

Green Finance and Sustainability:

Environmentally-Aware Business Models and Technologies

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Business Models, Regulation and Standard for Sustainability

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Towards the Transition to a Post-Carbon Society: The Crisis of Existing Business Models?.....	1
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This chapter provides a diagnosis of internal and external factors that will trigger incentives to reshape business models incorporating green considerations, on a basis of three sectors analysis (oil, car and outdoor sportswear industries). The authors are aiming at enlightening the way they conceive the transition and the challenges that remain for business transformations.

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John W. Bagby, Pennsylvania State University, USA

This chapter reviews the role of standardization activities in setting environmental constraints, in the development of green technologies, and in establishing metrics for environmental certification and monitoring. The implications of managing environmental standardization to attract financing for sustainable business models are so significant that disregarding the risks of environmental standardization imperils competitiveness.

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Jacqueline C. K. Lam, The University of Hong Kong, Hong Kong

Peter Hills, The University of Hong Kong, Hong Kong

This chapter reviews and discusses the debate over the effectiveness of environmental regulation in promoting industrial Technological Environmental Innovation (TEI). Using the innovation-friendly regulatory principles adapted from Porter and van der Linde (1995a and 1995b), this chapter demonstrates how properly designed and implemented environmental regulation (TEI promoting regulation) has played a critical role in promoting TEI in the transport industry in California and Hong Kong.

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Quantifying Sustainability: Methodology for and Determinants of an Environmental Sustainability Index 74

Kobi Abayomi, Georgia Institute of Technology, USA

Victor de la Pena, Columbia University, USA

Upmanu Lall, Columbia University, USA

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This chapter consider new methods of component extraction and identification for the Environmental Sustainability Index (ESI) – an aggregation of environmental variables created as a measure of overall progress towards environmental sustainability. Principally, the authors propose and illustrate a parametric version of Independent Component Analysis via Copulas (CICA). The CICA procedure yields a more coherent picture of the determinants of environmental sustainability.

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Theo Thiadens, Fontys University of Applied Sciences, The Netherlands

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Andries Kasper, Fontys University of Applied Sciences, The Netherlands

Anda Counoutte-Potman, Open University, The Netherlands

In this chapter, the current situation regarding green data centres in the Netherlands is mapped. The chapter successively goes through the entire chain of processes that are needed for arriving at greener data centres. The chapter starts with the legislators. It continues with the procurement of IT. It discusses the design of facilities required for a data centre and the ICT provisions as used by this data centre. It looks at the analysis of the degree of sustainability in data centres and the measures that need to be taken as a result of this. And it concludes by describing how ICT equipment could be recycled.

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Malgorzata Pankowska, University of Economics in Katowice, Poland

The first part of the chapter includes presentation of benefits resulting from IT (Information Technology) resources virtualization, Grid computing and cloud computing development. The second part

contains a model of IT governance for sustainability. The main important factors included in the model concern IT strategy, business strategy, IT management, business agreements.

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An Introduction to the Green IT Balanced Scorecard as a Strategic IT Management System 126

Yulia Wati, Chosun University, South Korea

Chulmo Koo, Chosun University, South Korea

This chapter introduces the Green IT Balanced Scorecard by incorporating an environmental aspect of technology into the scorecard measurement method. The authors conceptualized the Green IT balanced scorecard as “a nomological management tool to systematically align IT strategy with business strategy from an environmental sustainability perspective in order to achieve competitive advantage.”

Chapter 8

A New Recommendation for Green IT Strategies: A Resource-Based Perspective 153

Yulia Wati, Chosun University, South Korea

Chulmo Koo, Chosun University, South Korea

This chapter conceptualizes three different strategies: tactical green IT strategy, strategic proactive green IT strategy, and sustained green IT strategy, along with theory-based propositions for each of the strategies. The chapter also demonstrates that the Green IT strategy is path-dependent; that is to say, a firm’s prior experience and history helps determine its current strategies. This study also involves a discussion of the development of the theory, the proposed model, and some possible future research directions.

Chapter 9

Information and Communication Technologies (ICT) in Building Knowledge Processes in Vulnerable Ecosystems: A Case for Sustainability 176

Prakash Rao, Symbiosis International University, India

The present chapter explores the use of some of the current state of the art technologies like ICTs including tools like Remote Sensing and GIS as a means for providing sound and efficient decision making across various sectors.

Chapter 10

MSP430 Microcontroller: A Green Technology 191

Mala Mitra, PES School of Engineering, India

In this chapter, the architecture and function of a microcontroller, a device for system operation control at micro-level, is briefed. The need for a low power microcontroller towards sustainability and greening is stressed with various examples. The MSP430 Microcontroller, a product from Texas Instruments, is a very low power microcontroller.

Chapter 11

Toward a Conceptual Model for Sustainability and Greening through Information

Technology Management..... 199

A.T. Jarmoszko, Central Connecticut State University, USA

Marianne D'Onofrio, Central Connecticut State University, USA

Joo Eng Lee-Partridge, Central Connecticut State University, USA

Olga Petkova, Central Connecticut State University, USA

This study describes a conceptual approach to greening and sustainability through Information Technology management. The authors reviewed existing research and publications on the topic of greening, and concluded that while much has been written about ways to go green, much less are available on guidelines to help gauge the degree of greening efforts.

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Julien Chevallier, Université Paris Dauphine, France

This chapter details the idiosyncratic risks affecting each emissions market, be it in terms of regulatory uncertainty, economic activity, industrial structure, or the impact of other energy markets. Besides, based on a careful analysis of the EUA and CER price paths, this chapter assesses common risk factors by focusing more particularly on the role played by the CER import limit within the ETS.

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Tenke A. Zoltáni, Islan Asset Management, Switzerland

Since 2005, when the European Union Emissions Trading Scheme (EU ETS) launched, green adoption in business and industry has been marred by fraudulent carbon credits, VAT swindlers and carbon cowboys, inefficiencies of a nascent market, and not least of all by legislative uncertainty. The disrepute afforded by these examples hindered low carbon growth and deterred emerging business models from adopting more carbon friendly practices.

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Robert Bailis, Yale University, USA

Neda Arabshahi, Yale University, USA

To assess how voluntary emissions reduction programs have performed, this study examines the progress that C4C signatories have made. The results show widely dispersed GHG quantities and a range of reduction plans. Due to the lack of uniform, comparable data, the authors call for standardized, clearly defined carbon accounting guidelines as the first step towards effective corporate GHG management

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The GHG reduction from ships has attracted international attention. As the major transportation mode in international trade, how the reduction cost influences the international trade is becoming a major concern. How to allocate the funds collected from the emission regulation is also in controversy. This chapter summarizes the policy instruments under discussion in the International Maritime Organization and discusses the advantages of market based instruments.

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Emissions Trading at Work: The EU Emissions Trading Scheme and the Challenges for Large Scale Auctioning.....	291
<i>Bernd Mack, Deutsche Boerse, Germany</i>	
<i>Sabina Salkic, Deutsche Boerse, Germany</i>	

After introducing the foundations of cap-and-trade markets, the authors of this chapter confirm that the market architecture of the EU ETS is working and that secondary market trading is functioning. But they also illustrate frictions in price discovery and variability in pricing relations. This leads to the conclusion that efficiency and integrity of the emissions markets are particularly susceptible to institutional uncertainty and supply and demand constraints.

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<i>Frank Lefley, University of London, UK</i>	
<i>Joseph Sarkis, Clark University, USA</i>	

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Section 4

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<i>Marcus Thiell, Universidad de los Andes, Colombia</i>	
<i>Juan Pablo Soto Zuluaga, Universidad de los Andes, Colombia</i>	
<i>Juan Pablo Madiedo Montañez, Universidad de los Andes, Colombia</i>	
<i>Bart van Hoof, Universidad de los Andes, Colombia</i>	

This chapter presents a global overview of green logistics practices at various management levels and the inherent challenges of their implementation in emerging markets. It begins by clarifying the terminology and describing its scope and characteristics, and it continues with an analysis of the impact of green logistics on the creation of economic and social value.

Chapter 19

The Impact of Sustainability-Focused Strategies on Sourcing Decisions 358

Ozan Özcan, University of South Florida, USA

Kingsley Anthony Reeves Jr., University of South Florida, USA

This book chapter examines the relationship between the pursuit of a sustainability-focused corporate strategy and the level of vertical integration observed in organizations. The study makes two contributions. First, it develops the theoretical foundation for linking sustainability strategies to organizational structure. Second, it empirically examines the vertical integration level of 144 sustainability-focused companies in 9 different industries.

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Darren Prokop, University of Alaska Anchorage, USA

This chapter will discuss the role of logistics and supply chain management in the generation of such pollutants and examine methods to mitigate this byproduct of modern business activity. It will be shown that a series of trade-offs exist which are complex in nature and require careful consideration when confronting environmental concerns.

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Greener Transportation Infrastructure: Theoretical Concepts for the Environmental Evaluation of Airports..... 394

Jean-Christophe Fann, Université Libre de Bruxelles, Belgium & University of California, Berkeley, USA

Jasenka Rakas, University of California, Berkeley, USA

The adoption of greener construction practices occurs mostly in the realm of building projects. Existing environmental evaluations are often generic, and hence, unable to manage the complexity of larger infrastructure systems such as airports. To respond to this need, the authors of this chapter developed the theoretical grounds for the evaluation of greener airport systems.

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A Conceptual Model for Greening a Supply Chain through Greening of Suppliers and Green Innovation 422

H. K. Chan, University of East Anglia, UK

T.-Y. Chiou, University of East Anglia, UK

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Nowadays, more organisations are focusing on how to improve their environmental performance, partly driven by recent regulations in this area. This means that green supply chain management plays an important role over traditional supply chain management. Companies could gain competitive advantage through the proper management of their supply chain activities, for example, purchasing management. In fact, organisations can now generate more business opportunities than their competitors by addressing environmental management successfully.

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<i>Suat Kasap, Hacettepe University, Turkey</i>	
<i>Sibel Uludag Demirer, Villanova University, USA</i>	
<i>Sedef Ergün, Drogosan Pharmaceuticals, Turkey</i>	

This chapter presents an environmentally integrated manufacturing system analysis for companies looking for the benefits of environmental management in achieving high productivity levels. When the relationship between environmental costs and manufacturing decisions is examined, it can be seen that the productivity of the company can be increased by using an environmentally integrated manufacturing system analysis methodology.

Section 5 Regional Development

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<i>Zhao Ang, Freelance Researcher, Belgium</i>	

This chapter examines the impact of Chinese electricity market establishment and environmental regulatory institution on CCS. This chapter argues that Chinese government should protect Intellectual Property Right (IPR), liberalize electricity market, and enforce environmental regulation in order to harvest CCS benefits successfully.

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<i>Christian Ploberger, University of Birmingham, UK</i>	

China and its population are confronted with fundamental environmental challenges, as both environmental degeneration and the impact of climate change exhibit critical political, economic, and social implications for their future development. Among the various environmental challenges China faces, this chapter identifies pollution issues, soil erosion, acid rain, and sea-level rise.

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Zhang Mu, Jinan University, China

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Feng Xiao-na, Jinan University, China

Chen Shan, Jinan University, China

Recent years saw the global wave of new low-carbon economy, which is a new strategic measure to cope with global warming, and it has gained lots of concerns from many governments. As the representatives of developing countries, China is responsible for “common but distinguishing duty for global climate change.” Many policies have been made to develop low-carbon economy with the hope to advocate and innovate low-carbon economy in some industries and cities during these years.

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Government Policies and Private Investments Make for a Bright Cleantech Future in India 526

Gavin Duke, Aloe Private Equity, UK

Nidhi Tandon, Networked Intelligence for Development, Canada

Written from the perspective of private equity investment, this chapter highlights the factors needed to support clean technology development, and in particular, the importance of an enabling policy environment. Drawing from the experience of a private equity fund that seeks out environmental companies and grows them into viable international enterprises, this chapter showcases examples in India whose bottom lines include social and environmental benefits for all.

Chapter 28

Building a Sustainable Regional Eco System for Green Technologies: Case of Cellulosic Ethanol in Oregon 535

Bob Greenlee, Cascade Microtech, USA

Tugrul Daim, Portland State University, USA

Increasing gasoline prices, concerns about energy security, and the effect of greenhouse gases on global warming are driving demand for alternative fuels such as ethanol and biodiesel. In the United States, corn is the major source of fuel ethanol, but there are disadvantages to using crops for fuel, including increasing costs and competition with food sources.

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