# CONTENTS

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Chapter</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>List of Tables</td>
<td>i-iii</td>
</tr>
<tr>
<td></td>
<td>List of Exhibits</td>
<td>iv-v</td>
</tr>
<tr>
<td></td>
<td>Abbreviations</td>
<td>vi-viii</td>
</tr>
<tr>
<td>1.</td>
<td>Introduction</td>
<td>1-17</td>
</tr>
<tr>
<td></td>
<td>1.1 Introduction</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.2 Restructuring the Electricity Supply Industry</td>
<td>4</td>
</tr>
<tr>
<td></td>
<td>1.3 Objective of the Research</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>1.4 Need for the Study</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>1.5 Research Methodology</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>1.5.1 Primary Data Details</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td>1.5.2 Target Groups</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>1.5.3 Data Collection</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>1.5.4 Research Tools</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>1.6 Significant Contribution of the Study</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>1.7 Organization of this Thesis</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>1.8 Conclusion</td>
<td>17</td>
</tr>
<tr>
<td>2.</td>
<td>Literature Review</td>
<td>18-29</td>
</tr>
<tr>
<td>3.</td>
<td>Historical Perspective of Power Sector: A Review</td>
<td>30-64</td>
</tr>
<tr>
<td></td>
<td>3.1 Introduction</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>3.2 Energy Scenario in India</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>3.3 Pre Independence Power Scenario</td>
<td>33</td>
</tr>
<tr>
<td></td>
<td>3.4 Indian Power Sector by 1990: A Pre-Reform Profile</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>3.4.1 Growth of Power Sector in Generation and Transmission</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>3.4.2 Power Transmission</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>3.4.3 Transmission System development and Technology Trends</td>
<td>44</td>
</tr>
</tbody>
</table>
3.4.4 Unbundling of Generation and Transmission in Central Sector 45

3.5 State of Indian Power Sector in 1990’s and beyond 49
  3.5.1 Physical Performance 51

3.6 State Electricity Boards 52

3.7 Reforms Indian Electricity Industry 53

3.8 Drivers of Power Sector Reforms in India 56
  3.8.1 Government of India Political Consensus Building 56
  3.8.2 Multinational Power Majors 60
  3.8.3 Lack of Resources for Investment 61

3.9 Conclusions 62

4. India’s Power Sector Reforms-A Historical Perspective 65-91
  4.1 Introduction 65
  4.2 India’s Power Sector Reforms-Pre Independence 65
    4.2.1 Phase I: The Early Years and Minimal Regulations 66
    4.2.2 Phase II: State-Dominated Industry and Old-Style Regulation 70
    4.2.3 Phase III: Commercialization and new-style Regulation 75

4.3 The Electricity Act-2003 80

4.4 Functions of the Electricity Regulatory commission under the 2003 Act 86

4.5 State Electricity Regulatory Commissions 89

4.6 The Delhi Reform Package 90

5. Power Distribution Reforms in Delhi-A Historical Perspective 92-119
  5.1 Introduction 92
  5.2 Background 92
    5.2.1 The Situation before Restructuring 93
  5.3 Restructuring of the DVB 95
    5.3.1 Objectives 95
    5.3.2 The Drivers 96
5.3.3 The Process 97
5.3.4 Physical Restructuring 98
5.3.5 Financial Restructuring 108
5.3.6 Getting the Employees during restructuring 109

5.4 Privatisation of Distribution 109
5.4.1 Bidding Criteria 109
5.4.2 Building Certainty 110
5.4.3 Bidding Process and Selection of Investors 111
5.4.4 Proposed Documents Required for Privatisation 114

5.5 Experiences Learnt From Delhi Model 115
5.5.1 Positive Aspects of Reforms in Delhi 116
5.5.2 Negative Aspects of Power Sector Reforms in Delhi 117
5.5.3 Improvement in Performance Parameters 118

6. International Experiences in Deregulating Electricity Markets 120-145

6.1 Introduction 120
6.1.1 Structure and Organisation of Electricity companies 122
6.1.2 Motivations for Deregulation 123

6.2 Framework and Drivers for Regulations: The UK Experience 124
6.2.1 The Framework of UK Electricity Prior to Privatization 125
6.2.2 The Development of competition: The Electricity Acts 126

6.3 Lessons Learnt From UK Regulation 130

6.4 Framework UK Drivers for Regulations: The Chile Experience 132
6.4.1 Introduction 132

6.5 Conclusions: Lessons for India from other Countries 141
6.5.1 Viability of the Full Restructuring Model in India 141

6.6 Conclusions 145
7. Quality of Service and Performance: India’s Power Sector 146-162
   7.1 Introduction 146
   7.2 Background 147
   7.3 International Experience: Quality of Service Regulations 148
      7.3.1 UK Experience 148
      7.3.2 USA 149
      7.3.3 South Africa 151
   7.4 Indian Experience on Quality of Service and Regulations 151
      7.4.1 QoS Indicators 153
      7.4.2 Experiences of States 155
   7.5 Initiatives by the Government on QoS 158

8. Analysis and Findings 163-199
   8.1 Introduction 163
   8.2 Summary of the Work 163

9. Conclusions and Recommendations 200-215

10. Bibliography 216-226

11. Annexures I-IX