

2022-2030

***Net-Zero Electricity Generation and
Distribution Technologies & Markets
With Corona & COP26 Impacts***



Net-Zero Electricity Generation and Distribution Technologies & Markets - 2022-2030 With Corona & COP26 Impacts

***HSRC** is an American Israeli market intelligence & technology research firm specializing in Climate Mitigation Technologies, Transformational Technologies & Transformational Markets research and the Public Safety Industry. HSRC provides premium market off-the-shelf and custom reports on present and emerging technologies and industry expertise, enabling global clients to gain time-critical insight into business opportunities. HSRC's clients include over 1240 private sector clients (75% repeat customers), including major Fortune 2000 companies, the E.U., NATO, U.S. Congress and DOD, as well as government agencies in Japan, Korea, Taiwan, Israel, Canada, UK, Germany, Australia, Sweden, Finland and Singapore.*

*Washington D.C. 20004, 601 Pennsylvania Ave., NW Suite 900,
Tel: 202-455-0966, info@hsrc.biz, www.hsrc.biz*

Contents

1	The Report Key Assumptions	37
2	Executive Summary	38
2.1	Key Findings	38
2.2	Key Conclusions	51
2.3	Global Net-Zero Electricity Generation and Distribution Market Segmentation Vectors.....	61
2.4	Global Net-Zero Electricity Generation and Distribution Market – 2022-2030.....	62
2.4.1	Global Market by Technology – 2022-2030.....	62
2.4.2	Global Market by Revenue Source – 2022-2030.....	64
2.4.3	Global Market by Region – 2022-2030.....	64
2.4.4	Global Market by Country – 2022-2030.....	66
3	COP26 & COVID-19 Implications.....	67
3.1	COP26 Takeaway.....	67
3.2	COVID-19 Implications	68
4	The Industry Value Chain.....	70
5	Business Opportunities	71
6	Market Drivers.....	82
7	Market Inhibitors.....	83
8	SWOT Analysis	84
8.1	Strengths	84
8.2	Weaknesses	85
8.3	Opportunities.....	86
8.4	Threats.....	87
	TECHNOLOGY, PRODUCT & SERVICE MARKETS.....	89
9	Global Net-Zero Electricity Generation and Distribution Technologies, Products & Services Markets – 2020-2030	89
9.1	Technology, Products & Services Markets Size.....	89
9.2	Technology Products & Services Markets Dynamics.....	90
9.3	Technology Products & Services Markets Share	92
10	Bioenergy Market – 2022-2030	94
10.1	CEO Takeaway.....	94
10.1.1	Summary	94
10.1.2	Bioenergy for Electricity Generation	97
10.1.3	Bioenergy in Industry.....	97
10.1.4	Thermo-Chemical Process.....	98
10.1.5	Bio-Chemical Process	99

10.1.6	Bioenergy Conversion Technologies	100
10.1.7	Global Bioenergy Market	101
10.1.8	Global Bio-Heating Market	101
10.1.9	Biomass Heating For Buildings	102
10.1.10	Global Bio-Power Markets.....	103
10.1.11	The Global Solid Biomass Industry	104
10.1.12	The Global Liquid Biofuels Industry	105
10.1.13	The Global Gaseous Biomass Industry	105
10.1.14	Global Bioenergy CCS & CCU	105
10.1.15	Thermal Conversions	107
10.1.16	Chemical Conversion	107
10.1.17	Biochemical Conversion	107
10.1.18	Electrochemical Conversions	108
10.2	Key Vendors	108
10.3	Global Bioenergy Market – 2020-2030	109
10.3.1	Bioenergy Market Size	109
10.3.2	Bioenergy Market Dynamics.....	109
10.3.3	Bioenergy Market Share.....	109
11	Compressed-Air Storage Market – 2022-2030.....	110
11.1	CEO Takeaway.....	110
11.1.1	Summary	110
11.1.2	Adiabatic Compressed-Air Energy Storage	112
11.1.3	Diabatic Compressed-Air Energy Storage.....	112
11.2	Key Vendors	113
11.3	Global Compressed-Air Storage Market – 2020-2030	113
11.3.1	Compressed-Air Storage Market Size	113
11.3.2	Compressed-Air Storage Market Dynamics	114
11.3.3	Compressed-Air Storage Market Share.....	114
12	Concentrating Solar Power (CSP) Market – 2022-2030	115
12.1	CEO Takeaway.....	115
12.1.1	Summary	115
12.1.2	CSP Projects	117
12.1.3	CSP vs. Solar PV	118
12.2	CSP Key Vendors	118
12.3	Global Concentrating Solar Power (CSP) Market – 2020- 2030.....	119
12.3.1	Concentrating Solar Power (CSP) Market Size	119
12.3.2	Concentrating Solar Power (CSP) Market Dynamics	120
12.3.3	Concentrating Solar Power (CSP) Market Share	120
13	Direct Geothermal Heating & Cooling Market – 2022-2030.....	121
13.1	CEO Takeaway.....	121
13.1.1	Summary	121

13.1.2	Direct Geothermal Heating & Cooling Applications	122
13.1.3	Geothermal Heat Pumps. Heating and Cooling.....	122
13.1.4	Geothermal District Heating	123
13.1.5	Geothermal Heating Pump Price Competitiveness	124
13.2	Global Direct Geothermal Heating & Cooling Market – 2020-2030.....	125
13.2.1	Direct Geothermal Heating & Cooling Market Size.....	125
13.2.2	Direct Geothermal Heating & Cooling Market Dynamics	126
13.2.3	Direct Geothermal Heating & Cooling Market Share	126
14	Direct Solar Water Heating Market – 2022-2030.....	127
14.1	CEO Takeaway.....	127
14.1.1	Summary.....	127
14.2	Key Vendors	131
14.3	Global Direct Solar Water Heating Market – 2020-2030	131
14.3.1	Direct Solar Water Heating Market Size	131
14.3.2	Direct Solar Water Heating Market Dynamics	132
14.3.3	Direct Solar Water Heating Market Share	132
15	Geothermal Power Generation Market – 2022-2030	133
15.1	CEO Takeaway.....	133
15.1.1	Summary.....	133
15.1.2	Geothermal Electric Power Generation	135
15.1.3	Geothermal Power Plants LCOE.....	136
15.1.4	Enhanced Geothermal Systems (EGS).....	136
15.1.5	The 2022-2030 Market Growth Drivers	138
15.2	Key Vendors	139
15.3	Global Geothermal Power Generation Market – 2020-2030.....	140
15.3.1	Geothermal Power Generation Market Size	140
15.3.2	Geothermal Power Generation Market Dynamics	140
15.3.3	Geothermal Power Generation Market Share	141
16	Grid Modernization Market – 2022-2030	142
16.1	CEO Takeaway.....	142
16.1.1	Summary.....	142
16.1.2	Smart Grid.....	144
16.1.3	Transmission Lines Modernization	145
16.1.4	Demand Response.....	146
16.1.5	Hardening the Grid	146
16.1.6	Advanced Distribution Management Systems	147
16.1.7	Smart Inverters.....	147
16.1.8	Smart Meters.....	147
16.1.9	Microgrids.....	147
16.2	Global Grid Modernization Market – 2020-2030	149
16.2.1	Grid Modernization Market Size	149

16.2.2	Grid Modernization Market Dynamics.....	150
16.2.3	Grid Modernization Market Share.....	150
17	Grid-Scale Battery Storage Market – 2022-2030	151
17.1	CEO Takeaway.....	151
17.1.1	Summary.....	151
17.1.2	The U.S. Energy Storage Market	154
17.1.3	Grid-Scale Battery Storage Benefits.....	154
17.1.4	EVs and Energy Storage	155
17.2	Key Vendors	157
17.3	Global Grid-Scale Battery Storage Market – 2020-2030.....	157
17.3.1	Grid-Scale Battery Storage Market Size.....	157
17.3.2	Grid-Scale Battery Storage Market Dynamics	158
17.3.3	Grid-Scale Battery Storage Market Share	158
18	Hydroelectric Energy Storage Market – 2022-2030.....	159
18.1	CEO Takeaway.....	159
18.1.1	Summary.....	159
18.1.2	Facts & Figures	162
18.1.3	Pumped Hydroelectric Storage Technologies	162
18.1.4	Variable-Speed Pump-Storage Technology	163
18.1.5	Key Vendors.....	163
18.2	Global Hydroelectric Energy Storage Market – 2020-2030.....	164
18.2.1	Hydroelectric Energy Storage Market Size.....	164
18.2.2	Hydroelectric Energy Storage Market Dynamics	165
18.2.3	Hydroelectric Energy Storage Market Share	165
19	Hydroelectric Power Market – 2022-2030	166
19.1	CEO Takeaway.....	166
19.1.1	Summary.....	166
19.1.2	Hydropower LCOE	169
19.1.3	Hydropower Technology.....	169
19.1.4	Hydroelectric Power Project Construction Cost.....	170
19.2	Key Vendors	171
19.3	Global Hydroelectric Power Market – 2020-2030.....	171
19.3.1	Hydroelectric Power Market Size	171
19.3.2	Hydroelectric Power Market Dynamics.....	171
19.3.3	Hydroelectric Power Market Share.....	172
20	Marine Power Systems Market – 2022-2030.....	173
20.1	CEO Takeaway.....	173
20.1.1	Summary.....	173
20.1.2	Marine Tidal Power technologies	174
20.1.3	Marine Current Power Generation.....	175
20.1.4	Marine Osmotic Power Generation	175
20.1.5	Ocean Thermal Energy	176

20.1.6	Marine Wave Power	176
20.2	Key Vendors	177
20.3	Global Marine Power Market – 2020-2030	178
20.3.1	Marine Power Market Size	178
20.3.2	Marine Power Market Dynamics.....	178
20.3.3	Marine Power Market Share.....	179
21	Nuclear Energy Plants (> 1 GW) Market – 2022-2030	180
21.1	CEO Takeaway.....	180
21.1.1	Summary.....	180
21.1.2	Facts and Figures.....	181
21.1.3	Installed Base of Power Reactors - 2021	182
21.2	Key Vendors	182
21.3	Global Nuclear Energy Plants > 1 GW Market – 2020-2030.....	183
21.3.1	Nuclear Energy Plants > 1 GW Market Size.....	183
21.3.2	Nuclear Energy Plants > 1 GW Market Dynamics.....	183
21.3.3	Nuclear Energy Plants > 1 GW Market Share	184
22	Offshore Wind Power Market – 2022-2030.....	185
22.1	CEO Takeaway.....	185
22.1.1	Summary.....	185
22.1.2	Floating offshore wind power market.....	190
22.1.3	The Proliferation of Offshore Wind Power Farms by Geography.....	191
22.1.4	Operational Cost	192
22.1.5	Cost trends.....	192
22.2	Key Vendors	193
22.3	Global Offshore Wind Power Market – 2020-2030.....	193
22.3.1	Offshore Wind Power Market Size	193
22.3.2	Offshore Wind Power Market Dynamics.....	194
22.3.3	Offshore Wind Power Market Share.....	194
23	Onshore Wind Power Market – 2022-2030.....	195
23.1	CEO Takeaway.....	195
23.1.1	Summary.....	195
23.1.2	Onshore Wind LCOE Outlook	197
23.1.3	Onshore Wind Power Disadvantages.....	197
23.1.4	Key Vendors.....	197
23.2	Global Onshore Wind Power Market – 2020-2030.....	199
23.2.1	Onshore Wind Power Market Size	199
23.2.2	Onshore Wind Power Market Dynamics.....	199
23.2.3	Onshore Wind Power Market Share.....	200
24	Other Energy Storage Modalities Market – 2022-2030	201
24.1	Global Other Energy Storage Modalities Market – 2020- 2030.....	201

24.1.1	Other Energy Storage Modalities Market Size.....	201
24.1.2	Other Energy Storage Modalities Market Dynamics	201
24.1.3	Other Energy Storage Modalities Market Share	202
25	Other Renewable Energy Market – 2022-2030.....	203
25.1	Global Other Renewable Energy Market – 2020-2030	203
25.1.1	Other Renewable Energy Market Size	203
25.1.2	Other Renewable Energy Market Dynamics.....	203
25.1.3	Other Renewable Energy Market Share.....	204
26	Rooftop Solar PV Market – 2022-2030	205
26.1	CEO Takeaway.....	205
26.1.1	Summary	205
26.1.2	Solar Rooftop Technology	206
26.1.3	Solar Rooftop System Economics	207
26.1.4	Adoption Of Rooftop PV	207
26.2	Global Rooftop Solar PV Market – 2020-2030.....	207
26.2.1	Rooftop Solar PV Market Size.....	207
26.2.2	Rooftop Solar PV Market Dynamics	208
26.2.3	Rooftop Solar PV Market Share	208
27	Small Nuclear Reactors Market – 2022-2030	209
27.1	CEO Takeaway.....	209
27.1.1	Summary	209
27.1.2	Advantages of SMRs.....	210
27.1.3	SMR Challenges	211
27.2	Key Vendors	211
27.3	Global Small Nuclear Reactors Market – 2020-2030	212
27.3.1	Small Nuclear Reactors Market Size.....	212
27.3.2	Small Nuclear Reactors Market Dynamics	212
27.3.3	Small Nuclear Reactors Market Share	213
28	Solar PV (Utility Scale) Market – 2022-2030.....	214
28.1	CEO Takeaway.....	214
28.1.1	Summary	214
28.1.2	Market Outlook	218
28.2	Key Vendors	219
28.3	Global Solar PV (Utility Scale) Market – 2020-2030	220
28.3.1	Solar PV (Utility Scale) Market Size	220
28.3.2	Solar PV (Utility Scale) Market Dynamics.....	221
28.3.3	Solar PV (Utility Scale) Market Share.....	221
29	Thermal Energy Storage Market – 2022-2030.....	222
29.1	CEO Takeaway.....	222
29.1.1	Summary	222
29.1.2	Thermal Energy Storage Advantages.....	225
29.1.3	Molten Salt Storage Technology	226

29.1.4	Key Vendors.....	226
29.2	Global Thermal Energy Storage Market – 2020-2030.....	227
29.2.1	Thermal Energy Storage Market Size.....	227
29.2.2	Thermal Energy Storage Market Dynamics.....	227
29.2.3	Thermal Energy Storage Market Share.....	228
30	Waste to Energy Plants Market – 2022-2030	229
30.1	CEO Takeaway.....	229
30.1.1	Summary.....	229
30.1.2	Facts & Figures	230
30.1.3	Waste to Energy Economy.....	231
30.2	Global Waste to Energy Plants Market – 2020-2030	232
30.2.1	Waste to Energy Plants Market Size	232
30.2.2	Waste to Energy Plants Market Dynamics	232
30.2.3	Waste to Energy Plants Market Share.....	233
	REVENUE SOURCE MARKETS.....	234
31	Net-Zero Electricity Generation and Distribution Market by Revenue Source – 2020-2030	234
31.1	Global Market – 2020-2030	234
31.2	Net-Zero Electricity Generation and Distribution Market Dynamics – 2020-2030.....	235
31.3	Net-Zero Electricity Generation and Distribution Market Share – 2020-2030	236
	REGIONAL MARKETS	237
32	Regional Net-Zero Electricity Generation and Distribution Markets - 2020-2030.....	237
32.1	Regional Markets – 2020-2030.....	237
33	North America Net-Zero Electricity Generation and Distribution Market.....	238
33.1	North America Market CEO Takeaway	238
33.2	North America Market – 2020-2030	240
33.2.1	Market by Sector	240
33.2.2	Market by Revenue Source.....	242
33.3	North America Net-Zero Electricity Generation and Distribution Market Dynamics – 2020-2030	243
33.4	North America Market Share – 2020-2030	243
34	Latin America Net-Zero Electricity Generation and Distribution Market.....	244
34.1	Latin America Market CEO Takeaway	244
34.2	Latin America Market – 2020-2030	246
34.2.1	Market by Sector	246
34.2.2	Market by Revenue Source.....	248

34.3	Latin America Net-Zero Electricity Generation and Distribution Market Dynamics – 2020-2030	249
34.4	Latin America Market Share – 2020-2030	249
35	Europe Net-Zero Electricity Generation and Distribution Market.....	250
35.1	Europe Market CEO Takeaway	250
35.2	Europe Market – 2020-2030	252
35.2.1	Market by Sector	252
35.2.2	Market by Revenue Source	254
35.3	Europe Net-Zero Electricity Generation and Distribution Market Dynamics – 2020-2030	255
35.4	Europe Market Share – 2020-2030.....	255
36	Middle East & Africa Net-Zero Electricity Generation and Distribution Market.....	256
36.1	Africa Market CEO Takeaway.....	256
36.2	The Middle East Market CEO Takeaway	257
36.3	Middle East & Africa Market – 2020-2030.....	258
36.3.1	Market by Sector	258
36.3.2	Market by Revenue Source	260
36.4	Middle East & Africa Net-Zero Electricity Generation and Distribution Market Dynamics – 2020-2030	261
36.5	Middle East & Africa Market Share – 2020-2030	261
37	Asia Pacific Net-Zero Electricity Generation and Distribution Market.....	262
37.1	Asia Pacific Market CEO Takeaway	262
37.2	Asia Pacific Market – 2020-2030	265
37.2.1	Market by Sector	265
37.2.2	Market by Revenue Source	267
37.3	Asia Pacific Net-Zero Electricity Generation and Distribution Market Dynamics – 2020-2030	268
37.4	Asia Pacific Market Share – 2020-2030.....	268
	NATIONAL MARKETS.....	269
38	Net-Zero Electricity Generation and Distribution Market by Country – 2020-2030.....	269
38.1	Energy Consumption Indicators	269
38.2	National Markets Size – 2020-2030.....	273
38.3	National Markets Dynamics – 2020-2030	274
38.4	National Markets Shares – 2020-2030.....	276
38.5	National Markets by Revenue Source – 2020-2030.....	279
38.5.1	Infrastructure Markets.....	279
38.5.2	Product Sales	281
38.5.3	Maintenance Markets	282

38.5.4	Upgrades Markets	284
38.5.5	Other* Revenue Sources.....	286
North America		288
39	U.S. Net-Zero Electricity Generation and Distribution Market – 2020-2030	288
39.1	U.S. Market CEO Takeaway.....	288
39.1.1	Key Facts	288
39.1.2	National Policy.....	289
39.1.3	Energy Supply	289
39.1.4	Energy Consumption.....	289
39.1.5	Electricity	290
39.2	U.S. Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	291
39.3	U.S. Market Dynamics – 2020-2030	291
39.4	U.S. Market Share – 2020-2030	291
40	Canada Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	292
40.1	Canada Market CEO Takeaway	292
40.1.1	Key Facts	292
40.1.2	National Policy.....	292
40.1.3	Energy Supply	293
40.1.4	Energy Consumption.....	293
40.1.5	Electricity	294
40.2	Canada Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	294
40.3	Canada Market Dynamics – 2020-2030.....	294
40.4	Canada Market Share – 2020-2030.....	294
Latin America		296
41	Argentina Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	296
41.1	Argentina Market CEO Takeaway.....	296
41.1.1	Key Facts	296
41.1.2	National Policy.....	296
41.1.3	Energy Consumption.....	297
41.1.4	Electricity	298
41.2	Argentina Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	298
41.3	Argentina Market Dynamics – 2020-2030.....	299
41.4	Argentina Market Share – 2020-2030.....	299
42	Brazil Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	299

42.1	Brazil Market CEO Takeaway.....	299
42.1.1	Key Facts	299
42.1.2	National Policy.....	299
42.1.3	Energy Supply	301
42.1.4	Energy Consumption.....	301
42.1.5	Electricity	301
42.2	Brazil Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	303
42.3	Brazil Market Dynamics – 2020-2030	303
42.4	Brazil Market Share – 2020-2030	303
43	Chile Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	304
43.1	Chile Market CEO Takeaway.....	304
43.1.1	Key Facts	304
43.1.2	National Policy.....	304
43.1.3	Energy Supply	305
43.2	Chile Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	305
43.3	Chile Market Dynamics – 2020-2030.....	305
43.4	Chile Market Share – 2020-2030	305
44	Colombia Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	307
44.1	Colombia Market CEO Takeaway.....	307
44.1.1	Key Facts	307
44.1.2	National Policy.....	307
44.1.3	Energy Consumption.....	307
44.1.4	Electricity	308
44.2	Colombia Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	308
44.3	Colombia Market Dynamics – 2020-2030	309
44.4	Colombia Market Share – 2020-2030	309
45	Cuba Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	310
45.1	Cuba Market CEO Takeaway	310
45.2	Cuba Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	311
45.3	Cuba Market Dynamics – 2020-2030.....	311
45.4	Cuba Market Share – 2020-2030.....	311
46	Ecuador Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	312
46.1	Ecuador Market CEO Takeaway.....	312

46.2	Ecuador Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	312
46.3	Ecuador Market Dynamics – 2020-2030.....	312
46.4	Ecuador Market Share – 2020-2030.....	313
47	Mexico Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	314
47.1	Mexico Market CEO Takeaway.....	314
47.1.1	Key Facts	314
47.1.2	National Policy.....	314
47.1.3	Electricity	316
47.2	Mexico Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	316
47.3	Mexico Market Dynamics – 2020-2030.....	316
47.4	Mexico Market Share – 2020-2030.....	316
48	Peru Net-Zero Electricity Generation and Distribution Market – 2020-2030	318
48.1	Peru Market CEO Takeaway	318
48.2	Peru Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	319
48.3	Peru Market Dynamics – 2020-2030.....	319
48.4	Peru Market Share – 2020-2030.....	319
49	Puerto Rico Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	320
49.1	Puerto Rico Market CEO Takeaway	320
49.2	Puerto Rico Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	321
49.3	Puerto Rico Market Dynamics – 2020-2030	321
49.4	Puerto Rico Market Share – 2020-2030.....	321
50	Venezuela Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	322
50.1	Venezuela Market CEO Takeaway	322
50.2	Venezuela Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	323
50.3	Venezuela Market Dynamics – 2020-2030	323
50.4	Venezuela Market Share – 2020-2030	323
51	Rest of Latin America Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	324
51.1	Rest of Latin America Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	324
51.2	Rest of Latin America Market Dynamics – 2020-2030.....	324
51.3	Rest of Latin America Market Share – 2020-2030	324

Europe	325
52 Austria Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	325
52.1 Austria Market CEO Takeaway.....	325
52.2 Austria Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	326
52.3 Austria Market Dynamics – 2020-2030	326
52.4 Austria Market Share – 2020-2030	326
53 Belarus Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	327
53.1 Belarus Market CEO Takeaway.....	327
53.2 Belarus Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	328
53.3 Belarus Market Dynamics – 2020-2030	328
53.4 Belarus Market Share – 2020-2030	329
54 Belgium Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	329
54.1 Belgium Market CEO Takeaway	329
54.2 Belgium Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	330
54.3 Belgium Market Dynamics – 2020-2030	331
54.4 Belgium Market Share – 2020-2030	331
55 Bulgaria Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	331
55.1 Bulgaria Market CEO Takeaway.....	331
55.2 Bulgaria Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	333
55.3 Bulgaria Market Dynamics – 2020-2030	334
55.4 Bulgaria Market Share – 2020-2030	334
56 Czech Republic Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	335
56.1 Czech Republic Market CEO Takeaway.....	335
56.2 Czech Republic Net-Zero Electricity Generation and Distribution Market – 2020-2030	336
56.3 Czech Republic Market Dynamics – 2020-2030	336
56.4 Czech Republic Market Share – 2020-2030	337
57 Denmark Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	337
57.1 Denmark Market CEO Takeaway	337
57.2 Denmark Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	339

57.3	Denmark Market Dynamics – 2020-2030.....	340
57.4	Denmark Market Share – 2020-2030.....	340
58	Finland Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	341
58.1	Finland Market CEO Takeaway	341
58.2	Finland Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	342
58.3	Finland Market Dynamics – 2020-2030	342
58.4	Finland Market Share – 2020-2030.....	343
59	France Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	343
59.1	France Market CEO Takeaway.....	343
59.2	France Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	345
59.3	France Market Dynamics – 2020-2030	345
59.4	France Market Share – 2020-2030	345
60	Germany Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	347
60.1	Germany Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	351
60.2	Germany Market Dynamics – 2020-2030	351
60.3	Germany Market Share – 2020-2030.....	351
61	Greece Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	353
61.1	Greece Market CEO Takeaway	353
61.2	Greece Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	354
61.3	Greece Market Dynamics – 2020-2030	354
61.4	Greece Market Share – 2020-2030.....	354
62	Hungary Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	355
62.1	Hungary Market CEO Takeaway	355
62.2	Hungary Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	356
62.3	Hungary Market Dynamics – 2020-2030.....	356
62.4	Hungary Market Share – 2020-2030.....	357
63	Italy Net-Zero Electricity Generation and Distribution Market	
	– 2020-2030	357
63.1	Italy Market CEO Takeaway	357
63.2	Italy Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	360

63.3	Italy Market Dynamics – 2020-2030.....	360
63.4	Italy Market Share – 2020-2030.....	360
64	Netherlands Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	361
64.1	Netherlands Market CEO Takeaway.....	361
64.2	Netherlands Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	362
64.3	Netherlands Market Dynamics – 2020-2030.....	362
64.4	Netherlands Market Share – 2020-2030.....	363
65	Norway Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	364
65.1	Norway Market CEO Takeaway.....	364
65.2	Norway Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	365
65.3	Norway Market Dynamics – 2020-2030.....	365
65.4	Norway Market Share – 2020-2030.....	366
66	Poland Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	366
66.1	Poland Market CEO Takeaway.....	366
66.2	Poland Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	368
66.3	Poland Market Dynamics – 2020-2030.....	368
66.4	Poland Market Share – 2020-2030.....	368
67	Portugal Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	369
67.1	Portugal Market CEO Takeaway.....	369
67.2	Portugal Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	370
67.3	Portugal Market Dynamics – 2020-2030.....	370
67.4	Portugal Market Share – 2020-2030.....	370
68	Romania Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	372
68.1	Romania Market CEO Takeaway.....	372
68.2	Romania Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	373
68.3	Romania Market Dynamics – 2020-2030.....	373
68.4	Romania Market Share – 2020-2030.....	373
69	Russia Net-Zero Electricity Generation and Distribution	
	Market – 2020-2030.....	375
69.1	Russia Market CEO Takeaway.....	375

69.2	Russia Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	377
69.3	Russia Market Dynamics – 2020-2030	377
69.4	Russia Market Share – 2020-2030	377
70	Serbia Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	379
70.1	Serbia Market CEO Takeaway.....	379
70.2	Serbia Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	380
70.3	Serbia Market Dynamics – 2020-2030.....	380
70.4	Serbia Market Share – 2020-2030	380
71	Slovakia Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	381
71.1	Slovakia Market CEO Takeaway	381
71.2	Slovakia Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	382
71.3	Slovakia Market Dynamics – 2020-2030.....	382
71.4	Slovakia Market Share – 2020-2030.....	382
72	Spain Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	383
72.1	Spain Market CEO Takeaway.....	383
72.2	Spain Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	385
72.3	Spain Market Dynamics – 2020-2030	385
72.4	Spain Market Share – 2020-2030	385
73	Sweden Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	386
73.1	Sweden Market CEO Takeaway	386
73.2	Sweden Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	388
73.3	Sweden Market Dynamics – 2020-2030	388
73.4	Sweden Market Share – 2020-2030	388
74	Switzerland Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	390
74.1	Switzerland Market CEO Takeaway	390
74.2	Switzerland Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	391
74.3	Switzerland Market Dynamics – 2020-2030.....	391
74.4	Switzerland Market Share – 2020-2030.....	391
75	UK Net-Zero Electricity Generation and Distribution Market – 2020-2030	392

75.1	UK Market CEO Takeaway	392
75.2	UK Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	394
75.3	UK Market Dynamics – 2020-2030	394
75.4	UK Market Share – 2020-2030	395
76	Ukraine Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	396
76.1	Ukraine Market CEO Takeaway.....	396
76.2	Ukraine Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	397
76.3	Ukraine Market Dynamics – 2020-2030.....	397
76.4	Ukraine Market Share – 2020-2030.....	397
77	Rest of Europe Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	399
77.1	Rest of Europe Net-Zero Electricity Generation and Distribution Market – 2020-2030	399
77.2	Rest of Europe Market Dynamics – 2020-2030	399
77.3	Rest of Europe Market Share – 2020-2030	399
	Middle East & Africa	400
78	Algeria Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	400
78.1	Algeria Market CEO Takeaway.....	400
78.2	Algeria Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	400
78.3	Algeria Market Dynamics – 2020-2030	401
78.4	Algeria Market Share – 2020-2030	401
79	Egypt Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	402
79.1	Egypt Market CEO Takeaway.....	402
79.2	Egypt Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	403
79.3	Egypt Market Dynamics – 2020-2030	403
79.4	Egypt Market Share – 2020-2030	403
80	Iran Net-Zero Electricity Generation and Distribution Market – 2020-2030	405
80.1	Iran Market CEO Takeaway.....	405
80.2	Iran Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	406
80.3	Iran Market Dynamics – 2020-2030.....	406
80.4	Iran Market Share – 2020-2030	406

81	Israel Net-Zero Electricity Generation and Distribution Market – 2020-2030	408
81.1	Israel Market CEO Takeaway	408
81.2	Israel Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	410
81.3	Israel Market Dynamics – 2020-2030	410
81.4	Israel Market Share – 2020-2030.....	410
82	Kuwait Net-Zero Electricity Generation and Distribution Market – 2020-2030	411
82.1	Kuwait Market CEO Takeaway	411
82.2	Kuwait Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	412
82.3	Kuwait Market Dynamics – 2020-2030	412
82.4	Kuwait Market Share – 2020-2030.....	412
83	Saudi Arabia Net-Zero Electricity Generation and Distribution Market – 2020-2030	413
83.1	Saudi Arabia Net-Zero Electricity Generation and Distribution Market – 2020-2030	414
83.2	Saudi Arabia Market Dynamics – 2020-2030.....	414
83.3	Saudi Arabia Market Share – 2020-2030.....	414
84	South Africa Net-Zero Electricity Generation and Distribution Market – 2020-2030	416
84.1	South Africa Market CEO Takeaway	416
84.2	South Africa Net-Zero Electricity Generation and Distribution Market – 2020-2030	417
84.3	South Africa Market Dynamics – 2020-2030.....	417
84.4	South Africa Market Share – 2020-2030.....	417
85	Turkey Net-Zero Electricity Generation and Distribution Market – 2020-2030	419
85.1	Turkey Market CEO Takeaway	419
85.2	Turkey Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	421
85.3	Turkey Market Dynamics – 2020-2030	421
85.4	Turkey Market Share – 2020-2030	421
86	UAE Net-Zero Electricity Generation and Distribution Market – 2020-2030	422
86.1	UAE Market CEO Takeaway.....	422
86.2	UAE Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	423
86.3	UAE Market Dynamics – 2020-2030.....	423
86.4	UAE Market Share – 2020-2030	423

87	Rest of MEA Net-Zero Electricity Generation and Distribution Market – 2020-2030	424
87.1	Rest of MEA Net-Zero Electricity Generation and Distribution Market – 2020-2030	424
87.2	Rest of MEA Market Dynamics – 2020-2030	424
87.3	Rest of MEA Market Share – 2020-2030	424
88	Australia Net-Zero Electricity Generation and Distribution Market – 2020-2030	426
88.1	Australia Market CEO Takeaway	426
88.2	Australia Net-Zero Electricity Generation and Distribution Market – 2020-2030	427
88.3	Australia Market Dynamics – 2020-2030	427
88.4	Australia Market Share – 2020-2030	427
89	China Net-Zero Electricity Generation and Distribution Market – 2020-2030	428
89.1	China Market CEO Takeaway	428
89.2	China Net-Zero Electricity Generation and Distribution Market – 2020-2030	429
89.3	China Market Dynamics – 2020-2030	429
89.4	China Market Share – 2020-2030	429
90	India Net-Zero Electricity Generation and Distribution Market – 2020-2030	430
90.1	India Market CEO Takeaway	430
90.2	India Net-Zero Electricity Generation and Distribution Market – 2020-2030	431
90.3	India Market Dynamics – 2020-2030	431
90.4	India Market Share – 2020-2030	431
91	Indonesia Net-Zero Electricity Generation and Distribution Market – 2020-2030	432
91.1	Indonesia Market CEO Takeaway	432
91.2	Indonesia Net-Zero Electricity Generation and Distribution Market – 2020-2030	433
91.3	Indonesia Market Dynamics – 2020-2030	433
91.4	Indonesia Market Share – 2020-2030	433
92	Japan Net-Zero Electricity Generation and Distribution Market – 2020-2030	434
92.1	Japan Market CEO Takeaway	434
92.2	Japan Net-Zero Electricity Generation and Distribution Market – 2020-2030	435
92.3	Japan Market Dynamics – 2020-2030	435
92.4	Japan Market Share – 2020-2030	435

93	Kazakhstan Net-Zero Electricity Generation and Distribution Market – 2020-2030	436
93.1	Kazakhstan Market CEO Takeaway	436
93.2	Kazakhstan Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	437
93.3	Kazakhstan Market Dynamics – 2020-2030	437
93.4	Kazakhstan Market Share – 2020-2030.....	437
94	Philippines Net-Zero Electricity Generation and Distribution Market – 2020-2030	438
94.1	Philippines Market CEO Takeaway.....	438
94.2	Philippines Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	439
94.3	Philippines Market Dynamics – 2020-2030.....	439
94.4	Philippines Market Share – 2020-2030	439
95	South Korea Net-Zero Electricity Generation and Distribution Market – 2020-2030	440
95.1	South Korea Market CEO Takeaway	440
95.2	South Korea Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	441
95.3	South Korea Market Dynamics – 2020-2030	441
95.4	South Korea Market Share – 2020-2030	441
96	Thailand Net-Zero Electricity Generation and Distribution Market – 2020-2030	442
96.1	Thailand Market CEO Takeaway	442
96.2	Thailand Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	443
96.3	Thailand Market Dynamics – 2020-2030	443
96.4	Thailand Market Share – 2020-2030.....	443
97	Vietnam Net-Zero Electricity Generation and Distribution Market – 2020-2030	444
97.1	Vietnam Market CEO Takeaway.....	444
97.2	Vietnam Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	445
97.3	Vietnam Market Dynamics – 2020-2030	445
97.4	Vietnam Market Share – 2020-2030	445
98	Rest of Asia-Pacific Net-Zero Electricity Generation and Distribution Market – 2020-2030	446
98.1	Rest of Asia-Pacific Net-Zero Electricity Generation and Distribution Market – 2020-2030.....	446
98.2	Rest of Asia-Pacific Market Dynamics – 2020-2030	446
98.3	Rest of Asia-Pacific Market Share – 2020-2030	446

VENDORS	447
99 Company 1	447
100 Company 2	447
101 Company 3	448
102 Company 4	448
103 Company 5	449
104 Company 6	449
105 Company 7	450
106 Company 8	450
107 Company 9	451
108 Company 10	451
109 Company 11	452
110 Company 12	452
APPENDICES.....	453
111 Appendix A: Glossary	453
112 Appendix B: Abbreviations.....	471
113 Research Methodology	476
113.1 Report Structure.....	476
113.2 Methodology	476
113.3 For Whom is this Report?	477
114 Disclaimer and Copyright	478

List of Tables

Table 1 - Electricity Production by Country – 2020	48
Table 2 - Energy & Electricity and Per Capita Consumption by Country / Region	49
Table 3 - Renewable vs. Fossil Fuels Heating Efficiency Cost [\$ Cent / KWh] – 2020 & 2030 F.....	57
Table 4 - Global Net-Zero Electricity Generation and Distribution Market by Technology [\$B] – 2022-2030.....	62
Table 5 - Global Net-Zero Electricity Generation and Distribution Market by Revenue [\$B] – 2020-2030.....	64
Table 6 - Global Net-Zero Electricity Generation and Distribution Market by Region [\$B] – 2022-2030.....	64
Table 7 - Global Net-Zero Electricity Generation and Distribution Market by Country [\$B] – 2020-2030.....	66
Table 8 - Global Net-Zero Electricity Generation and Distribution Technology Products & Services [\$B] Markets – 2022-2030.....	89
Table 9 - Global Net-Zero Electricity Generation and Distribution Markets Annual Growth Rates [%] – 2022-2030.....	90
Table 10 - Global Net-Zero Electricity Generation and Distribution Products & Services Markets Shares [%] – 2022-2030	92
Table 11 - Energy Production from Solid Biofuels and Renewable Waste (MW) by Ten Leading Countries	96
Table 12 – Global Bioenergy Market Size [\$B] - 2022-2030.....	109
Table 13 – Global Bioenergy Market Dynamics [%] - 2022-2030	109
Table 14 - Global Net-Zero Electricity Generation and Distribution Market, Bioenergy Market Share [%] - 2022-2030.....	109
Table 15 – Global Compressed-Air Storage Market Size [\$B] - 2022-2030.....	113
Table 16 – Global Compressed-Air Storage Market Dynamics [%] - 2022- 2030.....	114
Table 17 - Global Net-Zero Electricity Generation and Distribution Market, Compressed-Air Storage Market Share [%] - 2022-2030.....	114
Table 18 – Global Concentrating Solar Power (CSP) Market Size [\$B] - 2022-2030.....	119
Table 19 – Global Concentrating Solar Power (CSP) Market Dynamics [%] - 2022-2030	120
Table 20 - Global Warming Mitigation Market, Concentrating Solar Power (CSP) Market Share [%] - 2022-2030.....	120
Table 21 – Cost (Euro/MWh) of Domestic Heating in France	124
Table 22 - Cost (Euro/MW) of District Heating in France	125
Table 23 – Global Direct Geothermal Heating & Cooling Market Size [\$B] - 2022-2030.....	125
Table 24 – Global Direct Geothermal Heating & Cooling Market Dynamics [%] - 2022-2030	126

Table 25 - Global Net-Zero Electricity Generation and Distribution Market, Direct Geothermal Heating & Cooling Market Share [%] - 2022-2030.....	126
Table 26 – Global Direct Solar Water Heating Market Size [\$B] - 2022-2030...	131
Table 27 – Global Direct Solar Water Heating Market Dynamics [%] - 2022- 2030.....	132
Table 28 - Global Net-Zero Electricity Generation and Distribution Market, Direct Solar Water Heating Market Share [%] - 2022-2030	132
Table 29 – Global Geothermal Power Generation Market Size [\$B] - 2022- 2030.....	140
Table 30 – Global Geothermal Power Generation Market Dynamics [%] - 2022-2030.....	140
Table 31 - Global Net-Zero Electricity Generation and Distribution Market, Geothermal Power Generation Market Share [%] - 2022-2030 ...	141
Table 32 – Global Grid Modernization Market Size [\$B] - 2022-2030	149
Table 33 – Global Grid Modernization Market Dynamics [%] - 2022-2030	150
Table 34 - Global Net-Zero Electricity Generation and Distribution Market, Grid Modernization Market Share [%] - 2022-2030.....	150
Table 35 – Global Grid-Scale Battery Storage Market Size [\$B] - 2022- 2030.....	157
Table 36 – Global Grid-Scale Battery Storage Market Dynamics [%] - 2022- 2030.....	158
Table 37 - Global Net-Zero Electricity Generation and Distribution Market, Grid-Scale Battery Storage Market Share [%] - 2022-2030	158
Table 38 – Global Hydroelectric Energy Storage Market Size [\$B] - 2022- 2030.....	164
Table 39 – Global Hydroelectric Energy Storage Market Dynamics [%] - 2022-2030.....	165
Table 40 - Global Net-Zero Electricity Generation and Distribution Market, Hydroelectric Energy Storage Market Share [%] - 2022-2030	165
Table 41 – Global Hydroelectric Power Market Size [\$B] - 2022-2030	171
Table 42 – Global Hydroelectric Power Market Dynamics [%] - 2022-2030.....	171
Table 43 - Global Net-Zero Electricity Generation and Distribution Market, Hydroelectric Power Market Share [%] - 2022-2030	172
Table 44 – Global Marine Power Market Size [\$B] - 2022-2030	178
Table 45 – Global Marine Power Market Dynamics [%] - 2022-2030.....	178
Table 46 - Global Net-Zero Electricity Generation and Distribution Market, Marine Power Market Share [%] - 2022-2030.....	179
Table 47 – Global Nuclear Energy Plants > 1 GW Market Size [\$B] - 2022- 2030.....	183
Table 48 – Global Nuclear Energy Plants > 1 GW Market Dynamics [%] - 2022-2030.....	183
Table 49 - Global Net-Zero Electricity Generation and Distribution Market, Nuclear Energy Plants > 1 GW Market Share [%] - 2022-2030 ...	184

Table 50 – Global Offshore Wind Power Market Size [\$B] - 2022-2030	193
Table 51 – Global Offshore Wind Power Market Dynamics [%] - 2022-2030....	194
Table 52 - Global Net-Zero Electricity Generation and Distribution Market, Offshore Wind Power Market Share [%] - 2022-2030	194
Table 53 – Global Onshore Wind Power Market Size [\$B] - 2022-2030	199
Table 54 – Global Onshore Wind Power Market Dynamics [%] - 2022-2030....	199
Table 55 - Global Net-Zero Electricity Generation and Distribution Market, Onshore Wind Power Market Share [%] - 2022-2030	200
Table 56 – Global Other Energy Storage Modalities Market Size [\$B] - 2022-2030.....	201
Table 57 – Global Other Energy Storage Modalities Market Dynamics [%] - 2022-2030.....	201
Table 58 - Global Net-Zero Electricity Generation and Distribution Market, Other Energy Storage Modalities Market Share [%] - 2022- 2030.....	202
Table 59 – Global Other Renewable Energy Market Size [\$B] - 2022-2030	203
Table 60 – Global Other Renewable Energy Market Dynamics [%] - 2022- 2030.....	203
Table 61 - Global Net-Zero Electricity Generation and Distribution Market, Other Renewable Energy Market Share [%] - 2022-2030	204
Table 62 – Global Rooftop Solar PV Market Size [\$B] - 2022-2030.....	208
Table 63 – Global Rooftop Solar PV Market Dynamics [%] - 2022-2030	208
Table 64 - Global Net-Zero Electricity Generation and Distribution Market, Rooftop Solar PV Market Share [%] - 2022-2030	208
Table 65 – Global Small Nuclear Reactors Market Size [\$B] - 2022-2030.....	212
Table 66 – Global Small Nuclear Reactors Market Dynamics [%] - 2022- 2030.....	212
Table 67 - Global Net-Zero Electricity Generation and Distribution Market, Small Nuclear Reactors Market Share [%] - 2022-2030	213
Table 68 – Global Solar PV (Utility Scale) Market Size [\$B] - 2022-2030	220
Table 69 – Global Solar PV (Utility Scale) Market Dynamics [%] - 2022- 2030.....	221
Table 70 - Global Net-Zero Electricity Generation and Distribution Market, Solar PV (Utility Scale) Market Share [%] - 2022-2030.....	221
Table 71 – Global Thermal Energy Storage Market Size [\$B] - 2022-2030	227
Table 72 – Global Thermal Energy Storage Market Dynamics [%] - 2022- 2030.....	227
Table 73 - Global Net-Zero Electricity Generation and Distribution Market, Thermal Energy Storage Market Share [%] - 2022-2030	228
Table 74 – Global Waste to Energy Plants Market Size [\$B] - 2022-2030.....	232
Table 75 – Global Waste to Energy Plants Market Dynamics [%] - 2022- 2030.....	232
Table 76 - Global Net-Zero Electricity Generation and Distribution Market, Waste to Energy Plants Market Share [%] - 2022-2030.....	233

Table 77 - Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030	234
Table 78 - Net-Zero Electricity Generation and Distribution Market AGRs [%] by Revenue Source – 2020-2030	235
Table 79 - Net-Zero Electricity Generation and Distribution Market by Region [\$B] – 2022-2030	237
Table 80 - North America Net-Zero Electricity Generation and Distribution Market Size [\$M] by Sector – 2020-2030.....	240
Table 81 - North America Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030.....	242
Table 82 - North America Net-Zero Electricity Generation and Distribution Market AGRs [%] by Revenue Source – 2020-2030.....	243
Table 83 - Latin America Net-Zero Electricity Generation and Distribution Market Size [\$M] by Sector – 2020-2030.....	246
Table 84 - Latin America Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030.....	248
Table 85 - Latin America Net-Zero Electricity Generation and Distribution Market AGRs [%] by Revenue Source – 2020-2030.....	249
Table 86 - Europe Net-Zero Electricity Generation and Distribution Market Size [\$M] by Sector – 2020-2030.....	252
Table 87 - Europe Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030	254
Table 88 - Europe Net-Zero Electricity Generation and Distribution Market AGRs [%] by Revenue Source – 2020-2030.....	255
Table 89 - Middle East & Africa Net-Zero Electricity Generation and Distribution Market Size [\$M] by Sector – 2020-2030.....	258
Table 90 - Middle East & Africa Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020- 2030.....	260
Table 91 - Middle East & Africa Net-Zero Electricity Generation and Distribution Market AGRs [%] by Revenue Source – 2020- 2030.....	261
Table 92 - Asia Pacific Net-Zero Electricity Generation and Distribution Market Size [\$M] by Sector – 2020-2030.....	265
Table 93 - Asia Pacific Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030.....	267
Table 94 - Asia Pacific Net-Zero Electricity Generation and Distribution Market AGRs [%] by Revenue Source – 2020-2030.....	268
Table 95 - Net-Zero Electricity Generation and Distribution Technologies Market Size [\$B] By Country – 2020-2030.....	273
Table 96 - Net-Zero Electricity Generation and Distribution Market AGRs [%] By Country – 2020-2030.....	274
Table 97 - National Market Shares of the Net-Zero Electricity Generation and Distribution Market [%] – 2020-2030.....	276

Table 98 - Net-Zero Electricity Generation and Distribution Infrastructure Markets Size [\$B] By Country – 2020-2030	279
Table 99 - Net-Zero Electricity Generation and Distribution Products Sales [\$B] By Country – 2020-2030.....	281
Table 100 - Net-Zero Electricity Generation and Distribution Maintenance Markets Size [\$B] By Country – 2020-2030	282
Table 101 - Net-Zero Electricity Generation and Distribution Upgrades Markets Size [\$B] By Country – 2020-2030	284
Table 102 - Net-Zero Electricity Generation and Distribution Other* Revenue Sources [\$B] By Country – 2020-2030	286
Table 103 - Renewable Energy and Climate Targets in the United States.	289

List of Figures

Figure 1 - COP26 Pledges & Targets Based GHG Emission [GTn] Forecast to 2030.....	39
Figure 2 - Global Warming 2010-2020 by GHG Source.....	40
Figure 3 - Renewable Energy Generation By Technology & By User.....	42
Figure 4 - Greenhouse Gas Emissions [%] by Sector.....	43
Figure 5 - Climate Change Causes and Effects.....	44
Figure 6- Global Energy demand (left) & GHS Emission (Right) By Sector – 2020.....	45
Figure 7 - GHG Emission per GWh of Energy Production - 2020.....	46
Figure 8 – Average USA Levelized cost [\$/MWh] of Electricity By Energy Technology – 2020.....	46
Figure 9 - Renewable Electricity Generation by Technology and Region.....	47
Figure 10 - Global Electricity Consumption by Energy Source – 1985-2020.....	47
Figure 11 - Levelized Cost [\$/MWh] of Energy, by Source – 2008-2020.....	47
Figure 12 - Renewable, Nuclear & Fossil Energy Prices [\$/MWh] & Installed Capacity – 2010-2019.....	48
Figure 13 - Global Warming vs. Number of Climate-Related Disasters - 1970-2032.....	50
Figure 14 - Energy Storage: Duration Time and Rated Power by Modality.....	50
Figure 15 - Renewable Generation Capacity By Region.....	51
Figure 16 - Leading Renewable Energy Capacity [GW] by Country - 2020.....	51
Figure 17 - Negative Emissions Role in Achieving NetZero.....	52
Figure 18 – Global GHG Emission Reduction [%] by Technology - 2030.....	57
Figure 19 - Global Electricity Generation [000 TWh] by Source - 2010-2040.....	58
Figure 20 - Global Net-Zero Electricity Generation and Distribution Market by Region [\$B] – 2022-2030.....	66
Figure 21 - Global LCOEs From Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	96
Figure 22 - Bioenergy Thermo-Chemical Process.....	100
Figure 23 - Bioenergy Bio-Chemical Process.....	101
Figure 24 – Global Bioenergy Market Size [\$B] - 2022-2030.....	110
Figure 25 - System Power Rating and Discharge Times of Energy Storage Technologies.....	111
Figure 26 - Compressed-Air Energy Storage System.....	112
Figure 27 - A Small Scale Compressed Air Storage System.....	112
Figure 28 – Global Compressed-Air Storage Market Size [\$B] - 2022-2030.....	114
Figure 29 - Global Average Levelized Cost of Energy Generation [\$/MWh] Concentrating Solar Power vs. Other Electric Power Sources - Q-4 2021.....	116
Figure 30 - Concentrating Solar Power System Layout and Costs.....	117

Figure 31 - Global LCOEs From Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	118
Figure 32 – Global Concentrating Solar Power (CSP) Market Size [\$B] - 2022-2030.....	120
Figure 33 - Applications of Direct Utilization of Geothermal Energy.....	123
Figure 34 – Closed (Left) & Open (Right) loop Geothermal Heat Pumps	124
Figure 35 - EU Areas Suitable for Geothermal Networks & Actual Geothermal Installed Capacity.....	125
Figure 36 – Global Direct Geothermal Heating & Cooling Market Size [\$B] - 2022-2030.....	126
Figure 37 - Residential Direct Solar Water Heating System	128
Figure 38 - Total Installed Solar Heating Area by Region - 2020.....	129
Figure 39 - Direct Solar Water Heating System Elements	129
Figure 40 - Direct Solar Heating Capacity [KW/1000 citizens] in 10 Leading Countries - 2020	130
Figure 41 - Global Solar Thermal Capacity [TWh] and Energy [TWh] – 2000-2022.....	131
Figure 42 - Distribution of Solar Thermal Systems for Newly Installed Water Collector by Region - 2020	131
Figure 43 – Global Direct Solar Water Heating Market Size [\$B] - 2022-2030.....	132
Figure 44 - Global Average Levelized Cost of Energy Generation [\$/MWh] Geothermal vs. Other Electric Power Sources - Q-4 2021.....	134
Figure 45 - Geothermal Electricity Generation Technologies	135
Figure 46 - Global LCOEs From Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	135
Figure 47 - Enhanced Geothermal Systems	136
Figure 48 - Geothermal Power Generation.....	137
Figure 49 - Map of 64 EGS Projects Around the World - 2020	139
Figure 50 – Global Geothermal Power Generation Market Size [\$B] - 2022-2030.....	141
Figure 51 - Diagram of a Conventional Electric Power System.....	143
Figure 52 - Modern Grid Architecture	144
Figure 53 - Climate Change Effects on the Electricity Grid.....	145
Figure 54 - Smart Grid Architecture	146
Figure 55 -Smart Grid Priorities	149
Figure 56 – Global Grid Modernization Market Size [\$B] - 2022-2030.....	150
Figure 57 - System Power Rating and Discharge Times of Energy Storage Technologies	152
Figure 58 - Grid Battery Storage Infrastructure.....	153
Figure 59 – Next Generation Battery Storage Goals.....	154
Figure 60 - Grid-Scale Battery Storage System.....	154
Figure 61 – Global Grid-Scale Battery Storage Market Size [\$B] - 2022-2030.....	159

Figure 62 - Pumped Storage Hydropower Site	160
Figure 63 - Pumped Hydro Energy Storage, Power Rating and Discharge Times Vs. Other Energy Storage Technologies	161
Figure 64 - Pumped Hydro Energy Storage System Layout	162
Figure 65 – Global Hydroelectric Energy Storage Market Size [\$B] - 2022- 2030.....	165
Figure 66 - Hydropower Installed Capacity by Country	167
Figure 67 - Global Average Levelized Cost of Energy Generation [\$/MWh] Hydropower vs. Other Electric Power Sources - Q-4 2021	168
Figure 68 - Global LCOEs From Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	168
Figure 69 - Hydropower Generation [TW h] by Region -1965-2020.....	169
Figure 70- A Hydropower Plant.....	171
Figure 71 – Global Hydroelectric Power Market Size [\$B] - 2022-2030	172
Figure 72 - Global LCOEs From Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	174
Figure 73 - Ocean thermal energy Conversion System (Right) and Oscillating Water Column System (Left)	175
Figure 74 - Wave Power System	178
Figure 75 – Global Marine Power Market Size [\$B] - 2022-2030	179
Figure 76 - Global Average Levelized Cost of Energy Generation [\$/MWh] Nuclear Energy Plants vs. Other Electric Power Sources - Q-4 2021	181
Figure 77 - Global LCOEs From Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	182
Figure 78 – Global Nuclear Energy Plants > 1 GW Market Size [\$B] - 2022- 2030.....	184
Figure 79 - Global Average Levelized Cost of Energy Generation [\$/MWh] Offshore Wind vs. Other Electric Power Sources - Q-4 2021	186
Figure 80 - Wind Turbine Power and Size 1985-2030	187
Figure 81 - Global LCOEs from Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	187
Figure 82 - U.S. DOE Offshore Wind Energy 2030 Goals	190
Figure 83- Global Installed Base Power [MW] of Offshore Wind Power to 2020.....	190
Figure 84 – Annual 2001-2021 Additional Offshore Wind Installed Capacity [GW] China vs. the Rest of World	191
Figure 85 – Global Offshore Wind Power Market Size [\$B] - 2022-2030	195
Figure 86 - Onshore Wind Turbines LCOE, Size, Capacity & Impacts – 2030.....	196
Figure 87 - Global Average Levelized Cost of Energy Generation [\$/MWh] Onshore Wind Power vs. Other Electric Power Sources - Q-4 2021	197

Figure 88 - Global LCOEs From Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	197
Figure 89 – Global Onshore Wind Power Market Size [\$B] - 2022-2030	200
Figure 90 – Global Other Energy Storage Modalities Market Size [\$B] - 2022-2030.....	202
Figure 91 – Global Other Renewable Energy Market Size [\$B] - 2022-2030....	204
Figure 92 - Global Average Levelized Cost of Energy Generation [\$/MWh] Rooftop Solar vs. Other Electric Power Sources - Q-4 2021	206
Figure 93 – Global Rooftop Solar PV Market Size [\$B] - 2022-2030	209
Figure 94 - Global Average Levelized Cost of Energy Generation [\$/MWh] Small Nuclear Reactors vs. Other Electric Power Sources - Q- 4 2021.....	210
Figure 95 - Global LCOEs From Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	211
Figure 96 – Global Small Nuclear Reactors Market Size [\$B] - 2022-2030	213
Figure 97 - Installed Base of Solar PV by Country.....	215
Figure 98 - Global Average Levelized Cost of Energy Generation [\$/MWh] Solar PV vs. Other Electric Power Sources - Q-4 2021	216
Figure 99 - Global LCOEs From Newly Commissioned, Utility-Scale Renewable Power Generation Technologies, 2010-2020.....	217
Figure 100 - Ground Mounted Solar PV System.....	218
Figure 101 -The DOE Solar PV Deployment [GW] Outlook 2020-2050	219
Figure 102 – Global Solar PV (Utility Scale) Market Size [\$B] - 2022-2030.....	221
Figure 103 - System Power Rating and Discharge Times Of Energy Storage Technologies	223
Figure 104 - Thermal Energy Storage (TES) System Layout.....	224
Figure 105 – Residential Thermal Energy Storage	225
Figure 106 – Global Thermal Energy Storage Market Size [\$B] - 2022-2030 ...	228
Figure 107 - Waste Management Process.....	230
Figure 108 - UN Projection of the Global Waste [M Ton/Annum] Quantity – 1950-2050.....	231
Figure 109 – Global Waste to Energy Plants Market Size [\$B] - 2022-2030.....	233
Figure 110 - Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030	236
Figure 111 - Net-Zero Electricity Generation and Distribution Market Share [%] by Revenue Source – 2020-2030	237
Figure 112 - Net-Zero Electricity Generation and Distribution Market by Region [\$B] – 2022-2030	238
Figure 113 - North America Final Energy Demand by Sector [EJ].....	239
Figure 114 - North America Primary Energy Consumption by Sector [EJ].....	240
Figure 115 - Cumulative 2022-2030 North America Net-Zero Electricity Generation and Distribution Market by Sector [\$B].....	242
Figure 116 - North America Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030.....	243

Figure 117 - North America Net-Zero Electricity Generation and Distribution Market Share [%] by Revenue Source – 2020-2030.....	244
Figure 118 - Latin America Final Energy Demand by Sector [EJ]	245
Figure 119 - Latin America Primary Energy Consumption by Sector [EJ]	247
Figure 120 - Cumulative 2022-2030 Latin America Net-Zero Electricity Generation and Distribution Market by Sector [\$B]	248
Figure 121 - Latin America Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030.....	249
Figure 122 - Latin America Net-Zero Electricity Generation and Distribution Market Share [%] by Revenue Source – 2020-2030.....	250
Figure 123 - Europe Final Energy Demand by Sector [EJ]	251
Figure 124 - Europe Primary Energy Consumption by Sector [EJ]	252
Figure 125 - Cumulative 2022-2030 Europe Net-Zero Electricity Generation and Distribution Market by Sector [\$B].....	254
Figure 126 - Europe Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030.....	255
Figure 127 - Europe Net-Zero Electricity Generation and Distribution Market Share [%] by Revenue Source – 2020-2030.....	256
Figure 128 - MEA Final Energy Demand by Sector [EJ]	257
Figure 129 - MEA Primary Energy Consumption by Sector [EJ]	258
Figure 130 - Cumulative 2022-2030 Global Middle East & Africa Change Mitigation & Adaptation Market by Sector [\$B].....	260
Figure 131 - Middle East & Africa Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020- 2030.....	261
Figure 132 - Middle East & Africa Net-Zero Electricity Generation and Distribution Market Share [%] by Revenue Source – 2020- 2030.....	262
Figure 133 - Australia, New Zealand, Japan and South Korea Final Energy Demand by Sector [EJ]	263
Figure 134 - Australia, New Zealand, Japan and South Korea Primary Energy Consumption by Sector [EJ]	265
Figure 135 - Cumulative 2022-2030 Asia Pacific Net-Zero Electricity Generation and Distribution Market by Sector [\$B]	267
Figure 136 - Asia Pacific Net-Zero Electricity Generation and Distribution Market Size [\$M] by Revenue Source – 2020-2030.....	268
Figure 137 - Asia Pacific Net-Zero Electricity Generation and Distribution Market Share [%] by Revenue Source – 2020-2030.....	269
Figure 138 - Energy Use Per Person, 2019	270
Figure 139 - Consumption-Based Energy Use Per Person: Global Map, 2020.....	271
Figure 140 - Consumption-Based Energy Use Per Person: Selected Countries	271
Figure 141 - Primary Energy Consumption by World Region – 1965-2020	272

Figure 142 - World Energy Trilemma Index: Leading Countries - 2021	273
Figure 143 - Net-Zero Electricity Generation and Distribution Market Share by Country – 2030	279
Figure 144 - U.S. Electricity Generation by Major Energy Source, 1950- 2020.....	291
Figure 145 - Canada Electricity Generation by Energy Source [%], 2018.....	295
Figure 146 - Energy Consumption by Source, Argentina.....	298
Figure 147 - Electricity Generation In Argentina In 2020, By Type Of Fuel* (In Terawatt Hours).....	299
Figure 148 – Brazil Power Generation Supply, 2020	302
Figure 149 - Total Energy Supply (TES) by Source, Chile 1990-2020.....	306
Figure 150 - Consumption Trends by Energy Source (Mtoe).....	309
Figure 151 - Total Energy Supply (TES) by Source, Cuba 1990-2020	311
Figure 152 - Ecuador Power Generation, 2020	313
Figure 153 - Mexico Electricity Generation by Technology (October 2020)	317
Figure 154 - Distribution of Electricity Generation in Peru in 2020, By Source	319
Figure 155 - Venezuela: Installed and Available Generating Capacity and Supply, 2000–2020.....	323
Figure 156 - Total Energy Supply (TES) by Source, Austria 1990-2020.....	326
Figure 157 - Consumption Trends by Energy Source in Belarus (Mtoe).....	328
Figure 158 - Total Energy Supply (TES) by Source, Belgium 1990-2019.....	331
Figure 159 - Bulgaria Installed Energy Capacity	333
Figure 160 - Total Energy Supply (TES) by Source, Czech Republic 1990- 2019.....	336
Figure 161 - Total Energy Supply (TES) by Source, Denmark 1990-2019	338
Figure 162 - Electricity Generation by Energy Source, Finland, 2000-2019	342
Figure 163 - France Total Energy Supply (TES) by Source 1990-2019.....	345
Figure 164 -The German Renewable Energy Use & Reduced Energy Consumption Scenario - 2005-2050	349
Figure 165 - Germany Electricity Generation per Week 22 – 2021 by Energy Generation Mode.....	350
Figure 166 - Sources of Large-Scale Energy Capacity [MW] Installed in Greece as of June 2020.....	354
Figure 167 - Total Energy Supply (TES) by Source, Hungary 1990-2019	356
Figure 168 - Total Energy Supply (TES) by Source, Italy 1990-2019	359
Figure 169 - Distribution of Electricity Generation in the Netherlands in 2020, By Source	362
Figure 170 - National Electricity Generation by Energy Source, Norway, in 2019.....	365
Figure 171 - Total Energy Supply (TES) by Source, Poland 1990-2019.....	367
Figure 172 - Total Energy Supply (TES) by Source, Portugal 1990-2019.....	370
Figure 173 – Romania Consumption Trends by Energy Source (Mtoe).....	373
Figure 174 - Russia Consumption Trends by Energy Source (Mtoe).....	376

Figure 175 - Serbian Energy Distribution, 2019	380
Figure 176 - Total Energy Supply (TES) by Source, Slovak Republic 1990- 2020.....	382
Figure 177 - Total Energy Supply (TES) by Source, Spain 1990-2020.....	384
Figure 178 - Sweden Energy Consumption, 1800-2020	387
Figure 179 - Total Energy Supply (TES) by Source, Switzerland 1990-2020 ...	391
Figure 180 - The UK Inland Energy Consumption, 1990 and 2020 by Energy Source	393
Figure 181 - The UK Electricity Generation, 1990 and 2020 by Energy Source	394
Figure 182 - Solar PV Installed by Quarter in UK.....	395
Figure 183 - Consumption Trends by Energy Source in Ukraine (Mtoe).....	397
Figure 184 - Installed Energy Capacity of Algeria, 2019 vs. Projected 2028	401
Figure 185 - Consumption Trends by Energy Source (Mtoe).....	403
Figure 186 - Iran's Electricity Generation by Fuel, 2019	406
Figure 187 – Consumption Trends by Energy Source in Israel (Mtoe)	409
Figure 188 - Total Energy Supply (TES) by Source, Saudi Arabia, 1990- 2019.....	414
Figure 189 - South Africa Electricity Consumption Breakdown by Sector (2020, %)	417
Figure 190 - Electricity Generation in Turkey from 2019 to 2020, by Fuel	420