

MARKETS AND PROFITABILITY

Quarterly Business Analysis

Quarter 4, 2019

December 2019



This Report was prepared by Nexant, Inc. ("Nexant"). Except where specifically stated otherwise in this Report, the information contained herein is prepared on the basis of information that is publicly available, and contains no confidential third party technical information to the best knowledge of Nexant. Aforesaid information has not been independently verified or otherwise examined to determine its accuracy, completeness or financial feasibility. Neither Nexant, Subscriber nor any person acting on behalf of either assumes any liabilities with respect to the use of or for damages resulting from the use of any information contained in this Report. Nexant does not represent or warrant that any assumed conditions will come to pass.

The Report is submitted on the understanding that the Subscriber will maintain the contents confidential except for the Subscriber's internal use. The Report should not be reproduced, distributed or used without first obtaining prior written consent by Nexant. Each Subscriber agrees to use reasonable effort to protect the confidential nature of the Report.

Copyright © by Nexant Inc. 2019. All rights reserved.



Contents

1	Executive Summary	1
1.1	Asia Pacific	1
1.2	United States	4
1.3	Western Europe	6
1.4	Crude Oil and Refining	13
2	Crude Oil, Refining and Petrochemical Feedstocks.....	22
2.1	United States NGLs	22
3	Olefins	25
3.1	Ethylene	25
3.1.1	Asia Pacific	25
3.1.2	United States	25
3.1.3	Western Europe	26
3.2	Propylene	50
3.2.1	Asia Pacific	50
3.2.2	United States	50
3.2.3	Western Europe	51
3.3	Butadiene	68
3.3.1	Asia Pacific	68
3.3.2	United States	68
3.3.3	Western Europe	69
3.4	Olefins Capacity Round-Up.....	78
3.4.1	North America	78
3.4.2	South America.....	78
3.4.3	Western Europe	78
3.4.4	Central and Eastern Europe.....	78
3.4.5	Middle East and Africa	78
3.4.6	Asia Pacific	78
4	Polyolefins	80
4.1	Low Density Polyethylene	80
4.1.1	Asia Pacific	80
4.1.2	United States	81
4.1.3	Western Europe	82
4.2	Linear Low Density Polyethylene	91
4.2.1	Asia Pacific	91
4.2.2	United States	92
4.2.3	Western Europe	92
4.3	High Density Polyethylene	102
4.3.1	Asia Pacific	102
4.3.2	United States	103
4.3.3	Western Europe	104



4.4	Polypropylene.....	113
4.4.1	Asia Pacific.....	113
4.4.2	United States.....	114
4.4.3	Western Europe	115
4.5	Polyolefins Capacity Round-Up	124
4.5.1	North America	124
4.5.2	South America.....	124
4.5.3	Western Europe	124
4.5.4	Central and Eastern Europe.....	124
4.5.5	Middle East and Africa	124
4.5.6	Asia Pacific.....	124
5	Vinyls.....	126
5.1	Chlor-Alkali, Ethylene Dichloride and Vinyl Chloride Monomer	126
5.1.1	Asia Pacific.....	126
5.1.2	United States.....	126
5.1.3	Western Europe	126
5.2	Polyvinyl Chloride.....	149
5.2.1	Asia Pacific.....	149
5.2.2	United States.....	149
5.2.3	Western Europe	149
5.3	Vinyls Capacity Round-Up	157
5.3.1	North America	157
5.3.2	South America.....	157
5.3.3	Western Europe	157
5.3.4	Central and Eastern Europe.....	157
5.3.5	Middle East and Africa	157
5.3.6	Asia Pacific.....	157
6	Aromatics.....	158
6.1	Benzene, Toluene and Xylenes	158
6.1.1	Asia Pacific.....	158
6.1.2	United States.....	159
6.1.3	Western Europe	160
6.2	Cyclohexane.....	200
6.2.1	United States.....	200
6.2.2	Western Europe	200
6.3	Caprolactam	206
6.3.1	Asia Pacific.....	206
6.3.2	United States.....	206
6.3.3	Western Europe	207
6.4	Aromatics Capacity Round-Up.....	215
6.4.1	North America	215
6.4.2	South America.....	215
6.4.3	Western Europe	215



6.4.4	Central and Eastern Europe.....	215
6.4.5	Middle East and Africa	215
6.4.6	Asia Pacific.....	215
7	Styrenics	216
7.1	Styrene	216
7.1.1	Asia Pacific.....	216
7.1.2	United States.....	217
7.1.3	Western Europe	217
7.2	Polystyrene.....	225
7.2.1	Asia Pacific.....	225
7.2.2	United States.....	225
7.2.3	Western Europe	226
7.3	Styrenics Capacity Round-Up.....	234
7.3.1	North America	234
7.3.2	South America.....	234
7.3.3	Western Europe	234
7.3.4	Central and Eastern Europe.....	234
7.3.5	Middle East and Africa	234
7.3.6	Asia Pacific.....	234
8	Butadiene Derivatives.....	235
8.1	Styrene Butadiene Rubber	235
8.1.1	Asia Pacific.....	235
8.1.2	United States.....	235
8.1.3	Western Europe	236
8.2	Acrylonitrile Butadiene Styrene	244
8.2.1	Asia Pacific.....	244
8.2.2	United States.....	244
8.2.3	Western Europe	245
8.3	Butadiene Rubber	253
8.3.1	Asia Pacific.....	253
8.3.2	United States.....	253
8.3.3	Western Europe	254
8.4	Butadiene and Derivatives Capacity Round-Up.....	262
8.4.1	North America	262
8.4.2	South America.....	262
8.4.3	Western Europe	262
8.4.4	Central and Eastern Europe.....	262
8.4.5	Middle East and Africa	262
8.4.6	Asia Pacific.....	262
9	Polyester and Intermediates	263
9.1	Mono Ethylene Glycol and Ethylene Oxide.....	263
9.1.1	Asia Pacific.....	263
9.1.2	United States.....	263



9.1.3	Western Europe	264
9.2	<i>para</i> -Xylene (PX)	277
9.2.1	Asia Pacific	277
9.2.2	United States	277
9.2.3	Western Europe	277
9.3	Purified Terephthalic Acid (PTA)	288
9.3.1	Asia Pacific	288
9.3.2	United States	288
9.3.3	Western Europe	288
9.4	Polyethylene Terephthalate (PET)	297
9.4.1	Asia Pacific	297
9.4.2	United States	297
9.4.3	Western Europe	297
9.5	Polyester and Intermediates Capacity Round-Up	306
9.5.1	North America	306
9.5.2	South America	306
9.5.3	Western Europe	306
9.5.4	Central and Eastern Europe	306
9.5.5	Middle East and Africa	306
9.5.6	Asia Pacific	306
10	Propylene Derivatives	308
10.1	Acrylonitrile	308
10.1.1	Asia Pacific	308
10.1.2	United States	308
10.1.3	Western Europe	308
10.2	Cumene, Phenol and Acetone	316
10.2.1	Asia Pacific	316
10.2.2	United States	317
10.2.3	Western Europe	318
10.3	Bisphenol-A and Polycarbonate	329
10.3.1	Asia Pacific	329
10.3.2	United States	330
10.3.3	Western Europe	331
10.4	Propylene Oxide	352
10.4.1	Asia Pacific	352
10.4.2	United States	352
10.4.3	Western Europe	353
10.5	Oxo Alcohols: Butanols and 2-Ethylhexanol	366
10.5.1	Asia Pacific	366
10.5.2	United States	366
10.5.3	Western Europe	367
10.6	Propylene Derivatives Capacity Round-Up	382
10.6.1	North America	382
10.6.2	South America	382



10.6.3	Western Europe	382
10.6.4	Central and Eastern Europe.....	382
10.6.5	Middle East and Africa	382
10.6.6	Asia Pacific.....	382
11	Isocyanates.....	383
11.1	Methylene Diphenyl Diisocyanate and Toluene Diisocyanate	383
11.1.1	Asia Pacific.....	383
11.1.2	United States.....	384
11.1.3	Western Europe	384
11.2	Isocyanates Capacity Round-Up.....	399
11.2.1	North America	399
11.2.2	South America.....	399
11.2.3	Western Europe	399
11.2.4	Central and Eastern Europe.....	399
11.2.5	Middle East and Africa	399
11.2.6	Asia	399
12	Linear Alpha Olefins	400
12.1	On Purpose Linear Alpha Olefins (Butene-1, Hexene-1 and Octene-1).....	400
12.1.1	Asia Pacific.....	400
12.1.2	United States.....	400
12.1.3	Western Europe	400
12.2	Full Range Linear Alpha Olefins	410
13	Methanol and Derivatives.....	412
13.1.1	Methanol.....	412
13.1.2	Asia Pacific.....	412
13.1.3	United States.....	412
13.1.4	Western Europe	413
13.2	Methyl Tertiary Butyl Ether	421
13.2.1	Asia Pacific.....	421
13.2.2	United States.....	421
13.2.3	Western Europe	421
13.3	Methanol Capacity Round-Up	429
13.3.1	North America	429
13.3.2	South America.....	429
13.3.3	Western Europe	429
13.3.4	Central and Eastern Europe.....	429
13.3.5	Middle East and Africa	429
13.3.6	Asia Pacific.....	429
14	Ammonia and Urea.....	430
14.1	Ammonia	430
14.1.1	Asia Pacific.....	430
14.1.2	United States.....	430
14.1.3	Western Europe	431



14.2	Urea.....	439
14.2.1	Asia Pacific.....	439
14.2.2	United States.....	439
14.2.3	Western Europe	440
14.3	Ammonia and Urea Capacity Round-Up.....	448
14.3.1	North America	448
14.3.2	South America.....	448
14.3.3	Western Europe	448
14.3.4	Central and Eastern Europe.....	448
14.3.5	Middle East and Africa	449
14.3.6	Asia Pacific.....	449

Appendices

A	Cost of Production Models	451
----------	--	------------

Figures

Figure 1	United States Cash Margin Index.....	9
Figure 2	United States Cash Margin Index.....	9
Figure 3	United States Cash Margin Index.....	9
Figure 4	United States Cash Margin Index.....	10
Figure 5	United States Average Return on Replacement Capital	10
Figure 6	Western Europe Cash Margin Index	12
Figure 7	Western Europe Cash Margin Index	12
Figure 8	Western Europe Cash Margin Index	12
Figure 9	Western Europe Cash Margin Index	13
Figure 10	Western Europe Return on Capital	13
Figure 11	Global Benchmark Crude Oil Pricing.....	16
Figure 12	Singapore Variable Cost Refining Margin	17
Figure 13	United States Gulf Coast Variable Cost Refining Margins	17
Figure 14	Western Europe Variable Cost Refinery Margins.....	17
Figure 15	South-East Asia Petrochemical Feedstock Prices	21
Figure 16	North-West Europe Petrochemical Feedstock Prices	21
Figure 17	United States Gulf Coast Petrochemical Feedstock Prices	22
Figure 18	United States Ethane Extraction Cash Margin	24
Figure 19	United States Ethane Extraction Margins.....	24
Figure 20	Ethylene Cost Competitiveness Summary	28
Figure 21	Ethylene Prices.....	29
Figure 22	Asia Ethylene Cash Cost Margins – Standard Naphtha Cracker.....	34
Figure 23	China Ethylene Cost Price and Margins.....	34
Figure 24	China Ethylene Cash Cost Margins	35
Figure 25	China Ethylene Return on Investment.....	35
Figure 26	China Ethylene Cost Price and Margins.....	35
Figure 27	United States Gulf Coast Ethylene Prices.....	37
Figure 28	United States Ethane Cracker Cash Cost Margins	37



Figure 29	United States Ethylene Cost, Price and Margin	37
Figure 30	United States Ethane/Propane Mix Feed Cracker Cash Cost Margins	39
Figure 31	United States Ethylene Cost, Price and Margin	39
Figure 32	United States Naphtha Cracker Cash Cost Margins	41
Figure 33	United States Ethylene Cost, Price and Margin	41
Figure 34	United States Ethylene Production Costs	43
Figure 35	United States Ethylene Profitability	43
Figure 36	Western Europe Naphtha Cracker Variable Cost Margins	46
Figure 37	Western Europe Naphtha Cracker Cash Cost Margins	46
Figure 38	Western Europe Ethylene Cost, Price and Margins	46
Figure 39	Western Europe European Ethylene Prices	47
Figure 40	Western Europe Ethylene Production Costs	49
Figure 41	Western Europe Ethylene Cash Margins	49
Figure 42	Propylene Cost Competitiveness Summary	52
Figure 43	Propylene Prices	53
Figure 44	Asia Propylene Cash Cost Margins, Propane Dehydrogenation	58
Figure 45	China Propylene Cost Price and Margins	58
Figure 46	China Propylene Cash Cost Margins	59
Figure 47	China Propylene Return on Investment	59
Figure 48	China Propylene Cost Price and Margins	59
Figure 49	United States Propylene Price Comparison	62
Figure 50	United States Propylene Cash Cost Margins	62
Figure 51	United States Propylene Leader Cost Price and Margin	62
Figure 52	United States Propylene Margins	63
Figure 53	United States Propylene Leader Cost Price and Margin	63
Figure 54	Western Europe Propylene Margins	66
Figure 55	Western Europe Propylene Cost, Price and Margin	66
Figure 56	Western Europe Propylene Cash Cost Margins	67
Figure 57	Western Europe Propylene Cost, Price and Margins	67
Figure 58	Butadiene Cost Competitiveness Summary	70
Figure 59	Butadiene Prices	70
Figure 60	Asia Butadiene Cash Cost Margins, Mixed C4 Extraction	73
Figure 61	China Butadiene Cost Price and Margins	73
Figure 62	United States Butadiene Margins	75
Figure 63	United States Butadiene Cost, Price and Margin	75
Figure 64	Western Europe Butadiene Extraction Margins	77
Figure 65	Western Europe Butadiene Cost Price and Margins	77
Figure 66	LDPE Cost Competitiveness Summary	83
Figure 67	LDPE Prices	83
Figure 68	Asia LDPE Variable Cost Margins	86
Figure 69	Asia LDPE Cash Cost Margins	86
Figure 70	China LDPE Cost Price and Margins	86
Figure 71	United States LDPE Variable Cost Margins	88
Figure 72	United States LDPE Cash Cost Margins	88



Figure 73	United States LDPE Leader Cost, Price and Margin	88
Figure 74	Western Europe LDPE Variable Cost Margins.....	90
Figure 75	Western Europe LDPE Cash Cost Margins	90
Figure 76	Western Europe LDPE Cost, Price and Margins.....	90
Figure 77	LLDPE Cost Competitiveness Summary.....	94
Figure 78	LLDPE Prices	94
Figure 79	Asia LLDPE Variable Cost Margins.....	97
Figure 80	Asia LLDPE Cash Cost Margins	97
Figure 81	China LLDPE Cost Price and Margins	97
Figure 82	United States LLDPE (Butene-1) Variable Cost Margins.....	99
Figure 83	United States LLDPE (Butene-1) Cash Cost Margins.....	99
Figure 84	United States LLDPE (Butene-1) Leader Cost, Price and Margins.....	99
Figure 85	Western Europe LLDPE Variable Cost Margins.....	101
Figure 86	Western Europe LLDPE Cash Cost Margins	101
Figure 87	Western Europe LLDPE Cost, Price and Margins	101
Figure 88	HDPE Cost Competitiveness Summary	105
Figure 89	HDPE Prices.....	105
Figure 90	Asia HDPE Variable Cost Margins	108
Figure 91	Asia HDPE Cash Cost Margins.....	108
Figure 92	China HDPE Cost Price and Margins.....	108
Figure 93	United States HDPE Margins (Injection Moulding) Variable Cost Margins	110
Figure 94	United States HDPE Margins (Injection Moulding) Cash Cost Margins.....	110
Figure 95	United States HDPE (Injection Moulding) Leader Cost Price and Margin	110
Figure 96	Western Europe HDPE Variable Cost Margins	112
Figure 97	Western Europe HDPE Cash Cost Margins.....	112
Figure 98	Western Europe HDPE Cost, Price and Margins	112
Figure 99	Polypropylene Cost Competitiveness Summary	116
Figure 100	Polypropylene Prices.....	116
Figure 101	Asia Polypropylene Variable Cost Margins	119
Figure 102	Asia Polypropylene Cash Cost Margins	119
Figure 103	China Polypropylene Cost Price and Margins.....	119
Figure 104	United States Polypropylene Variable Cost Margins	121
Figure 105	United States Polypropylene Cash Cost Margins	121
Figure 106	United States Polypropylene Leader Cost, Price and Margin	121
Figure 107	Western Europe Polypropylene Variable Cost Margins	123
Figure 108	Western Europe Polypropylene Cash Cost Margins	123
Figure 109	Western Europe Polypropylene Cost, Price and Margins	123
Figure 110	VCM Cost Competitiveness Summary	127
Figure 111	VCM Prices.....	128
Figure 112	EDC Prices	128
Figure 113	Asia Ethylene Dichloride Variable Cost Margin.....	131
Figure 114	Asia Ethylene Dichloride Cash Cost Margins.....	131
Figure 115	China Ethylene Dichloride Cost Price and Margins	131
Figure 116	Asia Vinyl Chloride Monomer Variable Cost Margins	135



Figure 117	Asia Vinyl Chloride Monomer Cash Cost Margins	135
Figure 118	China Vinyl Chloride Monomer Cost Price and Margins	136
Figure 119	South-East Asia Vinyl Chloride Monomer Cost Price and Margins.....	136
Figure 120	United States Chlor-Alkali Cash Cost Margins.....	138
Figure 121	United States Chlor-Alkali Leader Cost, Price, and Margin	138
Figure 122	United States EDC Variable Cost Margins.....	140
Figure 123	United States EDC Cash Cost Margins.....	140
Figure 124	United States` EDC Leader Cost, Price, and Margin	140
Figure 125	United States Vinyl Chloride Variable Cost Margins	142
Figure 126	United States Vinyl Chloride Cash Cost Margins	142
Figure 127	United States Vinyl Chloride Leader Costs, Price, and Margin	142
Figure 128	Western Europe ECU Cash Cost Margins	144
Figure 129	Western Europe ECU Cost and Margin	144
Figure 130	Western Europe Ethylene Dichloride Variable Cost Margins.....	146
Figure 131	Western Europe Ethylene Dichloride Cash Cost Margins.....	146
Figure 132	Western Europe Ethylene Dichloride Cost, Price and Margin.....	146
Figure 133	Western Europe Vinyl Chloride Monomer Variable Cost Margins	148
Figure 134	Western Europe Vinyl Chloride Monomer Cash Cost Margins	148
Figure 135	Western Europe Vinyl Chloride Monomer Cost, Price and Margins	148
Figure 136	PVC Cost Competitiveness Summary.....	150
Figure 137	PVC Prices	150
Figure 138	South-East Asia PVC Variable Cost Margins.....	152
Figure 139	South-East Asia PVC Cash Cost Margins.....	152
Figure 140	South-East Asia PVC Cost Price and Margins.....	152
Figure 141	United States PVC Pipe-Grade Variable Cost Margins	154
Figure 142	United States PVC Pipe-Grade Cash Cost Margins	154
Figure 143	United States PVC Pipe Grade Leader Cost, Price and Margin	154
Figure 144	Western Europe PVC Variable Cost Margins.....	156
Figure 145	Western Europe PVC Cash Cost Margins	156
Figure 146	Western Europe PVC Cost, Price and Margin	156
Figure 147	Benzene Cost Competitiveness Summary.....	161
Figure 148	Benzene Prices	162
Figure 149	Mixed Xylenes Cost Competitiveness Summary.....	163
Figure 150	Mixed Xylenes Prices	163
Figure 151	Asia Reformer Cash Cost Margins.....	166
Figure 152	China Reformer Cost, Price and Margin	166
Figure 153	Asia Benzene Cash Cost Margins.....	169
Figure 154	China Benzene Cost, Price and Margin	169
Figure 155	China Mixed Xylenes Margins.....	174
Figure 156	South-East Asia Mixed Xylenes Margins	174
Figure 157	China Mixed Xylenes, Price and Margin	175
Figure 158	China Mixed Xylenes, Price and Margin	175
Figure 159	United States Toluene Recovery for Chemicals versus Blending Into Gasoline)	176
Figure 160	United States Aromatics Prices.....	176



Figure 161	United States Reformer Margins	178
Figure 162	United States Reformate Cost, Price and Margin	178
Figure 163	United States Benzene Extraction Margins	181
Figure 164	United States Benzene – Toluene Conversion Cash Cost Margins	181
Figure 165	United States Benzene Cost Price and Margins	182
Figure 166	United States Benzene Cost, Price and Margin	182
Figure 167	United States Benzene Production Costs	184
Figure 168	United States Mixed Xylenes – Reformate Extraction Cash Cost Margins.....	187
Figure 169	United States Mixed Xylenes – Toluene Conversion Cash Cost Margins	187
Figure 170	United States Mixed Xylenes Cost Price and Margin.....	188
Figure 171	United States Mixed Xylenes Cost Price and Margin.....	188
Figure 172	United States Xylenes Production Costs.....	190
Figure 173	Western Europe Aromatics Prices	191
Figure 174	Western Europe Spot Price Differentials to Premium Unleaded Gasoline	191
Figure 175	Western Europe Reformer Cash Cost Margins.....	193
Figure 176	Western Europe Reformer Cost Price & Margins	193
Figure 177	Western Europe Benzene Cash Cost Margins.....	196
Figure 178	Western Europe Benzene Cost Price and Margin.....	196
Figure 179	Western Europe Benzene Cost Price and Margin.....	196
Figure 180	Western Europe Mixed Xylenes Cash Cost Margins	199
Figure 181	Western Europe Mixed Xylenes Cost, Price and Margins	199
Figure 182	Western Europe Mixed Xylenes Cash Cost Margins	199
Figure 183	Cyclohexane Prices.....	201
Figure 184	United States Cyclohexane Margins	203
Figure 185	United States Cyclohexane Leader Cost, Price and Margin	203
Figure 186	Western Europe Cyclohexane Margins.....	205
Figure 187	Western Europe Cyclohexane Leader Cost Price and Margin.....	205
Figure 188	Caprolactam Cost Competitiveness Summary.....	208
Figure 189	Caprolactam Prices	208
Figure 190	China Caprolactam Margins	210
Figure 191	China Caprolactam Cost Price and Margin	210
Figure 192	United States Caprolactam Margins.....	212
Figure 193	United States Caprolactam Leader Cost, Price, and Margin	212
Figure 194	Western Europe Caprolactam Margins	214
Figure 195	Caprolactam Cost Price and Margin	214
Figure 196	Styrene Cost Competitiveness Summary.....	218
Figure 197	Styrene Prices	218
Figure 198	South-East Asia Styrene Variable Cost Margins.....	220
Figure 199	South-East Asia Styrene Cash Cost Margins.....	220
Figure 200	South-East Asia Styrene Cost, Price and Margin.....	220
Figure 201	United States Styrene Variable Cost Margins.....	222
Figure 202	United States Styrene Cash Cost Margins.....	222
Figure 203	United States Styrene Leader Cost, Price and Margin	222
Figure 204	Western Europe Styrene Variable Cost Margins.....	224



Figure 205	Western Europe Styrene Cash Cost Margins	224
Figure 206	Western Europe Styrene Cost, Price and Margin	224
Figure 207	Polystyrene Cost Competitiveness Summary	227
Figure 208	Polystyrene Prices	227
Figure 209	South-East Asia Polystyrene Variable Cost Margins	229
Figure 210	South-East Asia Polystyrene Cash Cost Margins	229
Figure 211	South-East Asia Styrene Cost, Price and Margin.....	229
Figure 212	United States Polystyrene Variable Cost Margins	231
Figure 213	United States Polystyrene Cash Cost Margins	231
Figure 214	United States Polystyrene Leader Margins	231
Figure 215	Western Europe Polystyrene Variable Cost Margins	233
Figure 216	Western Europe Polystyrene Cash Cost Margins	233
Figure 217	Western Europe Polystyrene Cost, Price and Margin	233
Figure 218	Styrene Butadiene Rubber Cost Competitiveness Summary	237
Figure 219	Styrene Butadiene Rubber Prices	237
Figure 220	South-East Asia Styrene Butadiene Rubber Margins	239
Figure 221	South-East Asia Styrene Butadiene Rubber Cost, Price and Margin	239
Figure 222	United States Styrene Butadiene Rubber Margins	241
Figure 223	United States Styrene Butadiene Rubber Cost Price and Margin.....	241
Figure 224	Western Europe Styrene Butadiene Rubber Margins	243
Figure 225	Western Europe Styrene Butadiene Rubber Leader Cost Price and Margin.....	243
Figure 226	Acrylonitrile Butadiene Styrene Cost Competitiveness Summary	246
Figure 227	Acrylonitrile Butadiene Styrene Prices	246
Figure 228	South-East Asia Acrylonitrile Butadiene Styrene Margins	248
Figure 229	South-East Asia Acrylonitrile Butadiene Styrene Cost, Price and Margin	248
Figure 230	United States Acrylonitrile Butadiene Styrene Margins.....	250
Figure 231	United States Acrylonitrile Butadiene Styrene Leader Cost Price and Margin	250
Figure 232	Western Europe Acrylonitrile Butadiene Styrene Margins	252
Figure 233	Western Europe Acrylonitrile Butadiene Styrene Leader Cost Price and Margin	252
Figure 234	Butadiene Rubber Cost Competitiveness Summary	255
Figure 235	Butadiene Rubber Prices.....	255
Figure 236	South-East Asia Butadiene Rubber Margins.....	257
Figure 237	South-East Asia Butadiene Rubber Cost, Price and Margin	257
Figure 238	United States Butadiene Rubber Margins	259
Figure 239	United States Butadiene Rubber Leader Cost Price and Margin	259
Figure 240	Western Europe Butadiene Rubber Margins.....	261
Figure 241	Western Europe Butadiene Rubber Cost Price and Margin.....	261
Figure 242	Mono Ethylene Glycol Cost Competitiveness Summary	265
Figure 243	Mono Ethylene Glycol Prices.....	265
Figure 244	Asia Mono Ethylene Glycol Variable Cost Margins	269
Figure 245	Asia Mono Ethylene Glycol Cash cost Margins.....	269
Figure 246	China Mono Ethylene Glycol Cost, Price and Margin	270
Figure 247	China Mono Ethylene Glycol Cost, Price and Margin	270
Figure 248	United States Mono Ethylene Glycol Variable Cost Margins	272



Figure 249	United States Mono Ethylene Glycol Cash Cost Margins	272
Figure 250	United States Mono Ethylene Glycol Leader Cost, Price and Margin	272
Figure 251	Western Europe Ethylene Oxide Variable Cost Margins	274
Figure 252	Western Europe Ethylene Oxide Cash Cost Margins	274
Figure 253	Western Europe Ethylene Oxide Cost Price and Margin	274
Figure 254	Western Europe Ethylene Glycol Variable Cost Margins	276
Figure 255	Western Europe Ethylene Glycol Cash Cost Margins	276
Figure 256	Western Europe Ethylene Glycol Cost Price and Margin	276
Figure 257	<i>para</i> -Xylene Cost Competitiveness Summary	278
Figure 258	<i>para</i> -Xylene Prices	278
Figure 259	China <i>para</i> -Xylene Cash Cost Margins	281
Figure 260	South-East Asia <i>para</i> -Xylene Cash Cost Margins	281
Figure 261	China <i>para</i> -Xylene Cost, Price and Margin	281
Figure 262	United States <i>para</i> -Xylene Extraction and Isomerisation Margins	283
Figure 263	United States <i>para</i> -Xylene Cash Cost Margins	283
Figure 264	United States <i>para</i> -Xylene Return on Investment	284
Figure 265	United States <i>para</i> -Xylene Leader Cost, Price and Margin	284
Figure 266	Western Europe <i>para</i> -Xylene Margins (Leader)	286
Figure 267	Western Europe <i>para</i> -Xylene Cost Price and Margin	286
Figure 268	Western Europe <i>para</i> -Xylene Cash Cost Margins	287
Figure 269	Western Europe <i>para</i> -Xylene Return on Investment	287
Figure 270	PTA Cost Competitiveness Summary	289
Figure 271	PTA Prices	289
Figure 272	Asia PTA Variable Cost Margins	292
Figure 273	Asia PTA Cash Cost Margins	292
Figure 274	China PTA Cost, Price and Margin	292
Figure 275	United States PTA Fibre Grade Variable Cost Margins	294
Figure 276	United States PTA Fibre Grade Cash Cost Margins	294
Figure 277	United States PTA Fibre Grade Cost, Price and Margin	294
Figure 278	Western Europe PTA Margins	296
Figure 279	Western Europe PTA Cost, Price and Margins	296
Figure 280	PET Cost Competitiveness Summary	298
Figure 281	PET Bottle Grade Prices	298
Figure 282	Asia PET Bottle Grade Variable Cost Margins	301
Figure 283	Asia PET Bottle Grade Cash Cost Margins	301
Figure 284	China PET Bottle Grade Cost, Price and Margins	301
Figure 285	United States PET Bottle Grade Variable Cost Margins	303
Figure 286	United States PET Bottle Grade Cash Cost Margins	303
Figure 287	United States PET Bottle Grade Leader Cost, Price and Margin	303
Figure 288	Western Europe PET Bottle Grade Margins	305
Figure 289	Western Europe PET Bottle Grade Leader Cost, Price and Margin	305
Figure 290	Acrylonitrile Cost Competitiveness Summary	309
Figure 291	Acrylonitrile Prices	309
Figure 292	China Acrylonitrile Margins	311



Figure 293	China Acrylonitrile Cost, Price and Margin	311
Figure 294	United States Acrylonitrile Margins	313
Figure 295	United States Acrylonitrile Leader Cost, Price and Margin	313
Figure 296	United States Acrylonitrile Leader Margins	313
Figure 297	Western Europe Acrylonitrile Margins	315
Figure 298	Western Europe Acrylonitrile Cost Price and Margin	315
Figure 299	Phenol Cost Competitiveness Summary	319
Figure 300	Phenol Prices	319
Figure 301	Asia Integrated Cumene Phenol Variable Cost Margins	322
Figure 302	Asia Integrated Cumene Phenol Cash Cost Margins	322
Figure 303	China Phenol Cost, Price and Margin	322
Figure 304	United States Cumene Cash Cost Margins	324
Figure 305	United States Cumene Leader Cost, Price and Margin	324
Figure 306	United States Phenol Variable Cost Margins	326
Figure 307	United States Phenol Cash Cost Margins	326
Figure 308	United States Phenol Cost, Price, and Margin	326
Figure 309	Western Europe Integrated Cumene/Phenol Margins	328
Figure 310	Western Europe Phenol Cost Price and Margin	328
Figure 311	Bisphenol A Cost Competitiveness Summary	332
Figure 312	Bisphenol A Prices	332
Figure 313	South-East Asia Bisphenol A Variable Cost Margins	334
Figure 314	South-East Asia Bisphenol A Cash Cost Margins	334
Figure 315	South-East Asia Bisphenol A Leader Cost Price and Margin	334
Figure 316	United States Bisphenol-A Margins	336
Figure 317	United States Bisphenol-A Leader Cost, Price, and Margin	336
Figure 318	Western Europe Bisphenol A Margins	338
Figure 319	Western Europe Bisphenol A Leader Cost Price and Margin	338
Figure 320	Polycarbonate Cost Competitiveness Summary	339
Figure 321	Polycarbonate Prices	339
Figure 322	South-East Asia Polycarbonate Variable Cost Margins	342
Figure 323	South-East Asia Polycarbonate Cash Cost Margins	342
Figure 324	South-East Asia Polycarbonate Interfacial Cost Price and Margin	343
Figure 325	South-East Asia Polycarbonate Melt Phase Cost Price and Margin	343
Figure 326	United States Polycarbonate Variable Margins	346
Figure 327	United States Polycarbonate Cash Margins	346
Figure 328	United States Polycarbonate Cost, Price Margin - Interfacial	347
Figure 329	United States Polycarbonate Margins – Melt Phase Non-Phosgene	347
Figure 330	Western Europe Polycarbonate Variable Cost Margins	350
Figure 331	Western Europe Polycarbonate Cash Cost Margins	350
Figure 332	Western Europe Polycarbonate Interfacial Cost Price and Margin	351
Figure 333	Western Europe Polycarbonate Melt Phase Cost Price and Margin	351
Figure 334	Propylene Oxide Cost Competitiveness Summary	354
Figure 335	Propylene Oxide Prices	354
Figure 336	South-East Asia Propylene Oxide Variable Cost Margins	357



Figure 337	South-East Asia Propylene Oxide Cash Cost Margins	357
Figure 338	South-East Asia Propylene Oxide Cost Price and Margin	358
Figure 339	South-East Asia Propylene Oxide Cost Price and Margin	358
Figure 340	United States Propylene Oxide Margins	361
Figure 341	United States Propylene Oxide Cost Price and Margin	361
Figure 342	United States Propylene Oxide Cost Price and Margin	361
Figure 343	Western Europe Propylene Oxide Variable Cost Margins	364
Figure 344	Western Europe Propylene Oxide Cash Cost Margins	364
Figure 345	Western Europe Propylene Oxide Cost Price and Margin	365
Figure 346	Western Europe Propylene Oxide Cost Price and Margin	365
Figure 347	Oxo Alcohols Cost Competitiveness Summary.....	368
Figure 348	<i>n</i> -Butanol Prices	368
Figure 349	2EH Prices.....	369
Figure 350	South-East Asia Butanol Margins.....	371
Figure 351	South-East Asia Butanol Cost, Price and Margin.....	371
Figure 352	South-East Asia 2-Ethylhexanol Margins	373
Figure 353	South-East Asia 2-Ethylhexanol Cost, Price and Margin	373
Figure 354	United States Butanol Margins	375
Figure 355	United States Butanol Cost, Price and Margin	375
Figure 356	United States 2-Ethylhexanol Margins	377
Figure 357	United States 2-Ethylhexanol Cost, Price and Margin	377
Figure 358	Western Europe Butanol Margins	379
Figure 359	Western Europe Butanol Cost, Price and Margin.....	379
Figure 360	Western Europe 2-Ethylhexanol Margins.....	381
Figure 361	Western Europe 2-Ethylhexanol Cost, Price and Margin	381
Figure 362	Isocyanates Cost Competitiveness Summary.....	385
Figure 363	MDI Prices	386
Figure 364	TDI Prices	386
Figure 365	China MDI and Intermediates Costs	388
Figure 366	China MDI Margins.....	388
Figure 367	China TDI and Intermediates Costs	390
Figure 368	China TDI Margins.....	390
Figure 369	United States MDI and Intermediates Costs	392
Figure 370	United States MDI Margins.....	392
Figure 371	United States TDI and Intermediates Costs	394
Figure 372	United States TDI Margins	394
Figure 373	Western Europe MDI and Intermediates Costs.....	396
Figure 374	Western Europe MDI Margins	396
Figure 375	Western Europe TDI and Intermediates Costs.....	398
Figure 376	Western Europe TDI Margins	398
Figure 377	Butene-1 Regional Cost Competitiveness Summary	401
Figure 378	Hexene-1 Regional Cost Competitiveness Summary	401
Figure 379	Octene-1 Regional Cost Competitiveness Summary	402
Figure 380	Asia Pacific LAO Prices.....	403



Figure 381	United States LAO Prices	403
Figure 382	Western Europe LAO Prices	403
Figure 383	Asia Pacific LAO Margins	405
Figure 384	Asia Pacific Cost, Price and Margins	405
Figure 385	United States LAO Margins	407
Figure 386	United States LAO Cost, Price and Margins	407
Figure 387	Western Europe LAO Margins	409
Figure 388	Western Europe LAO Cost, Price and Margins.....	409
Figure 389	Full Range LAO Cost, Price and Margins	411
Figure 390	Methanol Cost Competitiveness Summary	414
Figure 391	Methanol Prices	414
Figure 392	China Methanol Margins.....	416
Figure 393	China Methanol Cost, Price and Margin.....	416
Figure 394	United States Methanol Margins	418
Figure 395	United States Methanol Cost, Price, and Margin	418
Figure 396	Western Europe Methanol Margins	420
Figure 397	Western Europe Methanol Cost, Price and Margin	420
Figure 398	MTBE Cost Competitiveness Summary	422
Figure 399	MTBE Prices.....	422
Figure 400	China MTBE Margins	424
Figure 401	China MTBE Cost, Price and Margin	424
Figure 402	United States MTBE Margins	426
Figure 403	United States MTBE Cost, Price, and Margin	426
Figure 404	Western Europe MTBE Margins.....	428
Figure 405	Western Europe MTBE Cost, Price and Margin.....	428
Figure 406	Ammonia Cost Competitiveness Summary	432
Figure 407	Ammonia Prices	432
Figure 408	China Ammonia Margins	434
Figure 409	China Ammonia Cost, Price and Margin	434
Figure 410	United States Ammonia Margins	436
Figure 411	United States Ammonia Cost, Price, and Margin	436
Figure 412	Western Europe Ammonia Margins	438
Figure 413	Western Europe Ammonia Cost, Price and Margin	438
Figure 414	Urea Cost Competitiveness Summary	440
Figure 415	Urea Prices	441
Figure 416	China Urea Margins.....	443
Figure 417	China Urea Cost, Price and Margin.....	443
Figure 418	United States Urea Margins	445
Figure 419	United States Urea Cost, Price, and Margin	445
Figure 420	Western Europe Urea Margins	447
Figure 421	Western Europe Urea Cost, Price and Margin	447



Tables

Table 1	United States Petrochemical Profitability Summary	8
Table 2	Western Europe Petrochemical Profitability Summary	11
Table 3	Monthly Crude Oil Pricing	15
Table 4	Singapore Refinery Costs, Revenue and Margins	18
Table 5	United States Gulf Coast Refinery Costs, Revenue, and Margins	19
Table 6	Western Europe Refinery Costs, Revenue and Margins	20
Table 7	United States Gulf Coast Petrochemical Feedstock Spot Prices	22
Table 8	United States Ethane Recovery Leader Costs, Revenues, and Margins	23
Table 9	China Ethylene Costs, Revenues and Margins	30
Table 10	China Ethylene Costs, Revenues and Margins	31
Table 11	China Ethylene Costs, Revenues and Margins	32
Table 12	South-East Asia Ethylene Costs, Revenues and Margins	33
Table 13	United States Ethylene Leader Costs, Revenues and Margins (Ethane Cracker)	36
Table 14	United States Ethylene Leader Costs, Revenues and Margins (Ethane/Propane Mixed Feed Cracker)	38
Table 15	United States Ethylene Leader Costs, Revenues and Margins (Standard Naphtha Cracker)	40
Table 16	United States Ethylene Production Costs (Cracker Feedstock Competitiveness)	42
Table 17	Western Europe Ethylene Leader Costs, Revenues and Margins Standard Naphtha Cracker with Butadiene and Benzene Extraction	44
Table 18	Western Europe Ethylene Leader Costs, Revenues and Margins Basic Naphtha Cracker (Standard Severity)	45
Table 19	Western Europe Ethylene Costs	48
Table 20	China Propylene Costs, Revenues and Margins	54
Table 21	China Propylene Costs, Revenues and Margins	55
Table 22	China Propylene Costs, Revenues and Margins	56
Table 23	South-East Asia Propylene Costs, Revenues and Margins	57
Table 24	United States Polymer Grade Propylene Leader Cost, Revenues, and Margins Refinery Propylene Splitter	60
Table 25	United States Polymer Grade Propylene Leader Cost, Revenues, and Margins Propane Dehydrogenation	61
Table 26	Western Europe Propylene Costs, Revenue and Margins Propane Dehydrogenation	64
Table 27	Western Europe Propylene Costs, Revenues and Margins Refinery Propylene Splitter	65
Table 28	China Butadiene Costs, Revenues and Margins Mixed C4 Extraction	71
Table 29	South-East Asia Butadiene Costs, Revenues and Margins	72
Table 30	United States Butadiene Costs, Revenues, and Margins Leader Plants	74
Table 31	Western Europe Butadiene Costs, Revenues and Margins	76
Table 32	China LDPE Costs, Revenue and Margins	84
Table 33	South-East Asia LDPE Costs, Revenue and Margins	85
Table 34	United States Low Density Polyethylene Leader Costs, Revenues, and Margins	87
Table 35	Western Europe Low Density Polyethylene Leader Costs, Revenues and Margins	89
Table 36	China LLDPE Costs, Revenue and Margins	95



Table 37	South-East Asia LLDPE Costs, Revenue and Margins.....	96
Table 38	United States Linear Low Density Leader Polyethylene Costs, Revenues, and Margins Butene-1 Grade	98
Table 39	Western Europe Linear Low Density Polyethylene Leader Costs, Revenues and Margins.....	100
Table 40	China HDPE Costs, Revenue and Margins.....	106
Table 41	South-East Asia HDPE Costs, Revenue and Margins	107
Table 42	United States High Density Polyethylene Leader Costs Revenues and Margins Injection Moulding Grade.....	109
Table 43	Western Europe High Density Polyethylene Leader Costs, Revenues and Margins.....	111
Table 44	China Polypropylene Costs, Revenue and Margins.....	117
Table 45	South-East Asia Polypropylene Costs, Revenue and Margins	118
Table 46	United States Polypropylene Leader Costs, Revenue, and Margins	120
Table 47	Western Europe Polypropylene Leader Costs, Revenues and Margins	122
Table 48	China Ethylene Dichloride Costs, Revenues and Margins.....	129
Table 49	South-East Asia Ethylene Dichloride Costs, Revenues and Margins	130
Table 50	China Vinyl Chloride Monomer Costs, Revenues and Margins	132
Table 51	China Vinyl Chloride Monomer Costs, Revenues and Margins	133
Table 52	South-East Asia Vinyl Chloride Monomer Costs, Revenues and Margins.....	134
Table 53	United States Chlor-Alkali Leader Costs Revenues and Margins.....	137
Table 54	United States Export Ethylene Dichloride Leader Costs, Revenues, and Margins.....	139
Table 55	United States Vinyl Chloride Monomer Leader Costs, Revenues, and Margins.....	141
Table 56	Western Europe Chlor-Alkali Leader Costs.....	143
Table 57	Western Europe Ethylene Dichloride Leader Costs, Revenues and Margins.....	145
Table 58	Western Europe Vinyl Chloride Monomer Leader Costs, Revenues and Margins Contract Economics	147
Table 59	China Polyvinyl Chloride Costs, Revenues and Margins	151
Table 60	United States Polyvinyl Chloride Leader Costs, Revenues, and Margins	153
Table 61	Western Europe Polyvinyl Chloride Leader Costs, Revenues and Margins	155
Table 62	China Reformer Costs, Revenues and Margins.....	164
Table 63	South-East Asia Reformer Costs, Revenues and Margins	165
Table 64	China Benzene Pygas Extraction Costs, Revenues and Margins	167
Table 65	South-East Asia Benzene Costs, Revenues and Margins	168
Table 66	China Mixed Xylenes Costs, Revenues and Margins Reformate Extraction	170
Table 67	China Mixed Xylenes Costs, Revenues and Margins	171
Table 68	South-East Asia Mixed Xylenes Costs, Revenues and Margins.....	172
Table 69	South-East Asia Mixed Xylenes Costs, Revenues and Margins.....	173
Table 70	United States Reformate Costs, Revenues, and Margins.....	177
Table 71	United States Benzene Costs, Revenues, and Margins Toluene Hydrodealkylation	179
Table 72	United States Benzene Costs, Revenues, and Margins Toluene Disproportionation	180
Table 73	United States Benzene Production Costs	183
Table 74	United States Mixed Xylenes Costs, Revenues and Margins Reformate Extraction	185
Table 75	United States Mixed Xylenes Costs, Revenues and Margins Toluene Disproportionation (TDP).....	186
Table 76	United States Mixed Xylenes Production Costs	189



Table 77	Western Europe Reformer Leader Costs, Revenues and Margins.....	192
Table 78	Western Europe Benzene Costs, Revenues and Margins Extraction from Pygas	194
Table 79	Western Europe Benzene Costs, Revenues and Margins Toluene Hydrodealkylation	195
Table 80	Western Europe Mixed Xylenes Costs, Revenues and Margins Toluene Disproportionation	197
Table 81	Western Europe Mixed Xylenes Costs, Revenues and Margins Reformate Extraction	198
Table 82	United States Cyclohexane Leader Costs, Revenues, and Margins	202
Table 83	Western Europe Cyclohexane Leader Costs, Revenues and Margins	204
Table 84	China Caprolactam Costs, Revenues and Margins Typical Plants.....	209
Table 85	United States Caprolactam Costs, Revenues, and Margins	211
Table 86	Western Europe Caprolactam Costs, Revenues and Margins.....	213
Table 87	South-East Asia Styrene Costs, Revenues and Margins.....	219
Table 88	United States Styrene Leader Costs, Revenues, and Margins	221
Table 89	Western Europe Styrene Leader Costs, Revenues and Margins	223
Table 90	South-East Asia Polystyrene Costs, Revenues and Margins	228
Table 91	United States Polystyrene Leader Costs, Revenues, and Margins	230
Table 92	Western Europe Polystyrene Leader Costs, Revenues and Margins	232
Table 93	South-East Asia Styrene Butadiene Rubber Costs, Revenues and Margins.....	238
Table 94	United States Styrene Butadiene Rubber Costs, Revenues and Margins Typical Plants.....	240
Table 95	Western Europe Styrene Butadiene Rubber Costs, Revenues and Margins	242
Table 96	South-East Asia Acrylonitrile Butadiene Styrene Costs, Revenues and Margins	247
Table 97	United States ABS Costs, Revenues and Margins Leader Plants	249
Table 98	Western Europe Acrylonitrile Butadiene Styrene Costs, Revenues and Margins.....	251
Table 99	Butadiene Rubber Costs, Revenues and Margins – South-East Asia	256
Table 100	United States Butadiene Rubber Costs, Revenues and Margins Leader Plants	258
Table 101	Western Europe Butadiene Rubber Costs, Revenues and Margins Typical Plants	260
Table 102	China Mono Ethylene Glycol Costs, Revenues and Margins Ethylene Oxidation and Hydration	266
Table 103	China Mono Ethylene Glycol Costs, Revenues and Margins From Coal Via DMO	267
Table 104	South-East Asia Mono Ethylene Glycol Costs, Revenues and Margins Ethylene Oxidation and Hydration	268
Table 105	United States Mono Ethylene Glycol Leader Costs, Revenues, and Margins	271
Table 106	Western Europe Ethylene Oxide Leader Costs, Revenues and Margins	273
Table 107	Western Europe Ethylene Glycol Leader Costs, Revenues and Margins.....	275
Table 108	China <i>para</i> -Xylene Costs, Revenues and Margins	279
Table 109	South-East Asia <i>para</i> -Xylene Costs, Revenues and Margins	280
Table 110	United States <i>para</i> -Xylene Leader Costs, Revenues, and Margins.....	282
Table 111	Western Europe <i>para</i> -Xylene Leader Costs, Revenues and Margins	285
Table 112	China PTA Costs, Revenues and Margins	290
Table 113	South-East Asia PTA Costs, Revenues and Margins	291
Table 114	United States PTA Leader Costs, Revenues, and Margins	293
Table 115	Western Europe PTA Costs, Revenues and Margins	295



Table 116	China PET Bottle Grade Costs, Revenues and Margins	299
Table 117	South-East Asia PET Bottle Grade Costs, Revenues and Margins	300
Table 118	United States PET Bottle Grade Leader Costs, Revenues, and Margins	302
Table 119	Western Europe PET Bottle Grade Leader Costs, Revenues and Margins	304
Table 120	China Acrylonitrile Costs, Revenues and Margins	310
Table 121	United States Acrylonitrile Leader Costs, Revenues, and Margins.....	312
Table 122	Western Europe Acrylonitrile Leader Costs, Revenues and Margins	314
Table 123	China Cumene/Phenol Costs, Revenues and Margins	320
Table 124	South-East Asia Cumene/Phenol Costs, Revenues and Margins	321
Table 125	United States Cumene Leader Costs, Revenues, and Margins.....	323
Table 126	United States Phenol Leader Costs, Revenues, and Margins Cumene Oxidation	325
Table 127	Western Europe Cumene/Phenol Leader Costs, Revenues and Margins	327
Table 128	South-East Asia Bisphenol A Costs, Revenues and Margins	333
Table 129	United States Bisphenol A (BPA) Leader Costs, Revenues, and Margins	335
Table 130	Western Europe Bisphenol A Costs, Revenues and Margins	337
Table 131	South-East Asia Polycarbonate Costs, Revenues and Margins Interfacial Process	340
Table 132	South-East Asia Polycarbonate Costs, Revenues and Margins Melt Phase Non Phosgene Process	341
Table 133	United States Polycarbonate Leader Costs, Revenues, and Margins Interfacial	344
Table 134	United States Polycarbonate Leader Costs, Revenues, and Margins Melt Phase Non-Phosgene.....	345
Table 135	Western Europe Polycarbonate Costs, Revenues and Margins Interfacial	348
Table 136	Western Europe Polycarbonate Phosgene Costs, Revenues and Margins Melt Phase Non Phosgene.....	349
Table 137	South-East Asia Propylene Oxide Costs, Revenues and Margins Hydrogen Peroxide (HPPO) Process	355
Table 138	South-East Asia Propylene Oxide Costs, Revenues and Margins Styrene (POSM) Process.....	356
Table 139	United States Propylene Oxide Costs, Revenues and Margins Chlorohydrin (CHPO) Process.....	359
Table 140	United States Propylene Oxide Costs, Revenues and Margins Styrene (POSM) Process.....	360
Table 141	Western Europe Propylene Oxide Costs, Revenues and Margins Hydrogen Peroxide (HPPO) Process	362
Table 142	Western Europe Propylene Oxide Costs, Revenues and Margins Styrene (POSM) Process.....	363
Table 143	South-East Asia Butanol Costs, Revenues and Margins	370
Table 144	South-East Asia 2-Ethylhexanol Costs, Revenues and Margins	372
Table 145	United States Butanol Costs, Revenues and Margins	374
Table 146	United States 2-Ethylhexanol Costs, Revenues and Margins.....	376
Table 147	Western Europe Butanol Costs, Revenues and Margins.....	378
Table 148	Western Europe 2-Ethylhexanol Costs, Revenues and Margins	380
Table 149	China MDI and Intermediates Costs, Revenues and Margins	387
Table 150	China TDI and Intermediates Costs, Revenues and Margins	389
Table 151	United States MDI and Intermediates Costs, Revenues and Margins	391
Table 152	United States TDI and Intermediates Costs, Revenues and Margins.....	393



Table 153	Western Europe MDI and Intermediates Costs, Revenues and Margins	395
Table 154	Western Europe TDI and Intermediates Costs, Revenues and Margins	397
Table 155	Asia Pacific LAO Cost, Revenues and Margins	404
Table 156	United States LAO Cost, Revenues and Margins	406
Table 157	Western Europe LAO Cost, Revenues and Margins.....	408
Table 158	Full Range LAO Production Costs	410
Table 159	China Methanol Costs, Revenues and Margins	415
Table 160	United States Methanol Costs, Revenues, and Margins Natural Gas Reforming.....	417
Table 161	Western Europe Methanol Costs, Revenues and Margins	419
Table 162	China MTBE Costs, Revenues and Margins.....	423
Table 163	United States MTBE Costs, Revenues, and Margins isobutylene ex Steam Cracker Raffinate-1	425
Table 164	Western Europe MTBE Costs, Revenues and Margins.....	427
Table 165	China Ammonia Costs, Revenues and Margins	433
Table 166	United States Ammonia Costs, Revenues, and Margins Natural Gas Reforming	435
Table 167	Western Europe Ammonia Costs, Revenues and Margins.....	437
Table 168	China Urea Costs, Revenues and Margins	442
Table 169	United States Urea Costs, Revenues, and Margins Integrated Ammonia	444
Table 170	Western Europe Urea Costs, Revenues and Margins	446