

MARKETS AND PROFITABILITY

Profitability Forecast: Ammonia and Urea - 2018

Global

December 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
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	Cyclicalities 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	Ammonia	39
5.1	Introduction.....	39
5.1.1	Pricing Basis and Mechanism	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	51
6	Urea.....	52
6.1	Introduction.....	52
6.1.1	Pricing Basis and Mechanism	52
6.2	Asia Pacific.....	53
6.2.1	Profitability Projections	53
6.2.2	Price Projections	54
6.3	United States	56
6.3.1	Profitability Projections	56
6.3.2	Price Projections	58
6.4	Western Europe	59
6.4.1	Profitability Projections	59
6.4.2	Price Projections	61
6.5	Regional Price Spreads	62

Figures

Figure 1	Crude Oil Price Scenarios	5
Figure 2	World Economic Performance and Outlook	9
Figure 3	United States GDP Price Deflator	11
Figure 4	Euro Versus US Dollar	12
Figure 5	Petrochemical Simulator Forecast 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	Petrochemical Industry Profitability and Operating Rate.....	22
Figure 13	Asian Petrochemical Industry Profitability	24
Figure 14	United States Petrochemical Industry Profitability	26
Figure 15	Western Europe Petrochemicals Industry Profitability	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	China Ammonia Margins	41
Figure 26	China Ammonia Cost, Price and Margin Projections	42
Figure 27	China Ammonia Price Forecast Scenarios.....	43
Figure 28	United States Ammonia Margin Projections.....	45
Figure 29	United States Ammonia Cost, Price and Margin Projections	46
Figure 30	Ammonia Price Forecast Scenarios	47
Figure 31	Western Europe Ammonia Margins	49
Figure 32	Western Europe Ammonia Cost, Price and Margin Projections.....	50
Figure 33	Western Europe Ammonia Price Forecast Scenarios	50
Figure 34	Global Ammonia Price Projections	51
Figure 35	China Urea Margin Projections.....	53
Figure 36	China Urea Cost, Price and Margin Projections	54
Figure 37	China Urea Price Forecast Scenarios	55
Figure 38	United States Urea Cash Margins	56
Figure 39	United States Urea Cost, Price and Margin Projections	58
Figure 40	United States Urea Price Forecast Scenarios.....	58
Figure 41	Western Europe Urea Margins	59
Figure 42	Western Europe Urea Cost, Price and Margin Projections	61
Figure 43	Urea Price Forecast Scenarios.....	61
Figure 44	Global Urea Price Projections	62

Tables

Table 1	World Economic Growth.....	9
Table 2	China Ammonia Cost, Profitability and Price Projections.....	41
Table 3	United States Ammonia Cost Profitability and Price Projections	45
Table 4	Western Europe Cost Profitability and Price Projections	49
Table 5	China Urea Cost, Profitability and Price Projections	53
Table 6	United States Urea Profitability and Price Projections	57
Table 7	Western Europe Urea Profitability Projections	60