

MARKETS AND PROFITABILITY

Profitability Forecast: Methanol and Derivatives - 2018

Global

September 2018



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. 2018. All rights reserved.



Contents

1	Executive Summary	1
1.1	Introduction.....	1
2	Economic Assumptions and Forecasting Methodology	2
2.1	Introduction.....	2
2.2	Scenarios	3
2.3	Crude Oil	4
2.3.1	Crude Oil Price Basis	4
2.3.2	Crude Oil Scenarios	4
2.3.3	Low Crude Oil Price	6
2.3.4	Medium Crude Oil Price	6
2.3.5	High Crude Oil Price	7
2.4	Economic Growth	8
2.4.1	Forecasting Methodology/Assumptions	8
2.4.2	Global Economic Growth	8
2.5	Inflation	11
2.6	Exchange Rates	12
2.6.1	Forecasting Methodology and Assumptions	12
2.6.2	Outlook for the Euro	12
2.7	Profitability Forecasting Methodology	13
2.7.1	Introduction.....	13
2.7.2	Price Influences.....	14
2.7.3	Petrochemical Production Costs	16
2.7.4	Driving Forces for Profitability	18
2.7.5	Cyclicality of the Petrochemical Industry	22
3	Petrochemical and Polymer Industry Profitability	24
3.1	Asia Pacific.....	24
3.2	United States.....	26
3.3	Western Europe	28
4	Petrochemical Feedstocks and Refined Products Pricing	30
4.1	Naphtha.....	32
4.2	Gasoline	33
4.3	Fuel Oil	34
4.4	Natural Gas	35
4.5	Ethane	36
4.6	Propane.....	37
4.7	Coal	38
5	Methanol.....	39
5.1	Introduction.....	39
5.1.1	Pricing Basis and Mechanism	39
5.1.2	Regional Price Definitions	39



5.2	Asia Pacific.....	40
5.2.1	Profitability Projections.....	40
5.2.2	Price Projections	42
5.3	United States.....	44
5.3.1	Profitability Projections.....	44
5.3.2	Price Projections	46
5.4	Western Europe	48
5.4.1	Profitability Projections.....	48
5.4.2	Price Projections	50
5.5	Regional Price Spreads	52
6	Methyl Tertiary Butyl Ether (MTBE).....	54
6.1	Introduction.....	54
6.1.1	Pricing Basis and Mechanism	54
6.1.2	Regional Price Definitions	54
6.2	Asia Pacific.....	55
6.2.1	Profitability Projections.....	55
6.2.2	Price Projections	57
6.3	United States.....	59
6.3.1	Profitability Projections.....	59
6.3.2	Price Projections	61
6.4	Western Europe	63
6.4.1	Profitability Projections.....	63
6.4.2	Price Projections	65
6.5	Regional Price Spreads	67
7	Acetic Acid.....	68
7.1	Introduction.....	68
7.1.1	Pricing Basis and Mechanism	68
7.1.2	Regional Price Definitions	68
7.2	Asia Pacific.....	69
7.2.1	Profitability Projections.....	69
7.2.2	Price Projections	71
7.3	United States.....	72
7.3.1	Profitability Projections.....	72
7.3.2	Price Projections	74
7.4	Western Europe	75
7.4.1	Profitability Projections.....	75
7.4.2	Price Projections	77
7.5	Regional Price Spreads	78



Figures

Figure 1	Crude Oil Price Scenarios	5
Figure 2	World Economic Performance and Outlook	9
Figure 3	United State GDP Price Deflator	11
Figure 4	Euro Versus US Dollar	12
Figure 5	Petrochemical SimulatorForecast Methodology	13
Figure 6	Petrochemical Price Influences	15
Figure 7	Production Cost Elements	16
Figure 8	Price Influences in the Cost Curve	18
Figure 9	Return on Capital and Operating Rate	19
Figure 10	Western Europe Average Return on Investment	20
Figure 11	United States Average Return on Investment	20
Figure 12	Return on Capital and Operating Rate	22
Figure 13	Asian Petrochemical Industry Profitability	24
Figure 14	United States Petrochemical Industry Average Return on Investment	26
Figure 15	Western Europe Petrochemicals and Polymers Industry Return on Capital	28
Figure 16	United States Petrochemical Feedstock and Refined Product Prices	31
Figure 17	United States Petrochemical Feedstock Prices Relative to WTI Crude Oil	31
Figure 18	Global Naphtha Prices.....	32
Figure 19	Global Premium Gasoline Prices	33
Figure 20	Global High Sulphur Fuel Oil Prices	34
Figure 21	Global Natural Gas Prices	35
Figure 22	United States Ethane Prices	36
Figure 23	Global Propane Prices.....	37
Figure 24	China Coal Prices	38
Figure 25	Asia Pacific Methanol Margins	41
Figure 26	Asia Pacific Methanol Costs and Margins	42
Figure 27	Asia Pacific Methanol Price Forecast Scenarios.....	43
Figure 28	United States Methanol Margin Projections	45
Figure 29	United States Methanol Costs and Margins	46
Figure 30	United States Methanol Price Forecast Scenarios.....	47
Figure 31	Western Europe Methanol Margin Projections.....	49
Figure 32	Western Europe Methanol Costs and Margins.....	50
Figure 33	Western Europe Methanol Price Forecast Scenarios	51
Figure 34	Global Methanol Prices	52
Figure 35	Asia Pacific MTBE Margins	56
Figure 36	Asia Pacific MTBE Costs and Margins.....	57
Figure 37	Asia Pacific MTBE/Gasoline Price Ratio	57
Figure 38	Asia Pacific MTBE Price Forecast Scenarios.....	58
Figure 39	United States MTBE Margin Projections	60
Figure 40	United States MTBE Costs and Margins	61
Figure 41	United States MTBE/Gasoline Price Ratio	61
Figure 42	United States MTBE Price Forecast Scenarios.....	62



Figure 43	Western Europe MTBE Margins.....	64
Figure 44	Western Europe MTBE Costs and Margins	65
Figure 45	Western Europe MTBE/Gasoline Price Ratio.....	66
Figure 46	Western Europe MTBE Price Forecast Scenarios	66
Figure 47	Global MTBE Prices	67
Figure 48	Asia Pacific Acetic Acid Margins	70
Figure 49	Asia Pacific Acetic Acid Costs and Margins	71
Figure 50	Asia Pacific Acetic Acid Price Forecast Scenarios	71
Figure 51	United States Acetic Acid Margin Projections	73
Figure 52	United States Acetic Acid Costs and Margins	74
Figure 53	United States Acetic Acid Price Forecast Scenarios.....	74
Figure 54	Western Europe Acetic Acid Margins.....	76
Figure 55	Western Europe Acetic Acid Costs and Margins.....	77
Figure 56	Western Europe Acetic Acid Price Forecast Scenarios	77
Figure 57	Global Acetic Acid Methanol Prices	78

Tables

Table 1	Economic Growth	9
Table 2	Asia Pacific Methanol Profitability and Price Projections	41
Table 3	United States Methanol Profitability and Price Projections	45
Table 4	Western Europe Methanol Profitability and Price Projections	49
Table 5	Asia Pacific MTBE Profitability and Price Projections	56
Table 6	United States MTBE Profitability and Price Projections	60
Table 7	Western Europe MTBE Profitability Projections	64
Table 8	Asia Pacific Acetic Acid Profitability and Price Projections	70
Table 9	United States Acetic Acid Profitability and Price Projections	73
Table 10	Western Europe Acetic Acid Profitability Projections	76