Plastic Recycling Collection National Reach Study

The aim of the project is to create knowledge on how plastics recycling can increase without increasing the risk of emitting hazardous substances to the environment.The first general conclusion is that to be able to increase recycling there are measures needed at different levels. The following areas are of interest: • Legislation: new legislation is not necessary, but harmonisation and clear guidance to the existing one is. • Market: to create a market safety on content is needed. • If substances added are less hazardous the recycled raw material would be “more safe” to use. • There should be higher attention put on the knowledge of the recyclers. • Traceability and content: Further work on labelling reaching the recycle part of the value chain needs to be developed. It is also needed to develop a systematic approach towards risk assessments linked to recycling.

“Guides readers toward the road less consumptive, offering practical advice and moral support while making a convincing case that individual actions . . . do matter.” —Elizabeth Royte, author, Garbage Land and Bottlemania Like many people, Beth Terry didn’t think an individual could have much impact on the environment. But while laid up after surgery, she read an article about the staggering amount of plastic polluting the oceans, and decided then and there to kick her plastic habit. In Plastic-Free, she shows you how you can too, providing personal anecdotes, stats about the environmental and health problems related to plastic, and individual solutions and tips on how to limit your plastic footprint. Presenting both beginner and advanced steps, Terry includes handy checklists and tables for easy reference, ways to get involved in larger community actions, and profiles of individuals—Plastic-Free Heroes—who have gone

beyond personal solutions to create change on a larger scale. Fully updated for the paperback edition, Plastic-Free also includes sections on letting go of eco-guilt, strategies for coping with overwhelming problems, and ways to relate to other people who aren't as far along on the plastic-free path. Both a practical guide and the story of a personal journey from helplessness to empowerment, Plastic-Free is a must-read for those concerned about the ongoing health and happiness of themselves, their children, and the planet.

This report summarises the knowledge on plastics in Nordic marine species. Nordic biota interacts with plastic pollution, through entanglement and ingestion. Ingestion has been found in many seabirds and also in stranded mammals. Ingestion of plastics has been documented in 14 fish species, which many of them are of ecology and commercially importance. Microplastics have also been found in blue mussels and preliminary studies found synthetic fibres in marine worms. Comparability between and within studies of plastic ingestion by biota from the Nordic environment and other regions are difficult as there are: few studies and different methods are used. It is important that research is directed towards the knowledge gaps highlighted in this report, to get a better understanding on plastic ingestion and impact on biota from the Nordic marine environment.

Solid Waste Recycling and Processing, Second Edition, provides best-practice guidance to solid waste managers and recycling coordinators. The book covers all aspects of solid waste processing, volume reduction, and recycling, encompassing typical recyclable materials (paper, plastics, cans, and organics), construction and demolition debris, electronics, and more. It includes techniques, technologies, and programs to help maximize customer participation rates and revenues, as well as to minimize operating costs. The book is packed

with lessons learned by the author during the implementation of the most successful programs worldwide, and includes numerous case studies showing how different systems work in different settings. This book also takes on industry debates such as the merits of curbside-sort versus single-stream recycling and the use of advanced technology in materials recovery facilities. It provides key facts and figures, and brief summaries of legislation in the United States, Europe, and Asia. An extensive glossary demystifies the terminology and acronyms used in different sectors and geographies. The author also explains emerging concepts in recycling such as zero waste, sustainability, LEED certification, and pay-as-you-throw, and places waste management and recycling in wider economic, environmental (sustainability), political, and societal contexts. Covers single- and mixed-waste streams Evaluates the technologies and tradeoffs of recycling of materials vs. integrated solutions, including combustion and other transformational options Covers recycling as part of the bigger picture of solid waste management, processing and disposal

Plastics offer a variety of environmental benefits. However, their production, applications, and disposal present many environmental concerns. Plastics and the Environment provides state-of-the-art technical and research information on the complex relationship between the plastic and polymer industry and the environment, focusing on the sustainability, environmental impact, and cost—benefit tradeoffs associated with different technologies. Bringing together the field's leading researchers, Anthony Andrady's innovative collection not only covers how plastics affect the environment, but also how environmental factors affect plastics. The relative benefits of recycling, resource recovery, and energy recovery are also discussed in detail. The first of the book's four sections represents a basic introduction to the key subject matter of

plastics and the environment; the second explores several pertinent applications of plastics with environmental implications–packaging, paints and coatings, textiles, and agricultural film use. The third section discusses the behavior of plastics in some of the environments in which they are typically used, such as the outdoors, in biotic environments, or in fires. The final section consists of chapters on recycling and thermal treatment of plastics waste. Chapters include: Commodity Polymers Plastics in Transportation Biodegradation of Common Polymers Thermal Treatment of Polymer Waste Incineration of Plastics The contributors also focus on the effectiveness of recent technologies in mitigating environmental impacts, particularly those for managing plastics in the solid waste stream. Plastic and design engineers, polymer chemists, material scientists, and ecologists will find Plastics and the Environment to be a vital resource to this critical industry.

The third Environmental Performance Review of North Macedonia examines progress made by the country in the management of its environment since 2011. It covers legal and policy frameworks, greening the economy, environmental monitoring, and public participation and education for sustainable development. Furthermore, the EPR addresses issues of specific importance to the country related to air protection, biodiversity and protected areas, as well as water, and waste and chemicals management. The review further provides a substantive and policy analysis of the country's climate change adaptation and mitigation measures and its participation in international mechanisms. The publication is aimed at officials and experts working for public authorities responsible for environmental policy, representatives of civil society, the business community, academia and the media.

Editor Candice L. Mancini uses a series of thought-provoking essays to take readers

across the globe, exploring international issues relating to garbage and recycling. Is E-waste dangerous in India? Is the Nile being ruined by pollution? Is Serbia doing enough to focus on their waste problems? Is Bangladesh's capital swimming in waste? How is China turning trash into art? Readers will explore these questions. They will learn whether Mexico City is running out of places to dump waste and whether the U.S. has a serious issue with plastic bags. Other cultures explored include Canada, Japan, Australia, Spain, the Philippines, and Sweden. One final treat for readers is they'll explore garbage and recycling in space.

The trans-disciplinary thematic areas of oceans management and policy require stocktaking of the state of knowledge on ecosystem services being derived from coastal and marine areas. Recently adopted Sustainable Development Goals (SDGs) especially Goals 14 and 15 explicitly focus on this. This Handbook brings together a carefully chosen set of world-class contributions from ecology, economics, and other development science and attempts to provide policy relevant scientific information on ecosystem services from marine and coastal ecosystems, nuances of economic valuation, relevant legal and sociological response policies for effective management of marine areas for enhanced human well being. The contributors focus on the possible nexus of science-society and science-policy with the objective of informing on decision makers of the governmental agencies, business and industry and civil society in general with respect to sustainable management of Oceans.

"Garbage doesn't exist in nature--the output of one organism is the useful input of another. So why does garbage exist in the human system? Why did it only become a problem the past century? And most importantly, how can we eliminate it--outsmart the very idea of garbage? Eco-entrepreneur Tom Szaky says that to outsmart waste first we have to understand it, then change how we create it, and finally rethink what we do with it. He traces the roots of our current garbage crisis to 20th century technological advances that resulted in historic changes in consuming habits--both the amount of garbage created and its longevity increased dramatically. Szaky argues we can turn this around by changing what we buy, when we buy, why we buy, and what we do with what we've bought. And through innovative recycling and creative "upcycling" (creating new products from discarded objects) we can stop seeing garbage as useless waste and start seeing it as useful waste--a tremendous volume of resources that are simply misunderstood. After reading this mind-expanding book you will never think of garbage the same way again"--

Industrial Applications of Renewable Plastics: Environmental, Technological, and Economic Advances provides practical information to help engineers and materials scientists deploy renewable plastics in the plastics market. It explores the uses, possibilities, and problems of renewable plastics and composites to assist in material selection and rejection. The designer’s main problems are examined, along with basic reminders that deal with structures and processing methods that can help those who

are generally familiar with metals understand the unique properties of plastic materials. The book offers a candid overview of main issues, including conservation of fossil resources, geopolitical considerations, greenhouse effects, competition with food crops, deforestation, pollution, and disposal of renewable plastics. In addition, an overview of some tools related to sustainability (Life cycle assessments, CO2 emissions, carbon footprint, and more) is provided. The book is an essential resource for engineers and materials scientists involved in material selection, design, manufacturing, molding, fabrication, and other links in the supply chain of plastics. The material contained is of great relevance to many major industries, including automotive and transport, packaging, aeronautics, shipbuilding, industrial and military equipment, electrical and electronics, energy, and more. Provides key, enabling information for engineers and materials scientists looking to increase the use of renewable plastic materials in their work Presents practical guidance to assist in materials selection, processing methods, and applications development, particularly for designers more familiar with other materials, such as metals Includes a candid discussion of the pros and cons of using renewable plastics, considering the technical, economic, legal, and environmental aspects

Plastics and Environmental SustainabilityJohn Wiley & Sons

Solid waste management affects every person in the world. By 2050, the world is expected to increase waste generation by 70 percent, from 2.01 billion tonnes of waste

in 2016 to 3.40 billion tonnes of waste annually. Individuals and governments make decisions about consumption and waste management that affect the daily health, productivity, and cleanliness of communities. Poorly managed waste is contaminating the world's oceans, clogging drains and causing flooding, transmitting diseases, increasing respiratory problems, harming animals that consume waste unknowingly, and affecting economic development. Unmanaged and improperly managed waste from decades of economic growth requires urgent action at all levels of society. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050 aggregates extensive solid aste data at the national and urban levels. It estimates and projects waste generation to 2030 and 2050. Beyond the core data metrics from waste generation to disposal, the report provides information on waste management costs, revenues, and tariffs; special wastes; regulations; public communication; administrative and operational models; and the informal sector. Solid waste management accounts for approximately 20 percent of municipal budgets in low-income countries and 10 percent of municipal budgets in middle-income countries, on average. Waste management is often under the jurisdiction of local authorities facing competing priorities and limited resources and capacities in planning, contract management, and operational monitoring. These factors make sustainable waste management a complicated proposition; most low- and middle-income countries, and their respective cities, are struggling to address these challenges. Waste management data are critical to creating

policy and planning for local contexts. Understanding how much waste is generated—especially with rapid urbanization and population growth—as well as the types of waste generated helps local governments to select appropriate management methods and plan for future demand. It allows governments to design a system with a suitable number of vehicles, establish efficient routes, set targets for diversion of waste, track progress, and adapt as consumption patterns change. With accurate data, governments can realistically allocate resources, assess relevant technologies, and consider strategic partners for service provision, such as the private sector or nongovernmental organizations. What a Waste 2.0: A Global Snapshot of Solid Waste Management to 2050 provides the most up-to-date information available to empower citizens and governments around the world to effectively address the pressing global crisis of waste. Additional information is available at http://www.worldbank.org/what-a-waste.

Green polymer materials from biomass-based natural resources are of paramount importance in a range of applications, from biomedicine to biocomposites. Indeed, during the last few years there has been increasing demand for green biocomposites obtained from renewable and sustainable biomass-based resources. Plants, grasses, straws, agriculture residues, algae, water plants etc. are among one of the most promising and the most abundant bio-based resources of biopolymers on earth and they are an indispensable

component in biocomposites. One of the important features of biomass-based materials is that they can be designated and tailored to meet different requirements depending upon the application. Renewability, low cost, eco-friendliness, ease of processing, non-abrasiveness and relevant mechanical as well as physico-chemical properties are among the most important advantages of using biomass-based materials for the development of green biocomposites. The prime aim of this book is to give an overview on different kinds of biomass-based biocomposites for a range of applications, from biocomposites to biomedicine. This book is unique in the sense that it deals exclusively with biomass-based biocomposites that are procured from the biopolymers found in nature. In addition, it covers novel topics related to the synthesis, properties, characterization and diverse applications of different biomass-based biocomposites including nanocomposites. Some of the main features are: An overview of the applications of biomass-based biocomposites in different fields to provide researchers/students with a thorough insight into the various systems. An up-to-date working reference on biomass-based biocomposites, including state-of-the-art techniques and developments in the field. Although the commercial applications of these biocomposites are in their infancy, these materials have a huge commercial potential. In setting out the next generation of advances in eco-

friendly biomass-based biocomposites, this book opens the way for further developments in the field. A review of the wealth of research on new biomass-based polymers, together with their applications. Biomass-based Biocomposites will be a standard reference book for biocomposites engineers and all those studying and researching in this important area, as well as those in the automotive industry. Professionals in academia and industry will appreciate the multidisciplinary nature of this comprehensive and practical reference book.
A Practical Guide to Plastics Sustainability: Concept, Solutions, and Implementation is a groundbreaking reference work offering a broad, detailed and highly practical vision of the complex concept of sustainability in plastics. The book's aim is to present a range of potential pathways towards more sustainable plastics parts and products, enabling the reader to further integrate the idea of sustainability into their design process. It begins by introducing the context and concept of sustainability, discussing perceptions, drivers of change, key factors, and environmental issues, before presenting a detailed outline of the current situation with types of plastics, processing, and opportunities for improved sustainability. Subsequent chapters focus on the different possibilities for improved sustainability, offering a step-by-step technical approach to areas including design, properties, renewable plastics, and recycling and re-use. Each

of these pillars are supported by data, examples, analysis and best practice guidance. Finally, the latest developments and future possibilities are considered. Approaches the idea of sustainability from numerous angles, offering practical solutions to improve sustainability in the development of plastic components and products Explains how sustainability can be applied across plastics design, materials selection, processing, and end of life, all set alongside socioeconomic factors Considers key areas of innovation, such as eco-design, novel opportunities for recycling or re-use, bio-based polymers and new technologies The use of plastic materials has seen a massive increase in recent years, and generation of plastic wastes has grown proportionately. Recycling of these wastes to reduce landfill disposal is problematic due to the wide variation in properties and chemical composition among the different types of plastics. Feedstock recycling is one of the alternatives available for consideration, and Feedstock Recycling of Plastic Wastes looks at the conversion of plastic wastes into valuable chemicals useful as fuels or raw materials. Looking at both scientific and technical aspects of the recycling developments, this book describes the alternatives available. Areas include chemical depolymerization, thermal processes, oxidation and hydrogenation. Besides conventional treatments, new technological approaches for the degradation of plastics, such as conversion

under supercritical conditions and coprocessing with coal are discussed. This book is essential reading for those involved in plastic recycling, whether from an academic or industrial perspective. Consultants and government agencies will also find it immensely useful.

Examines the commercialization of bottled water, discussing how the demand has been fueled by the marketing campaigns of big business and the impact that sales have had on the environment, public policy, and global access to a natural resource.

The first report from the project “Improvements in existing collection and recycling systems for plastic waste from households and other municipal waste sources” is focused on describing the existing situation when it comes to collection and recycling of plastic waste in the Nordic countries. The streams covered are (all from both households and other MSW sources): • Plastic packaging waste. • Non-packaging small plastic waste. • Plastic bulky waste. Similarities and differences among the Nordic countries are presented in the report. The findings provide input into the development of suggestions for improvements. The report is part of the Nordic Prime Ministers’ green growth initiative: “The Nordic Region – leading in green growth.” Read more in the web magazine “Green Growth the Nordic Way” at www.nordicway. org or at

www.norden.org/greengrowth The report for Part 2 will be published in December 2014.

The Plastics Paradox is the first and only book to reveal the truth about plastics and the environment. Based on over 400 scientific articles, it dispels the myths that the public believe today. We are told that plastics are not green when in fact, they are usually the greenest choice according to lifecycle analysis (LCA) We are told that plastics create a waste problem when they are proven to dramatically reduce waste, for example replacing 1lb of plastic requires 3-4lb of the replacement material We are told that plastics take 1000 years to degrade when in fact a plastic bag disintegrates in just one year outdoors We are led to believe that plastic bags and straws are an issue when in fact they barely register in the statistics The list goes on... Everything you believe now is untrue and we are making policies that harm the environment based on bad information. After reading The Plastics Paradox you will be able to make wise choices that help create a brighter future for us and for our children.

Provides an overview of state-of-the-art recycling techniques together with current and potential applications. Presents material that is normally only available in the form of conference proceedings Includes flow charts detailing the recycling process Helps identify the problems encountered in the recycling of polymers Presents pie graphs and photographs of

commercial outlets A comprehensive volume which will prove to be invaluable for polymer manufacturers, recyclers and marketers as well as environmental authorities and materials engineers.

This report covers the consumption of plastics in Europe, how much waste plastic is produced, a summary of recent legislation and the various methods of dealing with plastic wastes. The plastics recycling industry in Europe is then reviewed, with an in-depth look at the relevant legislation followed by a summary of the situation in most of the major European countries. The major end-use sectors for plastics and the problem of waste plastics in each are examined in the final section.

The book provides an overview of best practices in urban waste management in the zero waste framework, assuming a multidisciplinary perspective. By analysing exemplary cases of firms and local governments, significant ownership, governance, and performance issues are discussed, along with key drivers of sustainable urban waste management.

Achieving a high quality of waste plastic materials and recycling processes is a key challenge in closing the resource loops for plastics. This report reviews the status and trends for plastic waste flows and treatment in Denmark, Finland, Norway and Sweden. Furthermore, it gives an overview of existing policy instruments and the main challenges for designing policy instruments for improved recycling of plastic waste in these Nordic countries. The report identifies potential market failures associated with closing the resource loops for plastics. It reviews the economics research literature on policy instrument design for achieving optimal recycling rates and makes policy recommendations from the Nordic perspective. Finally, it presents results from a survey on market conditions to managers in the recycling and plastic

manufacturing industry in Sweden.

E-waste management is a serious challenge across developed, transition, and developing countries because of the consumer society and the globalization process. E-waste is a fast-growing waste stream which needs more attention of international organizations, governments, and local authorities in order to improve the current waste management practices. The book reveals the pollution side of this waste stream with critical implications on the environment and public health, and also it points out the resource side which must be further developed under the circular economy framework with respect to safety regulations. In this context, complicated patterns at the global scale emerge under legal and illegal e-waste trades. The linkages between developed and developing countries and key issues of e-waste management sector are further examined in the book.

Recycling of Plastic Materials

Survey’s the issues typically raised in discussions ofsustainability and plastics Discusses current issues not covered in detail previously suchas ocean litter, migration of additives into food products and therecovery of plastics Covers post-consumer fate of plastics on land and in theoceans, highlighting the environmental impacts of disposalmethods Details toxicity of plastics, particularly as it applies tohuman health Presents a clear analysis of the key plastic-related issuesincluding numerous citations of the research base that supports andcontradicts the popularly held notions

Plastic Waste and Recycling: Environmental Impact, Societal Issues, Prevention, and Solutions begins with an introduction to the different types of plastic materials, their uses, and the concepts of reduce, reuse and recycle before examining plastic types, chemistry and degradation patterns that are organized by non-degradable plastic, degradable and biodegradable plastics, biopolymers and bioplastics. Other sections cover current challenges relating to plastic waste, explain the sources of waste and their routes into the environment, and provide systematic coverage of plastic waste treatment methods, including mechanical processing, monomerization, blast furnace feedstocks, gasification, thermal recycling, and conversion to fuel. This is an essential guide for anyone involved in plastic waste or recycling, including researchers and advanced students across plastics engineering, polymer science, polymer chemistry, environmental science, and sustainable materials. Presents actionable solutions for reducing plastic waste, with a focus on the concepts of collection, re-use, recycling and replacement Considers major societal and environmental issues, providing the reader with a broader understanding and supporting effective implementation Includes detailed case studies from across the globe, offering unique insights into different solutions and approaches

The first-ever book on this subject establishes a rigid, transparent and useful

methodology for investigating the material metabolism of anthropogenic systems. Using Material Flow Analysis (MFA), the main sources, flows, stocks, and emissions of man-made and natural materials can be determined. By demonstrating the application of MFA, this book reveals how resources can be conserved and the environment protected within complex systems. The fourteen case studies presented exemplify the potential for MFA to contribute to sustainable materials management. Exercises throughout the book deepen comprehension and expertise. The authors have had success in applying MFA to various fields, and now promote the use of MFA so that future engineers and planners have a common method for solving resource-oriented problems.

Polyethylene terephthalate (PET) is the most recycled plastic in the world. This book covers all from the world market of PET to the many technologies and processes developed for separation, decontamination, recycling and manufacturing into food-grade and non-food-grade products of PET. Also, regulations, testing methods and analytical procedures according to the current regulatory framework are presented.

This book provides transdisciplinary analyses of the automotive plastics production and recycling system, including prognoses, scenarios and solutions for corporate sustainability management. A book on plastics, not written by a

plastics guy. But a sustainability guy. Plastics schizophrenia and the automotive abyss: The industry is facing a severe challenge. It is the inevitable and promising change towards a sustainable economy. However, the automotive industry is primarily concerned with the CO2 emissions from cars when driving, while the rise of lightweight plastics, electric drive and heavy batteries make the production and end-of-life phase ever more important. Therefore, the currently increasing use of non-sustainable virgin plastics in cars has to be tackled. The plastics and the automotive industry now have a chance, and this chance is the Recycling Renaissance. This book offers: • Holistic and transdisciplinary overview on sustainability and automotive plastics from all angles including economy, ecology, technology, and politics with a focus on Europe • Concise analyses, prognoses, tools and a roadmap with solutions for companies, developed together with international experts from industry and academia • Strong scientific basis and independent research including a Europe-wide survey, expert interviews, and workshops • More than 80 illustrations and 15 tables including a SCOT analysis • Executive summaries after each chapter for fast reading “The uniqueness of this book lies within the different point of view on this topic from a critical, outstanding scientist.” - Univ.-Prof. Dipl.-Ing. Dr.mont. Pomberger, Montanuni Leoben

This book is open access under a CC BY 4.0 license. This volume focuses on microscopic plastic debris, also referred to as microplastics, which have been detected in aquatic environments around the globe and have accordingly raised serious concerns. The book explores whether microplastics represent emerging contaminants in freshwater systems, an area that remains underrepresented to date. Given the complexity of the issue, the book covers the current state-of-research on microplastics in rivers and lakes, including analytical aspects, environmental concentrations and sources, modelling approaches, interactions with biota, and ecological implications. To provide a broader perspective, the book also discusses lessons learned from nanomaterials and the implications of plastic debris for regulation, politics, economy, and society. In a research field that is rapidly evolving, it offers a solid overview for environmental chemists, engineers, and toxicologists, as well as water managers and policy-makers.