ANNUAL REPORT 2011

Institute of Systems Sciences,
Innovation and Sustainability Research

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EDITORIAL

Welcome to the second edition of the annual report of ISIS, the Institute of Systems Sciences, Innovation and Sustainability Research. The goal of our annual reports is to document our performance and to inform our stakeholders about our research and teaching activities and our strategies.

“If you don´t go forwards, you go backwards” – this true for us as University Institute, too. The general situation for Austrian Universities is challenging, lack of political and financial support is a factor of uncertainty for the next years. Nevertheless, ISIS as part of the Faculty for “Environmental and Regional Sciences and Education” can present in this annual report a very successful year 2011 – and our motivated team, our experience and our competences are the basis for our success in future.

A main achievement in 2011 was our external research evaluation. This evaluation was based on a self-documentation and a site visit by external reviewers. The result was very positive and confirmed our strategy to focus on our core areas - sustainability, innovation and systems sciences - to answer questions dealing with Sustainable Development and Global Change. Based on this research evaluation our goals are to apply our competences in sustainability science and systems sciences and to increase our competences in innovation and transition science for transdisciplinary projects. We will also extend our position within the University of Graz research core area EGC (Environment and Global Change). Developing and executing research projects in our research areas funded by public and private sources are in the main focus of our strategy and we will focus on peer-reviewed publications to present our results to the international scientific community, too. In line with this we would like to further professionalize our PhD-education; the basis is the new doctoral school for environmental systems sciences founded in October 2011.

The most important resource is our motivated staff. We warmly welcome our new colleagues Prof. Manfred Füllsack and Prof. Wilfried Winiwarter who both received a fifty percent position in Systems Sciences. Prof. Baumgartner received the §98 professorship for Sustainability Management at ISIS and is since October 2011 the head of ISIS. We regret the leave of Prof. Binder in October 2011, we are very grateful for her vision and her work for ISIS and we wish her all the best for her new position at the University of Munich.

Rupert J. Baumgartner

Alfred Posch

CONTENT

1 THE INSTITUTE

1.1 History

In October 2007, the Faculty of Environmental and Regional Sciences and Education (URBi), was established, bringing together four branches of sciences: Environmental Systems Sciences, Geography, Sports Science, and Educational Sciences. This was also the starting point of the Institute of Systems Sciences, Innovation and Sustainability Research (ISIS). Besides the Wegener Centre for Environmental and Global Change (WegC), ISIS is the focal institute in the field of Environmental Systems Sciences and also responsible for the corresponding bachelor and master programmes in Environmental Systems Sciences.

In the beginning, the ISIS team consisted of four academic and one administrative staff members of the former Institute of Innovation and Environmental Management. Additionally, the coordination office for the study programmes in Environmental Systems Sciences was appended to the ISIS. There has always been a strong commitment to internationally renowned research for sustainable development, and to providing international, research-driven, and multifaceted education at ISIS. Thus, in 2008 the Austrian Federal Ministry of Science and Research and the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management awarded ISIS with the **Austrian Sustainability Award** in the two categories of research and teaching/ curricula.

Figure 1: Sustainability Award 2008

In October 2009, ISIS was again awarded, this time as an **Austrian UNESCO decade project** (*UN-Decade of Education for Sustainable Development 2005 – 2014*). The criteria comprised the integration of three sustainability dimensions, and the relevance for education and everyday life, including participatory elements. The jury especially emphasized the institutional embeddedness and the broad variety of topics covered at ISIS. Further, the planned professorships in Systems Sciences and Sustainable Development were considered positively. With this award, ISIS is allowed to use the UN-decade logo until 2014.

In 2009, the professorship for systems sciences was filled by Prof. Claudia Binder; and one year later the professorship for sustainability management was filled by Prof. Rupert Baumgartner. In 2011, Prof. Claudia Binder already left the ISIS and the professorship for systems sciences was filled by Prof. Manfred Füllsack and Prof. Wilfried Winiwarter, 50 % each. Now in spring 2012, five professors (4 full time equivalent), three senior scientists, 6 junior scientists (out of them 3 project staff), one lecturer, two administrative staff, and 9 student research assistants belong to ISIS.

1.2 Mission statement

The Institute of Systems Sciences, Innovation and Sustainability Research investigates the transition towards sustainability. Therefore, we study transition, innovation, and adaptation processes within human-environment systems, with a focus on firms and regions. We base our research on systems sciences, innovation and transition sciences as well as sustainability science, and develop inter- and transdisciplinary methods to analyse and model human-environment systems, develop scenarios and transition pathways, and assess regulatory strategies.

ISIS is composed of a highly motivated interdisciplinary group of researchers from fields including natural sciences, geography, and business administration.

ISIS is a special institute in several ways:

- It combines the three science fields: systems sciences, innovation and transition sciences and sustainability science.
- It is an interface institute and as such it has high collaboration potential with scientists from social and natural sciences.
- Given its transdisciplinary research focus it has strong collaborations with enterprises and within regions, allowing for high quality applied research.
- It combines qualitative and quantitative methods in its research projects.
- Being the coordinating institute of two international joint masters programmes, it is well embedded in international networks in both fields, teaching and research.

Within the URBi faculty, ISIS has a very special position, as it provides the interface to the different institutes within the faculty as well as to almost all faculties within the University of Graz. ISIS is, together with the Wegener Centre, part of the scientific field environmental systems sciences, and plays a central role within the research core area “Environment and Global Change”.

1.3 Faculty and Staff members

Professors

Univ.-Prof. Dr. **Rupert J. Baumgartner**
Phone: 3237 Email: rupert.baumgartner@uni-graz.at

Head of ISIS
Professor for Sustainability Management

Research interests: (Corporate) Sustainability Management, CSR, Sustainability Assessment, LCA, Industrial Ecology, Interorganizational Management.

Univ.Prof. Dr. **Claudia R. Binder**

Professor for Systems Sciences

Until October 2011.

Ao.Univ.-Prof. Dr. **Alfred Posch**
Phone: 3234 Email: alfred.posch@uni-graz.at

Vice head of ISIS
Dean for studies at the URBi Faculty
Academic coordinator of the International Joint Master programme in Sustainable Development

Research interests: Sustainability Learning and Management, Industrial Ecology, Environmental Decision Making, Sustainable Innovation.

Assoc. Univ.-Prof. Dr. **Gerald Steiner**
Phone: 7331 Email: gerald.steiner@uni-graz.at

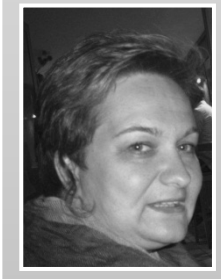
Since October 2011 guest-professorship at Harvard University, U.S.A.

Research interests: Methodology of Systems Analysis and Scenario Planning, Sustainable Innovation, Collaborative Creative Problem Solving, Sustainability Learning & Entrepreneurship, Industrial Design.

Senior Scientists

Dr. **Thomas Brudermann**
Phone: 7336 Email: thomas.brudermann@uni-graz.at

Research interests: Environmental Psychology, Social Dynamics and Crowd Psychology, Behavioural Economics and Neuroeconomics, Economic Psychology, Agent-based Modelling in Social Sciences, Decision Support Systems.



Dr. **Ulrike Gelbmann**
Phone: 7333 Email: ulrike.gelbmann@uni-graz.at

Research interests: Strategic Sustainability Management, Corporate Social Responsibility, Stakeholder Management, Sustainability Reporting, Social Sustainability, Resilience, Waste Management.

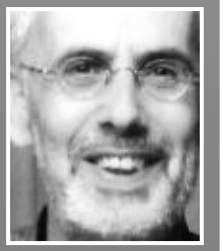
Dr. **Maximilian Mrotzek**
Phone: 7342 Email: maximilian.mrotzek@uni-graz.at

Research interests: System Dynamics, Disaster, Resource Scarcity, Silver.

Dr. **Elke Perl-Vorbach**
Email: elke.perl@uni-graz.at

Currently on maternity leave.

Lecturer



Dr. **Ralf Aschemann**
Phone: 3232 Email: ralf.aschemann@uni-graz.at

Academic coordinator of the Erasmus Mundus Master programme in Industrial Ecology and of transdisciplinary case-study teaching at ISIS.

Research interests: Environmental Assessment, Environmental Effects of Transport, Industrial Ecology, higher Education and Environmental Issues.

Junior Scientists

Mag. **Katja Bedenik**
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Until August 2011.

Mag. **Nina Braschel**
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Research interests: Emissions Trading, Waste Management.

Porfirio Guevara, MSc
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Research interests: Poverty and Education Analysis, Innovation, Economic Growth, International Trade, Environmental Economics, System Dynamics Modelling.

Mag. **Kathrin Reinsberger**
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Research Interests: Environmental Economics, Climate and Energy Policy, System Dynamics, Energy Management, Renewable Energy, Energy Transition.

Mag. **Corinne Von der Hellen**
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Until August 2011.

Project staff

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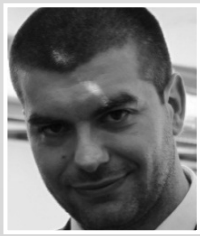

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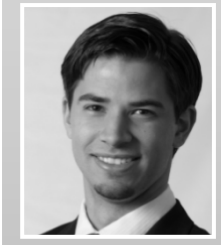

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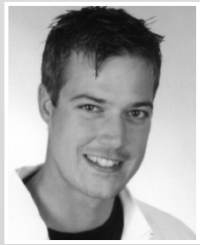

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Birgit Propst
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Since October 2011.

Anton Sentic
Email:
anton.sentic@uni-graz.at
Since October 2011.

1.4 Introduction of new professors

We want to use this annual report to introduce our new professors for systems sciences who start in February 2012 their position at ISIS.

Univ.-Prof. Dr. Manfred Füllsack

Is concerned with modelling and the computer-based simulation of systems, in particular, of complex adaptive systems. In this respect his focus is on multi-agent-simulation, on network theory and on evolutionary computation. Thematically his research interests focus on the sociology and economy of work and on labour conditions. Furthermore he is concerned with game theory, cybernetics, complexity research and with artificial intelligence and the epistemology of computation. Regarding theory he orientates on the sociological conception of Niklas Luhmann.

He studied informatics, philosophy, mathematics, sociology and music at the University of Vienna, acquired his PhD and his venia legendi in social philosophy at the Department for Philosophy at the University of Vienna. Subsequently he worked on several national and international universities and higher educational institutions, including Michigan State University and the Sociological Institute of the Russian Academy of Sciences.

He wrote and edited several books, including
Gleichzeitige Ungleichzeitigkeiten. Eine Einführung in die Komplexitätsforschung. Wiesbaden 2011.
Arbeit. Wien 2009.
Zuviel Wissen? Zur Wertschätzung von Arbeit und Wissen in der Moderne. Berlin 2006.
and is Author of about 35 papers in peer reviewed journals.

A part of his earlier years he lived in Melbourne/Australia and worked for Mobil Australia.

In the 1990ies he spent much time in Russia with sociological research on the transformation of Post-Soviet society and on the dynamics of post-socialist labour conditions.

Privately he is a mountaineering and music aficionado, preferring modern jazz and playing chromatic harmonica in small amateur ensembles.

Univ.-Prof. Dr. Wilfried Winiwarter

Prof. Winiwarter's interest in systems analysis derives from the overarching challenging of climate research. Originally an atmospheric scientist and specialist in assessing the release of trace compounds into the atmosphere, his expertise was called to quantify current and potential future emissions of climate relevant greenhouse gases. This triggered his interest to investigate global biogeochemical cycles, specifically the nitrogen cycle. Moreover he became confronted with the interaction between physical and social systems, and with their respective interferences, which now also serve as a major focus of his work.

Wilfried Winiwarter is a chemical engineer by training. Having received a PhD degree in environmental analytical chemistry at Vienna University of Technology, he carried out post-doc research at BYU in Provo, Utah (U.S.A.) and again at the Vienna University of Technology. Upon moving to Austria's largest non-university research centre, the Austrian Research Centres at Seibersdorf (a position that he maintained until his appointment as a professor to the University of Graz), he developed an independent scientific profile. The scientific achievements already during his first decade of mostly project-related research and his academic teaching commitment earned him full privileges of academic teaching (venia legendi, "Habilitation") in environmental chemistry in May 2003, again awarded by Vienna University of Technology.

At the same time, on a leave-of-absence from his Austrian affiliation, he joined the International Institute for Applied Systems Analysis (IIASA) in Laxenburg (near Vienna) where he still serves a Senior Research Scholar (part-time) and contributes to the development of the GAINS model, an integrated assessment model supporting the transfer of science results to the environmental policy arena.

Out of some 400 publications, more than 50 papers have been published in peer-reviewed journals. He has served as author and/or chair to technical committees related to air pollution and climate change (IPCC, UNECE), as well as a reviewer and on the boards of scientific conferences and journals. Since 2007 he has been co-opted into the Clean Air Commission of the Austrian Academy of Sciences.

Prof. Winiwarter is married and father of two grown-up children.

2 RESEARCH PROJECTS AND ACTIVITIES

2.1 Research profile

Research at ISIS is based on **three scientific pillars**: systems sciences, innovation and transition research, and sustainability research. By combining these three science fields, we seek to enhance the ability of human-environment systems to deal with global change.

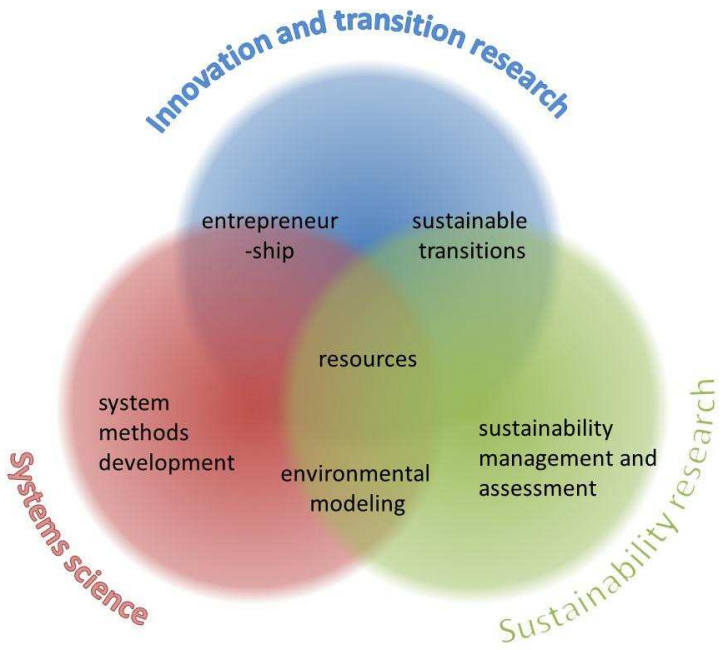


Figure 2: Science fields of ISIS

Systems sciences. Systems modelling (e.g., agent-based modelling or system dynamics), and environmental systems assessment provide a better understanding of different kinds of human environment systems and their adaptation processes to challenges of global change. We are engaged in system methods development, improving computer-based (multi-agent) simulations of systems, in particular of complex adaptive systems. Our investigations include environmental modelling, covering global biogeochemical cycles, like the nitrogen cycle. Special emphasis is put on the interaction between physical and social systems in order to develop concepts and strategies for sustainable development.

Innovation and Transition research. We see the management of innovations at different levels as a significant challenge for the transition towards sustainable development. It is our goal to gain insight in innovation processes for new products, services, and technologies, but also in transition processes in society, organizations, and sectors, like the energy sector. Therefore, it is necessary to generate an understanding of logics and patterns of human decision making and action. On this basis, we can develop inter- and transdisciplinary concepts for supporting important decisions that influence sustainability, and we can help initiate sustainability-oriented transition, innovation and adaptation processes in a variety of human-environment systems.

Sustainability research. Regions and corporations are important actors and entities for sustainable transitions. Thus, we investigate systems and processes for sustainability management systems and corporate social responsibility (CSR) initiatives at corporate level including the value chains and the regional level. Key aspects include developing environmental evaluation and controlling concepts and methods, strategic management, corporate sustainability management and strategies, lifecycle analysis, industrial ecology, integrated management systems, management of resources (like waste or energy).

We are currently executing or developing projects in the fields of regional and organizational energy systems, resources and waste, and sustainability management and assessment.

Regional and Organizational Energy Systems deals with the following questions: Which actors and what factors support or prevent the development of energy regions or the innovation and adoption of energy efficient technologies? How can these development processes be simulated? What policies support the creation of new and successful advancement of energy regions or the innovation and implementation of new technologies?

Resources and Waste considers the following questions: Which parameters lead to sustainable management of resources and waste? Which control mechanisms play a role? How can resource-waste systems be optimized from an environmental, social and economic point of view?

Sustainability Management and Assessment responds to the following questions: How can measures for the implementation of sustainable strategies in cooperation with stakeholders be developed and evaluated? How can sustainability aspects be integrated into corporate leadership? What management tools are appropriate for (corporate) sustainability management? How can sustainability performance of organizations be evaluated?

2.2 Research Projects

2.2.1 TERIM: Transition Dynamics in Energy Regions: An Integrated Model for Sustainable Policies

Energy regions are regional initiatives, which usually envision energy self-sufficiency by using regional renewable energy sources and building a decentralized energy infrastructure. Studies on energy regions have mostly looked at the technical-operational characteristics and informed policy-makers on how to improve energy infrastructure. However, they have missed out in providing and understanding the dynamics of the transition process, in particular the role of policies, social norm, and culture in stakeholders' decision-making and thus, on the transition process itself.

The main objectives of this project are (i) to simulate the transition dynamics of energy regions and (ii) to derive policy recommendations. Specifically, we will:

1. Analyse the transition dynamics in two Austrian energy regions, beginning from their establishment until today.
2. Develop an integrated simulation model for studying transition dynamics in energy regions including interrelations and feedbacks between the social system and the energy infrastructure, as well as the impact of policies on individual human behaviour and the transition process.
3. Derive policy recommendations for Austrian policy makers.

The conceptual approach combines elements of transition theory, policy design and improvement, and human-environmental systems research and modelling. One key element of our conceptual framework is the in-depth characterization of stakeholders' decision-making, where we will consider (i) the goals and interests of individuals; (ii) regional factors and local environmental conditions, as well as (iii) external factors.

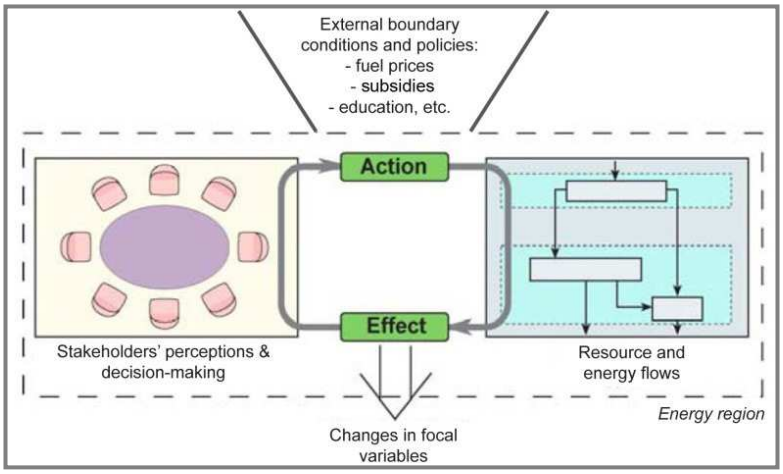


Figure 3: Conceptual framework of TERIM

Study regions:	ökoEnergieland Güssing Energieregion Weiz-Gleisdorf
Project team at ISIS:	Prof. Alfred Posch & Prof. Claudia R. Binder (project leaders) Mag.[a] Maria Hecher
Project partner:	University of Technology Delft, The Netherlands European Centre for Renewable Energy Güssing, Austria Energieregion Weiz-Gleisdorf, Austria
Duration:	2011 – 2013
Funding:	Austrian Climate and Energy Fund ("ACRP" Programme)
Website:	http://www.uni-graz.at/terim

2.2.2 iEnergy: Citizens supported by a stakeholder process to upgrade their smart urban region

In this project, stakeholders of different institutions and backgrounds are brought together to design consistent scenarios with respect to the vision of the Energy Region Weiz-Gleisdorf. The time horizon of scenarios is till 2050. To be able to benefit from scenario analysis it is highly important to first understand the structure of the boundary condition scenarios and their effect on a selected region. Second, a standardized and structured methodology allows for including aspects that might get forgotten within an intuitive approach. And third, in order to obtain a "holistic" system understanding it is necessary to develop scenarios in a group of stakeholders with different views of the problem. In this study we want to provide an input in that direction.

The objectives of this project are

- To gain a common understanding of the general characteristics of the region, including its weaknesses and strengths.
- To understand the interactions among the main internal and external (national and international) factors, which have an impact on the region.
- To construct consistent scenarios for the development of these impact factors.
- To valuate these scenarios with respect to their impact on the region.
- To propose measures for reaching the "best case" scenario or minimize negative impacts of other potential scenarios on the Energy Region Weiz-Gleisdorf.
- To stimulate the regional discourse in the Energy Region Weiz-Gleisdorf and to activate the public at large, key stakeholders, and the youth in particular, to participate in building the future of the Energy Region Weiz-Gleisdorf.

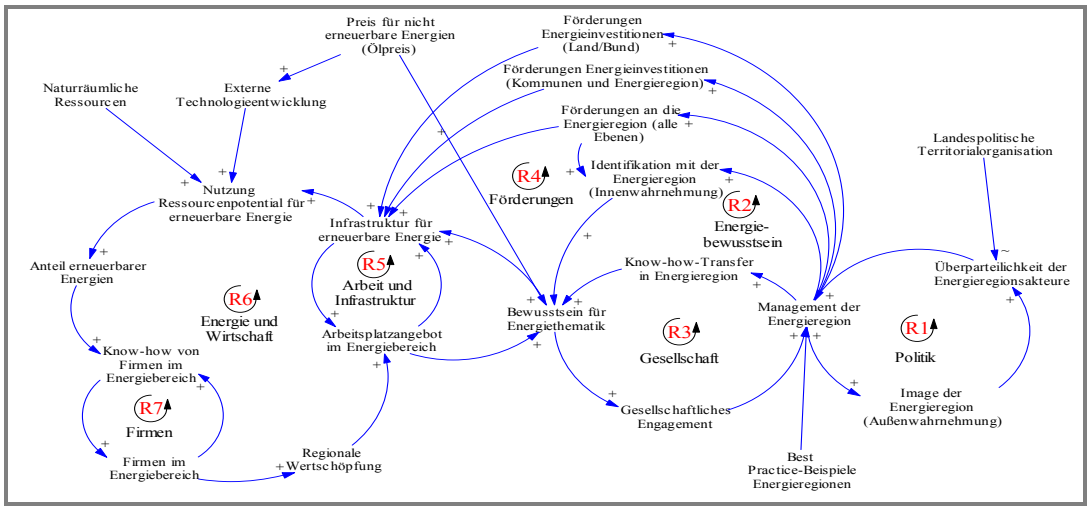


Figure 4: Causal Loop Diagram ("Reinforcing")

Project team at ISIS: Prof. Alfred Posch & Prof. Claudia Binder (project leaders)
Martin Kislinger, Florian Hold, Ulli Vilsmaier, Andreas Kreuzeder

Project partners: Energie Steiermark AG
Energieregion Weiz – Gleisdorf GmbH
Institute for Process and Particle Engineering, Graz University of Technology
Department of Geography, University of Munich, Germany

Duration: April to December 2011

2.2.3 RISK: Life cycle human exposure and risk assessment of pesticide application on agricultural products in Colombia

Although the human health effects of pesticides have decreased significantly in industrialized countries, misuse of pesticides in developing countries is still problematic. Chronic health problems and environmental impacts have not been well investigated and are likely to be significant. Possible factors contributing to these impacts include the application of old products with high persistence and toxicity and missing or insufficient protection of workers during pesticide application and use. Because a significant portion of the crops imported into Europe come from developing countries, responsible consumers and authorities in the exporting and importing countries are interested in understanding and ultimately mitigating the life-cycle environmental and health impacts of these products.

The objectives of this project are:

1. Quantifying the direct and indirect exposure of pesticide applications along the whole value chain.
2. Identifying the most relevant exposure pathways within various case studies (i.e. potato, flowers and banana farming systems) to better understand the overall toxic effects of pesticides applied in Colombia.
3. To build a model for human exposure and risk assessment that could be extended also in other South and Central American Countries with similar production systems.

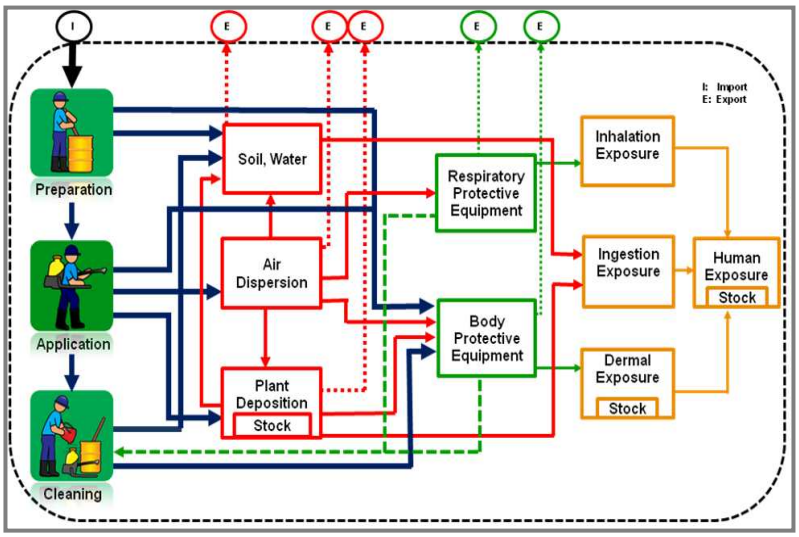


Figure 5: Material flow analysis of pesticide application

The conceptual model approach considers all the pathways followed by the pesticides after the application and its distribution in the different environmental compartments with special emphasis in the human exposure. The further development of the model will use two methods: material flow analysis and system dynamics.

Case Studies in Colombia:	Vereda La Hoya, Sabana de Bogotá, Urabá Antioqueño
Project team at ISIS:	Prof. Dr. Claudia. R. Binder (project leader) Camilo Lesmes-Fabian, M.Sc.
Project Partners:	ETH Zürich, University of Zürich, Universidad Nacional de Colombia and Uniboyacá.
Duration:	May 2010 – April 2012 (transferred to LMU Munich in 2011)
Funding:	Swiss Science National Foundation
Website:	http://www.uni-graz.at/risk_pesticide

2.2.4 CEA – CO2 Emissions trading and the waste industry

In order to reach the Austrian greenhouse gas reduction targets, a comprehensive set of policy measures and incentives needs to be implemented. This project examines the potential impact of applying the EU emission trading system in the Austrian waste sector, and its relevance for the economic situation of the waste industry as well as for the Austrian climate policy. Taking the present situation of the Austrian waste sector as a starting point, an attempt is made to identify the possibilities for integrating the Austrian waste sector into the trading system and the expected impact on various stakeholders. A systems approach is used to develop and compare several models and scenarios.

The three main research questions are:

- What is the initial situation in the waste industry concerning the aims of climate policy?
- How, and in what areas, might the Austrian waste industry be integrated into the EU emission trading system?
- What are the likely micro and macroeconomic impacts of such a move on the various stakeholders involved?

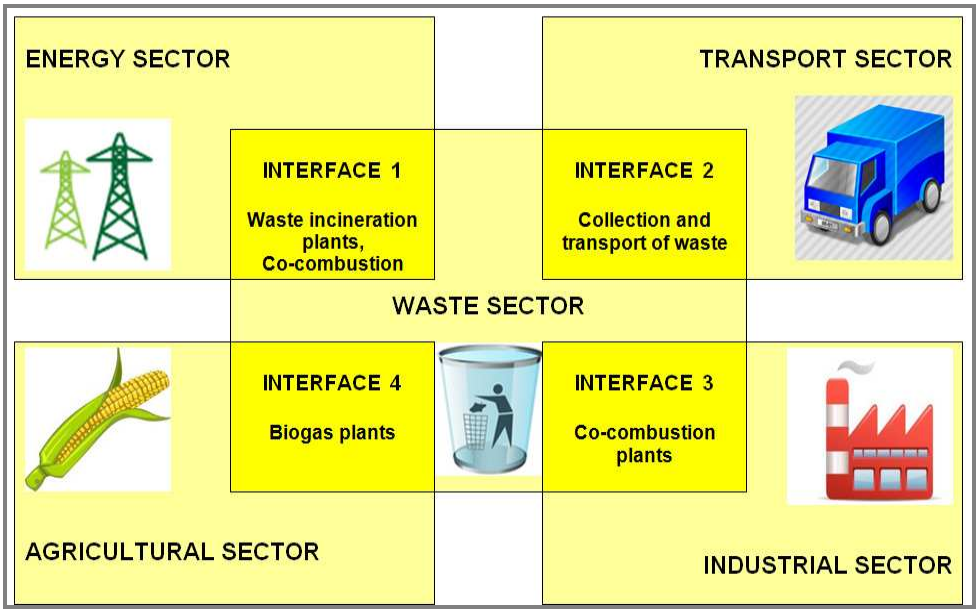


Figure 6: Interfaces of the waste sector

The results of the analysis will be of relevance in the structuring of Austrian waste and climate policy, and will also be significant for stakeholders and others interested in developing business models.

Project team at ISIS: Prof. Alfred Posch (project leader)
Mag. Nina Braschel

Duration: May 2010 – December 2011

Funding: ARA Altstoff Recycling Austria AG
Saubermacher Dienstleistungs AG

Website: http://www.uni-graz.at/cea

2.2.5 Alps: Analysing and Modelling Transitions of Common Property Pastures in the Swiss Alps

The common property pastures in the Swiss Alps provide significant services to the mountainous regions, such as income sources for farmers and tourism industry, protection from soil erosion, water-run-off, landslides, and high biodiversity. These services are highly dependent on continuous management of the alpine pastures. In Switzerland, most alpine summer pastures are common property and have been managed by local governance systems since the Middle Ages in order to avoid overuse of the scarce resources. Societal changes, like industrialization, rapid economic growth, and new agricultural policies, induced major transitions of the pasture management system, which led to abandonment of marginal land or intensification of productive areas ensuing reduction of biodiversity on the long-term.

The objectives of this project are:

1. To characterize, analyse, the transitions of the management system of common property pastures in the Swiss Alps, with special focus on institutional development, farmers decision making, and land use change.
2. To dynamically model the transitions of the social-ecological system (SES) using a systems dynamics approach.
3. To develop scenarios and strategies for coping with upcoming challenges such as market liberalization.

The conceptual model is based on Ostrom's general framework for analysing social-ecological systems (Ostrom 2009). It shows the social subsystems (blue) interacting (red) with the ecological subsystems (green).

This conceptual model is quantified based on survey data (farmer's decision making), and federal statistics (farm structure, land use, and land cover). The data of the SES are modelled using a systems dynamics approach.

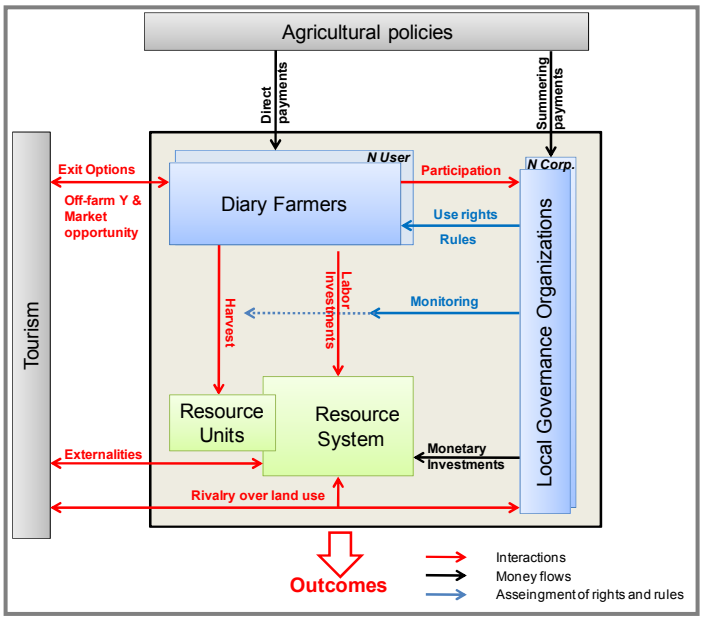


Figure 7: Conceptual model of Alps

Study regions:	Grindelwald (canton of Bern), Törbel (canton of Valais)
Project team at ISIS:	Prof. Dr. Claudia. R. Binder (project leader) Ivo Baur, M.A.
Project Partners:	University of Bern (CDE), Indiana University Bloomington ETH Zürich
Duration:	October 2009 – October 2012 (transferred to LMU Munich in 2011)
Funding:	Swiss Science National Foundation
Website:	http://www.uni-graz.at/alp

2.2.6 Shared Space

During the last decades the faces of cities and towns have changed dramatically as motorized traffic has become increasingly dominant. In addition, a technological progress-oriented planning philosophy supported this development by installing larger streets for cars and heavy traffic. This caused people to begin withdrawing from these spaces, reducing their activities to the necessary.

In this study, this dynamic development will be described by a system dynamics approach, with a focus on the quality of sojourn of the public street space in a small town in south-eastern Austria (Gleinstätten, Styria). In a final step, the policy phase, the effects of Shared Space will be included into the model, and thereby discussed for policy relevance.

The research questions of this project are:

1. How can the multidimensional construct of quality of public space be defined?
2. What are its main factors and how can the system be modelled dynamically?
3. What are the effects of Shared Space on the modelled system?

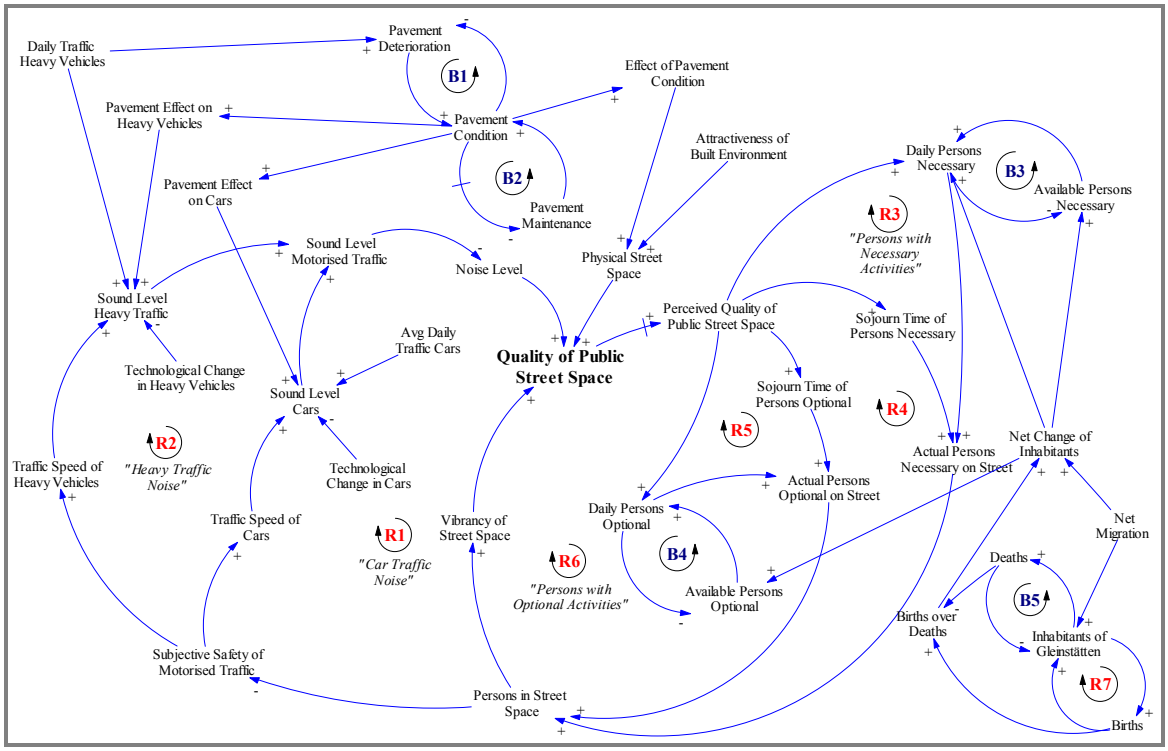


Figure 8: Causal Loop Diagram

Project team at ISIS:	Prof. Gerald Steiner (project leader) Mag. Corinne Von der Hellen Martin Kislinger Prof. Alfred Posch Mag. Hannes Klampfl-Pernold
Duration:	July 2008 – March 2011
Funding:	Land Steiermark, Fachabteilung 18A – Gesamtverkehr und Projektierung
Website:	http://www.uni-graz.at/shared_space

2.2.7 FoSentHE - Fostering Entrepreneurship in Higher Education

The increasing global integration and rise of global market have created a tremendous need to strengthen and build teaching programmes focused on enterprise and entrepreneurship. Indeed, the EU is determined to foster entrepreneurial mindsets among young people. At the 2006 Spring European Council, the Commission clearly stated that Member States should reinforce entrepreneurship education at all levels. The need to create a positive entrepreneurial climate and an appropriate framework facilitating entrepreneurship as well as to promote entrepreneurship education was also emphasised.

Objectives

- System-based research on entrepreneurship and innovation under the umbrella of sustainability.
- Improvement of the teaching practice regarding entrepreneurship in higher education at large, as well as facilitating entrepeneurship fostering in practice.
- Creation of the new e-course curricula in entrepreneurship at all levels of higher education.

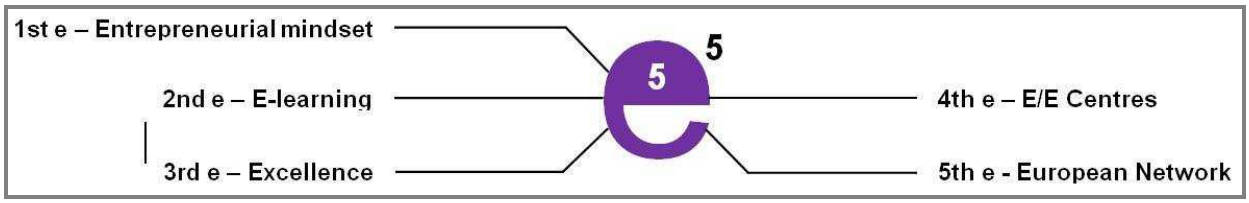


Figure 9: 5e5 outcome model

Project team at ISIS:	Assoc. Prof. Gerald Steiner (project leader) Mag. Elvis Kenik
Project partners:	University of Zagreb (grant holder) School of Business Administration, College of Management, Rishon Lezion University of Nice-Sophia Antipolis (UNSA) European Foundation for Management Development (EFMD) University of Maribor, Faculty of Economics and Business (FEB) Poznan University of Economics Juraj Dobrila University of Pula, Department for Economics and Tourisam University in Split, Faculty of Economics
Duration:	February 2009 – January 2012
Funding:	European Commission: Education, Audiovisual and Culture Executive Agency (EACEA)
Website:	http://www.uni-graz.at/fosenthe

2.2.8 Strategic Sustainability Thinking in Automotive Product Engineering

Sustainability issues are of rising relevance for the automotive industry due to legal requirements, stakeholder pressure and customer demands. Early phases of product development are of great importance not only for the reduction of costs but also for the improvement of a products' sustainability performance. This particularly holds true for innovative lightweight concepts, since they require the application of new materials and the development of new practices and process, on which there is only insufficient data and experience concerning their sustainability aspects available in very early product development (feasibility and/or concept phases). This lack of information and the high rate of uncertainty in the product feasibility and concept phase hinder the application of traditional sustainability assessment tools, such as Life Cycle Assessment, which moreover only focuses on environmental aspects and leaves out economic and social aspects. The aim of this project was to fully integrate a sustainability perspective into the product development process by facilitating Life Cycle Thinking and sustainability awareness among designers and engineers. A detailed analysis revealed that existing Eco-Design and Design for Sustainability tools were only partially applicable for this purpose, why a new tool, the Checklist for Sustainable Product Development was developed. It is based on the Framework for Strategic Sustainable Development methodology, and particularly focused on early phases of automotive development.

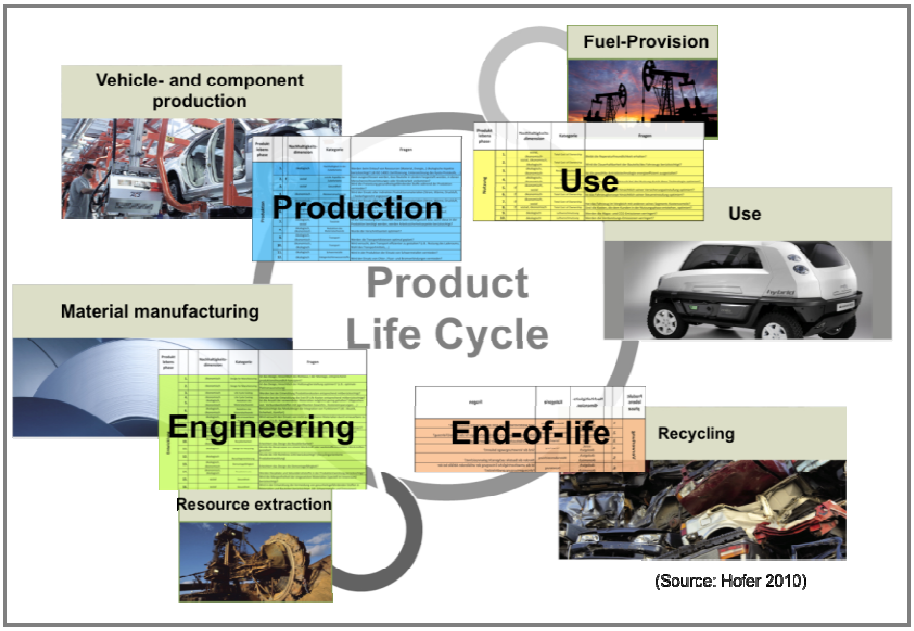


Figure 10: Product Life Cycle

Objectives:

The Sustainability Checklist created in cooperation with the engineering department of MAGNA STEYR

- allows the qualitative assessment and valuation of sustainability aspects in early phases of automotive development with a focus on innovative technologies,
- facilitates the integration of awareness for sustainability into day-to-day business,
- triggers life cycle thinking among executives, designers and engineers, and
- supports decisions over different technologies based on the sustainability evaluation.

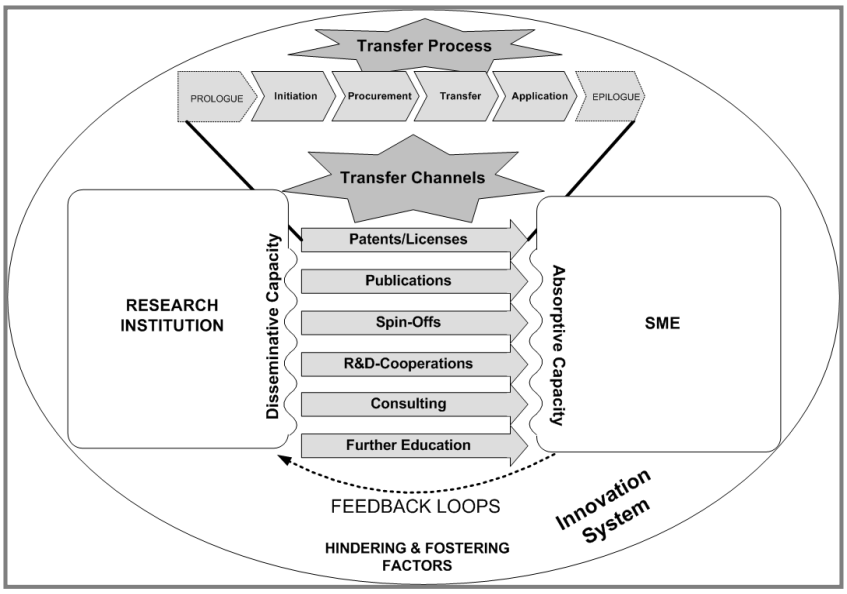
Results:
A test of the Checklist with nine technologies currently developed by MAGNA STEYR has proven it applicable for its particular purpose and has already led to improvements of the sustainability performance of several technologies.

Project team at ISIS:	Prof. Rupert Baumgartner (project leader) Josef-Peter Schöggl
Project partners:	MAGNA STEYR Fahrzeugtechnik AG & Co KG Dietmar Hofer
Funding:	MAGNA STEYR Fahrzeugtechnik AG & Co KG
Duration:	June 2011 – October 2011

2.2.9 Science Fit

The project Science Fit has been developed to support Styrian companies dealing with research institutions. Therefore, the goal of Science Fit is to foster cooperation between science and industry in Styria, in which the focus concentrates on knowledge transfer projects of SMEs.

The following figure shows the regional transfer system in a descriptive model, which serves as the underlying framework of the project:



For reaching the goal the project partners are actively contacting Styrian SMEs and if desired, arrange contacts to the appropriate experts in one of the Styrian universities. In addition, events, such as road shows and workshops, are organized by the team. Furthermore ISIS acts as a "scientific partner" in doing research in the field of knowledge and technology transfer between research institutions and SMEs.

Figure 11: Cooperation between science and SMEs

Project team at ISIS:	Prof. Stefan Vorbach (project leader) Mag. Romana Rauter, MMag. Dr. Elke Perl-Vorbach
Project partners:	TU Graz, F&T-Haus (lead partner) Montanuniversität Leoben Joanneum Research Karl-Franzens-Universität Graz
Duration:	August 2008 – December 2011
Funding:	European Union (EFRE), Land Steiermark, Stadt Graz
Website:	http://www.uni-graz.at/science_fit

2.3 PhD - projects

2.3.1 From Strategic Direction to Organizational Action: The Implementation of a Corporate Climate Change Strategy from a Subsidiary Perspective

Multinational corporations face increasing pressure from investors, customers, governments, and non-governmental organizations to take responsibility with regards to environmental issues. Incorporating environmental issues into corporate strategy beyond what is required by government regulation is a means to improve a corporation's alignment with these growing environmental concerns and expectations of stakeholders. The most prominent environmental issue this time is climate change. Multinational corporations are made accountable for the release of an extensive amount of greenhouse gas emissions through their operations around the world. They are also expected to possess resources and capabilities to address the climate change issue by reducing greenhouse gas emissions within reach of the corporation. Therefore the challenge for multinational corporations which pursue a proactive climate change strategy is to successfully implement its strategy within subsidiaries around the world in order to achieve noteworthy greenhouse gas reductions.

The objective of the dissertation is to identify facilitating factors within the organizational context as well as barriers to implementing a corporate climate change strategy. Propositions are developed based on strategy implementation research, environmental management research, and environmental psychology research and tested in the course of a case study. The design of the case study is built on the notion that taking an organizational as well as an individual perspective is crucial for a comprehensive consideration of the process of implementing a corporate climate change strategy within a multinational's subsidiaries.

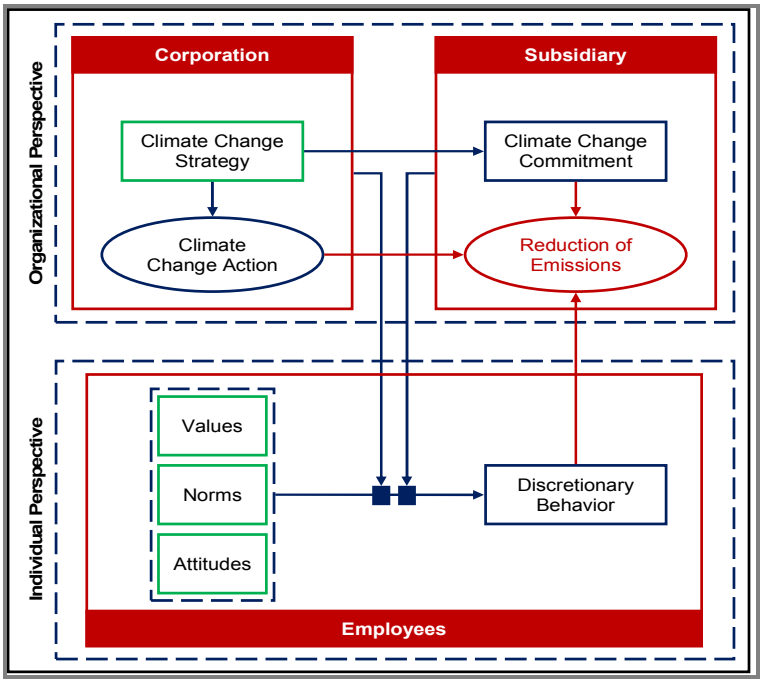


Figure 12: Implementation model of corporate climate change strategy

PhD student at ISIS: MMMag. Holger Klier
Duration: February 2009 - July 2011
Website: http://www.uni-graz.at/implement_cccs

2.3.2 The Study of Environmental Systems Sciences at the interface study and career

With the growing pressure on today's labour market, university graduates need special key competences in order to withstand international competition. This study is based on the hypothesis that employability is fostered by key competences that enable individuals to contribute to sustainable development. Those competences are the central part of the study of environmental systems sciences, founded in 1991 at the University of Graz. It encourages students to obtain skills for sustainable development, such as systems thinking, handling of complexity, anticipatory thinking, critical thinking, communication skills and interdisciplinary working. The aim is to generate interdisciplinary qualified academics, which are able to use the knowledge from more than one's own discipline, to consider problems as a whole and then handle and solve them in a systemic thinking way.

The research question of the dissertation is:

What is the relevance of the study of environmental systems sciences to the labour market?

The objectives of this project are:

1. Identifying key competences of environmental systems sciences graduates considering their qualification profile and key competences that enable individuals to contribute to sustainable development.
2. Comparison of employers' expectations and graduates' profile.
3. Identifying indicators to measure the relevance of the study of environmental systems sciences to the labour market.

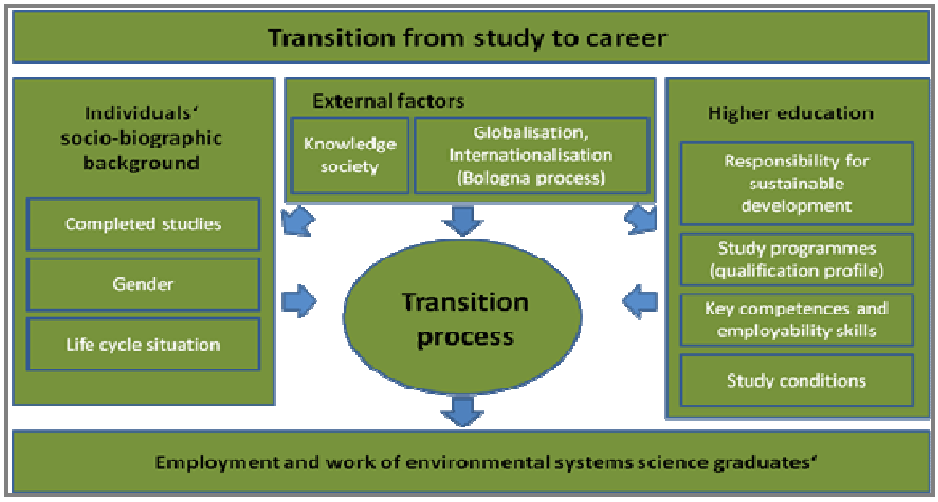


Figure 13: Transition from study to career

The conceptual framework considers the different types of the study of environmental systems sciences and their profile in regard to the labour market. Based on a survey we will quantify how useful the acquired competences described in the qualification profile are compared to the needs of graduates in their fields of work. The sample includes two groups: (i) the whole number of graduates of the studies of Environmental Systems Sciences from 1995 until 2010, and (ii) 10 representatives of employers and human resource managers.

PhD student at ISIS: Mag. Corinne Von der Hellen
Duration: 2008 – 2011
Website: http://www.uni-graz.at/ess_interface

2.4 Research cooperations and networks

2.4.1 EGC – Environment and Global Change

The University of Graz has defined seven research core areas, four of them with inter-university-cooperation. One of the latter is the research core area „Environment and Global Change“. Within this core area, global and regional climate and environmental changes are investigated and monitored. Further, the role of humans as co-initiator, co-concerned, and co-designer of this change as well as the question of search for possible ways for a transformation towards a sustainable development and innovation are central themes of EGC. Researchers from climate and environmental physics, environmental chemistry, hydro-geology, environmental biology, environmental economics, sociology, geography and regional sciences, systems sciences and sustainability research, environmental ethics and law collaborate interdisciplinary.

There are four main research areas:

- GlobEOS (Global Earth Observation and Stewardship)
- RegIMOS (Regional and Local Integrated Modelling System and Studies)
- GreenPROTEC (Green Processes and Technologies)
- RegiKNOWS (Regional Changes and Knowledge Transfer for Sustainability)

2.4.2 SES - Social-Ecological-Systems-Club

The Social Ecological Systems Club was founded by Nobel Prize Laureate Prof. Dr. Elinor Ostrom in order to develop a conceptual framework and an ontology to analyse and compare Social Ecological Systems (SES). The key issue is to understand why some SES are more sustainable than others and how the design of the governance of those systems are related to their sustainability. The SES Club is currently composed of renowned researchers from the USA and Europe, all of whom were personally selected by Prof. Ostrom. Prof. Claudia Binder is part of the SES Club.

2.4.3 ITdNet - International Transdisciplinarity Net

The ITdNet as a network on teaching and practicing transdisciplinary research has the aim to foster existing, and initiate new, boundary organizations between science and society. To this end, the network shares knowledge and experiences, organizes meetings and workshops, writes jointly scientific articles and initiates joint research projects.

Its programme is of true interdisciplinary nature, integrating knowledge from different disciplines, systems, interests and modes of thought with a set of specifically designed and internationally recognized methods. Going well beyond everyday research activities, the network follows a transdisciplinary approach integrating practice and research from the very beginning. As such, it contributes to closer relations between science and practice, assisting transition processes towards sustainable development. Prof. Claudia Binder, Prof. Alfred Posch and Prof. Gerald Steiner are board members of the ITdNet.

2.4.4 ISDR-Society – International Sustainable Development Research Society

The International Sustainable Development Research Society (www.isdrs.org) was formally founded in 2006 and builds upon a 17 year history of the International Sustainable Development Research Conferences and its associated journals like *Sustainable Development, Progress of Industrial Ecology or Business Strategy and the Environment*. The vision is to establish a forum where diverse research communities can come together creating a transparent dialogue on key problems, issues, initiatives, policies and strategies needed to make progress on sustainable development a reality. It aims to foster and communicate the importance of sustainable development in a global society, to promote collaboration and dialogue of a high quality and building bridges between different research communities and between research and its applications in society. In 2010 the 16th annual International Sustainable Development Research Conference was held in Hong Kong (China), in 2011 the 17th annual conference was held in New York (USA). Prof. Rupert Baumgartner is board member of the ISDR-Society.

2.4.5 ISIE – International Society for Industrial Ecology

Prof. Claudia Binder is member of the International Society for Industrial Ecology, ISIE (http://www.is4ie.org/). She was formerly Secretary of the society. ISIE was founded in 2001 and promotes industrial ecology as a way of finding innovative solutions to complex environmental problems. Its mission is to promote the use of industrial ecology in research, education, policy, community development, and industrial practices. It facilitates communication among scientists, engineers, policymakers, and managers interested in better integrating environmental concerns with economic activities.

2.4.6 Chulalongkorn University Bangkok

In May 2010, ISIS set up a Memorandum of Understanding with the Chulalongkorn University Bangkok (Thailand), Environmental Research Institute in the field of environmental research. Dr. Ralf Aschemann is the contact person at ISIS.

2.5 Seminars hosted by ISIS

The ISIS-seminar is a platform where generally external experts give a presentation on most relevant research topics. Usually organized on a monthly basis, besides ISIS-members this event is also open for the URBi Faculty and friends of the institute.

The seminars given in 2011:

Prof. Dr. Gerhard Chroust (J. Kepler University Linz): "*Software like an Understanding Friend - Challenges and Pitfall of Localization*", 19. January 2011.

3 PUBLICATIONS AND OTHER RESEARCH OUTPUT

Performance Record
Institute of Systems Sciences, Innovation and Sustainability Research

	2009	2010	2011
Publications			
Publications in scientific journals	7	14	7
Scientific monographs	2	3	1
Editorships of scientific monographs	2	1	2
Book Chapters	10	8	5
Contributions to conference proceedings	7	22	13
Posters presented at scientific conferences	0	3	3
Other scientific publications	1	1	5
Projects			
Internally funded projects	0	1	1
Third-party funded projects	14	19	17
Cooperation projects	2	1	1
Functions			
Functions in external scientific committees	2	3	4
Functions in external appointment and habilitation committees	1	1	1
Functions in international journals	29	27	24
Scientific reports	1	2	4
Networking			
Presentations at scientific conferences	19	22	10
Awards	0	2	0
Organization of scientific conferences	4	7	5
Visiting scientists (Incoming Mobility)	3	6	2
Travel activities (Outgoing Mobility)	3	16	7
Transfer – Science to professionals			
Publications – science to professionals	0	0	2
Publications in journals – science to professionals	0	0	1
Presentations – science to professionals	0	3	6
Organization of conferences for professionals	0	3	0
Training and further education – science to professionals	0	1	1
Transfer – Science to public			
Press releases	0	0	1
Publications for non-scientific audience	2	2	0
Presentations for non-scientific audience	3	5	6
Organized conferences for non-scientific audience	0	0	0
Training and further education	0	0	13

Performance of project staff included

3.1 Publications

3.1.1 Publications in scientific journals

Agarwal, Abhishek; Posch, Alfred; Strachan, Peter: *Editorial: Managing Industrial Symbiosis (IS) Networks*, in: Business Strategy and the Environment 20 (2011), 421 - 427.

Althaus, Hans-Joerg; Binder, Claudia; Knoeri, Christof: *An agent operationalization approach for context specific agent-based modelling*, in: Journal of Artificial Societies and Social Simulation: an inter-disciplinary journal for the exploration and understanding of social processes by means of computer simulation (2011).

Baumgartner, Rupert: *Critical perspectives of sustainable development research and practice*, in: Journal of Cleaner Production 19,8 (2011), 783 - 786.

Berdugo Moreno, M.; Binder, C.; Diaz Gomez, J.; Erazo Velásquez, A; Garcia Santos, G.; Guerrero Dallos, J; Hellweg, S.; Juraske, R.; Mosquera Vivas, C.: *Pesticide uptake in potatoes: Model and field experiments*, in: Environmental Science & Technology (Washington) (2011), 651 - 657.

Binder, Claudia; Lamprecht, Heinz; Lang, Daniel J.; Scholz, Roland W.: *The Trade-Off between Phosporus Recycling and Health Protection during the BSE Crisis in Switzerland - A "Disposal Dilemma"*, in: Gaia: oekologische Perspektiven in Natur-, Geistes- und Wirtschaftswissenschaften 20/2 (2011), 112 - 121.

Binder, Claudia; Tendall, Danielle: *Nuclear energy in Europe: uranium flow modelling and fuel cycle scenario trade-offs from a sustainability perspective*, in: Environmental Science & Technology (Washington) (2011).

Gelbmann, Ulrike-Maria: *Comparative Analysis of Innovative CSR-Tools For SMEs*, in: International Journal of Innovation and Sustainable Development 5,1 (2011), 35 - 50.

3.1.2 Editorships of scientific monographs

Biedermann, Hubert; Zwainz, Markus; Baumgartner, Rupert (Ed.): *Umweltverträgliche Produktion und nachhaltiger Erfolg: Chancen, Benchmarks und Entwicklungslinien*. München: Rainer Hampp Verlag 2011, 178.

Tschandl, Martin; Posch, Alfred (Ed.): *Integriertes Umweltcontrolling - Von der Stoffstromanalyse zum Bewertungs- und Informationssystem*. 2nd edition, Wiesbaden: Gabler 2011, 326.

3.1.3 Book chapters

Anastasiadis, Maria; Aschemann, Ralf; Gelbmann, Ulrike-Maria: *Sustainability Reporting in ECO-WISES. Eine Basis für aktives Stakeholdermanagement.*, in: Biedermann, Zwainz, Baumgartner (Ed.): Sustainability Management for Industries. Umweltverträgliche Produktion und nachhaltiger Erfolg. München/Mehring: Rainer Hampp 2011, 55 - 66.

Klingspiegl, Marlene; Posch, Alfred: *Stoff- und Energiebilanzierung in der industriellen Produktion*, in: Tschandl M., Posch A. (Ed.): Integriertes Umweltcontrolling: Von der Stoffstromanalyse zum Bewertungs- und Informationssystem. 2nd edition, Wiesbaden: Gabler 2011, 53 - 67.

Posch, Alfred: *Die Region als Innovationsdeterminante*, in: Janschitz, S.; Lieb, G.K. (Ed.): Nachhaltigkeit - Regionalentwicklung - Tourismus. Festschrift zum 60. Geburtstag von Univ.-Prof. Dr. Friedrich M. Zimmermann. Graz: Self-publisher 2011, 221 - 234.

Posch, Alfred: *Darstellung und kritische Analyse ökologieorientierter Bewertungsverfahren*, in: Tschandl M., Posch A. (Ed.): Integriertes Umweltcontrolling: Von der Stoffstromanalyse zum Bewertungs- und Informationssystem. 2nd edition, Wiesbaden: Gabler 2011, 101 - 128.

3.1.4 Contributions to conference proceedings

Anastasiadis, Maria; Aschemann, Ralf; Gelbmann, Ulrike-Maria: *Customizing Sustainability Reporting to Small-Scale Social EnterprisesSustainability Reporting in Ecologically Oriented Work Integration Social Enterprises (ECOWISEs)* in: Hahn, Young et al. (Ed.): Corporate Responsibility Research Conference Papers. Self-publisher 2011.

Aschemann, Ralf; Dullnig, Karin; Posch, Alfred; Reiter, Karl; Seebacher, Ulrike: *Integrating research and teaching by inter- and transdisciplinary case-studies: The case-study on mobility management along corridors.* in: Institute for Advanced Studies on Science Technology and Society (Ed.): Critical Issues in Science and Technology Studies. Self-publisher 2011.

Baumgartner, Rupert: *Business simulation for education and training on sustainability management*, in: IRDO - Institute for development of social responsibility (Ed.): Youth in focus of world changes. Marburg: IRDO - Institut za razvoj druzbene odgovornosti 2011.

Bedenik, Katja; Binder, Claudia: *The role of actors in transitions towards energy self-sufficient regions: the case of Güssing, Austria*, in: ZEE - Zentrum für erneuerbare Energien (Ed.): Book of abstracts. Self-publisher 2011.

Brudermann, Thomas: *Mass psychology – some insights from agent-based models*, in: European Futurists Club Lucerne (Ed.): European Futurists Conference Lucerne - May 20-22 2011. Self-publisher 2011.

Brudermann, Thomas; Dobernig, Karin; Stagl, Sigrid: *Environmentally harmful behaviours: Insights from social neuroscience.*, in: Haans, A., van Gennip, D. A. P., Ham, J., de Kort, Y. A. W., & Midden, C. J. H.Eindhoven University of Technology, Eindhoven, The Netherlands (Ed.): Proceedings of Environment 2.0: The 9th Biennial Conference on Environmental Psychology. Self-publisher 2011.

Brudermann, Thomas; Dobernig, Karin; Stagl, Sigrid: *Can Social Neuroscience enrich Ecological Economics?* , in: European Society for Ecological Economics (Ed.): 9th International Conference of the European Society for Ecological Economics. Self-publisher 2011.

Brudermann, Thomas; Dobernig, Karin; Stagl, Sigrid: *Green Neuroeconomics: How Neuroscience can inform Ecological Economics in the study of sustainable behaviours.* , in: European Society for Ecological Economics (Ed.): 9th International Conference of the European Society for Ecological Economics, June 14-17, Istanbul, Turkey. Self-publisher 2011.

Guevara Chaves, Porfirio: *Coordination Failures in Complex Environments: A Model for Primary Education Systems in Developing Countries*, in: Lyneis, J. (Ed.): 29th International Conference of the System Dynamics Society 2011. Self-publisher 2011.

Kenik, Elvis: *Motivation for self-employment in young people and the role of the University - The case of the University of Graz*, in: IRDO - Institute for development of social responsibility (Ed.): Youth in focus of world changes. Maribor: Self-publisher 2011.

Kenik, Elvis; Steiner, Gerald: *Society-Driven Innovation*, in: University of Maribor, Faculty of Economics and Business (Ed.): Entrepreneurship Education Innovations. 2011.

Matiasek, Rainer; Posch, Alfred: *Sustainable Consumer Behaviour - Theoretical concepts and empirical investigation of consumer behaviour in Europe and in the U.S.A.*, in: Earth Institute, Columbia University, NYC (Ed.): Moving Toward a Sustainable Future. Self-publisher 2011.

Mrotzek, Maximilian: *Approaching the tipping point: critical transitions in systems*, in: Richard Phares, Imrana A. Umar (Ed.): Conference Proceedings of the 29th International Conference of the System Dynamics Society, July 25 – 29, 2011 Washington, DC. 2011.

3.1.5 Posters presented at scientific conferences

Aschemann, Ralf: *The main results of the reports on environmental assessment in Europe 1st EnvironmentAsia International Conference on "Environmental Supporting in Food and Energy Security: Crisis and Opportunity", Laksi/Malaysia, 22 - 25 March 2011*, for: 1st EnvironmentAsia International Conference on "Environmental Supporting in Food and Energy Security: Crisis and Opportunity", Laksi/Malaysia, 22 - 25 March 2011, 2011.

Brudermann, Thomas; Dobernig, Karin; Stagl, Sigrid: *Sustainability policies: Insights from Neuroeconomics.* for: 17th Annual Sustainable Development Research Conference, May 8-10, New York, 2011.

Mrotzek, Maximilian: *Approaching the tipping point: critical transitions in systems*, for: System Dynamics Conference 2011.

3.1.6 Other scientific publications

Agarwal, Abhishek; Posch, Alfred: *Bridging organizations as institutional arrangements for sustainable development*, in: International Sustainable Development Research Society: ISDRS Newsletter Issue 3 2011 2011, 32 - 34.

Baumgartner, Rupert: *Business simulation for education and training on sustainability management*, in: International Sustainable Development Research Society: 2011, 19 - 20.

Baumgartner, Rupert; Cerin, Pontus: *Trade-offs in Auto industry emissions regulations: the case of environmental improvements, technological development, notion of political effectiveness and supporting domestic industry*, in: International Sustainable Development Research Society: ISDRS Newsletter Issue 3 2011 2011, 23 - 24.

Baumgartner, Rupert; Fthenakis, Vasilis: *Industrial ecology, sustainable production, and sustainable global product chains*, in: International Sustainable Development Research Society: ISDRS Newsletter Issue 3 2011 2011, 34 - 37.

Kislinger, Martin; Steiner, Gerald; Von der Hellen, Corinne: *Projektbericht Systemanalyse Shared Space*. 2011.

3.2 Functions

3.2.1 External scientific functions

Baumgartner, Rupert: *Dissertation Review*, University of Stavanger (Norway), 24.01.2011.

Posch, Alfred: *Master thesis review, Smallholders' participation engagement in sustainable supply chain governance systems - Opportunities and barriers of Indian smallholders in accessing global cotton supply chains,* Laia Fayet Perez, Utrecht, Utrecht University (Netherlands), 07.2011.

3.2.2 Functions in external scientific committees

Baumgartner, Rupert: *Dissertation Committee University of Stavanger* (Norway), Membership, 20.12.2010 - 10.03.2011.

Baumgartner, Rupert: *International Sustainable Development Research Society*, executive committee, since 01.07.2006.

Baumgartner, Rupert: *Saubermacher Umweltpreis* (Austria), Membership, 02.05.2011.

Steiner, Gerald: *European Rural Development Focus Group on alpine regions* (European Union), Membership, since 01.01.2001.

3.2.3 Functions in international journals

3.2.3.1 Editorial functions

Aschemann, Ralf: *Journal of Environmental Research*, Member Editorial Board, since 01.07.2009.

Aschemann, Ralf: *Journal of Environmental Assessment Policy and Management*, Member Editorial Board, since 01.10.2009.

Baumgartner, Rupert: *Journal of Cleaner Production*, Editor, since 01.11.2008.

Baumgartner, Rupert: *Progress in Industrial Ecology: an international journal*, Member Editorial Board, since 01.08.2007.

Baumgartner, Rupert: *Sustainable Development*, Member Editorial Board, since 01.10.2008.

Posch, Alfred: *Progress in Industrial Ecology: an international journal*, Editor, 2005 - 2011.

3.2.3.2 Reviews

Reviews were undertaken for following journals:

- Business Strategy and the Environment
- Journal of Cleaner Production
- Journal of Environmental Assessment Policy and Management
- Journal of Industrial Ecology
- Maritime Transport: United Nations Conference on Trade and Development (UNCTAD)
- Sustainable Development
- UVP-Report (ISSN 0933-0690)

3.3 Networking

3.3.1 Presentations at scientific conferences

Baumgartner, Rupert: *Business simulation for education and training on sustainability management*, Presenter, for: 6th international conference social responsibility and current challenges, IRDO - Institute for development of social responsibility (Slovenia), Maribor, 11.03.2011.

Baumgartner, Rupert: *Business simulation for education and training on sustainability management*, Presenter for: 17th International Sustainable Development Research Conference, Columbia University und ISDRS (USA), New York City, 09.05.2011.

Baumgartner, Rupert: *Organizational culture and corporate sustainability management: framework, strategies and change processes*, Presenter, for: 17th International Sustainable Development Research Conference, Columbia University und ISDRS (USA), New York City, 09.05.2011.

Gelbmann, Ulrike-Maria: *Customizing Sustainability Reporting to Small-Scale Social Enterprises*, Presenter, for: Corporate Responsibility Research Conference, Leeds, UK, 13.09.2011.

Gelbmann, Ulrike-Maria: *Facilitating Participation in a Postmodern Society – A Panarchy Model of Sustainability Groups*, Presenter, for: Resilience Alliance Conference, Tempe, AZ, USA, 14.03.2011.

Hecher, Maria: *Einflussanalyse von Indikatoren nachhaltiger Entwicklung*, 12.11.2011.

Posch, Alfred: *Integrating research and teaching by inter- and transdisciplinary case-studies: The case-study on mobility management along corridors.* Presenter, for: 10th Annual IAS-STS Conference "Critical Issues in Science and Technology Studies" Graz, May 2nd-3rd, 2011, IFZ Graz (Austria), Graz, 02.05.2011.

Posch, Alfred: *Sustainable Consumer Behaviour - Theoretical concepts and empirical investigation of consumer behaviour in Europe and in the U.S.A.*, Presenter, for: 17th Annual International Sustainable Development Research Conference, Columbia University, Earth Institute (USA), New York, 08.05.2011.

Posch, Alfred; Vorbach, Stefan: *Inter- und transdisziplinäres Lernen für eine nachhaltige Entwicklung*, Presenter, for: Series of lectures Sustainability4you, 4 Universities in Graz (Austria), 23.03.2011.

Von der Hellen, Corinne: *Umweltsystemwissenschaften an der Schnittstelle Studium und Beruf*, Keynote, for: Geographisches Kolloquium, Graz, 20.12.2011.

3.3.2 Organization of scientific conferences

Baumgartner, Rupert: *Track Chair at the 17th Annual International Sustainable Development Research Conference*, track chair, New York City, 08.05.2011 - 10.05.2011.

Hrast, Anita; Mulej, Matjaz; Risopoulos-Pichler, Filippina; Steiner, Gerald: *IRDO - "International Conference on Social Responsibility and Current Challenges" in Maribor/Slovenia*, since 06.06.2007.

Posch, Alfred: *Track chair at the 17th Annual International Sustainable Development Research conference (AISDRC) 2011 in New York, U.S.A.*, track chair, New York, 08.05.2011 - 10.05.2011.

Steiner, Gerald: *European Meeting on Cybernetics and Systems Research + co-chair of the symposium on "Management, Organizational Change, and Innovation"*, co-chair + programme committee, Vienna, since 02.04.2010.

3.3.3 Other scientific performance

Aschemann, Ralf: *Chairman for den stream "Stakeholder engagement" im Rahmen der IAIA-Tagung zu "10 Jahren SUP" in Prag*, 21.09.2011 - 23.09.2011.

Steiner, Gerald: *Member of the Scientific Board of the "Regional Centre of Expertise" (RCE) at the University of Graz*, since 2007.

3.4 Transfer: science to professionals

Baumgartner, Rupert: *Corporate Social Responsibility*, for: Sitzung des Ausschuss für integrierte Managementsysteme, ASMET (Austrian Society for Metallurgy), Kleinreichenbach (Austria), 02.11.2011.

Baumgartner, Rupert: *Lernen, Innovation und Nachhaltigkeit: das Online-Unternehmensplanspiel „Sustainability Manager"*, for: 8. Forum Innovation, Plattform für Innovationsmanagement, Wien (Austria), 31.03.2011.

Baumgartner, Rupert: *Nachhaltige Entwicklung: Chancen und Herausforderungen für die Innovation von Unternehmen*, for: ERFA Süd / Qualität & Innovation, Kärntner Entwicklungsagentur, Patergassen (Austria), 24.03.2011.

Baumgartner, Rupert: *Corporate Social Responsibility: Grundlagen und ISO 26000*, voestalpine AG (Österreich), 25.11.2011.

Brudermann, Thomas: *Massenpsychologie - der Mensch im Plural.*, for: 3. Wissenschaftliche Tagung der Polizeiakademie Niedersachsen, Polizeiakademie Niedersachsen, Nienburg/Weser (Germany), 08.09.2011.

Brudermann, Thomas: *Mass psychology – some insights from agent-based models.* Invited lecture at the International Institute for Applied Systems Analysis (IIASA), Laxenburg, Austria, February 3rd 2011.

Hecher, Maria: *Nachhaltigkeits-Assessment der wirtschaftlichen Entwicklung auf die Umwelt in Österreich*, 2011.

Posch, Alfred: *"Hat Kreislaufwirtschaft eine Zukunft? Cradle to Cradle hat Antworten"*, für: "Hat Kreislaufwirtschaft eine Zukunft? Cradle to Cradle hat Antworten", Club Zukunft der Stadt Graz, Graz (Austria), 12.10.2011.

Reinsberger, Kathrin: *Österreichischer Fortschrittsbericht im Rahmen der RL 2009/28/EG - Nationaler Aktionsplan für Erneuerbare Energien*, 2011.

3.5 Transfer: science to public

Baumgartner, Rupert: in: *Nachhaltigkeit kann sich für alle Betriebe lohnen*, Kärntner Wirtschaft, 18.11.2011.

Baumgartner, Rupert: *Wege zur Steigerung der Ressourcen- und Energieeffizienz in Industrieunternehmen*, for: WiWi aktuell Veranstaltungreihe "Umwelt und Wirtschaft: Geht das (gut)?", Universitätsclub der Uni Klagenfurt, Universität Klagenfurt (Austria), 24.11.2011.

Binder, Claudia: *Energieregion Weiz - Gleisdorf - "Quo Vadis?"*, for: 15 Jahre Energieregion & Generalversammlung, Energieregion Weiz - Gleisdorf (Austria), 10.05.2011.

Gelbmann, Ulrike-Maria: *Teilnahme an der Diskussions-Sendung "Impulse" in Radio Steiermark, Thema "Böses Plastik?"*, Radio Steiermark/ORF, Rundfunk, 30.05.2011.

Kenik, Elvis: *Scientific member*, IRDO Institute for Social Responsibility, since 01.03.2008.

Posch, Alfred: *Die Zukunft der Fortbewegung: Visionen für die urbane Mobilität*, for: Montagsakademie 2011/12Leitthema: "Mobilitäten", Institut of Systems Sciences, Innovation and Sustainability Research (University of Graz), Graz (Austria), 26.09.2011.

Posch, Alfred: *Impuls aus der Wissenschaft zum Master International Industrial Management*, für: Industrial Welcome DAy und Eröffnung des IWI-Masters International Industrial Management, FH Joannem, Kapfenberg (Austria), 06.10.2011.

Posch, Alfred: *Research for Sustainable Development*, for: Utrecht Students' Association's Excursion in Austria, Institute of Systems Sciences, Innovation and Sustainability Research (University of Graz), Graz (Austria), 15.04.2011.

Steiner, Gerald: *Member of the Scientific Advisory Board of "Keimblatt Ökodorf" (ecovillage)* (http://www.oekodorf.or.at/), Keimblatt Ökodorf, Keimblatt Ökodorf (Austria), since 2008.

4 TEACHING

4.1 Study Programmes

4.1.1 Environmental Systems Sciences

In teaching, ISIS is the focal institute for the bachelor and master study programmes in **Environmental Systems Sciences** with its five subject foci: business administration (respectively sustainability oriented management), chemistry, economics, geography, and physics.

The main idea of these study programmes is to generate interdisciplinary trained academics that are able to handle complex problems that are related to environmental protection and/or to the broader concept of sustainable development of different systems. Here, the capability to apply formal methods of systems sciences, in-depth knowledge in the respective subject focus and profound competences for working in interdisciplinary teams are the most important cornerstones of the profile of graduates in Environmental Systems Sciences.

The roots of the study programmes in Environmental Systems Sciences go back to 1991 when the first individual diploma studies were developed. Continuously increasing interests by students and high dedication of some professors finally led to the implementation of regular bachelor and master study programmes in October 2003 which are still unique in its conception in Europe. Now, about 1,300 students are enrolled in the bachelor and master programmes in Environmental Systems Sciences; the bachelor programmes comprise 180 ECTS credit points which equals a study period of six semesters, and the consecutive master programmes 120 ECTS credit points, or four semesters.

Figure 14: Teaching at ISIS

ISIS is responsible for the education in formal methods of systems sciences, mathematics and statistics, interdisciplinary education for basics in human-environment systems, parts of the subject focus business administration at bachelor level, the subject focus sustainability-oriented management at master level, and last but not least the interdisciplinary practical courses. The latter is a special and unique course type where an interdisciplinary team of teachers and students with different subject foci work together on a complex real-world problem for sustainable development of a certain system. Besides interdisciplinarity, also transdisciplinarity is part of the teaching concept, aiming at the integration of stakeholders from outside the University in order to initiate a mutual learning process between academics and practitioners.

Comprehensive information on Environmental Systems Sciences can be found at **www.uni-graz.at/usw/**.

4.1.2 International Joint Master's Programme in Sustainable Development

In 2008, a curriculum for the **International Joint Master's Programme in Sustainable Development** was designed and approved by six partner universities, with the University of Graz (Austria) as co-ordinating university, Ca' Foscari University of Venice (Italy), Leipzig University (Germany), and Utrecht University (The Netherlands) are degree-awarding consortium members, and Basel University (Switzerland) and Hiroshima University (Japan) are associated mobility partners.

In this master's programme sustainability issues are approached from an international as well as inter- and transdisciplinary perspective. The focus is set on applying the competences to the question of sustainable development and the needs and possibilities of societal transformation. It combines the strengths and specializations in teaching and top research of six partner universities, thereby offering the students a programme recognized in the countries of the consortium partners and the possibility of going on to PhD-studies as well as increasing the employability in the private, public and semi-public sector.

Admission to this Master's Programme is granted to persons who have completed at least the equivalent of a Bachelor's or Diploma degree, and can demonstrate their research skills, their basic knowledge of the natural and/or social sciences, and a general insight in the subject of sustainable development and intervention strategies. The Master's Programme comprises 120 ECTS credits corresponding to a period of study of at least four semesters or two years. 60 ECTS credits have to be earned at the home university. Students are required to complete at least 30 ECTS credits at one of the partner universities. Besides the academic coordination, ISIS offers courses for the first semester in basics in Sustainable Development, for the third integration semester, and one specialization track (second semester) in Sustainable Business Management. Master theses are generally supervised by two teachers of two different partner universities.

Comprehensive information on the International Joint Master's Programme in Sustainable Development can be found at **www.jointdegree.eu/sd.**

4.1.3 Erasmus Mundus Master's Programme in Industrial Ecology (MIND)

The European Commission's "Education, Audiovisual and Culture Executive Agency" (EACEA) selected the new **Erasmus Mundus Master's Programme in Industrial Ecology** (MIND) in July 2010. Beside the International Joint Master's Programme in Sustainable Development, this is the second Joint Master Programme, where ISIS is the coordinating institute.

MIND is a two-year programme with 120 ECTS, intending to train students

- to conduct industrial ecology analyses of complex sustainability problems,
- to design industrial ecology solutions for these problems, and
- to develop implementation strategies for those solutions identified.

The MIND consortium consists of the University of Graz as co-ordinator: Univ.-Prof. Dr. Claudia Binder acts as programme director, Dr. Ralf Aschemann as academic co-ordinator and the Office for International Relations is in charge of the administrative co-ordination. Partners in the MIND consortium are Leiden University and Delft University of Technology; Chalmers University of Technology Gothenburg; Asian Institute of Technology (Thailand); Rochester Institute of Technology (USA) and Waseda University (Japan).

In the first study year, the three EU universities offer basic modules on industrial ecology. In the second study year, all consortium universities offer a specialization module in industrial ecology (third semester), cf. the figure below.

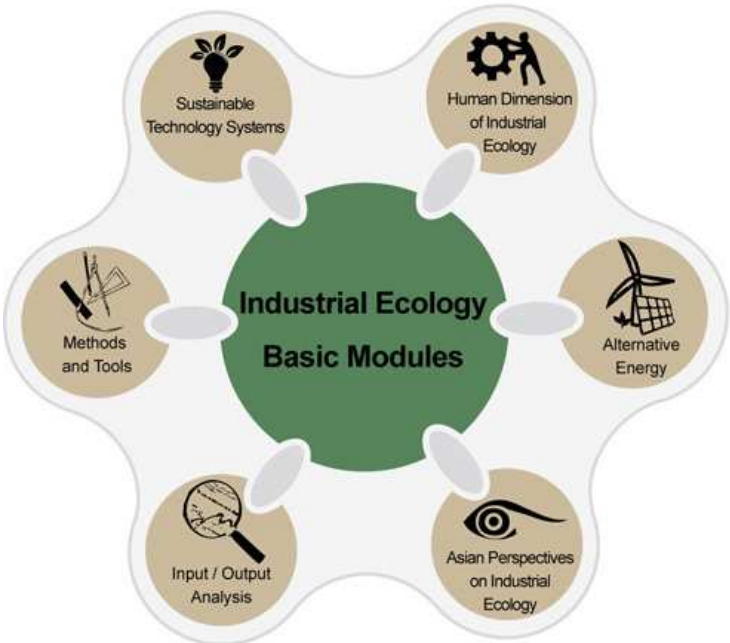


Figure 15: Structure of the MIND programme

It is intended to run MIND at least for five consecutive editions, i.e. study years 2011/12 to 2016/17. For the same period, the EACEA will support MIND by granting scholarships for students and scholars and by contributing to the running administrative costs.

With winter term 2011/12, MIND started its first edition: Seven students began their master programme at University of Graz, five at Leiden University and Delft University of Technology, and four at Chalmers University. From 21 to 26 August 2011, the students joined the MIND orientation week, organized on the Dutch island of Ameland.

Figure 16: MIND academics and students during their orientation week in Ameland/Netherlands (August 2011)

Meanwhile, the scholarship holders for the second MIND edition - starting with winter term 2012/13 - have been selected. This decision is still subject to approval on the part of EACEA.

Comprehensive information on MIND can be found at **www.emmind.eu.**

4.1.4 Doctoral School for Environmental Systems Sciences

In October 2011 the new Doctoral School for Environmental Systems Sciences was founded. The main goal is to provide high-quality education for our PhD-students in the field of environmental systems sciences. The study programme is based either on the curriculum for interdisciplinary environmental systems sciences or on the curriculum for environmental systems sciences focused on natural science.

The main differences to the previous doctoral programme are in two aspects:

- First, each PhD-Student has in addition to a supervisor a mentoring person who supports the candidate throughout the development of the thesis.
- The second difference is that the thesis has to be cumulative based on three peer-reviewed journal publications instead of writing a monograph.

This new form complies with international scientific standards and ensures that the valuable results achieved by our PhD-students are presented to an international auditorium.

Details about the doctoral school, especially the admission process can be found on our website **www.uni-graz.at/isis**.

4.2 Courses

Winter term 2010/2011

Type	Courses	Lecturer	Contact hours
VO	Allgemeine Ökologie für USW	Depisch B, Raspotnig G, Tschernatsch M	2
VU	Integral- und Differentialrechnungen für Umweltsystemwissenschaften	Hötzl E, Keeling S, Peichl G, Perko R, Schwaiger J	4
VU	Vektorrechnung für USW	Schwaiger J	3
PS	Proseminar zu Statistik für Umweltsystemwissenschaften	Ambros R, Feit T, Perko R	1
VU	Qualitative Systemwissenschaften 1 (SL1)	Binder C, Mrotzek M, Steiner G	3
VO	Qualitative Systemwissenschaften 2 (SL2)	Huber A	2
PS	Proseminar zu Qualitative Systemwissenschaften	Bartmann J, Baur I, Knöri C,	2
VU	Differentialgleichungen für Studierende der Umweltsystemwissenschaften	Prager W	2
VO	Vorlesung zu Statistik für Umweltsystemwissenschaften	Feit T	2
OL	Orientierungslehrveranstaltung für USW: NAWI für SOWI Studierende	Gspurnig J, Kosmus W, Lippitsch M, Sulzer W	2
OL	Orientierungslehrveranstaltung für USW: SOWI für NAWI Studierende	Steininger K, Vorbach S	2
VU	Methods for inter- and transdisciplinary problem solving	Aschemann R	2
PS	Social competences for inter- and transdisciplinary problem solving	Aschemann R	2
AG	IP Nachhaltige interkommunale Kooperation auf regionaler Ebene	Hasler A, Kraack L, Stranz S,	4
AG	IP Potenzialanalyse der Gemeinde Thal	Bedenik K, Mader M	4
AG	IP Plastic Planet - Kunststoff versus Glas in Verpackungsmaterialien	Gössler W, Vlk T	4
AG	IP Modellierung des Stoffstroms "Kunststoff"	Binder C, Guevara Chaves P, Lesmes Fabian C	4
AG	IP Innovative Lösungsansätze für nachhaltige (Groß-) Projekte/Veranstaltungen	Gelbmann U, Hasler A, Stranz S	6
AG	IP Mobilitätsmanagement an Korridoren	Aschemann R, Dullnig K, Posch A, Reiter K, Seebacher U	6
AG	IP Bewusstseinsbildung für nachhaltigen Konsum von Produkten aus Entwicklungsländern	Aschemann R, Diethart M, Mader C	6
AG	IP Klimawandel bedingte Naturkatastrophen in der Steiermark	Friesenbacher M, Gelbmann U, Mrotzek M, Sulzer W	6
AG	IP Students4Sustainability	Ehetreiber J, Risopoulos-Pichler F	4
AG	Hat unsere Zukunft Zukunft?	Ahamer G, Handler M, Kumpfmüller K	4
SE	Seminar zu Qualitative Systemwissenschaften (Modellierung der Umwelt- und Zivilisationsfolgen)	Schmickl T	2
SE	Seminar zu Qualitative Systemwissenschaften (Selbstorganisation in biologischen Systemen)	Schmickl T	2

SE	Seminar zu Qualitative Systemwissenschaften (Interdisziplinäre Ansätze von Mensch-Umwelt Systemen)	Binder C	2
VU	Umweltorientiertes Innovations- und Technologiemanagement	Rauter R	2
VU	MSD 1 (Betriebswirtschaftliche Umweltökonomie)	Baumgartner R, Vorbach S	2
PS	MSD 2 (Umwelt- und Nachhaltigkeitsmangement)	Baumgartner R	2
PS	MSD 2 (Stakeholdermanagement)	Gelbmann U	2
PS	MSD 2 (Nachhaltigkeitsmanagement und-berichterstattung)	Resel K	2
PS	MSD 2 (Nachhaltigkeit und CSR - Corporate Social Responsibility)	Baumgartner R	2
PS	MSD 2 (Energiemanagement im Unternehmen)	Rossbacher A	2
KS	EMM 1 (Eco-Entrepreneurship)	Steiner G	2
KS	EMM 2 (Eco-Controlling)	Baumgartner R	2
KS	ETM 1 (Innovation und Innovationsmanagement)	Globocnik D	2
KS	ETM 2 (Management von Umweltprojekten)	Braschel N, Posch A	2
PK	Umweltökonomisches Praktikum	Posch A	4

Summer term 2011

Type	Courses	Lecturer	Contact hours
VU	Integral- und Differentialrechnungen für Umweltsystemwissenschaften	Hötzl E, Schwaiger J	4
VU	Vektorrechnung für USW	Prager W, Schwaiger J	3
PS	Proseminar zu Statistik für Umweltsystemwissenschaften	Ambros R, Feit T, Perko R	1
VU	Qualitative Systemwissenschaften 1 (SL1)	Binder C, Mrotzek M	3
VO	Quantitative Systemwissenschaften 1 (SN1)	Schappacher W	3
PS	Proseminar zu Qualitative Systemwissenschaften	Baur I, Gebetsroither E	2
VU	Quantitative Systemwissenschaften 2 (SN2)	Desch G	2
VO	Qualitative Systemwissenschaften 3	Huber A	2
SE	SE Qualitative Systemwissenschaften	Binder C, Diebner H, Grossmann W	2
VU	Quantitative Systemwissenschaften 3 (SN3)	Halloy J	2
SE	Seminar zu Quantitative Systemwissenschaften	Propst G	2
AG	IP Entwicklung und Gestaltung von nachhaltigen AkteurInnen - Netzwerke auf regionaler Ebene	Gspurnig J, Hasler A, Huber W	4
AG	IP Wandel der internationalen Klimapolitik von Kyoto zu Kopenhagen	Lackner B, Steininger K, Töglhofer C, Türk A	6
AG	IP Zielgruppen-adäquate Kommunikation in Sachen Nachhaltigkeit	Ehetreiber J, Pichler R, Risopoulos-Pichler F, Schaller M, Steiner G	6
AG	Reporting on ECO-WISEs-Nachhaltigkeitsberichte für Sozialökonomische Betriebe mit ökologischer Ausrichtung	Anastasiadis M, Aschemann R, Gelbmann U	4
AG	Umweltauswirkungen des Luftverkehrs	Aschemann R, Friedrich A, Schweitzer S	4
AG	CO2-Bilanzierung in den Bereichen Energie- und Abfallwirtschaft sowie Zementindustrie	Aschemann R, Braschel N	4
AG	Students4Sustainability. Implikationen für Umweltsysteme	Binder C, Ehetreiber J, Schaller M, Von der Hellen C	4

VU	MSD 1 (Betriebswirtschaftliche Umweltökonomie)	Baumgartner R	2
PS	MSD 2 (Nachhaltigkeitsmanagement und -berichterstattung)	Resel K	2
PS	MSD 2 (Stakeholdermanagement)	Gelbmann U	2
PS	MSD 2 (Umwelt- und Nachhaltigkeitsmanagement)	Baumgartner R	2
PS	MSD 2 (Nachhaltigkeit und CSR - Corporate Social Responsibility)	Von der Hellen C	2
PS	MSD 2 (Energiemanagement im Unternehmen)	Rossbacher A	2
KS	EMM 1 (Eco-Entrepreneurship)	Dabic M, Kenik E, Pölzl M	2
KS	EMM 2 (Eco-Controlling)	Baumgartner R	2
KS	ETM 1 (Innovation und Innovationsmanagement)	Globocnik D	2
KS	ETM 2 (Management von Umweltprojekten)	Posch A	2
PK	Umweltökonomisches Praktikum	Posch A	4
KS	EMM 1 (Sustainable Product Development)	Steiner G	2
KS	EMM 2 (Integrated Management Systems)	Gelbmann U	2
SE	Sustainability and Environmental Management	Posch A	2

4.3 Completed master thesis

Albrecher, Jürgen Alois: *Innovationspotential der Organisationsform Maschinenring*, (Vorbach, Stefan).

Balloch, Sylvia: *Die Auswirkungen der Subprimekrise auf Corporate Social Responsibility in steirischen Betriebenl,* (Steiner, Gerald; Mrotzek, Maximilian).

Danzer, Birgit: *Nachhaltigkeit im Personalbereich Steirischer Vorzeigebetriebe*, (Posch, Alfred).

Ehrlich, Robert Alexander: *Darstellung des ökologischen Marketing Managements und Anwendbarkeit am Beispiel eines österreichischen Fast-Food Unternehmens*, (Vorbach, Stefan).

Erhart, Martina: *Die Rolle der europäischen Forschungsförderung als Voraussetzung zur Erreichung der Klima- und Energieziele am Beispiel der Elektrizitätswirtschaft in Österreich*, (Posch, Alfred).

Fasching, Claudia: *Corporate Social Responsibility im europäischen Vergleich*, (Baumgartner, Rupert; Gelbmann, Ulrike).

Feichtinger, Gerald: *E-Mobilität – Rahmenbedingungen und Möglichkeiten zur Lastbeeinflussung*, (Stigler, Heinrich).

Haindl, Martina: *Kooperationsformen zwischen Universitäten und der Wirtschaft in arabischen Ländern – Die Rolle von intermediären Institutionen*, (Schnitzer, Hans).

Haselsteiner, Sebastian: *Die Entwicklungsstrategien von Energieversorgungsunternehmen in Mitteleuropa – Ein empirischer Vergleich ausgewählter EVUs mit der Energie AG Oberösterreich*, (Posch Alfred).

Hecher, Maria Anna: *„Sustainability Solution Space" – Nachhaltikeits-Assessment für Österreich mittels sozio-ökonomischer und ökologischer Indikatoren*, (Binder, Claudia).

Hoelblinger, Eva: *Elektrizitätserzeugung aus Photovoltaikanlagen in der Europäischen Union Entwicklung, Status quo und die Situation der Fördersysteme*, (Stigler, Heinrich).

Koeberl, Christian: *Darstellung von Energieströmen und Identifikation von Potentialen zur Steigerung der Energieeffizienz*, (Vorbach, Stefan).

Koechl, Thomas: *Ölmärkte: Eine technisch-wirtschaftliche Analyse der globalen Versorgung mit Ölprodukten*, (Stigler, Heinrich).

Koinegg, Johann: *Analysis of building integrated photovoltaic in Austria – Effects and chances of the new EU building directive from the viewpoint of the module producer*, (Vorbach, Stefan).

Mader, Lukas: *Life-Cycle Extension Methods for Personal Computers – An Ecological and Economical Assessment*, (Posch, Alfred).

Monschein, Stefan: *Standortbezogene Erarbeitung von Treibhausgasemissionsfaktoren und errechnung von CO_2-Äquivalenten*, (Vorbach, Stefan; Foelsche, Ulrich).

Pierer, Magdalena: *The possible inclusion of the Austrian Waste Management in the EU Emissions Trading System – An empirical analysis on opportunities and limitations*, (Posch, Alfred; Glasbergen, Pieter).

Pusterhofer, Magdalena: *Incentives for the Austrian Waste Industry to join the European Union Emissions Trading Scheme*, (Posch, Alfred).

Schett, Eva: *Aufbau eines Informationssystems zum Management von Produktionstechnologien der MAGNA STEYR Fahrzeugtechnik Graz*, (Baumgartner, Rupert).

Schummi, Alexander: *Produktlebenszykluserweiterung von Konsumgütern – Aufbereitung und Wiederverkauf am Beispiel von Konsolenspielen*, (Posch, Alfred).

Wachter, Daniela: *Life Cycle Assessment einer Photovoltaik- und einer Windkraftanlage*, (Posch, Alfred).

Wetz, Ina: *Hemmnisse und Lösungsansätze zur Steigerung der energetischen Sanierungsrate*, (Vorbach, Stefan).

4.4 Completed dissertations

Bicman, Nada: *Produktivität in slowenischen Unternehmen der verarbeitenden Industrie – Mitarbeiterpotential, Innovationsaktivität und Unternehmensorganisation als potentielle Produktivitätstreiber*, (Vorbach, Stefan; Kenz Riedl, Jožica).

Klampfl-Pernold, Hannes: *Szenarioentwicklung für die Abfallverbrennung in Österreich – Eine zukunftsorientierte Szenarioanalyse der österreichischen Abfallwirtschaft*, (Vorbach, Stefan; Prisching, Manfred).

Matiasek, Rainer: *Unternehmerische Nachhaltigkeit. Unternehmensstrategien und Konsumenten*, (Posch, Alfred; Ungericht, Bernhard).

Rauter, Romana: *Wissenstransfer als Anstoß für Innovationsaktivitäten. Eine empirische Analyse am Beispiel steirischer Klein- und Mittelbetriebe des produzierenden Sektors*, (Vorbach Stefan; Posch, Alfred).

Von der Hellen, Corinne: *Umweltsystemwissenschaften an der Schnittstelle Studium und Beruf. Zur Relevanz von HochschulabsolventInnen für den Arbeitsmarkt am Beispiel der Umweltsystemwissenschaften*, Dissertation, Graz 2011, 276.

4.5 Other teaching

In July 2011, Dr. Aschemann worked as guest lecturer in Thailand at the International College for Sustainability Studies of Srinakharinwirot University, supported by ASEA-Uninet. He taught the course “Introduction to Sustainability” for a total of 120 second year students of the international B.A. programme “Sustainable Tourism”.

5 ADMINISTRATION

5.1 Functions within the University

Aschemann, Ralf: Academic c*oordinator of the Erasmus Mundus Master programme in Industrial Ecology (MIND)*, coordinator of research or education programme, since October 2011.

Aschemann, Ralf: *Erasmus coordinator at ISIS*, internal coordination, since October 2011.

Aschemann, Ralf: *Internal coordination of the interdisciplinary practical training (IPs),* internal coordination, since October 2011.

Aschemann, Ralf: *Substitute member of the faculty committee,* since October 2011.

Baumgartner, Rupert: *Head of ISIS, since October 2011.*

Baumgartner, Rupert: *Member of the faculty committee,* since 2011.

Baumgartner, Rupert: *Respondent of the CuKo USW,* strategic advisor, since 2010.

Gelbmann, Ulrike: *Member of the faculty committee*, since October 2011.

Posch, Alfred: *Vice head of ISIS,* since September 2009.

Posch, Alfred: *Dean for studies at the Faculty of Environmental, Regional and Educational Sciences.*

Posch, Alfred: *Member of the strategic council of the "Akademie für Neue Medien und Wissenstransfer"*, strategic advisor, since 2009.

Posch, Alfred: *Member of the awarding committee of the "Buchbinderpreises"*, internal coordination, since 2009.

Posch, Alfred: *Respondent of the faculty committee*, strategic advisor, since 2009.

Posch, Alfred: *Respondent of the CuKo USW*, strategic advisor, since 2009.

Steiner, Gerald: *Erasmus coordinator at ISIS*, internal coordination, until October 2011

Steiner, Gerald: *Member of the faculty committee*, until October 2011.

Steiner, Gerald: *Organizer of the ISIS-Science Seminar Series,* coordination of a research or education programme, until October 2011.

Von der Hellen, Corinne: *Publication planning at ISIS*, internal coordination, until December 2011.

5.2 Functions in external appointment and habilitation committees

Baumgartner, Rupert: *Appointment committee, TU Graz (Austria*), reviewer, until January 2011.