



Petroleum and Petrochemical Economics

Petrochemical Profitability Forecast

Western Europe

November 2015



This Report was prepared by Nexant, Inc. ("Nexant") and is part of the NexantThinking™ suite. 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. 2015. All rights reserved.

Contents

Section	Page
1 Executive Summary	1-1
1.1 INTRODUCTION.....	1-1
1.2 PETROCHEMICAL INDUSTRY PROFITABILITY	1-2
1.3 KEY PETROCHEMICAL AND POLYMER ISSUES	1-3
2 Economic Assumptions and Forecasting Methodology	2-1
2.1 INTRODUCTION.....	2-1
2.2 SCENARIOS	2-2
2.3 CRUDE OIL.....	2-3
2.4 ECONOMIC GROWTH	2-6
2.5 INFLATION.....	2-8
2.6 EXCHANGE RATES	2-9
2.7 PROFITABILITY FORECASTING METHODOLOGY	2-10
3 Petrochemical and Polymer Industry Profitability.....	3-1
3.1 PETROCHEMICAL PERFORMANCE	3-1
3.2 INDUSTRY PROFITABILITY	3-5
4 Petrochemical Feedstocks and Refined Products Pricing	4-1
4.1 INTRODUCTION.....	4-1
4.2 NAPHTHA	4-3
4.3 GASOLINE	4-4
4.4 GAS OIL	4-5
4.5 RESIDUAL FUEL OIL	4-6
4.6 LPG	4-7
4.7 NATURAL GAS	4-8
5 Olefins	5-1
5.1 ETHYLENE	5-1
5.2 PROPYLENE	5-13
5.3 BUTADIENE AND MIXED C ₄ S	5-26
6 Polyolefins	6-1
6.1 POLYOLEFINS SUMMARY	6-1
6.2 LOW DENSITY POLYETHYLENE (LDPE).....	6-4
6.3 LINEAR LOW DENSITY POLYETHYLENE (LLDPE).....	6-10
6.4 HIGH DENSITY POLYETHYLENE (HDPE)	6-17
6.5 POLYPROPYLENE (PP)	6-24
7 The Vinyls Chain	7-1
7.1 CHLOR-ALKALI	7-1

7.2	ETHYLENE DICHLORIDE (EDC)	7-6
7.3	VINYL CHLORIDE MONOMER (VCM).....	7-11
7.4	POLYVINYL CHLORIDE (PVC).....	7-17
8	Aromatics	8-1
8.1	INTRODUCTION.....	8-1
8.2	GASOLINE VALUATION FOR AROMATICS	8-2
8.3	REFORMATE AND PYGAS.....	8-5
8.4	BENZENE	8-10
8.5	TOLUENE	8-18
8.6	MIXED XYLENES	8-22
9	Styrenics.....	9-1
9.1	ETHYLBENZENE (EB)	9-1
9.2	STYRENE	9-2
9.3	GENERAL PURPOSE POLYSTYRENE (GPPS)	9-8
9.4	ACRYLONITRILE BUTADIENE STYRENE (ABS)	9-15
9.5	STYRENE BUTADIENE RUBBER (SBR).....	9-19
10	Polyester and Intermediates	10-1
10.1	PARA-XYLENE	10-1
10.2	ORTHO-XYLENE.....	10-11
10.3	MONO-ETHYLENE GLYCOL (MEG).....	10-13
10.4	PURIFIED TEREPHTHALIC ACID (PTA).....	10-20
10.5	POLYETHYLENE TEREPHTHALATE (PET)	10-26
11	Intermediates.....	11-1
11.1	ACRYLONITRILE (ACN).....	11-1
11.2	CUMENE, PHENOL AND ACETONE.....	11-6
11.3	CYCLOHEXANE	11-13
11.4	2-ETHYL HEXANOL (2-EH).....	11-17
11.5	N-BUTANOL AND ISOBUTANOL.....	11-21

Appendix	Page
A Petrochemical Feedstocks and Refined Products Prices	A-1
B Olefins	B-1
C Polyolefins Prices	C-1
D Vinyls Chain Prices	D-1
E Aromatics Prices	E-1
F Styrenics Prices.....	F-1
G Polyester and Intermediates Prices	G-1
H Intermediates Prices.....	H-1