

MARKETS AND PROFITABILITY

Quarterly Business Analysis

Quarter 4 2023

Petrochemicals, Polymers, C1 Chemicals and
Fertilizers

December 2023



This Report was prepared by NexantECA Energy & Chemicals Advisory ("NexantECA"). Except where specifically stated 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 and belief of NexantECA. The information has not been independently verified or otherwise examined to determine its accuracy, completeness or financial feasibility. Neither NexantECA, Subscriber nor any person acting on behalf of either shall have any liabilities for any loss or damage arising from or connected to the use of any information contained in this Report. NexantECA does not represent or warrant that any assumed conditions will come to pass.

The Report is for Subscriber's internal use only and shall be kept strictly confidential. The Report should not be otherwise reproduced, distributed or used without first obtaining prior written consent by NexantECA. Each Subscriber agrees to use reasonable effort to protect the confidential nature of the Report.

Copyright © by NexantECA (BVI) Ltd. 2023. All rights reserved.



Contents

1	Executive Summary	1
1.1	Asia Pacific	1
1.2	United States	2
1.3	Western Europe	3
2	Crude Oil, Refining and Petrochemical Feedstocks.....	11
2.1	Crude Oil and Refining	11
2.2	United States NGLs	18
3	Olefins	22
3.1	Ethylene	22
3.1.1	Asia Pacific	22
3.1.2	United States	23
3.1.3	Western Europe	24
3.2	Propylene	42
3.2.1	Asia Pacific	42
3.2.2	United States	43
3.2.3	Western Europe	44
3.3	Butadiene	58
3.3.1	Asia Pacific	58
3.3.2	United States	59
3.3.3	Western Europe	60
3.4	Olefins Capacity Round-Up.....	68
3.4.1	North America	68
3.4.2	South America	68
3.4.3	Western Europe	68
3.4.4	Central Europe	68
3.4.5	Eastern Europe	68
3.4.6	Middle East	68
3.4.7	Africa	68
3.4.8	Asia Pacific	68
4	Polyolefins	70
4.1	Low Density Polyethylene	70
4.1.1	Asia Pacific	70
4.1.2	United States	70
4.1.3	Western Europe	70
4.2	Linear Low Density Polyethylene	78
4.2.1	Asia Pacific	78
4.2.2	United States	78
4.2.3	Western Europe	78
4.3	High Density Polyethylene	86
4.3.1	Asia Pacific	86



4.3.2	United States.....	86
4.3.3	Western Europe	86
4.4	Polypropylene.....	94
4.4.1	Asia Pacific.....	94
4.4.2	United States.....	94
4.4.3	Western Europe	94
4.5	Polyolefins Capacity Round-Up	102
4.5.1	North America	102
4.5.2	South America.....	102
4.5.3	Western Europe	102
4.5.4	Central Europe	102
4.5.5	Eastern Europe	102
4.5.6	Middle East.....	102
4.5.7	Africa	102
4.5.8	Asia Pacific.....	102
5	Vinyls.....	103
5.1	Chlor-Alkali, Ethylene Dichloride and Vinyl Chloride Monomer	103
5.1.1	Asia Pacific.....	103
5.1.2	United States.....	103
5.1.3	Western Europe	104
5.2	Polyvinyl Chloride.....	124
5.2.1	Asia Pacific.....	124
5.2.2	United States.....	124
5.2.3	Western Europe	124
5.3	Vinyls Capacity Round-Up	132
5.3.1	North America	132
5.3.2	South America.....	132
5.3.3	Western Europe	132
5.3.4	Central Europe	132
5.3.5	Eastern Europe	132
5.3.6	Middle East.....	132
5.3.7	Africa	132
5.3.8	Asia Pacific.....	132
6	Aromatics.....	133
6.1	Benzene, Toluene and Xylenes	133
6.1.1	Asia Pacific.....	133
6.1.2	United States.....	134
6.1.3	Western Europe	135
6.2	Cyclohexane.....	170
6.2.1	United States.....	170
6.2.2	Western Europe	170
6.3	Caprolactam	175
6.3.1	Asia Pacific.....	175



	6.3.2	United States.....	175
	6.3.3	Western Europe	176
6.4		Aromatics Capacity Round-Up.....	184
	6.4.1	North America	184
	6.4.2	South America.....	184
	6.4.3	Western Europe	184
	6.4.4	Central Europe	184
	6.4.5	Eastern Europe	184
	6.4.6	Middle East.....	184
	6.4.7	Africa	184
	6.4.8	Asia Pacific.....	184
7		Styrenics	185
7.1		Styrene	185
	7.1.1	Asia Pacific.....	185
	7.1.2	United States.....	186
	7.1.3	Western Europe	187
7.2		Polystyrene.....	195
	7.2.1	Asia Pacific.....	195
	7.2.2	United States.....	196
	7.2.3	Western Europe	197
7.3		Styrenics Capacity Round-Up.....	205
	7.3.1	North America	205
	7.3.2	South America.....	205
	7.3.3	Western Europe	205
	7.3.4	Central Europe	205
	7.3.5	Eastern Europe	205
	7.3.6	Middle East.....	205
	7.3.7	Africa	205
	7.3.8	Asia Pacific.....	205
8		Butadiene Derivatives.....	207
8.1		Styrene Butadiene Rubber	207
	8.1.1	Asia Pacific.....	207
	8.1.2	United States.....	208
	8.1.3	Western Europe	209
8.2		Acrylonitrile Butadiene Styrene	217
	8.2.1	Asia Pacific.....	217
	8.2.2	United States.....	218
	8.2.3	Western Europe	219
8.3		Butadiene Rubber	227
	8.3.1	Asia Pacific.....	227
	8.3.2	United States.....	228
	8.3.3	Western Europe	228
8.4		Butadiene and Derivatives Capacity Round-Up.....	236



8.4.1	North America	236
8.4.2	South America.....	236
8.4.3	Western Europe	236
8.4.4	Central Europe	236
8.4.5	Eastern Europe	236
8.4.6	Middle East.....	236
8.4.7	Africa	236
8.4.8	Asia Pacific.....	236
9	Polyester and Intermediates	237
9.1	Mono Ethylene Glycol and Ethylene Oxide.....	237
9.1.1	Asia Pacific.....	237
9.1.2	United States.....	237
9.1.3	Western Europe	238
9.2	<i>para</i> -Xylene (PX).....	249
9.2.1	Asia Pacific.....	249
9.2.2	United States.....	249
9.2.3	Western Europe	250
9.3	Purified Terephthalic Acid (PTA).....	260
9.3.1	Asia Pacific.....	260
9.3.2	United States.....	260
9.3.3	Western Europe	260
9.4	Polyethylene Terephthalate (PET)	268
9.4.1	Asia Pacific.....	268
9.4.2	United States.....	268
9.4.3	Western Europe	268
9.5	Polyester and Intermediates Capacity Round-Up.....	276
9.5.1	North America	276
9.5.2	South America.....	276
9.5.3	Western Europe	276
9.5.4	Central Europe	276
9.5.5	Eastern Europe	276
9.5.6	Middle East.....	276
9.5.7	Africa	276
9.5.8	Asia Pacific.....	276
10	Propylene Derivatives.....	277
10.1	Acrylonitrile.....	277
10.1.1	Asia Pacific.....	277
10.1.2	United States.....	277
10.1.3	Western Europe	278
10.2	Cumene, Phenol and Acetone	286
10.2.1	Asia Pacific.....	286
10.2.2	United States.....	286
10.2.3	Western Europe	287



10.3	Bisphenol-A and Polycarbonate.....	297
10.3.1	Asia Pacific.....	297
10.3.2	United States.....	298
10.3.3	Western Europe	299
10.4	Propylene Oxide.....	320
10.4.1	Asia Pacific.....	320
10.4.2	United States.....	321
10.4.3	Western Europe	322
10.5	Oxo Alcohols: Butanols and 2-Ethylhexanol.....	337
10.5.1	Asia Pacific.....	337
10.5.2	United States.....	337
10.5.3	Western Europe	338
10.6	Propylene Derivatives Capacity Round-Up.....	352
10.6.1	North America	352
10.6.2	South America.....	352
10.6.3	Western Europe	352
10.6.4	Central Europe	352
10.6.5	Eastern Europe	352
10.6.6	Middle East.....	352
10.6.7	Africa	352
10.6.8	Asia Pacific.....	352
11	Isocyanates.....	354
11.1	Methylene Diphenyl Diisocyanate and Toluene Diisocyanate	354
11.1.1	Asia Pacific.....	354
11.1.2	United States.....	355
11.1.3	Western Europe	356
11.2	Isocyanates Capacity Round-Up.....	370
11.2.1	North AmericaThere is no update for polyurethane intermediates in this region.	370
11.2.2	South America.....	370
11.2.3	Western Europe	370
11.2.4	Central Europe	370
11.2.5	Eastern Europe	370
11.2.6	Middle East.....	370
11.2.7	Africa	370
11.2.8	Asia Pacific.....	370
12	Linear Alpha Olefins	371
12.1	On Purpose Linear Alpha Olefins (Butene-1, Hexene-1 and Octene-1).....	371
12.2	Full Range Linear Alpha Olefins	380
13	Methanol and Derivatives.....	382
13.1	Methanol.....	382
13.1.1	Asia Pacific.....	382
13.1.2	United States.....	382



13.1.3	Western Europe	383
13.2	Methyl Tertiary Butyl Ether	392
13.2.1	Asia Pacific	392
13.2.2	United States	392
13.2.3	Western Europe	392
13.3	Methanol Capacity Round-Up	400
13.3.1	North America	400
13.3.2	South America	400
13.3.3	Western Europe	400
13.3.4	Central Europe	400
13.3.5	Eastern Europe	400
13.3.6	Middle East	400
13.3.7	Africa	400
13.3.8	Asia Pacific	400
14	Ammonia and Urea	401
14.1	Ammonia	401
14.1.1	Asia Pacific	401
14.1.2	United States	401
14.1.3	Western Europe	402
14.2	Urea	410
14.2.1	Asia Pacific	410
14.2.2	United States	410
14.2.3	Western Europe	411
14.3	Ammonia and Urea Capacity Round-Up	419
14.3.1	North America	419
14.3.2	South America	419
14.3.3	Western Europe	419
14.3.4	Central Europe	419
14.3.5	Eastern Europe	419
14.3.6	Middle East	419
14.3.7	Africa	419
14.3.8	Asia Pacific	420

Appendices

A	Cost of Production Models	421
----------	--	------------



Figures

Figure 1	United States Cash Margin Index (Petrochemicals and polymers).....	6
Figure 2	United States Cash Margin Index (Base petrochemicals).....	6
Figure 3	United States Cash Margin Index (Intermediates)	6
Figure 4	United States Cash Margin Index (Polymers)	7
Figure 5	United States Average Return on Capital (Petrochemicals and polymers)	7
Figure 6	Western Europe Cash Margin Index (Petrochemicals and polymers)	9
Figure 7	Western Europe Cash Margin Index (Base petrochemicals)	9
Figure 8	Western Europe Cash Margin Index (Intermediates)	9
Figure 9	Western Europe Cash Margin Index (Polymers).....	10
Figure 10	Western Europe Return on Capital (Petrochemicals and Polymers)	10
Figure 11	Crude Oil Price Benchmarks	13
Figure 12	South-East Asia Petrochemical Feedstock Prices	13
Figure 13	North-West Europe Petrochemical Feedstock Prices	13
Figure 14	Singapore Variable Cost Refining Margin	14
Figure 15	United States Gulf Coast Variable Cost Refining Margins	14
Figure 16	Western Europe Variable Cost Refinery Margins.....	14
Figure 17	United States Gulf Coast Petrochemical Feedstock Prices	19
Figure 18	United States Ethane Extraction Margins.....	21
Figure 19	United States Ethane Extraction Cost Price & Margins	21
Figure 20	Ethylene Cost Competitiveness Summary	26
Figure 21	Ethylene Prices.....	26
Figure 22	Asia Ethylene Cash Cost Margins – Steam Crackers	29
Figure 23	China Ethylene Cost Price and Margins (Standard Naphtha Cracker)	29
Figure 24	China Ethylene Cash Cost Margins	30
Figure 25	China Ethylene Return on Investment.....	30
Figure 26	China Ethylene Cost Price and Margins (Methanol to Olefins)	30
Figure 27	United States Gulf Coast Ethylene Prices).....	34
Figure 28	United States Ethane Cracker Cash Cost Margins	34
Figure 29	United States Ethylene Cost, Price and Margin (Ethane Cracker).....	34
Figure 30	United States Ethylene Production Costs by Cracker Feedstock	36
Figure 31	United States Ethylene Profitability By Cracker Feedstock.....	36
Figure 32	Western Europe Naphtha Cracker Cash Cost Margins	39
Figure 33	Western Europe Ethylene Cost, Price and Margins (Standard naphtha cracker)	39
Figure 34	Western Europe Ethylene Prices	39
Figure 35	Western Europe Ethylene Production Costs by Cracker Feedstock.....	41
Figure 36	Western Europe Ethylene Cash Margins by Cracker Feedstock	41
Figure 37	Propylene Cost Competitiveness Summary	45
Figure 38	Propylene Prices	45
Figure 39	Asia Propylene Cash Cost Margins (Propane Dehydrogenation)	48
Figure 40	China Propylene Cost Price and Margins (Propane Dehydrogenation).....	48
Figure 41	China Propylene Cash Cost Margins	49
Figure 42	China Propylene Return on Investment	49



Figure 43	China Propylene Cost Price and Margins (Methanol to Olefins)	49
Figure 44	United States Propylene Prices)	52
Figure 45	United States Propylene Cash Cost Margins (Refinery splitter)	52
Figure 46	United States Propylene Leader Cost Price and Margin (Refinery Splitter)	52
Figure 47	United States Propylene Margins (Propane Dehydrogenation))	53
Figure 48	United States Propylene Leader Cost Price and Margin (Propane Dehydrogenation)	53
Figure 49	Western Europe Propylene Margins (Propane Dehydrogenation)	56
Figure 50	Western Europe Propylene Cost, Price and Margin (Propane Dehydrogenation)	56
Figure 51	Western Europe Propylene Cash Cost Margins (Refinery Splitter)	57
Figure 52	Western Europe Propylene Cost, Price and Margins (Refinery Splitter)	57
Figure 53	Butadiene Cost Competitiveness Summary	61
Figure 54	Butadiene Prices	61
Figure 55	Asia Butadiene Cash Cost Margins	63
Figure 56	China Butadiene Cost Price and Margins	63
Figure 57	United States Butadiene Margins	65
Figure 58	United States Butadiene Cost, Price and Margin	65
Figure 59	Western Europe Butadiene Margins	67
Figure 60	Western Europe Butadiene Cost Price and Margins	67
Figure 61	LDPE Cost Competitiveness Summary	71
Figure 62	LDPE Prices	71
Figure 63	Asia LDPE Variable Cost Margins	73
Figure 64	Asia LDPE Cash Cost Margins	73
Figure 65	China LDPE Cost Price and Margins	73
Figure 66	United States LDPE Variable Cost Margins	75
Figure 67	United States LDPE Cash Cost Margins	75
Figure 68	United States LDPE Cost, Price and Margin	75
Figure 69	Western Europe LDPE Variable Cost Margins	77
Figure 70	Western Europe LDPE Cash Cost Margins	77
Figure 71	Western Europe LDPE Cost, Price and Margins	77
Figure 72	LLDPE Cost Competitiveness Summary	79
Figure 73	LLDPE Prices	79
Figure 74	Asia LLDPE Variable Cost Margins	81
Figure 75	Asia LLDPE Cash Cost Margins	81
Figure 76	China LLDPE Cost Price and Margins	81
Figure 77	United States LLDPE (Butene-1) Variable Cost Margins	83
Figure 78	United States LLDPE (Butene-1) Cash Cost Margins	83
Figure 79	United States LLDPE (Butene-1) Leader Cost, Price and Margins	83
Figure 80	Western Europe LLDPE Variable Cost Margins	85
Figure 81	Western Europe LLDPE Cash Cost Margins	85
Figure 82	Western Europe LLDPE Cost, Price and Margins	85
Figure 83	HDPE Cost Competitiveness Summary	87
Figure 84	HDPE Prices	87
Figure 85	Asia HDPE Variable Cost Margins	89



Figure 86	Asia HDPE Cash Cost Margins	89
Figure 87	China HDPE Cost Price and Margins.....	89
Figure 88	United States HDPE Margins (Injection Moulding) Variable Cost Margins	91
Figure 89	United States HDPE Margins (Injection Moulding) Cash Cost Margins.....	91
Figure 90	United States HDPE (Injection Moulding) Leader Cost Price and Margin	91
Figure 91	Western Europe HDPE Variable Cost Margins	93
Figure 92	Western Europe HDPE Cash Cost Margins.....	93
Figure 93	Western Europe HDPE Cost, Price and Margins	93
Figure 94	Polypropylene Cost Competitiveness Summary	95
Figure 95	Polypropylene Prices	95
Figure 96	Asia Polypropylene Variable Cost Margins	97
Figure 97	Asia Polypropylene Cash Cost Margins	97
Figure 98	China Polypropylene Cost Price and Margins.....	97
Figure 99	United States Polypropylene Variable Cost Margins	99
Figure 100	United States Polypropylene Cash Cost Margins	99
Figure 101	United States Polypropylene Leader Cost, Price and Margin	99
Figure 102	Western Europe Polypropylene Variable Cost Margins	101
Figure 103	Western Europe Polypropylene Cash Cost Margins	101
Figure 104	Western Europe Polypropylene Cost, Price and Margins	101
Figure 105	VCM Cost Competitiveness Summary	105
Figure 106	VCM Prices	105
Figure 107	EDC Prices	105
Figure 108	Asia Ethylene Dichloride Variable Cost Margin.....	107
Figure 109	Asia Ethylene Dichloride Cash Cost Margins.....	107
Figure 110	China Ethylene Dichloride Cost Price and Margins	107
Figure 111	Asia Vinyl Chloride Monomer Variable Cost Margins	110
Figure 112	Asia Vinyl Chloride Monomer Cash Cost Margins	110
Figure 113	China Vinyl Chloride Monomer Cost Price and Margins	111
Figure 114	China Vinyl Chloride Monomer Cost Price and Margins	111
Figure 115	United States Chlor-Alkali Cash Cost Margins.....	113
Figure 116	United States Chlor-Alkali Leader Cost, Price, and Margin	113
Figure 117	United States EDC Variable Cost Margins.....	115
Figure 118	United States EDC Cash Cost Margins.....	115
Figure 119	United States` EDC Leader Cost, Price, and Margin	115
Figure 120	United States Vinyl Chloride Variable Cost Margins	117
Figure 121	United States Vinyl Chloride Cas Cost Margins	117
Figure 122	United States Vinyl Chloride Leader Costs, Price, and Margin	117
Figure 123	Western Europe ECU Cash Cost Margins	119
Figure 124	Western Europe ECU Cost and Margin	119
Figure 125	Western Europe Ethylene Dichloride Variable Cost Margins.....	121
Figure 126	Western Europe Ethylene Dichloride Cash Cost Margins.....	121
Figure 127	Western Europe Ethylene Dichloride Cost, Price and Margin.....	121
Figure 128	Western Europe Vinyl Chloride Monomer Variable Cost Margins	123
Figure 129	Western Europe Vinyl Chloride Monomer Cash Cost Margins	123



Figure 130	Western Europe Vinyl Chloride Monomer Cost, Price and Margins	123
Figure 131	PVC Cost Competitiveness Summary	125
Figure 132	PVC Prices	125
Figure 133	Asia PVC Variable Cost Margins.....	127
Figure 134	Asia PVC Cash Cost Margins.....	127
Figure 135	China PVC Cost Price and Margins	127
Figure 136	United States PVC Pipe-Grade Variable Cost Margins	129
Figure 137	United States PVC Pipe-Grade Cash Cost Margins	129
Figure 138	United States PVC Pipe Grade Leader Cost, Price and Margin	129
Figure 139	Western Europe PVC Variable Cost Margins.....	131
Figure 140	Western Europe PVC Cash Cost Margins	131
Figure 141	Western Europe PVC Cost, Price and Margin	131
Figure 142	Benzene Cost Competitiveness Summary	136
Figure 143	Benzene Prices	136
Figure 144	Mixed Xylenes Cost Competitiveness Summary.....	137
Figure 145	Mixed Xylenes Prices	137
Figure 146	Asia Reformer Cash Cost Margins.....	139
Figure 147	China Reformer Cost, Price and Margin	139
Figure 148	Asia Benzene Cash Cost Margins.....	141
Figure 149	China Benzene Cost, Price and Margin	141
Figure 150	China Mixed Xylenes Cash Margins	144
Figure 151	South-East Asia Mixed Xylenes Cash Margins.....	144
Figure 152	China Mixed Xylenes, Price and Margin (Reformate Extraction)	145
Figure 153	China Mixed Xylenes, Price and Margin (Toluene Disproportionation)	145
Figure 154	United States Toluene Recovery for Chemicals versus Gasoline Blending)	146
Figure 155	United States Aromatics Prices.....	146
Figure 156	United States Reformer Margins	148
Figure 157	United States Reformate Cost, Price and Margin	148
Figure 158	United States Benzene Extraction Margins.....	151
Figure 159	United States Benzene – Toluene Conversion Cash Cost Margins	151
Figure 160	United States Benzene Cost Price and Margins (Toluene dealkylation)	152
Figure 161	United States Benzene Cost, Price and Margin (Toluene disproportionation).....	152
Figure 162	United States Benzene Production Costs	154
Figure 163	United States Mixed Xylenes – Reformate Extraction Cash Cost Margins.....	157
Figure 164	United States Mixed Xylenes – Toluene Conversion Cash Cost Margins	157
Figure 165	United States Mixed Xylenes Cost Price and Margin (Reformate extraction).....	158
Figure 166	United States Mixed Xylenes Cost Price and Margin (Toluene disproportionation)	158
Figure 167	United States Xylenes Production Costs.....	160
Figure 168	Western Europe Aromatics Prices	161
Figure 169	Western Europe Spot Price Differentials to Premium Unleaded Gasoline	161
Figure 170	Western Europe Reformer Cash Cost Margins.....	163
Figure 171	Western Europe Reformer Cost Price & Margins	163
Figure 172	Western Europe Benzene Cash Cost Margins.....	166
Figure 173	Western Europe Benzene Cost Price and Margin (Pygas Extraction)	166



Figure 174	Western Europe Benzene Cost Price and Margin (Toluene hydrodealkylation)	166
Figure 175	Western Europe Mixed Xylenes Cash Cost Margins	169
Figure 176	Western Europe Mixed Xylenes Cost, Price and Margins (Toluene disproportionation)	169
Figure 177	Western Europe Mixed Xylenes Cash Cost Margins (Reformate Extraction)	169
Figure 178	Cyclohexane Prices	170
Figure 179	United States Cyclohexane Margins	172
Figure 180	United States Cyclohexane Leader Cost, Price and Margin	172
Figure 181	Western Europe Cyclohexane Margins	174
Figure 182	Western Europe Cyclohexane Leader Cost Price and Margin	174
Figure 183	Caprolactam Cost Competitiveness Summary	177
Figure 184	Caprolactam Prices	177
Figure 185	China Caprolactam Margins	179
Figure 186	China Caprolactam Cost Price and Margin	179
Figure 187	United States Caprolactam Margins	181
Figure 188	United States Caprolactam Leader Cost, Price, and Margin	181
Figure 189	Western Europe Caprolactam Margins	183
Figure 190	Western Europe Caprolactam Cost Price and Margin	183
Figure 191	Styrene Cost Competitiveness Summary	188
Figure 192	Styrene Prices	188
Figure 193	Asia Styrene Variable Cost Margins	190
Figure 194	Asia Styrene Cash Cost Margins	190
Figure 195	China Styrene Cost, Price and Margin	190
Figure 196	United States Styrene Variable Cost Margins	192
Figure 197	United States Styrene Cash Cost Margins	192
Figure 198	United States Styrene Leader Cost, Price and Margin	192
Figure 199	Western Europe Styrene Variable Cost Margins	194
Figure 200	Western Europe Styrene Cash Cost Margins	194
Figure 201	Western Europe Styrene Cost, Price and Margin	194
Figure 202	Polystyrene Cost Competitiveness Summary	198
Figure 203	Polystyrene Prices	198
Figure 204	Asia Polystyrene Variable Cost Margins	200
Figure 205	Asia Polystyrene Cash Cost Margins	200
Figure 206	China Polystyrene Cost, Price and Margin	200
Figure 207	United States Polystyrene Variable Cost Margins	202
Figure 208	United States Polystyrene Cash Cost Margins	202
Figure 209	United States Polystyrene Margins	202
Figure 210	Western Europe Polystyrene Variable Cost Margins	204
Figure 211	Western Europe Polystyrene Cash Cost Margins	204
Figure 212	Western Europe Polystyrene Cost, Price and Margin	204
Figure 213	Styrene Butadiene Rubber Cost Competitiveness Summary	210
Figure 214	Styrene Butadiene Rubber Prices	210
Figure 215	Asia Styrene Butadiene Rubber Variable Margins	212
Figure 216	Asia Styrene Butadiene Rubber Cash Margins	212



Figure 217	China Styrene Butadiene Rubber Cost, Price and Margin	212
Figure 218	United States Styrene Butadiene Rubber Margins	214
Figure 219	United States Styrene Butadiene Rubber Cost Price and Margin.....	214
Figure 220	Western Europe Styrene Butadiene Rubber Margins	216
Figure 221	Western Europe Styrene Butadiene Rubber Leader Cost Price and Margin.....	216
Figure 222	Acrylonitrile Butadiene Styrene Cost Competitiveness Summary	220
Figure 223	Acrylonitrile Butadiene Styrene Prices	220
Figure 224	Asia Acrylonitrile Butadiene Styrene Variable Margins	222
Figure 225	Asia Acrylonitrile Butadiene Styrene Cash Margins	222
Figure 226	China Acrylonitrile Butadiene Styrene Cost, Price and Margin	222
Figure 227	United States Acrylonitrile Butadiene Styrene Margins.....	224
Figure 228	United States Acrylonitrile Butadiene Styrene Leader Cost Price and Margin	224
Figure 229	Western Europe Acrylonitrile Butadiene Styrene Margins	226
Figure 230	Western Europe Acrylonitrile Butadiene Styrene Leader Cost Price and Margin	226
Figure 231	Butadiene Rubber Cost Competitiveness Summary	229
Figure 232	Butadiene Rubber Prices.....	229
Figure 233	Asia Butadiene Rubber Variable Margins	231
Figure 234	Asia Butadiene Rubber Cash Margins	231
Figure 235	China Butadiene Rubber Cost, Price and Margin	231
Figure 236	United States Butadiene Rubber Margins	233
Figure 237	United States Butadiene Rubber Leader Cost Price and Margin	233
Figure 238	Western Europe Butadiene Rubber Margins.....	235
Figure 239	Western Europe Butadiene Rubber Cost Price and Margin.....	235
Figure 240	Mono Ethylene Glycol Cost Competitiveness Summary	238
Figure 241	Mono Ethylene Glycol Prices.....	238
Figure 242	Asia Mono Ethylene Glycol Variable Cost Margins	241
Figure 243	Asia Mono Ethylene Glycol Cash Cost Margins	241
Figure 244	China Mono Ethylene Glycol Cost, Price and Margin (Ethylene oxidation)	242
Figure 245	China Mono Ethylene Glycol Cost, Price and Margin (From coal via DMO).....	242
Figure 246	United States Mono Ethylene Glycol Variable Cost Margins	244
Figure 247	United States Mono Ethylene Glycol Cash Cost Margins	244
Figure 248	United States Mono Ethylene Glycol Leader Cost, Price and Margin.....	244
Figure 249	Western Europe Ethylene Oxide Variable Cost Margins	246
Figure 250	Western Europe Ethylene Oxide Cash Cost Margins	246
Figure 251	Western Europe Ethylene Oxide Cost Price and Margin	246
Figure 252	Western Europe Ethylene Glycol Variable Cost Margins.....	248
Figure 253	Western Europe Ethylene Glycol Cash Cost Margins.....	248
Figure 254	Western Europe Ethylene Glycol Cost Price and Margin.....	248
Figure 255	<i>para</i> -Xylene Cost Competitiveness Summary.....	251
Figure 256	<i>para</i> -Xylene Prices	251
Figure 257	China <i>para</i> -Xylene Cash Cost Margins	253
Figure 258	South-East Asia <i>para</i> -Xylene Cash Cost Margins.....	253
Figure 259	China <i>para</i> -Xylene Cost, Price and Margin	253
Figure 260	United States <i>para</i> -Xylene Extraction and Isomerisation Margins	255



Figure 261	United States <i>para</i> -Xylene Cash Cost Margins).....	255
Figure 262	United States <i>para</i> -Xylene Return on Investment.....	256
Figure 263	United States <i>para</i> -Xylene Leader Cost, Price and Margin	256
Figure 264	Western Europe <i>para</i> -Xylene Margins	258
Figure 265	Western Europe <i>para</i> -Xylene Cost Price and Margin	258
Figure 266	Western Europe <i>para</i> -Xylene Cash Cost Margins	259
Figure 267	Western Europe <i>para</i> -Xylene Return on Investment	259
Figure 268	PTA Cost Competitiveness Summary	261
Figure 269	PTA Prices.....	261
Figure 270	Asia PTA Variable Cost Margins	263
Figure 271	Asia PTA Cash Cost Margins	263
Figure 272	China PTA Cost, Price and Margin	263
Figure 273	United States PTA Fibre Grade Variable Cost Margins	265
Figure 274	United States PTA Fibre Grade Cash Cost Margins	265
Figure 275	United States PTA Fibre Grade Cost, Price and Margin	265
Figure 276	Western Europe PTA Margins.....	267
Figure 277	Western Europe PTA Cost, Price and Margins	267
Figure 278	PET Cost Competitiveness Summary	269
Figure 279	PET Bottle Grade Prices	269
Figure 280	Asia PET Bottle Grade Variable Cost Margins.....	271
Figure 281	Asia PET Bottle Grade Cash Cost Margins.....	271
Figure 282	China PET Bottle Grade Cost, Price and Margins	271
Figure 283	United States PET Bottle Grade Variable Cost Margins	273
Figure 284	United States PET Bottle Grade Cash Cost Margins	273
Figure 285	United States PET Bottle Grade Leader Cost, Price and Margin.....	273
Figure 286	Western Europe PET Bottle Grade Margins	275
Figure 287	Western Europe PET Bottle Grade Leader Cost, Price and Margin	275
Figure 288	Acrylonitrile Cost Competitiveness Summary	279
Figure 289	Acrylonitrile Prices	279
Figure 290	China Acrylonitrile Margins.....	281
Figure 291	China Acrylonitrile Cost, Price and Margin	281
Figure 292	United States Acrylonitrile Margins	283
Figure 293	United States Acrylonitrile Leader Cost, Price and Margin	283
Figure 294	United States Acrylonitrile Leader Margins (Domestic & export)	283
Figure 295	Western Europe Acrylonitrile Margins	285
Figure 296	Western Europe Acrylonitrile Cost Price and Margin	285
Figure 297	Phenol Cost Competitiveness Summary	288
Figure 298	Phenol Prices	288
Figure 299	Asia Integrated Cumene Phenol Variable Cost Margins	290
Figure 300	Asia Integrated Cumene Phenol Cash Cost Margins.....	290
Figure 301	China Phenol Cost, Price and Margin	290
Figure 302	United States Cumene Cash Cost Margins.....	292
Figure 303	United States Cumene Leader Cost, Price and Margin	292
Figure 304	United States Phenol Variable Cost Margins	294



Figure 305	United States Phenol Cash Cost Margins	294
Figure 306	United States Phenol Cost, Price, and Margin	294
Figure 307	Western Europe Integrated Cumene/Phenol Margins	296
Figure 308	Western Europe Phenol Cost Price and Margin	296
Figure 309	Bisphenol A Cost Competitiveness Summary	300
Figure 310	Bisphenol A Prices	300
Figure 311	Asia Bisphenol A Variable Cost Margins	302
Figure 312	Asia Bisphenol A Cash Cost Margins.....	302
Figure 313	China Bisphenol A Cost Price and Margin	302
Figure 314	United States Bisphenol-A Margins.....	304
Figure 315	United States Bisphenol-A Leader Cost, Price, and Margin	304
Figure 316	Western Europe Bisphenol A Margins	306
Figure 317	Western Europe Bisphenol A Leader Cost Price and Margin	306
Figure 318	Polycarbonate Cost Competitiveness Summary	307
Figure 319	Polycarbonate Prices.....	307
Figure 320	China Polycarbonate Variable Cost Margins.....	310
Figure 321	China Polycarbonate Cash Cost Margins	310
Figure 322	China Polycarbonate Interfacial Cost Price and Margin.....	311
Figure 323	China Polycarbonate Melt Phase Cost Price and Margin	311
Figure 324	United States Polycarbonate Variable Margins.....	314
Figure 325	United States Polycarbonate Cash Margins.....	314
Figure 326	United States Polycarbonate Cost, Price Margin - Interfacial	315
Figure 327	United States Polycarbonate Margins – Melt Phase Non-Phosgene.....	315
Figure 328	Western Europe Polycarbonate Variable Cost Margins.....	318
Figure 329	Western Europe Polycarbonate Cash Cost Margins.....	318
Figure 330	Western Europe Polycarbonate Interfacial Cost Price and Margin	319
Figure 331	Western Europe Polycarbonate Melt Phase Cost Price and Margin	319
Figure 332	Propylene Oxide Cost Competitiveness Summary	323
Figure 333	Propylene Oxide Prices	323
Figure 334	China Propylene Oxide Variable Cost Margins	327
Figure 335	China Propylene Oxide Cash Cost Margins.....	327
Figure 336	China Propylene Oxide Cost Price and Margin (Chlorohydrin).....	328
Figure 337	China Propylene Oxide Cost Price and Margin (Styrene monomer - POSM).....	328
Figure 338	China Propylene Oxide Cost Price and Margin (Hydrogen peroxide - HPPO)	328
Figure 339	United States Propylene Oxide Margins	331
Figure 340	United States Propylene Oxide Cost Price and Margin (Chlorohydrin - CHPO).....	331
Figure 341	United States Propylene Oxide Cost Price and Margin (Styrene monomer - POSM)	331
Figure 342	Western Europe Propylene Oxide Variable Cost Margins	335
Figure 343	Western Europe Propylene Oxide Cash Cost Margins	335
Figure 344	Western Europe Propylene Oxide Cost Price and Margin (Chlorohydrin - CHPO)	336
Figure 345	Western Europe Propylene Oxide Cost Price and Margin (Styrene monomer - POSM)).....	336
Figure 346	Western Europe Propylene Oxide Cost Price and Margin (Hydrogen peroxide - HPPO)	336



Figure 347	Oxo Alcohols Cost Competitiveness Summary	339
Figure 348	<i>n</i> -Butanol Prices	339
Figure 349	2EH Prices.....	339
Figure 350	Asian Butanol Margins.....	341
Figure 351	China, Costs, Price and Margin.....	341
Figure 352	Asian 2-Ethylhexanol Margins	343
Figure 353	China 2-Ethylhexanol Cost, Price and Margin.....	343
Figure 354	United States Butanol Margins	345
Figure 355	United States Butanol Cost, Price and Margin	345
Figure 356	United States 2-Ethylhexanol Margins	347
Figure 357	United States 2-Ethylhexanol Cost, Price and Margin	347
Figure 358	Western Europe Butanol Margins	349
Figure 359	Western Europe Butanol Cost, Price and Margin.....	349
Figure 360	Western Europe 2-Ethylhexanol Margins.....	351
Figure 361	Western Europe 2-Ethylhexanol Cost, Price and Margin	351
Figure 362	Isocyanates Cost Competitiveness Summary	357
Figure 363	MDI Prices	357
Figure 364	TDI Prices	357
Figure 365	China MDI and Intermediates Costs	359
Figure 366	China MDI Margins.....	359
Figure 367	China TDI and Intermediates Costs	361
Figure 368	China TDI Margins.....	361
Figure 369	United States MDI and Intermediates Costs	363
Figure 370	United States MDI Margins.....	363
Figure 371	United States TDI and Intermediates Costs	365
Figure 372	United States TDI Margins	365
Figure 373	Western Europe MDI and Intermediates Costs.....	367
Figure 374	Western Europe MDI Margins	367
Figure 375	Western Europe TDI and Intermediates Costs.....	369
Figure 376	Western Europe TDI Margins	369
Figure 377	Butene-1 Regional Cost Competitiveness Summary	372
Figure 378	Hexene-1 Regional Cost Competitiveness Summary	372
Figure 379	Octene-1 Regional Cost Competitiveness Summary	372
Figure 380	China LAO Prices	373
Figure 381	United States LAO Prices.....	373
Figure 382	Western Europe LAO Prices	373
Figure 383	China LAO Cash Margins.....	375
Figure 384	China LAO Cost, Price and Margins	375
Figure 385	United States LAO Cash Margins	377
Figure 386	United States LAO Cost, Price and Margins	377
Figure 387	Western Europe LAO Cash Margins	379
Figure 388	Western Europe LAO Cost, Price and Margins.....	379
Figure 389	Full Range LAO Cost, Price and Margins	381
Figure 390	Methanol Cost Competitiveness Summary	384



Figure 391	Methanol Prices	384
Figure 392	China Methanol Margins.....	386
Figure 393	China Methanol Cost, Price and Margin.....	386
Figure 394	United States Methanol Margins	388
Figure 395	United States Methanol Cost, Price, and Margin	388
Figure 396	Western Europe Methanol Margins	391
Figure 397	Western Europe Methanol Cost, Price and Margin (Natural Gas Reforming)	391
Figure 398	Western Europe Methanol Cost, Price and Margin (Vacuum Residue)	391
Figure 399	MTBE Cost Competitiveness Summary	393
Figure 400	MTBE Prices.....	393
Figure 401	China MTBE Margins	395
Figure 402	China MTBE Cost, Price and Margin	395
Figure 403	United States MTBE Margins	397
Figure 404	United States MTBE Cost, Price, and Margin	397
Figure 405	Western Europe MTBE Margins.....	399
Figure 406	Western Europe MTBE Cost, Price and Margin.....	399
Figure 407	Ammonia Cost Competitiveness Summary	403
Figure 408	Ammonia Prices	403
Figure 409	China Ammonia Margins	405
Figure 410	China Ammonia Cost, Price and Margin	405
Figure 411	United States Ammonia Margins	407
Figure 412	United States Ammonia Cost, Price, and Margin	407
Figure 413	Western Europe Ammonia Margins	409
Figure 414	Western Europe Ammonia Cost, Price and Margin	409
Figure 415	Urea Cost Competitiveness Summary	412
Figure 416	Urea Prices	412
Figure 417	China Urea Margins.....	414
Figure 418	China Urea Cost, Price and Margin.....	414
Figure 419	United States Urea Margins	416
Figure 420	United States Urea Cost, Price, and Margin	416
Figure 421	Western Europe Urea Margins.....	418
Figure 422	Western Europe Urea Cost, Price and Margin	418

Tables

Table 1	United States Petrochemical Profitability Summary	5
Table 2	Western Europe Petrochemical Profitability Summary	8
Table 3	Monthly Crude Oil Pricing.....	12
Table 4	Singapore Refinery Costs, Revenue and Margins	15
Table 5	United States Gulf Coast Refinery Costs, Revenue, and Margins.....	16
Table 6	Western Europe Refinery Costs, Revenue and Margins	17
Table 7	United States Gulf Coast Petrochemical Feedstock Spot Prices.....	18
Table 8	United States Ethane Recovery Leader Costs, Revenues, and Margins	20
Table 9	China Ethylene Costs, Revenues and Margins.....	27



Table 10	China Ethylene Costs, Revenues and Margins.....	28
Table 11	United States Ethylene Leader Costs, Revenues and Margins (Ethane Cracker).....	31
Table 12	United States Ethylene Leader Costs, Revenues and Margins (Ethane/Propane Mixed Feed Cracker)	32
Table 13	United States Ethylene Leader Costs, Revenues and Margins (Standard Naphtha Cracker).....	33
Table 14	United States Ethylene Production Costs (Cracker Feedstock Competitiveness)	35
Table 15	Western Europe Ethylene Leader Costs, Revenues and Margins Standard Naphtha Cracker	37
Table 16	Western Europe Ethylene Leader Costs, Revenues and Margins Basic Naphtha Cracker (Standard Severity)	38
Table 17	Western Europe Ethylene Costs (Cracker Feedstock Competitiveness).....	40
Table 18	China Propylene Costs, Revenues and Margins	46
Table 19	China Propylene Costs, Revenues and Margins	47
Table 20	United States Polymer Grade Propylene Leader Cost, Revenues, and Margins Refinery Propylene Splitter.....	50
Table 21	United States Polymer Grade Propylene Leader Cost, Revenues, and Margins Propane Dehydrogenation.....	51
Table 22	Western Europe Propylene Costs, Revenue and Margins Propane Dehydrogenation	54
Table 23	Western Europe Propylene Costs, Revenues and Margins Refinery Propylene Splitter.....	55
Table 24	China Butadiene Costs, Revenues and Margins Mixed C4 Extraction	62
Table 25	United States Butadiene Costs, Revenues, and Margins Leader Plants	64
Table 26	Western Europe Butadiene Costs, Revenues and Margins.....	66
Table 27	China LDPE Costs, Revenue and Margins	72
Table 28	United States Low Density Polyethylene Leader Costs, Revenues and Margins.....	74
Table 29	Western Europe Low Density Polyethylene Leader Costs, Revenues and Margins	76
Table 30	China LLDPE Costs, Revenue and Margins	80
Table 31	United States Linear Low Density Leader Polyethylene Costs, Revenues, and Margins Butene-1 Grade	82
Table 32	Western Europe Linear Low Density Polyethylene Leader Costs, Revenues and Margins	84
Table 33	China HDPE Costs, Revenue and Margins.....	88
Table 34	United States High Density Polyethylene Leader Costs Revenues and Margins Injection Moulding Grade.....	90
Table 35	Western Europe High Density Polyethylene Leader Costs, Revenues and Margins.....	92
Table 36	China Polypropylene Costs, Revenue and Margins.....	96
Table 37	United States Polypropylene Leader Costs, Revenue, and Margins	98
Table 38	Western Europe Polypropylene Leader Costs, Revenues and Margins	100
Table 39	China Ethylene Dichloride Costs, Revenues and Margins.....	106
Table 40	China Vinyl Chloride Monomer Costs, Revenues and Margins	108
Table 41	China Vinyl Chloride Monomer Costs, Revenues and Margins	109
Table 42	United States Chlor-Alkali Leader Costs Revenues and Margins.....	112
Table 43	United States Export Ethylene Dichloride Leader Costs, Revenues, and Margins.....	114
Table 44	United States Vinyl Chloride Monomer Leader Costs, Revenues, and Margins.....	116



Table 45	Western Europe Chlor-Alkali Leader Costs.....	118
Table 46	Western Europe Ethylene Dichloride Leader Costs, Revenues and Margins.....	120
Table 47	Western Europe Vinyl Chloride Monomer Leader Costs, Revenues and Margins	122
Table 48	China Polyvinyl Chloride Costs, Revenues and Margins	126
Table 49	United States Polyvinyl Chloride Leader Costs, Revenues, and Margins	128
Table 50	Western Europe Polyvinyl Chloride Leader Costs, Revenues and Margins	130
Table 51	China Reformer Costs, Revenues and Margins.....	138
Table 52	China Benzene Pygas Extraction Costs, Revenues and Margins	140
Table 53	China Mixed Xylenes Costs, Revenues and Margins Reformate Extraction	142
Table 54	China Mixed Xylenes Costs, Revenues and Margins	143
Table 55	United States Reformate Costs, Revenues, and Margins.....	147
Table 56	United States Benzene Costs, Revenues, and Margins Toluene Hydrodealkylation	149
Table 57	United States Benzene Costs, Revenues, and Margins Toluene Disproportionation	150
Table 58	United States Benzene Production Costs	153
Table 59	United States Mixed Xylenes Costs, Revenues and Margins Reformate Extraction	155
Table 60	United States Xylenes Costs, Revenues and Margins Toluene Disproportionation (TDP)	156
Table 61	United States Mixed Xylenes Production Costs	159
Table 62	Western Europe Reformer Leader Costs, Revenues and Margins.....	162
Table 63	Western Europe Benzene Costs, Revenues and Margins Extraction from Pygas	164
Table 64	Western Europe Benzene Costs, Revenues and Margins Toluene Hydrodealkylation	165
Table 65	Western Europe Mixed Xylenes Costs, Revenues and Margins Toluene Disproportionation	167
Table 66	Western Europe Mixed Xylenes Costs, Revenues and Margins Reformate Extraction	168
Table 67	United States Cyclohexane Leader Costs, Revenues, and Margins	171
Table 68	Western Europe Cyclohexane Leader Costs, Revenues and Margins	173
Table 69	China Caprolactam Costs, Revenues and Margins Typical Plants.....	178
Table 70	United States Caprolactam Costs, Revenues, and Margins	180
Table 71	Western Europe Caprolactam Costs, Revenues and Margins.....	182
Table 72	China Styrene Costs, Revenues and Margins	189
Table 73	United States Styrene Leader Costs, Revenues, and Margins.....	191
Table 74	Western Europe Styrene Leader Costs, Revenues and Margins	193
Table 75	China Polystyrene Costs, Revenues and Margins	199
Table 76	United States Polystyrene Leader Costs, Revenues, and Margins	201
Table 77	Western Europe Polystyrene Leader Costs, Revenues and Margins	203
Table 78	China Styrene Butadiene Rubber Costs, Revenues and Margins	211
Table 79	United States Styrene Butadiene Rubber Costs, Revenues and Margins Typical Plants.....	213
Table 80	Western Europe Styrene Butadiene Rubber Costs, Revenues and Margins	215
Table 81	China Acrylonitrile Butadiene Styrene Costs, Revenues and Margins	221
Table 82	United States ABS Costs, Revenues and Margins Leader Plants	223
Table 83	Western Europe Acrylonitrile Butadiene Styrene Costs, Revenues and Margins.....	225
Table 84	Butadiene Rubber Costs, Revenues and Margins – China.....	230



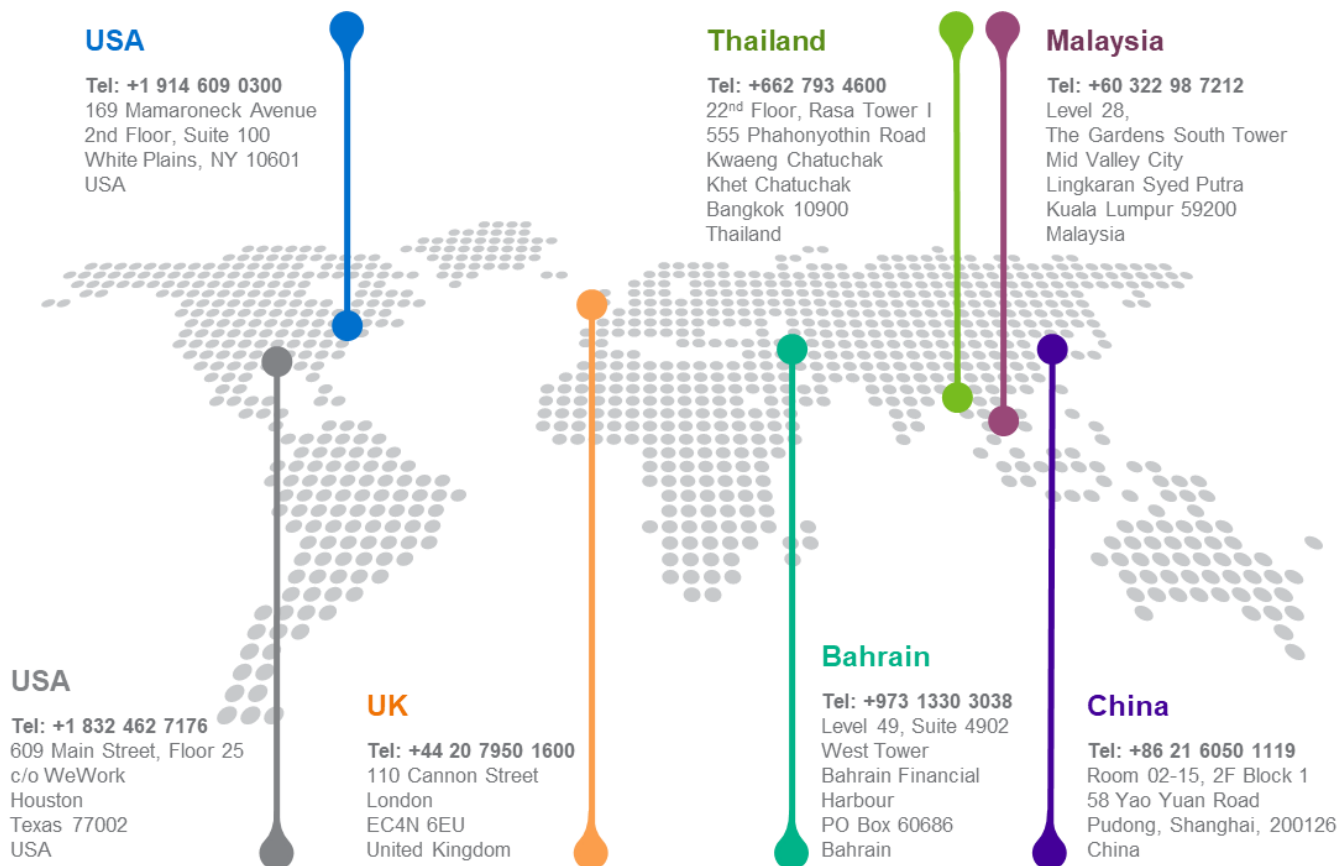
Table 85	United States Butadiene Rubber Costs, Revenues and Margins Leader Plants	232
Table 86	Western Europe Butadiene Rubber Costs, Revenues and Margins Typical Plants	234
Table 87	China Mono Ethylene Glycol Costs, Revenues and Margins Ethylene Oxidation and Hydration	239
Table 88	China Mono Ethylene Glycol Costs, Revenues and Margins From Coal Via DMO	240
Table 89	United States Mono Ethylene Glycol Leader Costs, Revenues, and Margins	243
Table 90	Western Europe Ethylene Oxide Leader Costs, Revenues and Margins	245
Table 91	Western Europe Ethylene Glycol Leader Costs, Revenues and Margins	247
Table 92	China <i>para</i> -Xylene Costs, Revenues and Margins	252
Table 93	United States <i>para</i> -Xylene Leader Costs, Revenues, and Margins	254
Table 94	Western Europe <i>para</i> -Xylene Leader Costs, Revenues and Margins	257
Table 95	China PTA Costs, Revenues and Margins	262
Table 96	United States PTA Leader Costs, Revenues, and Margins	264
Table 97	Western Europe PTA Costs, Revenues and Margins	266
Table 98	China PET Bottle Grade Costs, Revenues and Margins	270
Table 99	United States PET Bottle Grade Leader Costs, Revenues, and Margins	272
Table 100	Western Europe PET Bottle Grade Leader Costs, Revenues and Margins	274
Table 101	China Acrylonitrile Costs, Revenues and Margins	280
Table 102	United States Acrylonitrile Leader Costs, Revenues, and Margins	282
Table 103	Western Europe Acrylonitrile Leader Costs, Revenues and Margins	284
Table 104	China Cumene/Phenol Costs, Revenues and Margins	289
Table 105	United States Cumene Leader Costs, Revenues, and Margins	291
Table 106	United States Phenol Leader Costs, Revenues, and Margins Cumene Oxidation	293
Table 107	Western Europe Cumene/Phenol Leader Costs, Revenues and Margins	295
Table 108	China Bisphenol A Costs, Revenues and Margins	301
Table 109	United States Bisphenol A (BPA) Leader Costs, Revenues, and Margins	303
Table 110	Western Europe Bisphenol A Costs, Revenues and Margins	305
Table 111	China Polycarbonate Costs, Revenues and Margins Interfacial Process	308
Table 112	China Polycarbonate Costs, Revenues and Margins Melt Phase Non Phosgene Process	309
Table 113	United States Polycarbonate Leader Costs, Revenues, and Margins Interfacial	312
Table 114	United States Polycarbonate Leader Costs, Revenues, and Margins Melt Phase Non-Phosgene	313
Table 115	Western Europe Polycarbonate Costs, Revenues and Margins Interfacial	316
Table 116	Western Europe Polycarbonate Phosgene Costs, Revenues and Margins Melt Phase Non-Phosgene	317
Table 117	China Propylene Oxide Costs, Revenues and Margins Chlorohydrin Process	324
Table 118	China Propylene Oxide Costs, Revenues and Margins Styrene (POSM) Process	325
Table 119	China Propylene Oxide Costs, Revenues and Margins Hydrogen Peroxide (HPPO) Process	326
Table 120	United States Propylene Oxide Costs, Revenues and Margins Chlorohydrin (CHPO) Process	329
Table 121	United States Propylene Oxide Costs, Revenues and Margins Styrene (POSM) Process	330
Table 122	Western Europe Propylene Oxide Costs, Revenues and Margins Chlorohydrin (CHPO) Process	332



Table 123	Western Europe Propylene Oxide Costs, Revenues and Margins Styrene (POSM) Process.....	333
Table 124	Western Europe Propylene Oxide Costs, Revenues and Margins Hydrogen Peroxide (HPPO) Process	334
Table 125	China Butanol Costs, Revenues and Margins.....	340
Table 126	China 2-Ethylhexanol Costs, Revenues and Margins	342
Table 127	United States Butanol Costs, Revenues and Margins	344
Table 128	United States 2-Ethylhexanol Costs, Revenues and Margins.....	346
Table 129	Western Europe Butanol Costs, Revenues and Margins.....	348
Table 130	Western Europe 2-Ethylhexanol Costs, Revenues and Margins	350
Table 131	China MDI and Intermediates Costs, Revenues and Margins	358
Table 132	China TDI and Intermediates Costs, Revenues and Margins	360
Table 133	United States MDI and Intermediates Costs, Revenues and Margins	362
Table 134	United States TDI and Intermediates Costs, Revenues and Margins.....	364
Table 135	Western Europe MDI and Intermediates Costs, Revenues and Margins	366
Table 136	Western Europe TDI and Intermediates Costs, Revenues and Margins	368
Table 137	China LAO Cost, Revenues and Margins	374
Table 138	United States LAO Cost, Revenues and Margins	376
Table 139	Western Europe LAO Cost, Revenues and Margins.....	378
Table 140	Full Range LAO Production Costs	380
Table 141	China Methanol Costs, Revenues and Margins	385
Table 142	United States Methanol Costs, Revenues, and Margins Natural Gas Reforming.....	387
Table 143	Western Europe Methanol Costs, Revenues and Margins	389
Table 144	Western Europe Methanol Costs, Revenues and Margins	390
Table 145	China MTBE Costs, Revenues and Margins.....	394
Table 146	United States MTBE Costs, Revenues, and Margins isobutylene ex Steam Cracker Raffinate-1	396
Table 147	Western Europe MTBE Costs, Revenues and Margins	398
Table 148	China Ammonia Costs, Revenues and Margins	404
Table 149	United States Ammonia Costs, Revenues, and Margins Natural Gas Reforming	406
Table 150	Western Europe Ammonia Costs, Revenues and Margins	408
Table 151	China Urea Costs, Revenues and Margins	413
Table 152	United States Urea Costs, Revenues, and Margins Integrated Ammonia	415
Table 153	Western Europe Urea Costs, Revenues and Margins	417



NexantECA partners with clients to help them navigate the big global energy, chemicals and materials issues of tomorrow. We provide independent advice through our consulting, subscriptions and reports, and training businesses using expertise developed in markets, economics and technology through our fifty years of operation. We are entirely dedicated to supporting sustainable development of the industry and provide expert advice with efficiency, speed, and agility.



Disclaimer

This Report was prepared by NexantECA, the Energy and Chemicals Advisory company. Except where specifically stated otherwise in this Report, the information contained here is prepared on the basis of information that is publicly available, and contains no confidential third-party technical information to the best knowledge of NexantECA. Aforesaid information has not been independently verified or otherwise examined to determine its accuracy, completeness or financial feasibility. Neither NexantECA, Client 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. NexantECA does not represent or warrant that any assumed conditions will come to pass.