

**Book Title: *Carbon Reduction: Policies, Strategies and Technologies***

This book provides an overview of carbon reduction approaches, techniques and strategies as a means of meeting sustainability goals. This book summarizes the history, policies and agenda that are the key building blocks in the implementation of carbon reduction programs. Technologies are discussed that have potential to achieve carbon reduction goals. Strategies grow from the policies and technologies available to impact carbon. This book also considers the management approaches and means of financing carbon reduction projects. This book will provide a practical applications and approaches to carbon reduction and be the definitive sourcebook on the subject.

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**Introduction**

Overview of the book with a brief description of each chapter.

**Section 1: Policies and Strategies**

**Chapter 1: The Importance of Reducing Carbon Emissions**

- The developing global crises – sorting out the agenda
- The underlying causes and effects
- Carbon emissions
- The costs of reducing carbon emissions
- The impact of transportation systems
- Potential for reducing carbon emissions
- Linkages between sustainability and carbon emissions

**Chapter 2: Introduction and Statement of the Problem**

- The basics of carbon reduction
- Conceptual framework
- The problem of carbon reduction
- The links between fossil fuels and carbon emissions

**Chapter 3: The Environmental Impacts of Carbon Emissions**

- Sources of carbon emissions – concrete, biomass, transportation and power plants
- Air and water quality concerns
- Carbon-induced environmental concerns
- The greenhouse effect
- International Efforts - The Kyoto Treaty & the Montreal Protocol
- Global warming – International concerns and efforts toward international cooperation
- Impacts on human and species

**Chapter 4: Governmental Carbon Reduction Policies and Programs**

- Successful carbon reduction policies
- Reducing carbon footprints
- International, Federal and State Initiatives
- Demand-side conservation approaches
- Public and private sector partnerships
- White tags and green tags

### **Chapter 5: Local Policies**

- Local governmental policies
- The developing patchwork of local and regional carbon regulations
- Cities going green
- Case studies – Santa Monica, Portland, Austin and Seattle
- Cambridge community carbon reduction projects
- Transportation Systems – Alternative fuel technologies available to reduce the energy and environmental impacts of transportation systems.
- Sustainable cities – their role in the post-hydrocarbon age

### **Chapter 6: Carbon Reduction Strategies for Buildings**

- Green buildings and green construction practices
- Green construction materials
- Building preservation
- Energy Star buildings
- Zero energy buildings
- Net positive energy construction
- Carbon neutral construction

## **Section 2: Tools and Technologies**

### **Chapter 7: Technologies that reduce CO<sub>2</sub> impact**

- The potential impact of alternative energy
- Energy systems and their importance in reducing atmospheric carbon
- Alternative energy as a carbon reduction solution - Wind energy, solar energy, hydro-power, bio-fuels and geothermal energy
- Technologies for water conservation
- Landfill gas extraction
- Distributed generation
- Nuclear energy
- Questionable technologies – CTL and others

### **Chapter 8: Carbon Sequestration Technologies**

- Approaches to pre-and post- combustion capture
- Biological sequestration: natural carbon capture systems
- Geological sequestration
- Ocean injection and fertilization

- Terrestrial carbon sinks
- Biological sequestration - trees and vegetation

### **Chapter 9: Corporate Carbon Reduction Programs – Strategies and Technologies**

- How corporations use carbon reduction strategies to achieve sustainability  
Changing the corporate vision and redefining goals
- Carbon reduction in the manufacturing and industry sectors
- Service industries
- Developing and implementing corporate carbon reduction programs
- Data accumulation and management
- Supply chain assessments

### **Chapter 10: Industrial and Manufacturing Carbon Reduction Technologies**

- Impact of industrial carbon emissions
- The metrics of carbon reduction
- Modeling systems
- Special applications for the industrial sector – CO<sub>2</sub> Capture
- Industrial Carbon Reduction Technologies
- Utility Case Studies: San Diego Electric, EON, Duke Energy
- Manufacturing Case Studies: Subaru, BMW, Pfeifer

### **Section 3: Managing, Financing and Implementing Carbon Reduction Projects**

#### **Chapter 11: Organizational Structure and Resources**

- Organizational structures
- Resources – Internal and External
- Leadership and decision-making processes
- Developing interdisciplinary teams

#### **Chapter 12: Action Plan for Implementing Carbon Reduction**

- Developing a carbon reduction management plan
- Real world results of carbon reduction projects
- References, Case Studies and replicable models
- Carbon audits and assessments
- Measuring results of carbon reduction programs
- Carbon disclosure statements

#### **Chapter 13: Financial Approaches to Carbon Reduction**

- The pros and cons of carbon offsets
- Costs of carbon capture systems
- Financial solutions to carbon reduction
- Cost/Benefit analysis techniques
- Alternative financing mechanisms
- Performance contracting

## **Chapter 14: Implementing Successful Carbon Reduction Programs**

- How planning strategies are linked to carbon emissions
- What planning techniques are being use to achieve carbon production avoidance
- Cap-and-trade programs
- Carbon emissions trading mechanisms vs. emissions taxes
- Transportation systems and alternatives
- Case study – Norway and Sweden
- The developing world's growing carbon contribution – China, India and Brazil

## **Chapter 15: The Future of Carbon Reduction**

- Reduction and regulation of carbon markets
- Information tools for integrating sustainable solutions
- Reducing carbon emissions – future strategies
- Prospects for carbon sequestration
- Carbon reduction technologies of the future (plasma-arc)
- Merging policies across local, state and federal governments
- The potential of a shift to non-carbon fuels
- Redesigning the built environment with carbon reduction practices
- Energy substitutes
- The future of cities – Chicago and Amsterdam