

Climate Change, Supply Chain Management and Enterprise Adaptation: Implications of Global Warming on the Economy

Costas P. Pappis
University of Piraeus, Greece



INFORMATION SCIENCE REFERENCE

Hershey · New York

Table of Contents

Foreword	viii
Preface	x
Acknowledgment	xv
Chapter 1	
The Enterprise in the 21st Century	1
<i>Introduction</i>	1
<i>The Extended Enterprise</i>	6
<i>Corporate Social Responsibility</i>	9
<i>What Does the 21st Century Bring Forward?</i>	17
<i>Discussion and Conclusion</i>	22
<i>References</i>	25
Chapter 2	
Global Warming: Basic Facts	30
<i>Introduction</i>	30
<i>The Greenhouse Effect</i>	32
<i>The IPCC's Reports</i>	34
<i>Changes in Atmospheric Constituents and in Radiative Forcing</i>	36
<i>Surface and Atmospheric Climate Change</i>	39
<i>Changes in Snow, Ice, and Frozen Ground</i>	46
<i>Oceanic Climate Change and Sea Level</i>	49
<i>Climate Change Evolution, Climate Models and the SRES Scenarios</i>	51

<i>Palaeoclimate</i>	58
<i>Discussion and Conclusion</i>	59
<i>References</i>	62

Chapter 3

Global Impacts of Climate Change	66
<i>Introduction</i>	66
<i>Reviews of Climate Change Impacts</i>	68
<i>Implications for People around the World</i>	70
<i>Implications for Developing Countries</i>	74
<i>Implications for Developed Countries</i>	76
<i>Monetary Costs of Climate Change</i>	78
<i>Discussion and Conclusion</i>	85
<i>References</i>	89

Chapter 4

Climate Change and Supply Chain Operations	93
<i>Introduction</i>	93
<i>Supply Chain Operations and Their Management</i>	96
<i>Climate Change and Firms: The Carbon Disclosure Project</i>	104
<i>The Manufacturing Sector</i>	108
<i>The Transportation Sector</i>	111
<i>Warehousing and Storage</i>	114
<i>Trading</i>	116
<i>Consumption and Customer Service</i>	117
<i>The Role of Information Technology</i>	119
<i>Discussion and Conclusion</i>	121
<i>References</i>	124

Chapter 5

Climate Change Adaptation Policies	127
<i>Introduction</i>	127
<i>Key Climate Adaptation Concepts</i>	129
<i>Climate Adaptation in the Developed World</i>	132
<i>Climate Adaptation in Developing Countries</i>	138
<i>Company Climate Adaptation</i>	143
<i>Discussion and Conclusion</i>	147
<i>References</i>	148

Chapter 6

Climate Change Mitigation Policies	152
<i>Introduction</i>	152
<i>Drivers of Global Emissions' Increase</i>	153
<i>Stabilization of Greenhouse Gas Concentrations</i>	156
<i>Instruments of Mitigation</i>	159
<i>The Kyoto Protocol</i>	159
<i>Carbon Trading</i>	163
<i>The Clean Development Mechanism</i>	167
<i>Joint Implementation</i>	168
<i>Technology Policies</i>	169
<i>Shifting to New or Improved Technologies</i>	169
<i>Technological Options</i>	171
<i>Power Generation Technologies</i>	173
<i>Technological Developments in Other Areas</i>	175
<i>The Case of Biofuels</i>	178
<i>Change of Preferences and Behavior</i>	180
<i>Discussion and Conclusion</i>	182
<i>References</i>	185

Chapter 7

Business Responses to Climate Change	190
<i>Introduction</i>	190
<i>The Carbon Disclosure Project</i>	192
<i>A Boardroom Agenda</i>	192
<i>The Carbon Disclosure Project Methodology</i>	194
<i>The CDP6 Findings</i>	197
<i>The CERES Report</i>	209
<i>The 100 Companies' Profiles</i>	209
<i>The Report Findings</i>	211
<i>EPA Climate Leaders</i>	217
<i>Other Greenhouse Gas Programs and Company Examples</i>	218
<i>Sectors Moving Ahead and New Opportunities</i>	220
<i>Examples of Sectors Moving Ahead</i>	220
<i>New Opportunities</i>	224
<i>Sectors Lagging Behind</i>	225
<i>Company Examples</i>	227
<i>The Case of Small and Medium Enterprises</i>	231
<i>Discussion and Conclusion</i>	234
<i>References</i>	238

Chapter 8

Coping with Risk and Uncertainty	241
<i>Introduction</i>	241
<i>Handling Uncertainty and Risk</i>	248
<i>Decision Framework Approaches to Uncertainty and Risk</i>	252
<i>The UNEP Framework</i>	253
<i>The UK Climate Impacts Programme Framework</i>	254
<i>The Australian Greenhouse Office Framework</i>	256
<i>The Ministry for Environment of New Zealand Framework</i>	257
<i>Uncertainty, Risk, and Insurance</i>	258
<i>Discussion and Conclusion</i>	263
<i>References</i>	266

Chapter 9

Frameworks of Policy Making Under Climate Change	271
<i>Introduction</i>	271
<i>The UNEP Framework</i>	273
<i>Scope and Structure</i>	273
<i>Generic Issues</i>	274
<i>Socio-Economic Scenarios</i>	275
<i>Climate Change Scenarios</i>	277
<i>Integration</i>	278
<i>Adaptation to Climate Change: Theory and Assessment</i>	280
<i>Sectoral Chapters</i>	283
<i>The UK Climate Impacts Programme Framework</i>	283
<i>Scope and Structure</i>	283
<i>The Eight Stages for Decision Making</i>	284
<i>Tools and Techniques</i>	288
<i>The Australian Greenhouse Office Framework</i>	289
<i>Scope and Structure</i>	289
<i>Conducting an Initial Assessment</i>	291
<i>The Generic Principles</i>	294
<i>Other Considerations</i>	296
<i>The New Zealand Climate Change Office Framework</i>	298
<i>Scope and Structure</i>	298
<i>How to Assess Climate Change</i>	299
<i>How to Identify What Will be Materially Affected</i>	300
<i>Developing Scenarios</i>	301
<i>Risk Assessment</i>	303

<i>Integrating Climate Change Risk Assessment into Council Decisions</i>	304
<i>Discussion and Conclusion</i>	305
<i>References</i>	306
Epilogue	309
Appendix	317
About the Author	332
Index	333