

Life Cycle Assessment Reusable And Disposable Nappies In

This book reviews the manufacturing processes of different shopping bags used for grocery purposes, life cycle impacts, modelling of life cycle impacts, carbon and eco-footprints in different countries, consumption of shopping bags in different countries, consumer behaviour of shopping bags in various countries and its relation to eco-impact, assessment of functionality of shopping bags, concept and framework of eco-functional assessment of shopping bags, biodegradation of shopping bags, etc.

This volume is a technical and operative contribution to the United Nations "Decade on Education for Sustainable Development" (2005-2014), aiding the development of a new generation of designers, responsible and able in the task of designing environmentally sustainable products. The book provides a comprehensive framework and a practical tool to support the design process. This is an important text for those interested in the product development processes.

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Life cycle design is a proactive approach for integrating pollution prevention and resource conservation strategies into the development of more ecologically and economically sustainable product systems. Cross media pollutant transfer and the shifting of other impacts can be avoided by addressing the entire life cycle, which includes raw materials acquisition, materials processing, manufacturing and assembly, use and service, retirement, disposal and the ultimate fate of residuals. The goal of life cycle design is to minimize aggregate risks and impacts over this life cycle. This goal can only be attained through the balancing of environmental, performance, cost, cultural, legal, and technical requirements of the product system. Concepts such as concurrent design, total quality management, cross-disciplinary teams, and multi-attribute decision making are essential elements of life cycle design that help meet these goals. The framework for life cycle design was developed to be applicable for all product domains. It was written to assist not only design professionals but all other constituents who have an important role in life cycle design including corporate executives, product managers, production workers, distributors, environmental health and safety staff, purchasers, accountants, marketers, salespersons, legal staff, consumers, and government regulators. A coordinated effort is required to institute changes needed for successful implementation of life cycle design. Part I seeks to promote the reduction of environmental impacts and health risks through a systems approach to design. The approach is based on the product life cycle, which includes raw materials

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acquisition and processing, manufacturing, use/service, resource recovery, and disposal. A life cycle design framework was developed to provide guidance for more effectively conserving resources and energy, preventing pollution, and reducing the aggregate environmental impacts and health risks associated with a product system. This framework addresses the product, process, distribution, and management/information components of each product system. Part II describes the three components of a life cycle assessment (inventory analysis, impact analysis, and improvement analysis) as well as scoping activities, presents a brief overview of the development of the life cycle assessment process, and develops guidelines and principles for implementation of a product life cycle assessment. The major states in a life cycle are raw materials acquisition, manufacturing, consumer use/reuse/maintenance, and recycle/waste management. The basic steps of performing a life cycle inventory (defining the goals and system boundaries, including scoping; gathering and developing data; presenting and reviewing data; and interpreting and communicating results) are presented along with the general issues to be addressed. The system boundaries, assumptions, and conventions to be addressed in each stage of the inventory are presented.

Abstract : Around 500 million plastic straws per day are being consumed in the U.S. (U.S. National Park Service, 2019), and nearly 7.5 million straws are reported to lie around U.S. shorelines (Borenstein, 2018). The estimated cost of plastic pollution is reported to be \$13 billion in economic damage to marine ecosystems each year (Avio et al., 2017). The ongoing action against the use of single-use plastic straws has created a surging demand for sustainable alternatives to plastic straws, with nearly ten types of single-use and reusable drinking straws now on the market. Given that no

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one study quantifies and compares the environmental impact of these various straw types, this study uses the Cumulative Energy Demand and the IPCC 2013 GWP 100a V1.03 impact assessment methods in the SimaPro8.5 database to conduct a limited life-cycle assessment (LCA) of the standard plastic straw and its most commonly used alternatives: the paper straw, the bioplastic/compostable (PLA) straw, and the (reusable) metal straw. The study also assesses the blue carbon and carbon dioxide sequestration potential of the seaweed-based straw. The use of a (reusable) metal straw was found to have a significantly lower overall environmental impact than that of other straws over one year, provided that the use of hot water is avoided when washing the metal straw and that the standard washing time is cut to half. Over 85 percent of the environmental impacts reported came from the washing of the metal straw, indicating that human behavior is a key driver of environmental impact. For the single-use straw types, the standard plastic straw was found to have less than half of the energy demand and nearly one-third of the global warming potential of that of a paper straw and a bioplastic straw. Thus, these alternative material straws are not empirically reducing the environmental impacts of straw use. Conversely, the CO₂ sequestration potential of the seaweed-based straw was estimated to be 0.00165 kg per straw, indicating the straw's potential to be carbon neutral or even carbon negative, depending on how the straw's life-cycle is designed when production is scaled-up. Public policy instruments play a key role in reducing the consumption of plastic straws. While a variety of command-and-control, market-based, investment-based, education-based, and voluntary policy instruments exist to reduce the use of plastic straws, the default choice modification policy instrument has been the most successful in reducing the consumption of plastic straws while minimizing impacts to businesses. Data

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from this study recommends a default choice modification (straw upon request) framework combined with certification and environmental labeling, and investments in waste management infrastructure and R&D as the most effective set of policies to reduce single-use plastic straw consumption in the U.S. The study concludes with proposals for five areas for further research: (1) ecotoxicology of marine plastics integrated into LCA; (2) LCA of other drinking straw types; (3) a comprehensive economic assessment of plastic pollution; (4) the development of a new Sustainability Index inclusive of socio-economic indices, blue carbon and ecotoxicology of marine plastics; and (5) a conjoint choice analysis (including a cost comparison study) to assess consumer willingness-to-pay.

This book comprises recent developments in life cycle assessment (LCA) both with regards to the methodology and its application in various research fields, including mobility, engineering and manufacturing. Containing numerous original research articles from leading German research institutes, the book provides an insightful resource for professionals working in the field of sustainability assessment, for researchers interested in the current state of LCA research as well as for advanced university students in different scientific and engineering fields.

This student version of the popular bestseller, Life Cycle Assessment Handbook, is not a watered-down version of the original, but retains all of the important information and valuable lessons provided in the first book, along with helpful problems and solutions for the student learning about Life Cycle Assessment (LCA). As the last several decades have seen a dramatic rise in the application of LCA in decision making, the interest in the life cycle concept as an environmental management and sustainability tool continues to grow. The LCA Student Handbook offers a look at the role

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that life cycle information, in the hands of companies, governments and consumers, may have in improving the environmental performance of products and technologies. It concisely and clearly presents the various aspects of LCA in order to help the reader better understand the subject. The international success of the sustainability paradigm needs the participation of many stakeholders, including citizens, corporations, academia, and NGOs. The handbook links LCA and responsible decision making and how the life cycle concept is a critical element in environmental sustainability. It covers issues such as building capacity in developing countries and emerging economies so that they are more capable of harnessing the potential in LCA for sustainable development. Governments play a very important role with the leverage they have through procurement, regulation, international treaties, tax incentives, public outreach, and other policy tools. This compilation of points to the clear trend for incorporating life cycle information into the design and development processes for products and policies, just as quality and safety concerns are now addressed throughout product design and development. The Life Cycle Assessment Student Handbook is not just for students. It is also a valuable resource for practitioners looking for a desktop reference on LCA or for any engineer, manager, or policy-maker wishing to learn about LCA.

Written by an expert, using the same approach that made the previous two editions so successful, *Fundamentals of Environmental Chemistry, Third Edition* expands the scope of book to include the strongly emerging areas broadly described as sustainability science and technology, including green chemistry and industrial ecology. The new

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edition includes: Increased emphasis on the applied aspects of environmental chemistry Hot topics such as global warming and biomass energy Integration of green chemistry and sustainability concepts throughout the text More and updated questions and answers, including some that require Internet research Lecturers Pack on CD-ROM with solutions manual, PowerPoint presentations, and chapter figures available upon qualifying course adoptions The book provides a basic course in chemical science, including the fundamentals of organic chemistry and biochemistry. The author uses real-life examples from environmental chemistry, green chemistry, and related areas while maintaining brevity and simplicity in his explanation of concepts. Building on this foundation, the book covers environmental chemistry, broadly defined to include sustainability aspects, green chemistry, industrial ecology, and related areas. These chapters are organized around the five environmental spheres, the hydrosphere, atmosphere, geosphere, biosphere, and the anthrosphere. The last two chapters discuss analytical chemistry and its relevance to environmental chemistry. Manahan's clear, concise, and readable style makes the information accessible, regardless of the readers' level of chemistry knowledge. He demystifies the material for those who need the basics of chemical science for their trade, profession, or study

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curriculum, as well as for readers who want to have an understanding of the fundamentals of sustainable chemistry in its crucial role in maintaining a livable planet.

This guide is aimed at procurers in the Nordic healthcare sector who are responsible for purchasing textile products and services and assists them in developing processes for establishing suitable and practicable environmental criteria in tender documents. Procurers can learn which aspects in the production and care of textiles have most environmental significance and how these can be addressed through criteria. They can learn more about the role of ecolabels in procurement and can find links to ready-to-use criteria, and other useful information from national procurement agencies. The guide has been developed in cooperation with a Nordic Network of Procurers in the Health Sector as part of an initiative under the Nordic Action Plan for Sustainable Fashion and Textiles “Well-dressed in a Clean Environment”: It is funded by the Nordic Council of Ministers.

This issue of Anesthesiology Clinics, guest edited by Drs. Alison Perate and Vanessa Olbrecht, focuses on Pediatric Anesthesia. This is one of four issues each year selected by the series consulting editor, Dr. Lee Fleisher. Articles in this issue include, but are not limited to: The Pediatric Difficult Airway: Updates and Innovations; Current Knowledge of the

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Impact of Anesthetics on the Developing Brain; Anesthesia for Innovative Pediatric Surgical Procedures; Pediatric Mass Casualty Preparedness; The Pediatric Burn: Current Trends and Future Directions; Managing the Child with Complex Congenital Heart Disease; Modernizing Education of the Pediatric Anesthesiologist; Regional Anesthesia: Options for the Pediatric Patient; Managing the Pediatric Patient for Anesthesia Outside of the OR; New Trends in Fetal Anesthesia; Anesthetic Implications of the Common Congenital Anomalies; Managing the Adult Patient with Congenital Disease; Trends in Pain Management: Thinking Beyond Opioids; Sustainability in the OR: Reducing Our Impact on the Planet; Current Trends in OSA; and Processed EEG Guided Propofol Infusion in Children.

An interdisciplinary framework for managing sustainable agrifood supply chains Supply Chain Management for Sustainable Food Networks provides an up-to-date and interdisciplinary framework for designing and operating sustainable supply chains for agri-food products. Focus is given to decision-making procedures and methodologies enabling policy-makers, managers and practitioners to design and manage effectively sustainable agrifood supply chain networks. Authored by high profile researchers with global expertise in designing and operating sustainable supply chains in the agri-

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food industry, this book: Features the entire hierarchical decision-making process for managing sustainable agrifood supply chains. Covers knowledge-based farming, management of agricultural wastes, sustainability, green supply chain network design, safety, security and traceability, IT in agrifood supply chains, carbon footprint management, quality management, risk management and policy-making. Explores green supply chain management, sustainable knowledge-based farming, corporate social responsibility, environmental management and emerging trends in agri-food retail supply chain operations. Examines sustainable practices that are unique for agriculture as well as practices that already have been implemented in other industrial sectors such as green logistics and Corporate Social Responsibility (CSR). Supply Chain Management for Sustainable Food Networks provides a useful resource for researchers, practitioners, policy-makers, regulators and C-level executives that deal with strategic decision-making. Post-graduate students in the field of agriculture sciences, engineering, operations management, logistics and supply chain management will also benefit from this book. Healthcare infection control has led to increased utilization of disposable medical devices, which has subsequently led to increased adverse environmental effects attributed to healthcare and its

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supply chain. In dental practice, the dental bur is a commonly used instrument that can either be reused or used once and then disposed. To evaluate the disparities in environmental impacts of disposable and reusable dental burs, a comparative life cycle assessment (LCA) was performed. The comparative LCA evaluated a reusable dental bur (specifically, a 2.00mm internal irrigation pilot drill) reused 30 instances versus 30 identical burs used as disposables. The LCA methodology was performed using framework described by the International Organization for Standardization (ISO) 14040 series. Sensitivity analyses were performed with respect to ultrasonic and autoclave loading. Findings from this research showed that when the ultrasonic and autoclave are loaded optimally, reusable burs had 40% less of an environmental impact than burs used on a disposable basis. When the ultrasonic and autoclave were loaded to 66% capacity, there was an environmental breakeven point between disposable and reusable burs. Eutrophication, carcinogenic impacts, non-carcinogenic impacts, and acidification were limited when cleaning equipment (i.e., ultrasonic and autoclave) were optimally loaded. Additionally, the bur's packaging materials contributed more negative environmental impacts than the production and use of the bur itself. Therefore, less materially-intensive packaging should be used. Specifically, the glass fiber

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reinforced plastic casing should be substituted for a material with a reduced environmental footprint. Life cycle assessment enables the identification of a broad range of potential environmental impacts occurring across the entire life of a product, from its design through to its eventual disposal or reuse. The need for life cycle assessment to inform environmental design within the built environment is critical, due to the complex range of materials and processes required to construct and manage our buildings and infrastructure systems. After outlining the framework for life cycle assessment, this book uses a range of case studies to demonstrate the innovative input-output-based hybrid approach for compiling a life cycle inventory. This approach enables a comprehensive analysis of a broad range of resource requirements and environmental outputs so that the potential environmental impacts of a building or infrastructure system can be ascertained. These case studies cover a range of elements that are part of the built environment, including a residential building, a commercial office building and a wind turbine, as well as individual building components such as a residential-scale photovoltaic system. Comprehensively introducing and demonstrating the uses and benefits of life cycle assessment for built environment projects, this book will show you how to assess the environmental performance of your clients' projects, to compare

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design options across their entire life and to identify opportunities for improving environmental performance.

Life cycle assessment (LCA) is used to evaluate the environmental impacts of textile products, from raw material extraction, through fibre processing, textile manufacture, distribution and use, to disposal or recycling. LCA is an important tool for the research and development process, product and process design, and labelling of textiles and clothing.

Handbook of Life Cycle Assessment (LCA) of Textiles and Clothing systematically covers the LCA process with comprehensive examples and case studies. Part one of the book covers key indicators and processes in LCA, from carbon and ecological footprints to disposal, re-use and recycling. Part two then discusses a broad range of LCA applications in the textiles and clothing industry. Covers the LCA process and its key indicators, including carbon and ecological footprints, disposal, re-use and recycling Examines the key developments of LCA in the textile and clothing industries Provides a wide range of case studies and examples of LCA applications in the textile and clothing industries

Formally established by the EPA nearly 15 years ago, the concept of green chemistry is beginning to come of age. Although several books cover green chemistry and chemical engineering, none of them transfer green principles to science and technology in general and their impact on the future. Defining industrial ecology, Environmental Science

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and Technology: A Sustainable Approach to Green Science and Technology provides a general overview of green science and technology and their essential role in ensuring environmental sustainability. Written by a leading expert, the book provides the essential background for understanding green science and technology and how they relate to sustainability. In addition to the hydrosphere, atmosphere, geosphere, and biosphere traditionally covered in environmental science books, this book is unique in recognizing the anthrosphere as a distinct sphere of the environment. The author explains how the anthrosphere can be designed and operated in a manner that does not degrade environmental quality and, in most favorable circumstances, may even enhance it. With the current emphasis shifting from end-of-pipe solutions to pollution prevention and control of resource consumption, green principles are increasingly moving into the mainstream. This book provides the foundation not only for understanding green science and technology, but also for taking its application to the next level. This review describes the process of life cycle analysis in some detail. It describes the different organisations involved in researching and applying these techniques and the database resources being used to generate comparative reports. The overview explains the factors to be considered, the terminology, the organisations involved in developing these techniques and the legislation which is driving the whole process forward. The ISO standards relating to environmental management are also discussed briefly in the document. Design for the environment is covered in the report. This review is accompanied by summaries of selected papers on life cycle analysis and environmental impact from the Rapra Polymer Library database.

Life Cycle Assessment Student Handbook John Wiley & Sons
Australian Master Environment Guide was previously

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published by CCH Australia. The Australian Master Environment Guide is a practical handbook designed for environmental managers, health and safety managers, business managers, students and anyone who needs an overview of environmental best practice and law. It contains information on key aspects of environmental management in industries such as techniques, systems, land development, pollution, chemicals, energy, waste, water and biodiversity. Incorporating HC 100, session 2007-08 and HC 1094, session 2008-09

Life Cycle Assessment (LCA) has developed in Australia over the last 20 years into a technique for systematically identifying the resource flows and environmental impacts associated with the provision of products and services. Interest in LCA has accelerated alongside growing demand to assess and reduce greenhouse gas emissions across different manufacturing and service sectors. Life Cycle Assessment focuses on the reflective practice of LCA, and provides critical insight into the technique and how it can be used as a problem-solving tool. It describes the distinctive strengths and limitations of LCA, with an emphasis on practice in Australia, as well as the application of LCA in waste management, the built environment, water and agriculture. Supported by examples and case studies, each chapter investigates contemporary challenges for environmental assessment and performance improvement in these key sectors. LCA methodologies are compared to the emerging climate change mitigation policy and practice techniques, and the uptake of 'quick' LCA and management tools are considered in the light of current and changing environmental agendas. The authors also debate the future prospects for LCA technique and applications.

There is a relationship between the healthcare sector and treatment of the patient in the delivery of service. During the

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process of this relationship, waste and CO₂ are generated, which increases over time. Compared to other industries, very little information is available with which to make science-based decisions in order to reduce waste and CO₂ emissions while still maintaining quality patient care. This research investigates three areas to assess the environmental impact of healthcare: nutrition, hospital materials, and radiology. This research applies critical literature analysis techniques, life cycle assessment, and energy analysis to identify the aspects of sustainability improvement of healthcare services and products with an emphasis on hospitals. In order to provide solutions, one area of study is assessing the amount of food waste in hospitals by quantifying and analyzing food consumption, waste, and energy use in a hospital food system so that environmental impacts may be avoided. Therefore, quality and quantity are important factors in hospitals, whether producing high quality with instruments (reusable and disposable [single-use] products), on the one hand, or overproducing food or items, on the other. Life cycle cradle-to-grave studies are widely used to understand the environmental consequences of reusable and disposable products. The hypothesis of this study in the area of radiology focuses on imaging modalities. With the energy data from quantitative imaging, we can establish the role of healthcare teams in lowering the hospital energy footprint and thus contributing to hospital sustainability. Lower energy means less electricity, less power plant emissions (SO_x, smog, CO₂) into the air and water, and ultimately less impact on public health.

1.1 Life Cycle Assessment (LeA): a fascinating and sophisticated tool The greening of the economy is not a new task, but it is a challenge for which a lot of tasks still have to be done. It is known that the main source of environmental deterioration by industry is not any more the chimneys and

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other process related emissions, but the products and services produced. Products are regarded as carriers of pollution: they are not only a potential source of pollution and waste during their use; they are also a cause of resource depletion, energy consumption, and emissions during their life starting with the extraction of the raw materials and ending with their disposal (i.e. connecting production and consumption stages). The challenge of these decades is now the greening of products and services. The new focus on products (cp. Oosterhuis/Rubik/Scholl 1996) was introduced as a policy approach of shared responsibility in which different actors are involved along the life-cycle of a product, each having specific responsibilities.

In the disposal phase of shopping bags/textile products, recyclability is one of the primary factors that need to be considered in evaluating the eco-impact. There are no models or approaches to quantify the recyclability potential of various textile fibres and raw materials used for shopping bags in terms of their environmental and economic gains. An attempt was made in this research to develop a model to quantify the recyclability potential index (RPI) of various textile fibres and raw materials used for shopping bags. Results of the RPI model indicate that polypropylene and polyester outscored all the other materials in question. Apart from reusability and recyclability, biodegradability is also an important focus in the ecological category. This research employed the results of a biodegradability test conducted for various shopping bags on the same platform using the soil burial test. Soil burial test results showed that paper bags followed by cotton bags demonstrated better biodegradation results. Regarding consumption behaviour, the perceptions or opinions of consumers have to be taken into consideration to make the end-of-life scenario values in the life cycle assessment calculations rather than using assumptions of the usage and

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disposal values. LCA studies reported to date on various shopping bags have used an assumption to model the end-of-life scenarios of various shopping bags, but this may not reflect reality. Hence a questionnaire survey was conducted in this research among different user groups in Mainland China, Hong Kong and India and the results from the real users were utilized to model the end-of-life phase of the various shopping bags. With the aid of the eco-functional model where the values from the discussed aspects are synthesized, eco-functional capacities of any product can be assessed and an "eco-functional" score can be assigned to any product. 23 samples made out of different types of shopping bags were assessed in terms of their eco-functional properties and the eco-functional score of each bag was evaluated and the results are presented. The results of the eco-functional assessment reveal the importance of every aspect of a product to meet the requirements of eco-functional assessment. For the eco-functional assessment combined with LCA study various shopping bags, a suitable functional unit based on consumption statistics from Mainland China, Hong Kong and India was earmarked for this LCA study. Detailed life cycle inventory details were collected for various life cycle phases of different types of shopping bags. Carbon footprint, ecological footprint and eco-damage assessments were made to quantify the life cycle impacts of each phase of the various shopping bags with the aid of SIMAPRO version 7.3 of LCA software. The LCA results revealed that each phase of life cycle impacted the final result and the reusable bags outscored single use bags in all three territories. Nonwoven bags made out of polypropylene followed by polyester and woven cotton bags caused fewer life cycle impacts. LDPE bags were shown to create higher impacts in the list of samples chosen for this study. Also the life cycle impacts of shopping bags used by an average

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Indian were found to be less compared to those for Chinese and Hong Kong residents. It was also apparent from the LCA results that the greater degree of reuse selected, the less the carbon footprint, ecological footprint and eco-damage in all the three territories. Even a small contribution from the consumer's side, to reuse a bag one more time, would make a great difference in terms of mitigating environmental impact. Consumer's support in terms of reusing a bag till its last point in life cycle and recycling it rather than disposing to landfill, supported by government recycling policies, will reduce the environmental impacts made by different types of shopping bags.

This collection is the only comprehensive source of readings and cases that can serve as a stand-alone text or supplement for courses in environmental strategy, ethics, green marketing, or clean production. The book is noteworthy for the premier quality of its contributions, with content taken from journals such as the Harvard Business Review, and written by recognized leaders in the field, such as John Elkington, Stuart Hart, Paul Hawken, Amory Lovins, & Hunter Lovins, Forest Reinhardt, Daniel Esty, and William McDonough & Michael Braungart. Edited by an acknowledged leader in the field of environmental management and strategy, this book fills a major gap in the teaching of business and the environment. New to this edition: 70% of the entries in this book are new to this edition, and cover many current and emerging topics, such as the Triple Bottom Line, Climate Change, Transparency & The Global Reporting Initiative, and Base of the Pyramid. Updated coverage of topics such as Environmental Regulation, Green Marketing, Environmental Strategy, and Clean Operations. Eleven new cases backed by six videos that ensure excellent classroom discussions. Many of the readings and cases are international in flavor, ensuring adequate exposure to the

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global nature of environmental management. An Instructor's Resource CD with complete teaching and cases notes is available to support use of this fine collection. Intended Audience The book will work perfectly as the core text for courses such as Environmental Management, Green Marketing, Clean Production, and Environmental Policy and Strategy. In addition, the book can support course modules in business and the environment that are part of many other courses.

Many environmental problems resulting from atmospheric, land and water pollution are now widely understood. The combination of both improved technology and legislative pressure has led to a reduction in pollution from industrial practices in the West in recent years. However, sustainable development is dependent upon a new approach to environmental protection - clean technology. This book is in two parts. The first explores the ecological principles governing the function of ecosystems, sustainability and biodiversity (Chapter 1) and the problems resulting from atmospheric pollution (Chapter 2), water pollution (Chapter 3) and land pollution (Chapter 4). For example, there is increasing international concern that the combustion of fossil fuels is leading to an increase in the levels of carbon, sulphur and nitrogen gases which pollute the atmosphere of our planet. The enhanced levels of carbon gases such as carbon dioxide may cause change in our global climate and, in turn, lead to flooding and loss of low-lying coastal regions. In addition, the deposition of sulphur and nitrogen oxides is believed to be the cause of 'acid rain' which has led to loss of fish stocks from upland lochs and damage to forestry plantations.

LCA - Quo vadis? discusses overarching topics, new developments and major problems of Life Cycle Assessment (LCA), and compares LCA with site-specific environmental

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management. The text profits from two years of interdisciplinary, coordinated research activities of the Priority Programme Environment of the Swiss National Science Foundation. How should system boundaries of a product life cycle be drawn? · How can environmental interventions be allocated to products? · How are background inventory data collected and used? · How can imprecision in the LCA method be ascertained and checked? · How can relevant environmental interventions be distinguished from irrelevant ones? · What requirements should a software tool for LCA meet?§ A concept of site-specific LCA is proposed in response to criticism of the current approach of LCA. Furthermore, managerial eco-controlling - the emerging method of site-specific environmental management - is discussed. The book concludes with an outlook of possible paths in the future development of LCA.

Tourism is an activity that anyone can take part in, regardless of their age, gender, nationality or level of income. This makes tourism one of the most rapidly developing industries in the world. Despite the number of benefits which tourism produces, it also has significant negative impacts on the environment. To minimise the scope of these negative impacts, joint efforts combining tourism and environmental management are called for. This book examines the application of the Life Cycle Assessment (LCA) method and lifecycle thinking as a tool to generate more accurate and holistic appraisals of the environmental impacts of tourism. Looking at the issue of sustainability of tourism operations, the book evaluates how it can be improved. It highlights the potential of LCA to affect tourist behaviour and contribute to tourism policy-making and managerial practice. This book provides a valuable resource for undergraduates, postgraduates and researchers interested in sustainable tourism, sustainable development and environmental impact

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assessment.

Waste Reduction : 6th report of session 2007-08, Vol. 2:

Evidence

The first book of its kind, the LCA Handbook will become an invaluable resource for environmentally progressive manufacturers and suppliers, product and process designers, executives and managers, and government officials who want to learn about this essential component of environmental sustainability.

This book describes the importance of the goal and scope phase for the entire LCA study. In this first phase of the LCA framework (ISO standardized), the purpose of the assessment is defined and decisions are made about the details of the industrial system being studied and how the study will be conducted. Selecting impact categories, category indicators, characterization models, and peer review is decided during goal and scope definition. The book provides practical guidance and an overview of LCIA methods available in LCA software. Although not specified in the ISO standards, Attributional LCA and Consequential LCA are presented in order to appropriately determine the goal and scope of an assessment. The book closes with the interconnection between goal and scope definition and the interpretation phase. Example goal and scope documents for attributional and consequential LCAs are provided in the annexes.

Many books on sustainability have been written in the last decade, most of them dealing with agricultural systems, communities, and general business practices. In contrast, Handbook of Sustainability for the Food

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Sciences presents the concept of sustainability as it applies to the food supply chain from farm to fork but with a special emphasis on processing. Structured in four sections, Handbook of Sustainability for the Food Sciences first covers the basic concepts of environmental sustainability and provides a detailed account of all the impacts of the food supply chain. Part two introduces the management principles of sustainability and the tools required to evaluate the environmental impacts of products and services as well as environmental claims and declarations. Part three looks at ways to alleviate food chain environmental impacts and includes chapters on air emissions, water and wastewater, solid waste, energy, packaging, and transportation. The final part summarizes the concepts presented in the book and looks at the measures that will be required in the near future to guarantee long term sustainability of the food supply chain. Handbook of Sustainability for the Food Sciences is aimed at food science professionals including food engineers, food scientists, product developers, managers, educators, and decision makers. It will also be of interest to students of food science.

This first hands-on guide to ISO-compliant Life Cycle Assessment (LCA) makes this powerful tool immediately accessible to both professionals and students. Following a general introduction on the philosophy and purpose of LCA, the reader is taken through all the stages of a complete LCA analysis, with each step exemplified by real-life data from a major LCA project on beverage packaging. Measures as carbon and water footprint,

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based on the most recent international standards and definitions, are addressed. Written by two pioneers of LCA, this practical volume is targeted at first-time LCA users but equally makes a much-valued reference for more experienced practitioners. From the content: * Goal and Scope Definition * Life Cycle Inventory Analysis * Life Cycle Impact Assessment * Interpretation, Reporting and Critical Review * From LCA to Sustainability Assessment and more.

Designing buildings and physical environments depends on social structure, social needs, economic data, environment, and technological development. Planning these environments is heavily influenced by cultural and regional need, the existing environment, and the materials available. *Reusable and Sustainable Building Materials in Modern Architecture* is an essential reference source that discusses the shaping of building design through culture and materials as well as the influence of environment on building design. Featuring research on topics such as passive design, ecological design, and urban design, this book is ideal for academicians, specialists, and researchers seeking coverage on culture, environment, and building design. Extensively revised and updated, this popular text presents an accessible yet rigorous treatment of environmental and natural resources economics, including climate change and the economics of sustainability. Completely revised and updated, the fourth edition now includes new figures and tables, definitions to assist the reader, and updated policy information. New advances in the science, economics

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and policy approaches to climate change have been integrated into essentially all-new chapters on incentive regulation and global climate change. This innovative textbook integrates economics with science and public policy in a balanced and accessible way that will be appreciated by students from disciplines ranging from economics and natural resources management to environmental studies and energy policy.

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