EU AT

CONFERENCE UNDER THE AUSPICES OF AUSTRIA'S EU PRESIDENCY

INTERNATIONAL CONFERENCE ON

ENVIRONMENTAL MANAGEMENT AND INNOVATION

PROCEEDINGS

April 28 and 29, 2006
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BMVIT und BMLFUW, Wien im April 2006

Preface

The EMAS Conference 2006 held under the Austrian EU Presidency concentrates on one of the key themes of Europe's future. Sustainable Development needs the decoupling of economic growth and use of resources. Therefore, increasing eco-efficiency is an important goal of environmental policy as well as the dissemination of instruments promoting a sustainable and innovative economy.

Against this backdrop, the environment should receive more emphasis in educational institutions. Major issues in this context are that educational institutions and the economy should learn from each other and that the intergenerational dialogue should be fostered between today's and tomorrow's economic actors. Here, EMAS schools have an important pioneering role to play.

The development of EMAS registrations in Austria shows that Austria was able to confirm its leading position in Europe in the past years. The conference offers a platform for Austria's outstanding enterprises. The presentation of the EMAS Awards to the best companies is one of the highlights of the conference.

This conference is to contribute to promoting EMAS and, thereby, sustainable development through higher efficiency and a sparing use of resources.

Josef Pröll
Minister for Agriculture,
Forestry, Environment
and Water Management

Preface

Technology innovations as the main prerequisite for the success of national economies are the result of multi-facetted processes. They no longer form the end-points of a linear development from basic research to industrial application but, are the result of a complex system involving a multiplicity of players. Innovation, however, needs institutions that provide the necessary stimuli.

The Austrian Federal Ministry of Transport, Innovation and Technology (BMVIT) sees itself as a provider of such stimuli for the Austrian innovation system, acting as a strategic player whenever those responsible for innovation need support. It supports research workers and provides structures as well as funds that enable research to be undertaken on both the European and national levels. It promotes the interplay between resources and innovators of this country and focuses on key technologies building on the strong points of Austrian research.

Environmental technologies and technologies fostering sustainable development are among these strong points. This technology sector has shown growth rates which are far beyond the average of industry and play an important role in Austrian exports. Through the Austrian research and technology programme “Factory of Tomorrow” we promote cooperation between researchers and business and provide stimuli that will have a decisive influence on where research and technologies on sustainability are heading in the next few years.

We are proud to be co-hosting this conference on Environmental Management and Innovation under the auspices of Austria’s EU presidency and to discuss and share the results of our research with experts from all over the world. As Europe unites, Austria’s researchers are called upon to contribute to the success of the European innovation system. In this context the Austrian Federal Ministry of Transport, Innovation and Technology sees itself as one of the providers of much-needed impulses for innovation.

Eduard Mainoni
State Secretary,
Federal Ministry of Transport,
Innovation and Research

PROCEEDINGS

International Conference on Environmental Management and Innovation

April 28 - 29, 2006

Vienna Imperial Palace

Austria

Under the Auspices of

Austria's Eu Presidency

Content

Parallel Session (8) World Café, Tomorrow`s Solutions

Saturday, April 29, 09:45 - 12:00

Parallel Session (9) Sustainable Development in public organisations and schools

Saturday, April 29, 09:45 - 12:00

21st Century Strategies for Sustainability

Hazel Henderson
Calvert-Henderson Quality of Life Indicators USA
www.HazelHenderson.com; www.Calvert-Henderson.com

A growing scientific consensus now states that the 6 billion-plus members of the human family must achieve sustainability and reverse ecological damage to planetary lifesupport systems within the next 25 years. Such a global transformation of current unsustainable production, consumption and institutional practices poses one of the greatest challenges to human ingenuity, innovation and managerial skills. Such a wholesale transformation must also involve a shift in values, priorities and paradigms underlying conventional academic disciplines and methodologies. Foremost is a need to reintegrate human knowledge after some 300 years of Cartesian reductionism.

Equally important is the need to review and re-code human experience as we evolved from our earliest stages as small roving bands of nomads to our present domination of planetary ecosystems. Behaviors that helped early humans survive: territoriality, fear, mistrust of others, competition and violence have become deadly in today's global interdependent world. Our primitive reptilian brainstems where such behaviors arise, are not fully integrated with our more evolved forebrains. Thus, the goals of global sustainability must begin with deep and painful self-examination.

Exploring these deeper issues of global sustainability must begin with examining the assumptions and deep economic sourcecodes underlying unsustainable modern practices- -- from government policy-making, corporate beliefs to academic disciplines and even nation-state systems operating since the Treaty of Westphalia in 1648. Most urgent is the re-thinking and overhaul of the dysfunctional economic theories embedded in so many decisions, public and private policies that drive us toward un-sustainability. This malfunctioning economic sourcecode deeply buried in the "hard-drives" of businesses, governments and all Western institutions has driven unsustainable forms of development and is now driving today's narrow, suboptimizing forms of globalization. This is leading to a global "race to the bottom" as economic textbooks promote short-term, money-denominated profitability and GNP growth. Such competition between corporations and countries becomes a form of global economic warfare (Henderson, 1996).

At the same time, scientific research in many fields has now invalidated most of the core principles underlying mainstream economic theories and undercut their rationales for both business and government decision-making. Even business school curricula are now seen by many scholars as narrowly focused on efficiency, short-term profit which still justify externalizing costs to society and ecosystems- --even contributing to the current corporate crime wave.

The good news is that much reconstruction of knowledge is now underway – evidenced in the USA by the ubiquitous references to the need for "connecting the dots." Yet too many economists still try to capture other more comprehensive disciplines within these narrower frameworks, e.g., ecological economics, behavioral economics, neuroeconomics etc. and force them into their own narrow general equilibrium models. Nonlinear, dynamic ecological systems and processes cannot be understood using general equilibrium models or by economists' misappropriation of mathematics. Even chaos theory and the fashionable agent – based computer models cannot capture the multidimensional interactions of humans and ecosystems.

Today's "paradigm wars" and the battles amongst statisticians about how to value and measure "wealth," "progress," "productivity," efficiency," are evaluated as well as the new schemes for tracking and monitoring human progress toward shared goals of sustainability. Pragmatism is triumphing over old ideologies and dogmas, as socially responsible investing has grown to a multi-trillion dollar sector of OECD capital markets. The new battles over shareholder activism, whether by environmentalists and labor unions hoping to broaden corporate acceptance of the "stakeholder" model or by hedge fund managers recently forcing management into short-termism to pump up stock prices. Even central bankers are not immune as citizens better understand money-creation and bankers see their power to manipulate and shape markets. [Henderson, "The Politics of Money," 2006, www.HazelHenderson.com].

As science forces humans to accept and embrace their own evolution, many scholars are decoding and recoding our past. Today's globalization of markets and technology can no longer be driven by faulty, obsolete economics. Only multi-disciplinary, systemic policy models can steer public and private decisions toward sustainability. A new stage of globalization has been reached as efforts are now underway to globalize governance and address the need for global public goods: peace, health, education, human rights, workplace standards, environmental stewardship and consumer protection.

The emergence of global citizens and world public opinion are fruits of the same technologies of communication that drive unsustainable commercialism and over consumption. We have all the tools we need to

achieve our goals of global sustainability. Mounting crises, including global warming are forcing policy responses. Many of the key, creative players responding within the in European Union are participating in this important conference.

Changes are needed in public and private decision-making at every system level from individuals, local communities to cities, nations, corporations and international institutions. Local actions everywhere and many global initiatives are leading the way. The United Nations Millennium Development Goals are achievable with political will. Private initiatives include the Global Marshall Plan which lays out the possibilities for a global design revolution in sustainable technologies steered by "eco-social markets." The requisite value changes laid out in the Earth Charter are now accepted by millions world wide (www.earthcharter.org). As conventional economic models are re-tooled to internalize the social and environmental costs of current unsustainable industrial models, it will be evident that the shift toward global sustainability will save money and resources and can employ every willing adult on the planet.

FIGURES

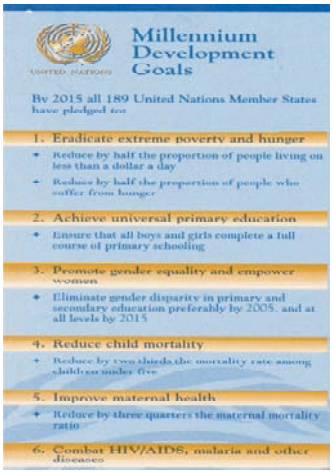

Figure 1, Millennium Development Goals

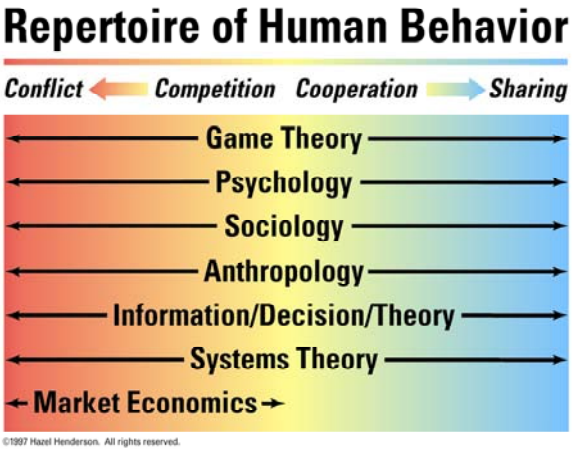

Figure 2, Repertoire of Human Behavior

CERES GLOBAL REPORTING INITIATIVE

ACCOUNTING FOR SUSTAINABILITY

Sample Dimensions and Criteria: Source: © CERES.org/GRI 1999

COMPANY PERFORMANCE	*ECONOMIC*	*SOCIAL*	*ENVIRONMENTAL*
Diversity	Diversification	Employee Diversity	Resource – Use (Renewable or Non)
Added Value	Return on Capital Employed	Intangible Values Knowledge	Re-using "Wastes"
Productivity	Profit Margins	Employee and Customer Retention Rates	Resource-Use Efficiency
Integrity	Disclosure Political Contributions	Complaints Lawsuits	Environmental Management
Health	Rating Agencies Reports	Employee Injury Benefits	Health Risks of Products, Facilities
Development	Innovation	Employee Education	Environmental Technologies

Figure 3, CERES Global Reporting Initiative

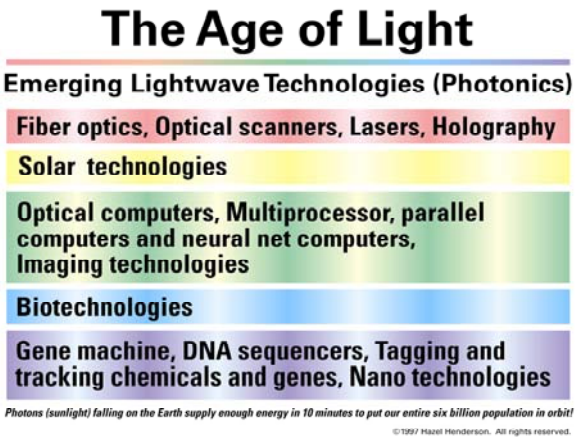

Figure 4, The Age of Light

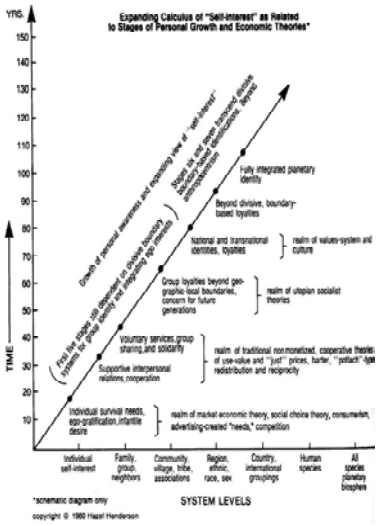

Figure 5, Toward Planetary Citizenship

Figure 8, Gross National Product Problems

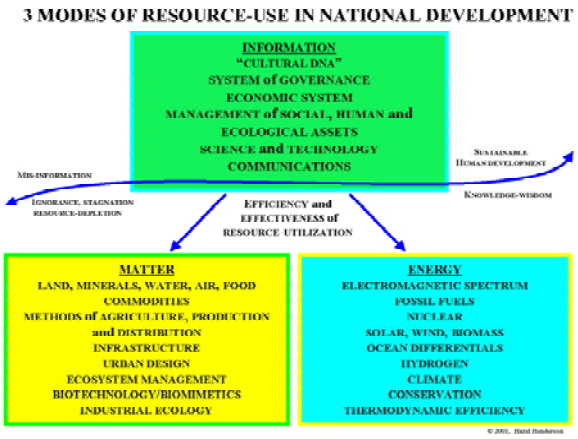

Figure 6, Three Modes of Resource Use

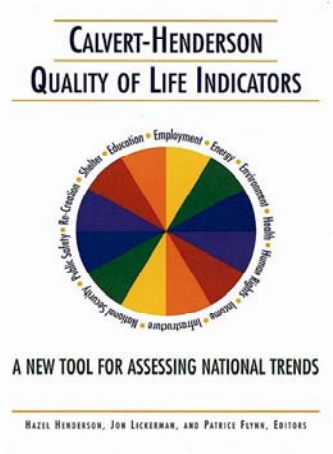

Figure 9, Calvert-Henderson Quality of Life Indicators

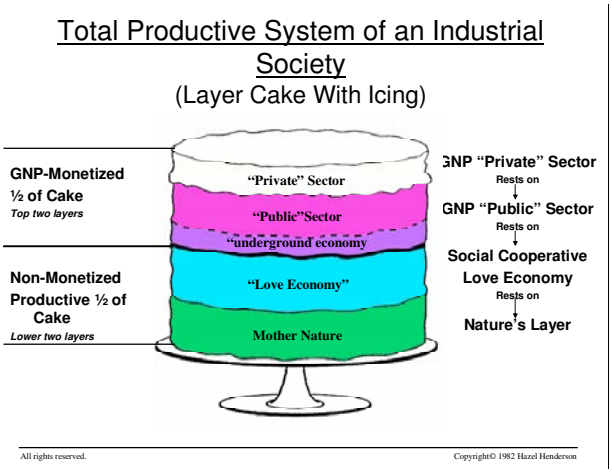

Figure 7, Total Productive System of an Industrial Society

DIFFERING VIEWS OF MARKETS & COMMONS All such schematizations are, at best, approximations and often culturally arbitrary	
ECONOMISTS	**FUTURISTS/SYSTEMS**
Markets Private Sector • Individual decisions • Competition • "Invisible Hand" • Anti-trust	*Open Systems* • Divisible resources • Win-lose rules • (Adam Smith's rules)
Commons Private Sector • Property of all - Privatization • Monopoly under regulation • Consortia	*Closed systems* • Indivisible resources • Win-win rules • Cooperation • Agreements
H.Henderson (1995) *UN Policy and Financing Alternatives*	

Figure 10, Differing Views of Markets and Commons

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Sustainability Strategies for European Industries

Reto Ringger
Founder & CEO SAM Group

Increasing investor demand – from retail to institutional asset owners – for sustainabiliy investing and for sustainable companies can be observed across the globe. At the same time, companies worldwide moved sustainability up their agenda to use it as a key source of competitive advantage. This is emphasized by the fact that sustainability indicators are increasingly linked to financial value drivers and integrated into Annual Reports.

The corporate sustainability assessment that SAM conducted in 2005 perceived an improvement in sustainability performance across all sectors. Companies are converging in first generation sustainability themes like corporate governance. Transparency and accountability along the whole supply chain are increasingly visible through policies and control mechanisms. On the other hand, substantial room for progress in sustainability remains on the corporate agenda. One example is the area of human capital management.

Although corporations widely recognize and acknowledge the importance of it for their success, this area remains an important differentiating factor. One of the issues that raised particular attention both on the corporate side as well as in the investment community in 2005 is climate change. A report prepared for the Carbon Trust and the Institutional Investors Group on Climate Change stated that "virtually all classes of pension assets have the potential to be affected by climate change". To help better evaluate those risks and opportunities, the demand for better information about corporate greenhouse gas emissions and how companies plan to mitigate the impact of climate change, is increasing. One example is the Carbon Disclosure Project (CDP), a coalition of institutional investors with more than USD 21 trillion in assets. The project's third report, released in 2005, showed a significantly increased awareness of climate change and disclosure of related data among US corporations.

The integration of the sustainability issues into the business processes is particularly driven by the Governance, Risk, and Compliance agenda. Since the publication of the COSO II framework for enterprise risk management in September 2004, leading companies have put more emphasis on the nonfinancial risks and opportunities. Even more broadly, the ever increasing requirements from laws, regulations, and stakeholder expectations are calling for an integrated framework for governance, risk management, and compliance, turning it from a reactive response to becoming a value-adding principle.

SUSTAINABILITY AND COMPETITIVE ADVANTAGE

Sustainability is a viable business approach for companies as it expands the limits to growth and therefore enhances their competitive position. Sustainable companies are an attractive investment, because they offer superior returns in the form of more sustainable shareholder value creation. The competitive position held by a market participant determines its share of overall value added. Sustainability trends and challenges are any irreversible developments that alter the forces of competition exerted on a company, either by changes in the intensity of competition (internal factors, e.g. increasing innovation activities by some sector players) or by changes in the competitive environment (external factors, e.g. change in legislation). All such trends and challenges pose risks and create opportunities for companies towards securing or increasing their share of overall value added.

Sustainable companies embrace change by seizing opportunities and by managing risks that the sustainability developments impose on the forces of competition in each sector, thus enhancing their competitive position. Seizing opportunities before others seize them should lead to higher return on invested capital. Managing risks better than peers should lead either to lower costs of production or to lower financing costs. Since shareholder value is but a function of return on invested capital and weighted average costs of capital, shareholder value is increased.

TRENDS AND CHALLENGES

Sustainability trends and challenges are likely to change the future competitive environment in each sector, shaping the context for each player within a sector. Some sustainability trends affect all sectors in a similar manner.

The demand for transparency, for example, driven both by regulation and investor pressure, is a trend affecting all sectors in much the same way. Better reporting as well as corporate governance frameworks are consequences of this trend. In contrast, sectorspecific challenges depend on the sector's characteristics, such as the degree of regulation, supply and demand structures, and barriers to entry. Some trends and challenges affect more than one sector, but not all sectors alike.

As an example, global climate change affects energy intensive sectors much more than others. Challenges for

the oil & gas producers for instance include energy resource scarcity and the environmental effects of greenhouse gas emissions.

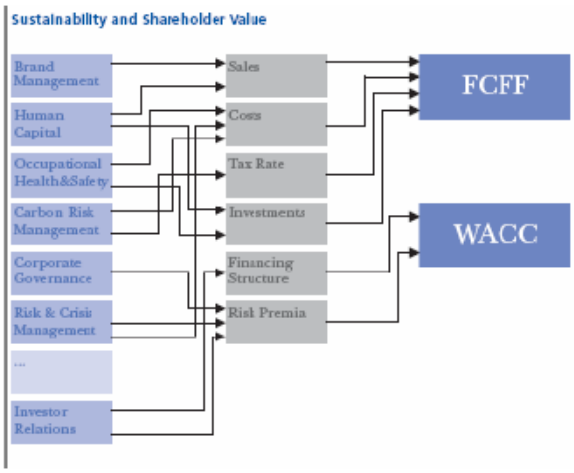
These challenges are likely to create an increased demand for clean, sustainable and competitive energy, with recent high energy prices and high price volatility reinforcing the importance of alternatives to fossil fuels. The development of alternatives will, in turn, be a key influence on the competitive positioning of energy companies.

SUSTAINABILITY AND SHAREHOLDER VALUE

The transmission mechanisms of corporate sustainability performance to corporate financial performance (shareholder value) are formulated by breaking down the two determinants of shareholder value: free cash flow to the firm and weighted average costs of capital. Free cash flow to the firm is a function of revenues, costs, and tax and reinvestment rates. Weighted average costs of capital are a function of short-term interest rates and a company's risk premiums on equity, bonds and cash. Corporate sustainability performance impacts shareholder value via at least one of these components.

In general, seizing opportunities means that more profitable investments can be detected and made. This should lead to an increase in free cash flow to the firm. Managing risks better than its peers decreases production costs and/or lowers a company's risk premium for financing. This leads to either an increase in free cash flow to the firm or a decrease in the financing costs, defined as weighted average costs of capital. Each sustainability criteria must be linked to at least one of the components. Management decisions regarding sustainability criteria are assumed to impact value drivers such as a company's resource efficiency, workforce motivation, innovation potential, reputation with stakeholders, and exposure to a variety of risk factors, both internal and external. The positive influence should sooner or later be measurable in the company's financials.

Corporate governance, occupational health and safety and human capital management may serve as illustration.



Corporate governance may be linked to the risk premiums a company has to pay on equity or debt. Best practices in corporate governance can be assumed to reduce the level of misalignment between shareholder interests and interests of management, thus reducing the risk of misappropriation of funds. Best practices in occupational health and safety may be assumed to reduce costs by reducing staff turnover, insurance premiums and perhaps litigation claims. Best practices in human capital management may be linked to sales, cost efficiency, and reinvestment rates due to increasing the level of innovation.

SAM has developed a company valuation model that includes the corporate sustainability performance of a given company to guide its investments. This model makes use of the information on the companies' capabilities to benefit from future developments. Factors of firm value that are influenced by the criteria assessed include sales growth, operating margin, capital expenditures, tax rates, financing costs and the competitive advantage periods.

Results of the EMAS Conference 2006 – Education and Training

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This short paper is a summary of the results of the lectures and statements of the first day of the EMAS Conference 2006 - Education and Training.

I. INNOVATION MANAGEMENT, COMMUNICATION AND KNOWLEDGE MANAGEMENT

Knowledge Management:

The Finnish curricula in Lower and Upper Secondary Education have integrated issues of sustainability. As such, each school is responsible for including these issues in their school curricula. The National Board of Education has given recommendations on building and implementing the sustainable development (SD) programme. To support these objectives, two projects were set up: The Socrates project SUSDE (Handbook on how to practise ecological, social, and economic sustainability in schools) and the LIFE Envedu Project (Environmental criteria and certification system for schools).

Environmental certification: ENVEDU

The Environmental Criteria for Schools and Educational Establishments, the certification system with ist organisation and rules, the external auditing system with its guidelines, and the self-assessment method with ist tools, were developed and produced in the ENVEDU Project. The Guide to Environmental Certification and EMAS Registration of Educational Establishments and the Auditor's Guide were published by the Project. Environmental certificates have been awarded to ten schools. On the basis of the feedback and contacts, it can be said that interest towards Environmental Certification is increasing among educational establishments and further certificates are expected to be awarded in 2006.

II. EMAS – A DRIVER FOR IMPROVING COMPETENCIES, COMMUNICATION AND SOCIAL SKILL

This lecture gives concrete examples of what has been achieved and established in the school AHS-Rahlgasse in Vienna in terms of qualifications and knowledge

- on a school level (measures, programmes, curricula..)
- in the field of social acting: teamwork, conflict management and conflict resolving, gender sensitivity, to name but a few of those basic skills.
- in the field of ecological knowledge: to understand ecological contexts and to know about the significance of sustainability for our living standards and to be equipped with basic competencies in sustainable behaviour.
- In the field of economy: to know about economic contexts worldwide, about resulting pressures and to live accordingly
- on an international level (Comenius projects with schools in various European countries, EMAS-network for schools).

EMAS is a suitable environmental management system in order to:

- organise and guarantee continuity, dependability and improvement among all the pupils and school staff, thus making an important contribution to the local Agenda-21-process, and creates a model of an environmentally and efficiently organised system among schools .

The next big goal in the development of the school`s programme is to achieve sustainability with regard to the whole system.

III. PARALLEL SESSION A

Communication and Training for EMS and Cleaner Production

Education and training for EMAS
Interface between economy and education
Personal development and further training

This session shows some examples of needs and demands on employees and expected (social) skills and "ecological" behaviour which students should already show. Good practice of cooperation between companies and schools are presented.

IV. PARALLEL SESSION B:

EMAS and Schools: Communication as a main driving force for improvement

- Propagating EMAS for schools - The DIR-EMAS Project
- Communication as a driving force for EMAS - EMAS schools of European network

In this session international (European) networking of EMAS (and Eco) schools and teacher training organisations are presented. The benefits of mutual help and advantages of international cooperation and communication are shown. Examples of how to spread the ideas of EMAS with the aim to improve the environmental and social effects of schools are presented.

V. CONCLUSION

The main results of the first conference day are:

- cooperation between companies and schools are very useful and successful
- EMAS is a valuable management system not only for companies but also for non profit organisations and schools
- a future theme is the development of EMAS to a sustainable management system

Results of the Conference on Environmental Management Accounting and Cleaner Production, in Graz April 25 - 27

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bmvit rns IÖW INSTITUT FÜR ÖKOLOGISCHE WIRTSCHAFTSFORSCHUNG

Results of the Conference on Environmental Management Accounting and Cleaner Production, in Graz April 25 - 27

Dr. Christine Jasch
Institute for environmental management and economics, IÖW, Vienna, Austria
www.ioew.at

Some statistics

- 9th conference of the EMAN network
- special subject: EMA and CP, linked to the „factory of tomorrow" framework of BM VIT
- 100 participants from all over Europe, but also Japan, China, Vietnam, Korea, Australia, South Africa, Argentina, USA
- 70 presentations + poster session
- linking of several networks: EMAN-Network, UN DSD WG on EMA, FEE Sustainability Working Party, European Sustainability Reporting Award ESRA, PREPARE, CP-Centers, Akademia network of TU GRAZ and IÖW

1

Basic Questions

How can economic growth and environmental impact be de-coupled?
How can production and consumption be de-linked from resource throughput?
How can changes lead to competitive advantages for European manufacturers

2

Beyond eco-efficiency and continuous improvement

Progress towards zero wastes & emissions: rather than seeking to reduce waste, companies will come as close as possible to eliminating it altogether

Whole systems thinking: addressing problems at the level of the entire system, rather than the parts.

Looking beyond internal operational sustainability and making the world's problems the company's problems

Moving beyond the focus on the environmental issues to a focus on Sustainable Development

3

The Zero Emission Techniques + Systems approach (Hans Schnitzer, TU Graz)

Define the ideality:

- The ideal production process delivers all of the benefits without any side effects or extra costs:
  - it has no wastes and emissions
  - it has no need for additional equipment
  - requires no work or maintenance
- makes the system easier
- uses available resources
- initiates the transition to a higher system level

4

UN CSD decision 6/3 (1998)

Encouraged UNDESA and other organizations to study the factors that influence company decision making such as economic competitiveness and environmental management , including the adoption of best practices.

5

Membership of the UN DSD WG on EMA Improving the role of government in the promotion of EMA

The members of the working group are from national environment agencies and ministries, international organizations, industry, accounting firms, academia and United Nations agencies. The UNDSD has acted as secretariat for the group

To date the group includes experts from government agencies in Argentina, Australia, Austria, Brazil, Cambodia, Canada, China (also Taiwan-POC), Colombia, Costa Rica, Czech Republic, Denmark, Egypt, Finland, Germany, Hungary, India, Indonesia, Ireland, Italy, Japan, Mexico, Nepal, Netherlands, Norway, Peru, Philippines, Poland, Portugal, Republic of Korea, Scotland, Slovak Republic, South Africa, Sweden, Tanzania, Thailand, United Kingdom, United States of America, Vietnam and Zimbabwe

1st meeting : Washington DC, USA. August 1999.
2nd meeting: Vienna, Austria. May 2000
Bonn, Germany, Tokyo, Japan. Bristol, UK. Lund, Sweden.
Seoul, Korea. Copenhagen, Denmark
9th meeting: Vienna, Austria June 2005

6

EMA Definition from UN DSD EMA WG

EMA is broadly defined to be the identification, collection, analysis, and use of two types of information for internal decision-making:

- physical information on the use, flows, and fates of energy, water, and materials (including wastes) *and*
- monetary information on environment-related costs, earnings, and savings.

7

UN DSD EMA Publications

- Environmental Management Accounting: Procedures and Principles.
- Environmental Management Accounting: Government Policies and links
  - **EMA: Policy review**
  - **EMA: links to other information systems and stakeholders**
- EMA quick guides
  - Guide for Government decision makers
  - Guide for Business decision makers
- IFAC guidance document

8

Jasch Ch., EMA, Procedures and Principles, United Nations, New York, 2001

The book was prepared for the UN DSD, EMA WG. It was commissioned by the Austrian Ministry for Transport, Innovation and Technology, the Austrian Ministry for Agriculture, Forestry, Environmental Protection and Water Management and the Austrian Chamber of Commerce.

Translations available into German, Spanish, Portuguese, Japanese, Korean, Chinese, Czech, Lithuanian, etc

You can also find the excel tool and case studies under www.ioew.at

9

INSTITUT FÜR ÖKOLOGISCHE WIRTSCHAFTSFORSCHUNG

IFAC Board Of Directors

INTERNATIONAL GUIDANCE DOCUMENT ON
ENVIRONMENTAL MANAGEMENT ACCOUNTING (EMA)

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Several reasons for the strong interest in EMA

- Increasing pressure from stakeholders interested in environmental issues
- Increasing importance of environment and material flow-related costs
- Increasing recognition of problematic accounting practices
- Growing demand for integrated consideration of financial and physical aspects of environmental management
- The concepts of sustainable development and corporate social responsibility also require a combined consideration of financial, environmental and social aspects.
- Regulatory bodies and rating agencies put a strong focus on disclosure of environmental and financial aspects in financial and non-financial reports .

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Prominent examples of environmental pressure

supply chain pressures, such as large companies requiring their suppliers to comply with the Environmental Management System (EMS) standard of the International Standardization Organization;
disclosure pressures from various stakeholders for companies to publicly report their environmental performance in annual financial accounts and reports or in voluntary corporate environmental performance reports, for example, via the guidelines of the Global Reporting Initiative;
financing pressures via the worldwide growth of socially responsible investment (SRI) funds, investment rating systems such as the Dow Jones Sustainability Index and investment policy disclosure requirements;
regulatory control pressures, for example, the RoHS Directive, a European Union (EU) regulation that restricts the use of certain hazardous substances in electrical and electronic equipment sold in the EU;
environmental tax pressures, for example, various government-imposed environment-related taxes such as carbon taxes, energy use taxes, landfill fees and other emissions fees;
cap and trade pressures, such as the emissions cap and trading aspects of the Kyoto Protocol.

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Drivers for sustainability reporting and corporate responsibility

International KPMG survey 2005 quotes:

- to have a good brand and reputation
- to be an employer of choice
- to have and maintain a strong market position
- to have the trust of the financial markets and increase shareholder value
- to be innovative in developing new products and services and creating new markets

= purely economic, not an ethical argument!

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Reasons for doing EMA

In companies with existing Environmental Management Systems and Cleaner Production (CP) projects, EMA is used to improve the consistency of information systems and for internal budgeting, cost calculation and investment appraisal.

For newcomers to environmental management (EM) EMA can be used as a screening tool: how much money do we loose by NOT doing EM and CP?

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EMAN

- The Environmental and Sustainability Management Accounting Network

EMAN global: www.eman-global.net
serves as an „umbrella" of all EMAN sections (e.g. links to the homepages of all EMAN sections)
organises the publication of an annual EMAN book
establishes an information exchange between the EMAN regional sections

All EMAN regional sections are now established

EMAN EU: www.eman-eu.net
chairperson Stefan Schaltegger: schaltegger@uni-lueneburg.de

EMAN Asia Pacific: www.eman-ap.net
chairperson Katsuhiko Kokubu: kokubu@kobe-u.ac.jp

EMAN Americas: www.eman-am.net
chairperson Samuel Mongrut: mongrut_SA@up.edu.pe

EMAN Africa: www.eman-af.net
chairperson Maryna Möhr-Swart: mmohrswart@bullion.org.za

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EMAN- EU

- The EU Environmental and Sustainability Management Accounting Network

EMAN EU: www.eman-eu.net

Steering committee

- Martin Bennett, Gloucestershire Business School, United Kingdom
- Christine Jasch, IÖW Institute for Ecological Economics Vienna, Austria
- Keith Maunders, School of Business, Central European University, Budapest, Hungary
- Birgitte Mogensen, PWC PriceWaterhouseCoopers, Copenhagen, Denmark
- Tuula Pohjola, Technical University of Helsinki, Finland
- Stefan Schaltegger (chairperson), CSM Centre for Sustainability Management, University of Lüneburg, Lüneburg, Germany

EMAN-EU conference 2007

- *23 – 25 May 2007 Helsinki University of Technology (TKK), Finland*
- *Topic: Environmental Management Accounting & Sustainable Supply Chains*
- **EMAN-Global conference 2007, South Africa**

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Call for Papers

5th EMAN book

Topic:
Environmental Management Accounting for Cleaner Production

Editors: Stefan Schaltegger, Martin Bennett, Roger Burritt and Christine Jasch

Submission of full papers: submissions@uni-lueneburg.de
before 30 June 2006

The book will have a **clear focus on accounting**. We encourage the submission of papers discussing approaches and practical experiences of accounting for cleaner production. The papers can also cover more general new approaches of EMA and sustainability accounting which are of interest to the EMA community.

Information and guideline for authors: www.eman-eu.net
www.eman-global.net Download of the guidelines under "submissions"

EMA & CP- status

What has been achieved so far?

- Several case studies world wide
- several good publications
- EMA partly well established
- CP partially mainstream business

Current issues:

- outreach to health and safety issues
- sustainability management accounting
- external costs
- education of accountants
- go beyond ecoefficiency towards sustainable solutions
- foster innovation towards sustainability

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EMA & CP- status

What still needs to be done?

- diffusion into companies and accountants
- education of accountants
- more co-operation between accountants and technical departments
- better documented case studies, especially in investment appraisal
- definition and tools for sustainability management accounting
- harmonisation of disclosure requirements for statistical reporting, environmental reporting, sustainability reporting
- life cycle costing and supply chain management
- innovate on the systems level; search for "factor 10" solutions

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More information and downloads?
www.ifac.org/store
www.eman-global.net
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www.ioew.at

Thank you for your attention!

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Factory of Tomorrow – the Austrian Approach towards Sustainable Product Development

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Already in the early 1990s Austria invested much effort in the research and promotion of tools for the development of environmentally friendly products and processes. A series of product competitions and case studies aimed at motivating industry to embrace the notion of ECODESIGN as an important factor of securing the quality of their products. Yet strategies trying to bring about the success of eco-products by means of a technology push proved a failure.
New approaches are building on research work, which has been carried out, with Austrian participation, within the framework programmes of EU research. The notion of sustainable product service systems, based on value chain management and creating a market pull for innovations in resource efficiency has become a focus within the framework of the national RTD programme "Factory of Tomorrow". Case study projects and international networking are important drivers in the development of this new approach.

I. INTRODUCTION

Since the early 90's the Austrian Ministry of Transport, Innovation and Technology has supported and financed research and development projects in the areas of "environmentally sound design" or "ECODESIGN" [1]. Product competitions were tendered out bi-annually from 1992 onward under the label "Austrian ECODESIGNcontest" [2]. The last contest was held in 2002 in the context of the research programme "Factory of Tomorrow"[3].

In order to promote the restructuring process towards sustainable development, the Austrian Ministry of Transport, Innovation and Technology (bmvit) initiated, in 1999, the Austrian Research Programme on Technologies for Sustainable Development – at:sd (Impulsprogramm Nachhaltig Wirtschaften) [13], [14]. It has since supported numerous research and development projects as well as demonstration and diffusion measures implemented within the scope of several subprograms, which provide significant innovative impetus for Austria's economy.

The sub-programme "Factory of Tomorrow" (Fabrik der Zukunft) aims to initiate and realize innovative technology development in Austria, which should demonstrate, by means of concrete examples, the feasibility of a sustainable economy. Therefore, the programme focuses especially on projects that, using a comprehensive strategy can be further developed to result in demonstration and model projects or to contribute to such a development. The development of model strategies and case study projects supporting the transition from environmental management toward environmental - and subsequently sustainability - management accounting has been an integral part of the sub-programme.

A great number of successful developments in this field have shown that the objectives of sustainability and the economic success of an enterprise do not contradict each other. Eco-efficiency is an important entrepreneurial concern that also benefits the enterprise and, in the long run, increases its value [17].

II. AUSTRIAN RESEARCH ON ECODESIGN

A. *Tools and Methodologies*

"The objective should be a production, which – according to the traditional economic principle - creates the highest possible benefit during the longest possible period of time with the least possible input of raw materials and energy."
(Walter R. Stahel) [1]

The first projects dealing with environmentally friendly products and processes were commissioned in the early nineties in the context of the Austrian PREPARE programme [4]-[9], [15]. Measurement and development tools like the "ecological footprint" [11], LCA (Life Cycle Assessment) or MIPS (Material Input per Service Unit) [2] were used to help businesses in creating ecologically sound products. The outcome could be gauged by the participation of companies in the biannual ECODESIGN contest, which lead to interesting results also on the research side.

Models were established to define the dimensions along which ECODESIGN should evolve and how it's success should be measured.

Figure 1: Natura linea clothes, award winner at the ECODESIGN contest in 1994

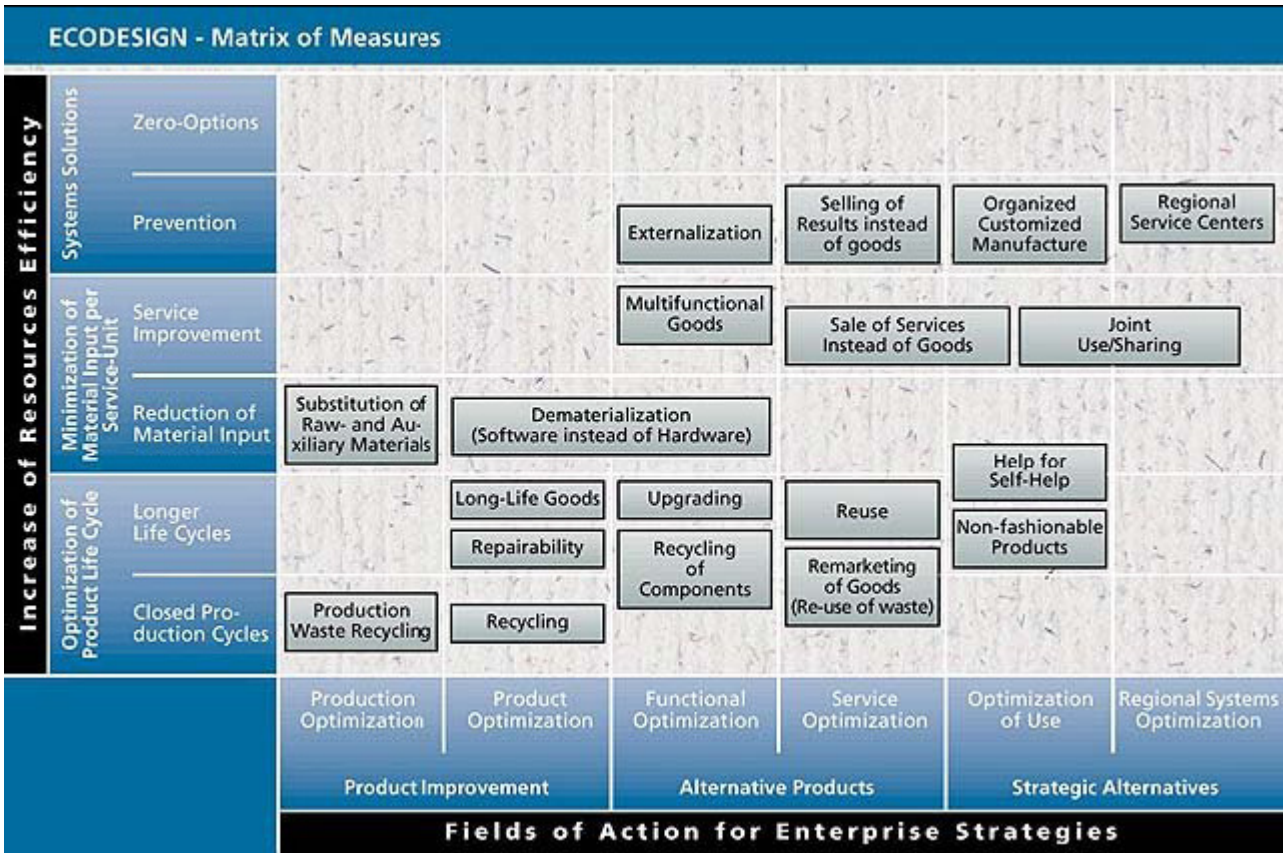

Figure 2: ECODESIGN – Matrix of Measures [2]

This time saw the establishment of information tools like the Austrian ECODESIGN Information Knot (www.ecodesign.at), an internet website dedicated to the theme of product development, which subsequently grew to become one of the finest relevant sites worldwide with an interesting variety of tools and information available [2]. Among the tools commissioned by the BMVIT, the ECODESIGN Pilot [16] and Assistant became a reliable tool, which has helped many students and companies to decide among different optional design paths.

B. The Service Approach Leading to Sustainability

These projects finally paved the way to a new understanding of product development to be oriented towards benefit and need rather than the physical artefact itself. Concrete strategies for the implementation of sustainable development in Austria had been discussed predominantly in connection with the development and the use of new technologies. However, the transition towards sustainability will involve not only the diffusion of these alternative technologies but also social innovation and structural change in the economic system. Solutions aiming at new lifestyles, at building social networks and new forms of organization or the supply of novel services are suitable means to reduce the consumption of natural resources, to promote the diffusion of environmentally sound technologies, to secure jobs in regional economies on a long-term basis, and, to some extent, also to improve the opportunities of underprivileged segments of the population. Research projects commissioned by BMVIT focused on service- [17], [19] and social innovations[18] as important aspects of a sustainabilityoriented design of products and services.

Social innovations were defined as means ”to open new roads towards the realization of essential goals, in particular, to find new forms of organization, new regulations and lifestyles that are capable of redirecting social change and thus will offer better solutions to problems than conventional approaches, thus, examples that are worthy of imitation and institutionalization” [17]. The results of the projects showed that social and technological innovations are not mutually exclusive. On the contrary, case studies demonstrated that, from the viewpoint of sustainable development, existing technologies may be the starting point for innovative social projects. On the other hand, social innovations require technological solutions (carsharing, car-pooling, contracting plans, corporate mobility management).
Other projects added cultural [20] and regional [21] approaches.

C. ECODESIGN and Product Service Systems within the "Factory of Tomorrow"

The research programme "Factory of Tomorrow", which started in 2000, took up its product focus from the results of the projects mentioned above. It regarded Eco-services as services aiming at an ecological and efficient use of natural resources. The consumer – often also owner of the material product – thus had to be looked at as a user of the product. In the new product service system, the commercial supplier would remain owner of the product and be responsible for maintenance and servicing. Therefore, he or she will be interested in longevity, ease of repair and optimized use of the product (multiple use, joint use).

Results from the first projects conducted under the "Factory of Tomorrow" [22] lead to the conclusion, that the concept of Eco-services, which does not aim at selling a material product but rather its benefit shows a high potential for innovation and conservation of the environment. The overall goal is to minimize the input of material and energy, to reduce the amount of waste and to develop concepts for maintenance which prolong the service-life of products or which facilitate reuse or recycling.

The transition from the sale of material goods to the sale of services will confront manufacturers and consumers alike with far-reaching changes in the organization and marketing structures. Manufacturers will have to abandon conventional marketing concepts; shortterm realization of profit at the "point of sale" will have to give way to an economy focusing on mediumand long-term pay-off times. More often than not, this necessary re-orientation meets with mental barriers within the companies. Consumers, too, show psychological barriers against the transition from the concept of owning a products to a concept of using material goods. Apart from price, quality, function, and design of a product, permanent availability and the psychosocial factors of ownership still play an important role.

The fundamental approach to the implementation and promotion of new service concepts will consist in raising public and private awareness of the fact that sharing the benefit of a product contributes to the conservation of the environment and also opens potential fields of new business activity. The implementation and successful diffusion of these concepts requires a professional and user-friendly organization, offensive marketing, and, at the political level, support by means of intensive opinion forming processes. The idea of product service systems (PSS) shifts the corporate focus from selling products to providing functions (selling services). It stands for a new way of thinking in order to minimize a product's environmental impacts during its life cycle and at the same time fulfilling the consumer's needs [23], [24], [25].

III. FUTURE WORK AND INTERNATIONAL COOPERATION IN THE "FACTORY OF TOMORROW"

A. New Focus

Future work tendered out within the programme "Factory of Tomorrow" will expand on the results available from the present projects [26] and case studies. An additional focus will be the questions of risk and opportunity costs of product service systems, which are becoming increasingly established in both banking and investment policies towards sustainability. Much of the new work is based on the results of recent international projects from Germany [27], and those done within the framework programme of EU research [28].

B. Trans-National Programme Cooperation

Much of the new work will be tendered out in transnational joint calls within the programme network of the ERA-NET SUSPRISE, where product development will be one of several thematic focus areas in the years to come.

SUSPRISE is a coordination action under the 6th Framework Programme of European research and brings together ministries and agencies from 10 different European countries with the aim to coordinate and strengthen cooperation of national research programmes on the "sustainable enterprise".

TABLE I: COUNTRIES & AGENCIES PARTICIPATING IN SUSPRISE

Country	Participant
Austria	bmvit, Austrian Research Promotion Fund - FFG
Belgium	IWT
Denmark	Danish EPA
Germany	BMBF, PTJ (Jülich), PFT-FZK (Karlsruhe)
Finland	Academy of Finland
France	Agence Nationale de Recherche – ANR
Ireland	Irish EPA
Netherlands	MinEZ, MinVrom, SenterNovem
Spain	IHOBE (Basque Country)
Switzerland	Federal Office of Environment – FOEN
UK	DTI

A first pilot call for tenders is currently under way with the participation of Germany and Austria, while a larger joint call, which will include five or more countries will be launched in early 2007.

IV. CONCLUSION

Product Service Systems are being considered of carrying high potential for the practical implementation of a sustainable economy. Not only do they seem to lead toward sustainable consumption, but they also create a market pull towards sustainable innovations, which might lead to completely new but tailor made technical solutions. Much work, however, is still needed to understand the social, economic and technical mechanisms to be considered, if we want to reap the possible benefits of a sustainable lifestyle.

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at:sd

NACHHALTIGwirtschaften

The Austrian Programme on Technologies for Sustainable Development – at:sd

Goal:

To foster a structural change leading towards a sustainable economy **through** research, development **and** dissemination**.**

at:sd sub-programmes

NACHHALTIGwirtschaften

Building of Tomorrow 1999 - 2007

Support of research and development projects concerning energy efficiency, the use of renewable energy sources and the use of ecological building materials in the building sector. The results obtained will be implemented through trend-setting demonstration buildings.

Factory of Tomorrow 2000 - 2008

Support of research and development projects in the field of production processes, product service systems and renewable resources. The results will be put into practice through trend-setting demonstration projects.

Energy Systems of Tomorrow 2003 - 2009

Support of research and development projects concerning renewable energy sources, efficiency, system innovations and strategies. The results will be realised through trend-setting regional model systems.

1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009

at:sd programme objectives

NACHHALTIGwirtschaften

Strategic objectives

- Building **R&D competence** by fostering interdisciplinary co-operation and networking
- Support in generating new **cooperative R&D** projects setting a landmark for the future
- **Concept-driven project chains** to demonstrate new technologies for sustainable development

at:sd features

NACHHALTIGwirtschaften

- **calls for proposals oriented towards the overall goal of the programme**
- **incentives for the generation of future-oriented RTD projects**
- **support by programme management before and after the call**
- **evaluation of project proposals by an international jury**
- **dissemination of the results and support through accompanying measures**

at:sd key principles

NACHHALTIGwirtschaften

7 Key Principles

- Orientation at function / service
- Resource efficiency
- Use of renewable resources
- Multiple (cascadic) use of resources
- Embedding, flexibility and adaptability (appropriateness)
- Tolerance (fault-proof), ability to learn and risk-precaution
- Ability to ensure work, income and quality of life

evaluation by international jury

at:sd instruments

NACHHALTIGwirtschaften

basic research of strategic importance

strategic concepts and cooperative research studies with active involvement of companies

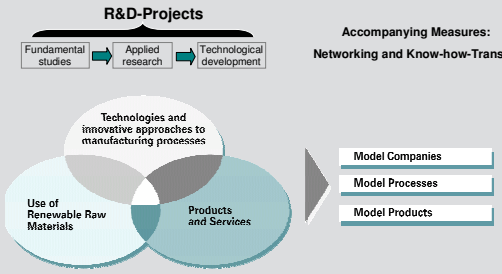
concept-driven development of components and advanced technologies

demonstration projects

accompanying measures (contests, qualification schemes, support for new enterprises,...)

Strategy of Factory of Tomorrow

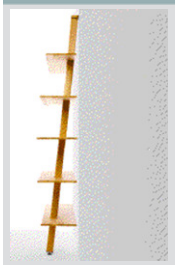
NACHHALTIG wirtschaften



bmvit FFG 8 FABRIK der Zukunft

Austrian ECODESIGN Contest

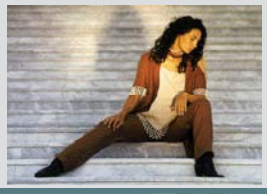
NACHHALTIG wirtschaften



CHAOS
solid wood
shelf system

- 1992 – 2002 every two years
- Goal: to monitor industry's progress towards ECODESIGN
- Development of assessment tools

Examples of Award Winners



Natura linea clothes

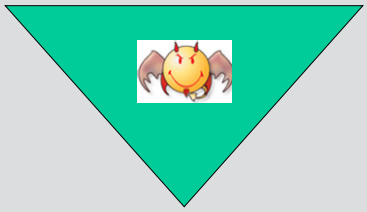
bmvit FFG 11 FABRIK der Zukunft

Drivers of Product Development

NACHHALTIG wirtschaften

technology push

regulation

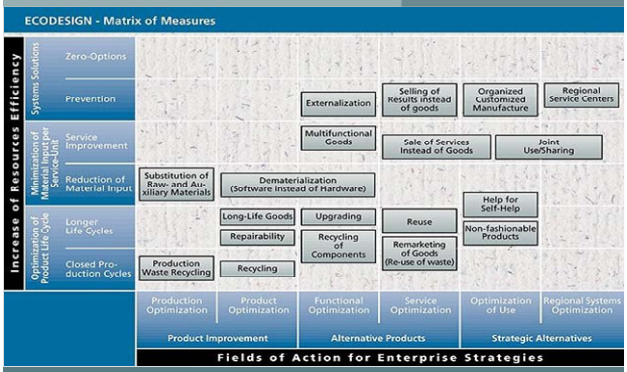


market pull

bmvit FFG 9 FABRIK der Zukunft

ECODESIGN Matrix of Measures

NACHHALTIG wirtschaften



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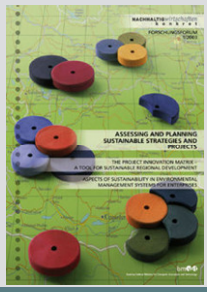
Evaluation Tools

NACHHALTIG wirtschaften

- ecological footprint
- LCA
- MIPS
- PROMISE



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ECODESIGN Platform & Pilot

NACHHALTIG wirtschaften

- Austrian Ecodesign Information Platform (1996)

ECODESIGN INFO KNOTEN

www.ecodesign.at

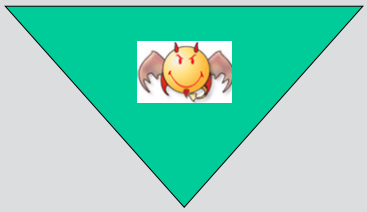
- Software tool for the environmental assessment of products (pilot)
- Software tool for finding product improvement strategies (assistant)

bmvit FFG 13 FABRIK der Zukunft

Drivers of Product Development

NACHHALTIG wirtschaften

technology push regulation



market pull

bmvit FFG 14 FABRIK der Zukunft

Homeservices

NACHHALTIG wirtschaften

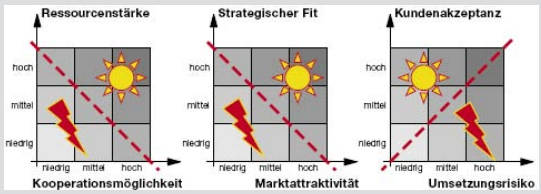
- sustainable services
  - within the housing sector
- analysis of effects on:
  - environment
  - employment
  - acceptance by consumers
  - hindrances as well as prerequisites for sustainable facility management
  - new positioning of concierge systems
- analysis of service offers in 3 fields:
  - external suppliers
  - property business
  - residents

bmvit FFG 15 FABRIK der Zukunft

Eco-Efficient Product Service Systems

NACHHALTIG wirtschaften

- step by step methodology for the development of future markets through the introduction of eco-efficient product service systems
- methodology for initiating, designing and implementing eco-efficient product service systems
- workshop series with participants from 13 different sectors
- practical guideline (manual)



bmvit FFG 16 FABRIK der Zukunft

Product-Related Environmental Information Systems

NACHHALTIG wirtschaften

- inventory of product-related environmental information systems
- survey of implementations within Austrian companies
- and analysis with respect to principal applications

- Scientific analysis of PEIS and decision types
- Inventory of PEIS in Austria
- PEIS for the 'production plant of tomorrow'

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PSS Landmarks

NACHHALTIG wirtschaften

product and process innovation	Technology
service and system innovation	User System
institutional innovation	Culture

- Best Practice Examples for Product Service Systems
- success factors and hindrances
- restraining factors and basic conditions
- selected fields within the range of industrial applications
  - business to business (b2b)
  - business to consumers (b2c)
- national, European and international PSS examples and projects collected and analysed in a matrix

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PSS Water

NACHHALTIG wirtschaften

- product-Service System Water
- based on earlier projects in the area of PSS, EMA and Zero Emission
- guideline for offering sustainable water management in industry and public utilities as a service.
- development of PSS for water and new water efficiency measures
- integrated service for public water suppliers (fresh water supply, water treatment and recycling to discharge into the runoff ditch)

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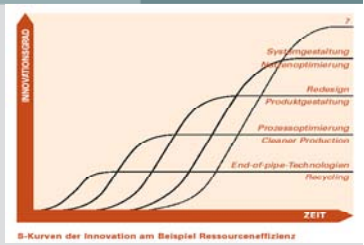
Repro FAB

NACHHALTIG wirtschaften

- reprocessing of used goods
- a strategy of sustainability and it's impact on the supply chain of a „factory of tomorrow“
- to improve the competitiveness of reprocessing-activities as strategies towards higher resource productivity



S-Kurven der Innovation am Beispiel Ressourceneffizienz

- analysis of the changes necessary within the supply chain to achieve re-integration of used goods into the supply chain beyond the Point of Sale

New Projects I

NACHHALTIG wirtschaften

- introduction of eco-efficient product service systems in public procurement
  - analysis of market barriers and hurdles
  - development of strategies to overcome those obstacles
  - documentation of available good practice examples
- planning strategy for Austrian PSS providers
  - based upon an analysis of best practice examples
  - international systematic PSS development approaches as a benchmark

New Projects II

NACHHALTIG wirtschaften

- forest wood and non-wood products & services
  - analysis of potential umbrella products representative for Austrian forestry
  - estimation of economic and socioeconomic effects of management strategies
  - evaluation of their possible impact on the forest management unit level
- PSS strategies (follow up on PSS Landmarks)
  - develop and implement strategies for sector specific sustainable systems-innovations
  - along product-chains
  - workshops with companies

Thank You!

NACHHALTIG wirtschaften

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Reflections: Ten Years of Sustainable Product Development and Design

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The presentation will give a snapshot of key issues and developments over the last ten years. In conclusion there will be some thoughts on where are we now? and where are we going?

Worldwide there has been a growing number of 'producer responsibility' laws enacted initially focused on electronics, cars and packaging - this has focused minds on 'end of life' issues. In Europe, from the mid to late nineties a broader debate on (environmental) product policy at a national level and Integrated Product Policy (IPP) at an EC level has emerged. However, a wide range of approaches have been taken with the predominant use of single instruments such as eco-labels. Japan has constructed a framework to increase recycling and eco-design through use of a toolbox including, for example, the passing of the Green Purchasing Law in 2001. The Japanese approach seems to be as much about a lack of natural resources and little landfill, as about competitive advantage. In the US, developments continue to be fragmented and diffused at a federal and state level. Outside of the G8, we have seen and are seeing dramatic economic growth from China and India, however the environment has taken a back seat in the short-term - with product policy and eco-design considerations still at the earliest stages of progress. Linked to 'low cost sourcing' by transnationals we have seen manufacturing in many sectors moving out of Europe and the US to South and South-East Asia spreading economic power more globally. This changing business model means that design, assembly and manufacturing is now geographically diffuse irrespective of where the point of final consumption happens. This has dramatic future implications for product design and development particularly in the West. This and growing population issues are leading to a renewed interest in Sustainable Consumption and Production. However, climate change is now taking centre stage with growing acceptance of the uncertainty around global weather patterns.

Where are now? and what does all this mean for products and services?. Most product-related environmental improvements are incremental or based on re-designs with little radical innovation focused on significant reduction in materials and energy use throughout the lifecycle. Most eco-design is practised by advanced, transnational companies and there has been little penetration amongst small and medium-sized enterprises. Much of the applied eco-design knowledge and experience is within the large, leading-edge companies and generally speaking external support systems are lacking or lagging behind. The focus is on eco-design compliance and design for 'end of life' rather than wider lifecycle considerations which reinforces the focus on incremental and re-design change. Initial phases of eco-design have focused on technical and engineering aspects with organisational implications largely taking a back seat. However, various companies are now starting to adapt existing business processes and management systems to take account of product-related environmental issues. A key issue, for many companies is still presenting the internal business case for eco-design and winning over middle-management who are largely concerned about finance, finance and finance! Some leading companies are starting to make senior executives bonuses dependant to achievement of eco-product objectives!. Design engineers tending to be doing eco-design within firms - whereas product designers are generally not engaged in the discussion, with key innovation opportunities being missed. In Europe, the forthcoming implementing measures related to the Energy Using Products (EuP) Directive will bring much of this into focus. On a broader level, there has been considerable discussion over the environmental benefits of moving from tangible products to intangible services (Product – Service - Systems (PSS)).

However, what is clear is that PSSs are complex and reduced sustainability impacts are case dependent with much depending on systems design. Sustainable Solutions (product/services) design and development that focuses on reducing negative and enhancing positive environmental, social, ethical, economic and financial impacts throughout the value chain is a much newer area - with the social/ethical dimensions still poorly understood. A growing opportunity for product/service design and development may emerge from the growing interest in South-East, Europe and the US in the use of public procurement as a tool to drive improved environmental and broader sustainability performance of product/services.

Where are we going? There will be growing interest in low carbon technologies and energy reduction in use, due to rising energy prices and concern over energy security. As environmental considerations increase amongst customers particularly in 'business to business' (B2B) and 'business to government' (B2G) product/markets there will need to be the increasing integration of material and

energy aspects in product design and development alongside cost, quality, etc - and addressing organisational dimensions of this will be key issue. The development of simple but not simplistic tools to analyse and enable sustainability impacts and improvements - initially focused on materials, energy and toxicity - will be a growing imperative. We may see major companies start to 'design for (their own) closed loops' e.g. developing their own systems and infrastructure to enable eco-design. Some key questions remain unanswered, in today's increasingly competitive business world, a price cutting war is set to continue, what will the rising influence of Chinese and Indian brands and acquisitions mean over the next ten years? How can companies deliver higher quality product/service solutions in a globalised world? How will policy and innovation processes help to deliver the service and products with lower sustainability impact whilst retaining and creating shareholder and stakeholder value?

Consumer Trends – sustainable and unsustainable developments

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Given the importance of private consumption in the economy, it is necessary that consumption patterns be changed in order to reach sustainable development. Consumer behavior and lifestyles are increasingly recognized as determining factors for sustainable development since consumption structures influence production processes and involve resource use and waste generation. The results presented focus on economic modeling and empirical analysis of sustainable structures in private consumption regarding mobility and heating in Austria. The emphasis is laid on consumer services derived from a combination of stocks (e.g. building stock, transport systems) and flows (mainly energy).

Model based scenario simulations were carried out to illustrate the effects of various policy instruments (economic, regulatory and social) used to reach a given emission target in the consumption areas chosen.

The simulations show that applying one single instrument would require very large policy interventions, although economic instruments (e.g. taxes on road transport) result in positive macroeconomic effects due to the recycling of tax revenues to households. The analysis shows that an effective impact on consumption – in terms of reaching more sustainable consumption patterns - requires the simultaneous application of a bundle of instruments in order to avoid negative effects on consumer welfare.

I. INTRODUCTION

In much of the past decades, environmental debate tended to concentrate largely on the negative environmental impacts of production processes. In 1992, the Rio Earth Summit led to a more comprehensive approach, introducing the concept of sustainable development to the political and scientific debate (Bruntland, 1987, Ecological Economics, 1999, 28 (3), European Commission, 2002). Consumer behavior and lifestyles are increasingly recognized as determining factors for achieving sustainability (OECD, 1999, 2002). Consumption patterns affect production processes and involve resource use. A rise in consumer demand increases environmental pressures, since on the one hand, in order to satisfy the demand more resources have to be used, and on the other hand, there is a simultaneous increase in the amount of waste produced.

Thus, a prerequisite for sustainable development is a significant change in the structures of private consumption, given the macroeconomic importance of consumption. In the EU as well as in Austria private consumption represents a share of nearly 60 percent of GDP.

The analysis of sustainable structures in private consumption in Austria presented in this paper focuses on heating and mobility (see Kletzan et al., 2002). The consumption expenditures for housing, heating and lighting and transport amount to one third of total consumption expenditures of private households. These consumption activities are also relevant in terms of energy use and related CO2 emissions. In Austria, private households' final energy demand for heating and lighting (including electricity) and mobility represent on average more than 40 percent of total final energy demand. The related CO2 emissions amount to 30 percent of Austria's total emissions..

II. ECONOMIC MODELLING OF SUSTAINABLE STRUCTURES IN PRIVATE CONSUMPTION

For the empirical analysis of sustainable consumption structures an economic consumption model is used. The focus in this model is put on consumption services for heating and mobility that are generated by a combination of flows (mainly energy) with a specific capital stock (e.g. transport infrastructure, diversely energy efficient buildings).

The model is used to calculate "sustainability scenarios" for CO2 emissions of households from heating and transport. Over a period of approximately ten years (1990 – 1998) a 13 percent reduction of household emissions compared to 1990 has to be achieved ("Kyoto target"). The results of these ex post simulations reveal the extent to which actual emissions diverge from the target set. The gap between the two emission paths shows the magnitude of interventions needed to redirect consumption patterns. The necessary changes in consumption structures towards sustainability are implemented by applying one policy instrument in each scenario (see Table 1). These interventions comprise economic instruments affecting prices (road pricing, zero prices in public urban transport), regulatory instruments or support measures affecting technologies (regulations regarding thermal standards for housing, transport infrastructure) as well as measures affecting consumer lifestyles (regional planning, shifts in the structure of consumer groups towards more sustainable consumption patterns)

TABLE I: POLICY INSTRUMENTS USED IN THE SUSTAINABILITY SCENARIOS FOR HEATING AND TRANSPORT IN AUSTRIA

Changes in variables (Average 1990 - 1998)				
Simulation Scenarios – Transport	**Road Pricing**	**Zero Charge**	**Regional Planning**	**Demand Shifts**
Road toll revenues	1.8 bill. €			
Vehicle tax		0.34 bill. €		
Price of Public Transport		-29.6 percent		
City population density (increase)			41 persons / km2	
Change in shares of household types				14 percentage points
Simulation Scenarios - Heating			**Building Codes**	**Demand Shifts**
Investments in thermal improvement			8.7 bill. €	
Change in shares of household types				12 percentage points

For transport, the following sustainability scenarios were calculated:

-'Road Pricing': a kilometer charge for cars is introduced, revenues are returned to households via a uniform transfer payment ('eco-bonus'),

-'Zero Charge': the price of public transport is reduced, which is financed by an increase in the vehicle tax,

-'Regional Planning': the density of city populations is raised,

-'Demand Shifts': the proportion of 'normal' households falls, that of sustainable households rises.

For heating, the following sustainability scenarios were calculated:

-'Building Codes': minimum standards for the thermal quality of residential buildings induce investments in improving the building stock,

-'Demand Shifts': the proportion of 'normal' households falls, that of sustainable households rises.

The results show that massive changes through the introduction of the assumed policy instruments are necessary in order to achieve the emissions target through reductions in the respective consumption activities and energy demand, as:

-road pricing of 4 cent per kilometer for individual motorized traffic (with revenues of 1,8 billion €),

-significant decreases in prices of public urban transport (approx. 30 percent) and offsetting the reduction in revenues of 340 billion € by increasing the vehicle tax for private cars,

-changing regional planning in order to increase population density in cities (and decreasing population density in the surrounding areas) by 41inhabitants per km²,

-Inducing investments of 8,7 billion € in thermal improvement of residential buildings by changing the standards defined in building codes,

-inducing significant changes in the lifestyles of 12 to 14 percent of households towards sustainability.

III. CONCLUSIONS

The economic analysis of sustainable consumption patterns aims to highlight the effects of a substitution of flows by stocks for transport and heating (e.g. improvements in thermal quality of buildings, more energy efficient transport systems). Relevant in this respect is on the one hand the role of technological innovation to attain higher energy efficiency in producing the relevant consumption services and on the other hand shifts in consumer demand towards more sustainable consumption patterns.

Although the results from the scenarios – especially those applying economic instruments - appear positive for the macro-economy in terms of conventional economic indicators like consumption growth, and despite theoretical confirmation of their potential efficiency in terms of reducing environmental pressures, political realities show little use of such policy instruments. Regarding the assumptions implemented in the scenarios the actual developments in Austria during the 1990es in large part did not show a movement into that direction (as for taxing car passenger transport) or even went in the opposite direction (as for regional planning, population density and transport demand).

The modelling results further indicate that any attempt to achieve the targeted 13% reduction in CO2 emissions by concentrating on specific single measures would involve intense or excessive effort. It seems that moving prevailing consumption behavior towards a more sustainable form requires the willingness to accept major changes in the existing economic framework and is only likely to succeed when a bundle of diverse policy instruments is used.

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Beyond EMAS: "Sustainability Management System"? Just another buzzword?

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I. EMAS: FUTURE AT STAKE

Welcome to the EMAS paradox: EMAS it is the most accepted standard for environmental management systems (EMS) and has gained a lot of credibility among stakeholders. Yet the real impact in terms of organizations registered is still small and it is losing ground to the CSR & sustainability movement which is getting momentum worldwide. Cynics might claim because "sustainability" is just a general framework without concrete requirements and obligations so everybody can subscribe to. Furthermore new guidelines [1] and ISO standards [2] for CSR & sustainability reporting and management systems are being developed, which drags the interest away from EMAS.

Having worked for more than a decade in the EMAS business we believe EMAS has raised awareness for environmental issues and has improved environmental performance (especially the "quick wins") of organisations. However many companies have started to consider downgrading from EMAS to ISO14001, which requires no environmental reporting. Companies do not see the benefits of EMAS and argue that their environmental statement has not attracted much interest among their stakeholders. This is true but not surprising because of the technical focus and the poor communication quality of these statements.

At the end of the 1990's more and more companies (especially larger ones) started to supplement their environmental reports and included social and economical issues. Sustainability reporting developed and guidance standards evolved (GRI). Many companies argue it gives them more flexibility and attracts more attention by the public and their investor's community. Unlike EMAS, sustainability reporting is a communication instrument and does not necessarily require a documented (environmental) management system.

II. IS THERE A NEED FOR A "SUSTAINABILITY MANAGEMENT SYSTEM"?

A management system is the set of tools, procedures and regulations used by an organization to ensure that it can be managed according to its principles and values and to achieve its objectives. Given the common understanding that one of the major pillars of a sustainable organization is its environmental commitment we have already an established, well known and proofed management system concept: EMAS and ISO 14001! Why inventing something new?

The other pillar is social responsibility. The content behind this concept still has to be developed much further and it is not unlikely that it can be integrated into existing management systems like quality or health and safety management systems.

For the time being a "sustainability management system" is the least needed thing in the discussion about sustainability or CSR. Because first of all sustainability or CSR is about leadership and the definition of core values, principles, policies and objectives of an organization. But corporate sustainability or CSR policies and objectives are often very fuzzy and thus giving very little guidance for management and employees. In this context a "sustainability" management system does not add value. If you do not know where to go (principles, values and objectives) you don't need a vehicle (management system) to move forward. So don't confuse your employees by setting up a sustainability management system, it is just another management buzzword! For the time being it remains an empty expression and lacks credibility, both within and outside the organization.

On the other hand one can rely on EMAS with clear objectives at least for environmental issues, well accepted, transparent and credible. And you can build on it if you what to extend your commitment to other CSR /sustainability issues like social aspects and stakeholder engagement: EMAS^{plus}.

In this presentation we will outline this concept and present a brief case study for EMAS^{plus} based on an ongoing project at the University of Natural Resources and Applied Life Sciences in Vienna.

EMAS will only survive if it plays a prominent and well accepted role within the sustainability framework.

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[2] ISO 26000 Guidance on social responsibility

Sustainability visions for EMAS

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Federal Ministry of Agriculture and Forest,
Environment and Watermanagement

The European Community eco-management and audit scheme (EMAS) was introduced by a European regulation in 1993. Today, its legal basis is defined in Regulation (EC) No 761/2001 (EMAS II).

The voluntary participation in EMAS requires that "organisations" undergo a strict audit by an environmental verifier (organisations or individuals) who is accredited and supervised by the state. In Austria, the Environmental Management Act (Umweltmanagementgesetz) and related ordinances govern the accreditation and supervision of environmental verifiers as well as the registration of participating organisations and sites. With around 260 registered organisations, Austria continues to be among the leading European countries with regard to the number of EMAS registrations, taking the lead in relation to the number of inhabitants. Across the EU, EMAS again experiences an increase with currently around 4,700 sites in 3,275 organisations. In this context, the successful implementation of EMAS in the new EU Member States can be seen as an important step towards an environment-friendly economic development in Europe.

Enterprises applying EMAS meet the demand for an environmental dimension of corporate social responsibility that was raised in the fifth European Environmental Action Programme and strengthened in the sixth Environmental Action Programme. How can EMAS, being an effective instrument of environmentally sound company management, be more successful and spread in the future?

The EVER Study commissioned by the European Commission to analyse the strengths and weaknesses of EMAS identifies in its conclusions a broad range of highly diverse options for the revision of the EMAS Regulation. Now, the Member States are called upon to present their ideas on the future orientation of EMAS.

The experiences made in the implementation of EMAS in Austria for more than **ten years** lead to the following **conclusions**:

EMAS is the best developed eco-management scheme and, in contrast to other environmental management systems, provides for the mandatory communication of environmental information (in the form of an environmental statement).

EMAS integrates the requirements of the standard ISO 14001:2004 and can be very well combined with other areas (health, safety, quality).

In addition to the environmental management system according to ISO under which private certification bodies are responsible for audits, the strengths of EMAS lies in the accreditation and supervision of environmental verifiers by public authorities and registration of organisations applying for EMAS (including the monitoring of compliance with legal requirements by authorities). Thus, EMAS is not only the most demanding solution in the field of environmental management but also the system with the highest credibility.

Through validated environmental statements/environmental reports, the public is informed about environmental impacts in line with specific criteria (other types of reports, such as sustainability reports, use a variety of criteria and are difficult to compare; moreover, their external validation is not regulated as yet).

With regard to its delimitation from or link to other instruments, EMAS also aims at achieving maximum clarity and transparency. A great variety of instruments of corporate environmental protection, sometimes with much lower standards than EMAS, make orientation difficult for market actors.

The focus of EMAS on legal compliance results in manifold links that are not yet fully exploited at present.

Objectives of the EMAS revision (EMAS III)

The achievements of EMAS justify a higher acceptance by authorities. The legal basis of EMAS and its role as a legal compliance instrument make it possible for authorities, for example, to permit lower requirements in the supervision and approval of installations. This aspect should be taken into account in the revision throughout the EU.

With a view to green public procurement, it should be possible to give precedence to EMAS organisations in awarding public contracts.

EMAS should be given a clearer position on the market and should be differentiated from less demanding

approaches. In granting state aids, it should be considered whether schemes involving lower requirements than EMAS are suitable as a preparation for or as a first step towards the introduction of an environmental management system in line with EMAS.

In this context, the EMAS sign should be supported as a "trademark" for the most demanding environmental management by targeted marketing activities and given more public visibility.

In general, EMAS's functions as a legal compliance instrument and an environmental reporting tool based on a standardised management system (according to ISO) should be strenghtened by EMAS III.

Even today, EMAS stands for high credibility and transparency — those are features playing a key role in business.

Based on these pillars, EMAS should be given significantly more support as a central element of credible corporate management towards sustainable economic development by pooling all the forces available. EMAS does not need to be re-invented, but only has to be appropriately applied and disseminated!

Sustainable Products in EMAS

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EMAS I (Regulation 1836/93)

- SITE-based with a focus on
- MANUFACTURING organisations
- No particular Management System prescribed

RESULT

- Focus on the MANUFACTURING ACTIVITIES on the SITE

EMAS II (Regulation 971/2001)

- Organisation-based
- Open to ALL organisations
- Management System is ISO 14001
- Focus on the organisation's "ACTIVITIES, PRODUCTS AND SERVICES"

ADSI project for DG Environment

Objective

To produce guidance for organisations implementing EMAS to bring greater focus to their "Products"

Focus of the guidance

"Products"

as opposed to "activities" and "services"

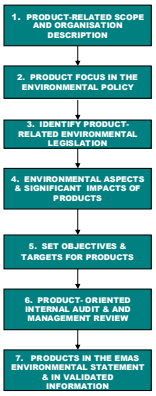
EMAS Requirements

Annex I-A. clause 3.1 now requires that:-

"The organisation shall establish, implement and maintain a procedure(s) to identify the environmental aspects of its *activities, products and services……."*

ISO 14001:2004 and EMAS Regulation (amended)

Guidance Process flow



Problem

Organisations still focusing on "Activities", Not on "Products and Services"

Evidence

Surveys of EMAS Environmental Statements

Structure of the Guidance

The guidance :-

- Gives specific product-focused guidance on each stage of the EMAS implementation process
- Refers to existing EMAS Guidance in Commission Decisions and Recommendations
- Draws on the information in the ISO 14000 series of standards
- Identifies websites and other sources of information

Structure of the Guidance

For each stage, the guidance describes:-

- **What EMAS requires**
- **Gives advice on "what to do"**
- **Gives suggestions on "how to do it"**
- **States issues to be considered**
- **Identifies sources of information (Commission Decisions/Recommendations and standards, etc.)**

2. Environmental Policy - II

- Consider including commitments to any of the following in the policy:-
  - to implement product developments or process developments;
  - to design products taking into account environmental aspects;
  - to phase out specific products or associated manufacturing processes which create major environmental impacts;
  - to increase the information provided to users on the environmental impacts of products and on ways of reducing them, for example through correct use, maintenance or disposal.

1. The scope of the EMS

- Should list all of the **products** as well as the **activities/services** of the organisation.

3. Community legislation

- **Importance and impact of Community legislation and product related legislation is not adequately recognised**
- **Anticipating future Community legislation is an issue for organisations**
- **Community legislation (particularly future legislation) is a driver of:-**
  - **system change**
  - **product development**
  - **continual improvement**

2. Environmental Policy - I

- The policy should recognise that all of the organisation's products, as well as its activities, can cause impacts on the environment.
- Where the impacts of the organisation's products are significant the policy should recognise this and might even identify individual products for specific attention.
- Commitment to "continual improvement and prevention of pollution". Organisations can achieve this through their products as well as through their activities.
- Commitment to compliance with applicable environmental legislation, specifically including product-related environmental legislation.

4. Aspects and Impacts

Recommends that organisations use "Eco-mapping" or "Impact Scoring"

Expands on the existing Commission Guidance, but follows the same 3-stage approach:

1. **Identify environmental aspects and associated impacts (both direct and indirect)**
2. **Define criteria for assessing the significance of the environmental aspects**
3. **Determine which aspects of the organisation's products have a significant environmental impact**

5. Objectives and targets

- Should be set against specific products as well as against activities
- Should recognise the importance of product and process development

7. Published Information

- Participation in Type I schemes
  - Eco-label
  - Nordic Swan
- Type II
  - Terminology
  - Self declared environment related product claims DG Health and Consumer protection
- Type III
  - Status of ISO 14025 standard
  - INTEND project

6. Internal Audit & Management Review

- Bring adequate focus to products in internal audits by including products:-
  - in the defined scope of the audits,
  - in the audit programme,
  - in reporting criteria.
- Appropriate attention to auditor training and selection.
- Review of the Policy to confirm adequate focus on the products.

Results foreseen

- Better balance between

  Activity Orientation and

  Product Orientation
- Support for "Environment-related Product Claims"
  - In the EMAS Statement
  - In validated information published under EMAS logo

7. Environmental Statement & Published Information

- Statement should focus on Products as well as Activities
- Organisations have largely failed to use the opportunity to publish validated product-related information under the EMAS logo

Status of the Guidance Document

- Circulated by Commission for comments - deadline 7 April 2006
- Publication as non-legally binding guidance
- Commission document is available from
  - Dina.Van-Mulders@cec.eu.int
  - John Hussey at Huss@Esatclear.ie

Sustainable Innovation Management

Voyage from Eco-Balances to Innovation Coaching

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In the late 80s we started corporate projects compiling eco-balances (mass and energy balances, input output balances). These projects resulted in a higher company-wide awareness of environmental matters and impacts. Environmental programs and first external reports were published, at that time attracting international attention by the media. After many years of corporate environmental management development projects and a voyage through all kinds of environmental management systems, experimenting with environmental indicators, environmental controlling procedures, guidelines, internal and external reporting systems etc., and heading for a meanwhile enlarged vision of sustainability, we came up with two conclusions.

All the endeavors of environmental management so far, and probably not only ours, showed two main deficits:

- Firstly, Environmental Management Systems (EMS's) concentrated on the organization of processes and responsibilities. We did very well in the organization of an EMS, but not very well in the reduction of environmental destruction. EMS's had difficulties getting down to the core of environmental problems, the material flow. We realized that companies had only fragmentary information on the material flow throughout the corporation, its physical quantities and monetary values, ending in the product or in unwished emissions.
- Secondly, we realized that environmental management systems, including indicators and reports, objectives and programs etc., produced many good ideas, but not many results. The Environmental Managers were busy, but the rest of the company was not much involved. Environmental affairs were considered side line business, nice to have, not core business.

In the late 90s a new generation of research and development projects, in the company as well as at the university, therefore concentrated on a higher transparency of material flow throughout the company. We wanted to know exactly what kind of material, in what quantities and what monetary values entered the company, where did it go, where was it stored, transformed, transported and where and how did it leave the company. We were not content with environmental spot information on concentrations in effluents, on end of pipe fees for waste or tons of recycled paper. We were not content with partial information on some stocks, some material movements, some material losses. We wanted to get the whole picture of material movements and stocks at every spot throughout the company. We wanted to know exactly where in the company toxic or other waste was generated, in quantities and values, what cost center or product was responsible for its generation, what were the purchasing costs of the materials involved, the handling costs of materials, including processes of cleaning, transportation, separation, storage, disposing etc.

And we found that people in charge of cost centers had detailed information on personal costs in their area of responsibility, but only fragmentary information on material costs, material stocks, movements etc. This world-wide phenomenon leads world wide to an inclination of managers when - regularly - being asked to reduce costs they struggle to reduce those costs they have information on, personnel costs. It also resulted in a lack of material efficiency, as there was no reliable information on material efficiency of a certain process, a certain facility or warehouse. Line managers were not much interested in environmental information and cost information on material flows was not available.

The projects showed that most of the information needed was somewhere included in the companies Enterprise Resource Planning (ERP) System, like SAP, but the information was not accessible, not compiled properly, and of poor quality.

These astonishing results led to projects under headings like Material Flow Cost Accounting or Material Flow Management. The projects resulted in higher material efficiency, meaning fewer resources, fewer emissions. The projects shifted from obnoxious side line and add-on efforts, involving the environmental officer and some idealistic environmentalists, to projects including the head of production, controllers, IT-managers and: top management.

The material efficiency project process in a rough outline:

1.) Drawing material flow charts
2.) Drawing information flow charts
3.) Harmonizing information flows and material flows, improving ERP-information
(Information from the ERP-System quite often does not correspond with the actual material flow or shows poor quality in plausibility checks)

4.) Generating specific material reports according to specific management needs along the flow of material throughout the company
5.) Deriving quick win and long term improvement programs for material efficiency
6.) Implementing improvement programs

Besides the tight focus on organization and documentation, the first generation of environmental projects already showed another serious deficit. The Environmental Management Systems produced Environmental Guidelines, Objectives and Programs. But the company-wide implementation of these lagged far behind. The Environmental Officers and their supporting working groups struggled and the rest of the company had "to do business". Also, in the second set phase of development, through Material Flow Management, the projects produced even more interesting results, reports, indicators, short and long term programs for measures, promising not only environmental improvements, but also economic gains. But again - and surprisingly- even measures leading obviously to economic cost reduction were not consequently pursued. People were so busy accomplishing their day-to-day tasks, handling personal conflicts with colleagues, troubleshooting in urgent assignments, that they had no energy or willingness for innovative improvements, no openness to deal with operational sequences differently than before. They saw their immediate work environment and handled their proper task properly, - without hardly any company-wide perspective, not even across departmental boarders.

According to these experiences, the new phase of in-company projects followed a new set of questions: What kept corporate people from implementing innovative measures? Where did the blockades come from? How were these to be overcome? How could differing perceptions of a company's reality, of material and information flows, be matched, considering not only a particularistic point of view, but in view of the entire whole, the whole process from the beginning to the end of pipe? How could individualistic perspectives, from an engineer's, an environmental, a monetary point of view, be merged into a holistic, integrated, sustainability-oriented perspective and a resulting common and synergetic action?

This new phase of company projects focused now on the following procedures:

1.) Joint elaboration of company wide Material and Information Flow Charts
2.) Improving material reports out of the existing ERP-System according to specific needs (e.g. of the managers in charge of Production, of a specific facility's operation, of Quality, Environment, R&D, for calculation purposes)
3.) Joint development of continuous improvement programs
4.) Explicit planning of development and implementation programs
5.) Implementation, auditing and reporting

New in this project generation was the explicit planning of the implementation and innovation phase, as well as the implementation itself and its evaluation. The former concepts assumed somehow that good ideas and programs would be implemented automatically. But this (phase 6 in the first project phase above) actually did not happen. The new explicit implementation planning made use of new concepts of innovation and change management, following some basic rules:

- People have different perceptions of "reality". For joint action these differences have to be detected and harmonized (a constructivist approach).
- People tend to perceive their immediate work environment. For joint action the whole (e.g. material flow, information flow) has to be visualized, perceived jointly. Interdependencies in the systems network, consequences of changes at one end leading to changes at the system's other ends have to be made aware, requesting communication between people from one end with those at the other, between top and bottom in both directions (a "systemic" approach).
- People do not only react to objective targets, to facts and figures. They are social subjects. They construct meaning through experience and learning. They react to (conscious or unconscious) fears, perceptions, prejudices, beliefs, emotions, vanities etc. Change and innovation processes are social processes, not only engineering or managerial business administration processes. They have to be dealt with as social processes, dealing consciously and constructively with fears, differing perceptions, prejudices, emotions etc.
- Peoples' actions are not only determined by social phenomena, but also by company structures restricting innovative flexibility, e.g. technological facilities, IT realities, architectural structures, encrusted procedures. For innovation processes the interaction between social phenomena and structural aspects has to be considered. The vicious circle is that changes in structures take place only through changes in attitudes and behaviors, changes in attitudes and behaviors only happen through changes of structures.
- Successful innovation processes not only require the individual capability of innovative action. The company as a whole needs to develop an organizational competence for innovation as part of its corporate culture. Innovation is not just a creative R&D result. It is a long term comprehensive process of taking innovative

ideas from its source of origin through all parts of the company to an economically, socially and environmentally sound market solution, to the customer.

- The company wide organizational climate and culture for innovation can be developed through internal or external coaching processes concentrating on the efficiency of material and information flows and their sustainability.

Summing up: Sustainable innovation management follows a long term perspective including economically, socially and environmentally sound procedures to ensure the company's long term existence. This might conflict with a short term ROI perspective. The core of sustainable management is the company's material flow and its efficiency in terms of material consumption, of time and costs. ERP-Systems have to generate robust and comprehensive information on all material flows, all in- and outputs. Innovation management has to consider that innovation processes are determined by social as well as by structural realities. They require social changes (of attitudes and behaviors) as well as structural changes. People construct their own realities. For joint action differing perceptions have to be harmonized. Small changes at one end of a system might have considerable consequences at other ends. Communication between these ends and along the flows of material and information has to be made possible. Innovation Management has to install an Innovation Management System, from Company Guidelines to Innovation Controlling. But first of all it inspires the Organizational Development of organizational (not only individualistic) innovation competencies, of an innovative corporate culture. Innovation Coaching takes over the responsibility to develop such a culture.

This voyage took us from the first compilations of Eco-Balances to the installation of Environmental Management Systems over the development of (Environmental or) Material Cost Accounting approaches to the redesign of ERP-Systems. We moved through the grinding implementation of innovation processes to a systemic approach of innovation coaching in order to develop a corporate innovation culture under the auspices of sustainability. This voyage is endless, sustainability a rough road mark.

Trends in Environmental and Sustainability Accounting

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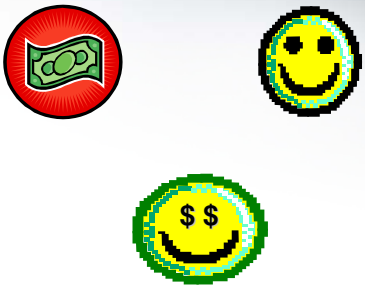
" Trends in Environmental and Sustainability Accounting "

Tarcisio Alvarez-Rivero
DSD / UDESA

Discretion to do what ?



- **The accounting system has flaws**
- **and this system is the basis for decisions made by management**
- **All managerial decisions are based on discretion**
- **"Discretion is:**
  "the capacity to distinguish between what is right and what is wrong, lawful and unlawful, wise or foolish, sufficiently to render one amenable and responsible for his acts"
  – Black's Law Dictionary

But wouldn't it be nice if we could reduce the number of corporate responsibility decisions for which managers have to rely on the business judgment rule to prove discretion?

This is where EMA and SMA move in.

By improving the accounting system more and more of the decisions made by managers will fall into the

 and  categories

- **Particularly in a world of CSR (et al..) managers rely on discretion to undertake certain activities**

"Business Judgment Rule"

"Managers have the ability but not the absolute right to distract resources from profit maximizing goals"

Systems such as EMA and SMA do not replace or add to the list of environmental or social management tools.

"They just make them better"

and allow managers to integrated decisions that were once considered outside of the profit maximizing equation into the company's menu of profit seeking activities.

So where is the future

Given the expansion of "CSR" (et al) activities

And the real but often ignored potential of misuse of managerial discretion in the name of CSR

EMA and SMA have great value in addressing these gaps in the business system

They also are key tools in addressing the "Volume" problem

International EMA website

www.emawebsite.org

Environmental Management Accounting Resource and Information Center (EMARIC)

International Federation of Accountants (IFAC)

www.ifac.org

What is the volume problem

- It's about relationships in the supply chain
- and the fact that they are based on one simple equation

Volume = Revenues

(in other words the more materials or products I sell the more money I make. So it works for my supplier and same for the guy who manages my waste)

WEBSITE

www.un.org/esa/sustdev/sdissues/technology/estema1.htm

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So where do we go (where have we been)

On EMA it's simple

EMAS → UNEWGEMA → IFAC → Everybody/ Every business accounting use

SMA is a new problem:

Are there gaps in the system related to social, H&S accounts?

Or as many people imply those gaps are only related to the social impacts of environmental issues

Either way we don't know, but we do need to find out

The IFAC guidance document on EMA

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Recognising the increasing importance of environmental issues and the difficulty of managing these issues, the International Federation of Accountants (IFAC), supported by the Division for Sustainable Development of the United Nations Department of Economic and Social Affairs (DSD/UNDESA), has issued new guidance on environmental management accounting (EMA)

Keywords: **environmental costs, material flow costs, IFAC, environmental management accounting**.

I. INTRODUCTION

Although the guidance is aimed primarily at professional accountants within organisations, it is also of interest to professional accountants and auditors who are becoming more involved in tracking or verifying environment-related information in financial and other reports. It is also targeted at improving the communication between the financial and the technical departments in organisations, as well as the consistency of data management between them..

II. WHAT IS EMA?

Because EMA has no single, universally accepted definition, the guidance document offers two complementary definitions from the International Federation of Accountants (IFAC) and the EMA Expert Working Group of the United Nations Division of Sustainable Development (UNDSD), which highlight the broad types of information typically considered under EMA, as well as some common EMA data analysis techniques and uses.

The definition given by the United Nations Expert Working Group on EMA distinctively highlights both the physical and monetary sides of EMA. According to the UN group, EMA is broadly defined to be the identification, collection, analysis and use of two types of information for internal decision making:

- physical information on the use, flows and destinies of energy, water and materials (including wastes) and
- monetary information on environment-related costs, earnings and savings.

The physical and the monetary accounting side of EMA are developed in more detail. The translation into German as well as an Excel-tool for the assessment of annual environmental costs in German and English is available for download at http://www.ioew.at .The cost categories described in the IFAC guidance document on EMA are:

Environment-related Cost Categories:

1. Materials Costs of Product Outputs
Includes the *purchase costs* of natural resources such as water and other materials that are converted into products, by-products and packaging.

2. Materials Costs of Non-Product Outputs
Includes the *purchase (and sometimes processing) costs* of energy, water and other materials that become Non-Products Output (Waste and Emissions).

3. Waste and Emission Control Costs
Includes costs for*: handling, treatment and disposal* of Waste and Emissions; *remediation and compensation* costs related to environmental damage; and any control-related *regulatory compliance* costs.

4. Prevention and Other Environmental Management Costs
Includes the costs of *preventive environmental management* activities such as cleaner production projects. Also includes costs for *other environmental management activities* such as environmental planning and systems, environmental measurement, environmental communication and any other relevant activities.

5. Research and Development Costs
Includes the costs for *Research and Development* projects related to environmental issues.

6. Less Tangible Costs
Includes *both internal and external costs* related to less tangible issues. Examples include *liability, future regulations, productivity, company image, stakeholder relations and externalities.*

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Lifting the curtain: what's inside GRI's newly released draft Guidelines?

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After a year of multi-stakeholder discussion and development, the Global Reporting Initiative (GRI) has released a draft version of the G3 Guidelines for the purposes of eliciting comments from the public. Alyson Slater provides a brief overview of the highlights and changes you will find in the draft G3 Guidelines.

The Sustainability Reporting Guidelines first began to take shape in the late 1990's, and were released for the first time in2000. A second version was released at the World Summit for Sustainable Development in 2002 , and was acclaimed a significant technical improvement from the first version. Known as the 2002 Guidelines (or'G2'), these have steadily become the basis for reporting sustainability performance by many hundreds of organizations worldwide.

Now, nearly four years later, GRI is in the middle of a process to innovate, update, and upgrade the G2 Guidelines. The third generation of Guidelines('G3') are available in draft form, for the purposes of gaining public comment and opinion, from January to the end of March 2006. They are scheduled for release in a final version in October 2006.

AT A GLANCE: WHAT'S NEW IN G3?
• Guidance on defining the content of a report and the process of reporting;
• Guidance on setting the report boundary;
• Each reporting principle is accompanied by a set of self-selftests to help with their application; tests
• New section in Disclosure Items on strategy and analysis that highlights key issues, risks, and opportunities;
• Indicator section has been restructured and now contains Disclosures on Management Approach and Performance Indicators; and
• A full set of indicator protocols are available.

FIRST, THE BLUEPRINT

There are two things that are constant about the Sustainability Reporting Guidelines:
• They must be developed using a global, multistakeholder, consensus seeking process; and
• They must be continuously improved based on feedback provided by people who prepare reports and use reported information based on them.
In order to ensure the Guidelines keep up with the increasingly sophisticated needs of reporting organisations and information seekers alike, GRI embarked on a review of the G2 Guidelines about 18 months after their mid-2002 release. This review engaged 450 people worldwide, from backgrounds such as business, investment, civil society, labour, accounting, academia, and others.

Although needs and drivers for reporting differ across geographic location and sectors, there was a substantial set of consistent messages that emerged from this global review process. These messages directly influenced which areas of the Guidelines were prioritised for improvements, and where new content areas had to be developed.

Overall goals for the G3 Guidelines resulting from this global, multi-stakeholder review process were, in summary:
• Make the Guidelines more user friendly by adjusting the guidance itself, the way it is written, and the format within which it is presented;
• Minimise transition costs from G2 to G3for those organisations already using the Guidelines, and decrease the barriers for new organisations to get started with reporting using the Guidelines;
• Provide guidance on selecting relevant and material issues and indicators to report on;
• Refine the reporting principles, disclosure items, and indicators so they become more suitable as criteria for assurance purposes;
• Find out what could be done to make sustainability reporting of greater utility to investors and analysts;
• Create performance - oriented indicators, but still include space for organisations to put these results in context and explain the overarching management approach.
• Make qualitative indicators more comparable and results-oriented; and
• Create protocols that clarify what an indicator is actually asking for, or how it should be responded to, by providing definitions of terms that appear in the indicator wording, compilation methodology, and other useful references.

Volunteers from business, civil society, investment, academia, non-governmental organisations, labour, accounting, and others came together and create all aspects of the GRI reporting framework. The draft G3 Guidelines are a result of the following multistakeholder technical working groups which convened between January and November 2005:
• The Reporting as a Process Working Group was tasked with providing guidance on the process of using the Guidelines and focused on updating and further developing the reporting principles (18 members);
• The Indicator s Working Group(IWG) was responsible for reviewing the indicator set as a whole, ensuring

quality and consistency of the indicators' design (15 members);
• The IWG worked with a series of issue-specific expert Advisory Groups that examined indicators and protocols in their areas of expertise. Fifty individuals participated in groups for biodiversity and water, pollution, labour, human rights, society, product responsibility, and economics.

G3 ANATOMY

FORMAT

In 2002, the Guidelines were the only major document completed in the GRI reporting framework, and as a result provided a combination of reporting guidance, explanation about reporting trends, rationale for the structure of the Guidelines, and the history of the Guidelines and the GRI network. In contrast, the G3 Guidelines focus only on reporting expectations to ensure amore clear and concise document.

STRUCTURE

The overall structure and logic of the document have been adjusted to better match the flow of a typical reporting process, and is aimed to make the Guidelines more practical and easier to understand. New guidance on processes like boundary setting and issue identification should help mesh better with organisational planning and management systems.

The Guidelines now follow a logical flow, starting from strategy and analysis of sustainability, including risks and opportunities; followed by disclosure son the management of key issues; and finally ending with results-oriented performance indicators. It is hoped that this approach allows reporting organisations to put their performance in the context of macro sustainability issues and then specific management approaches.

G3 SKELETON

Part 1 is broken into three sections:
• How to determine what issues to report on, and select relevant and material indicators;
• How to set the report boundary; and
• How to ensure the quality of reported information.

Part 2 contains the standard disclosure set and has three main sections:
• Disclosure items (general context setting);
• Management disclosures outlined specifically for economic, environment, human rights , labour, product responsibility, and society issues; and
• Performance indicators categorised into economic, environment, human rights, labour, product responsibility, and society issues.

Part 3 wraps up with other considerations for the reporting process, such as:
• Frequency and medium of reporting;
• Assurance and reporting; and
• The sustainability report as a living document, and the cycle of continuous improvement.

Did you know? Other reporting framework components are built to be used with the Guidelines, including Sector Supplements, Boundary Protocol and Indicator Protocols.

REPORTING PRINCIPLES

The basis for any guidance on the selection, presentation, and quality of report content has always been found in the reporting principles, however there was a strong message that this did not come through in the G2 Guidelines.

The reporting principles have been reviewed and updated. Each principle is presented with a short definition, a longer explanation on how it can be useful in application, and a series of self tests that will help the practitioner apply the principle.

See the text box below for an appended overview of the principle of comparability, as an example. It should be noted that there are no reporting or disclosure expectations associated with the self-tests, and that these are simply meant to provide a checklist or practicable guidance on what is expected in terms of application of the principle.

In addition to the new structure, format, and applicability, the principles have been grouped in terms of those that help define report content, and those that help ensure quality of reported information.

Principles to use when determining report content:
• Sustainability context;
• Stakeholder engagement;
• Completeness; and
• Relevance/materiality

In the G3 Guidelines, these four principles are presented in one block, along with some additional guidance on issue identification and indicator selection. A strong new theme in theG3 text is the importance of viewing the indicator set first through a filter for relevance and materiality.

PRINCIPLE:	Comparability
DEFINITION:	The information reported should remain consistent and be compiled and presented in a manner that enables stakeholders using the report to analyze changes in the organization's performance over time as well as relative to other organizations.
EXPLANATION:	See G3 draft for full explanation
TESTS:	• The report and the information contained within it can be compared on a year-to-year basis; and • The organisation's performance can be compared with appropriate benchmarks

Principles to use to ensure quality of reported information:

- Timeliness;
- Accuracy;
- Assurability;
- Balance;
- Neutrality; and
- Clarity

Also included along with the reporting principles is a new section on how to set the report boundary. This section builds on existing guidance found in the boundary technical protocol, along with new and practical guidance on how to determine which entities' performance should be represented by the report.

WHAT HAPPENED TO THE PRINCIPLE OF TRANSPARENCY?

The overarching goal behind sustainability reporting is transparency. By applying the principles, and reporting on relevant indicators, organizations move toward greater transparency. For this reason, transparency was removed from the list of actionable principles, and instead is taken as the overarching concept behind the entire GRI reporting framework.

STANDARD DISCLOSURES

The Standard Disclosures sections of the draft G3 Guidelines contain three basic parts: Disclosure Items, Disclosures on Management Approach, and Performance Indicators. A quick overview of main changes and highlights for each of these three components are presented below.

DISCLOSURE ITEMS

These are designed to elicit the overall, context setting information about the reporting organisation, including size, scale, sector, approach to sustainability, stakeholder engagement, parameters for the report, etc. In the 2002 Guidelines these were called 'Reporting Elements'. Here is an overview of the changes to the section:

- New disclosures in sections 1.1and 1.2 to mesh with investor's sustainability information needs, and to draw more explicit discussion of the organisation's strategy and its key risks and opportunities with respect to sustainable development;
- The G2 sections called 'Report Scope' and 'Report Profile' have been reorganised into a section called' Report Parameters' which provides information on what the report covers and the processes underlying its preparation; and
- The G2 sections titled 'Governance and Overarching Policies ' and 'Management Systems' are now merged and called 'Governance, Commitments and Engagement'. The governance disclosures have been updated and contain some new elements.

AN EVOLUTION: THE SEPARATION BETWEEN MANAGEMENT APPROACH AND PERFORMANCE INDICATORS

The main challenge to the G3 working groups was to refine the indicators so that they became more performance oriented, elicited more comparable data, and were generally more robust and consistent. However, the one caveat was that this level of consistency could not be achieved if it meant the loss of narrative information such as discussion on policies or management approach.

In the G2 Guidelines, indicators were a mixture of requests for descriptions of management procedures and measures for outcome or performance oriented data. The draft G3 Guidelines propose to separate out resultsoriented indicators from management information.

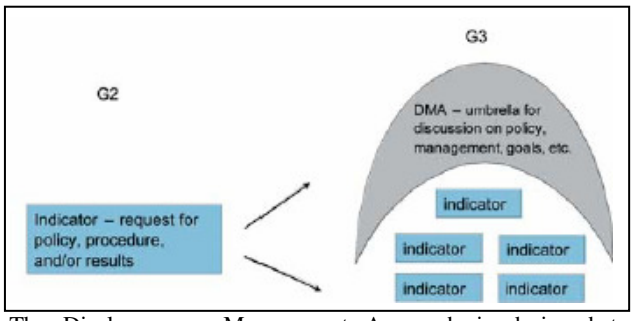
In order to bring more consistency, and to keep the indicators focused on eliciting performance oriented information, a new type of disclosure mechanism was created called 'Disclosure on Management Approach'(DMA) which is designed to provide the space for organisations to discuss the context for their performance results, including policies, procedures, targets, etc. The indicators themselves have been refined so that they are results or outcome focused, and can be used to show change over time if results are compared year-on-year.

DISCLOSURES ON MANAGEMENT APPROACH

A set of Disclosures on Management Approach are found at the start of each of the six indicator sets (economic, environment, human rights, labour, product responsibility, and society)and are designed to elicit narrative or qualitative information about the management of each of these sustainability categories broadly. The management disclosures include requests for discussion of policies, procedures and targets, etc. These disclosures are meant to set the context for sustainability performance information – which follows next.

PERFORMANCE INDICATORS

The primary goals for indicator refinement were to enhance their clarity, comparability, and assurability, and ensure that they focus on effectively communicating performance. 'Performance' is considered the ability to track changes over time, and outcomes achieved as a result of the organisation's actions. These results are placed in the context of stated policies, goals, and commitments to international standards.



The Disclosure on Management Approach is designed to provide the space for organisations to discuss the context for their performance results.

This context can be communication through the use of the DMA (above). Main changes and points of interest for the indicators are:

• **Economic indicators** – retained concept of economic value added/wealth distribution, but expanded the section's coverage of indirect economic impacts. Specifically included new indicators to highlight involvement in local markets as well as indicators related to new issues such as climate change and pensions coverage;

• **Environment indicators** – mostly clarifications, refinements, and ensuring feasibility of measurement. Biodiversity indicators were streamlined to reduce overlap and inconsistencies;

• **Labour indicators** – new topics added on gender, pay ratios, and skills development. Focus on making the descriptive process indicators into comparable qualitative or quantitative disclosures;

• **Human rights indicators** –significant change in the section due to consolidations and refocusing on occurrence of incidents in order to get to comparable disclosures;

• **Product responsibility and society indicators** – focused on a move towards comparability and also did a limited amount of consolidation. One indicator added on corruption.

INDICATOR PROTOCOLS

A technical protocol was developed for each indicator. Protocols should be used when reporting on G3 indicators. Protocols are concise in length (approximately 1 page) and contain definitions of terms used in the indicator wording, a set of compilation methodologies or expectations, and a list of useful resources for the practitioner. The development of the indicator protocols was prioritised because it was seen to be a significant contribution to achieving two of the major goals around the G3 development process:

• **Ease of use** – with a clear set of expectations, definitions, and compilation methodologies, reporting using the GRI indicators should become more straightforward;

• **Comparability** – protocols will help to elicit similar responses in terms of data aggregation, presentation, etc.

Indicator count

G2 core	G2 additional	G3 core	G3 additional
50	47	47	32
Total: 97		Total: 79	

Sustainability Analysis in Asset Management

- Taking into account long term Risks and Opportunities

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Kommunalkredit Dexia
ASSET MANAGEMENT

Sustainability Analysis in Asset Management
` Taking into account long term Risks & Opportunities´

Catherine Friedrich, Head of SRI Marketing & Communication
Dexia Asset Management
Vienna, 28 April 2006

DEXIA Asset Management

Two-step sustainability analysis for stock selection

Kommunalkredit Dexia ASSET MANAGEMENT

1. Sector studies

- What are the sustainability-related issues in each sector?
- What are their relevance in terms of corporate risks and opportunities?

⇨ **Different weights applied to the sustainable themes/dimensions within each sector**

2. Company analysis and rating

- How does a company integrate the sustainability-related issues specific to its sector?

⇨ **Companies ranked within their sector**

Stock selection
(sustainable universe)

SRI : Principles & objective

Kommunalkredit Dexia ASSET MANAGEMENT

- **Sustainable and responsible investing (SRI) is about:**
  - **Integrating sustainability analysis into the investment process (principles)**
    - Long-term economic growth cannot be achieved without factoring the interests of the stakeholders (i.e. customers, investors, employees, suppliers, the environment & society)
    - The interaction with stakeholders is a source of risks and opportunities : compliance / legal action, reputation, process improvement/deterioration, innovation
- **Generating a double alpha (objective)**

Internal sustainability analysis
- Best-in-class selection of companies with the most attractive long-term risk / opportunity profile

First source of alpha

Quantitative / fundamental analyses

Active stock selection based on a strict risk management

Second source of alpha

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1. Sector studies – All sustainability-related issues

Kommunalkredit Dexia ASSET MANAGEMENT

Employees
- Staff relations
- Diaglogue with employees
- Employability
- Diversity & discrimination
- Training & career management
- Responsiveness to change
- Working conditions
- Work time & flexibility
- Reumunerations
- Health & safety
- Labour practice of suppliers

Customers
- Commercial practices
- Anti-competitive practices
- Commercial behaviour
- Quality management
- Customer relationship management (CRM)
- Quality & safety assurance

Investors
- Corporate Governance
- Board accountability
- Audit and reporting
- Investors´rights
- Remuneration
- Sustainable outlook
- Sustainablity governance
- Sustainability business model
- Long-term profitability

Company

Suppliers
- Sustainable relationships

Environment
- Process-related environment impacts
- Water consumption & related emissions
- Energy & climated change
- Other atmospheric emissions
- Land use & biodiversity
- Raw materials and waste
- Product related environmental impacts
- Use
- Disposal & recycling
- Environmental practices of suppliers

Society
- Process-related local relations
- Local community interactions
- Site safety & security
- Access to products/services
- Public authorities relations
- Taxes
- Lobbying
- Corruption
- Compliance

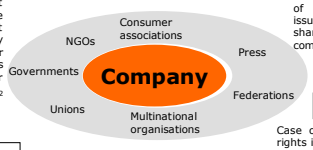
Relations with stakeholders: source of risks & opportunities

Kommunalkredit Dexia ASSET MANAGEMENT

Environment
New environmental legislation may require a significant investment for some companies, whilst others that already observe higher standards can focus on increasing their market share (eg. CO_2 emissions…)

Clients
Health and quality issues may lead to changes in purchasing habits (eg. organic products, 'lite' products, GMO…)

Shareholders
The effective management of corporate governance issues is vital to maintain shareholder confidence in a company



Suppliers
Case of the abuse of Human rights in the supply chain has a considerable impact on the reputation and brand image of companies

Employees
The quality of employment contracts, training and career management are all positive factors in attracting, developing and retaining talent

Society
In developing countries, integrating the expectations of the local population with the company's activities is a real asset

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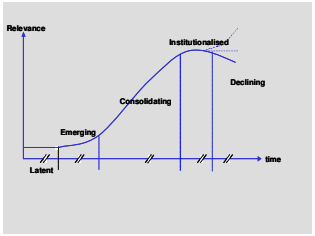
1. Sector studies – Identifying relevant issues

Kommunalkredit Dexia ASSET MANAGEMENT

The relevance of sustainability-related issues vary over time



Example of **CO2 emissions**
- "Institutionalized" in the Utilities sector
- "Consolidating" in the Transport sector
- "Emerging" in the Bank sector

RELEVANCE = (Occurrence * Financial Impact) + Scenario

The relevance of a specific theme depends on the past/current importance of a theme and its likely future evolution.

2. Company analysis and rating: *In-depth evaluation*

Kommunalkredit Dexia ASSET MANAGEMENT

T-S-P analysis

T - transparency
- Quality of the company's public reporting
- Data reliability

S - strategy
- Relevance of the strategy developed for each issue
- Human and material resources engaged
- Pro-activity

P - performance
- Versus its peers in the sector
- Trends

- Company scores from 0 to 100 for each relevant issue
- Scores formalised in the in-house sustainability database
- Weighted final company score, reflecting relative relevance of sustainability issues in the sector

⇨ **Sustainability rating of each company in the MSCI World**

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Best-in-class selection

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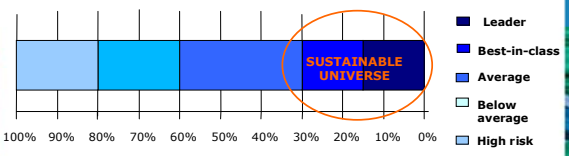

Proportion of the global investment universe

Sustainable Universe = Leaders + Best-in-class + Runners-up

In addition, the sustainable universe is checked with regards to the respect for the 10 fundamental principles of Global Compact*

* These principles derive from the Universal Declaration of Human Rights, the International Labor organisation's Declaration on Fundamental Principals, the Rio Declaration on Environment and Development.

Kommunalkredit Dexia ASSET MANAGEMENT

Thank you very much

for

your attention!

This is all about financial management

Kommunalkredit Dexia ASSET MANAGEMENT

	Equity selection	Portfolio construction	Risk management	
Investment universe	**Phase 1: sustainability analysis** Selecting the companies with the best long term risk/opportunity characteristics	**Phase 1: best tracking portfolio** Reduction of relative risk = neutrality/benchmark: - geographic allocation - sector - style	**Risk control** • Ex-ante • Ex-post	Model portfolio
	Phase 2: financial analysis •Quantitative analysis • Fundamental analysis	**Phase 2: optimisation** Performance maximisation		

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The Disclosure Requirements of the EU-Modernisation Directive for the annual report

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I. LEGAL BACKGROUND

With the „Commission Recommendation of 30 May 2001 on the recognition, measurement and disclosure of environmental issues in the annual accounts and annual reports of companies "[1] the Commission wished to integrate information on environmental issues within the financial statements and annual reports. This Recommendation can be seen as guidance in respect of environmental issues for the appliance of the fourth and the seventh directive[2] and the International Financial Reporting Standards (IFRS).

A survey[3] throughout the EU showed the implementation status of the Recommendation for all EU-Member States (EU 15). The national regulations and standards varied concerning contents and scope throughout the European Union. Some countries had hardly any effort to include non financial data in the financial statements, some countries already had requirements concerning a full statement of financialand environmental (as well as social) data.

The Modernisation Directive[4] focuses clearly on the adaptation of the European accounting regulations to the IFRS. Additionally further mandatory regulations are included, that should enhance the comparability of annual reports prepared by Community companies whose securities are admitted to trading on a regulated market. By January 1st 2005 the Directive had to be implemented in national law.

In Austria the Modernisation Directive was implemented with the Rechnungslegungsänderungsgesetz 2004 (ReLÄG 2004: Act on the Application of International Accounting Standards – Federal Law Gazette I no. 161/2004, entered into force on January 1, 2005)[5]. According to the Directive and to Austrian law the regulations have to be applied with financial years commencing from the January 1st, 2005 onward.

II. SCOPE

The necessity of restoring confidence through transparency and better information was clearly communicated. Therefore the focus of the Modernisation Directive was laid on specifying additional financial information as well as clarifying the need for non financial information. With the Modernisation Directive the need for better financial and non financial information was addressed and adopted. [6]

The main issues concerning environmental and social information disclosure in the annual report are the definitions of parameters and methodology in accounting in order to guarantee comparability of given information as well as issues of materiality concerning the influence onto economic, social and environmental performance. Environmental and social issues are not only covered with the Modernisation Directive, with the EU Regulation No 1606/2002 the IAS 16, 20, 36, 37 and 38 will be seen as a basis for an – however not clearly differentiated– emphasis on environmental issues. Most of the EU15 Member States did not introduce elements of disclosure in the annual report prior to the implementation of the Modernisation Directive. Thus specification of information on environment and social issues has to be included with reports concerning the business years starting from January 1st, 2005 latest.[7]

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[1] 2001/453/EC – Commission Recommendation of 30 May 2001 on the recognition, measurement and disclosure of environmental issues in the annual accounts and annual reports of companies (notified under document number c(2001) 1495)

[2] Directive 78/660/EEC respectively 83/349/EEEC

[3] conf. PriceWaterhousCoopers (editor) – Implementation in Member States of the Commission Recommendation on Treatment of Environmental Issues in Companies' Financial Reports (2004)

[4] Directive 2003/51/EC of the European Parliament and of the Council of 18 June 2003 amending Directives 78/660/EEC, 83/349/EEC, 86/635/EEC and 91/674/EEC on the annual and consolidated accounts of certain types of companies, banks and other financial institutions and insurance undertakings (L 178/16 from July 17th 2003) – Modernisation Directive

[5] Federal Act, ReLÄG 2004: Act on the Application of International Accounting Standards – Federal Law Gazette I no. 161/2004, entered into force on January 1, 2005, that took account of the need to take legislative steps resulting from the requirements of Regulation (EC) no. 1606/2002 (IAS-Directive) on the application of international accounting standards and the need to implement Directive 2003/51/EC (Modernisation Directive) and Directive 2003/38/EC (Threshold Directive) and thus changing the Austrian Accounting Law (Handelsgesetzbuch – HGB), the Banking Industry Act (Bankwesengesetz) and the Insurance Control Act (Versicherungsaufsichtsgesetz)

[6] conf. COM (2003) 284 final: Communication from the Comission to the Council and the European Parliament – Modernising Company Law and Enhancing Corporate Governance in the European Union – A Plan to move Forward

[7] conf. PriceWaterhousCoopers (editor) – Implementation in Member States of the Commission Recommendation on Treatment of Environmental Issues in Companies'

The Modernisation Directive can therefore be seen as one of the main measures to increase transparency by broadening the contents of the annual report being part of the annual financial statements. The importance of the annual report is stressed especially as it contributes to the fair review of business development and business complexity. For a true and fair view financial information and aspects are not sufficient. Further information especially concerning environmental and social aspects have to be included. As the process of broadening the aspects within the annual report can be seen as an evolving process and as the description of non financial issues - especially concerning the complexity of these matters seen in connection with the company's performance, development and position – can be seen as a burdensome undertaking, a very careful approach to these issues is needed.[8]

III. IMPLEMENTATION – TOOLS AND CONTENT

With the implementation of the Modernisation Directive and its transformation into Austria law the mandatory extension of the annual report includes both financial and, where appropriate, non-financial key performance indicators. A key performance indicator (KPI) is defined as a *"factor by reference to which the development, performance or position of the business of the entity can be measured effectively. They are quantified measurements that reflect the critical success factors of an entity and disclose progress towards achieving a particular objective or objectives."*[9] Generally all information necessary for an understanding of the company's position, performance and development in both financial and in non-financial respects ought to be included. The specific scope with non-financial key performance issues has to be laid onto environmental and employee matters. All this information and its analysis should refer to and additionally explain the amounts reported in the annual accounts. With the given information a balanced and comprehensive analysis of the development and performance of the business and of the position of the undertakings consistent with the size and complexity of the business has to be presented.[10][11]

IV. REPORTING PRINCIPLES

Disclosure requirements for the annual report include significant non-financial key performance indicators. Within the explanatory remarks to the ReLÄG only a reference to the Commission Recommendations is indicated, as far as ecological and social aspects are concerned. Especially these issues deal with

- common environmental / social strategy and policy
- achieved improvements in the field of environmental protection / social issues
- legal compliance
- adequate environmental or social performance indicators
- reference to additional environmental, social or sustainability related reporting and audits

The main challenge can be seen in the responsible selection of germane performance indicators. Despite all endeavours for general applicable core indicators in these fields[12] regional and branch related differentiations will be inevitable. Derivation, assessability, impartiality and integrity of data are of fundamental importance. All this needs to be clearly comprehensible with the basic concept behind.[13] The fundamentals for building up a concept can be taken from EU policy-paper such as the 6th environmental program[14], the social agenda 2005-2010[15] as well as the CSR-[16] As far as additional general accepted standards are available, they can be taken for shaping the individual concept as well.[17] Albeit problems with non financial data transfer into the financial report, chapters 243 and 267 HGB demand a close reference to amounts displayed in the financial report.[18]

Financial Reports (2004)

[8] conf. Directive 2003/51/EC of the European Parliament and of the Council of 18 June 2003 – Modernisation Directive (9)

[9] AFRAC – Austrian Financial Reporting and Auditing Committee: Diskussionsergebnisse aus der Arbeitsgruppe "Lagebericht 2004" - http://www.afrac.at/arbeitsgruppen.php?sm=ag1&mc=fa1&ag=7&subm=1&lev=2 (20.3.2006)

[10] conf. Finanmarkt-Aufsichtsbehörde (editor) – Jahresbericht der Finanzmarkt-Aufsichtsbehörde (http://www.fma.gv.at/JBInteraktiv/DATA/en/text_eur_rechtsentwicklung.htm - March 13th 2006)

[11] ReLÄG; Act on the Application of International Accounting Standards – Federal Law Gazette I no. 161/2004. Directive 2003/51/EC of the European Parliament and of the Council of 18 June 2003 – Modernisation Directive

[12] conf. 2001/453/EC – Commission Recommendation of 30 May 2001 on the recognition, measurement and disclosure of environmental issues in the annual accounts and annual reports of companies

[13] E.g. issues such as air pollution, climate change, ozone depletion, natural ressources, toxic substances, waste, fresh water etc., as defined with the Industry- EPI (Environmental Pressure Indices) by the JRC (EU Joint Research Centres) are to be of great importance while reporting on environmental issues

[14] http://europa.eu.int/comm/environment/newprg/index.htm (14.3.2006)

[15] http://europa.eu.int/comm/employment_social/social_policy_agenda/social_pol_ag_en.html (14.3.2006)

[16] http://europa.eu.int/comm/employment_social/emplweb/csr-matrix/csr_matrix_en:cfm and http://europa.eu.int/comm/employment_social/socdial/csr/ (both 14.3.2006)

[17] e.g. GRI – Reporting Guidelines (Global Reporting Initiative), http://www.globalreporting.org (14.3.2006)

[18] The Commission Recommendation mainly emphasises the need for data in physical units and not related to financial data (money). In order to enhance the understanding for the importance and the development values can be related to financial data (balance or income statement)

Furthermore the disclosure of risk assessment is of great relevance… It relates to non financial as well as to financial key performance indicators, as for risk management and risk assessment a holistic approach needs to be undertaken. Risks need to be categorised in e.g.

- human risk
  - retirement arrangements
  - fluctuation
  - sick bay
- operational risk
  - IT
  - environment
  - management
- business risk
  - distribution
  - products
  - supply chain
  - customer relation

All these risks have to be considered under a going concern view.[19]

V. CONCLUSION

The necessary quality of the contents of the annual reports can not be conclusively stipulated yet. The quality of the contents can be seen as an ongoing process, a development, as the status as well as the development of rather not national but international standards will become more and more relevant when reporting on these (financial and non financial) issues.

[19] AFRAC – Austrian Financial Reporting and Auditing Committee: Interimsergebnisse aus der Arbeitsgruppe "Lagebericht 2004" – http://www.afrac.at/arbeitsgruppen.php?sm=ag1&mc=fa1&ag=7&subm=1&lev=2 (20.3.2006)

Sustainable service systems – a trigger for technical Innovation

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The transition from purchase of products to the supply of sustainable Product-Service-Systems (PSS) is expected to be a fundamental contribution to a more sustainable development (not only in the sense of the reduction of material flows but also in reference to a higher quality of life and to a competitive advantage). It is a fact that this paradigm shift - from the sale of products to the supply of solutions for the satisfaction of needs – has not yet prevailed perceptible. This paper draws on some best practice projects carried out in Austria which take/took up the problem of how to implement Product-Service-Systems (PSS) in different industry sectors.

Keywords: **Product Service Systems, Service Innovation, Sustainable Services, Sustainable Innovation, Sustainable Development**

Product-Service-Systems (PSS) are defined as "a system of products, services, and supporting infrastructure that is designed to be competitive, satisfy customer needs and have a lower environmental impact than traditional business models" [1]. This approach is a further development of the EcoDesign-approach. EcoDesign focuses on the product life cycle which is divided into 5 steps: resource extraction, production, transport, utilisation, and end of life. Aim of this approach is to minimise or prevent environmental impacts during all phases through various strategies generally focusing on the product itself. As businesses gain added value by selling products, this means that the more products are sold the higher is the profit - added value and resource use are coupled.

By applying Product-Service-Systems organisations may change their way of thinking of how business has to be done. The focus is not on the production and sale of the products anymore but on the provision of functions. Therefore, solutions have to be developed that satisfy the customer's needs and increase his quality of life. In many cases the customer is not interested in the actual product (e.g. a washing machine) but in its function/performance (washing, centrifuging, drying) which allows the customer to satisfy his needs (e.g. clean, folded, immediately usable clothes), at least partially. The concept of selling desired results instead of goods is called "Service Economy" [2].

Recent experiences with Product-Service-Systems have shown that on the one hand companies were unfamiliar with the term "Product-Service-System" but on the other hand had already been dealing with such approaches and had begun implementing them with only the difference of using other terms. This is the case not only in Austria but is also the experience of the European/international Product-Service-Systems community [3]. Furthermore, a trend of Western industrialised nations towards a service economy is to be noticed. This trend is reflected in the increasing proportion of service oriented added value within the gross national product.

Therefore, the idea came up to support sustainable economic systems by focussing on the term "innovation" as this is, spoken in terms of economy, a well-known term although different connotations might be connected with it.

The aim must be to direct the already existing strategic considerations and business activities to the provision of services and to support "functional sales". External researchers and/or consultants could conduct the process and integrate sustainability concepts more intensely in the company's innovation process.

To gain a picture if Product-Service-Systems really could be a trigger for innovation has been the focus of different projects in Austria which will be presented during EMICO 2006.

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Stakeholder Involvement and Innovative Business Models for Sustainability

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This article introduces a conceptual business model framework consisting of the competitive advantage of the services, the customer benefits, as well as the resources and capabilities of the providers of the service, and the financing arrangement. Secondly, it discusses stakeholders whose involvement is needed in order to make sustainable services a feasible approach to complement and substitute material and energy intensive consumption and production.

I. BUSINESS MODELS

Despite the abundance of innovation and ideas since the introduction of eco-efficient service thinking in the mid-1990s, only few truly eco-efficient or sustainable services[1] have made their way to the market place, especially to the consumer market. One of the reasons is the slow rate of change in institutions and cognitive structures. But there is also a lack of systematic analysis of the business perspective. Until sustainable service innovations are turned into concepts that are feasible in the market, the numerous instances for reducing resource consumption will remain nothing but unattainable ideals.

Consequently, in recent years the term 'business model' has proliferated in the sustainable service discussion, but the concept has not been used in a organized fashion. Here a systematic business model framework is proposed and exemplified with a number of eco-efficient product-service examples The following questions form the base of framework:

- What kinds of competitive advantage pertain to the sustainable service,
- Which benefits can users or customers derive from the service (in comparison to more traditional ways and means of fulfilling their needs)
- Which capabilities and other resources does the provider or the network of providers have, and
- How is the service financed?

The model is applicable not only for commercially provided services, but for a service of any provider, be it an NGO, a public sector provider, a business enterprise or a network of these actors.

The business model framework can be utilised for multiple purposes, especially testing and improving the market viability of eco-efficient product-service concepts. But it can also assist in identifying stakeholders, who need to be involved in creating eco-efficient product-services. Namely, making eco-efficient services work in real life often calls for involvement of multiple stakeholders.

II. STAKEHOLDER INVOLVEMENT

Frequently when thinking about sustainable services, we tend to assume that new enterprises should miraculously appear to provide such services, or we try to persuade large corporations to adopt product-service systems that enhance sustainable development. However, if consumers are to use services compensating products, they need to be as easily accessible as owned products. One of the implications is that services ought to be offered directly at home or near to it. But how to accomplish this in a cost-efficient fashion? For whom does it make sense to offer sustainable services to consumers at their home or in the vicinity? Who then become relevant stakeholders?

A European study shows that sustainable or potentially sustainable household services are offered by a variety of providers from SMEs, non-profit organizations or public sector service providers to housing organizations, housing management companies and large companies [1]. Particularly two relevant stakeholder groups, housing organizations and housing management companies, are completely missing from the sustainable service discussion. Yet they are in many instances natural agents to provide services or act as an intermediary for homeservices – and the pioneering ones actually already do so. They bear close proximity to the consumers, the residents, and hence have the opportunity to provide services directly to the residents in their homes. From the consumers' viewpoint, proximity means that services can be acquired as easily as products fulfilling the same need, which is one of the main conditions for consumers to replace or supplement their product-based consumption with services.

[1] For brevity, eco-efficient or sustainable product-service systems are here called eco-efficient services.

In the same vein, depending on the consumption cluster (such as nutrition, mobility, housing), households alone have only limited – greater or lesser, but still limited – possibilities to influence their patterns of consumption. There are other actors who are relevant in setting the frame for consumption choices. For instance with regard to housing and construction, property owners (housing providers), local authorities and service providers influence the housing framework (e.g. form of heating and the like are seldom a free consumer choice). Or as regards mobility, local authorities and service providers have a lot to do with the transport infrastructure (such as public transport or bicycle lanes), and therefore they set the limits within which consumers are able to decide how to fulfil their housing and mobility needs. They are all stakeholders that influence on households' ability to organize their daily lives as sustainably as possible.

As to eco-efficient business-to-business services, less stakeholders appear to be involved than in consumer settings. Analysis of some result-oriented services – which arguably hold the greatest promise in terms of eco-efficiency [2] – indicates that financial institutions are crucial stakeholders. Services of ESCOs (energy service companies) and its equivalent for material efficiency services, MASCO business, are examples where banks and other lender institutions are stakeholders of whom the spreading of material and energy efficiency services is dependent on [3,4].

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Product-service systems in examples

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This paper presents the product-service system examples from a range of industrial sectors and from business-to-business and business-to-consumer markets. The goal is to demonstrate the diversity of existing offers in B2B market and to highlight the drivers for companies to shift to these innovative business models. The goal of the two B2C cases is to demonstrate the complexity of developing PSS for households. The paper concludes with outlining the necessary steps for PSS development and application.

I. ENVIRONMENTAL PROBLEMS AND PRODUCT-SERVICE SYSTEMS

Current patterns of human activity cannot be sustained indefinitely since the assimilating capacity of the planet is reaching its limits and the continued exploitation of natural resources is being constantly questioned. The last few decades have seen the unprecedented growth in strategies and approaches with which to address environmental problems. Technical and efficiency solutions have been developed to reduce the environmental impact. However, the expectation that these strategies would solve the problems has not been realised, mainly because of increasing levels of consumption stimulated by continuous population growth and rising levels of affluence. Economic growth is seen as a driver of development and the sign of a healthy economy by major economic models. It is sustained by increased consumer demand and is usually measured in material terms. But, there is an apparent conflict between the goals of economic growth and the goal of preserving a clean environment both for ourselves and for future generations. The product-service system concept has been suggested as a way to reduce the conflict by exploring possibilities to sustain economic growth and consumer demand by creating more value without using more resources and causing more pollution. Examples of fully developed or initial PSS can be found in many sectors and in both business-to-business and business-to-consumer markets. However, drivers behind these changes vary, as well as the complexity of the developed systems. In the following sections PSS examples from different sectors are presented.

II. BUSINESS TO BUSINESS EXAMPLES

A large number of sectors investigate the possibility of extending their product offers with services driven by very different motives.

Production equipment is often leased and installed by the original equipment manufacturers (OEM), who take it back at the end of the contract. Therefore, appropriate solutions need to be found for its reuse and refurbishment, as well as for ensuring that the equipment is used properly. These considerations drive OEMs, e.g. Alfa Laval, to develop durable and upgradable production equipment, install monitoring devices, provide maintenance services and let customers pay per use.

In aeronautical industry fractional ownership of aircraft is organised by firms as a service-provision to their customers rather than outright ownership of the product, e.g. Bombardier Flexjets, Netjets, Summitjets. In addition, power-by-the-hour contracts rather than separate purchase of spares and maintenance services are also rather spread.

Providers of utilities experienced deregulation of markets and now find it progressively difficult to compete as margins are constantly falling [1]. The so-called energy service companies, (ESCOs), find the solution in delivering efficiency services (energy efficiency or water efficiency audits) or in providing systems solutions, such as total home management, least cost planning and demand side management, which include delivering and monitoring energy and water use, provision of solutions that save resources, increase safety at home and continuously adjust services to the changing needs of customers.

Producers of primary and secondary chemicals are the focus of continuous ever-stringent legislation, while users are being squeezed between the increasing diversity of new chemicals on the market and the increasing costs of chemical management. It was shown that for each dollar spent on purchasing a chemical, $5-10 are spent on its management [2] - the cost that is often not transparent to the users. Providers of chemical management services (CMS), e.g. Castrol, Quaker, Safechem, Dow, are able to reduce chemical management cost and improve environmental performance, while providing opportunity for shared gains.

Mature industries (e.g. carpet, furniture) with low innovation potential perceive PSS idea as an innovation strategy. For them extending product offers with services or delivering use value through economically feasible closed systems provides competitive advantage. Producers of synthetic carpets, e.g. Interface Inc, DuPont, MilliCare, BASF, lease carpets that are produced in modules, extend carpet life by replacing modules of high traffic with modules from areas with low traffic, provide maintenance services and recycle the carpets at the end-of-life (EOL) stage.

In the cases of products with high end-of-life value product-service systems may provide an opportunity to capitalise on the EOL value. Xerox, Océ and Ricoh are examples of document companies that remanufacture office equipment and lease their products to ensure the return flow of own products. For example, in the U.S, savings from Xerox remanufacturing operations were estimated to amount to about $ 250 million per year [3] [4], while in Europe, the demand for remanufactured Xerox machines exceeded supply by 50% [5].

Many more examples of PSS-like initiatives from B2B sector can be found. Although one has to remember that while in some sectors these schemes become mainstream, in the majority of sectors these examples come from few proactive companies and/or represent a niche application area.

In business-to-consumer markets, schemes that can be called PSS are developed for discretely used customer durables, such as washing machines and cars. These examples are presented in more detail in the following section

III. BUSINESS TO CONSUMER EXAMPLES

The car sharing services are provided by two types of organisations: commercial car sharing organisations (CSO) and car sharing cooperatives (CSC). Many car sharing organisations were set up as cooperatives and then later turned into commercial organisations. From the outset, cooperatives were rather small and run by their members [6]. Nowadays in Sweden, the majority of car sharing users are members of such cooperatives [7]. The concept of car sharing has recently caught attention at the policy level and although no specific policy instruments were developed to promote car sharing, a number of policy documents mention car sharing as one of the solutions to the mobility problem. At the national level, some municipalities have started to acknowledge the potential of car sharing in reducing environmental impact, primarily traffic congestion, and support creation of specifically designated for CSOs parking spaces [8] [9]

Car sharing is still a niche solution. In total 300 000 people are members of car sharing organisations around the world [10]. CSOs strive to disseminate the idea of car sharing as part of the total mobility solution. They establish new alliances with relevant actors such as railways, taxi services, public transportation companies, etc. [11], [12]. CSOs show that the profile of users is slowly changing. For example, StattAuto reports changing market segment with time from young environmentally aware people to more ordinary people who see mostly personal benefits in the car sharing service [13]. From the environmental perspective, car sharing reduces the travelled distances, facilitates the choice of more technically advanced and environmentally sound vehicles and stimulates consumer changes by making the cost of car use transparent [14]. A shared car substitutes between 5 and 10 privately owned cars [15]. The major challenge for many CSOs is to attract new customers and some CSOs are experimenting with combined solutions, such as food delivery services for members of car sharing organisations. Attracting new members is also clearly a challenge because of the embedded norms of ownership, status and image associated with car ownership and not least due to the vested interests of a number of powerful stakeholders in the services, industries and infrastructure surrounding the car ownership.

The case of washing centres was investigated on purely Swedish data and Swedish context. It is of interest for the discussion on PSS as it presents an example of how a political will may influence the introduction of environmentally sound innovative patterns of consumption, even if the initial purpose was a different one. Furthermore, this case is an example of a fully-fledged PSS, comprising product eco-redesign, development of special services and infrastructure as well as the establishment of special networks of actors who jointly provide the washing function for private people. The development of community-based washing centres in Sweden followed the political decision to integrate women into the work market and the consequent need to alleviate the burden of household work [16]. This decision was supported by integrating facilities for washing centres into community planning and into strategic plans for city development. Lately, energy authority and other organisations have provided guidelines and advocated the instalment of energy-efficient equipment in communal washing centres. Electrolux supplies washing machines to a large number of washing centres. The company also provides maintenance, upgrading and take back services. Electrolux's Professional Appliances division assists various companies and communities in starting up new washing centres. Electrolux provides installation of the washing equipment, training of the service personnel, assists with environmental permits, contracts for maintenance and even offers attractive loans for service providers. From the environmental point of view, community-based washing centres provide a significant improvement. It is estimated that one washing room with 3 washing machines serves 25-30 households per week [17]. However, savings from the shared use in comparison to washing at home are reduced by the use of tumble driers since households that wash at home tend to use clothes lines [18].

IV. CONCLUSION

This paper provided an overview of examples of product-service systems from different industry sectors from business-to-business and business-to-consumer markets. The B2B examples demonstrate a great diversity in the scale of change, ranging from added services, such as education and maintenance, to development of a truly systemic solutions to customer need that includes changes in product and service design, development of a network of actors who deliver the offer to customers in the most efficient way, establishment of necessary infrastructure, which ensures EOL remanufacturing of products and closing the material cycle to reduce resource use. The B2C

cases demonstrated that customer acceptance of PSS to a large extent depends on how challenging they are to the established norms in the society, such as the individual ownership for private people or as the need to link the producers' profit to the number of material products sold on the market.

In summary, PSS presents an interesting opportunity for businesses and consumers, but in order to become a solution to environmental problems, it needs to be further developed with environmental criteria in mind. In addition, visions of more sustainable lifestyles must be followed by investments into structural changes, which may trigger companies to deliver more sustainable solutions beyond "the more the better" mentality and make it sensible for customers to incorporate new consumption patterns and levels.

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Sustainable management in SCA-Group – best practice

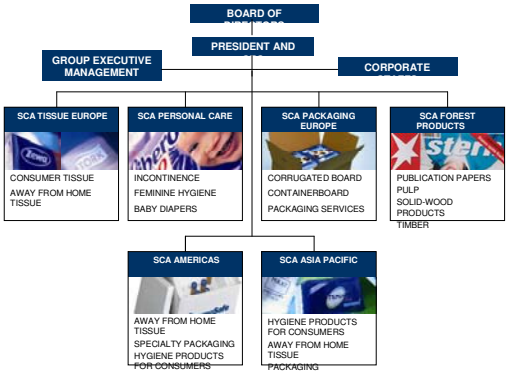
Solveig Eriksson
member of SCA Environmental Management network
member of SCA Forest Products Environmental council

SCA's VISION

SCA's vision is to be recognised as the leading provider of value for customers, employees and shareholders in its field

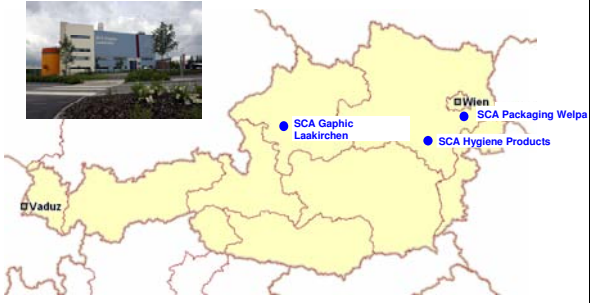
SCA

Organization - SCA Group



SCA

Austria Map with SCA Mills



SCA

Environmental management systems

Throughout the world there exists a number of environmental manage-ment systems and certification schemes. SCA promote the use of EMAS or ISO 14001 for mills and factories and FSC certification for the forest management. FSC is the only forest certification scheme that is acknowledged by WWF and other non-governmental environmental organisations. All forest owned by SCA is FSC certified.

SCA

Best practice in Innovation management approaches

Klaus Barduna
Stora Enso Environment
Regional Operational Support Continental Europe

STORAENSO

Focus on the future

Best practice in – Innovation management approaches

International Conference on Environmental Management and Innovation
Vienna, 28th to 29th April, 2006
Klaus Barduna, Stora Enso Environment

STORAENSO

Key strategic sustainability issues

- Sustainability in emerging markets
- Occupational health and safety
- Asset review and reductions in workforce
- Acceptability of fibre sources
- Environmental performance, including emissions and climate change

Management systems help units to integrate Stora Enso's policies and principles into their operational management. They help units to recognise the most important aspects of the operations, set targets and follow up the performance related to environmental issues, forestry, occupational health and safety, and corporate social responsibility.

STORAENSO

Stora Enso in Brief

- A world leader
  - 16.9 million tonnes of paper and board
  - 7.7 million m^3 of sawn and processed wood products
- Four main divisions
  - Stora Enso Publication Paper, Stora Enso Fine Paper, Stora Enso Packaging Boards and Stora Enso Forest Products
- Sales EUR 13.2 billion
- Approximately 46 000 employees in more than 40 countries
- Market capitalisation EUR 9.3 billion (31 Dec 2005)
- Shares listed on Helsinki, Stockholm and New York stock exchanges

STORAENSO

Unique coverage in EMS implementation

- Stora Enso is a forerunner in the forest industry in EMAS registration
- Stora Enso Kabel Mill was No. 1 with EMAS in German industry
- Stora Enso units were also first with EMAS in Finland, France, The Netherlands and Sweden (also, No. 1 with ISO 14001 in Canada and Spain)
- Since March 2003, 100% of Stora Enso's total pulp, paper and board production capacity is covered by EMAS and/or ISO 14001
- In Austria: Sawmills Bad St. Leonhard, Brand and Sollenau with EMAS and ISO 14001, Ybbs proceeding

STORAENSO

Sustainability

"Sustainability means building accountability into the way we work, creating long-term value on an economically, socially and environmentally sustainable basis. This requires being transparent and open to dialogue with our stakeholders."

STORAENSO

EMS - A Tool to Achieve Sustainability

- Environmental Management Systems have increased…
  - executive environmental awareness
  - environmental involvement and engagement of all employees
  - awareness of laws and regulations

  … and improved
  - emergency response
  - chemical management
  - resource efficiency
  - waste management
  - environmental risk management
  - environmental performance
- Environmental Management Systems have enhanced…
  - stakeholder credibility
  - local communication

  … facilitated
  - implementation of Group Environmental Performance Targets

  … and generated
  - cost savings

Member of Dow Jones Sustainability Indexes

ETHIBEL MEMBER OF THE ETHIBEL SUSTAINABILITY INDEXES

FTSE THE INDEX COMPANY

Group environmental targets

Approved in November 2004, to

- focus efforts to achieve and maintain industry-leading performance;
- achieve credibility with stakeholders;
- create competitive advantage;
- support our license to operate;
- maintain industry-leading position in independent environmentally related indices.

Environmental performance proofs wishes for future EMAS ...

- ... related to "Regulation"
  - Easier, faster and less costly permitting processes;
  - Reduction of supervision by authorities; better acceptance of mills' own supervision;
  - Decrease of environmental fees/taxes/charges;
  - Better conditions with credits and insurance contracts;
  - Reasonable verification procedures.
- ... related to "Communication"
  - Member States to enforce EMAS promotion;
  - Allow the EMAS logo on products and packaging;
  - Appropriate relevance of EMAS in public procurement.

EMAS VERIFIED ENVIRONMENTAL MANAGEMENT ISO 14001

Group environmental targets & progress

Areas	Targets for 2005-2009	Progress during 2005
Air emissions	Total sulphur reported as sulphur dioxide (SO_2): 15% reduction by the end of 2009[1)]	A good reduction of 8% achieved.
Water discharges	Chemical Oxygen Demand (COD): 10% reduction by the end of 2009[1)]	Target nearly achieved with a reduction of 9%.
Waste to landfill	10% reduction by the end of 2009[1)]	Target already achieved with a 12% reduction.
Energy	Increased trend in the power-to-heat ratio of internal energy production Conduct energy efficiency reviews at each pulp, paper and board mill at least once in a two-year cycle.	Performance did not improve, but remained stable at the 2004 level. Target exceeded for the period 2004–2005.
Fibre acceptability	Fibre traceability for procurement of round-wood, chips, sawdust and pulp: increase the total percentage of roundwood, chips, saw-dust and pulp covered by traceability systems to 98% in 2005, and 100% from 2006 onwards.	Both targets were already reached in 2005. Work will now focus on the third-party certification of the traceability system.

[1)] Targets are normalised for saleable production (expressed as emissions per tonne of product) of pulp, paper and board – with regard to the baseline year 2004. Baseline corrections will be applied as changes in the production structure and product portfolio occur.

More information ...

Stora Enso's Sustainability Report 2005.
It is the first report to reflect challenges along Stora Enso's value chain: Raw material and suppliers - The Group - Markets - Investors - Society.
The report and background material can be found at
www.storaenso.com/sustainability

Stora Enso also has 55 EMAS-registered operations and their EMAS statements, as well as a separate sustainability report for North American operations.
These publications can be found at
www.storaenso.com/EMAS

Group Environmental Performance 2005

Most environmental performance indicators developed favourably during 2005.

AREA AND PARAMETER	% Change 2001 to 2005	% Change 2004 to 2005
AIR		
CO_2, non-renewable fuels	-11	-3
CO_2, total	-3	-5
Total sulphur as SO_2	-29	-9
NO_x (NO_2)	-5	-5
WATER		
COD	-12	-9
AOX	-20	-8
Phosphorus	-18	7
Nitrogen	-3	8
Process water	-21	-1
Non-contact cooling water	-12	-1
WASTE		
Waste to landfill	-27	-11

(Figures normalised for production)

Legal compliance and benefits from regulatory relieves

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I. CONDITIONS FOR NOTICEABLE ADMINISTRATIVE SIMPLIFICATIONS FOR EMAS-ORGANISATIONS AND THEREFORE ALSO FOR A DISCHARGE OF THE STATE (DEREGULATION):

- Effective legal compliance concerning substantial environmental impacts
  - High standards for environmental verifiers and environmental assessment
    - Improved independence of the environmental verifiers from the examined companies and sites (appointment by independent institutions ? – obligatory periodic change of verifiers – compelling regulation of charges)
    - Verifiers must be able to recognize the relevant specific environmental problems concerning the enterprise
    - Strict exemination of the relevant hazard potentials
    -

II. POSSIBILITIES OF DEREGULATION / ADMINISTRATIVE SIMPLIFICATIONS

- Combination of external control and internal control in connection with verification / validation (eg control of minimum and maximum values in connection with immission control)
- Objective distinction according to environmental danger / combined with instruments of private law
- Restriction of control of the enterprise in connection with current validating
-

III. THE AUSTRIAN UMG (UMWELTMANAGEMENTGESETZ – LAW ON ECO-MANAGEMENT) AS EXAMPLE

- § 21 UMG: Only notification necessary, when the plant is modified_ improvements possible
- § 22 UMG: Consolidated Decision of the authority _ also cooperation between authorities and environmental verifiers ?
- § 23 UMG: Refraining from administrative punishments
- § 24 UMG: Environmental representatives (waste representative, waste water representative) need not be announced to the authorities
- § 25 UMG: Reduction of monitoring by the authorities
-

IV. REQUIREMENTS OF FURTHER ECONOMIC INCENTIVES

1. Advantages in connection with public procurement
2. Fiscal benefits (as compensation for external costs)

V. RESUMÉE

EMAS is good, but it has to be improved.

Environmental Accounting, IFAC

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During 2005, Danisco initiated a corporate pilot program "Global Waste Initiative" for testing the adequateness of EMA as tool for production sites. The objective was to apply EMA for identification of reducing the environmental impact from waste and wastewater.

I. INTRODUCTION

Danisco is a global supplier of food ingredients, supplying our customers from more than 70 manufacturing facilities throughout the world. A global program was launched in 2005, focusing on waste and waste water reducing initiatives. Two pilot assessments using EMA were conducted at our manufacturing facilities in Finland and USA. The objective was to identify direct and indirect environment-related costs at each facility, and evaluate the internal use of EMA for identifying initiatives reducing the environmental impact and their related costs.

II. GLOBAL WASTE INITIATIVE

A. *Objectives*

In order to evaluate the adequateness of EMA for the purpose of identifying waste reducing initiatives, to independent pilot assessments were conducted and evaluated.

The objectives of the assessments were:

- Investigate EMA as a tool for identification of environmental saving initiatives
- Comparison of EMA results versus annual reported environmental costs
- Evaluate EMA as benchmarking tool
  - o between production sites
  - o for each production site
- Evaluate required resources for EMA assessments

Both EMA assessments were based on [1].

B. *Characteristics of pilot sites*

Though both facilities are owned by Danisco, they are substantial different regarding regulation, production processes and utility systems.

1) Danisco Sweeteners OY, Kotka, Finland

The facility is located by the seaside on the south coast of Finland. The main product of the facility is Xylitol, used in e.g. chewing gum, toothpaste. The site has a pretreatment of waste water, and purchases both power and thermal energy from a CHP-plant located next to the facility. The site uses seawater as cooling water. The site has certified ISO9001, ISO14001 management systems.

2) Danisco USA Inc., Kansas, USA

The facility is a stand-alone facility in an industrial area in the area of Kansas City. The main product is emulsifier based on vegetable oils. The site purchases power and natural gas for steam production. Waste water is processed in a pretreatment equipment before discharge to a public treatment facility. The site has certified ISO9001, ISO14001 and a OHSAS 18001 management systems.

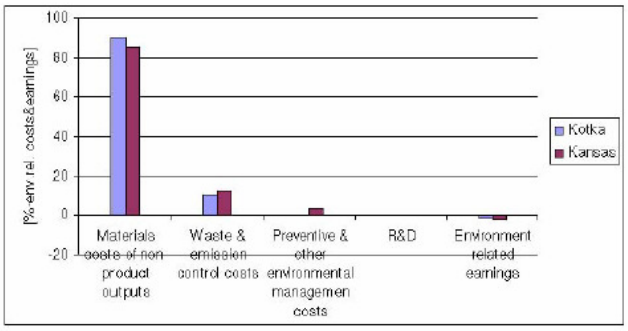

Figure 1: Environment-related costs in cost categories.

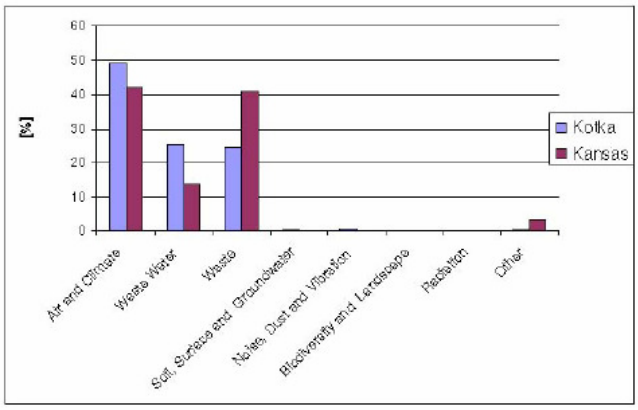

Figure 2: Environment-related costs in environmental domains.

III. CONCLUSION

The conclusions for the two pilot sites showed several similarities. In both cases, a consistent mass balance could be established covering the fiscal year May '04 – April '05. As expected, costs of non-products outputs are considerable in both cases, while costs for environmental control are minor. The evaluation indicated EMA as a suitable tool for benchmarking sites, and useful for identifying cost flows through production.

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Sustainability Accounting: the SIGMA project and beyond

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I. Introduction

This paper gives a short overview of the talk for the 2006 International Conference on Environmental Management and Innovation. The talk and this paper will cover:

- short overview of the SIGMA (**S**ustainability - **I**ntegrated **G**uidelines for **Ma**nagement) project
- short overview of the SIGMA Sustainability Accounting Guide
- a schematic for organizing and understanding the different information which comes under the umbrella of "Sustainability Accounting"
- Different examples of financial sustainability accounting
- Looking to the future: how leading edge practice is now based on strategies and investor relations
- No sustainability without participation: how sustainability accounting can enhance stakeholder engagement.

II. The SIGMA Project

The SIGMA Project was launched in 1999 with the support of the UK Department of Trade and Industry. It is a partnership between the British Standards Institution (the leading UK standards organisation), Forum for the Future (a leading UK-based sustainability charity and think-tank), and AccountAbility (an international professional body for accountability).

The aim was to provide clear, practical advice to organisations to help them make a meaningful contribution to sustainable development.

The SIGMA project developed guidelines which help organisations to:

- Effectively meet challenges posed by social, environmental and economic dilemmas, threats and opportunities.
- Become architects of a sustainable future

The project had a number of organisational partners who piloted the SIGMA Guidelines. The Guidelines consist of:

- a set of Guiding Principles that help organisations to understand sustainability and their contribution to it.
- a Management Framework that integrates sustainability issues into core processes and mainstream decision-making. It is structured into phases and sub-phases.

SIGMA is the first of its kind, but it links into existing management systems and frameworks such as ISO 14001, Investors in People, the ISO 9000 series, OHSAS 18001 and AA1000 Framework. This provides compatibility with existing systems and helps organisations to build on what they already have in place.

The Guidelines are supported by a range of tools, guides and case studies to aid their implementation and to address specific sustainability challenges. They include tools on stakeholder engagement, the Balanced Scorecard, and Sustainability Accounting.

The SIGMA Guidelines were published on 1 September 2003. The British Standards Institute is currently converting SIGMA into BS 8900 Guidance for managing sustainable development. It is anticipated that the British Standard will be published in May 2006.

The SIGMA project is discussed in depth at www.projectsigma.com.

III. The SIGMA Sustainability Accounting Guide

The SIGMA Sustainability Accounting Guide was one of the tools designed to support the SIGMA Guidelines. It was written by Julie Richardson and David Bent (of Forum For The Future) with editorial input from the Association of Chartered Certified Accountants (ACCA), Cooperative Financial Services (CFS), Wessex Water and sd3.

The Guide considers sustainability accounting is a useful tool that can be employed to assist organisations in becoming more sustainable. The Guide recognised the important role of financial information in this transformation and shows how traditional financial accounting can be extended to take account of sustainability impacts at the organisational level. The focus is on extending the range of monetised information (covering environmental, social and economic impacts) on which decisions are made. The Guide was addressed both to sustainability practitioners and to finance professionals.

The Guide itself was built around the Sustainability Accounting cube – explained below. It gave examples of the many ways people were reporting financial information as part of understanding sustainability.

IV. Organising Sustainability Accounting Information

The Sustainability Accounting cube was developed by

Forum For The Future in 2003 as a way to locate all financial information relating to a single organisation and sustainability. Its basic assumption is that all financial information pertaining to an organisation can by organised according to

1. What is the timing of the impact being measured? Is it a) a snapshot of the state of the stock of a resource (familiar from financial accounting as a balance sheet), or b) is it a measurement of a flow – a change in magnitude of a resource over a period of time (like a profit and loss account)?

2. What is the location of the impact? Does it a) fall within an organisation's financial reporting boundaries, i.e. an internal impact, is it b) a cost or benefit which is imposed externally of the organisation on wider society, or is it c) a cost or benefit to the organisation of avoiding or restoring the external impact (which we term the shadow impact)?

3. What is the type of impact? Is the impact economic, social, or environmental?

If these questions, and their answers, are displayed together in three-dimensions, the result can be presented as the Sustainability Cube shown in Diagram 1 below. Considered in this way, traditional financial accounting is narrow and only addresses one ninth of the cube. It is limited to the consideration of internal, economic Balance Sheet stocks and Profit and Loss account flows. Our Financial Sustainability Accounting expands the boundaries of concern to not only include environmental and social impacts of an organisation's actions, but also the externalities that they create, and the shadow costs to the company of avoiding or restoring the impacts. This gives eighteen (3 x 3 x 2) possible ways to categorise financial sustainability accounting information.

The Guide, published in 2003, does not have a separate designation of "shadow" cost. However, we believe it is important to distinguish between actual costs which will be borne by others (the externalities) and the hypothetical "full costs" that an organisation could incur.

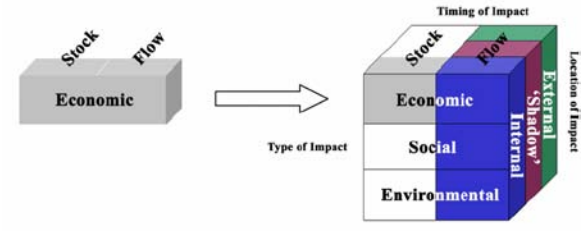

Diagram 1: The financial Sustainability Accounting Cube: from traditional to sustainability accounting

As well as expanding the Cube in order to distinguish its contents better, we have also developed a schematic to understand the place of financial sustainability accounting data with other sustainability-related information (Diagram 2).

The financial Sustainability Accounting cube organises financial data only. But financial information is only one sort of quantitative data. Other qualitative data includes indicators, and results of eco-footprinting. Therefore, the cube is within the class of quantitative data.

In turn, we assert that qualitative information is a special case of the wider qualitative accounts. We contend that the the assumptions behind the quantitative information are just as subjective as those for qualitative data, but create numbers rather than stories as the output. The full quantitative accounts form the espoused theories of an organisation: what they say about how they interact with the world. Finally, the qualitative accounts are a manifestation of the theories-in-action, the actual performance of the organisation.1

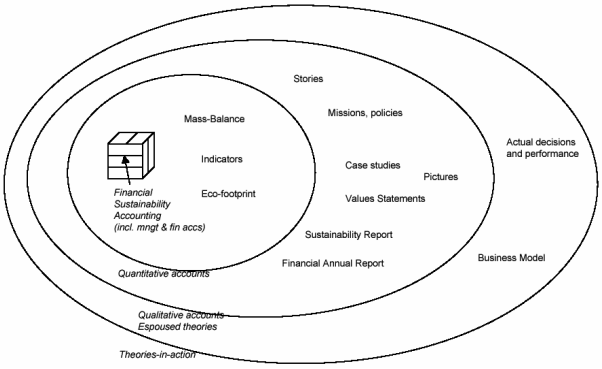

Diagram 2: the place of financial sustainability accounting data with other sustainability-related information

This way of organising sustainability information allows us to see that:

- The espoused accounts of any organisation are not the same as its actual performance, they are proxies for it. This can be summed up in the phrase "the map is not the territory".
- Differences between espoused theories and theories-in-use are opportunities to improve the very assumptions that an organisation has about the way it interacts with the world (what Argyris and Schon call "double-loop learning").

V. Different Examples of Sustainability Accounting

Looking to the Sustainability Accounting Cube, we can see different examples that relate to a financial flow

- Economic, internal flows:
  - o Traditional Profit and Loss Account, as used (with many variations) in management accounts and reported in financial accounts across the world.
  - o Economic Value Add (EVA) tables, used by SABMiller and proposed in the Global Reporting Initiative (GRI) Guidelines consultation draft (January 2006) as indicator EC1. An EVA table shows how cash is generated (from customers) and how it is

[1] The language of espoused theories and theories-in-use is taken from Argyris and Schon. See, for instance, Chris Argyris, "Teaching Smart People How to Learn" Harvard Business Review, May/June 1991

distributed to suppliers, employees, tax authorities, investors. It gives a scale of distribution.

o Further proposed GRI Economic indicators under the aspect "Economic Performance" also fit here:
- EC2: Financial implications of climate change
- EC4: Financial assistance received from government

- Social, internal flows
o Social Value Add redraws the P&L to bring out the benefits and costs of social policies, including the values which underpin the business, and activities with social intent. The Cooperative Bank has calculated the contribution to profit of its ethical stance, that is the flow to its bottom line of its social positioning.

- Environmental internal flows
o An Environmental Financial Statement redraws the Profit and Loss Account to give the historic costs and benefits of environmentally-related initiatives or projects. Baxter Healthcare is a good example. Environmental Management Accounting falls under this banner.

- Environmental shadow flows
o At Forum For The Future we have developed a technique for putting a price on how much it would cost an organisation to have no significant environmental impact. The technique was published as "Environmental Cost Accounting: An Introduction and Practical Guide" with the UK Chartered Institute of Management Accounting. A version is also available through the SIGMA Environmental Accounting Guide (on the SIGMA webste). The central insight of the method is the "sustainability gap": the difference between performance today and an environmentally sustainable level of performance. The gap is derived from the latest science or policy pronouncements. So, the Intergovernmental Panel on Climate Change (IPCC) states we will need a 60% reduction in climate change gases by 2050 from the 1990 baseline to have an acceptable level of climate change. Therefore, to a first approximation, an organisation needs to reduce its climate change gas production by 60% in order to close the sustainability gap. An organisation can choose to bridge the sustainability gap in a number of ways:
- Efficiency measures
- Using a renewable supply
- Paying another organisation to not produce the impact they would have otherwise (for instance, through carbon trading)

The shadow cost is the amount the organisation would have to pay, at current market prices, to bridge the sustainability gap.

The method relies on the following steps:
1. Define boundaries
2. Identify environmental impacts
3. Collect data
4. Construct physical accounts of emissions etc, and determine sustainability gap
5. Calculate avoidance cost

The method is used in published accounts by Wessex Water, AWG and the Natural Environment Research Council (NERC).

- External flows In the terms of the cube, any studies of externalities translates social and environmental impacts into the financial consequences. However, it is rare for companies to commission or report them specifically as part of understanding their sustainability performance. However, two examples are below:
o Sustainability Assessment Model (SAM) developed by Jan Bebbington for BP uses externalities to look at the sustainability of a project or capital investment. The SAM assesses the social, environmental, and economic impacts of a project over its full life cycle and monetises all the impacts so that they can be compared on a like-for-like basis.
o The Pharmaceutical company Novo Nordisk has considered the socio-economic impacts of individual sites on the local community as part of its sustainability reporting.
o The proposed Economic indicator in GRI EC9 Indirect economic impacts also fits in this category:

The authors know of no examples which consider the financial stocks of sustainability an organisation.

VI. LOOKING TO THE FUTURE

Since the SIGMA Sustainability Guide was published in 2003 the sustainability agenda in the UK has moved on. At that time the key focus was on risk mitigation and cost avoidance. Now, UK business leaders are moving to an opportunity agenda: how can we evolve our core business to profit and create a sustainable future?

In Forum we believe that business leaders are increasingly following Jorgen Randers dictum: "Do the profitable thing now, and do it as responsibly as possible. At the same time, press hard, on a moral basis, for making more of those responsible things more profitable in the future" (in Just Values, Forum for the Future and BT, 2003)

Sustainability accounting techniques need to keep up with this shift. The methods described in the SIGMA Sustainability Accounting Guide are historic and transaction-based: they can help management reduce costs. However, they do not help progressive managers or sustainability champions frame sustainability in terms of the profit motive. And so, they do not give Boards the means to commit to sustainability or to communicate sustainability to their investors. Without the tools to bring sustainability into decisions about the future and to communicate the value to senior managers and investors, sustainability in business will be restricted to a "compliance plus" mentality.

Fortunately, the period since the publication of the Guide has seen the bubbling up of techniques which address this gap. The shift is highlighted in the following table:

	From:	To:
Time:	Historic	Prospective
Look like:	Monthly management accounts, with costs incurred	Value at Stake, discounted cashflow or options calculations
Purpose:	Stewardship (organisation's assets and stakeholders' assets)	Capital allocation (organisation's assets and investors' capital)
Relevant departments:	Operations (such as environmental managers)	Strategy and Planning, Investor Relations
Relevant processes:	Monthly / Quarterly / Annual management performance information	Board Strategy setting, capital investment appraisals, investor presentations
Use in reporting	Performance in sustainability (all stakeholders)	Likelihood of future strategies to succeed (investors)

However, we are not faced with either techniques which focus on stewardship or approaches focused on capital allocation. Like traditional financial accounting, sustainability accounting needs different techniques for different purposes. Methods which allow managers to comply with legislation, mitigate risk and reduce costs will play their part. Methods which allow managers to demonstrate stewardship of the resources they impact are important.

However, the need of sustainability practitioners today is for tools that demonstrate the opportunity of sustainability to senior business people, and be able to communicate that opportunity to investors. Senior managers need approaches that inform them of the best way of allocating the capital they have available in terms of the return to the business (and so the investor) and to society at large.

Therefore, new approaches are being developed. One example is sdEffect (http://www.sdeffect.com/). This recent report from Yachnin & Associates in Canada calculates the contribution to share price of:

- Waste and energy reduction, translated into cost savings
- Fast tracking of a large new development due to superior community relations, leading to earlier returns
- Risk reduction at a large site due to superior community relations, leading to a reduced discount factor
- Safety record leading to reduced lost time and so to cost savings

In the UK the Enhanced Analytics Initiative (EAI http://www.enhancedanalytics.com/) is an international collaboration between asset owners and asset managers aimed at encouraging better investment research, especially that which takes account of the impact of extra financial issues on long-term investment. The Initiative currently represents total assets under management of €757 billion (US$920 billion).

EAI seeks to address the absence of quality, long-term research which considers material extra-financial issues. The Initiative incentivises research providers to compile better and more detailed analysis of extra financial issues within mainstream research. Its impact depends upon offering credible market incentives to interested and appropriate research agencies to encourage them to adapt their research process and to become more innovative. In this way the EAI is acting as a bridge from leading edge sustainability practitioners and the investors they need to encourage.

The Carbon Disclosure Project (CDP http://www.cdproject.net/) provides a secretariat for the world's largest institutional investor collaboration on the business implications of climate change. CDP represents an efficient process whereby many institutional investors collectively sign a single global request for disclosure of information on Greenhouse Gas Emissions. The latest round reports emissions of 2,994,834,887 metric tones of CO2e: or roughly 13% of total anthropogenic GHG emissions worldwide. The report also found that cost of carbon may erode annual net income by as much as 45%, depending on carbon prices, compliance periods and individual company circumstances. Conversely, carbon costs will have a net positive effect on firms with a surplus of allowances.

At Forum for the Future, our work with partners has also developed in this fashion. With ChemCo (the division of an international chamicals company) we considered the superior environmental performance of a lubricant for fridges2. The lubricant increases energy efficiency by 20%, saving the end-user energy costs and reducing the climate change impact of using the fridge. The tones of CO2 saved by this product were over 3 times the total CO2 produced by ChemCo in all its operations and manufacturing. The end-user saved some $30-70 a year from the product, but ChemCo only received $1. So, ChemCo is capturing only a small part of the value its product has to the end user. The results lead to the following strategic recommendations:

- For Product X, expand marketing offer to include the financial savings of resource productivity
- Focus R&D resources on products which increase the financial savings of resource productivity
  - o Generate more value for consumers
  - o Reduce externalities imposed on society
  - o Higher margins for ChemCo

In addition, the accounts reinforced that sustainability is an opportunity for ChemCo, not just an inevitable compliance cost.

With TourCo (a large UK-based tour operator) we

[2] To appear in Business Strategy and the Environment Sustainability Accounting special edition

undertook a large piece of work on sustainability and their strategy. In its strategic decision-making, TourCo uses Value At Stake (VAS): effectively, an evaluation of the contribution to current share-price of any initiative in order to prioritise their implementation. We took various possible scenarios relating to sustainability to show that TourCo already had a significant portion of its current share price at risk. The figures allowed us to articulate the benefits of leadership in sustainability.

VII. NO SUSTAINABILITY WITHOUT PARTICIPATION

A great deal of CSR-related activity has been based on stakeholder engagement. Stakeholders are usually defined as anyone who is affected by or who affects an organisation. In an ideal world, involving stakeholders in an organisation's business process can lead to management having access to better information on how they are perceived, and be able to react quicker than their rivals in a complicated world. In this ideal setting, stakeholder engagement is part of negotiating the license to operate: defining the range of activities an organisation can undertake in delivering its mission.

However, little stakeholder engagement currently reaches this ideal. In many circumstances there are legitimate questions of whether the stakeholders are being deceived and co-opted, plus basis of the engagement is often perceived as "fluffy".

At Forum we have developed a technique we call "participative accounting". The intent is to provide substantive data for the stakeholder engagement, and a means to really draw out the different underlying assumptions of the participants.

For an industry or company a figure for the associated externality is obtained. Then, the different stakeholders are approached with two questions:

1. How do you believe responsibility for this cost should be allocated between the different parties?
2. What would the different parties need to do in order to discharge their responsibilities, in your eyes?

The first question allocates an externality to different parts of the supply chain (including the end consumer). The second describes the "responsibility gap": the difference between the current level of performance and a level which would be considered responsible.

The final step is to bring the different stakeholders together, so they are exposed to the many different viewpoints. The ultimate aim is to try to create a consensus of what needs to be done by all the parties to discharge their responsibility.

We undertook this with AlcCo, an alcohol producer in the UK[3]. The results of the financial calculations are secondary to the changes brought about by deeper stakeholder engagement. The process of the stakeholder engagement changed perceptions in the company of whether they could be responsible and how. They have since changed their marketing messages away from a laddish attitude (where drinking is associated with social or sexual success) to focusing on the quality of the drink: the largest step requested by the stakeholders.

VIII. CONCLUSION

The SIGMA Sustainability Accounting Guide articulated our thinking in 2003. It remains broadly useful, with a slight updating of the cube and an acknowledgement of the shift in sustainability accounting. Into the future sustainability accounting will need to create techniques that:

- Understand the audience (internal managers or external stakeholders, including investors?)
- Use the process of how the accounts are generated as part of achieving change (for instance, through experts alone or with stakeholders?)
- Match the purpose of the decisions being made (stewardship or capital allocation?)
- The unit of sustainability (individual organisation, the sector or the whole system?)

Sustainability accounting must be about having the right method to generate the right information for the right people at the right time for the right decision. The frontier of prospective information needed for strategic decisions is the latest step. Creating accounting information which makes the sustainable (or otherwise) dynamics of the whole system apparent is beyond even that.

Nevertheless, the techniques highlighted above are part of giving organisations the information they need to participate in creating a sustainable society.

[3] Appearing in EMAN 2004 conference proceedings.

Environmental Management Systems as Basis for Successful Sustainability Reporting in VERBUND

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I. INTRODUCTION

In Austria, VERBUND operates 108 hydropower plants (in seven plant groups), 4 thermal power plants and the supra-regional, high-voltage grid which extends over approx. 3,510 km. The group covers ca. 50 % of domestic demand for electricity and has approx. 2,500 employees.

At VERBUND, reporting on environmental issues enjoys a long tradition. In addition to the reports on environmental data required by the authorities, the company has worked continuously on the development of a group-wide environmental management and information system since **1994**. Since the introduction of this system, environmental reports have been drawn up on an annual basis. In these reports, environmentally relevant variables are indicated on the basis of parameters which were developed in close cooperation with Federal Environmental Agency. The standards laid down in the EMAS Directive, which had not yet been enacted, were also considered. In fiscal **2002**, the Environmental Report was replaced with the Sustainability Report, which is also published annually.

Verbund's environmental management system (EMS) orientates on the group's environment strategy plan and plays a decisive role in improving environmental performance in a sustainable manner. The development of innovative, interdisciplinary approaches and their subsequent implementation represents one of the central tasks in the environment area. In compliance with the international standards, the Sustainability Report focuses not only on environmental issues but also embraces economic and social affairs.

II. EMS WITHIN VERBUND – CHRONOLOGICALDEVELOPMENT

In **1995**, a decision was taken to implement the power plants and facilities of Verbund in the environmental management system in accordance with EMAS and ISO 14001. In **June 1995**, the **steam-generating power plant Voitsberg** was the first Verbund plant to be implemented in the system.

When the **Upper Drau run-of-river power plants** were audited for the first time in 1996, it was possible – for the first time in Europe – to audit the run-of-river plants as one location in accordance with EMAS.

In **1997**, a decision was taken to integrate all other plant types of VERBUND into the environment management system in accordance with EMAS and ISO 14001 within the framework of a **type scenario**. Following the integration of **substation Tauern** in **1998** and the **storage power plant group Glockner- Kaprun** in **2000,** the type scenario was completed in **2001** with the integration of the **Danube power plant Freudenau**. Evidence could now be furnished that systems such as this can be used for all plant types within the group. **Location expansions** have been carried out on an ongoing basis since **2002**.

At present, 58 plants are certified **in accordance with ISO 14001** and **27 of these plants** are also **certified in accordance with EMAS.**

ISO 14001	thereof also EMAS	
53	22	Hydropower plants in 4 plant groups
4	4	Thermal power plants
1	1	Grid facility

Based on the standard capacity in accordance with **ISO 14001**, certified hydropower plants account for **39.1 %** of generation. The share for plants certified in accordance with **EMAS** comes to **31.7 %**. The corresponding shares of generation for steamgenerating power plants come to **100 %** in each case.

The following location expansions are planned for **2006**:

Lower Danube power plant group
(4 →5 power plants)
Glockner-Kaprun storage power plant group
(3 →7 power plants)
Drau run-of-river power plant group
(7 →10 power plants)
Grid facilities area

Based of an United Nations protection, Division for Sustainable Development, Working group Environmental Management Accounting, since **2003** environmental costs will be determined. With this uniform calculation now systematic comparisons of annual environmental costs are possible.

III. BENEFITS

The development and continuous operation of an environmental management system sensitizes the employees and increases their environmental awareness. The existence of a tried and tested environmental management system gives the group a competitive edge. The greatest benefits are, of course, derived by the environment, the local population and the company itself, the operator of the plants. A functional environmental management system enhances generation and cost efficiency. While the electricity market was in a state of transition – key words here include liberalization and deregulation – and companies had to contend with new conditions and organizational changes, this instrument made it a lot easier to execute tasks that arose within the framework of the company's responsibilities. One development that bears mentioning in this context is the **database application "Forelle"** which was introduced in **2003**. With this application it is possible to monitor and update the observance of standards arising from laws, decisions and internal stipulations in online operation.

This organizational benefit also has a positive external effect. The corporate image is greatly boosted and the trust that is placed in the company by the authorities and neighboring municipalities is strengthened through the publication of environmentally relevant data. Since **2004**, all environmental declarations have been published – in a uniform structure - on the Verbund homepage.

Moreover, when a company is being evaluated by the capital market, the existence of an environmental management system that has been successfully implemented for many years, the presentation of measurable and logical environmental performance together with the environmental security that is derived therefrom and ongoing improvement represent decisive quality criteria.

IV. FROM ENVIRONMENT REPORT TO SUSTAINABILITY REPORT

VERBUND was awarded the AERA 2000, the environmental award of the Chamber of Chartered Certified Accountants for the best Environmental Report in **2000**. Here, the individual parameters namely, energy efficiency, emissions avoidance and the actual environmental situation, were, according to the jury, portrayed in an excellent manner.

In an international corporate responsibility rating of ecological and social aspects carried out by oekom research AG, VERBUND was ranked No. 1 in the environmental area in **2001** from a total of 20 energy utilities in the water and electricity area. In **2004**, VERBUND was ranked No. 2 in the environmental area from a total of 37 international applicants. On both occasions, the jury underscored the fact that Verbund had already been publishing environmentally relevant data in its Environmental Report for several years (EMS, production structure, environmental effects such as emissions).

In the last years, international stock markets have introduced a number of indices for sustainable companies. Here, environmental and social aspects were added to the purely economic criteria normally used to evaluate a company. Rating agencies use extensive questionnaires to investigate the performance of companies in the three areas of sustainability (economy, environment and social affairs). The evaluation of these rating agencies forms the basis for the inclusion of companies in stock market indices and sustainability funds.

In **2002**, the Verbund share was included in FTSE4Good, the sustainability index at the London Stock Exchange. One criterion that companies must meet to remain in this index states that "one third of the plants must be certified in accordance with EMAS or ISO". This fact alone underlines the importance of the EMAS audits and ISO certification for Verbund. When completing the questionnaires one can always refer to the facts and figures gathered within the framework of the EMS. In addition to guaranteeing a high level of data security this also saves a lot of time.

V. MOTIVES BEHIND THE PREPARATION OF A SUSTAINABILITY REPORT

- **Investors and analysts** expect companies to provide information that extends beyond financial and environmental reporting. Our stakeholders require that the company be presented in a uniform and integrated manner and that social aspects be included. This development is attributable to the realization that the future of a company and its eaening power depend on a number of factors that extend well beyond purely economic considerations.
- Since it was founded approx. 60 years ago, Verbund has focused intensively on guaranteeing a **sustainable electricity supply**. Given that 90 % of our generation comes from environmentally friendly and regenerative hydropower, sustainability plays a decisive role within the group. This is one of the reasons why Verbund was and still is a trailblazer in the area of sustainability reporting.
- **Sustainable companies are top performers** on the stock markets and generate higher returns over the long term. Greater transparency, an intensive focus on the issue at hand and the overall presentation of all relevant details promote the development of the company in the direction of enhanced sustainability.
- By communicating our performance in the area of sustainability, we are improving our **image** and strengthening the relationship that has been established with out most important stakeholders.
- The Sustainability Report is also an important **medium for internal communication**. Employees are keen to work in a sustainable company and sustainability also plays an increasingly important role when recruiting new staff.

VI. THE CONCEPT BEHIND THE VERBUND SUSTAINABILITY REPORT

When preparing the first Sustainability Report, a project organization, which comprises the Sustainability Board and the Sustainability Committee, was set up.

The Sustainability Board, which is in charge of preparing the decision-making process, reports directly to the Managing Board. The Sustainability Committee coordinates the implementation of the sustainability activities and prepares the Sustainability Report. The committee comprises experts for social affairs, the environment, the economy and communications as well as representatives of the larger group subsidiaries. This guarantees that all of the relevant issues and areas of activity are addressed. This is of great significance, particularly when identifying issues that should be covered in the Sustainability Report. We feel that the Sustainability Report should include all sustainability aspects that are important from a company viewpoint and also all points that are relevant for the stakeholder. In the three reports that have been published to date – each with a maximum of 70 pages – our expositions were compact and very readable.

The Verbund Sustainability Report is published annually and focuses on the activities of the company from a sustainability perspective. It supplements the Annual Report and, for organizational reasons, is released approx. four months after the Annual Report. At the present time, Verbund has opted not to issue an integrated report, not least due to the vast amount of information that needs to be imparted and the fact that the contents of a summarized report would inevitably be less addressee-specific.

When preparing the report, the requirements of our stakeholders and, in particular, those of the capital market and the rating agencies are taken into account. We distribute the Sustainability Report to approx. 3000 addresses spread over various target groups and also enclosed a questionnaire with last year's report. In addition, we conducted personal, qualitative interviews with 20 internal and external stakeholders to identify the expectations they have of our Sustainability Report.

When preparing the Sustainability Report we adhere to the guidelines of the Global Reporting Initiative from **2002**. Approx. 100 indicators from the three areas economy, environment and social affairs form the core of these guidelines. As mentioned above, the data material from the environmental management system EMAS and ISO 14001 formed an important basis for the definition of the environmental parameters. The Global Reporting Initiative has been working on the creation of new guidelines for sustainability reporting for two years. The new draft accommodates the requirements of the rating agencies to an even greater extent.

Since **2003**, our reports have been certified by an independent, external auditor.

VII. PRIZES FOR THE VERBUND SUSTAINABILITY REPORT

The VERBUND sustainability reports published in **2002** and **2004** each won the 1st prize at ASRA, the Austrian Sustainability Reporting Award. This award is launched by the Austrian Chamber of Certified Accountants in cooperation with the Austrian Business Council for Sustainable Development (ABCSD), the Lebensministerium, the Association of Industry and the Federal Environmental Agency for the best sustainability reports from Austrian companies.

This confirms our strategy of using the solid and extensive database from ISO 14001 and EMAS as a basis for our sustainability reporting.

Sustainability, product aspekts and reporting: Key issues for EMAS-Revision

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The main findings of the EMAS evaluation conducted in 2005 confirmed on one hand that the scheme is widely perceived as a useful support for policy makers, regulators and other institutional and economic actors, that it does improve the environmental performance of participating organisations and provides considerable benefits to them in terms of better monitoring and management of compliance with environmental legislation. On the other hand however, market penetration of the scheme is not reaching its full potential because existing and would-be participants are sometimes deterred by the current lack of competitive reward (market response, recognition by public institutions, etc) when joining the scheme.

While it is too early to "sketch out" the detailed changes that will be brought to the EMAS Regulation, we can foresee that, following the principles of better regulation, the main directions for the revision of the scheme will be: a clearer positioning of the scheme as 'the' standard of excellence by strenghtening its key pillars which are performance (legal compliance and environmental performance improvement), credibility (external verification) and transparency (reporting); a simplification for the implementation of the scheme so as to make it more attractive for SMEs; the provision of truly meaningful incentives to participating organisations; an internationally recognised scheme and an optional product and CSR dimension to the scheme.

Following the scheme's evaluate on last year, the revision of the EMAS Regulation is starting in the beginning of 2006. The European Commission will make a proposal for a revised EMAS Regulation (including a full stakeholder consultation and impact assessment) in the beginning of 2007, which will then be discussed and agreed by the European Parliament and Council of Ministers, possibly in 2009.

Sustainable Industries
UNIDO´s approach

Petra Schwager
UNIDO

United National Industrial Development Organization

Sustainable Industries

UNIDO's Approach

1

United National Industrial Development Organization

AGENDA

- UNIDO in general
- Cleaner and Sustainable Industrial Development
- UNIDO's Worldwide Cleaner Production Programme
- Sustainable Industrial Resource Management (SIRM)
- Chemical Leasing

2

UNIDO in general

BACKGROUND

UNIDO was set up in 1966 and became a specialized agency of the United Nations in 1985.

As part of the United Nations common system, UNIDO has responsibility for promoting industrialization throughout the developing world, in cooperation with its 171 Member States.

Its headquarters are in Vienna, and it is represented in 35 developing countries.

3

UNIDO in general

VISION

To improve the living conditions of people and promote global prosperity through offering tailor-made solutions for the sustainable industrial development of developing countries and countries with economies in transition.

4

UNIDO in general

MAIN AREAS

(a) Strengthening industrial capacities, including programmes in support of the global forum function and policy advice; and

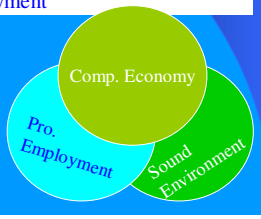
(b) Technical cooperation activities to promote Cleaner and Sustainable Industrial Development.

5

Cleaner and Sustainable Industrial Development

Productivity Enhancement for Social Advance:

- Competitive Economy
- Sound Environment
- Productive Employment



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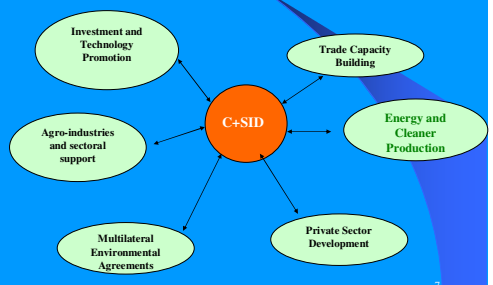
Cleaner and Sustainable Industrial Development



7

UNIDO's worldwide CP Programme

SERVICES

National Cleaner Production Centres and Programmes are set up with the support of existing local institutions to deliver:

- Awareness-raising on the benefits of CP;
- Training of experts on CP and related issues;
- Technical assistance to companies;
- Assistance in development of investment projects:
- Policy advice to national and local governments

UNIDO's worldwide CP Programme

Sustainable Industrial Resource Management

MEANS

•Sustainable Industrial Resource Management (SIRM) aims at the implementation of circular material and energy flow in the entire production chain to achieve "zero waste" and enable efficient material and energy use;

•Closing-the-loops in selected industrial sectors;

•Change in the relation between manufacturer and user, where manufacturers shift from selling products to supplying services;

•Substitution of non-renewable energy sources with renewable ones.

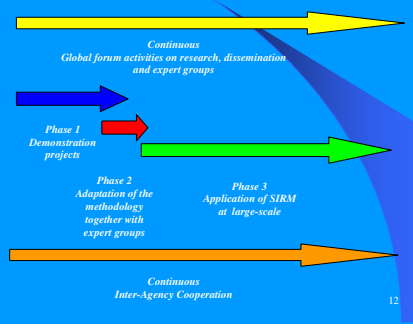
UNIDO's worldwide CP Programme

- Since 1994: Establishment and management of National Cleaner Production Centres and Programmes in 35 countries.
- The aim of the National Cleaner Production Centres and Programmes is to promote UNIDO's services on sustainable industrial development to enhance the competitiveness and market access of industry, primarily SMEs, in developing and transition countries.

8

The way forward to promote SIRM

SIRM

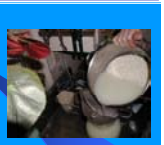


12

UNIDO SIRM initiatives

PROJECTS

Regional SIRM project for Central America: Closing-the-loops in the dairy sector



Closing-the-loops in priority industrial sectors in Nicaragua, with special focus on renewable energy.

Chemical Leasing

Chemical Leasing

ACTIVITIES

Implementation of demonstration and training projects in cooperation with three NCPCs (Egypt, Mexico and Russia – St. Petersburg).

During first year of project: 20 companies involved

International multi-stakeholder working group, with representatives of: industries, consultants, governments and quality assurance institutions.

Development of toolkit and instruments to support the global implementation of Chemical Leasing business models.

New SIRM initiative: Chemical Leasing

AIM

Service oriented business strategy that shifts the focus from increasing sales volume of chemicals towards a value-added approach. The producer mainly sells the functions performed by the chemical and functional units are the main basis for payment (e.g.number of pieces cleaned).

The responsibility of the producer and service provider is extended and may include the management of the entire life cycle.

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Thank you for your attention

16

Factory of Tomorrow: The Green Bio-refinery

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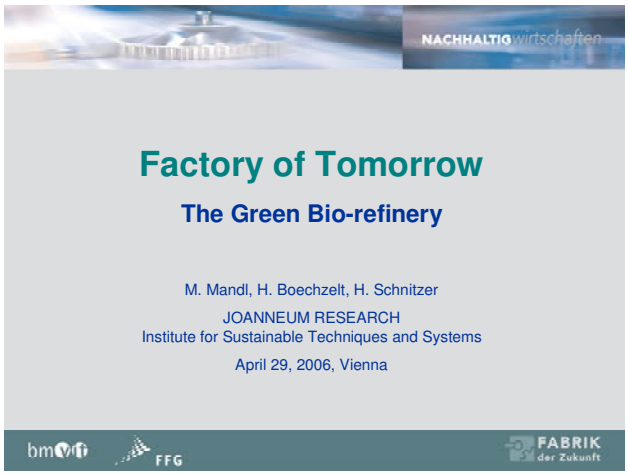
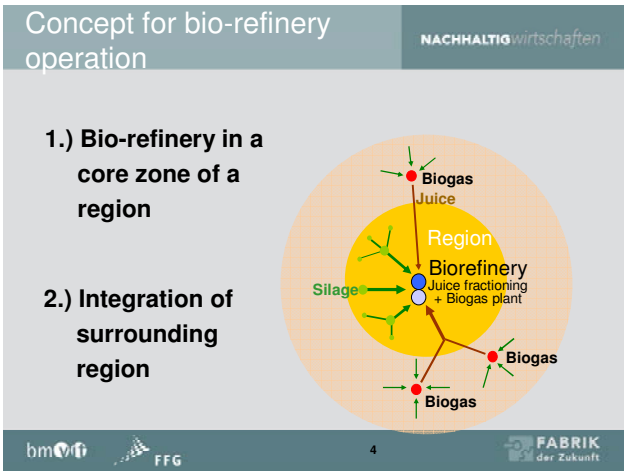
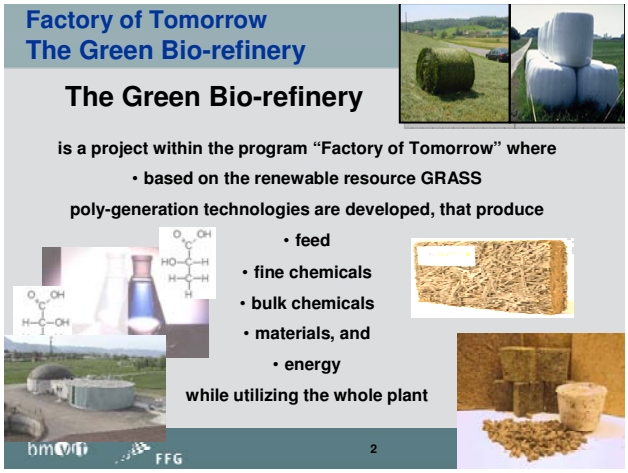
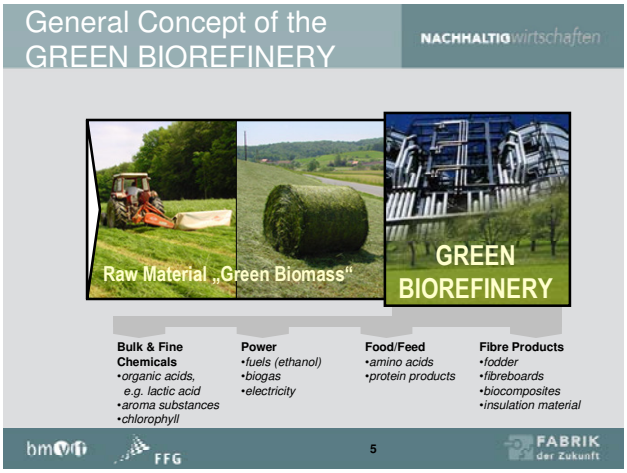
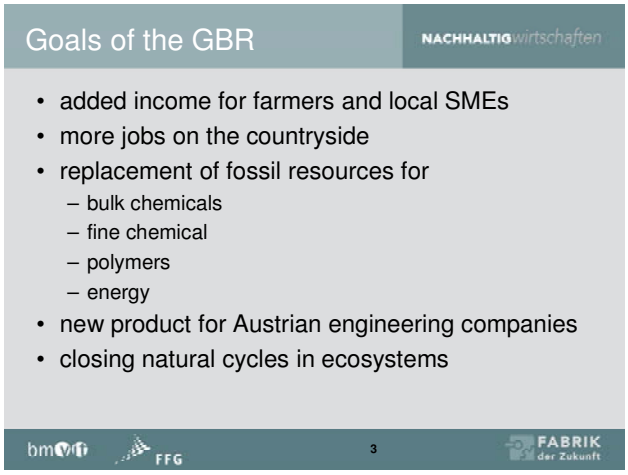
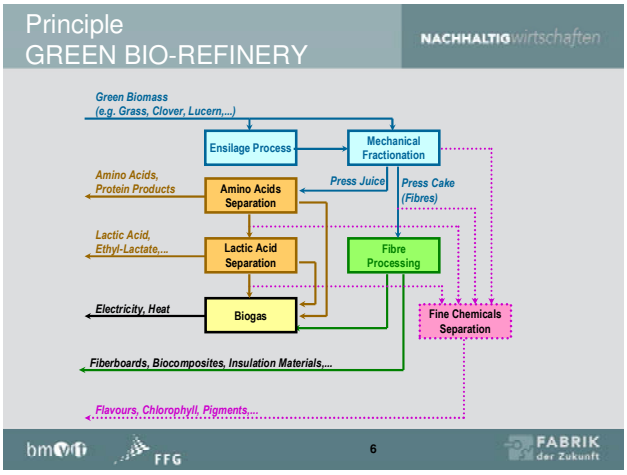






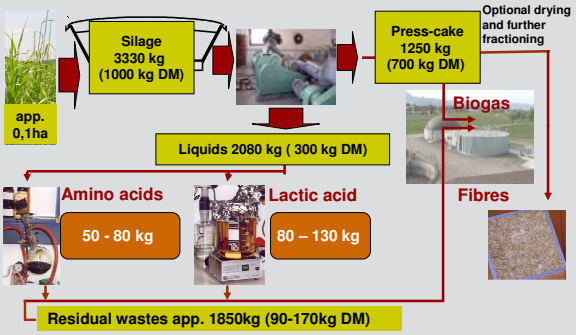






Mass Balance - Overview

NACHHALTIG wirtschaften

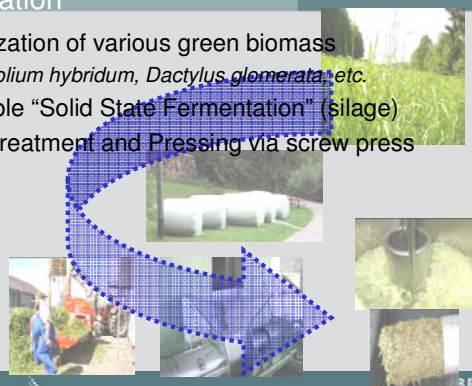


bmvit FFG 7 FABRIK der Zukunft

Raw Material and Separation

NACHHALTIG wirtschaften

- Utilization of various green biomass
  - *Lolium hybridum, Dactylus glomerata, etc.*
- simple "Solid State Fermentation" (silage)
- Pretreatment and Pressing via screw press



bmvit FFG 8 FABRIK der Zukunft

mechanical fractioning

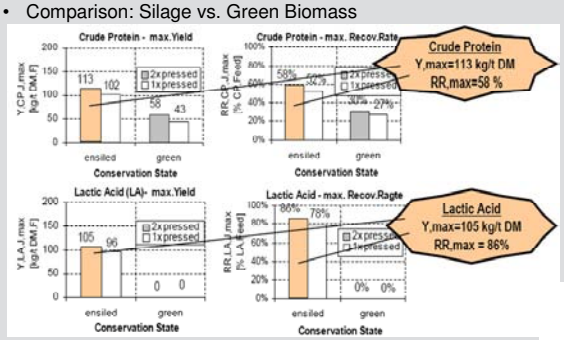
NACHHALTIG wirtschaften

bmvit FFG 9 FABRIK der Zukunft

Raw Material and Separation

NACHHALTIG wirtschaften

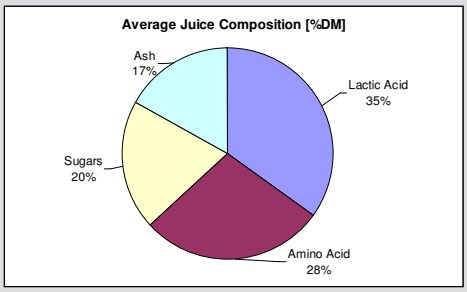
- Comparison: Silage vs. Green Biomass



bmvit FFG 10 FABRIK der Zukunft

Raw Material and Separation

NACHHALTIG wirtschaften

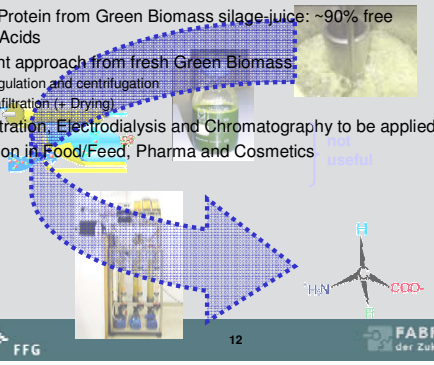


bmvit FFG 11 FABRIK der Zukunft

Liquid Separation and Processing

NACHHALTIG wirtschaften

- Protein/Amino Acids
  - Crude Protein from Green Biomass silage-juice: ~90% free Amino Acids
  - Different approach from fresh Green Biomass:
    - Coagulation and centrifugation
    - Ultrafiltration (+ Drying)
  - Nanofiltration, Electrodialysis and Chromatography to be applied
  - Utilization in Food/Feed, Pharma and Cosmetics

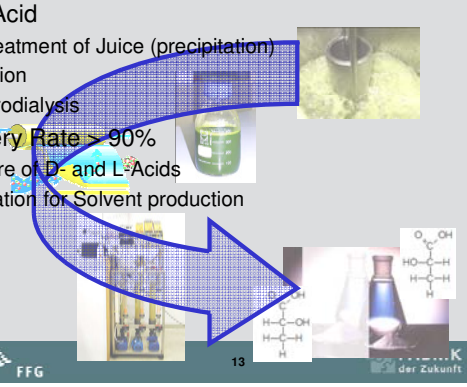


bmvit FFG 12 FABRIK der Zukunft

Liquid Separation and Processing

NACHHALTIG wirtschaften

- Lactic Acid
  - Pretreatment of Juice (precipitation)
  - Filtration
  - Electrodialysis
- Recovery Rate > 90%
  - Mixture of D- and L-Acids
  - Utilization for Solvent production

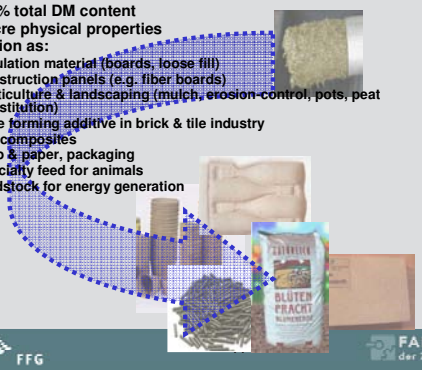


bmvit FFG 13 FABRIK der Zukunft

Solid Fraction Utilization

NACHHALTIG wirtschaften

- Presscake
  - **~50-60% total DM content**
  - **Mediocre physical properties**
  - **Utilization as:**
    - **insulation material (boards, loose fill)**
    - **construction panels (e.g. fiber boards)**
    - **horticulture & landscaping (mulch, erosion-control, pots, peat substitution)**
    - **pore forming additive in brick & tile industry**
    - **bio-composites**
    - **pulp & paper, packaging**
    - **specialty feed for animals**
    - **feedstock for energy generation**



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Possible fibre products

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Current Developments and Outlook

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- Feedstock needs Quality Control
- Optimization of mechanical separation process completed
- Down stream processing of liquid fraction in lab scale, further optimization necessary
- Multiple utilization options for fibrous material
- Energy generation via biogas as integral part of the Biorefinery
- Preliminary economic evaluation for pilot scale plant positive
- Search for investors/consortium for implementation of pilot plant

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Factory of Tomorrow Green Bio-Refinery

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Next steps

- **optimizing the separation**
- **first proto-type installation**

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Acknowledgements

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- Company Partners:
  - VTU Engineering
  - Gradient GmbH
  - Herneth Gartenbau
  - Aquasol Handelsges.m.b.H
  - Hydrogreen
- Cooperation Partners
  - BiorefSYS Biorefinery Systems (Dr. Kromus)
  - BOKU- Inst. f Lebensmitteltechnologie (Dr. Prof Novalin)
  - IFA Tulln; Abt Umwelt Biotechnologie (Dr. Neureither)

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Factory of Tomorrow: Wood Plastic Composites

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Factory of Tomorrow
Wood Plastic Composites
NACHHALTIG wirtschaften

Synopsis

Elimination of the weak points in the economical successfull production of wood plastic composites

Systematic study on structure-property-relationships of high filled wood plastic composites based on polyolefins.

Development of a new dosing and feeding-system for loose wood fibers – direct extrusion

Development of extrusion tool for high filled WPC`s with high extrusion speed

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Wood Plastic Composites
NACHHALTIG wirtschaften

State of the art at project start

- **No systematic work on structure-property relationships**
- **Wood content < 70%**
- **Wood pellets, not fibers (problem with feeding)**
- **Tool design only for WPC <60% wood**

2 technical problems and systematic R&D work

3 linked projects

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Wood Plastic Composites
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Project Partners

Project Coordination
Transfercenter for Polymer Technology

Scientific Partners
Johannes Kepler University, Linz
Competence Center Wood, Linz

Industrial Partners
Cincinnati Extrusion GmbH, Vienna
Greiner Extrusionstechnik GmbH, Nußbach
GriffnerHaus AG, Griffen
IFN, Internorm Bauelemente GmbH, Traun
Trodat GmbH, Wels

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Wood Plastic Composites
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Objectives

- **Systematic work on the formulation-property-matrix (based on PO)**
- **Optimization of the properties and standardization of the woodfibers**
- **Development of new processing technologies (direct feeding and dosing of fibers)**
- **Optimization of the extrusion tool**
- **Creation of the necessary technological and material Know-how for the production of competitive products**

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Results

Development of a profile – sole plate for prefabricated houses

Multifunctional
Outside wall
Inside wall
New heating system

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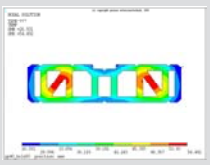
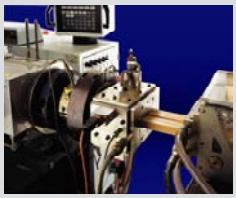
Wood Plastic Composites
NACHHALTIG wirtschaften

Results

Extrusion tool





Broad processing window (60-90% wood)
Up to 3 m/min

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Results

Direct extrusion feeding equipment

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Results

Systematic knowledge of the influence of

- **Wood - content**
  fiber geometry
  type
- **Polymer (Polyolefins)**
- **Coupling agent**
- **Processing conditions**

on the mechanical properties of WPC`s

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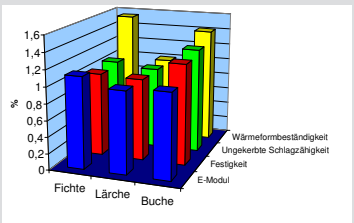
Results



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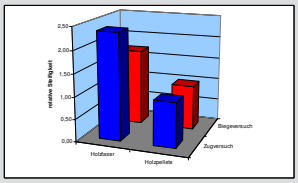
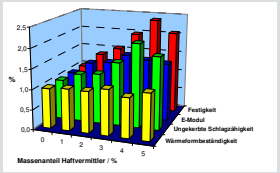
Results





Factory of Tomorrow Wood Plastic Composites

NACHHALTIG wirtschaften

Results

Factory of Tomorrow Wood Plastic Composites

NACHHALTIG wirtschaften

Future development

TCKT has at the moment more than 40 clients (worldwide) in R&D for WPC

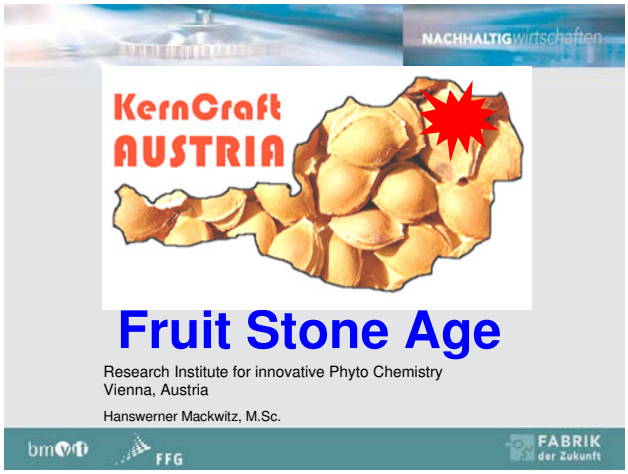
TCKT has started 16 projects in NFC (extrusion and injection molding) since 2003

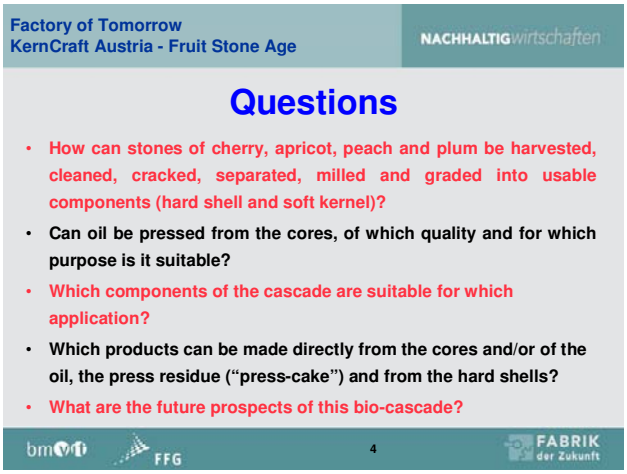
Greiner has sold more than 60 WPC-extrusion tools

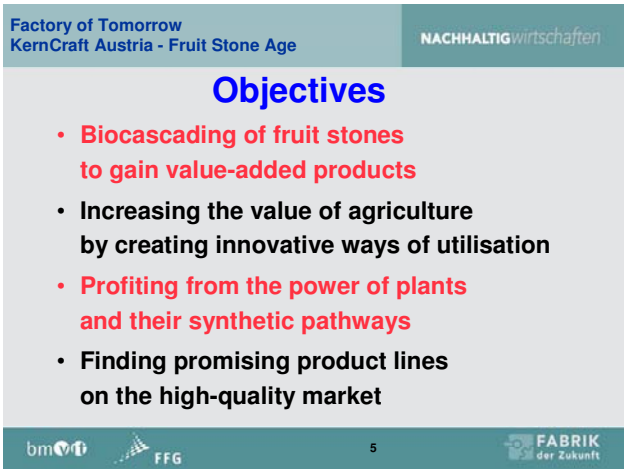
Cincinnati has sold more than 100 extruders for WPC-extrusion

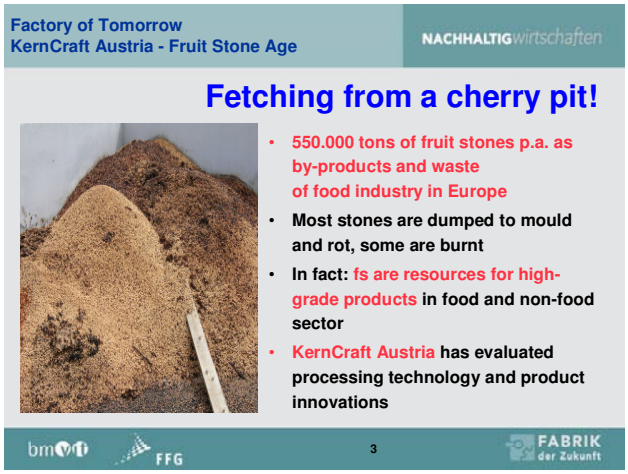
Factory of Tomorrow: Fruit Stone Age

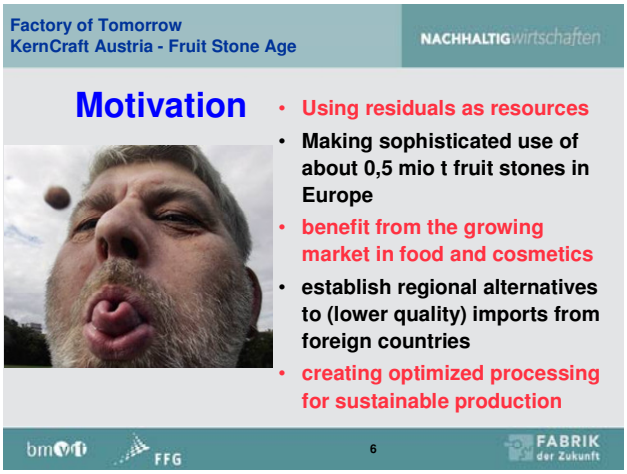
Hanswerner Mackwitz
Research Institute for innovative Phyto Chemistry
Obere Viaduktgasse 2/29, 1030 Vienna, Austria
Tel.: +43-(0)1-810 1000 Email: office@alchemia-nova.net











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KernCraft Austria - Fruit Stone Age
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Project Topics

- Evaluation of quantities and location of fruit stones (regional and European level)
- Characterization of hard shell and kernel (physical and chemical)
- Design and evaluation of product innovations
- Networking und making of partnerships
- Development of processing technology including upgrading to pilot scale
- Implementation of structures for the long term utilisation of fruit stones

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Project Partners

Degussa Fluidverfahren-stechnik	degussa. creating essentials	Extraction of aroma components
Farthofer Edeldestillerie		Destillery
LFS Tulln	Fachschule Tulln	Agricultural School
Vulcolor Naturfarben		Extraction of Natural Colours
Ölmühle Fandler	Ölmühle Fandler	Oil-Mill

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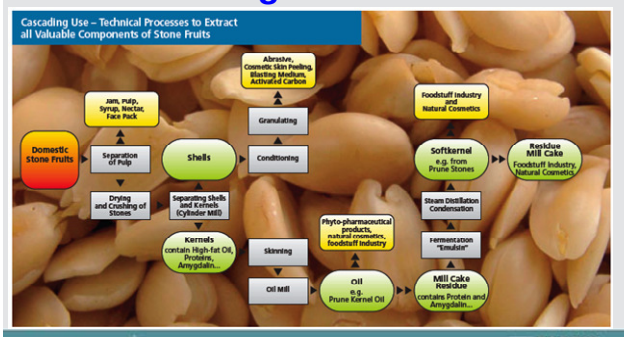
Cascading Fruit Stones



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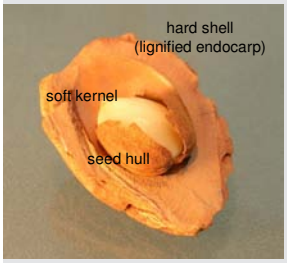
Nawaro Cascading (precurser project)



- analysis of fruit stone quantities and distribution
- drying, breaking, separation of fs and oil-milling on lab-scale
- chemical analysis of constituents (fatty acid spectrum, amygdalin, protein, carbohydrates etc.)
- physical characterization of hard shell
- development of product ideas and first samples

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Project Partners

Cimbria Heid	CIMBRIA	Processing Equipment
Helms Technologie	HELMS TECHNOLOGIE GMBH	Processing Equipment
Sanoll Naturkosmetik	SANOLL BIOKOSMETIK	Natural Cosmetics
Zotter Schokoladen Manufaktur	zotter SCHOKOLADEN MANUFAKTUR	Chocolate Delicacies

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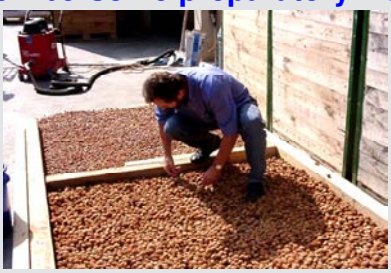
Cumbersome preparatory work



- Drying of fruit stones in the Austrian sun
- Sorting out all moldy specimens

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Important !

Aflatoxin is not tolerated - only the good survive!

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Stones must be cracked

But a cylinder mill is absolutely inappropiate for this job !

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Learning by doing

- **Inspite of much and many disappointing experiments -**
- **keep your frustration tolerance high !**

Too many soft kernels destroyed most separation technologies failed

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Gravity separation trial with sodium chloride solution

Not really a mind-boggling success story

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Light bulb moments

Ingenious cracking apparatus
friendly encouraged by Robert Fandler+, oil milling expert of Styria

- **Two abrasive belts mount stationary and firmly fixed combined with a skewed channel of a metal sheet -**
- **Plum pit should be cracked when the abrasive belt machine moves slowly - but it was not cracked - it was seized up und stank tremendously because of friction heating**

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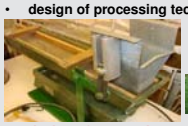
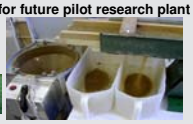
Nawaro Cascading Pilot

- **processing trials with different kinds of machinery**
- **comparison of processing technology**
- **design of processing technology for future pilot research plant**





- **design of processing technology for future pilot research plant**
- **evaluation of economic parameters and constraints**
- **market investigations**
- **further product explorations**

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Deliverables

- hard shells "micronised"
- serve as filler for polymers
- Polishing-creams
- technical abrasive for delicate surface cleaning
- dental abrasive
- bio-pellets for clean bio-energy

- clean soft kernel
- high-value ingred. sweets and chocolate industry
- marillo-, cherrypan
- high-price aromatic edible oils
- Press cake for muesli bars and
- natural essence
- cosmetic and nutraceutical ingredients

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Technical Abrasives

before abrasion

- Corroded metals (brass, steel, aluminium), grounded iron and varnished wood

after abrasion

- Cleaning of wood and aluminium
- for antiques and other special applications

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Kernel Oil

- Kernel Oil with outstanding characteristics
- special taste
- healthy fatty acid spectrum
- no amygdalin (well below critical value of 50 ppm)
- approved by EU
- food and cosmetic applications for high quality sector

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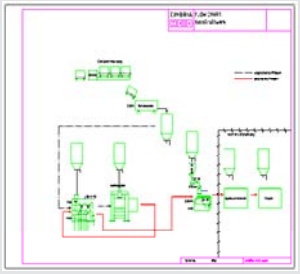
Pilot Plant

- Separation of molded and broken fruit stones (optical sensors)
- Drying (hot air)
- Cleaning (brushing machine)
- Calibration (sieving machine)
- Breaking (roller mill - adaptable to stone size)
- Separation of kernels and hard shell particles (sieving machine and gravity separator)
- Fine-Separation (optical and ultrasonic sensors)



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Cosmetics and Delicacies

Natural Body Lotion

- Natural emulsifier: cherry kernel presscake
- Oil component: cherry kernel oil

Muesli Bar

- Crispy, aromatic component: apricot presscake
- For a special mouth-feeling

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KernCraft Austria

- 2 more years of research to optimize machinery and processing parameters
- Upscaling to more than 200 tons of fruit stones (for economic processing) not possible at the moment

- Product development
- Quality Management
- Logistics
- More networking

- ... powered by investors

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Factory of Tomorrow: Environmentally acceptable resin impregnation of electrical machines using heat by current

Walter Schmidt
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Email: walter.schmidt@elinebgmotoren.at

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Factory of Tomorrow

Environmentally acceptable resin impregnation of electrical machines using heat by current

Walter Schmidt
ELIN EBG Motoren GmbH
April 29, 2006, Vienna

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Objectives

- Reduction of organic emissions
- Improvement of working conditions for operators
- Reduction of energy consumption
- Improvement of impregnation quality
- Reduction of process times

Synopsis

The windings of electrical machines and generators (e.g. wind and water power generators) have to be embedded into a resin matrix.

Why impregnate at all?

- Mechanical and environmental protection
- Immobilisation
- Better heat conduction
- Improvement of the insulation strength

A new procedure has to be examined, to reduce organic emissions during the process and improve the quality.

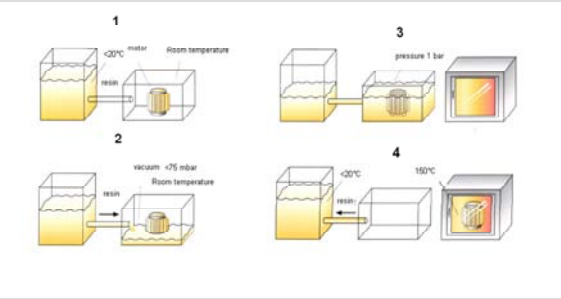
Important members of the project organisation

ELIN EBG Motoren GmbH
- Project management
- Mechanical and thermal calculations
- Production of testing machines and prototypes

Technical University of Graz
Institute of electrical machines and propulsion technology
- Technical support and calculation

Suppliers
Gottlieb Thumm GmbH
- Development of the new technology
- Design of the current UV installation

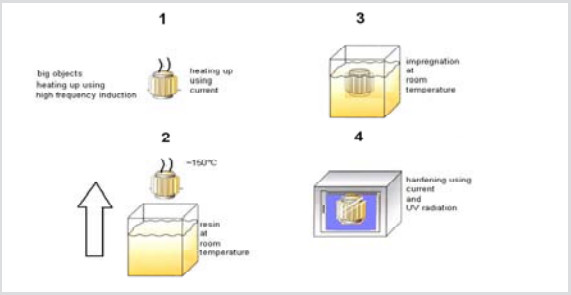
State of the art – vacuum pressure impregnation - VPI



Progress of work

- Technical and economic evaluation of a new technology (Heating by current)
- Possible match of different resins for the new technology
- Concepts for hardening of resin at parts of the machine, which are not current-flown
- Investigation of the application not only for random wound coils but also form wound coils

Result: New Technology - Current UV Impregnation



Benefits

- Reduction of the complete organic emissions by 70%
- Reduction of the processing time by 90%
- Reduction of the energy consumption by 70%
- New low-emission resins are available and can now be used
- For resins with solvent, reduction of emissions by 75% are feasible

Future development

- Adaption for rotor impregnation
- Adaption for high voltage machines using epoxy resin
- Upgrade of the facility for further impregnation vessels
- Possible impregnation with silicone resins

contact data

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A Dialog on Tomorrow's Solutions for „Sustainable Industries" World Cafe Style

Report Session 8

Facilitators: Heinz P. Wallner, Kurt Schauer

Introduction to the "World Café" Dialogue

Impulse-Statement:
Sustainable Industries - Solutions of Tomorrow
Helmut F. Karner, Management Consultant

"All-in-one-room" Meeting in World Café Style:

- Five working groups at five tables
- Two short sessions (30 minutes) for brainstorming at tables
- short presentations (3 Min.) of most important results (Table Hosts)

What was the Goal?

A Dialogue on "Tomorrow's Solutions" for European Corporate Sustainability Concepts

- starting from existing concepts and ideas,
- and than drawing a bow to tomorrow's solutions with interactive dialogues

What was the method based on?

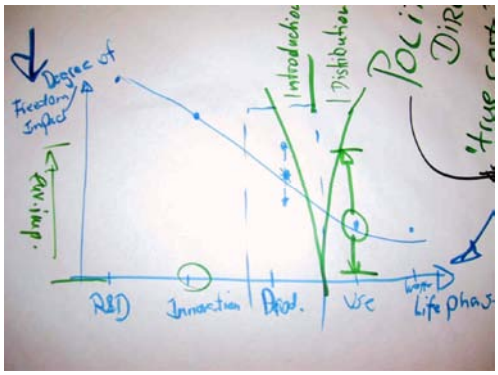
- Participants had the possibility to contribute to almost all question being dealt with at three different tables.
- The World Cafe is more than just a methodology bringing people together and to harness the collective knowing on a topic.
- It is also the means by which we can edge our way through the doorway into a brighter future.
(see: www.theworldcafe.com)

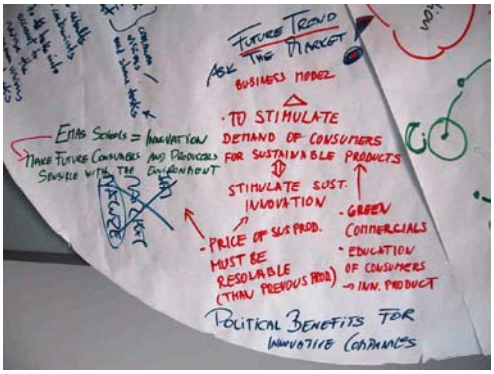
Tables + Hosts + Theme

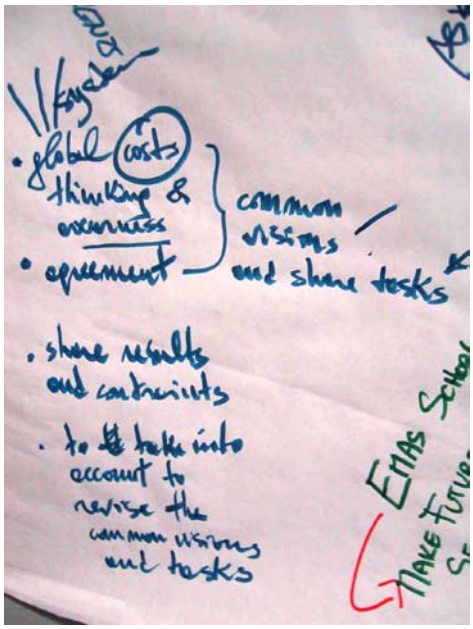
Table	Host	Theme
1	Wolfgang Wimmer	Sustainable Innovation and Technology
2	Sabine List	
3	Stefan Gara Martina Göd	EMAS and sustainable management systems
4	Hans Schnitzer Ralph Thurm	Environmental accounting and sustainability reporting
5	Walter Seeböck Helmut F. Karner	Tomorrow's Solutions – Business model innovation

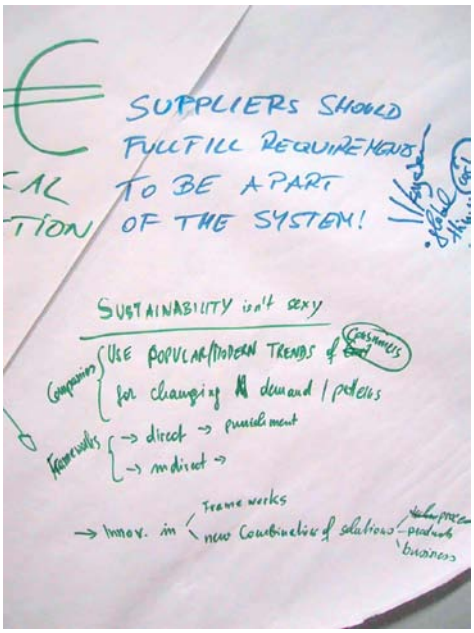
Highlights Table 1 – Wolfgang Wimmer

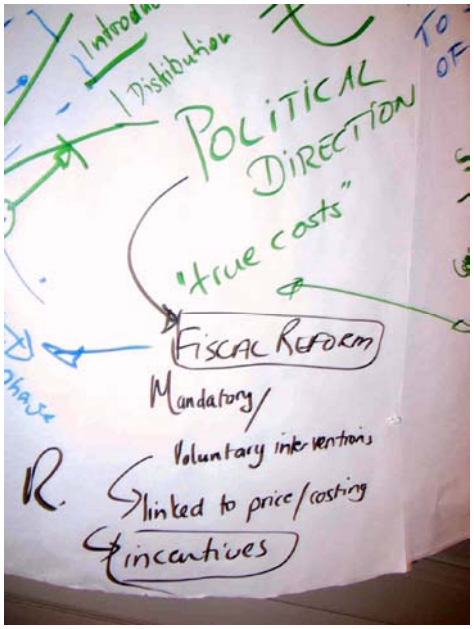
- Stakeholder need to share common vision and tasks (what needs to be done and to which costs?)
- Demand side driven
- Political directions are required
- Modern trends should be used (e.g. ebay initiated reuse of products on a broad base)
- Thinking out of the box





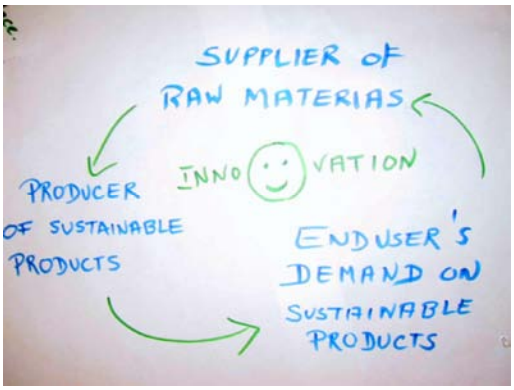


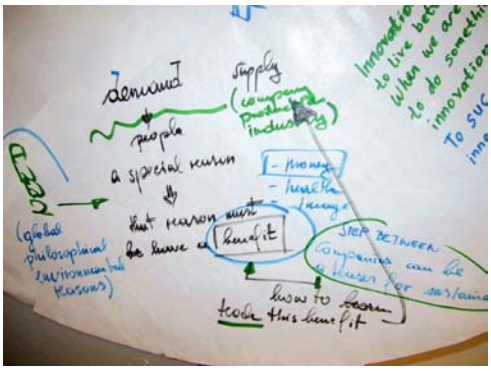


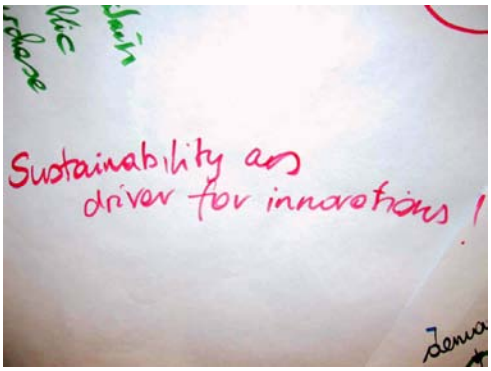


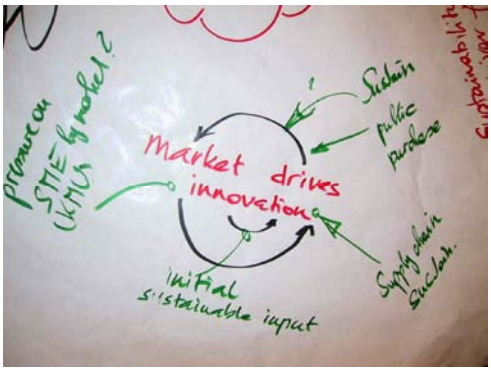
Highlights Table 2 – Sabine List

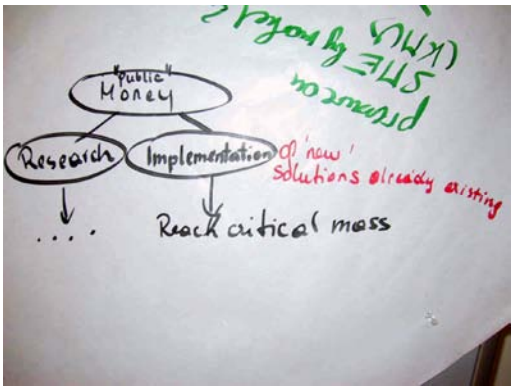
- Market mainly drives innovation
- Implementation of sustainable solutions is important to reach critical mass
- Research in the framework of sustainability should look more on the system improvements





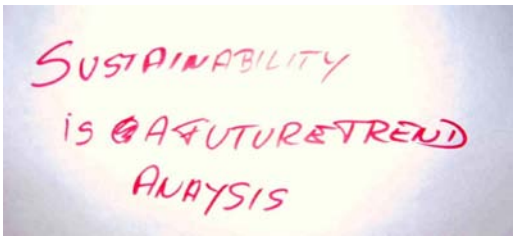


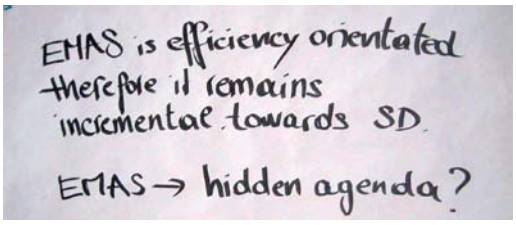


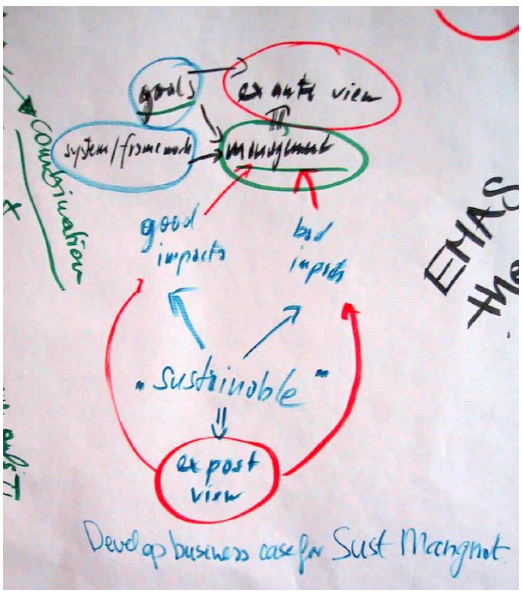


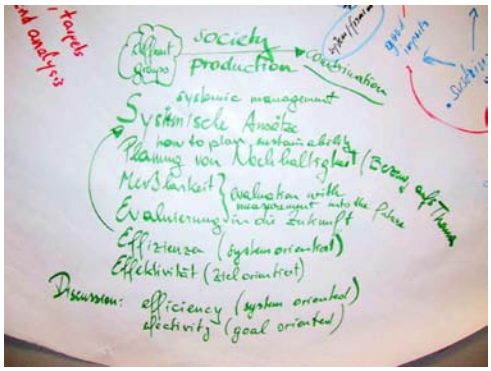
Highlights Table 3 – Martina Göd / Stefan Gara:

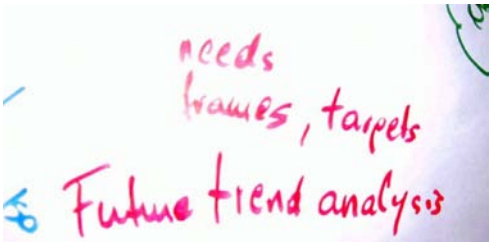
- Organisations need guidance on evaluating the sustainability targets within each other
- Customer needs are the limits of sustainability
- Sustainability is not just a matter of one organisation but of a region or sector (including customers)

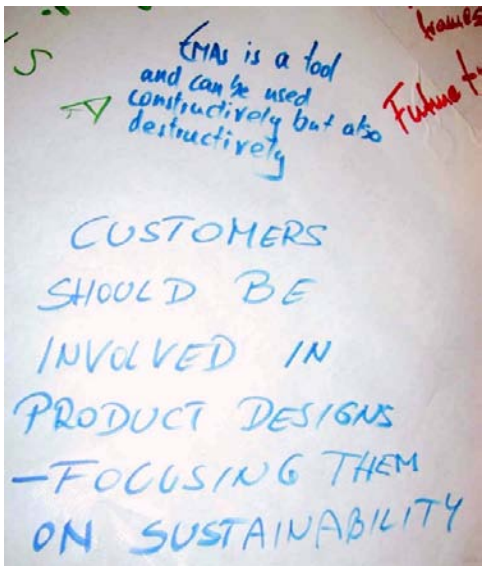






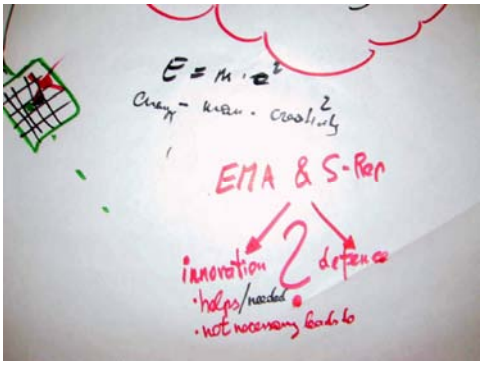


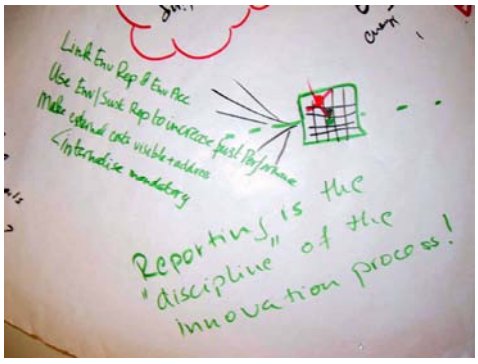


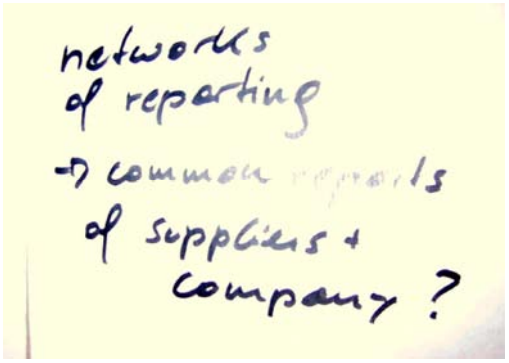


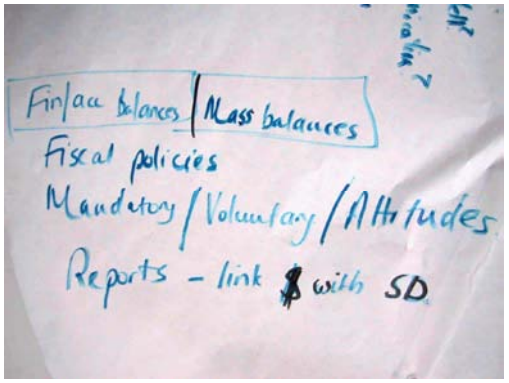
Highlights Table 4 – Hans Schnitzer/Ralph Thurm:

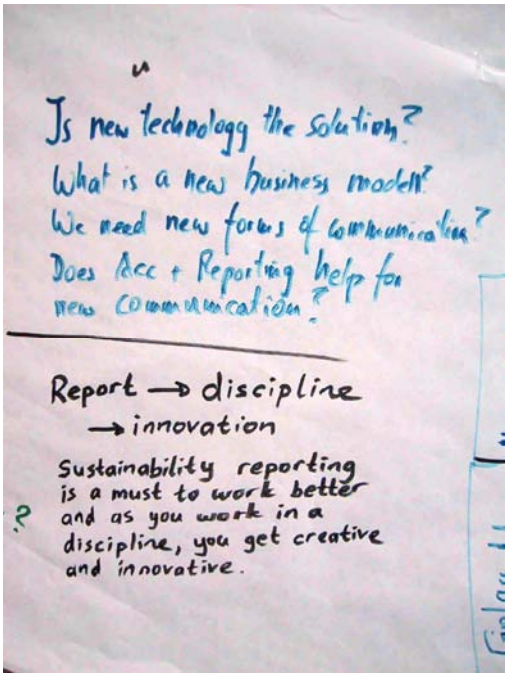
- New ways of accounting and reporting (accepted internally and externally) are needed to create sustainable growth and innovation
- Environmental accounting and sustainable reporting can assist in awareness raising of needed changes in pricing systems which are essential to create change
- Environmental accounting and sustainable reporting introduced into the consumer / suppliers / stakeholder network can altogether raise new business models
- Environmental accounting and sustainability reporting can be a „discipline“ in the innovation process together with creativity

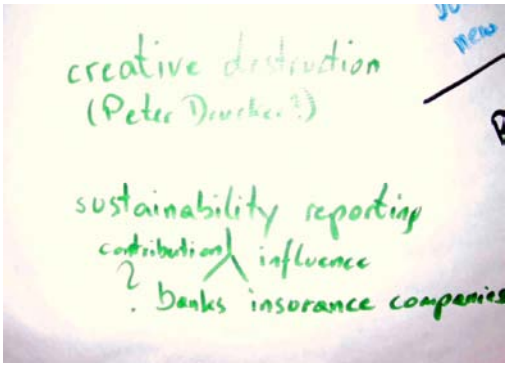


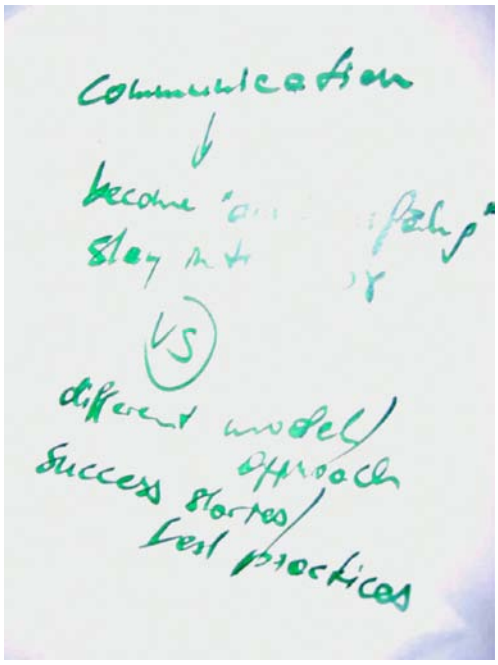


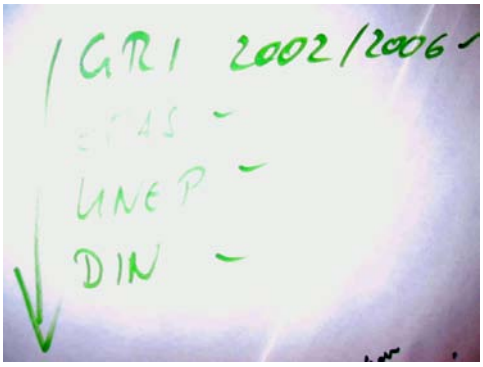









Communication
VS
different model/
approach
Success stories
Best practices


GRI 2002/2006
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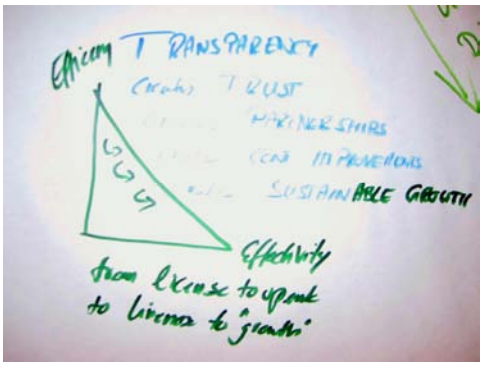
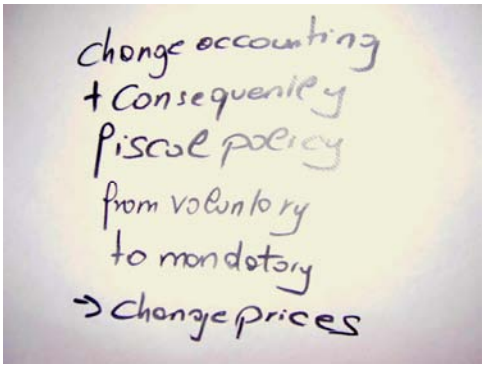
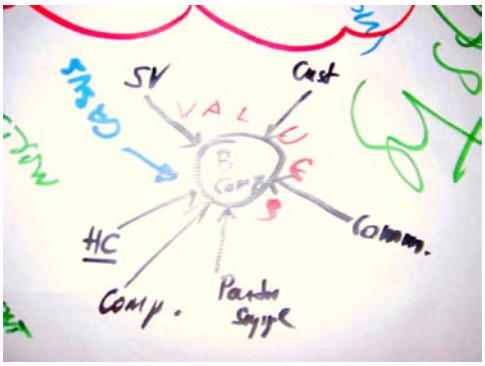
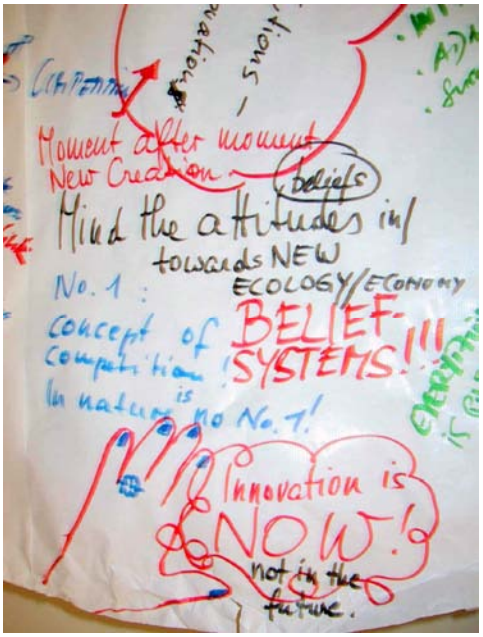

Efficiency
TRANSPARENCY
Effectivity
from license to operate
to license to "grow"

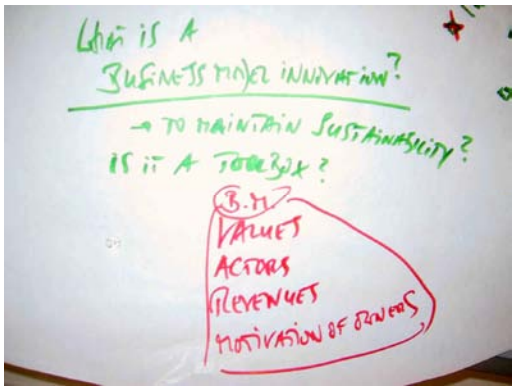

change accounting
+ Consequently
Fiscal policy
from voluntary
to mandatory
→ change prices

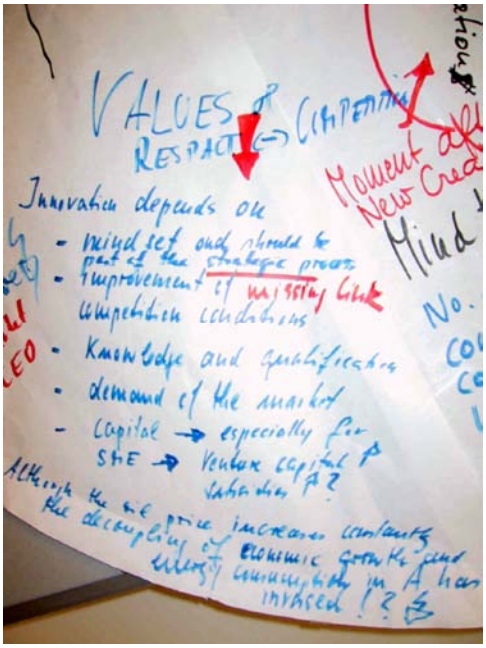
Highlights Table 5 – Walter Seeböck/ Helmut Karner

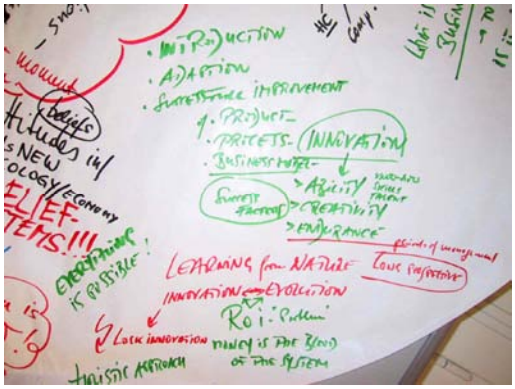
- We need to learn from nature – Innovation is now!
- What is a business model system? Set of, values, revenue streams, actors:
  - Company, Customers,Competitors, Suppliers, Shareholders, Human Capital, Casus (acts of God)
- We should not allow systems to limit us – we need to remove the barriers
- Endurance is the key – we must begin with the long term perspective



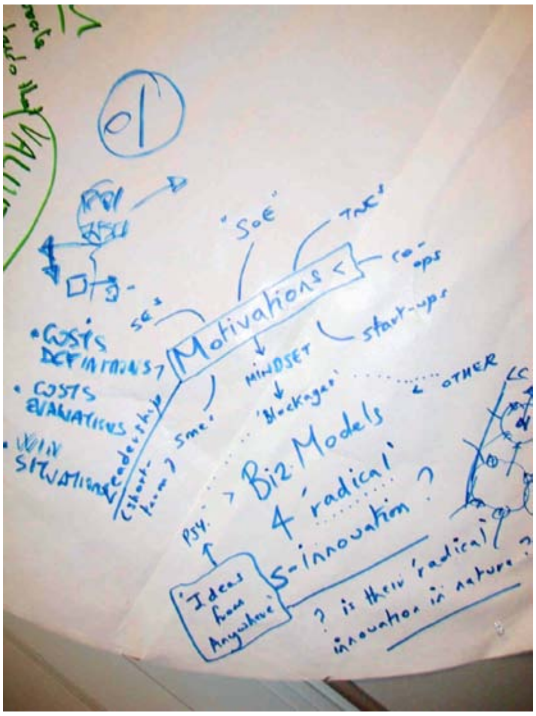


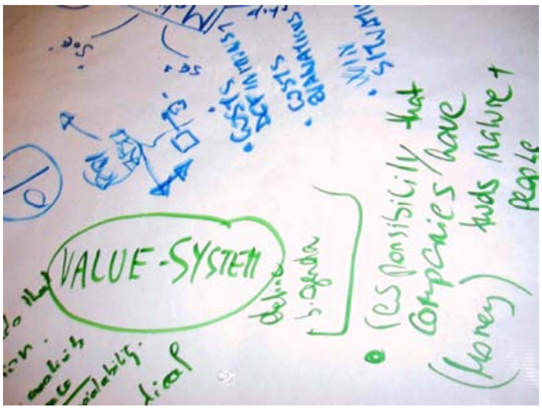


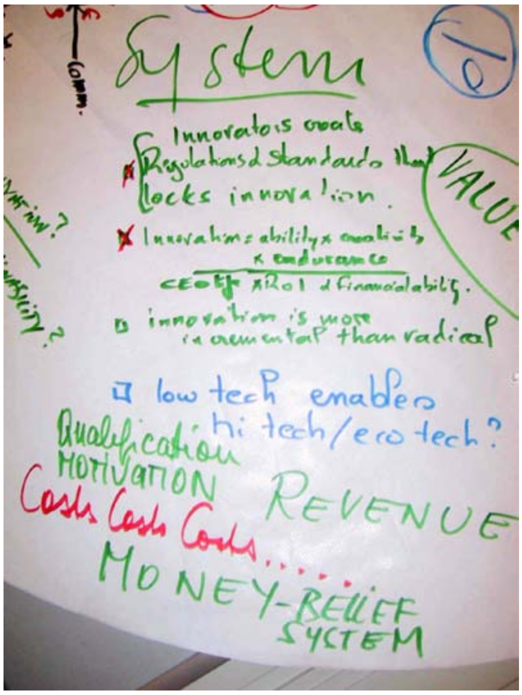





Relax
more consens
less compromise
as a base of decision
Business models, that don't limit our minds!
CEFE
OTHER


Motivations
MINDSET
Biz Models
4 'radical'
S-innovation ?
Ideas from Anywhere
? is their 'radical' innovation in nature ?
COSTS DEFINITIONS
COSTS EVALUATIONS
WIN SITUATIONS
start-ups
OTHER


VALUE-SYSTEM
responsibility that companies have (money) towards nature + people


System
Innovators goals
Regulations & standards that locks innovation.
innovation is more incremental than radical
low tech enables hi tech/eco tech?
Qualification
MOTIVATION
Costs Costs Costs.....
REVENUE
MONEY-BELIEF SYSTEM
VALUE

Staying powerkeep
EMAS alive in schools

Margrit Knapp-Meimberg, Regine Litz-Gutensohn
Internationale Gesamtschule Heidelberg, Baden Badener Strasse 14 69120 Heidelberg, Germany

I INTRODUCTION

In 1997 the International Comprehensive School Heidelberg (IGH) started the pilot project to transfer the formally called Eco Audit Scheme , today EMAS, for the first time to a school. Since then the IGH has been certified three times, last in 2005. Enforcing EMAS we ask ourselves: ‘ Do we want to and are we able to continue? Which factors can help us and support us to go on.? In the following we will show how the IGH has succeeded in preserving EMAS. We want to demonstrate which factors enable a long-lasting and successful process in dealing with our environment.

II THE IGH AND EMAS

The IGH is a school of about 1840 students, composed of nearly 60 nations. It includes different types of schools, starting with a primary school. Environmental projects started in the 80s in an open group of teachers. In 1995 an E-Team was founded and concentrated on the reduction of energy by changing behaviour, as one part of climatic protection. In 1996 the project EMAS started to be discussed and was finally signed in 1990 for the first time, a 2nd and 3rd certification followed in 2002 and 2005. The IGH then participated the German SINa project and the EMAS experiences could help to develop the SINa Sustainability-Audit. In 2005 our school was elected as project school of the United Nations to support the UN-Decade of Sustainability.

III FACTORS TO MAINTAIN EMAS

III.1 People

The process of steady improvement is dependent on continuity and the active co-operation of people. Different people can join in the environmental project at school. So we’ve built up a management system since 1999. Members are elected on a democratic basis, as required by EMAS. These are important elements of the management system:

- there should at least be one person who takes responsibility and functions as co-operator, e.g. in elections
- involvement of all different parts of the school is important, also e.g. principles and janitors.
- responsibility of students is an important training.
- young multipliers are appointed.

The conviction of the people involved is of importance. Nobody should be obliged. ‘Think positive’, that’s the motto of success.

III.2 Time and facilities

The continuity of EMAS in our school is guaranteed through time frames. At defined times we have regular team meetings, work groups and present agendas in staff meetings.

There is an ECO-Room, an identified room for environmental meetings for the representatives of the management system. We have other information schemes as shelves, info boards, exhibitions and a board to indicate the present consumption of energy. Publishing information to everybody concerned is important. As more people take notice, more will become motivated. That’s why regular meetings, information and contributing papers are effective means.

III.3 Motivation

If the work you’ve done is appreciated, your motivation will rise. We do this through certificates, prizes and posters for the public.

III.4 Making use of EMAS structures

EMAS is an obligation for permanent improvement. Regulations are very time- consuming, but still the requirements make sense. It’s important for cohesion rather than having an arbitrary process Thus this process is as well strengthened as preserved.

- **Examinations of the current state**

can easily be carried through by students. The IGH At the IGH these activities become a part of the school curriculum.

- **The environmental programme**:

has constantly to be planed and examined. Thisalso can be done with the students during school lessons as a part of the curriculum. In this way improvements can be achieved and it is very important, the everybody can see them and can take part of them. Through saving energy with the help of the E-team we were able to afford, e.g. a solar panel, a wind turbine, energy saving light bulbs etc. Our eco meeting room was also furnished with parts of this money.

- **The environmental declaration**

helps to maintain EMAS as students can write articles.

- the school public gets information
- students are appreciated for their achievements
- it can be discussed in class

IV EMAS IS LIVING THROUGH PROJECTS

Through EMAS we want to improve our consciousness for the environment. With EMAS we fulfil the guideline of our environmental politics and the aims of our environmental programme.

There are plentiful projects and lots of themes to be taught in class, e.g. how to avoid or separate refuse, how to save energy and water, mobility.

Figure 1: Meeting of the students Eco-Speaker

V 5. CO-OPERATION AND SUPPORT

for the expansion of EMAS co-operation and the support of other institutions is important. We have networks with different partners.

V.1 National co-operation

with town counsel, industry, German schools in the BLK Programme 21, oil painting project with the Climate Alliance , EEE (Experiencing Renewable Energy) , Project of the Decade of Sustainability

V.2 International co-operation

by the European Seminars, a video conference with Paris, climate conference in Stockholm, Japan and cooperating with China.

V.3 Support at three levels

personnel, organizational and financial is important.

• within the school: students, heads, colleges, janitors, parents

• beyond school : school board, industry, politicians Exchange with everybody involved should be on a regular basis.

VI PROSPECTS

EMAS is good for schools if it is used for the education of sustainable development. This process should be supported and accepted by many people. It should be realised as a joint process with the students. Calling for sustainability it is important to support all the existing EMAS schools and their cooperation.

This way EMAS schools can get role models for other schools to take part and to support a sustainable development.

The Eco-Kids Project

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I. INTRODUCTION

The high school GRG 6, Rahlgasse has been working on environmental topics since 1999. Different subjects were involved in a project concerning quality of life, damages to the environment and conservation. At the beginning of the year 2000 we started to think over our day-to-day operations with regard to sustainability. This was the start of environmental management in schools.

In 2004 we had the revalidation of our EMAS certification.

II. FIRST YEAR

The EU Eco-Management and Audit Scheme (EMAS) was originally restricted to companies in industrial sectors and therefore it was necessary to adapt the system for schools. Our Initial Environmental Review showed us the importance of communication to improve environmental awareness and environmental knowledge.

To ensure the successful implementation of the environmental programme, we decided to develop a communication system that works with the help of our pupils. As a specific target for the new environmental statement we thought about a project called “Eco- Kids”, that would give our students more responsibility for the continuous improvement of our school’s environmental performance.

In two years a group of 3-5 students should be able to coordinate a communicative exchange between the environmental team and our pupils.

In every class two students were elected (one boy and one girl) to look after environmental issues.

Every teacher in the environmental team of our school was responsible for 3 classes. They acted as coaches for the students and gave them support.

In the first year the pupils were trained in environmental knowledge, communication and team work. They made an initial comprehensive analysis of the environmental problems caused by their peers and planned strategies to improve their behaviour.

The fact that they had been assigned to this project led to an increased awareness for environmental concerns and was an important aspect of the project.

At the end of the first year the pupils organized an activity called “ no cars in our street”. Our school is situated in the center of Vienna and our pupils have no space to play and spend their breaks. For several years we have been trying to have the street in front of our school converted into a pedestrian area. Unfortunately without success.

With this action the students again managed to direct the attention of the neighbours to this problem.

III. SECOND YEAR

In 2005 we started the second year of the project. In every class there are two students who are responsible for environmental issues and they meet once a month. These meetings are still organized and moderated by two teachers. In future they should be able to arrange these conferences themselves.

The students are still trained by members of the environmental team and are involved in several projects.

IV. CONCLUSION

Sustainable acting in school needs a communication system that works at the peer-group base.

Especially teenagers depend on the acceptance of the peer group. If you really want to make a difference with regard to sustainable environmental behavior, action should be directed at the peer group as this has shown to be more influential than instructions given out by teachers.

Our “Eco-Kids” project takes this experience as a starting point. It is of great importance to attract students to this project who are not only interested in environmental matters but who also have adequate social skills. Commitment to environmental sustainability can turn into something that will help students to score with their peers. If commitment to the environment turns out to be something that is seen as “cool”, then a major breakthrough in environmental education has been achieved.

It was very important for us that the students enjoyed their assignment. We organized team weekends where the students had the chance to spend fun time with each other and to plan activities that would focus on them. We would like our students to realize that the experience gathered in this project might be useful in their future jobs. It is our hope that companies will realize this potential and will support our students’ commitment to his project.

School for Tomorrow, a program towards sustainability for schools

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E-mail: thiernondiaye@coren.be – natachathevenod@coren.be –fabricelesceu@coren.be

I. CORENASBL

Founded in 1994, *Coordination Environnement (Coren)* is a non-profit organization leading projects to improve environment through environmental education for sustainable development. We lead two projects in the Walloon Region (French part of Belgium):

- "Ecoles pour Demain" : Schools for tomorrow
- "Ecoles de la qualité environnemen(to)tale": Quality school . it's consist to coach schools toward the environmental certification ISO 14001.

II. SCHOOLS FOR TOMOROW

This is a campaign which takes place during a school year. Pupils are involved in all steps of the process.

Work begins with a review of the environmental impact of the schools and identification of issues for action. Pupils get a questionnaire from Coren and lead themselves their investigation. The class is separated in 5 groups. Each group deals with a theme (waste, energy, water, mobility, school life). Pupils check the infrastructure for inefficiencies such as leaky taps or electric equipment left overnight. Coren has elaborated a new Internet tool : "auditoscope". Pupils fill in information collected (energy and water consumption, waste production, habits of commuting, purchase practice) on a website. Therefore, schools can compare their performances.

Information from the review is used to identify priorities and create an action plan, which sets realistic targets to improve environmental performances. Schools consign their actions on a charter which is signed by the Walloon Minister of Environment. The action plan could involve, for example, a paper recycling policy, the purchase of eco-friendly cleaning products, car sharing promotion and turning off lights.

At the end of the year, there is an evaluation to ensure that the targets have been reached. It also ensures that environmental education is an on-going process in the school.

If schools respect these steps, they get the label "Schools for Tomorrow". Since the beginning of this program, 187 got the label and 50% of these schools pursue annually. The environmental Minister recognizes the involvement of schools to improve the environment and to educate pupils. Coren organizes each year a manifestation. Schools are invited to present their projects and to exchange with the others schools.

III. THROUGH THE ENVIRONMENTAL CERTIFICATION ISO 14001

Since 2001, Coren leads the project "Ecoles de la qualité environnemen(to)tale". Coren coaches schools through the environmental certification ISO 14001. Three schools get the certification: l'IESPP (a nursing school), le Collège Sainte-Véronique (maternal, primary and secondary school), l'Institut Robert Schuman (a technical and professional secondary school). Two schools are building their management system: IPEA la Reid (an agronomic school), le College Saint-Augustin (a general, technical and professional secondary school).

The three certified first schools finish their cycle of three years. This year, they should achieve their audit of renewal.

Following this experience, Coren has published a guide "Ecoles en route vers la certification environnementale".

Among the interest of this system, we can point:

- An integration of an environmental education for sustainable development,
- A citizen responsibility: pupils are involved in the school life – they take part in the decision making.
- A trump for the future professional life of the pupils: many firms got the environmental certification – pupils in professional schools get competence in sustainable resource management.
- An improvement of the environmental performance.
- An improvement of the quality of life in school.
- A respect of the environmental legislation.

In spite of interests of environmental certification, schools are confronted to a human resource lack in intern to manage the system and the weakness of their financial means also constitutes for example an obstacle of size to make for example heavy investments appropriate in conformity of infrastructures, to make ecological purchases and to pay for the certification and audits.

Until now costs of the certification and audit of surveillance are taken in charge by the region.

Schools Training Program for Implementing Sustainability Management Systems

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I. Introduction

Schools and educational establishments have an important role in promoting the sustainable development by supporting the growth of the students as environmentally responsible and skilled citizens. To help educational establishments in this challenging task, environmental criteria and certification system have been developed in Finland in the Life Environment project *Envedu* (2001-2004). The main emphasis of the criteria was set on the teaching to meet the needs and requirements of schools. To assist and support educational establishments in implementing this criteria and building Sustainability Management Systems, also special training is offered for teachers and other school staff.

II. Environmental Criteria For Schools

The Environmental Evaluation System for educational establishments is an entity that consists of 1) the Environmental Criteria of Educational Establishments, 2) Training for teachers for building and implementing the Sustainble Management System and 3) Environmental Certification System, that consists of network of external auditors, their training system and the Certification Body.

The Environmental Criteria have been created as tools and incentives for the development of operation and quality of teaching. The use of the criteria and the certification are voluntary. The criteria set a standard for environmental performance of an exemplary level. To reach the level of the criteria requires several years of systematic work, but an educationl establishment can also use the criteria as a development tool without any intention of applying the certificate. The criteria contain three entities, which are: 1. Planning, organising and development of environmental issues, 2. Teaching and learning, and 3. Maintenance activities.

III. Training for Teachers

SYKLI Environmental School of Finland provides training courses for teachers to support the construction of Sustainability Management System. The trainings are based on the Environmental Criteria for Schools, but the participants do not necessarily have to apply for the certificate. Based on the training schools can also build their Sustainability Management System based on some other standard, like EMAS.

The training applies to all levels of educational establishments from primary to vocational schools. The training course lasts about eight months, which includes approximately six days of training. Between training days the participants work on the Sustainability Management System of their school, e.g. participants carry out an environmental review, plan the environmental programme etc. The themes on the training days are e.g. sustainable development in teaching and curricula, maintenance activities like waste management, energy and water use on the schools, procurement and the documentation of the Sustainability Management System.

In years 2000-2006 trainings of sustainable development for teachers have been organised in 10 cities and there have been approximately 450 participants altogether on these trainings. The training is funded by the Finnish National Board of Education (FNBE) and it is therefore free of charge for the participants. In Finland sustainable development is included in the core curricula and therefore this training is a good tool for schools to implement sustainable development in the school curricula and teaching.

IV. Environmental Certification

Before a school can apply for the Environmental Certificate, it has to carry out a self-assessment. Furthermore, an independent, external auditor evaluates the self-assessment report and carries out an audit in the school. The auditor verifies, that the school fulfils the Environmental Criteria, and gives the school feedback on its strengths and needs of improvement. The school applies for the Environmental Certificate from the OKKA Foundation. The certificate is free of charge, but the school compensates the costs for the external auditor. The certificate is valid for a three year-period at a time.

A certified school can also complete its environmental management system to fulfill the requirements of the international standards ISO 14 001 and EMAS regulation. More guidance for this can be found in the guide “Environmental Certification and EMAS Registration of Educational Establishments”, which was created in the Envedu-project.

Teachers and representatives of other school staff are trained as external auditors on specific training courses. On this training, the auditors get well familiar with the criteria, the auditing process and also the interpretation of the criteria. So far SYKLI has trained more than 130 auditors. To maintain their qualification as auditors, they must participate in a one day further training every year.

V. FUTURE ASPECTS

The Environmental Criteria focus on the ecological aspect of sustainable development but in the future they will be extended to cover also the economic, social and cultural aspects. In 2006 started a national development project, that aims at creating a criteria to evaluate the social sustainability and the level of health and safety issues in the school. The criteria will be ready in 2007. SYKLI is developing a training course to support schools in implementing also the social and cultural criteria in the teaching and other activities.

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UNTERNEHMENSPROFIL

Das 1932 gegründete Unternehmen zählt seit Jahren zu den international führenden Herstellern hydraulischer Hebe-, Lade- und Handlingsysteme. Als multinationale Unternehmensgruppe mit Sitz im österreichischen Salzburg verfügt der Konzern über Produktions- und Montagestandorte in Europa sowie Nord- und Südamerika. Innovation, weitere Internationalisierung und Diversifikation der Produkte und Dienstleistungen bilden die strategischen Säulen der Unternehmensstrategie. Oberstes Bekenntnis ist es, Kunden weltweit erfolgreicher zu machen.

Das Stammprodukt ist der LKW-Knickarmkran. In diesem Segment ist das Unternehmen mit knapp 150 Modellen und einem Marktanteil von über 30 Prozent Weltmarktführer. Auch bei Containerwechselsystemen (PALIFT und GUIMA) ist PALFINGER weltweit größter Hersteller. Produkte wie der CRAYLER Mitnahmestapler, die Ladebordwände RATCLIFF und PALGATE, das Containertransfersystem MOBILER oder die LKW-montierte Hubarbeitsbühne BISON erweitern seit Jahren kontinuierlich das Produktportfolio. Zudem entwickelt das Unternehmen innovative Lösungen für Eisenbahnanwendungen, Brückeninspektion und den Recyclingbereich. Krane für den Einsatz in Land- und Forstwirtschaft sowie den Off-Road-Bereich runden die Produktpalette ab.

Mit über 1.500 Vertriebs- und Servicestützpunkten auf allen fünf Kontinente ist PALFINGER immer und überall nahe am Kunden. Diese weltweite Präsenz ermöglicht ein optimales Pre- und Aftersales maßgeschneidert auf die Bedürfnisse der jeweiligen Märkte. Rund 97 Prozent der Produkte werden in 125 Länder weltweit exportiert.

Global Business erfordert aber auch eine Global Structure. Seit Anfang 2004 agiert die PALFINGER Gruppe innerhalb einer neuen Organisationsstruktur welche die Strategie des kontrollierten Wachstums unterstützt. Die neue „Global PALFINGER Structure“ definiert als oberstes Ziel, die optimierte Operationsfähigkeit des Unternehmens in den jeweiligen geografischen Märkten. Operativ wird PALFINGER mit Area Sales Divisions und Product Divisions geführt: Zunächst wurden die Areas „Europe“, „North America“ und „South America“ als eigenständige Marktgebiete definiert. Anfang 2006 wurde die Sales Division um die Area Asia & Pacific erweitert. Mit dieser neuen Struktur werden dezentral flexible und schnelle Entscheidungen vor Ort gewährleistet, die PALFINGER Händler aber ganz speziell den Endkunden schlagkräftiger machen.

Die PALFINGER-Gruppe steht zu rund 64 Prozent im Besitz der Familie PALFINGER und zu rund 31 Prozent im Streubesitz. 5 Prozent hat die PALFINGER AG im Rahmen eines Aktienrückkaufprogrammes erworben. Seit Juni 1999 notiert PALFINGER im Amtlichen Handel der Wiener Börse.

Im Jahr 2005 erwirtschaftete das Unternehmen mit 3.087 Mitarbeitern einen Gesamtumsatz von EUR 520,0 Millionen (EBIT 65,1 Millionen EUR).

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The market trend is moving towards integrating management systems. Companies throughout Europe and Austria are increasingly consolidating the three major fields – quality, environment, and occupational health and safety (OH&S) – into standardized systems. The benefits are obvious: the similar structure of the ISO 9000, ISO 14000/EMAS and OHSAS 18001 standards generates a series of synergy effects with substantial savings in time and costs. Common documentation covers all management and business processes. Integrated systems enables simplified handling, clarity and transparency. In order to accommodate this trend in further education, Quality Austria has aligned the content of quality, environment and OH&S courses for Management Technicians and Systems Managers: the course series “Integrated Management Systems” consolidates the content in a completely new and forward-looking structure. This newly created Quality Austria course teaches the fundamentals in combined basic modules through applied exercises. Specialized subject expertise is then taught in separate subject modules.
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- Verbund Austria Power Grid in the category small und medium sized enterprises
- Audi Hungaria Kft. in the category large enterprises.

The innovative chimney sweeper in Lower Austria, Peter Engelbrechtsmüller won the EMAS AWARD 2005 in the categorie of micro enterprises with less than 10 employees.

Wolfgang Hackenauer, Quality Austria, Laszlo Vagdalt, Audi Hungaria Kft, Zsombor Ferjancsik, ÖQS Hungary, Karl Kohutek Verbund Austria Power Grid AG, Laszlo Vagdalt, Audi Hungaria Kft., Peter Engelbrechtsmüller, Winner of the EMAS AWARD 2005, Herbert Aichinger, European Commission, Willibald Synek and Franz Haderspöck, both Verbund Austria Power Grid AG

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