

Contents

Preface — V

Chapter 1

Historical development and basic ideas — 1

References — 15

Chapter 2

Economic-ecological concepts — 19

2.1 Value creation and supply chains — 19

2.1.1 Supply chain — 19

2.1.2 Technological progress in value chains – a dilemma — 21

2.2 Circular economy — 21

References — 23

Chapter 3

Business and sustainability — 25

3.1 Business models — 25

3.2 Sustainable business models — 25

3.3 Schools offering theories on ecologically sustainable business models — 27

3.3.1 Natural capitalism — 29

3.3.2 Blue economy — 30

3.3.3 Regenerative design — 31

3.4 Criteria for evaluation and benchmarking for economic sustainability — 32

3.4.1 SDGs of the United Nations — 32

3.4.2 Measures and criteria for the transition phase — 33

3.4.3 Resolve methodology — 34

3.4.4 Emission pricing — 34

3.4.5 Assessment at national levels – beyond GNP — 37

References — 39

Chapter 4

Life cycle assessment (LCA) — 43

4.1 Introduction — 43

4.2 Steps to take in the standardised LCA process — 43

References — 48

Chapter 5

Environmental footprints and their calculation — 51

- 5.1 CO₂ footprints — 51**
 - 5.1.1 GHG emission footprint and CO₂ footprint — 51**
 - 5.1.2 GHP Scope 1, 2 and 3 emissions — 52**
 - 5.1.3 Emissions — 54**
- 5.2 Economic risks linked to emissions — 57**
- 5.3 Example: print on different substrates — 66**
 - 5.3.1 Boundary conditions — 67**
 - 5.3.2 Printing — 73**
 - 5.3.3 Discussion — 80**
- 5.4 Example: backing oven — 82**
- 5.5 Example: digital newspaper — 86**
 - 5.5.1 Phases in lifetime — 86**
 - 5.5.2 Server farms — 88**
 - 5.5.3 Read/consume — 88**
 - 5.5.4 Discussion — 91**
- 5.6 Summary — 91**
 - References — 94**

Chapter 6

Eco-design — 97

- 6.1 Guidelines — 97**
- 6.2 Tool kits — 98**
 - 6.2.1 MET matrix — 98**
 - 6.2.2 Eco-design-strategy wheel (LiDS-Wheel) — 99**
 - 6.2.3 Eco-designchecklists — 101**
 - 6.2.4 An approach to eco-design — 104**
- 6.3 Eco-design – a “high-level” example — 105**
 - 6.3.1 Introduction — 105**
 - 6.3.2 Approach — 106**
 - 6.3.3 Starting point — 106**
 - 6.3.4 Product life cycles and circular economy — 107**
 - 6.3.5 Recommendations on eco-design and management for the circular economy — 108**
 - 6.3.6 Eco-design guidelines — 111**
 - 6.3.7 Eco-management guidelines — 111**
 - 6.3.8 Recommendations for the management of environmental impacts — 111**
- 6.4 Sustainable approaches to fibre-related resource management — 114**
 - 6.4.1 Order initiator supply chain checklist — 115**
 - References — 117**

Chapter 7**Life cycle assessment of an organisation — 119**

- 7.1 Introduction — 119
- 7.2 General approach — 120
 - 7.2.1 Priority principle — 120
- 7.3 Sustainability of an organisation — 121
 - 7.3.1 Background — 122
 - 7.3.2 Best practices — 124
 - 7.3.3 Environmental audits for organisations — 125
- References — 127

Chapter 8**Energy and material strategy — 131**

- 8.1 Material strategy — 131
 - 8.1.1 Accounting and return logistics — 131
 - 8.1.2 Material recycling as a business model – an example — 137
- 8.2 Energy-related strategy — 140
- References — 141

Chapter 9**Stakeholder and their contributions — 143**

- 9.1 Manufacturing and logistics — 144
- 9.2 Research and development — 146
- 9.3 Facility management — 150
- 9.4 Procurement — 150
- 9.5 Marketing — 156
- 9.6 Quality management — 159
- 9.7 Health and safety — 162
- 9.8 Legal — 163
- 9.9 Distribution and logistics — 164
- 9.10 Field service — 166
- 9.11 Duties of all stakeholders — 167
- References — 172

Chapter 10**Audits — 173**

- 10.1 General — 173
- 10.2 Questionnaires — 176
 - 10.2.1 General — 176
- 10.3 Reporting — 178
- References — 179

Chapter 11

Information and transparency — 181

- 11.1 Communication with employees — **182**
- 11.2 Communication with the public — **183**
- 11.3 Communication with customers — **184**
- 11.4 Communication with share holders — **188**
- 11.5 Communication with partners — **190**
- 11.6 Corporate sustainability report — **192**
- 11.7 Environmental Policy — **192**
- References — **194**

Chapter 12

Instead of a conclusion – a perspective? — 197

- 12.1 The Paris Agreement and the 2 °C target — **197**
- 12.2 Tipping points — **199**
- 12.3 Economic scenario until 2050 — **200**
- 12.3.1 Fewer jobs and climate change lead to migration — **201**
- 12.4 Legislation and litigation — **201**
- 12.4.1 Legal disputes and court proceedings — **203**
- 12.5 Summarizing thoughts — **204**
- References — **207**

Annex

Annex 1 – Sources — 215

Annex 2 – Glossary — 217

List of Figures — 223

List of Tables — 225

Biography — 229

Index — 231