2008). Critical analysis on the usefulness of the process and results is provided.

References

WORKSHOP 9. SUSTAINABLE TRANSPORTATION

Chair: Vilja Varho, Finland Futures Research Centre
Time: Friday, 10th June, at 10.30-12.30
Venue: Room B3118

Delphi on Transport and CO₂ Emissions – Finnish Scenarios up to 2050

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Reducing the emissions of greenhouse gases has become one central target in the search for sustainable development. One crucial question is how to fulfil economic and social needs while reducing the ecological impact of human action. We shall discuss the Finnish transport sector, which is growing and yet under severe pressure to cut CO₂ emissions. Policies have been set to place to guide the development of the sector, such as emission-based car taxation, but their impact – especially in the long run – remains to be seen. We asked some thirty Finnish Delphi panellists’ views of the probable and preferred future of transport volumes, CO₂ emissions, and qualitative changes within the sector, up to the year 2050. We used questionnaires and interviews, including both quantitative and qualitative questions. The panel was chosen to represent widely different areas of expertise, demonstrating variance in terms of age, gender, education, place of employment, etc. Scenarios are made with the aid of a cluster analysis of the quantitative material, and a qualitative content analysis of the qualitative material. The study provides insights to the drivers that shape the future of the transport sector and of the policies that aim to steer transport to a sustainable direction.

Supply Chains of the Future – Scenarios for an Energy Constrained and Low-Carbon World Until 2030

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Our paper will present the results of an extensive empirical scenario analysis in the field of business research, more specifically sustainable transport and mobility. In our research we applied an innovative internet-based, real-time Delphi approach and surveyed 48 experts from the fields of transportation and logistics from more than 20 countries around the globe. We were particularly interested in the panel’s view of the role of sustainability in supply chains until 2030. The expert panel discussions resulted in 822 qualitative arguments which we used for scenario writing. The most probable scenario for a sustainable development shows: Supply chains ensure that the cost of emissions is paid by those who reap the benefits, spurred not only by regulation, but also by changes in consumer behaviour. Our research further reveals that supply chains are likely to benefit from
improvements in technology which enable significant real-time control, allowing greater flexibility. And although in some sectors regional supply chains are likely to grow in importance, overall the supply chain of 2030 will remain primarily a complex global system – but one where transport costs and emissions are increasingly key constraining factors.

References

Analysing the Sustainability of Road Freight Transport - Combining Multiple Sources of Information

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Sustainability in general as well as in the context of transport has many dimensions. Here we concentrate on road freight transport and especially on greenhouse gases (GHG). Reducing GHG and above all CO2 emissions has become a key objective as the global attention has focused on climate change. In European projections, transport has been recognised as a sector which is growing in terms of CO2 emissions unlike other sectors. Particularly in road freight transport there are currently no viable alternatives to fossil fuels in large extent. The demand for transport is also expected to grow substantially.

A widely accepted framework has been constructed for analysing energy efficiency and CO2 emissions in road freight transport. This framework links the economical activity and CO2 emissions in order to analyse different factors and for instance to compare countries with each other or to study the development over time. In this paper we will discuss this framework from the perspective of combining data from national statistics, literature review, web-based survey for hauliers and Delphi survey in order to make sensible forecasts for the next decades considering the development of sustainability and specially CO2 emissions in road freight transport.
Affecting the Sustainability Innovation Acceptance Through Systematic Mapping and Re-Employing of Actors, the Case of a Renewable Energy Project

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Despite the publicly recognized need to switch to renewable energy for the sake of sustainability and the existence of solid technical base for that, the efforts to implement such solutions often fail due to the social and business sector resistance, or unfavorable regulatory environment. However, the history shows that most innovations have to go under transformation until they are accepted. The paper presents the method for systematically tracking and managing the factors affecting the success of renewable energy projects.

The method is based on the actor-network theory, which is intended for exploring the history of innovations’ acceptance by mapping the controversies in the networks consisting of human and non-human actors and their relations. It is proposed in the paper that such mapping is an effective tool for assessing the current state of innovative renewable energy projects and bringing them forward to the desired outcome. It is to be reached by systematically tracking the actors in the program, i.e. the necessary people, technologies and other factors substituting the solution, and the anti-program, i.e. the human and non-human actors preventing the solution implementation project from success, and attempting to employ the latter into the program of the project or neutralize them.

A Small Step towards Sustainable Transport - Media Debate over Finnish Car Tax Reform

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Finnish car tax reform, which was enacted in 2008, created a lively public debate over transport policy's environmental and societal impacts. The national level reform was based on EU level requirements for carbon dioxide emission reductions, ultimately aiming to promote more sustainable transport. Based on material from the dominant Finnish newspaper Helsingin Sanomat, we analyze the public discussion on the topic. By using the Environmental Protection Process (EPP) framework as a conceptual tool, we perform a quantitative content analysis on the media discussion of car tax reform. The EPP framework is an integrative tool aimed at gaining an overall view of the characteristics of environmental problems. Our study suggests that societal factors, emissions, targets, measures and potential side-effects of the reform dominate the media discussion of the car tax reform. The future orientation of the discussion appears to emphasize short-term impacts over longer time perspectives. Overall, it seems that despite of relatively wide-ranging discussion, the media debate contributed only marginally to the public understanding of the prerequisites of sustainable transport.
WORKSHOP 10. SUSTAINABLE ENERGY

Chair: Jyrki Luukkanen, Finland Futures Research Centre
Time: Friday, 10th June, at 10.30-12.30 & 14.30-15.30
Venue: Lecture room B4116

Energetic Metabolism of European Societies: A Multi Scale Approach for the Analysis of the European Union 15 Countries

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The paper illustrates the application of the MuSIASEM approach within the realm of energetic analysis applied to a case study example of the European Union 15 countries. Initially the paper introduces the concept of building an “energy grammar” (in contrary to the conventional linear flows of energy analysis) capable of making a distinction between different forms of energy and how they flow through the society. Specifically, the grammar characterizes the differentiation between Primary Energy Sources and Energy Carriers and how these perform end use functions for the society. Thereafter, the option space, associated with this dynamic energy metabolism for societies are used to create biophysically feasible scenarios that can help in assisting to the decision making process within ecological economics.

Keywords: Energetic metabolism, Societal metabolism, Energy Accounting, Energy Statistics, Energy Return on Investment (EROI), Primary Energy Sources, Energy Carriers

Sustainable Development Criteria to Set the Agenda for Climate Mitigation Technology Research

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Problem: Demand for electricity will increase sharply in next 20-40 years, but current generation technologies threaten the climate system. Many are urgently calling for a massive R&D effort to develop low-cost non-carbon generation, transmission, and end-use technology usable at global scale. Where should governments and other research investors direct the effort?

Approach: The paper selects cardinal principles of sustainable development and social-ecological resilience theory, including ecological, economic and social/governance factors, with reference to the Millennium Ecosystem Assessment framework. It applies the principles to identify sustainable electricity scenarios, and proposes that the preferred scenarios steer science and technology R&D. For
example, intragenerational equity points to need for reliable low-cost electricity for billions of the world’s poor. Social-ecological resilience theory should guide technology choices on ecological and governance terms.

Outcome: Key conclusions on technology needs/preferences for electricity generation, transmission and use for sustainable development: create capacity for distributed rather than centralized generation (also reduces economic and ecological costs of transmission); where transmission required, more efficient, less intrusive systems; technologies to reduce ecological and social impact of renewable energy (wind, solar, tidal) on sensitive land and coastal areas; minimize deployment of high-impact or overly complex technologies (e.g., biofuels, large hydro, nuclear power); enhance end-use efficiency.

Distributed Photovoltaic Generation and Energy Storage Systems Insertion – A Brazilian Consumer Case Study

Olga Moraes Toledo1, Delly Oliveira Filho2, Antonia Sonia Alves Cardoso Diniz3, Maria Helena Murta Vale4, Jose Helvecio Martins1, Brian Steward5, Evandro de Castro Melo5 & Paulo Marcos de Barros Monteiro6

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Insertion of distributed generation in the electricity system and more recently the insertion of different energy storage methods are being studied as an alternative for planning the electric expansion. Distributed generation with energy storage connected to the electricity system is an option for attending low-income populations and also when considering improvement of the load factor in order to allow expansion of the grid. Within this scope, the problem of distributed generation insertion and recently, energy storage has become of vital importance for usage optimization of these resources. In this work, the objective was to encounter a set of photovoltaic generation arrays with energy storage which induce the best performance of the analyzed consumer. A results matrix was generated permitting the planning of different energy supply strategies. A case study was performing with a Brazilian great consumer to the insertion of energy storage and photovoltaic generation. The main of the work was on the analysis of loss of power supply and sustainability obtained of simulations proposed to the consumer. The results show that increases of 2% in the sustainability index can perform a increase of 5% in a overall system reliability for the best case in this study.

Land use for Livelihood Activities in Cambodia - Analysis of Household Survey Results and Agricultural Practices

Tytti Pasanen, Jyrki Luukkanen, Francesca Allievi, Juha Panula-Ontto, Jarmo Vehmas & Burkhard Auffermann
Finland Futures Research Centre, Finland

This paper discusses the relationship between land management and livelihood activities in Cambodia. A multi-scale integrated analysis of societal and ecological metabolism (MuSIASEM) was applied to the
results of a Cambodian household survey in 2009. Overall aim is to explore residential wealth within different income levels and geographical locations.

Cambodian household survey (n=1261) was conducted by Finland’s Futures Research Centre and Indochina Research Ltd. in 2009. Households in sixteen provinces were asked about their land ownership and livelihood activities. The key of the analysis method, developed by Mario Giampietro, is to represent the performance of an average household in terms of a set of key variables. Variables are divided into fund and flow variables, with fund depicting the resources and flow the relevant outputs of the system. In this study, fund variables consist of the hectares of total farm land, land in cash production and land generating net agricultural income, owned by an average household. Flow variables include total annual expenditure and income from agricultural activities. The main interests include estimating how efficiently land is used in terms of cash income in different income groups and provinces and how important agriculture is for households when it comes to covering total expenditure. These parameters can provide help in understanding wealth and economic structure within different geographical regions and socio-economic backgrounds in Cambodia.

A Message from B1: Foster Intrinsic Values Among Electricity Consumers

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Due to GHGs households’ electricity consumption should be reduced. However, years with campaigning in Norway suggests large changes are difficult. Thus, we face a paradox: from IPCC we know substantial reductions are necessary, but, the important electricity consumer sector seems not able to contribute. Somehow, we have to overcome this paradox; households cannot be exempted. We discuss whether this is possible by continue looking at the electricity sector in isolation. Instead, we suggest that for significant reductions to take place, systemic large-scale changes that pull coherently in the necessary direction are required broadly in all parts of society simultaneously. We use the IPCC SRES B1 scenario storyline as an indication of how the world has to develop to be within sustainable constraints. One message we get from investigating this future sustainable world is the need for transformation of value systems, which means the human interior dimensions must be addressed. We assume the whole society is geared into developing according to the B1 storyline, and explore how the approach towards household electricity consumers should be. Based on interviews and focus groups we analyze consumer’s relation to electricity and suggest strategies for how to foster changes towards intrinsic/worldcentric values.

Rearranging Utility-Driven Demand Side Management to Respond Market Conditions

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Energy saving is expected to be one of the biggest solutions of future in mitigating climate change. Traditionally energy utilities have had strong role in providing Demand Side Management (DSM)
actions due to political requirements. After energy market liberalization and privatization in late 1990s in Europe, the search for new market based solutions, i.e. market-driven DSM, has gain interest. After 13 years of energy market liberalization in Finland consumers have finally now started to switch between the energy providers. Energy utilities have thus transformed from being solely production companies into a service companies. This has placed consumers and clients in the center of developing new energy products and thus understanding consumer perspectives has become one of the core issues. By combining data gathered on consumer perspectives and actions toward energy saving by two different methods this paper aims to identify possibilities for energy utility to develop and offer new energy saving products and contracts. Results show strongly skeptical perspectives of consumers towards energy utility in promoting consumer energy saving.

Microalgae as a Biofuel Feedstock: Risks and Challenges

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From sustainability perspective, the potential risks associated with microalgae based biofuel (MBB) production will be investigated in this paper, including environmental, economic, social and cultural dimensions. Environmentally, four main concerns are mapped out: firstly, there exists potential water safety risks, such as water resource abuse, regional pollution caused by downstream, groundwater recharge deficiency, etc.; secondly, unreasonable construction will lead to land use overexpansion, land pollution and service expectancy reduction; thirdly, it may exert a detrimental effect on local ecosystem, causing algal blooms and biological invasion; finally, it may emit unexpected greenhouse gases (NOx, CH4). From an economic risk standpoint, MBB production requires overwhelming investments due to expensive start-up establishment and more people may be unemployed because of increased automation. Socially, contaminant discharge will threaten the health of local animals and people, and over time microalgae may become the medium for mosquitoes to spread disease. From cultural point of view, it requires time for people in developing countries to adapt MBB to their daily life as an alternative to conventional fossil fuel. Taking the above challenges into consideration, efficient government policies, proactive company behaviors and positive public participation will play an important role in minimizing or even eliminating these potential risks.

Keywords: microalgae, biofuel, impact, risk, challenge

Microbial Enhanced Oil Recovery: A Technology Tool for Sustainable Development of Residual Oil

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Microbial enhanced oil recovery (MEOR) take advantages of metabolites produced by bacteria to improve the sweep efficiency and reduce viscosity; change wettability at oil water interface, and
alteration of rock properties. Laboratory investigations by fermentation process with molasses as main carbon source and a strain of Clostridium tyrobutyricum have demonstrated great potentials in production of the needed metabolites for enhanced oil recovery purposes. Results from experiments showed that gas production, acid production and biofilm can be sustainable produced at relatively cheaper cost using a residual product. The overall gas yield per 20 g of molasses in 500ml of aqueous solution can be over 2000ml over a period of 96 hours depending on the salinity condition of the medium. This suggests that sufficient production of biogenic gas needed for oil reservoir repressurization is possible. Production of acid can reach an average of about 1500 mg/l between 24-120 hours. The acid and the microbial fluid were able to modify the properties of chalk samples from the North Sea. These results demonstrate the possibilities of sustainable production of metabolites for enhanced oil recovery by utilization of bacteria and have potential to eliminate the use of harsh chemical during oil recovery processes.

**Keywords**: microbial enhanced oil recovery, oil reservoir, acid, gas, sustainable

**CO2 Economy in the BRIC Countries - Decomposition Analysis of Brazil, Russia, India and China**

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This article analyses the factors that impact the amount of CO2 emissions and energy use in the so called BRIC-countries, Brazil, Russia, India and China. Different factors having an effect in the greenhouse gas emissions from fossil fuels are analysed using decomposition analysis. In mathematical decomposition analysis, the observed change in explained variable is divided in meaningful components. The shares of these components can be compared and the change in the shares over time can be studied.

We have conducted two different types of decomposition analyses. The first one is chained decomposition analysis, in which the observed change in CO2 is decomposed to four intensity factors and an extensive factor, population. The second decomposition analysis is a structural decomposition analysis of the final energy use. In this decomposition the change in final energy use in agricultural, industrial and service sectors are decomposed into activity, intensity and structural effects.

The results of the decomposition analyses indicate on the one hand some similar trends of convergence in the three economies. This can be interpreted to be caused be the globalisation of the economic processes, which directs the production processes of the companies to develop in similar patterns. On the other hand, there are also differences in the development trends caused by the different structures of the economies.
WORKSHOP 11. SUSTAINABILITY IN DESIGN

Chair: Katriina Siivonen, Finland Futures Research Centre
Time: Friday 10th June, at 14:30-15:30
Venue: Lecture room B3118

Designing Sustainable Innovation

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In the years to come, businesses will have to face two key-challenges: Sustainability and Innovation. This case study will answer the question of how to making sustainable innovations actually happen in a global enterprise. The Author gives exemplars of sustainable innovations recently developed and presents the process and theoretical foundations of the framework in use.

Given the tremendous costs involved in modifying existing products as well as with flops, business demands an ex-ante approach towards sustainable innovations, as opposed to ex-post approaches like technology assessment or diffusion research, reconciling the business and environmental / futures perspectives on sustainability. The systemic multi-perspective framework for business opportunity scanning (BOS) developed at KSB AG is a novel and evolving practical approach to the front-end of innovation. Characteristic is the dominance of the stakeholder perspective; appraising the socio-technical system in action and how this system is embedded in its contexts. Unlike conventional wisdom in innovation management i.e. creating many ideas, sorting them out by predicting the ideas futures, and doing risk management, BOS aims at making the future by designing innovations.

BOS has proven to help KSB shaping the future and creating sustainable innovations.

Sustainability Awareness in Design - Bridging the Gap between Design Research and Practice

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This paper will report on the findings of a study on how design practitioners in Finland understand sustainability and implement sustainability principles. Our hypothesis is that there is a crucial gap between academic research and professional practice in implementing design-for-sustainability. Moreover in our previous research we have detected a significant gap between how human-centred designers (HCD) (implicating social sustainability principles) and eco-designers (implicating environmental sustainability principles) perceive their scope of responsibility. Our ultimate aim is to bridge these gaps in order to promote more sustainable innovation-oriented practice in Finnish industry.
We intend to test our hypotheses and measure these perceived gaps by gathering statistically reliable quantitative data in a survey, qualitative data in interviews and a literature review. The aim of the survey is to gain robust understanding of (1) how Finnish design practitioners currently define sustainability and success in their work, (2) if or how they apply sustainability principles, and (3) what barriers hinder them from a sense of broader responsibility. Our paper will therefore map designers’ existing mindsets and values; tools, methods, and guidelines employed; and definitions of success and responsibility scope. Our guiding framework is the Framework for Strategic Sustainable Development FSSD.

Sustainability and Industrial Design in Finland: Barriers and Future Prospects

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Considerations of environmental and social responsibility have been present within the field of industrial design in Finland ever since the 1960’s. However, despite an early encounter with sustainability issues the learning curve towards sustainable design seems to have been longer than could have been expected. Based on literature and semi-structured interviews with design professionals, this paper highlights the barriers sustainability has faced within the field of industrial design in Finland. It is shown, that contextual factors have had a strong influence in the development and institutionalization of new practices and ideas. Due to this sensitivity to context, future prospects for sustainable design are discussed based on three scenarios that explore the future of sustainability. As a result, the article identifies key issues that shape the development and future of sustainable design.
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