2nd SUSTAINABLE SUMMER SCHOOL

THE MAIN FOCUS OF THIS YEAR'S SUSTAINABLE SUMMER SCHOOL WAS ›SOCIETIES, SYSTEMS AND SWARMS‹. **THE** PARTNERS' VISION WAS TO CREATE A HIGH QUALITY PROGRAM OF FURTHER EDUCATION […] **DESIGNERS** CAN PLAY AN ESSENTIAL ROLE IN REVERSING THE WORLD'S CURRENT PATTERNS OF UNSUSTAINABLE CONSUMPTION. **IF** WE WANTED TO GUARANTEE EVERYBODY ON THIS PLANET THE SAME LIFESTYLE WE HAVE TO DEMATERIALIZE OUR ECONOMY. **THIS** YEAR'S MOTTO OF ›SYSTEMS, SWARMS, SOCIETIES‹ INVITED THE STUDENTS TO THINK ABOUT SOCIETIES AND THE MEANING OF THEIR COMPLEX STRUCTURES. **USUALLY** 5–10% OF THE GROUP'S MEMBERS MUST SERVE AS LEADERS IN ORDER TO DIRECT GROUPS OF DIFFERENT SIZES. **IF** WE WISH TO STUDY ISSUES OF GOVERNANCE, WE FIRST MUST KNOW HOW SOCIETIES WORK. **HUMAN** BEINGS ARE THE ONLY CREATURES IN THE BIOSPHERE THAT HAVE INVENTED CULTURE AS A MEANS OF SURVIVAL AND DEVELOPMENT. **ART** CAN OFTEN DEAL WITH EMOTIONS MUCH BETTER THAN SCIENCE. **WHENEVER** YOU NEED A CAR, YOU SIGN UP AND HAVE INSTANT ACCESS TO DIFFERENT CATEGORIES OF VEHICLES RATHER

2nd
SUSTAINABLE
SUMMER
SCHOOL

PLATE
REFRIGERATOR

FAMILY... PEOPLE
... CHEAP

YOUNG
PEOPLE
...

WASTE
MANAGEMENT

GARBAGE SYSTEM
WATER
POLLUTION ONLY
IN SEVERAL TOWNS

FOOD LEAVINGS
FOR DOMESTIC
ANIMALS

BUY TO
HOMELESS?

RECIPES

WASTE
MANAGMENT

REAR AN
ANIMAL

SHOPPING IN
THAI CENTRA
OR SHARING IN
SMALL
NEIGHBOURHOODS
APARTMENTBLOCKS

CONSERVATION
METHODS

... (work in building)

BIRCH JUICE
~ JUS
ORANGE JUICE
WATER SERVICE
MAKER/CARETAKER

Supermarket
deadpackaging
vegetables

Re-cycling
-waste -paper
-organic -glass
-plastic & allum.

COMMUNITY
PROJECTS

CELL PHONE
(SMS
NOTICE)

RADIO

PROJECTS

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VALUES

• Community

⤷ Unity / Connection with others
    — Social (knowledge)
    — economical (new start-up bus...
    — ecological benefit

• Adjusted to the local structures (...)

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Content

1 Manifesto
2009 / **2010**

2009/DEMATERIALIZE: CREATE ATTRACTIVE LIFESTYLES WITH LESS RESOURCE CONSUMPTION. **RETHINK** EXISTING SYSTEMS AND DEVELOP NEW ONES. **CHANGE** THE CULTURAL ATTITUDE. BE AWARE OF PATTERNS. **RESHAPE** MARKETS AND INFLUENCE POLITICIANS BY YOUR INDIVIDUAL CHOICES. **SHARE** YOUR STUFF. **MAKE** IT COOL TO BE GREEN. **DEVELOP** MEDIA-PARTNERSHIPS TO RAISE AWARENESS. **CHERISH** CULTURAL DIVERSITY – IT IS A PRECIOUS RESOURCE. **CONSIDER** PEOPLE'S HEALTH. **UNDERSTAND** THE »REAL PRICE« OF PRODUCTS AND SERVICES. THE USE OF NATURE HAS ITS PRICE. **2010/RAISE** YOUR AWARENESS OF MATERIAL GOODS. **SUPPORT** COMMUNICATION IN PUBLIC SPACES. BENEFIT FROM IT. **SHAPE** FUTURE LIFEWORLDS IN A GREEN FASHION. **SPREAD** IDEAS AND THOUGTS CONCERNING LOCAL AND ORGANIC FOOD. **KEEP** AN OPEN MIND TOWARDS DIFFERENT PEOPLE AND HABITS. **SAVE** ENERGY, WATER AND MONEY. **SHARE** THINGS YOU DON'T OFTEN USE. **BE** A LEADER. BE SOCIAL. BE RESPONSIBLE FOR THE THINGS YOU DO. **RETHINK** YOUR HABITS.

2 Introduction

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The concept of the Sustainable Summer Schools

Christa Liedtke
Najine Ameli

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Sustainability is a topic that is becoming increasingly important for designers. They are beginning to realise that it is time for them to step up and make sustainability a part of the products and services which they design. Demonstrating the possibilities of working in a more sustainable fashion and giving young professionals a chance to experience the true meaning of sustainability are just some of the goals of the Sustainable Summer Schools.

Due to the enormous success of the 1st Sustainable Summer School, the organisational team set about planning the 2nd Sustainable Summer School immediately after the first programme's completion.

In order to take advantage of the location's very unique working conditions, the 2nd Sustainable Summer School was, like the 1st Sustainable Summer School, took place at the monastery at Jüchen. The event was again hosted by the resident monks, whose graceful understatement ensured that the entire event was a very special experience.

The Sustainable Summer Schools draw not only upon the wonderful surroundings, but they are also enriched by the participants' varied and international backgrounds as well as the organisational team's expert knowledge. The group consists of professionals from universities and research institutions, including Brigitte Wolf and Marcel Befort from the University of Wuppertal, Bernd Draser and Davide Brocchi from ecosign Academy, Anke Bernotat and Ulrich Scholz from the Folkwang University of the Arts, Nina Gellersen and Luzius Schnellmann from the Lucerne University of Applied Sciences and Arts, Nora Brüggemann from Centre on Sustainable Consumption and Production and Christa Liedtke and Najine Ameli from the Wuppertal Institute.

In addition to organising event in its entirety, the team is also responsible for planning the workshops.

The main focus of this year's Sustainable Summer School was »Societies, Systems and Swarms«. In order to provide a broad overview of their work, experts from the fields of industry and research were invited to give their detailed and up to date insights into these themes. Made up of interdisciplinary teams participating in workshop groups including students, teachers, company representatives and experts, the Summer Schools are

»THE MAIN FOCUS OF THIS YEAR'S SUSTAINABLE SUMMER SCHOOL WAS ›SOCIETIES, SYSTEMS AND SWARMS‹.«

»innovation campuses« that set out to develop sustainable and resource-efficient product-service systems. As mentioned above, the inspirational atmosphere is not only the result of the team members and experts diverse areas of expertise, but also by the participants' diverse cultural backgrounds and varying levels of education. The concepts developed at the Sustainable Summer School confirmed the last year's hypothesis, which stated that possessing goods was becoming less and less important, whereas the opposite was true concerning the supply of services – i.e., we must use fewer resources to create greater satisfaction. It is not really surprising that the idea of »sharing« and »structures of social interaction« played a key role in the concepts developed by all of last year's groups.

This document is intended to provide the reader with an idea of the inspirational and motivational atmosphere of the 2nd Sustainable Summer School. This publication begins with an INTRODUCTION that will provide the reader with a rough overview of the entire setting. The experts are then presented in the form of taken from the speeches which they held on the EXPERT DAY which provide insight into the methods and tools they use in their daily work. These focus on the main theme of the 2nd Sustainable Summer School – »Societies, Systems and Swarms«. Summarising all of this information, REFLECTIONS can be seen as a catalyst that can help transform the information provided at the Sustainable Summer School into practical approaches. WORKSHOPS describes the development of the ideas as well as the results of the different working groups. The last chapter provides a list of all of the partners and participants.

At this point we would like to cordially invite you to take part in the 3rd Sustainable Summer School, which will take part in August 2011 (see www.designwalks.org).

Objectives of the Summer School

Christa Liedtke
Najine Ameli

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Through a more system-oriented research and design concept the participants' resource and sustainability competencies should be strengthened. This is true for both – the teachers and students – whose strategies change depending on the situation.

Objectives

» To achieve a »knowledge to action« approach that will create visible teaching and implementation success.
» To reach tomorrow's decision makers and generally strengthen competencies in the fields of resources and sustainability.
» To develop concrete concepts and ideas for resource-efficient and sustainable product-service systems.
» To connect international students and teachers with one another in order to generate an active community.
» To participate in the development of demanding as well as high-quality system-oriented solutions.
» To connect with other individuals interested in these topics.

The partner's vision was to create a high quality program of further education and to shape Germany's image as both host and initiator in the field of sustainable and resource-efficient design. Furthermore, we intended to create a quality international network based around the concept of sustainable design.

The inclusion of project sponsors should allow us to immediately implement our conclusions, and these concepts should continually progress and be subject to further development.

Creating Basic Knowledge

The Internet platform www.designwalks.org aims to provide designers with teaching and study material as well as examples and concepts related to structural forms of resource efficiency and sustainability. We intend to create a medium for the exchange of information and interaction between interested students, teachers and companies. The platform should enable

participants to develop design concepts in an interactive fashion and locate design and research partners in similar fields.

Design Activities

In one to six-week workshops or at summer/winter schools which take place at an innovation campus, students and professionals from the field of design and product development will create innovative and resource-efficient product-service solutions and systems in an interdisciplinary and trans-disciplinary fashion.

Teachers, professors and experts will not only broaden the participants' perspectives, but they will also gain extremely valuable knowledge by means of this trans-disciplinary approach and their interactions with other experienced participants.

Innovative and eco-intelligent concepts will help in the creation of innovation networks consisting of research institutes, companies, and other organisations responsible for managing projects. These concepts are then further developed in innovation workshops »living labs« (http://www.livinglabproject.org/). The transition from invention to innovation to marketability is accompanied by network actors.

Bundling Excellence

Together with specialists in the field of sustainability and resource efficiency (including energy and energy efficiency) our aim is to create an academic and international network for sustainable design – known as »design walks« – that can conduct inter-disciplinary and transdisciplinary research in the field of resource efficiency, develop research projects, and apply for research funds.

The vision is to create a »virtual design campus« that assists research as well as researchers. In order to create this network, we must first develop a network concept and initiate shared projects for joint implementation. Shared laboratories, project houses and/or innovation workshops, or the implementation of joint innovation campus offerings, for example, are

intended to strengthen collective activities and help foster the exchange of researchers as well as the expansion of academic offerings.

Accelerating implementation
Communicative platforms such as the Design Management forum (www.design-management-forum.de) help foster cooperation and sponsorship that will allow students to develop great ideas and even launch them on the market. These processes are supported by means of continuous and quality PR activities.

Furthermore, the Sustainable Summer Schools can form a part of interdisciplinary and transdisciplinary research agendas in the field of sustainable production and consumption by integrating them into European and international research groups.

Design and Sustainability

Anke Bernotat
Nora Brüggemann

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In their act of creating, designers mainly produce things – the products that fill the world around us. We need not look much further than the desks, chairs, floors and lights that inhabit the living space around us to see the results of designers' hard work. Everything is designed: the best-suited raw materials are chosen, and energy is used to create a tangible product based on what before was just a vision. The desks, chairs, and floor coverings are then transported to stores, where they are purchased by the end users. Finally, they are discarded when they are no longer useful.

As a consequence, the decision to buy a (designed) product is also a decision to »consume« it – regardless of whether the product is furniture or food, clothing or an automobile. The consumption decisions made by consumers are different the world over – some consume out of preference, others out of necessity or scarcity. Particularly notable are the rates of overt »conspicuous consumption« (Veblen, 1973) among those living in or adapting to Western and Northern cultures. If these forms of consumption were adopted by all of the world's population, we would consume far more resources than is sustainable:

»At current consumption rates and population growth, by 2100 we will need the resources of four planets to sustain a decent standard of living.« (UNEP quoted in CP/RAC, 2008)

Designers can play an essential role in reversing the world's current patterns of unsustainable consumption. They are strategically positioned at the beginning of the cycle and their decisions are critical in pre-defining how sustainable the »life« of a product will be. After all, it is estimated that more than 80% of a product's environmental impact is determined at the design stage (EC, 2010). So regardless of whether the desk is made out of wood or plastic, the chair is easy to disassemble when its useful life has expired, the floor covering is comprised of recycled raw materials, or the lighting design incorporates the »look« of energy efficient bulbs, sustainable design can play a significant role in helping increase resource the

»DESIGNERS CAN PLAY AN ESSENTIAL ROLE IN REVERSING THE WORLD'S CURRENT PATTERNS OF UNSUSTAINABLE CONSUMPTION.«

efficiency, durability, quality, value, and recyclability of a product in order to decrease the environmental and social impacts present throughout a product's life cycle.

A shift towards »greener« design choices means that only greener products will be available for consumers to purchase. By contributing to the creation of sustainable products, designers can thus help send a clear signal that they wish to contribute to influencing and shaping more sustainable patterns of consumption and production.

It is precisely for these reasons that designers should feel free to constantly and unrelentingly reexamine our societal system and its various subsystems from a fresh perspective. What is the »way to do things« and what is not? How does one do it differently? In this process, designers become the co-designers of our surroundings. They first reveal and then develop the opportunities that influence a more sustainable existence.

Design has nothing to do with the unnatural magic that makes cars hover (or even fly?) and kitchen appliances that beat eggs upside down. A true focus on sustainable innovation and change will require much more. In creating visions for the future, the designer needs to incorporate cultural exigencies – whether aesthetic, social, economic, ecological, or user-oriented – and always think in terms of »extremes«. What is the future of communication? How can we define »mobility« without cars in a world without fossil fuels? What about life in a service-oriented society? By thinking in such terms, the designer becomes a revolutionary, a thought-provoker, a mediator between technology and society.

Our planet's resources may be finite, but new perspectives and opportunities are not. Therefore, it is all the more important that we harness these notions in order to customise and tailor both our future co-existence as well as the changing face of consumer society's products and services. This is why we need designers with foresight and poise. Designers who rec-

ognise appropriate technologies and materials when they see them. And, most importantly, we need designers with the gumption to take the ideas and concepts relevant to our changing society and apply them directly to »Our Common Future's« sustainable reality.

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MIPS / Hot Spot Analysis

Christa Liedtke
Michael Lettenmeier
Najine Ameli

MIPS – Material Input Per Service Unit Concept
(Michael Lettenmeier, Najine Ameli)

Introduction

Everyone should now be aware of the fact that lifestyles in the industrialised countries are changing the ecosphere. This is clearly visible in our changing climate, for example. Once stable systems have become unstable due to the influence of both the extraction of materials and the emissions and wastes that are the result of human economy on natural material flows and cycles (see Lettenmeier et al. 2009; Schmidt-Bleek 2009).

Over the course of the last few decades, the technosphere's demand for resources has increased dramatically. At present the human economy consumes as many resources as if we had two planets at our disposal. Nevertheless, 90% of the non-renewable materials we use are wasted in the process of making products available to the end-user. We do not handle natural resources in an efficient manner.

Mankind must recognise that all human use of materials is changing natural material flows and ecosystems.

If we wish to guarantee the same quality of life for all of the Earth's inhabitants, we must dematerialise our economy. At present, 20% of the planet's people are using 80% of all of its natural resources. Global levels of natural resource consumption must be reduced by half, and consumption rights have to be evenly distributed among the world's rising population. This strategy will reduce occurrences of ecological disasters, resource based social conflicts and civil wars, and increase the financial stability of our economies, companies, and households (Meyer 2009). The use of natural resources by industrialised countries therefore needs to be reduced on average to approximately one-tenth of its present level (Schmidt-Bleek 1994; Schmidt-Bleek 2009). This is also known as the »factor 10« goal.

In order to implement the factor 10 goal, it is important to benchmark the eco-efficiency, or resource productivity, of technologies, products, and services to determine resource efficiency potentials (see Rohn et al. 2009). In developing this unit of measurement, Friedrich Schmidt-Bleek devel-

»IF WE WANT TO GUARANTEE EVERYBODY ON THIS PLANET THE SAME LIFESTYLE WE HAVE TO DEMATERIALIZE OUR ECONOMY.«

oped the concepts of the »Ecological Backpack« and MIPS, which visualise the invisible material burden posed by products or services in order to then compare their potential environmental impacts. As any input from nature into the technosphere eventually becomes an output impacting the environment, measuring input can provide an estimation of the potential for environmental impact.

Ecological Backpack

The Ecological Backpack, also known as the Material Footprint, represents this invisible material burden. It is represented by the total input of natural resources (material input, MI) – minus the weight of the product itself – required by a given product »from the cradle to the point of sale«. It is measured in mass unit such as kilograms or tonnes. The Ecological Backpack provides a summary of resource use in the production of goods (Schmidt-Bleek 2009) and is an important measurement for comparing functionally equivalent goods from competing producers at the point of sale (Lettenmeier et al. 2009).

The Ecological Backpack describes a product's invisible material burden. However, most products would provide no benefit if additional materials, energy, and/or water are not added to the equation. This additional input is what is needed to create a unit of service or benefit.

MIPS can thus be seen as a means or measuring the »Ecological Backpack of a service«.

MIPS stands for »Material Input Per unit of Service« over the entire life cycle of a product or service. It allows us to estimate a product's input-oriented environmental impact potential (Lettenmeier et al. 2009).

MIPS = MATERIAL INPUT PER SERVICE UNIT = MI/S
RECIPROCAL OF MIPS = S/MI = RESOURCE PRODUCTIVITY

MI is provided in terms of tonnes, kilograms, or grams. In contrast, the service (S) is case-specific and must be defined as the specific perform-

ance offered by a product, e.g. one kg of clean clothes or a 10-km journey (Schmidt-Bleek 2009). The service must be rigorously defined in each individual case. By focussing on a product's benefits instead of the actual ownership of a product opens up a whole new dimension of development options. This shift corresponds to growing market trends of renting, sharing, and leasing goods instead of merely owning them. (Lettenmeier et al. 2009)

ACCORDING TO THE ECOLOGICAL BACKPACK AND MIPS, ALL MATERIAL CONSUMPTION OVER A PRODUCT'S ENTIRE LIFE CYCLE (BEGINNING WITH THE POINT OF THE EXTRACTION IN NATURE, OVER THE COURSE OF MANUFACTURING AND USE, AND ENDING WITH ITS RECYCLING OR DISPOSAL) IS CALCULATED AS NATURAL RESOURCE CONSUMPTION. **THE FOLLOWING** CATEGORIES OF RESOURCES ARE COUNTED SEPARATELY: **»BIOTIC** (OR RENEWABLE) RAW MATERIALS **»ABIOTIC** (OR NON-RENEWABLE) RAW MATERIALS **»EARTH MOVEMENTS** IN AGRICULTURE AND FORESTRY (INCLUDING EROSION). **»AIR** (MAINLY THE OXYGEN USED IN COMBUSTION PROCESSES) **»WATER**

The MI factors are expressed in kg/kg (kg of resources per kg of the material used), kg/kWh (kg of resources per kilowatt-hour of energy consumed), or kg/tkm (kg of resources to transport one tonne over one kilometre). In this manner, the use of MIPS is at the same time practicable, comprehensible, and harmonised. (Lettenmeier et al. 2009).

PRACTICAL INDICATORS FOR DETERMINING RELEVANT POTENTIAL OF ENVIRONMENTAL IMPACT MUST SATISFY THE FOLLOWING REQUIREMENTS: **»THEY** MUST BE SCIENTIFICALLY FOUNDED. **»THEY** MUST GUARANTEE TRANSPARENT AND REPRODUCIBLE ESTIMATES OF THE POTENTIAL ENVIRONMENTAL IMPACT OF PROCESSES, GOODS AND SERVICES FROM CRADLE TO GRAVE. **»THEY** MUST BE EASY TO APPLY IN PRACTICAL USE AND BE TIME AND COST EFFICIENT. **»THEY** MUST GIVE TARGETED ANSWERS. **»THEY** MUST BE RELEVEANT TO THE ECONOMY AND TO PROFITABILITY IN TERMS OF PRACTISE AND CONCEPT. **»THEY** MUST BE APPLICABLE ON LOCAL, REGIONAL, AND GLOBAL LEVEL. **MIPS** AND THE ECOLOGICAL BACKPACK ARE ONE OPTION FOR AN INDICATOR MEETING THESE REQUIREMENTS. **SOURCE**: SCHMIDT-BLEEK 1994, 2009

Resource Productivity

By turning around the MIPS formula (MI/S), one can derive the amount of benefit provided by a given cradle-to-cradle quantity of material. S/MI thus becomes an expression for resource productivity.

This means we can compare the degree of service that can be created by »investing« a certain amount of natural resources. Resource productivity can be improved by technical decisions as well as by the consumer's personal decisions.

What makes MIPS unique?

MIPS can be applied at different levels, such as at the company level as well as industry-wide. By interlocking the processes at all of these levels, the optimisation of all material inputs contributes to an increase in resource productivity over the entire life cycle or in terms of the overall economy (see for example Schmidt-Bleek 2009, Schmidt-Bleek et al. 1998).

Finally, MIPS is a robust and reliable indicator for the comparison and estimation of functionally comparable products and services in terms of their material and energy requirements over their entire life cycles. (Lettenmeier et al. 2009)

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**Designguide and Hot Spot Analysis – Instruments for Designers
(Christa Liedtke, Najine Ameli)**

Sometimes it is hard to be a designer. He or she is often asked to make the best out of a situation for which the decision makers must take responsibility. The crucial decisions (the selection of the materials, systemic decisions, service decisions) might already have been made and the designer seems to be there just »to make everything look good.«

As the decisions with the greatest impact are made at the very beginning of a new product or service's development (during the product planning phase, not only 80% of the production costs are defined but so are 80% of the environmental impact [Tischner et al. 2000]), the designer has to make sure that he or she plays a role in the decision-making process from the very beginning. This is the only way to develop truly sustainable products and service systems.

ECO-DESIGN: GOOD DESIGN IS SUSTAINABLE DESIGN. **IT** RESULTS IN OBJECTS, SYSTEMS OR SERVICES THAT WORK AESTHETICALLY, FUNCTIONALLY AND COMMERCIALLY, IMPROVING PEOPLE'S LIVES AND MAKING THE SMALLEST POSSIBLE IMPACT ON THE PLANET. **IT** IS A PROCESS **... GOOD** DESIGN IS A VERB, NOT JUST A NOUN. **IT** IS A SEQUENCE OF STEPS THAT DEFINES PROBLEMS, DISCOVERS SOLUTIONS AND MAKES THEM REAL **... JOINING** CREATIVITY AND INNOVATION … **CREATIVITY** GENERATES IDEAS AND INNOVATION EXPLOITS THEM. **GOOD** DESIGN CONNECTS THE TWO. **IT** LINKS IDEAS TO MARKETS, SHAPING THEM TO BECOME PRACTICAL AND ATTRACTIVE PROPOSITIONS FOR CUSTOMERS OR USERS **... END** DELIVERING VALUE. **GOOD** DESIGN IS A QUANTIFIABLE BENEFIT, NOT A COST. **ITS** VALUE CAN BE MEASURED ECONOMICALLY, SOCIALLY AND ENVIRONMENTALLY. **SOURCE**: THE GOOD DESIGN PLAN (UK), 2007

In terms of a general definition of design, EcoDesign seems to be fairly common. EcoDesign is intended to develop products, systems, infrastructures, and services that use as little resources, energy, and landscapes as possible to fulfil needs in the most efficient manner possible, minimise the use and emission of toxic substances, and minimise waste throughout the entire life cycle (Schmidt-Bleek/Tischner 1994). The SYSTEMATIC panel on eco-innovation defined eco-innovation as »the creation of novel and competitively priced goods, processes, systems, services, and procedures designed to satisfy human needs and provide a better quality of life for everyone with a life-cycle minimal use of natural resources (materials including energy and surface area) per unit output, and a minimal release of toxic substances.« (Systematic 2008)

Hot Spot Analysis – an instrument for determining the most important criteria

In order to establish an appropriate basis for making decisions, it is important to have the right tools and background information at hand. One quite interesting method for designers is known as Hot Spot Analysis.

HOT SPOTS ARE ASPECTS IN A SPECIFIC PHASE OF A LIFE CYCLE THAT ASSUME A HIGH DEGREE OF RELEVANCE WITHIN THE ENTIRE CHAIN. **ONE** CAN USE SEVERAL DIFFERENT INDICATORS OR FOCUS ON A HUGE AMOUNT OF ASPECTS RELATED TO THE TARGET OR STRATEGY. **IN** ORDER TO SIMPLIFY THE APPROACH, ONE CAN FOCUS ON A MANAGEABLE AMOUNT OF DIFFERENT INDICATORS IN THE DESIGNING PROCESS. **THE FOLLOWING ASPECTS** ARE CONSIDERED: **»ENVIRONMENTAL** ASPECTS: RESOURCE EFFICIENCY, WATER USE/ RUCKSACKS, LAND USE, AND ENERGY EFFICIENCY/CO2 EMISSIONS **»SOCIAL** ASPECTS: CONSUMER SATISFACTION, HEALTH AND SAFETY, HAZARDOUS SUBSTANCES **»ECONOMIC** ASPECTS: COST EFFICIENCY IN PRODUCTION AND CONSUMPTION, COST OF RESEARCH AND DEVELOPMENT. **ONCE** IDENTIFIED, HOT SPOTS CAN BE THE LEVERAGE POINTS THAT CAN ALLOW DESIGNERS TO MAKE A PRODUCT MORE SUSTAINABLE IN TERMS OF ECO-DESIGN. **FURTHER** ASPECTS COULD BE ADDED TO THE EVALUATION IF NECESSARY.

As Hot Spot Analysis was initially developed for companies to help them improve the sustainability indicators of their products and services, this method can support the interaction between company needs and the developmental work of designers or scientists in the R&D process.
For designers who wish to apply sustainability as an aspect of their work, this method has been summarised in a Design Guide that focuses on the design process (compare www.designwalks.org).

The Designguide as a guideline to help the designer integrate aspects of sustainability

An Instrument for integrating sustainability
The aim of the design guide is to illustrate how eco-design concepts can be applied in practice. The concept is based on eco-design, which focuses on dematerialisation and service orientation across the product's life-cycle. The following five systematic steps provide the designer with an easy-to-follow and systematic roadmap when designing a sustainable product or service.

Each step of the process is supported by ready-to-use worksheets that allow the designer to easily relate the concepts explained in the first part of the guide to his/her everyday work. At the same time, the process avoids limiting the designer's creativity.

Step 1: Assessing the existing product's purpose and life-cycle

What is the product's principle service? Are there other kinds of services that could be provided? To answer these questions, first, designers are asked to provide a detailed description of the product's service or utility in order to understand the purpose of design. Second, the complete product life-cycle will be drawn. This provides the basis for identifying the Hot Spots.

Step 2: Identifying Hot Spots in a product life-cycle

After identifying these Hot Spots, the designer will understand the points where improvement is most needed in order to make the product more sustainable. A first table helps grading each phase of the life cycle according to its contribution to the product's overall sustainable impact. (For example, a wedding ring is highly resource-intensive during the first stage of raw material extraction when compared to the other life cycle phases that could be rated grade 3. However, later life-cycle phases receive lower scores due to minimal changes during the usage phase.) A second table allows for the evaluation of the environmental, social, and economic sustainability aspects for every phase of the product life cycle. Hot Spots are identified by multiplying these scores with the scores from the first table, thus incorporating the combined importance of every stage or the product's life-cycle. A reviewer can repeat the process in order to obtain a second opinion on the allocated ratings. Finally the Hot Spots are mapped in an overview grid.

Step 3: Searching for possible new innovative solutions

Techniques such as brainstorming, morphological analysis or analogies may be helpful at this stage. It is supporting to select and describe the three most promising solutions from an environmental point of view in terms of their resource efficiency. Depending on the requirements, these could offer an absolutely new service system or merely represent improvements. Using a table of detailed environmental criteria, the solutions are assessed during every phase of the product's life-cycle. If no solution is deemed satisfactory, the search is started anew.

Step 4: Detailed planning of the found solution

At this point designers are encouraged to create a spider diagram which identifies the points that lead to the optimisation of environmental and economical factors. The designer must then ask the following questions:

» How can the minimal use of material and energy be achieved?
» Which is a reasonable lifespan that can still satisfy the function?
» Which is the best material when considering function and lifespan?
» How can a sensible – and therefore materially extensive – recycling take place?
» How can transport be avoided?
» How can we ensure the end product is free of hazardous materials?
» What has to be considered in order to ensure customer satisfaction?
» How can the cost of research and development be minimised?
» How can usage efficiency be maximised in order to keep user costs low?

Step 5: Evaluation of the design solutions

The design drafts are first assessed and compared with one another. Hot spot analysis is again used, but here MIPS estimates and pollutant consideration are also useful. At this point the most successful solution to fit the task will emerge. A comparison with existing solutions is necessary, particularly in terms of material and energy intensity as well as the potential for pollution. Care needs to be taken to avoid overlooking important detail solution and previously achieved optimisations.

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Process and Programme

Christa Liedtke
Najine Ameli

In light of the amazing success of the 1st Sustainable Summer School, the decision of where to hold the 2nd Sustainable Summer School was an easy one. In late August 2010, the participants and lecturers assembled once again at the 600-year-old Nikolaus Monastery in North Rhine-Westphalia (NRW), Germany. This year's motto – »Societies, Systems and Swarms« – encouraged the attendees to contemplate societies as well as the meaning of their complex structures.

On the first day of the programme on Monday, the 30th of August, organisers held an introduction in the form of an »Expert Day«, which was held at ecosign/Academy for Design, a private university focussing on ecology. Renowned experts from a wide range of fields addressed a variety of issues relating to this year's motto. They not only presented their latest research activities but also discussed them later in small groups together with the participants.

Prof. Dr. Jens Krause from the Leibniz-Institute of Freshwater Ecology and Inland Fisheries and Prof. Dr. Stefan Krause from the University of Applied Sciences Lübeck first provided insights into the topic of »Collective Behaviour and Swarm Intelligence«. Prof. Dr. Uwe Schneidewind from the Wuppertal Institute and the Schumpeter School/University of Wuppertal gave a presentation on »Swarms and Sustainable Transition Management – the Ambivalence of Swarm Conduct for Sustainability Strategies«. Prof. Dr. Johannes Weyer from the Technische Universität Dortmund explained »New Modes of Governance of Complex Systems in the Era of Autonomous Technology«. Last but not least, Prof. Dr. Harald Welzer from the Center for Interdisciplinary Memory Research discussed »Social Intelligence and Swarm Intelligence«. (For more detailed information, please see the articles in chapter 3.)

After a kick-off speech held at the end of the day by Prof. Peter Wippermann from Trendbüro, the design critic Dr. René Spitz presented a panel discussion made up of all of the invited experts in which the students could learn about how the various fields of science are actually intertwined.

This discussion dealing with the role of the designer had a significant impact on the course of the week's activities.

»THIS YEAR'S MOTTO OF ›SYSTEMS, SWARMS, SOCIETIES‹ INVITED THE STUDENTS TO THINK ABOUT SOCIETIES AND THE MEANING OF THEIR COMPLEX STRUCTURES.«

Introduction

The following day the Wuppertal Institute first introduced a portfolio in order to introduce students to the research agenda as it relates to sustainable consumption and production as well as sustainable design processes. Next, students were shown a »Design Guide« that was created in order to help them integrate aspects of sustainability into the design process. Finally, students were introduced to the workshops and then grouped together into teams. The workshop directors explained additional procedures and provided their groups with more information relating to the workshops' specific topics. The participants remained in their teams for the next three days, where they were guided and coached by the professors.

On Tuesday evening students had a chance to discuss their first impressions with the artists Milica Reinhart and Marjan Verkerk. On Wednesday evening, Conrad Wagner, managing director of the Swiss company Mobility Systems, first discussed his own experiences in developing a carsharing company before delving into a general discussion of the opportunities provided by sharing concepts.

On Friday, the workshop groups presented and discussed the results of their developed concepts. Father Andreas Petith was invited to join the presentation and was ask to judge the concepts. The winning concept was awarded a prize sponsored by Prof. Dr. Siegfried Maser (Emeritus of Wuppertal University). Finally, the summer school ended with a wonderful party for all of the participants.

PROGRAMME OVERVIEW

Day 1:
Arrival at Düsseldorf's main railway station followed by a guided tour of the monastery.

Day 2:
Expert Day with experts from different fields of research:

» Prof. Dr. Jens Krause, Leibniz-Institute for Freshwater Ecology and Inland Fisheries, Department of Fish Biology and Ecology
» Prof. Dr. Stefan Krause Department of Electrical Engineering and Computer Science, University of Applied Sciences Lübeck
» Prof. Dr. Uwe Schneidewind, Wuppertal Institute and Schumpeter School/ University of Wuppertal, Chair of Sustainable Transition Management
» Prof. Dr. Johannes Weyer, Technische Universität Dortmund, Faculty of Business, Economics and Social Sciences, Technology Studies
» Prof. Dr. Harald Welzer, Center for Interdisciplinary Memory Research, Head of the Center for Interdisciplinary Memory Research at Essen and research professor of Social Psychology at the University of Witten/Herdecke

Panel Discussion presented by René Spitz, design critic and theorist
Kick-off speech held by Prof. Peter Wippermann from Trendbüro and Folkwang University

Day 3–6:
Parallel design workshops focussing on a variety of subjects followed by evening discussions with the artists Milica Reinhart and Marjan Verkerk as well as Conrad Wagner, managing director of the Swiss company Mobility Systems.

Day 6:
Final presentations, evaluation and awards ceremony, farewell party.

THE MAIN FOCUS OF THIS YEAR'S SUSTAINA-BLE SUMMER SCHOOL WAS ›SOCIETIES, SYSTEMS AND SWARMS‹. **THE** PARTNERS' VISION WAS TO CREATE A HIGH QUALITY PROGRAM OF FURTHER EDUCATION […] **DESIGNERS** CAN PLAY AN ESSENTIAL ROLE IN REVERSING THE WORLD'S CURRENT PATTERNS OF UNSUSTAINABLE CONSUMPTION. **IF** WE WANTED TO GUARANTEE EVERYBODY ON THIS PLANET THE SAME LIFESTYLE WE HAVE TO DEMATERIALIZE OUR ECONOMY. **THIS** YEAR'S MOTTO OF ›SYSTEMS, SWARMS, SOCIETIES‹ INVITED THE STUDENTS TO THINK ABOUT SOCIETIES AND THE MEANING OF THEIR COMPLEX STRUCTURES.

3 Expert Day

DIRECTION! THE IN THE SAME THE FACE IN THE SAME FACE IN THE FACE IN FACE THE SAME DIRECTION! IN THE **FACE** IN THE DIRECTION! IN THE SAME FACE IN THE FACE SAME THE DIRECTION! FACE FACE IN THE DIRECTION! FACE FACE DIRECTION! FACE IN FACE THE DIRECTION! FACE IN THE DIRECTION! FACE IN THE DIRECTION! SAME FACE FACE IN SAME DIRECTION! FACE IN THE DIRECTION! SAME DIRECTION! FACE **IN** THE SAME FACE DIRECTION! IN FACE IN THE SAME FACE DIRECTION! IN THE SAME FACE IN THE SAME DIRECTION! FACE IN **THE** SAME FACE IN THE SAME DIRECTION! FACE IN THE FACE SAME DIRECTION! FACE DIRECTION! IN THE **SAME** DIRECTION! THE FACE IN THE SAME DIRECTION! FACE IN THE DIRECTION! SAME DIRECTION! FACE IN THE SAME IN DIRECTION! IN FACE IN THE SAME DIRECTION! FACE IN THE SAME FACE DIRECTION! FACE IN THE SAME IN FACE IN THE SAME **DIRECTION!** IN FACE IN THE SAME IN DIRECTION! FACE IN THE IN DIRECTION! IN THE FACE DIRECTION! SAME DIRECTION! FACE IN THE SAME FACE IN THE SAME DIRECTION! FACE IN THE SAME IN DIRECTION! IN FACE IN THE SAME DIRECTION! FACE IN THE SAME FACE FACE

Collective Behaviour and Swarm Intelligence

Prof. Dr. Jens Krause
Prof. Dr. Stefan Krause

40   Collective behaviour and consensus-forming decisions are topics which are new to biology, even though they have existed in the social sciences for quite some time. In this context it is important to note that a biological point of view can introduce a different perspective to these issues as evolutionary approaches and the principles of self-organisation also have an important role to play. One way to model collective behaviour is shown by Couzin et al. (2002). The model postulates three simple interaction zones:

1. repulsion zone within which individuals move away from each other that serves to helps them avoid collisions.
2. an orientation zone within which individuals tend to align (i.e. face in the same direction).
3. an attraction zone within which individuals are attracted to one another.

Individual-based computer simulations that use this modelling approach have successfully recaptured many aspects of the grouping or **swarming** behaviour of real-life systems such as fish shoals, insect **swarms**, or bird flocks. Building upon this work, we introduced a number of agents into the simulation with directional preferences in order to determine how many leaders it takes to guide a group. In our simulations made up of up to several hundred individuals, we discovered that usually 5–10% of the group's members must serve as leaders in order to direct groups of different sizes (Couzin et al. 2005). The predictions obtained from this computer simulation were tested using groups of humans. In the experiment, human subjects were instructed to walk at a normal walking speed while keeping within arm's length of one another. They were not to talk or gesture to one another (very much like real pedestrians in an urban environment). Only a small proportion of the individuals were given a specific target in space which they should steer towards without leaving the group. It turned out that as few as ten leaders were sufficient to guide the other 190 individuals to the target (Dyer et al. 2009). This confirmed one of the key predictions in Couzin's model (2005). Insights into human crowd dynamics can be applied to different contexts. For instance, they can be used to improve

»USUALLY 5–10% OF THE GROUP'S MEMBERS MUST SERVE AS LEADERS IN ORDER TO DIRECT GROUPS OF DIFFERENT SIZES.«

building evacuation procedures in case of emergencies or help manage the behaviour of large crowds in public spaces during political demonstrations or other mass gatherings (Dyer et al. 2009).

To further explore the relationship between the individual and the group, we designed a robotic fish that can interact with live fish as it is accepted by the fish as conspecific. Experiments showed that the »Robofish« is quite adept at guiding small to medium-sized shoals of fish. However, if it demonstrates risky behaviour such as approaching a predator, groups are unlikely to follow – as opposed to singletons, which almost always follow (Ward et al. 2008). This ability of social groups to make better decisions than singletons (at least in some situations) is an interesting characteristic that leads some scientists speak of **swarm** intelligence (**SI**) in such contexts. We would like to suggest the following definition for **SI** (Krause et al. 2010): »Two or more individuals independently, or at least partially independently, acquire information and these different packages of information are combined and processed through social interaction which provides a solution to a cognitive problem in a way that cannot be implemented by isolated individuals.«

SI has been described for some animal systems, but it is also of great relevance to the human domain. The electronic media have unlocked a hitherto largely untapped potential for **swarm** intelligence in humans that is relevant to areas such as company management, elections prediction, product development, and the entertainment industry (Krause et al. 2010). **SI** is a rapidly developing field which has become a hotbed for innovative research as well as wild speculation. In this talk we shall tie together approaches from seemingly disparate areas by introducing a general definition of **SI** that can unite **SI** studies of both animal and human groups. Furthermore, we identify criteria that must be met for **SI** to function and suggest areas in which further progress with **SI** research can be made. We conclude that **SI** has many applications for human societies, but it is important to also be aware of the limitations. We predict that **SI** will become an important tool in future decision-making processes that may offer a competitive advantage to those companies and institutions with the knowledge necessary to harness it.

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Swarms and Sustainable Transition Management – The Ambivalence of Swarm Conduct for Sustainability Strategies

Prof. Dr. Uwe Schneidewind

1. **Sustainability** research, social sciences and design

Discussions of **sustainability** must take into account the close interaction between ecosystems and socio-technical systems comprised of society, politics, economy, and technologies. The realisation of **sustainable** development is linked to one main challenge. This »sustainability challenge« – the decoupling of growth in prosperity and wealth from resource consumption and negative ecological impacts – is essentially a threefold strategy. First, prosperity or wealth are decoupled from material growth, leading to »sufficiency«. Second, the quantitative decoupling challenge leads to maximum energy and material »efficiency«. Third, notions of qualitative decoupling by means of reconciling ecology and technology lead to ecological »consistency«.

We are already aware of the (ecological) targets necessary to bring about sustainability, and we also know a great deal about the technologies that can help us reach these targets. However, history has shown that we are failing to implement substantial strategies – the challenge of bringing about a highly complex socio-technical change has been underestimated for quite some time. Overcoming this deficit calls for a procedural turn in sustainability research that focuses on the social sciences.

Viewing the sustainability challenge as a design issue poses the following question: How to design our socio-technical system(s) in order to promote prosperity and wealth without destroying our planet?

2. Transition enabling as a research perspective at the Wuppertal Institute

The above question – regardless of whether it is viewed from the perspective of design or social sciences – is the key aspect of a relatively new approach to research in sustainability science known as transition enabling. This approach primarily deals with design questions such as how to manage, shape, and steer transitions towards the realisation of **sustainable** societies.

The Dutch Knowledge Network for System Innovation and Transitions (KSI) defines transitions as a »radical, structural change of a societal (sub) system that is the result of a coevolution of economic, cultural, techno-

logical, ecological and institutional developments at different scale-levels« (Rotmans/Loorbach 2010: 108). These – essentially functional – scale levels are defined as follows (cf. Geels/Schot 2010: 18–27). First, we have what is known as the »**socio-technical landscape**«, which is characterised by very slow changes that are difficult to influence (e.g. climate change, industrialisation processes or phenomena such as urbanization or individualisation). The structure at the landscape level forms the overarching basic conditions – the exogenous context – for the next two functional levels. The second level is known as the »**socio-technical regime**«. These socio-technical regimes are characterised by cognitive (belief systems, guiding principles, goals, innovation agendas, problem definitions, search heuristics), regulative (standards, laws) and normative (values, roles, behavioural norms) rules shared by the relevant actors in a regime (governments, companies, civil society, scientists, etc.). The regime forms the dominant structure, culture, and practices within a system – the centre of power, so to speak. The third level is known as the »**socio-technical niche**«, which is composed of the individual actors, technologies, and practices from which radical innovations and forerunner movements emerge.

Transitions may take place when instabilities arise at the regime level caused by tensions between the regime and its environment (either at the niche or landscape level) or learning and adaptation processes at the regime level itself. These tensions create windows of opportunity for a niche to become more powerful and to replace the »old« regime. For a transition to successfully occur, the structural developments at each level must be mutually reinforcing and be focussed in the same direction.

3. The Role of Swarms and Swarm Behaviour in Enabling Transition towards Sustainability

The example of urban transportation can be used to illustrate possible transition processes and the role(s) of swarm behaviour in these processes. The socio-technical landscape forming the exogenous context of urban transportation systems is characterised by demographic and societal developments such as urbanisation and individualisation. These structures at

the landscape level have influenced the conditions at the regime level: the socio-technical regime is characterised by the growing importance of individual mobility and the relevant supporting infrastructures (streets, cars, fuel supply, public transport, etc.). In recent years, however, changing conditions at the landscape level have placed structures at the regime level under pressure: ecological and economic developments such climate change and volatile prices for fossil fuels have challenged existing modes of traffic behaviour and existing infrastructures, for example. These developments have simultaneously favoured and strengthened niches and niche developments such as R&D in the field of electric cars, the emergence of car sharing initiatives, bike rental systems or new strategies for urban public transport.

Fig. 1: Interaction between landscape, regimes and niches in transition processes (source: Geels/Schot 2010: 25) **»page 46**

Swarms and swarm behaviour play an important – but also very ambivalent – role in these transition processes. On the one hand, swarms and the swarm behaviour of niche actors serve as important transition enablers, provided that they attain a critical size sufficient to bring about change (e.g. the spread of car-free districts within transition town movements, car pooling and car sharing initiatives, campaigns for enhanced bike traffic, etc.). On the other hand, swarms and swarm behaviour also act as major barriers to successful transitions: swarm behaviour in form of well-established routines and »mimesis« at the regime level largely serve to impede niche innovations' ability to achieve a breakthrough. In addition to these routines, there are always swarms of »foot draggers« acting as regime stabilisers and defenders (such as the automotive industry's position vis-à-vis urban transport).

Fig. 2: The ambivalent role of swarms in transition processes **»page 47**

4. Open (design) questions – lessons to learn

The highly ambivalent role of swarms and swarm behaviour described above outlines four distinct and central questions of transition research that could be answered by design:

1. Can eco-systemic or technological metaphors or analogies to nature (such as the word of »swarms«) serve as adequate enablers for social learning? Are such metaphors an adequate means of conceptualising the necessary changes at the individual level?
2. What design principles taken from swarm research can be applied to support societal transition processes? For example, how could we make use of existing insights into marketing research (see for example for Malcolm

Gladwells The Tipping Point) in order to facilitate and accelerate transition processes towards **sustainability**?

3. How can new transformative swarms be formed?
4. Which design principles can be applied to embedded technologies that will allow them to serve as a swarm enabler? How can design lead to embedded lifestyle innovations?

Increasing structuration of activities in local practices

Socio-technical **landscape** (exogenous context)

Landscape developments put pressure on existing regime, which opens up, creating windows of opportunity for novelties

New **regime** influences **landscape**

Socio-technical **regime**

2.» 3.»
1.» 4.»
6.» 5.»

Socio-technical **regime** is ›dynamically stable‹. On different dimensions there are ongoing processes.

New configuration breaks through, taking advantage of ›windows of opportunity‹. Adjustments occur in socio-technical **regime**.

Elements become **aligned**, and **stabilise** in a dominant design. Internal momentum increases.

External influences on **niches** (via expectations on networks)

Small networks of actors support **novelties** on the basis of expectations and visions. Learning processes take place on multiple dimensions (co-construction). Efforts to link different elements in a seamless web.

Niche-innovations

Time

1. Industry
2. Markets, user preferences
3. Science

4. Culture
5. Technology
6. Policy

EXAMPLE: URBAN TRANSPORTATION

» Demografic and societal Developments
(urbanization, individualization)

» Importance of individual mobility
» Traffic infrastructure
(streets, public transport, fuel-supply, …)

» New electric cars
» Car sharing initiative
» Public transport strategy of a city

Figure 1: Multi-level perspective on transitions (adapted from Geels, 2002: 1263)

Increasing structuration of activities in local practices

Socio-technical **landscape** (exogenous context)

Landscape developments put pressure on existing regime, which opens up, creating windows of opportunity for novelties

New **regime** influences **landscape**

Socio-technical **regime**

2.» 3.»
1.» 4.»
6.» 5.»

Swarm behaviour in form of routines, »mimesis«, »swarm enabling infrastructures« as transition barrier

Socio-technical **regime** is ›dynamically stable‹. On different dimensions there are ongoing processes.

New configuration breaks through, taking advantage of ›windows of opportunity‹. Adjustments occur in socio-technical **regime.**

Swarms of niche actors as transition enabler (Transition town movement, Bio-energy villages, campaigns to change electricity supplyer)

Elements become **aligned**, and stabilise in a dominant design. Internal momentum increases.

Small networks of actors support **novelties** on the basis of expectations and visions. Learning processes take place on multiple dimensions (co-construction). Efforts to link different elements in a seamless web.

Swarms of »foot-draggers« as regime stabilizer (e.g. actual discussion on nuclear power in Germany)

Niche-innovations

Articulation processes on **niches** (via expectations on networks)

1. Industry
2. Markets, user preferences
3. Science

4. Culture
5. Technology
6. Policy

Time

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New Modes of Governance of Complex Systems in the Era of Autonomous Technology

Prof. Dr. Johannes Weyer
Robin D. Fink
Fabian Lücke

New modes of governance

New technology allows for new modes of governance that go beyond traditional modes of decentralised self-regulation (»market«) or centralised control (»hierarchy«). This is particularly applicable in cases of large-scale, networked, and highly automated infrastructure **systems**. At first glance, the current trend appears to be headed towards decentralisation:

» In the case of electricity production, the user is increasingly becoming a producer of – primarily renewable – energy.
» In air transportation, pilots are taking over functions of separation and coordination which were formerly performed by the air traffic controller.
» Services in electronic networks such as Wikipedia heavily rely on crowd wisdom.

However, a paradox soon emerges (cf. Surowiecki 2005), as even decentralised **systems** are in need of coordination, particularly when a high degree of reliability is at stake. Such **systems** cannot simply rely on the mechanism of self-organization and wait for emergent effects to occur. New modes of governance combining the problem-solving capabilities of local coordination with the overall needs of global stability have yet to be found.

Can we (re-)construct societies at the computer screen?

If we wish to study issues of governance, we first must know how societies work. This means that models are needed that integrate the coordination of actors (at the micro level), the integration of the social **system** (at the macro level), as well some concepts dealing with interplay of the micro and macro levels. Hartmut Esser's model of sociological explanation (MSE) (Esser 1991, 1993, cf. Coleman 1995) is an appropriate concept as it combines the micro and the macro perspectives while allowing for a detailed analysis of three core aspects, namely:

» The logic of situation (macro-micro-link): the individual actor's perception of the current situation

» The logic of selection: the decision-making process at the micro level based on each singular actor's subjective notion of expected utility

» The logic of aggregation (micro-macro link): the integration of a large number of actions into an emergent social structure shaped by actors' actions, yet capable of providing the context for their situational perceptions in the next sequence.

Furthermore, the Esserian MSE is highly formalised and is therefore suitable for computer simulations. These simulations provide a new method for studying the dynamic of large social **systems** made up of heterogeneous actors with different capabilities, interests, strategies, etc.

Simulation software such as NetLogo (http://ccl.northwestern.edu) allows for agent-based modelling and simulation (ABMS) that enables social scientists to study non-linear processes as well as the emergence of complex patterns at the macro level (such as the phenomenon of segregation in population groups). These complex structures emerge as the simple result of recursive interactions among agents which behave according to very basic rules at the micro level. ABMS thus allows for laboratory experiments involving social **systems** and the exploration of alternatives that can be introduced by modifying agents' internal parameters, such as strategy and memory capacity, for example.

The canteen model

Robin D. Fink and Fabian Lücke observed that the length of queues at the Technische Universität Dortmund's cafeteria varies from time to time, and they asked themselves if it was possible to explain this phenomenon. In terms of ABMS, the question was rather if it was possible to construct it. Using NetLogo, they created a cafeteria model consisting of three types of actors (the glutton, the money-saver, and the »foodie«) who are given a choice of three meals with different properties (tasty, large quantities, cheap). Most importantly, each actor's choice (micro level) depends in part on his or her individual preferences (such as eating large quantities, saving time, etc.) as well as on the state of the overall **system** (macro level), in

this case the current length of the queues, which is a result of previous individuals' decisions, and so on.

The cafeteria model is thus well suited for analysing the interplay of micro decisions and macro patterns from a dynamic perspective, as the inputs change constantly. Computer simulation is the only method applicable to the social sciences that provides the researcher with the opportunity to study such phenomena.

The test showed that most foodies choose the tastiest meal, as was to be expected, but some of these individuals may indeed make other choices. There is no simple decision-making pattern, as this depends on a complex interplay of the actor's strategy and his or her perception of the situation (which is in turn the result of the previous actions of many other actors).

Furthermore, social actors do not behave according to a simple stimulus-response pattern. In contrast to ants and bees, which also produce complex patterns at the macro level (such as swarms), decision making at the individual level is a complex process which can be analysed by means of the Esserian MSE mentioned above.

As is true of the case of ants and bees, however, the result of decentralised coordination is complexity at the macro level – sometimes accompanied by emergent effects (such as the dish-of-the day being sold out!) – that may be undesirable, unpredictable, or

Smart governance by means of smart technology?

The question arises as to whether the social processes and social **systems** described above can be controlled in some way that can help avoid undesirable outcomes. For a variety of reasons, we want to guide society or societal **subsystems** and direct them in desirable directions for the sake of environmental protection, sustainability, gender issues, and equal opportunity, for example

How can we control such a scenario as depicted in the cafeteria model? In principle, there are three basic levers:

1. Changing the rules of decision making at the micro-level, which means reprogramming the agents or – in real society – better information for people waiting in the queue.
2. Changing the rules of the game at the macro-level by, for example, providing additional meals or opening additional counters in order to speed up food service.
3. Reshaping the boundary conditions of actors' decision-making processes by providing more information about the state of the **system** or by real-

time networking of waiting people using smart devices which are linked to the cafeteria's IT network, for example.

The last of these items points to the role of smart technology in coordinating processes. Smart autonomous technology can play a dual role, as it improves the ability of actors to make their decisions independently and coordinate at a local level, thus fostering decentralisation. However, smart technology also allows for a real-time networking of all components within a large-scale **system**, thus fostering a trend towards recentralisation (cf. Rochlin 1997, Carr 2009). It is an open question as to which new mode(s) of governance will finally succeed and provide a pattern for governing the networked society.

In various social areas (such as energy, air transportation, or information technology) a new mode of »smart governance« (Willke 2007) has been tested in real-life experiments. Practice seems to be far ahead of theory when it comes to finding a smart combination of the problem-solving capabilities of local coordination and the needs of global stability within the overall system.

Computer simulation may help to explore these new modes of governance, but only as this method is driven by a reasonable theory of the modern network society.

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Social Intelligence and Swarm Intelligence

Prof. Dr. Harald Welzer

Human beings are the only creatures in the biosphere that have invented culture as a means of survival and development. **Human** groups are essentially cooperative, and the **human** brain is a social organ – its neuronal architecture is shaped by the interaction with other social beings and culture. Therefore, insights obtained by means of swarm intelligence research might be of use in some limited areas of the **human** domain. However, as **humans** have consciousnesses and declarative memory systems, the actions of **human** groups are generally very different from those of other animal groups. This workshop discusses the unique aspects of the **human** life form and ponders what can be achieved by a more realistic view of the sociality of intelligence.

»HUMAN BEINGS ARE THE ONLY CREATURES IN THE BIOSPHERE THAT HAVE INVENTED CULTURE AS A MEANS OF SURVIVAL AND DEVELOPMENT.«

First Evening Talk
with Milica Reinhart and Marjan Verkerk

Davide Brocchi

How to transform a non-place into a totem
In August 2010 a group of institutions (the Wuppertal Institute, ecosign, Folkwang University of the **Arts**) organised the 2nd Sustainable Summer School held in Jüchen, Germany. The participants were made up of twenty design students from a number of countries. During the »Evening Talks«, the participants listened to a number of individuals who creatively apply the guiding idea of sustainability in their work. The first of the talks was held with two **artists** who together realised an innovative project in the disadvantaged outskirts of Hagen, a city in Germany's Ruhr Basin.

We now know that the current dominant development model is leading us towards societal collapse. We are aware of both the necessity of sustainability as well as the need for proven solutions to social and ecological problems. Two central questions remain: Why doesn't our society change, although we know it should and could change? What does a transition of our society into a sustainable one hinder and/or promote?

Such questions cannot be answered solely by new technologies, efficiency strategies, or outdated economic models. Instead, they require an examination of the social and cultural factors behind societal development, a process in which feelings and emotions play a very important role. According to psychology's iceberg theory of human behaviour, (conscious) rational arguments and (subconscious) emotions influence our decisions in the ratio of 20 percent to 80 percent. We maintain that **art** is often in a better position to deal with emotions than science.

The Ruhr Basin is an ideal laboratory for experimentation with, developing, and studying the possibilities of transitions into sustainability. This region is a product of the industrial revolution and was the epitome of coal mining and heavy industry for over a century. Many people from very different countries came to work in the factories of Duisburg, Essen, or Dortmund. Today, only ruins remain to remind us of this past phase of economic growth.

»ART CAN OFTEN DEAL WITH EMOTIONS MUCH BETTER THAN SCIENCE.«

The crisis began around fifty years ago as high unemployment forced many people to move away. Some districts in cities such as Duisburg lost more than fifty percent of their population. The people who left the region were mainly highly qualified, high-income earners. A large proportion of those who remained are individuals with immigrant backgrounds. One might think that a region such as this might be capable of recognising much earlier than others that unlimited economic growth is only a myth.

This situation transformed the question of Strukturwandel – a structural transition from an industrial-based economy to a post-industrial economy – into a main priority for regional and local governments. Over the last thirty years they invested resources into extending the service sector. Whereas parts of the Ruhr Basin were retransformed into natural areas, several industrial ruins were transformed into theme parks. Today these parks are stations of the European Route of Industrial Heritage.

One great vision that seeks to help steer the regional economy away from an industrial base seeks to establish an economy based on culture, scientific research, academic education, creative and **artistic** work, and cultural diversity. It is precisely this effort that convinced the European Commission to choose this region as the European Capital of Culture for 2010.

The motto of Ruhr.2010 is its programme: Change through Culture – Culture through Change! This ideal framework provides **artists** with the opportunity to develop and experiment with creative strategies of urban transition.

Two of these **artists** are Milica Reinhart and Marjan Verkerk. The Croatian and the Dutch **artist** met the first time in the international exhibition of **art** projects »Visible Visions« that was a part of the UN-Conference Rio+10 programme in Johannesburg in 2002. One year later they began to hash out an **art** project for an area to the south of the Ruhr Basin. They concentrated their attention on a road bridge running through the medium-sized city of Hagen, where Reinhart lives and works. This bridge »does not cross water, but channels traffic – 40,000 cars per day. Also a lot of pedestrian use it as an underpass, not a very pleasant experience – through

a grey neighborhood beset by problems where people from eighty-two nationalities live in close proximity.«[1]

This description is typical for many disadvantaged areas in the Ruhr Basin that still bear the marks of heavy industry's the collapse. The road bridge is a non-place whose existence is cognitively repressed. It has no identity of its own, and it is a place where no one would remain voluntarily. This bridge is also a symbol for the contradictions that exist within the industrial model of development – the model that originally led to the rational and centralised design of these cities according to the myth of total automobile mobility at the expense of social communication and quality of life in public spaces.

The artists' aims in this creative intervention were:
a) To transform the road bridge »from a soulless feature into a multicoloured beacon« [1]; from an Unort (non-place), symbol of social exclusion in a decadent industrial society, into a »totem«, symbol of integration in a heterogeneous neighbourhood. Minimal material input should lead to a maximum immaterial output.
b) To serve as a catalyst in a process that transforms the inhabitants of the area around the bridge from object into subject, from consumer into producer, from audience into author of cultural production and urban transition.

The bridge's design was based on »›human resources‹ that were abundantly available in the area: the inhabitants, and their memories.«[1] Reinhart and Verkerk began to interview a number of women and girls who lived within a square-kilometre radius of the bridge. »Why did we interview only women? We tried to ask men about personal memories, but they usually came up with the colours of the shirts of their local soccer team. We also found that women are often the storytellers, and conduits to the next generation. Mothers strongly seemed to influence the way their children integrated with an alien society.«[1]

On one hand, it was not easy to gain the level of trust needed for an intimate interview discussing personal memories. **Artists** are often seen as outsiders (not only) in working-class milieus. On the other hand, the inhabitants of this area were positively impressed to meet someone who had come to listen and who wanted to learn about the life experiences of migrants living in the city's periphery.

Reinhart and Verkerk needed one year to collect forty-two stories from women of a number of different nationalities. »In a women-only

context, many interviews became very emotional affairs. Hidden feelings came to the surface – homesickness, distress at lost dreams, traumatic memories. Some women led very difficult lives, and experienced real hardship. 81-year old Margarethe from Germany ran before the Russians in World War II, 26-year old Thuy fled her country, Vietnam, in the war. Many interviewees said this was the first time they had shared their feelings with outsiders.«[1]

»Emotionally, some of them have never really left their country of origin«, says Verkerk. An African woman once told her: »Ghana is always in my head. I am here, but I am still always there.« When she looked at the trees in the outlying area of Hagen, a woman from South America remembered the rainforest in her country of origin.

During the interviews, the women selected the exact colours that they connected with their memories from a very detailed chart, with each selecting between ten and twenty colours each. »Using the selected hues, the **artists** created an individual **artwork** relating to the women, their countries, and their stories. These colours compositions, in a specific order, make up the overall design for the bridge. The women were also invited to write the word for ›bridge‹ in their own language: puente, köpru, ponte, brücke, etc. These words appear in white neon letters in front of the finished design so that it lights up at night.«[1]

Reinhart and Verkerk began to paint the bridge in 2008, five years after the project was initiated. Their **artwork** immortalised the stories of local residents, even though these people are neither heroes nor do they belong to an elite.

Colours are an ideal code for expressing feelings and emotions and are thus well suited for promoting empathy. Empathy is a universal language that promotes social communication regardless of differences between cultures, social classes, milieus, generations, or biographies. A bridge of course is an ideal symbol for just such a connecting form of communication.

A work consisting of forty-two paintings dealing with the same number of stories as told by women, the work stretches 450 metres along the side of the bridge and gives visibility to an heterogeneous community and a »globality« which previously had been overlooked.

Migrants are »ambassadors« of this globality which is seldom shown by the media or experienced by tourists, yet it exists for example in people's inner lives. These are our neighbours.

Reinhart and Verkerk titled their project »die Sehnsucht nach Ebene 2«. Sehnsucht means longing, nostalgia, and homesickness. »Ebene 2« is the bridge's official name.

An examination of the project's process illustrates why the results could not be predicted. The two **artists** began their project without financial support, and in the early years they worked on this project without receiving any, or only very little, funds.

In light of the existing social order, it is often be impossible to begin work on such a project in cases in which money is made a precondition. The real precondition is the motivation we need in order to leave the existing social order – an order that is, at least in part, based on the power of money.

The genesis of »die Sehnsucht nach Ebene 2« was accompanied by a political debate in Hagen between those who opposed the project (they believed it was a waste of money) and those who supported the communication and debate it had initiated among different groups of people.[1] On the one hand, these conflicts threatened the project's continuation, but it also promoted public and media awareness of the project: »A stream of articles, interviews and readers' letters appeared in the local papers.«[1] This process made the bridge to something more than just a work of **art**.

Every social system is a complex system whose transition cannot be completely controlled. Reinhart and Verkerk preferred the risk of a participatory process over simplified process characterised by a top-down design. For the **artists**, the real author of »die Sehnsucht nach Ebene 2« is the extremely heterogeneous community of Hagen that came together and discovered a new common identity on the Level 2.

[1] Project-website: http://www.sehnsuchtnachebene2.de, by Moze Jacobs

Service Design for Mobility and CarSharing: More mobility … less traffic…

Conrad Wagner

As a result of economic development and urban lifestyles, automobile traffic and related traffic problems, such as traffic jams, are on the increase. More automobile traffic leads us to consume more fuel and resources while creating more pollution. Parked cars take up rare and valuable space in urban environments and lead to unpleasant and unattractive parking facilities. Traffic analysis and traffic solutions dating from the previous century, which called for the construction of more roads and parking facilities, have not solved the problems at hand. In fact, these strategies have created a vicious circle in which ever more traffic is created and even more land is used for infrastructure and automobiles. We have known since the 1960s that »the one who builds more roads will harvest more traffic.« Instead of automobile traffic supporting prosperity and social inclusion, such traffic instead represents a great burden on the society's investment and wealth both at present and in the future.

Mobility management in support of a one-stop shopping solution
Whereas the transport and automobile industries (OEM) have been the focus of engineering and technical advances for quite some time, **mobility** and access began to play a role in the traffic planning and business sectors in the 1990's. Integration of different modes of traffic (supply side) as well as the promotion of sustainable behaviour in various forms of traffic such as, for example, car sharing, carpooling, bicycle rental, etc. (demand side) have been incorporated into newly integrated mobility services.

Car sharing as a vibrant aspect of the mobility solution
Time-share vehicles programmes, a concept also known as car sharing, have been introduced worldwide as a new mode of transportation that serves as a vibrant part of the solution aimed at countering increasing amounts individual automobile traffic. Whenever you need a car, you sign up and are granted instant access to various categories of vehicles instead of simply owning just one car. Various business models have been crafted to address different target areas such as residential zones (condominium complexes and family homes), business car sharing for office buildings,

»WHENEVER YOU NEED A CAR, YOU SIGN UP AND HAVE INSTANT ACCESS TO DIFFERENT CATEGORIES OF VEHICLES RATHER THAN OWNING JUST ONE CAR.«

campus-to-campus solutions, as well as solutions targeted at gated resorts. The service can be implemented as a single-port application in which cars must be returned to the same location at the end of the trip, as multi-port applications in which cars can be dropped off at a different location, or as a free-floating application in which cars can be parked on any street within a defined urban boundary. Time-share vehicles have an impact on users' behaviour and encourage them to drive less while remaining fully mobile with instant access to vehicles at any time of the day or week (in this manner it is much like a form of »**mobility** insurance«). These plans result in fewer cars on the roads and less space dedicated to parked cars in the cities.

Enabling technologies, partnership management, and a new role for car manu-facturers as mobility service providers
Important triggers that can help encourage such **mobility** systems include enabling technologies such as smartcards, mobile communication, Web 2.0, geo-localisation, and geo-tagging. The concept must first be adapted and customised for each country or region to meet local social and cultural conditions. Distributional partners such as transit administrators, employers, developers, and retailers can tailor car sharing distribution to fit their existing target groups. Operational partners can benefit from synergy in the car sharing operation (finance cars, fleet management and maintenance, etc.). The business concept might also support new forms of communication as well as high-tech industries. It creates new third-sector jobs, thus playing a major role in the worldwide development of the transport of people and goods. The concept spurs social inclusion and helps encourage the transformation of automobile manufacturers from mere vehicle producers into an integrated service industry comparable to, for example, the cell phone industry or hotel and restaurant chains.

For more information see the following examples of car sharing schemes:
» www.**mobility**.ch (Switzerland and Europe)
» www.zipcar.com (USA)
» http://carsharingus.blogspot.com (car sharing blog)

» www.car2go.com (for smart car sharing by Daimler)
» www.ConnectByHertz.com (Hertz)
» www.relayrides.com (for neighbour-to-neighbour car sharing)
» www.mu.peugeot.fr – www.mu.peugeot.de (car sharing by Peugeot)
» www.wego.co.nl (Premium sustainable mobility for all)
» www.intragomobility.com – www.vulog.com (rental and management solutions)

» **Aspects requiring further study:**
  Possible contradictions that may well offer opportunities for innovation
» High-tech technical solutions vs. labour-oriented, non-technical, or self-organised solutions
» Enabling technologies (for larger fleet volumes) vs. tailored processes (for small fleet volumes)
» The needs of modern urban populations vs. traditional habits and behaviour in local cultures
» Cars as an emotional status symbol vs. **mobility** services as intelligent status symbols
» »Regular« cars vs. specialty vehicles (electric vehicles, etc.)
  Private sector ventures vs. public-private partnerships

The ABCDE of World Car Sharing by Eric Britton (Paris): Nov. 16, 2009:

A Places where people are rich enough to be able to buy and operate a car, and
B Places in which it is difficult for some reason to have your own car (increasing problems with parking, traffic congestion, etc.), and
C Places in which a car can be safely left in open public areas, and
D Places in which there is at least one other person or household with whom to share a car, and
E Places where the (potential) user density is high enough (for example, Switzerland Mobility prefers not to go to locations in towns with less than 5,000 inhabitants. Car sharing locations generally tend to be in high density neighborhoods).

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Main characteristics:

1. Individuals independently acquire information

2. information is combined and processed through social interaction

3. a cognitive problem is solved in a way that cannot be implemented by isolated individuals

Complete definition: *Krause, Ruxton & Krause 2010. Trends in Ecology and Evolution 25: 28-34*

USUALLY 5–10% OF THE GROUP'S MEMBERS MUST SERVE AS LEADERS IN ORDER TO DIRECT GROUPS OF DIFFERENT SIZES. **HOW** TO DESIGN OUR SOCIO-TECHNICAL SYSTEM(S) IN ORDER TO PROMOTE PROSPERITY AND WEALTH WITHOUT DESTROYING OUR PLANET? **IF** WE WISH TO STUDY ISSUES OF GOVERNANCE, WE FIRST MUST KNOW HOW SOCIETIES WORK. **HUMAN** BEINGS ARE THE ONLY CREATURES IN THE BIOSPHERE THAT HAVE INVENTED CULTURE AS A MEANS OF SURVIVAL AND DEVELOPMENT. **ART** CAN OFTEN DEAL WITH EMOTIONS MUCH BETTER THAN SCIENCE. **WHENEVER** YOU NEED A CAR, YOU SIGN UP AND HAVE INSTANT ACCESS TO DIFFERENT CATEGORIES OF VEHICLES RATHER THAN OWNING JUST ONE CAR.

4 Workshops

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Morning Reflections

Bernd Draser

While immersed in our workshops at the Nikolaus Monastery, we found it a productive practice to take a few short breaks from our work and step back for a couple of minutes in order to look back with a fresh perspective over the results of the past day as well as the challenges that lay before us. Here are some of our initial questions as well as our first attempt at providing answers:

What do we do when we design?

The design **process** is the deliberate designation of an object to a function that is accomplished by choosing a specific form and material. Both form and material have a functional dimension, but there is an aesthetic and semantic dimension that goes along with it. Forms and materials can embody habits and history which speak a language of their own. Sustainable designers are committed to understanding and expressing themselves in this language.

Yet some designations occur unknowingly during a design **process**: We designate an object according to our normative values, our own imagination and cultural patterns, our concepts of the world, and our position in it, often unaware of the fact that we are doing so. Sustainable designers wish to cultivate awareness for these **processes**, as our products shape us as much as we shape them.

What can we learn from artists?

Looking back on the evening discussion with the artists Milica Reinhart and Marjan Verkerk, it was striking just how complex their understanding of the creative **process** proved to be. It is not only the bridge they painted, but their work also involved interviews, tackling complex administrative, bureaucratic and political **processes**, and participating in dynamic discourses sparked by their project.

The philosophy of art has been debating this phenomenon since the 1800s and has posited that the aesthetic experience has become detached from the object in the development of modernity and found a new home in the theoretical and conceptual reflections surrounding art. The main

»THE DESIGN PROCESS IS THE DELIBERATE DESIGNATION OF AN OBJECT TO A FUNCTION THAT IS ACCOMPLISHED BY CHOOSING A SPECIFIC FORM AND MATERIAL.«

Workshops

consequence of this **process** is the rationalisation and conceptualisation of aesthetic judgement.

Designers can learn from artists how design **processes** have become more complex. Sustainable design is not about »sexing up« objects and messages, but about reflecting on the entire life cycle of designed objects, including their economic, ecological, ethical, and aesthetic consequences. It is necessary to think in terms of **processes** and networks and not only in terms of the relationships between objects or form and function.

Do we need mobility and competition?

Looking back on the evening talk with mobility designer Conrad Wagner, the question arose as to what degree we truly need mobility and competition. It is stunning to consider that the humans have been nomadic species for about 99% of their history. Mobility is a core human trait, and sustainable mobility concepts must address the fact that mobility is a basic human need. Sustainable mobility design must address new concepts of mobility and not just seek to reduce it.

As mammals, humans are a competitive species. Civilisation is the **process** of transforming biological disposition into culture. If we ignore this disposition when designing new and sustainable societal **processes**, we place our ability to make the transformation to sustainability at risk.

And what can we learn from the fish?

Brigitte Wolf

When we observe a shoal of **fish**, we are fascinated by how this great number of individual **fish** is able to act as large single unit. All of the **fish** in the shoal turn simultaneously into the same direction, yet they never bump into each other when they move. They always respect each individual's space, yet the group's cohesion always seems perfect. It is an interesting phenomenon in which hundreds or thousands of individuals behave in a coordinated fashion. Obviously, there is no leader to tell them what to do – they are self-organised. The question is how does the self-organisational process function? What are the organisational and/or guiding structures behind it?

The workshop title »And What Can We Learn from **Fish**?« must be understood as a metaphor for self-organisational systems in general. Our environment – the planet Earth – is a super-system composed of many self-organising systems. Mankind has added hierarchical organisational systems, such as those found in politics, companies, and institutions. Orders are passed from the top to the bottom in order to steer the organisation.

Not only **fish** but also birds, bees, and ants live in **swarms**, and all of these are self-organising systems. The shoal of **fish** finds the best place for food. The flock of birds fly south in order to survive cold winters. They switch their positions in the **swarm** depending on the air stream and thus save energy. When they »dance«, bees show their fellows the shortest way to a food supply. Ants figure out the shortest way to a source of food by producing pheromone trails. A single **fish**, bird, bee, or ant is actually not that intelligent, but together they develop an incredible intelligence that is capable of achieving great things. They develop what is known as **swarm** or collective intelligence. This form of intelligence functions by following a limited number of rules. A **fish** shoal follows, for example, three basic rules:

» Separation: steer to avoid crowding local shoal-mates
» Alignment: steer towards the average heading of local shoal-mates
» Cohesion: steer to move toward the average position of local shoal-mates (1)

»[…] THE STUDENTS WERE TASKED WITH CRE-
ATING A SELF-ORGANISING STRUCTURE THAT
CAN IMPROVE OR ENRICH HUMAN LIFESTYLES
IN A SUSTAINABLE FASHION.«

Workshops

That explains how **fish** organise themselves, but it does not explain how they decide where to find food or how to survive? In their research, Jens and Stefan Krause investigated how decisions are made in **fish swarms** and if the same rules could be applied to **swarms** of human beings.(2) The emergent processes between the individuals in a **swarm** cannot yet be fully explained.

For example, ants construct anthills which when compared to the ant's size are much bigger than the biggest skyscraper ever built by human beings. How is the decision to build an anthill made – when and where is it made? Scientists at the Santa Fe Institute have investigated the rules governing the social behaviour of ants and have discovered what is known as the »ant algorithm«.(3) In the world of business, the ant algorithm is used to plan effective logistic processes.

As opposed to **fish**, birds, and bees, a single human being is quite intelligent, but severe problems can often arise in large groups of people. There are certain occasions in which human crowds panic. Examples such as the Hajj in Mecca 2006 or the 2010 Love Parade in Duisburg have shown the danger one faces in large groups of people. In both instances, people were killed or suffered physical and psychological injury. To prevent accidents in large groups of people, security experts study **swarm** be-haviour to design security systems that can help control their movement. Ensuring the safety of people moving in big public events, such as plan-ning fire-escape routes, is a tremendous challenge. Daily traffic jams also demonstrate the problems of human crowd behaviour.

In the realm of business, **swarm** intelligence has been used to improve existing structures or to construct self-organising structures. Here are some examples:

» Gore-Tex has won numerous management awards in the past. The organi-sational structure of the company is quite unique. It is organised into self-organising cells. Self-organisation of human beings appears to be restricted to a certain number of individuals. If a cell grows too large, a new one is formed, and the company thus grows organically. This non-hierarchical business model has – thus far – proved to be successful.

» Another example is the design studio »sietemedia«(4) in Mexico. The owner organised his studio based on a model of a human cell – a further example of a self-organising system. As a cell grows, it doubles its functions and then forms a new cell which includes the original's entire DNA. In this manner, the job description of the founder is to serve as a form of DNA.

» A group of IT specialists in Australia quit their jobs. They liked to drink beer and they soon realised that there is really only one large brand on the Australian beer market. They decided to create their own beer brand from scratch. They involved their social networks in the development process and these networks in turn involved others. Finally a big community came together to decide what type of beer they wanted to make, how it would be produced, the packaging, and the name. When the beer came to market, it could count on a large group of loyal customers.(5)

Human beings are and will always be different from animals living in **swarms**. Nevertheless, it is useful to reflect how the principles of self-organisation can serve as a source of inspiration in creating successful organisational structures for everyday life. Reflections, examples, facts, and ideas such as these formed the basis for the workshop, and the students were tasked with creating a self-organising structure that can improve or enrich human lifestyles in a sustainable fashion.

Results

Phlox – Exploit your Neighbourhood
Chistina Mertens from Hamburg, Andrea Augsten from Wolfsburg, and Carina Matzky, Daniel Hyngar, and Jasmin Acar from Cologne developed the concept of social interaction known as »phlox«. To accompany the concept, they came up with a slogan: »Exploit your Neighbourhood«.

The working group began by discussing how modern societies are very complex systems. Many people live extremely flexible lifestyles, and they are cut off from family and friends as a consequence. Social interactions are instead transferred to social networks in the internet. Personal social interactions are limited, as people create independent infrastructures to manage their own lives. Maintaining these infrastructures takes time and often results in wasted energy and resources. The discussion began with a simple example: A single person who bakes a cake eats a few pieces ends up throwing the rest away. It might be a good idea to share the cake with others in order to make friends or help nourish one's relationships with neighbours. It would also be a more ecological and more economical decision. It sounds easy, but we all know that in real life such things are never quite so simple.

How would your neighbour react if you invited her/him to share a cake? Maybe she/he might be annoyed as she/he is busy with something else? Maybe she/he would not be sure of your intentions? Maybe she/he doesn't like cake? Maybe she/he doesn't want to have to talk to you? Maybe she/he is pleased? Who knows what could happen? Maybe you just won't ask as the fear of rejection is simply too great.

In order to expand upon this concept, the group discussed how society works and how its various actors coordinate with one another. Social relationships are based on sympathy, trust, reliability, knowing and acceptance of one another, and common experiences. Achieving these qualities is much more difficult than designing an internet platform for a new kind of neighbourhood social network. The technical facilities can be achieved rather quickly, but acceptance and satisfying use of a neighbourhood network pose an immense challenge.

The students first defined their vision: Talking to your neighbours improves your quality of life. Then they described what they would like to improve. They wanted to improve social interaction and the feeling of togetherness in order to provide a greater sense of security. At the same time they wanted to achieve resource efficiency by reducing consumption. The overall objective was to enrich social life, have fun, and inspire one another's sense of curiosity while saving time, money, and resources by doing things together and helping one another.

The group decided to focus on a concrete example by analysing social interactions within a house of flats in Cologne. A close look a the residents' lifestyles and living conditions offered several possibilities that could benefit from sharing, for example, transportation, food, WLAN, babysitting, infrastructure, and electricity with their neighbours.

Inhabitants
6 men
7 women
2 babies
1 dog
1 hamster

SHARING
WLAN
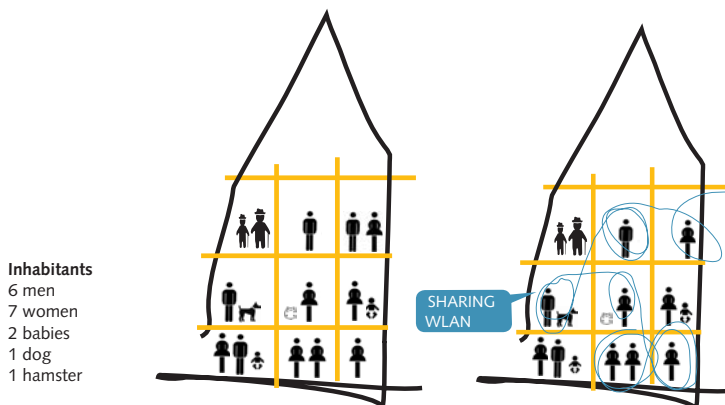
In the following the group members discussed what they had learned about **swarm** intelligence and how to use this knowledge to design the processes and structures of social networks for human communication that can help build a community. People living in a house of flats belong to different »**swarms**«, such as friends, family, yoga groups, mother and child groups, work colleagues, and choral societies, and each of these groups has its own rules. A neighbourhood community is something that happens voluntarily – nobody can be forced to join the group. Thus it is best to start small and motivate neighbours by showing them the advantages of such a programme.

The group developed a step-by-step concept which is to be published on a website where anyone who is interested in the idea can download it. The program is called »Phlox – Exploit your Neighbourhood«. The concept makes a number of recommendations:

» Start with some small action to arouse your neighbours' curiosity. Motivate them to participate. For example, take some books you have already read and place them in the entrance hall with a message reading »books for exchange«. Let them respond.
» Knock at your neighbour's door. Explain the basic concept and ask if they have had any personal experiences that might provide further insight. Listen to their wants, needs, and concerns.
» Encourage them to establish their own individual rules for exchange and for the common use of goods, space, etc.
» Explain the use of the digital exchange platform and start sharing.
   Vote and receive sustainability points for sharing activities.
» Share your experiences with other users to encourage competition and improvement.

DO YOU LIKE THE IDEA?

How to inform your neighbourhood

Visit our homepage and
download infopackage!

Start small actions to make
them curious!

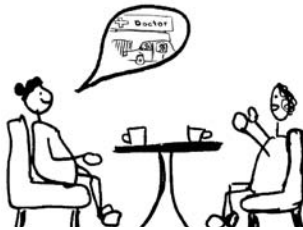Let them respond!
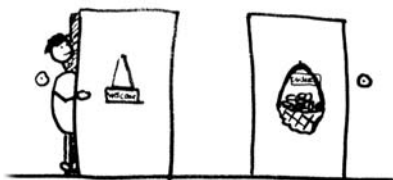
Get in contact with your
neighbours!

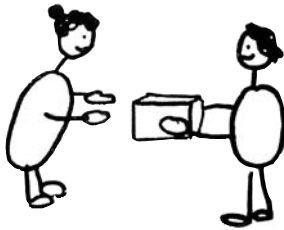Explain the basic concept!

Ask for their personal
experience!
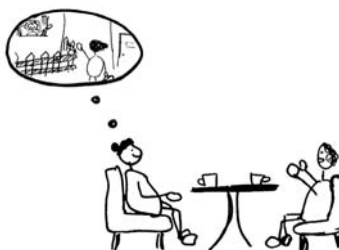
Listen to their needs!

Individual rules protect from disappointment!

Hand out the communication device!

Start sharing!

VOTING SYMBOLS

areas

food

mobility transport

infrastructure

helping hand

sustainability

energy

recycling

water

money

If the idea succeeds and a neighbourhood community develops, the members will benefit from a more pleasant social climate, assistance, quick and simple solutions to everyday problems, and greater security. It is all a result of the fact that people are caring for one another.

It is up to each individual to decide to join the community. In order to achieve a sense of safety and comfort, we recommend establishing simple and exact rules and communicating them clearly. Members will benefit from an improved social, economic, and ecological environment by sharing with their neighbours.

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(3) Eric Bonabeau, Rodrigo M., and Theraulaz, G.: Swarm Intelligence – From Natural to Artificial Systems, Oxford University Press 1999; Marco Dorigo, Ant Colony Optimization, MIT Press 2004,

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(5) »Von Freund zu Freund«, brand eins, Heft 2, 2008

Shaping a Sustainable Future: Good Food

Nina Gellersen
Luzius Schnellmann

Task

Design is about shaping the future. Whereas in the past our discipline dealt with creating new products to satisfy customer wants and commercial needs, today things are no longer as simple. Designers' responsibilities must also include aspects such as ecological und social needs. How can we significantly reduce our Ecological Backpack? How do we convert our one-way methods of production into a closed circle in which everything is useful and nothing is wasted? How can we disengage ourselves from focusing on material goods? How can sustainable lifestyles gain broad acceptance?

In this workshop, we sought everyday solutions that can make a contribution towards changing our lives for the better. By sharing our skills, knowledge, and resources, we – as designers, but also as humans – are able to create something that is worth more than the sum of its parts.

The aim of our workshop was to find approaches that can be implemented directly while avoiding the political path. Such approaches would start small but seek to achieve a maximum effect while remaining open to further development. Following the principles »open source«, »bottom-up«, and »co-design«, we focused on designing a structure which it is the user who ultimately provides the content.

Method

The workshop's focus lies in applying »open source« concepts from the field of computer science to the area of sustainability. This idea of open development was reflected not only in the resulting project but also in its development. The workshop supervisors at times took on the role of moderators and added their expert knowledge to the process. However, for the most part the group organised itself and developed a common concept that combined all of the participants concerns and desires.

The Wuppertal Institute's presentation on resource efficiency provided the basis for an extensive discussion at the beginning of the workshop, and notes were taken on the topics and problems as well as the initial ideas and solutions we discussed. This exchange was supplemented by study of specialised texts in small groups and brief inputs regarding the

»THE AIM OF OUR WORKSHOP WAS TO FIND APPROACHES THAT CAN BE IMPLEMENTED DIRECTLY WHILE AVOIDING THE POLITICAL PATH.«

MIPS-concept (Material Input Per Service Unit) and the Cradle-to-Cradle approach, which were followed by a critical discussion of how these concepts could be integrated into the project development process. Practical examples such as the Transition Town movement or exemplary social design websites were also a focus of our discussions.

»Ecological **food**« rapidly emerged as a main focus of interest for the workshop participants. The group's international makeup, with participants from Argentina, Germany, Italy, Latvia, Pakistan, and Switzerland, opened up a variety of perspectives on the topic and heightened awareness of our differences as well as our similarities. A zoom-in/zoom-out culture emerged, and this constant change in perspective became a tool in the development of a holistic project.

The Result: »Good Food«

Good **Food** is a structure which enables interested people to become part of a **food** network. It also encourages users to serve as co-designers.
Good **Food** collects ideas such as:

» strategies to help reduce waste and close material-cycles
» resource-sparing transport and preparation of dishes
» sharing knowledge and experiences dealing with the subject of **food**
» awareness of both the general as well as the particular aspects of the topic

Good **Food** primarily supports interconnection at a local level, yet it also encourages a global exchange of ideas. Anyone can take part if they are interested in good **food** and would like to contribute something to the

getting
the food
(production,
transportation)

GOOD FOOD
close the cycle

food
preparation
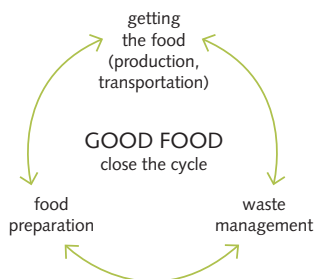
waste
management

project, such as recipes, tips on cultivation of vegetables and herbs, composting of organic waste, breeding and care of livestock, etc. Local **food** producers, retailers, restaurants, or service providers are given an opportunity to highlight their offers and expand their clientele. Furthermore, Good **Food** helps establish new social contacts by forming buying syndicates, ar-ranging group dinners, or simply via exchanges on the Good **Food** internet platform, for example.

Good **Food** is available to everyone: pupils and students from Namibia to Denmark, street-**food** vendors in Mumbai, housewives in Switzerland, mushroom collectors in Latvia, or farmers in Lower Saxony.

Multifaceted touchpoints are necessary to assure individual access to Good **Food** for people from various backgrounds and financial ability. At its centre is a website which serves as a forum for knowledge and services. Individual entries are organised in the form of case studies which can be revised intuitively in various subcategories or by means of a sophisticated search function organised according to topic. Additionally, local offers and events can be posted and their location displayed on a map of the area.

This digital, web-based touchpoint will be supplemented with further offers, which, depending on the region, will address a larger range of users, such as markets and exhibitions, neighbourhood parties, workshops and activities in schools and universities, print media (flyers, newspaper articles, banners, stickers, etc.), radio, and television cooking shows.

Here are just a few of the many examples developed in the workshop group's pool:
» »Rent-a-Chicken«
» »How to produce birch juice.«
» »I'd like to sell my homemade chutney.«
» »Do you know how to prepare yerba mate?«
» »Let's meet up to buy directly from the farmers outside the city.«

Good Food
» gets people talking to one another
» promotes local producers and manufacturers
» keeps traditions alive
» saves resources
» expands horizons
» is at times a bit bizarre, but it's fun!

Workshop Participants
Maria Josefina Eliggi (Argentina)
Gwendolyn Kulick (Germany / Pakistan)

Viola De Marzi (Italy)
Anda Mendrike (Latvia)
Oliver Metternich (Germany)
Sabrina Remorini (Argentina)
Nina Gellersen (workshop direction, Germany / Switzerland)
Luzius Schnellmann (workshop direction, Switzerland)

Urban Creative Lifeworlds

Bernd Draser
Davide Brocchi

Background

Ever since they were first founded, cities have functioned as cultural, economic, and creative hot spots. However, sizzling **urban** lifestyles also arise in the urban peripheries, which are subject to flexible and informal networks. Throughout the nineteenth century, **urban** development was closely linked to industrialisation; the last decades of deindustrialisation have represented a challenge for many cities. Participation, networks, and creativity are decisive strategies for meeting such challenges. The »Ruhr Metropolis« located near the Summer School venue can serve as a model for such structural changes, and remarkable efforts have been made to confront the challenges which this area faces. This is why it was designated the European Cultural Capital for 2010 with the motto »Culture through Change, Change through Culture«.

Workshop goals and intentions

Fundamental questions influenced our efforts over the course of the entire workshop: How can social and economic challenges be met with more sustainable solutions? What is labour? What is leisure? What is a citizen in the post-industrial age? How can creativity be enhanced? How can we take advantage of creative forces in the urban peripheries? What are the perspectives for urban life in the future? The workshop intended to develop new concepts of **urbanity** and creative solutions for future sustainable lifeworlds by:

- » Analyzing urban living environments, discussing their origins and structures, and looking at the city as a system of interactions.
- » Immersing ourselves into some real-life projects aimed at transforming a normal **urban** environment into a creative lifeworld.
- » Providing participants a space for their creativity to shape and apply new ideas.
- » Discussing and evaluating participants' ideas and sketches as a real-life test of their ideas.

»THE WORKSHOP INTENDED TO DEVELOP NEW CONCEPTS OF URBANITY AND CREATIVE SOLUTIONS FOR FUTURE SUSTAINABLE LIFEWORLDS […]«

Workshop Participants
Najine Ameli (Germany)
Tom Harezlak (USA)
Jade Moyse (UK)
Rafael de Vasconcelos Barboza (Brazil)
Davide Brocchi (sustainability lecturer, ecosign)
Bernd Draser (philosophy lecturer, ecosign)
Special guest: Conrad Wagner (entrepreneur, Mobility Designer)

Theory Kick-Off
As a theoretical introduction to the theme, Bernd Draser provided a detailed overview of the roots and history of **urbanity**, beginning with Anatolia and Mesopotamia and touching upon the Greek poleis as well as Rome and the medieval cities. One important aspect was an exploration of **urbanity's** economic, symbolic, and utopian dimensions.

Davide Brocchi provided a complementary perspective by reviewing sociological, economic, ecological, and cultural definitions of cities and initiating a discussion of both the positive and negative aspects of the city in terms of sustainability. The discussion also touched on the systemic and evolutive approaches to creating a sustainable city.

As a segue into the creative part of the workshop, Brocchi presented two existing projects that seek to realise this goal: 2–3 Streets in Duisburg and Berlin's Möckernkiez.

Swarmville: The Game
Swarmville is a game for real lives and real cities, a game with a great variety of aims. Players mainly seek to apply swarm movements and integrate sustainability into daily life in a playful yet effective manner.

The idea of the game is based on two important symbols of **urbanity**: the axis mundi, an archaic symbol of the centre that helped structure and organise settlements both horizontally as well as vertically, and the agora, a place for the public, politics, trade, and communication. These symbols are connected by applying the concept of swarm intelligence. Additional inspirations were taken from our »Evening Talks« with the experts.

The tool for accomplishing the workshop's goals is known as »Swarmville«. Swarmville is a modular park area organized and nourished by the city's citizens. Its modular system makes Swarmville mobile and flexible in terms of both form and size, enhancing creativity and responsibility in the neighbourhoods while and fostering knowledge about more sustainable ways of life without patronising area residents.

What will Swarmville do? It begins by organising and introductory event designed to arouse residents' curiosity. It will provide all the materials needed and let them inspire people. It will get people involved and encourage the growth of an agora before allowing a self-adjusting system take control of events. It will provide the joy of flow, flexibility, and freedom in a self-adjusting, ongoing project.

How Swarmville works
Step 1: People are first attracted to an art event triggered by viral street art and guerrilla marketing. The campaign is first conducted in a single neighbourhood. At the appropriate point and time, an announcement is made that the street will be closed off for a block party in the form of a park.
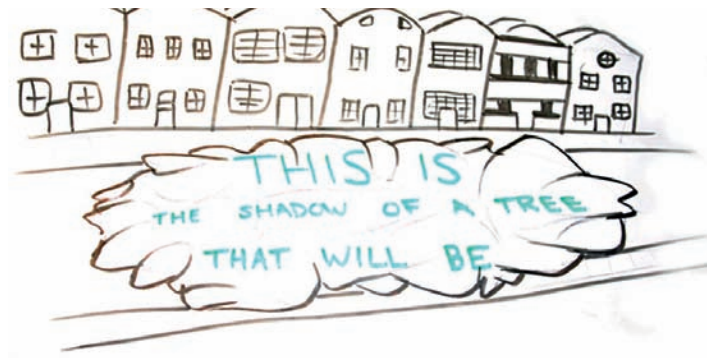
Step 2: As announced, one morning the street is closed, and materials are provided to enable people to build up a modular and flexible park area. Mobile and flexible means that the materials can be moved to additional locations. In this manner, everyone will have the opportunity to live in a park at some point. Again, all of the tools are self-explanatory and suggest ways to get started with growing the park.
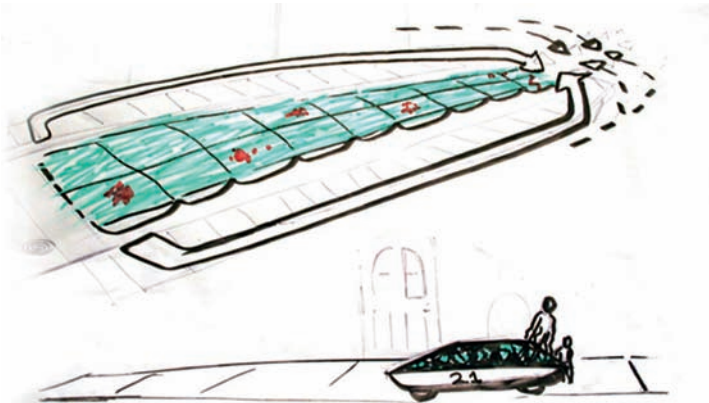
Step 3: Once established, the park's character can change depending on the will of the participants: After a certain time the park moves on, either constantly, very slowly, or in one great leap to the next place. When it leaves one place, something will be left behind to prove that it was there. An award given by the residents themselves provides the motivation to continue the good work.
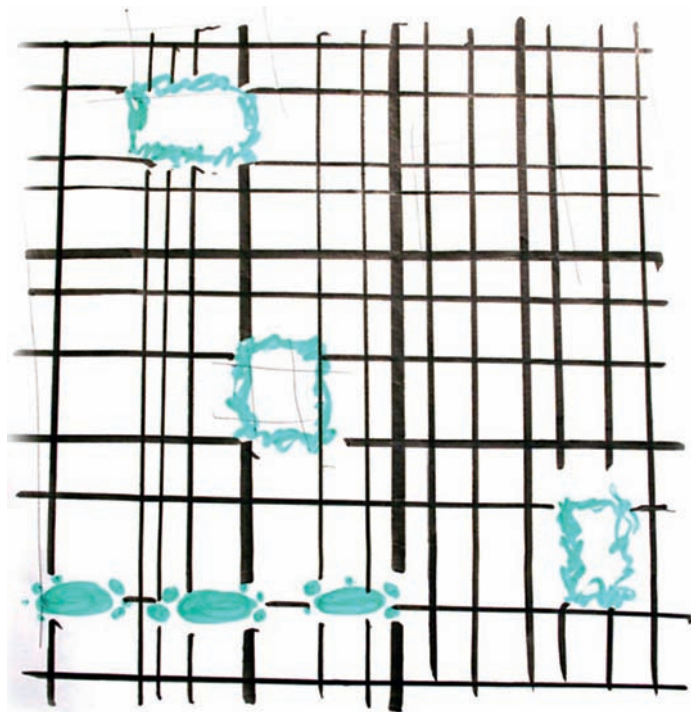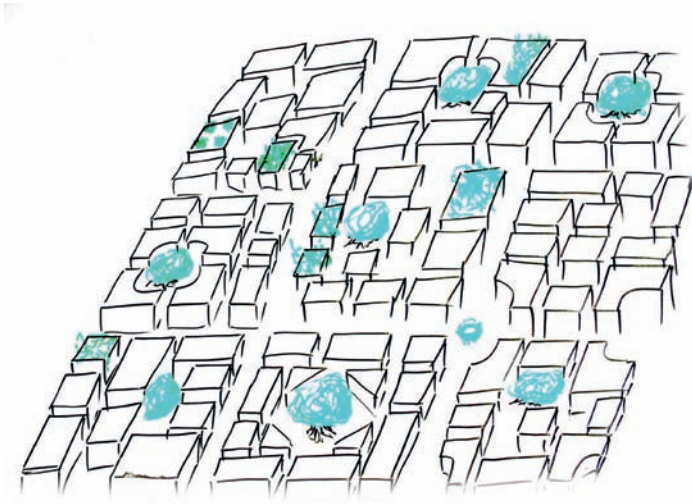
Swarmville's effects

Swarmville increases the quality of life in as well as the value of participating in neighbourhoods while encouraging awareness of sustainable lifestyles. A process of communication, civil participation, deceleration, and de-virtualisation is fostered that can oppose anonymity and de-territorialisation. In the long run, Swarmville may have effects on new and more sustainable perceptions of car traffic and individual mobility. A sense of community and responsibility will grow. The opportunity to grow fruits and vegetables will make consumers of the seasons as well as seasonal and regional products.

Swarmville can be initiated as a small experiment that functions as a model for larger projects.

Summary

Christa Liedtke
Najine Ameli

A focus on the key issues of »Societies, Systems and Swarms«

Designers should be aware that they will play a key role in the process of designing tomorrow's societies. All of the participating students, some of whom travelled great distances to take part in the 2nd **Sustainable** Summer School, demonstrated that not only are they aware of this responsibility, but they are also willing to shoulder some of the responsibility. By participating in one of the workshops, each participant had to overcome his or her notion of the »common understanding of being a designer«, meaning they had to think beyond conventional boundaries. After they were provided with a great deal of insight into different fields of research and introduced to new, more **sustainable** methods of generating products and services, participants sought to develop new solutions aimed at enhancing social interaction.

Working under the conditions established by these basic guidelines, students developed service systems that are primarily based on collaboration, either among the inhabitants of a specific house, a specific city, or even among participants scattered across the globe. Interestingly, all of the workshop results are capable of complementing one another and all of them focus on social interaction as an integral part of the design process. Their designers seek to create an open process of interaction that empowers the actors themselves to become the responsible developers of their own working structures and goals. These products or services primarily offer actors the opportunities that will allow them to combine and integrate these products and services into their daily life.

The concepts can be seen as related framework of instruments, as each of them contributes to create a new and more **sustainable** culture of coexistence.

Phlox

For of a house of flats with a number of different people with different needs and different lifestyles living together under one roof, PHLOX provides an answer to the question of how residents can easily benefit from

one another. It helps to stop the unravelling of the community while promoting a caring and helping neighbourhood environment in a place where previously all of the inhabitants had been strangers.

Swarmville
People choose to live in towns or cities as that is where the jobs and cultural attractions are to be found. However, these places are unfortunately becoming more and more uncomfortable as a result of the smell, noise, and accelerating pace of life. Swarmville serves as a possible solution to the question of how to combine the advantages of living in a small town with the offerings of a lively city.

Good Food
Taking its cue from the knowledge that is embedded in all of the world's cultures, Good Food seeks to provide information about a more **sustainable** food preparation, food transportation, and food waste management. This network is accessible for everyone regardless of where they live. The greater the number of people from different places that participate in this network, the greater the store of knowledge the service can provide. A variety of strategies are offered that can help spread this knowledge, such as the internet, radio, and other media.

In summary, it was quite surprising to see just how the concepts could be so similar yet at the same time so varied in scope. Students proved to have a similar mindset, even though they came from such diverse cultural backgrounds. The attitudes of these young designers is a cause for hope and we look forward to them taking up the responsibility of creating more **sustainable** products and service systems that are needed to help promote the dematerialisation of our economy.

Sustainable Health

Brigitte Wolf

According to the concept of work-life-balance, intellectual work needs compensation through physical exercise. The Sustainable Summer School takes care of the well being of the participants by involving the sports department of Wuppertal University, which is eager to promote the concept of »Pausen Express«. The concept of the program is to interrupt the work process for a short physical exercise to improve the mental and physical **fitness**. The exercises are guided by professional instructors. Gabriele Maass, the coordinator of the Pausen Express Program, elaborated a special and diverse program for the days of hard work in the monastery.

On Tuesday, Pia Scholl directed an outdoor circuit training using simple equipments and inspired the participants to test their **fitness**. On Wednesday, St. Peter's Hall, the main work room, was turned into a gym for an hour and Ginette Hopkins introduced the new **fitness** program »Zumba«, based on Latin American music and dance. On Thursday, Annika Gmyrek motivated the participants to lower the stress of preparing the final presentation by doing »Tae Bo« – a **fitness** program based on boxing movements that elates people to move with the rhythm of the music.

The Summer School participants embraced the **fitness** program. Many students and instructors participated and enjoyed the break for a strengthening and refreshing physical exercise.

»THE SUSTAINABLE SUMMER SCHOOL TAKES CARE OF THE WELL BEING OF THE PARTICIPANTS BY AND INVOLVING THE SPORTS DEPARTMENT OF WUPPERTAL UNIVERSITY […]«

Workshops

Perspectives

Christa Liedtke
Najine Ameli

Following the 1st Sustainable **Summer School**, the 2nd Sustainable **Summer School** took place in August and September 2010. In light of all of the positive feedback which we received in the wake of the 2009 event, the 2nd **Sustainable Summer School** found that it had a great deal to live up to.

Using the same general framework, this year's Sustainable **Summer School** focused on the key issues of »Societies, Systems and Swarms«. Projects also dealt with the social aspects of sustainability.

The participants, experts, and guests were pleased with the entire event, and their enthusiasm and the lively atmosphere can be viewed as a proof of the necessity for similar events for the future as well as the appetite for more first-hand insight and knowledge concerning the topic of sustainability. We are pleased to announce that the 3rd Sustainable **Summer School** is already in the works. At present, next year's main theme will be »Managing Sustainable Design« with a special focus on the economic aspects of sustainability.

To further guarantee even more multifaceted insights into different aspects of sustainability and related fields of research, we plan to augment the organisational team with professionals from other countries.

We are already looking forward to again welcoming design students as well as an interdisciplinary group of students from around the world to the Nikolaus Monastery in Jüchen next year.

»THIS YEAR'S SUSTAINABLE SUMMER SCHOOL FOCUSED ON THE KEY ISSUES OF ›SOCIETIES, SYSTEMS AND SWARMS‹.«

Workshops

Anward 2010 (Siegfried Maser)

100

Everyone knows that it is easier to criticise than to **praise**, so let's practise **praising**. This prize is intended to encourage students to both contemplate and articulate their colleagues' well-deserved **praise**. Who is using their talents to the best of his or her ability? The forest would be rather quiet if only the birds with the best voices chose to sing.

»[…] LET'S PRACTISE PRAISING.«

THE DESIGN PROCESS IS THE DELIBERATE DE-SIGNATION OF AN OBJECT TO A FUNCTION THAT IS ACCOMPLISHED BY CHOOSING A SPECI-FIC FORM AND MATERIAL. [...] **THE** STUDENTS WERE TASKED WITH CREATING A SELF-ORGA-NISING STRUCTURE THAT CAN IMPROVE OR ENRICH HUMAN LIFESTYLES IN A SUSTAINABLE FASHION. **THE** AIM OF OUR WORKSHOP WAS TO FIND APPROACHES THAT CAN BE IMPLEMEN-TED DIRECTLY WHILE AVOIDING THE POLITICAL PATH. **THE** WORKSHOP INTENDED TO DEVELOP NEW CONCEPTS OF URBANITY AND CREATIVE SOLUTIONS FOR FUTURE SUSTAINABLE LIFE-WORLDS [...] **DESIGNERS** SHOULD BE AWARE THAT THEY WILL PLAY A KEY ROLE IN THE PRO-CESS OF DESIGNING TOMORROW'S SOCIETIES. **THE** SUSTAINABLE SUMMER SCHOOL TAKES CARE OF THE WELL BEING OF THE PARTICIPANTS BY AND INVOLVING THE SPORTS DEPARTMENT OF WUPPERTAL UNIVERSITY [...] **THIS** YEAR'S SUSTAINABLE SUMMER SCHOOL FOCUSED ON THE KEY ISSUES OF ›SOCIETIES, SYSTEMS AND SWARMS‹. [...] **LET'S** PRACTISE PRAISING.

5 Participants & Partners

BE TO BE EACH BE ATTRACTED EACH TO EACH OTHER! BE ATTRACTED TO EACH BE BE ATTRACTED TO OTHER! BE ATTRACTED TO TO EACH TO OTHER! BE ATTRACTED EACH **BE** ATTRACTED TO EACH ATTRACTED OTHER! ATTRACTED BE ATTRACTED EACH OTHER! ATTRACTED BE ATTRACTED TO EACH BE OTHER! BE EACH ATTRACTED OTHER! ATTRACTED TO EACH OTHER! BE ATTRACTED TO BE EACH OTHER! BE TO EACH ATTRACTED TO **ATTRACTED** EACH OTHER! BE ATTRACTED TO EACH OTHER! BE ATTRACTED EACH TO EACH OTHER! BE ATTRACTED **TO** EACH OTHER! BE ATTRACTED TO EACH OTHER! BE ATTRACTED TO **EACH** TO ATTRACTED OTHER! BE TO EACH OTHER! BE TO BE ATTRACTED EACH OTHER! ATTRACTED EACH TO EACH BE ATTRACTED EACH OTHER! BE ATTRACTED TO EACH OTHER! BE ATTRACTED TO OTHER! BE ATTRACTED TO EACH TO OTHER! BE TO ATTRACTED EACH **OTHER!** BE ATTRACTED TO EACH EACH EACH TO BE ATTRACTED TO OTHER! BE ATTRACTED TO EACH BE TO ATTRACTED TO EACH BE ATTRACTED TO OTHER! BE TO EACH OTHER! BE ATTRACTED EACH TO BE ATTRACTED TO EACH BE ATTRACTED TO EACH OTHER! BE ATTRACTED

The Venue: Nikolaus Monastery

Bernd Draser

For more than 600 years, the Nikolaus **Monastery** has been a place of deceleration and reflection – just the right venue for the 1st Sustainable Summer School in 2009 to discuss issues of sustainability and the future of everyday life and rituals. It was also the perfect place for the 2nd Sustainable Summer School in 2010 to delve into the sustainable dimensions of »Societies, Systems, and Swarms«.

Located in the picturesque rural countryside of the Lower Rhine, the **monastery** offers a stark contrast to the nearby open-pit lignite mines at Garzweiler and the urban centres of Cologne, Düsseldorf, and the Ruhr Valley. A vivid and diverse metropolis with twenty centuries of rich heritage, Cologne forms an important cultural centre. The state capital of Düsseldorf plays host to a number international corporations and serves as the region's political and economic centre.

The Ruhr, the focal point of German industrialisation during nineteenth and twentieth centuries, symbolises the difficulties and challenges faced by the sustainable re-design of a entire region that is still experiencing structural changes in terms of economy, ecology, and society. In 2010 the Ruhr was named the European Capital of Culture.

The **monastery** building, which replaced an earlier hermitage and chapel, dates back to 1400. Today the **monastery** is run by the Catholic Order of Oblati Mariae Immaculatae, a religious order founded in early nineteenth century. The **monastery** is surrounded by a huge park that offers wide spaces for retreat, reflection, and relaxation. It is also the perfect place for our daily workouts, guided by sport scientists from Wuppertal University.

The fathers and brothers of the order proved to be quite accommodating, flexible, and generous hosts. Meals were served in the antique refectory, and participants were accommodated in simple but cosy two-bed rooms. There were impressively furnished and decorated rooms available for the plenary and workshop sessions, such as the antique library and St. Peter's Hall with its gorgeous ceiling fresco.

It is the **monastery's** place amidst the tensions between past and future, heritage and burdens, new cultures and challenges, and its location

»TODAY THE MONASTERY IS RUN BY THE CATHOLIC ORDER OF OBLATI MARIAE IMMACULATAE, A RELIGIOUS ORDER FOUNDED IN EARLY NINETEENTH CENTURY.«

set against the surrounding area's urban energy, industrial relics, and rural silence that made the Nikolaus **Monastery** the perfect venue for the 1st and 2nd Sustainable Summer Schools, and we are looking forward to returning for the Third Sustainable Summer School in 2011!

Lucerne University of Applied Sciences and Arts
The School of Art and Design

Nina Gellersen
Luzius Schnellmann

Creativity and Innovation for the Benefit of Culture, Society and Business
The School of Art and **Design** offers a range of disciplines unmatched anywhere in Switzerland. It is the country's oldest arts school with a tradition spanning more than 130 years. The school draws on an extensive network of connections with faculty, students and projects in Switzerland and abroad. Its selected bachelor and master programmes and its twenty fully equipped in-house workshops give it a name in the fields of applied art and **design** affording students the kind of skills that will help them meet the challenges of this industry. This, in turn, further boosts the school's reputation.

The **Design** and Arts institutes contribute in equal measure to the areas of research and training, as well as in professional development and service. In the field of **design**, the school's major research areas are visual narrative and explanation (communicating by means of images) and **design** and management (managing creative processes).

In our research-based Master of Arts in **Design** study programme students can choose between two majors, each of which provides the opportunity to specialise within the contextual framework of the disciplines at Lucerne School of Art and **Design**: Animage and Product **Design** & Management. Product **Design** & Management is directed at product and textile **designers** as well as graduates from affiliated disciplines. Within the major students can choose from the three areas of specialisation:

Textiles
This track encompasses the **design** of surfaces and of textiles for garments and interior **design** to the development of innovative, functional materials, like Smart Textiles. Students examine manufacturing techniques and explore novel approaches by researching, experimenting and specifying.

»THE SCHOOL OF ART AND DESIGN OFFERS A RANGE OF DISCIPLINES UNMATCHED ANYWHERE IN SWITZERLAND.«

Products

In this specialization, students deal with the **design** of high-quality consumer goods for everyday life and accessories. These products are purchased directly by the user, whose needs are thus placed centre stage. There is also a focus on incorporating the products into their respective spatial, temporal and ideal contexts.

Services

In this track, emphasis is placed on the development and **design** of services that are usable, useful and innovative. Although the focus is on the user, service **designers** are also required to rethink the corporate and environmental structures that comprise the service ecology.

Folkwang University of the Arts

Anke Bernotat
Ulrich Scholz

An overview of Folkwang University's world of design
Designers attended the School of Trades and Applied Arts here even before the Folkwang School of Music, Dance and Speech was founded in 1927. **Designers** were closely associated with other artistic fields in Folkwang from the school's very beginning and in 1928 they formed the Folkwang School of **Design** (Folkwangschule für Gestaltung). From 1948 to 1972, photographers, carvers, sculptors, graphic **designers**, commercial artists and other artists shared the same roof with musicians, dancers, and actors at the Benedictine Abbey in Werden. However, it was not until 2007 that this school became an official part of Folkwang University, including its programmes in photography as well as communication and industrial **design**. The school is currently planning to move into the Zollverein complex.

No future without a past
Folkwang is one of the oldest photography schools in Germany, and under Otto Steinert in the 1950s it was the last word in photography instruction. The disciplines of communication and industrial **design** are also indebted to the particular Folkwang tradition and are represented by numerous distinguished teaching staff and a wide range of interdisciplinary artistic, theoretical, and practical instruction. **Design** at Folkwang University encourages cross-disciplinary work with international partners and maintains close contact with representatives from the areas of commerce and industry, thus allowing the »Folkwang idea« to promote realistic concepts while vibrantly moving forward into the future.

What is Folkwang design?
Properly educated **designers** make an important contribution to shaping our environment by virtue of their comprehensive manner of practical and critical thinking, their sensibility, their capacity to imagine the future, and their knowledge of culture, art, technology, ergonomics, science, and the marketplace. Folkwang University's **design** program aims to educate precisely these **designers** and provide them with the foundation they require

»AS FOR THE FUTURE, YOUR TASK IS NOT TO FORESEE IT, BUT TO ENABLE IT« ANTOINE DE SAINT-EXUPÉRY

to establish their own individual attitudes and approaches to **design** – all within the context of a unique cross-disciplinary course structure that fuses theory with practice.

Without **design**, technological innovations are often of no use to humanity. Through the integration of »cultural quality«, **design** can discover applications for new technical innovations.

Innovation & Design

Design serves as a link between technological innovations and cultural context. As both catalyst and moderator, the **designer** oversees the developmental process from initial conception to the **design** of useful and relevant products. In this fashion, **designers** combine inspiration and anticipation to create innovations oriented towards a specific context.

Our working group deals primarily with the integration of new technological developments and conventional techniques combined, most importantly, with the possibilities and opportunities that these new discoveries present both for today and in the future.

Ecosign/Academy for Design

Bernd Draser
Davide Brocchi

Sustainable **design** integrates ecological, economic, and social interests in equal measure in terms of both form and concept. In order to implement these three competences into real life solutions, it is necessary to have a solid foundation in matters of aesthetics, theory, and culture. This interdisciplinary foundation enables complex ways of thinking for a complex world that can help overcome simple linear ways of thought. Ecosign/Academy for **Design** has been educating professionals about sustainable **design** since 1994.

Ecosign offers full-time courses which award the student a diploma in **design**. **Design** is presented in its holistic context, and students receive intensive training in technical processes, basic theory, and handicraft skills and simultaneously learn to transfer these skills to a more ecologically responsible form of **design**.

The students learn to position themselves as ecologically-aware and future-orientated **designers** who function in an area located between industry, consumers, and the environment. They learn how to make effective use of the world's resources as well as all possible solutions. Solutions must be found which pose no threat to the environment yet can still attract and appeal to consumers, thus making them both practical and profitable for industry.

Students are trained to think cooperatively, to work in teams, and to acquire the necessary qualifications needed in a multinational society and an ever more globalised world. All of the courses implement the ecosign concept.

Theoretical courses include philosophy, psychology, **design** theory, art history, and **design** management. The skills acquired in these courses are applied in various projects which help prepare the students to become successfully **designers**. **Design** achievements are made more complex through the added aspects of ecology and philosophy. The conceptual method of work increases quality while opening up a range of new possibilities, and personal interviews, presentations, and general discussions of projects open up a variety of new perspectives. All in all, students receive a solid practical education, a comprehensive overview of their future profession, and all of the tools necessary for them to develop both responsible behaviour as well as a keen sense of judgement.

»ECOSIGN OFFERS FULL-TIME COURSES WHICH AWARD THE STUDENT A DIPLOMA IN DESIGN.«

University of Wuppertal
Department of Industrial Design

Brigitte Wolf
Marcel Befort

Shaping the Future!

Industrial **Design** is a scientific and artistic study programme. Multidisciplinarity, practical relevance, internationality and a doctoral program strengthen the university profile of the career. Industrial **design** is a scholarly and creative Bachelor of Arts (BA) programme that offers students the possibility of specialising in:

» Technical products / product systems
» Strategic **Design**

The Bachelor of Arts (BA) in Industrial **Design** is a four years programme, and enrolment takes place annually beginning with the winter semester. The programme offers a practical university education in process-driven product development and the development of **design** strategies. The ›Wuppertal Model's‹ unique mission is to enhance the industrial **designer's** core competencies by adding skills like **design** thinking, applied research and strategy development to his or her repertoire.

New ways of thinking are linked with technical and **design** expertise. The **design** programme connects people's future needs with commercial business strategies as well as the economy. A course of studies in industrial **Design** at the University of Wuppertal – the only university in Germany to offer a degree in »strategic **design**« – means to learn how to develop innovations.

The department is currently in the process of establishing a master's degree in Strategic Innovation. The Master in Strategic Innovation is a three semester programme (one and a half year), that enables students to advance their career chances by using **design** skills to create authenticity and strategic market positioning for companies and organisations.

The students benefit from interdisciplinary, international co-operations with other renowned **design** schools, and are encouraged to participate in international exchange programmes. Finally, the option of obtaining a Ph.D. in **design** is one of the unique offerings of the University of Wuppertal's industrial **design** department.

»THE DISTINCTIVENESS OF THE ›WUPPERTAL MODEL‹ IS TO ENHANCE THE CORE COMPETENCY OF THE INDUSTRIAL DESIGNER […]«

Wuppertal Institute for climate, Environment and Energy

Christa Liedtke
Najine Ameli

Sustainable Development requires an integrated approach to policy and science, as many of the issues raised by **sustainable** development cannot be addressed within a single department or by using the tools offered by individual scientific disciplines. This is where the Wuppertal Institute for Climate, Environment and Energy's research programme begins – by adopting an interdisciplinary approach and working towards systems research and understanding. Applied **sustainability** research is the Wuppertal Institute's stated mission.

The Wuppertal Institute explores and develops models, strategies, and instruments that support **sustainable** development at the local, national, and international levels. **Sustainability** research at the Wuppertal Institute focuses on ecology and its relationship to economy and society. Special emphasis is placed on the technological and social innovations that decouple economic growth from the use of nature and wealth and on launching initiatives that address these issues.

Research Group 4 deals with service-oriented **sustainable** production and consumption systems and seeks to develop instruments, concepts, and strategies that promote the transition to more **sustainable** patterns of production and consumption. Our research focuses on the development and market launch of products and services that are deemed **sustainable** in terms of their entire life-cycles as well as optimised production processes throughout the entire added-value chain. Instead of containing and supporting of mass flows that are expensive in terms of cost, time, and nature, Research Group 4's focus is directed towards the needs and wants of clients and consumers and creating eco-intelligent solution strategies.

The **Sustainable** Production and Consumption Research Group is convinced that making markets and economies more **sustainable** requires the optimisation of both production and consumption patterns. One possibility of achieving this goal is to initiate an exchange of information between different institutions and businesses which could contribute to integrated **sustainability** in terms of both production and consumption.

»APPLIED SUSTAINABILITY RESEARCH IS THE WUPPERTAL INSTITUTE'S STATED MISSION.«

The 2nd **Sustainable** Summer School once again provided us with an opportunity to discuss the issue of **sustainability** with young designers and empower them to integrate these issues into their daily work and design routines. It offered a great opportunity for collaboration as well as for a number of new ideas and discoveries. The members of the Wuppertal Institute for Climate, Environment and Energy staff who participated at the 2nd **Sustainable** Summer School were Dr. Christa Liedtke, director of the Research Group 4, and research assistant Najine Ameli.

CSCP

Nora Brüggemann

The ways in which products and services are delivered to our doors have become increasingly complex and globalised. The actions taken by designers, producers, retailers and consumers are all interlinked and can have far-reaching effects on all of these actors as well as the global environment. For instance, decisions taken by producers about the design of a product may have repercussions for the consumer in terms of the negative environmental effects that result from its use. In the same way, decisions taken by consumers located on one side of the world might influence producers and communities on the other. The challenge is to manage these interdependencies in a manner that advances human development without causing harm to the environment. The UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP) was established in order to meet this challenge.

Founded in 2005 by the Wuppertal Institute and the United Nations Environment Programme (UNEP), the CSCP provides scientific support, consultation, and transfer services in the field of sustainable consumption and production. The CSCP's international and dynamic team of forty-five experts from fifteen different countries focuses on the development, testing, implementation, and monitoring of concrete projects in both developing and developed countries. As a part of its activities, the CSCP also aims to provide a visual face to sustainability. For example, the CSCP

» develops visions for sustainable **lifestyles** through an open social platform and dialogue across different stakeholder groups.
» organises dialogue processes between civil society organisations and other stakeholders to identify research needs in the area of sustainable consumption and production and to suggest policy measures.
» systematically identifies challenges and opportunities in the area of products and services on behalf of an international retailer in order to both reduce negative environmental and social effects and support mainstreaming of sustainable products and services.

»CSCP […] AIMS TO PROVIDE A VISUAL FACE TO SUSTAINABILITY.«

» hosts international conferences such as »The Future of Sustainable Products and Services« in 2009 and »The Future of Sustainable **Lifestyles** & Entrepreneurship« in 2011.

» visualises sustainability in publications such as the handbook »Do SMART business – Week by Week«, which illustrates environmental and social actions for the managing directors and employees of SMEs.

» fosters sustainable consumption and production (SCP) and sustainable entrepreneurship qualification with the SMART Start Up project, which organises training events for African students and teachers.

» raises awareness of sustainable **lifestyles** by organising the teamS Idea Competition for school groups in order to teach them about the environmental impacts of daily choices.

» links different SCP projects in Asia by hosting the SWITCH Network Facility, which fosters knowledge exchange and replication of good practice.

Participants

Organizational team:
- » Bernd **Draser** M.A., ecosign/Academy for Design, philosophy lecturer
- » Davide **Brocchi**, Dipl., sustainability lecturer at ecosign/Academy for Design and INFU – Institute for Environmental Communication, Leuphana University of Lüneburg
- » Prof. Anke **Bernotat**, Folkwang University of the Arts, Essen, industrial design, focus: innovation and design
- » Dipl. Des. Ulrich **Scholz** , research assistant at the University of the Arts, Essen, Assistant for materials scienence, manufacturing technology and methodic design
- » Prof. Nina **Gellersen**, School of Art & Design, Lucerne University of Applied Sciences and Arts, Master of Arts in Design, Co-Head Major Product Design & Management
- » Luzius **Schnellmann**, Dipl., assistant to the head of the M.A. Design programme at Lucerne University of Applied Sciences and Arts
- » Prof. Dr. Brigitte **Wolf**, University of Wuppertal, industrial design, design theory, focus: methodology, planning and strategy
- » Dipl. Des. Marcel **Befort**, research assistant at the University of Wuppertal, industrial design, design theory, focus: methodology, planning and strategy
- » Nora **Brüggemann**, Project Manager, UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP)
- » Dr. Christa **Liedtke**, Director: Sustainable Production and Consumption, Wuppertal Institute for Climate, Environment and Energy
- » Dipl. Des. Najine **Ameli**, Wuppertal Institute for Climate, Environment and Energy

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- » Prof. Dr. Jens **Krause**, Leibniz-Institute for Freshwater Ecology and Inland Fisheries, Department of Fish Biology and Ecology
- » Prof. Dr. Stefan **Krause** Department of Electrical Engineering and Computer Science, University of Applied Sciences Lübeck

» Dr. Christa **Liedtke**, Director: Sustainable Production and Consumption, Wuppertal Institute for Climate, Environment and Energy
» Milica **Reinhart** and Marjan **Verkerk**, are an artists-duo since 2000
» Prof. Dr. Uwe **Schneidewind**, Wuppertal Institute and Schumpeter School/University of Wuppertal, Chair for Sustainable Transition Management
» Conrad **Wagner**, Mobility Systems, Stans, Switzerland
» Prof. Dr. Harald **Welzer**, Center for Interdisciplinary Memory Research, Head of the Center for Interdisciplinary Memory Research at Essen and Research Professor of Social Psychology at the University of Witten/Herdecke.
» Prof. Dr. Johannes **Weyer**, Technische Universität Dortmund, Faculty of Business, Economics and Social Sciences, Technology Studies
» Prof. Peter **Wippermann**, Trendbüro and Folkwang University

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TODAY THE MONASTERY IS RUN BY THE CATHOLIC ORDER OF OBLATI MARIAE IMMACULATAE, A RELIGIOUS ORDER FOUNDED IN EARLY NINETEENTH CENTURY. **THE SCHOOL** OF ART AND DESIGN OFFERS A RANGE OF DISCIPLINES UNMATCHED ANYWHERE IN SWITZERLAND. **FOLKWANG** IS ONE OF THE OLDEST PHOTOGRAPHY SCHOOLS IN GERMANY […] **ECOSIGN** OFFERS FULL-TIME COURSES WHICH AWARD THE STUDENT A DIPLOMA IN DESIGN. **THE DISTINCTIVENESS** OF THE ›WUPPERTAL MODEL‹ IS TO ENHANCE THE CORE COMPETENCY OF THE INDUSTRIAL DESIGNER […] **APPLIED** SUSTAINABILITY RESEARCH IS THE WUPPERTAL INSTITUTE'S STATED MISSION. **CSCP** […] AIMS TO PROVIDE A VISUAL FACE TO SUSTAINABILITY.

THAN OWNING JUST ONE CAR. **THE** DESIGN PROCESS IS THE DELIBERATE DESIGNATION OF AN OBJECT TO A FUNCTION THAT IS ACCOMPLISHED BY CHOOSING A SPECIFIC FORM AND MATERIAL. […] **THE** WORKSHOP INTENDED TO DEVELOP NEW CONCEPTS OF URBANITY AND CREATIVE SOLUTIONS FOR FUTURE SUSTAINABLE LIFEWORLDS […] **DESIGNERS** SHOULD BE AWARE THAT THEY WILL PLAY A KEY ROLE IN THE PROCESS OF DESIGNING TOMORROW'S SOCIETIES. **THIS** YEAR'S SUSTAINABLE SUMMER SCHOOL FOCUSED ON THE KEY ISSUES OF ›SOCIETIES, SYSTEMS AND SWARMS‹. […] **LET'S** PRACTISE PRAISING. **THE SCHOOL** OF ART AND DESIGN OFFERS A RANGE OF DISCIPLINES UNMATCHED ANYWHERE IN SWITZERLAND. **FOLKWANG** IS ONE OF THE OLDEST PHOTOGRAPHY SCHOOLS IN GERMANY […] **ECOSIGN** OFFERS FULL-TIME COURSES WHICH AWARD THE STUDENT A DIPLOMA IN DESIGN. **THE DISTINCTIVENESS** OF THE ›WUPPERTAL MODEL‹ IS TO ENHANCE THE CORE COMPETENCY OF THE INDUSTRIAL DESIGNER […] **APPLIED** SUSTAINABILITY RESEARCH IS THE WUPPERTAL INSTITUTE'S STATED MISSION. **CSCP** […] AIMS TO PROVIDE A VISUAL FACE TO SUSTAINABILITY.