

MARKETS AND PROFITABILITY

Market Insights: Bimodal HDPE

November 2022



This Report was prepared by NexantECA, the Energy and Chemicals Advisory company ("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. 2022. All rights reserved.



Contents

1	Executive Summary	1
2	Introduction	7
2.1	Overview	7
2.2	Bimodal HDPE Properties	8
2.3	Bimodal HDPE Production	10
2.4	Bimodal HDPE Applications	12
2.4.1	Film	12
2.4.2	Pipe	13
2.4.3	Blow Molding	18
2.4.4	Injection Molding	20
2.4.5	Wire and Cable	21
2.4.6	Fiber	21
3	Market Outlook	22
3.1	Global	22
3.1.1	Market Overview	22
3.1.2	Market Drivers	28
3.1.3	Market Constraints	28
3.1.4	Competitive Landscape	29
3.1.5	Supply and Demand Analysis	31
3.1.6	Pricing Analysis and Trends	32
3.1.6.1	Pricing Basis and Mechanism	32
3.1.6.2	Global Trends	33
3.2	Asia Pacific (excluding China)	36
3.2.1	Market Overview	36
3.2.2	Market Drivers	42
3.2.3	Market Constraints	43
3.2.4	Competitive Landscape	43
3.2.5	Supply and Demand Analysis	45
3.2.6	Imports and Exports	45
3.3	China	46
3.3.1	Market Overview	46
3.3.2	Market Drivers	49
3.3.3	Market Constraints	49
3.3.4	Competitive Landscape	49
3.3.5	Supply and Demand Analysis	51
3.3.6	Imports and Exports	51
3.4	North America	52
3.4.1	Market Overview	52
3.4.2	Market Drivers	55
3.4.3	Market Constraints	56
3.4.4	Competitive Landscape	56



3.4.5	Supply and Demand Analysis	58
3.4.6	Imports and Exports	58
3.5	South America	59
3.5.1	Market Overview	59
3.5.2	Market Drivers	61
3.5.3	Market Constraints	61
3.5.4	Competitive Landscape.....	62
3.5.5	Supply and Demand Analysis	62
3.5.6	Imports and Exports	63
3.6	Western Europe	64
3.6.1	Market Overview	64
3.6.2	Market Drivers	67
3.6.3	Market Constraints	67
3.6.4	Competitor Landscape	67
3.6.5	Supply and Demand Analysis	68
3.6.6	Imports and Exports	68
3.7	Central Europe	69
3.7.1	Market Overview	69
3.7.2	Market Drivers	71
3.7.3	Market Constraints	72
3.7.4	Competitive Landscape.....	72
3.7.5	Supply and Demand Analysis	72
3.7.6	Imports and Exports	73
3.8	Eastern Europe	74
3.8.1	Market Overview	74
3.8.2	Market Drivers	76
3.8.3	Market Constraints	76
3.8.4	Competitive Landscape.....	77
3.8.5	Supply and Demand Analysis	78
3.8.6	Imports and Exports	79
3.9	Middle East.....	80
3.9.1	Market Overview	80
3.9.2	Market Drivers	82
3.9.3	Market Constraints	83
3.9.4	Competitive Landscape.....	83
3.9.5	Supply and Demand Analysis	85
3.9.6	Imports and Exports	85
3.10	Africa	86
3.10.1	Market Overview	86
3.10.2	Market Drivers	88
3.10.3	Market Constraints	88
3.10.4	Competitive Landscape.....	89
3.10.5	Supply and Demand Analysis	90
3.10.6	Imports and Exports	90



4	Cost Competitiveness.....	91
4.1	Cost Structure and Assumptions.....	91
4.1.1	Variable Costs	91
4.1.1.1	Feedstock Costs	92
4.1.1.2	Utility Costs	92
4.1.1.3	By-product Credits	93
4.1.2	Direct Fixed Costs	93
4.1.3	Allocated Fixed Costs	94
4.1.4	Other Considerations	94
4.2	Delivered Cost Assumptions	95
4.2.1	Shipping Costs	95
4.2.2	Tariffs	95
4.3	Regional Competitiveness	95
5	Market Summary	97

Figures

Figure 1	Properties of Bimodal Polyethylene	8
Figure 2	Long-Term Performance of Different Pipe Materials.....	14
Figure 3	Properties of PE80 and PE100 Pipe	15
Figure 4	Rapid Crack Propagation (RCP) Performance of Bimodal and Unimodal PE Pipe Materials	16
Figure 5	Comparison of Maximum Operating Pressure Ratings for SDR 11 Pipe.....	16
Figure 6	Sustained Pressure Testing for Bimodal and Unimodal MDPE Pipe Materials	17
Figure 7	ESCR Performance for Bimodal Versus Unimodal	18
Figure 8	Top Load (Nominal Part Weight) Performance	18
Figure 9	Properties of Bimodal and Unimodal Blow Molding Resin	19
Figure 10	Performance Properties for Caps and Closures.....	20
Figure 11	Performance Characteristics for Caps and Closures	21
Figure 12	Global Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	23
Figure 13	Global Bimodal HDPE Demand Forecast by End-Use, 2017-2027	24
Figure 14	Global Bimodal and Unimodal HDPE Demand, 2017-2027	24
Figure 15	Global Bimodal and Unimodal HDPE Demand by Region, 2022-e	26
Figure 16	Global Bimodal HDPE Demand Forecast by Region, 2017-2027	27
Figure 17	Bimodal HDPE Demand Penetration of Total HDPE Market by Region	28
Figure 18	Global Bimodal and Unimodal HDPE Capacity, 2014-2024	29
Figure 19	Global Bimodal-Capable HDPE Capacity by Region	30
Figure 20	Global Bimodal-Capable HDPE Capacity by Owner, 2022-e.....	30
Figure 21	Global HDPE Trade by Region, 2017-2027	31
Figure 22	Global Bimodal Capacity and Demand, 2017-2027	31
Figure 23	Global HDPE Prices	33
Figure 24	Global Black PE100 HDPE Price History	34
Figure 25	Global Black PE100 Pipe Resin Price Forecast	34
Figure 26	Asia Pacific (excl. China) Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	37



Figure 27	Asia Pacific (excl. China) Bimodal HDPE Demand Forecast by End-Use, 2017-2027	38
Figure 28	Asia Pacific (excl. China) Bimodal and Unimodal HDPE Demand, 2017-2027	38
Figure 29	Asia Pacific (excl. China) Bimodal and Unimodal HDPE Demand by Country, 2022-e	40
Figure 30	Asia Pacific Bimodal-Capable HDPE Capacity by Country, 2022e	43
Figure 31	Asia Pacific Bimodal and Unimodal HDPE Capacity, 2017-2027	44
Figure 32	Asia Pacific Bimodal Capacity and Demand, 2017-2027	45
Figure 33	China Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	46
Figure 34	China Bimodal HDPE Demand Forecast by End-Use, 2017-2027	47
Figure 35	China Bimodal and Unimodal HDPE Demand, 2017-2027	47
Figure 36	China Bimodal and Unimodal HDPE Capacity, 2017-2027	51
Figure 37	China Bimodal Capacity and Demand, 2017-2027	51
Figure 38	North America Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	52
Figure 39	North America Bimodal HDPE Demand Forecast by End-Use, 2017-2027	53
Figure 40	North America Bimodal and Unimodal HDPE Demand, 2017-2027	53
Figure 41	North America Bimodal and Unimodal HDPE Capacity, 2017-2027	57
Figure 42	North America Bimodal Capacity and Demand, 2017-2027	58
Figure 43	South America Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	59
Figure 44	South America Bimodal HDPE Demand Forecast by End-Use, 2017-2027	60
Figure 45	South America Bimodal and Unimodal HDPE Demand, 2017-2027	60
Figure 46	South America Bimodal and Unimodal HDPE Capacity, 2017-2027	62
Figure 47	South America Bimodal Capacity and Demand, 2017-2027	62
Figure 48	Western Europe Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	64
Figure 49	Western Europe Bimodal HDPE Demand Forecast by End-use, 2017-2027	65
Figure 50	Western Europe Bimodal and Unimodal HDPE Demand, 2017-2027	65
Figure 51	Western Europe Bimodal and Unimodal HDPE Capacity, 2017-2027	67
Figure 52	Western Europe Bimodal Capacity and Demand, 2017-2027	68
Figure 53	Central Europe Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	69
Figure 54	Central Europe Bimodal HDPE Demand Forecast by End-Use, 2017-2027	70
Figure 55	Central Europe Bimodal and Unimodal HDPE Demand, 2017-2027	70
Figure 56	Central Europe Bimodal and Unimodal HDPE Capacity, 2017-2027	72
Figure 57	Central Europe Bimodal Capacity and Demand, 2017-2027	73
Figure 58	Eastern Europe Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	74
Figure 59	Eastern Europe Bimodal HDPE Demand Forecast by End-Use, 2017-2027	75
Figure 60	Eastern Europe Bimodal and Unimodal HDPE Demand, 2017-2027	75
Figure 61	Eastern Europe Bimodal and Unimodal HDPE Capacity, 2017-2027	78
Figure 62	Eastern Europe Bimodal Capacity and Demand, 2017-2027	78
Figure 63	Middle East Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	80
Figure 64	Middle East Bimodal HDPE Demand Forecast by End-Use, 2017-2027	81
Figure 65	Middle East Bimodal and Unimodal HDPE Demand, 2017-2027	81
Figure 66	Middle East Bimodal and Unimodal HDPE Capacity, 2017-2027	84
Figure 67	Middle East Bimodal Capacity and Demand, 2017-2027	85
Figure 68	Africa Bimodal and Unimodal HDPE Demand by End-Use, 2022-e	86



Figure 69	Africa Bimodal HDPE Demand Forecast by End-Use, 2017-2027	87
Figure 70	Africa Bimodal and Unimodal HDPE Demand, 2017-2027	87
Figure 71	Africa Bimodal and Unimodal HDPE Capacity, 2017-2027	89
Figure 72	Africa Bimodal Capacity and Demand, 2017-2027	90
Figure 73	Components of Delivered Cost to Market	91
Figure 74	Bimodal HDPE Delivered Cost to China (Cash Cost Ethylene)	96
Figure 75	Porter's Five Forces	97

Tables

Table 1	Commercial Specifications for HDPE Film Resin	12
Table 2	ISO Standard Classification of Pipes	13
Table 3	Global HDPE Demand by End-Use	25
Table 4	Global HDPE Demand by Region	27
Table 5	Asia Pacific (excl. China) HDPE Demand by End-Use	39
Table 6	China HDPE Demand by End-Use	48
Table 7	North America HDPE Demand by End-Use	55
Table 8	South America HDPE Demand by End-Use	61
Table 9	Western Europe HDPE Demand by End-Use	66
Table 10	Central Europe HDPE Demand by End-Use	71
Table 11	Eastern Europe HDPE Demand by End-Use	76
Table 12	Middle East HDPE Demand by End-Use	82
Table 13	Africa HDPE Demand by End-Use	88
Table 14	Feedstock Price Assumptions	92
Table 15	Utility Rates	92
Table 16	Wage Assumptions	93
Table 17	Capital Cost Location Factors	94
Table 18	Freight Costs, Delivered to China	95
Table 19	Tariffs Due on Imports into China	95