

# Contents

<b>1</b>	<b>Energy-Based Economic Development</b> . . . . .	1
1.1	Why EBED, Why Now? . . . . .	2
1.2	Reaching a Diverse Audience. . . . .	4
1.3	Complex Challenges that Establish the Need for EBED . . . . .	5
1.3.1	Reduce Greenhouse Gases and Other Emissions. . . . .	5
1.3.2	Improve Cost, Efficiency, and Energy Security . . . . .	6
1.3.3	Reduce Energy Poverty. . . . .	8
1.3.4	Identify Energy-Based Economic and Employment Opportunities . . . . .	9
1.3.5	Identify Energy Links to Alleviate Poverty . . . . .	9
1.4	Outline of the Book . . . . .	10
	References . . . . .	12
<b>2</b>	<b>Defining Energy-Based Economic Development</b> . . . . .	15
2.1	Definition . . . . .	15
2.1.1	Other Definitions of the Energy–Development Nexus . . . . .	17
2.2	Foundations . . . . .	19
2.2.1	Economic Development . . . . .	19
2.2.2	Energy Policy and Planning. . . . .	20
2.2.3	Convergence . . . . .	22
2.3	EBED Goals . . . . .	23
2.3.1	Energy Goals . . . . .	23
2.3.2	Economic Development Goals . . . . .	27
2.4	Conclusion. . . . .	32
	References . . . . .	32
<b>3</b>	<b>Process and Approaches</b> . . . . .	37
3.1	Process . . . . .	38
3.1.1	Engage Stakeholders . . . . .	40
3.1.2	Identify Goals and Objectives . . . . .	40
3.1.3	Identifying Assets, Needs, and Gaps. . . . .	41
3.1.4	Select and Design Strategy and Approach. . . . .	43
3.1.5	Identify Metrics . . . . .	44

3.1.6	Pilot and Implement . . . . .	44
3.1.7	Monitor and Evaluate . . . . .	45
3.2	EBED Approaches . . . . .	45
3.2.1	Point of Intervention . . . . .	45
3.2.2	Geographic Scale . . . . .	49
3.2.3	Scale of Transformation . . . . .	51
3.3	Conclusion . . . . .	52
	References . . . . .	53
<b>4</b>	<b>Supportive Policies for Energy-Based Economic Development . . .</b>	<b>55</b>
4.1	Technology Innovation Policies . . . . .	58
4.2	Technology Adoption and Commercialization Policies . . . . .	60
4.2.1	Feed-In Tariffs . . . . .	60
4.2.2	Net Metering, Interconnection Standards, and Framework Laws . . . . .	61
4.2.3	Loan Guarantees . . . . .	62
4.2.4	Incentives . . . . .	62
4.2.5	Government Procurement and Demonstration . . . . .	63
4.2.6	Information and Education . . . . .	64
4.2.7	Regulatory Standards . . . . .	64
4.3	Entrepreneurship Policies . . . . .	65
4.3.1	Start-Up and Expansion Capital . . . . .	66
4.3.2	Access to Infrastructure and Services . . . . .	67
4.3.3	Entrepreneurship Awareness and Training . . . . .	67
4.4	Industrial Growth Policies . . . . .	68
4.4.1	Business Climate Policies . . . . .	70
4.4.2	Information and Coordination Policies . . . . .	70
4.4.3	Import Substitution, Export Promotion, and Foreign Direct Investment Policies . . . . .	71
4.4.4	R&D for Industrial Growth Policies . . . . .	72
4.5	Workforce Development . . . . .	73
4.6	Climate and Environmental Policies . . . . .	74
4.6.1	Emission Performance Standards . . . . .	74
4.6.2	Direct Emissions Regulation . . . . .	74
4.6.3	Taxes and Cap-and-Trade Programs . . . . .	75
4.7	Planning . . . . .	75
4.7.1	Integrated Resource Planning . . . . .	76
4.7.2	Comprehensive and Strategic Planning . . . . .	76
4.7.3	Low Emission Development Planning . . . . .	77
4.7.4	Sustainable Cities Planning . . . . .	77
4.8	Conclusion . . . . .	78
	References . . . . .	78

<b>5</b>	<b>Evaluation and Metrics</b> . . . . .	81
5.1	Outcome Metrics . . . . .	82
5.2	Type of Initiative Evaluated . . . . .	86
5.3	Methodological Approach . . . . .	87
5.4	Timing and Research Design . . . . .	89
	References . . . . .	90
<b>6</b>	<b>Case Study Approach</b> . . . . .	95
6.1	Selection of EBED Cases . . . . .	96
<b>7</b>	<b>Subnational EBED Cases</b> . . . . .	99
7.1	Case Study 1: The Bandeirantes Landfill Gas to Energy Project . . . . .	100
	7.1.1 The Program . . . . .	100
	7.1.2 EBED Framework . . . . .	101
7.2	Case Study 2: Clean Energy Works Oregon . . . . .	102
	7.2.1 The Program . . . . .	103
	7.2.2 EBED Framework . . . . .	103
7.3	Case Study 3: Copenhagen Cleantech Cluster . . . . .	104
	7.3.1 The Program . . . . .	105
	7.3.2 EBED Framework . . . . .	106
7.4	Case Study 4: Kamworks, Rural Cambodia . . . . .	106
	7.4.1 The Program . . . . .	107
	7.4.2 EBED Framework . . . . .	108
7.5	Case Study 5: Natural Gas Development in Southwestern Pennsylvania, United States . . . . .	109
	7.5.1 The Program . . . . .	110
	7.5.2 EBED Framework . . . . .	112
7.6	Case Study 6: Nuru Energy . . . . .	113
	7.6.1 The Program . . . . .	113
	7.6.2 EBED Framework . . . . .	114
	References . . . . .	115
<b>8</b>	<b>National Case Studies</b> . . . . .	119
8.1	Case Study 7: Biofuels in Singapore . . . . .	119
	8.1.1 The Program . . . . .	120
	8.1.2 EBED Framework . . . . .	121
8.2	Case Study 8: China Golden Sun . . . . .	122
	8.2.1 The Program . . . . .	122
	8.2.2 EBED Framework . . . . .	123
8.3	Case Study 9: Ethiopia National Cookstoves Program . . . . .	124
	8.3.1 The Program . . . . .	125
	8.3.2 EBED Framework . . . . .	125

8.4	Case Study 10: Lao People’s Democratic Republic National Hydropower Initiative . . . . .	126
8.4.1	The Program . . . . .	127
8.4.2	EBED Framework . . . . .	127
8.5	Case Study 11: Morocco Solar and Wind . . . . .	128
8.5.1	The Program . . . . .	129
8.5.2	EBED Framework . . . . .	130
8.6	Case Study 12: South African Renewables Initiative. . . . .	131
8.6.1	The Program . . . . .	132
8.6.2	EBED Framework . . . . .	133
	References . . . . .	134
<b>9</b>	<b>A Hybrid Model: The American Recovery and Reinvestment Act. . . . .</b>	<b>137</b>
9.1	Overview of ARRA . . . . .	138
9.2	Energy-Related Recovery Act Offices and Programs. . . . .	139
9.2.1	Office of Energy Efficiency and Renewable Energy . . . . .	141
9.2.2	Office of Electricity Delivery and Energy Reliability . . . . .	145
9.2.3	DOE Loan Programs Office. . . . .	145
9.2.4	Department of Housing and Urban Development’s Green Retrofit Program. . . . .	146
9.2.5	Commonalities Within Programs . . . . .	147
9.3	Case Studies of Selected Local Recovery Act–Funded Initiatives . . . . .	147
9.3.1	Green Launching Pad . . . . .	147
9.3.2	Energize Phoenix . . . . .	148
9.3.3	Summary of Case Studies . . . . .	150
9.4	Early Evaluations of ARRA and Potential Implications. . . . .	150
9.5	Conclusions . . . . .	152
	References . . . . .	153
<b>10</b>	<b>Common Themes and Conclusions . . . . .</b>	<b>157</b>
10.1	EBED Efforts Often Require a Multidimensional and Comprehensive Approach . . . . .	158
10.2	There is no Single Prescription. . . . .	158
10.3	Timing is Crucial and Difficult . . . . .	159
10.4	Strategic Investment may be Necessary. . . . .	160
10.5	Project Self-Sufficiency can be Challenging. . . . .	161
10.6	Public–Private Partnerships Play an Important Role . . . . .	161
10.7	Attention to Economic Benefit and Burden is Important . . . . .	162
10.8	EBED Efforts may be Met by Unintended Consequences . . . . .	162

10.9	Political Will and a Consistent, Stable Policy Environment is Crucial . . . . .	163
10.10	Community Participation is Important, Especially for Place-Based Approaches. . . . .	163
10.11	EBED in the 21st Century . . . . .	164



<http://www.springer.com/978-1-4471-6340-4>

Energy-Based Economic Development  
How Clean Energy can Drive Development and  
Stimulate Economic Growth

Carley, S.; Lawrence, S.

2014, XIV, 165 p. 13 illus., Hardcover

ISBN: 978-1-4471-6340-4