

Contents

Part I Introduction

1	About This Book	3
	Michael Z. Hauschild, Ralph K. Rosenbaum and Stig Irving Olsen	
2	Main Characteristics of LCA	9
	Anders Bjørn, Mikołaj Owsianiak, Christine Molin and Alexis Laurent	
3	LCA History	17
	Anders Bjørn, Mikołaj Owsianiak, Christine Molin and Michael Z. Hauschild	
4	LCA Applications	31
	Mikołaj Owsianiak, Anders Bjørn, Alexis Laurent, Christine Molin and Morten W. Ryberg	
5	LCA and Sustainability	43
	Andreas Moltesen and Anders Bjørn	

Part II Methodology

6	Introduction to LCA Methodology	59
	Michael Z. Hauschild	
7	Goal Definition	67
	Anders Bjørn, Alexis Laurent, Mikołaj Owsianiak and Stig Irving Olsen	
8	Scope Definition	75
	Anders Bjørn, Mikołaj Owsianiak, Alexis Laurent, Stig Irving Olsen, Andrea Corona and Michael Z. Hauschild	

9	Life Cycle Inventory Analysis	117
	Anders Bjørn, Andreas Moltesen, Alexis Laurent, Mikołaj Owsianiak, Andrea Corona, Morten Birkved and Michael Z. Hauschild	
10	Life Cycle Impact Assessment	167
	Ralph K. Rosenbaum, Michael Z. Hauschild, Anne-Marie Boulay, Peter Fantke, Alexis Laurent, Montserrat Núñez and Marisa Vieira	
11	Uncertainty Management and Sensitivity Analysis	271
	Ralph K. Rosenbaum, Stylianos Georgiadis and Peter Fantke	
12	Life Cycle Interpretation	323
	Michael Z. Hauschild, Alexandra Bonou and Stig Irving Olsen	
13	Critical Review	335
	Ralph K. Rosenbaum and Stig Irving Olsen	
14	Use of Input–Output Analysis in LCA	349
	Tuomas J. Mattila	
15	Life Cycle Costing: An Introduction	373
	Jan-Markus Rödger, Louise Laumann Kjær and Aris Pagoropoulos	
16	Social Life Cycle Assessment: An Introduction	401
	Andreas Moltesen, Alexandra Bonou, Arne Wangel and Kossara Petrova Bozhilova-Kisheva	
Part III Applications		
17	Introduction to Part III: Application of LCA in Practice	425
	Ralph K. Rosenbaum	
18	Life Cycle Thinking and the Use of LCA in Policies Around the World	429
	G. Sonnemann, E.D. Gemechu, S. Sala, E.M. Schau, K. Allacker, R. Pant, N. Adibi and S. Valdivia	
19	Globalisation and Mainstreaming of LCA	465
	Arne Wangel	
20	Organisational LCA	481
	Julia Martínez-Blanco and Matthias Finkbeiner	
21	Future-Oriented LCA	499
	Stig Irving Olsen, Mads Borup and Per Dannemand Andersen	
22	Life Cycle Management	519
	Niki Bey	
23	Ecodesign Implementation and LCA	545
	Tim C. McAloone and Daniela C.A. Pigosso	

24 Environmental Labels and Declarations	577
Jeppe Frydendal, Lisbeth Engel Hansen and Alexandra Bonou	
25 Cradle to Cradle and LCA	605
Anders Bjørn and Michael Z. Hauschild	
26 LCA of Energy Systems	633
Alexis Laurent, Nieves Espinosa and Michael Z. Hauschild	
27 LCA of Electromobility	669
Felipe Cerdas, Patricia Egede and Christoph Herrmann	
28 LCA of Buildings and the Built Environment	695
Benjamin Goldstein and Freja Nygaard Rasmussen	
29 LCA of Food and Agriculture	723
Teunis J. Dijkman, Claudine Basset-Mens, Assumpció Antón and Montserrat Núñez	
30 LCA of Biofuels and Biomaterials	755
Susanne Vedel Hjuler and Sune Balle Hansen	
31 LCA of Chemicals and Chemical Products	783
Peter Fantke and Alexi Ernstoff	
32 LCA of Nanomaterials	817
Mirko Miseljic and Stig Irving Olsen	
33 LCA of Drinking Water Supply	835
Berit Godskesen, Noa Meron and Martin Rygaard	
34 LCA of Wastewater Treatment	861
Henrik Fred Larsen	
35 LCA of Solid Waste Management Systems	887
Ioannis Bakas, Alexis Laurent, Julie Clavreul, Anna Bernstad Saraiva, Monia Niero, Emmanuel Gentil and Michael Z. Hauschild	
36 LCA of Soil and Groundwater Remediation	927
Gitte Lemming Søndergaard and Mikołaj Owsianiak	
Part IV LCA Cookbook	
37 LCA Cookbook	963
Michael Z. Hauschild and Anders Bjørn	
Part V Annexes	
38 Report Template	1051
Anders Bjørn, Alexis Laurent and Mikołaj Owsianiak	

39 Illustrative Case Study: Life Cycle Assessment of Four Window Alternatives 1059
Mikołaj Owsianiak, Anders Bjørn, Heidi B. Bugge,
Sónia M. Carvalho, Leise Jebahar, Jon Rasmussen,
Caroline M. White and Stig Irving Olsen

40 Overview of Existing LCIA Methods—Annex to Chapter 10 1147
Ralph K. Rosenbaum

Glossary 1185

Index 1199



<http://www.springer.com/978-3-319-56474-6>

Life Cycle Assessment

Theory and Practice

Hauschild, M.; Rosenbaum, R.K.; Olsen, S. (Eds.)

2018, XX, 1216 p. 223 illus., 114 illus. in color.,

Hardcover

ISBN: 978-3-319-56474-6