

# NexantThinking™

## Petroleum and Petrochemical Economics

### Market Dynamics

Refined Products

December 2017



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. 2017. All rights reserved.

# Contents

---

Section	Page
1 Executive Summary .....	1-1
1.1 INTRODUCTION.....	1-1
1.2 GLOBAL MARKET OVERVIEW .....	1-2
1.3 REGIONAL MARKET OVERVIEW .....	1-6
1.3.1 North America .....	1-6
1.3.2 South America.....	1-8
1.3.3 Western Europe .....	1-10
1.3.4 Central & Eastern Europe .....	1-12
1.3.5 Middle East.....	1-14
1.3.6 Africa .....	1-16
1.3.7 Asia Pacific.....	1-18
2 Introduction.....	2-1
2.1 THE REFINING INDUSTRY .....	2-1
2.2 REFINED PRODUCT MARKET DRIVERS .....	2-2
2.2.1 Background .....	2-2
2.2.2 Summary.....	2-2
3 Global Market Overview .....	3-1
3.3 ELECTRIC VEHICLE MARKET OVERVIEW .....	3-6
3.3.1 Introduction.....	3-6
3.3.2 Electric Vehicle Types.....	3-6
3.3.3 Electric Vehicle Market Development .....	3-7
3.3.4 Electric Vehicle Market Drivers .....	3-9
3.3.5 Assumptions and Outlook .....	3-10
3.4 BUNKER FUEL REGULATIONS .....	3-13
3.4.1 Introduction.....	3-13
3.4.2 Summary.....	3-13
4 North America .....	4-1
4.1 REGIONAL MARKET OVERVIEW .....	4-1
4.1.1 Demand.....	4-1
4.1.2 Current and Planned Refining Capacity.....	4-4
4.1.3 Supply .....	4-6
4.1.4 Net Trade .....	4-8

4.2	UNITED STATES .....	4-10
4.2.1	Demand .....	4-10
4.2.2	Current and Planned Refining Capacity .....	4-13
4.2.3	Supply .....	4-14
4.2.4	Net Trade .....	4-15
5	South America .....	5-1
5.1	REGIONAL MARKET OVERVIEW .....	5-1
5.1.1	Demand .....	5-1
5.1.2	Current and Planned Refining Capacity .....	5-4
5.1.3	Supply .....	5-7
5.1.4	Net Trade .....	5-8
5.2	BRAZIL .....	5-10
5.2.1	Demand .....	5-10
5.2.2	Current and Planned Refinery Capacity .....	5-11
5.2.3	Supply .....	5-12
5.2.4	Net Trade .....	5-13
6	Western Europe .....	6-1
6.1	REGIONAL MARKET OVERVIEW .....	6-1
6.1.1	Demand .....	6-1
6.1.2	Current and Planned Refining Capacity .....	6-4
6.1.3	Supply .....	6-6
6.1.4	Net Trade .....	6-7
7	Central and Eastern Europe .....	7-1
7.1	REGIONAL MARKET OVERVIEW .....	7-1
7.2	RUSSIA .....	7-10
7.2.1	Demand .....	7-10
7.2.2	Current and Planned Refining Capacity .....	7-12
7.2.3	Supply .....	7-14
7.2.4	Net Trade .....	7-15
8	Middle East .....	8-1
8.1	REGIONAL MARKET OVERVIEW .....	8-1
8.2	SAUDI ARABIA .....	8-11
8.2.1	Demand .....	8-11
8.2.2	Current and Planned Refining Capacity .....	8-14
8.2.3	Supply .....	8-14
8.2.4	Net Trade .....	8-15

8.3	IRAN .....	8-17
8.3.1	Demand .....	8-17
8.3.2	Current and Planned Refining Capacity .....	8-19
8.3.3	Supply .....	8-20
8.3.4	Net Trade .....	8-21
9	Africa .....	9-1
9.1	REGIONAL MARKET OVERVIEW .....	9-1
10	Asia Pacific .....	10-1
10.1	REGIONAL MARKET OVERVIEW .....	10-1
10.1.1	Demand .....	10-1
10.1.2	Current and Planned Refining Capacity .....	10-7
10.1.3	Supply .....	10-10
10.1.4	Net Trade .....	10-12
10.2	CHINA .....	10-14
10.2.1	Demand .....	10-14
10.2.2	Current and Planned Refining Capacity .....	10-17
10.2.3	Supply .....	10-19
10.2.4	Net Trade .....	10-21
10.3	INDIA .....	10-23
10.3.1	Demand .....	10-23
10.3.2	Current and Planned Refining Capacity .....	10-25
10.3.3	Supply .....	10-26
10.3.4	Net Trade .....	10-27

<b>Figure</b>		<b>Page</b>
1.1	Global Refined Product Demand by Region .....	1-2
1.2	Global Refining Capacity, Throughput & Operating Rate .....	1-3
1.3	Global Net Trade in Refined Products .....	1-5
1.4	North American Refined Product Net Trade .....	1-7
1.5	United States Refined Product Net Trade .....	1-7
1.6	South American Refined Product Net Trade .....	1-9
1.7	Brazil Refined Product Net Trade .....	1-9
1.8	Western Europe Refined Product Net Trade .....	1-11
1.9	Central & Eastern Europe Refined Product Net Trade .....	1-13
1.10	Russia Refined Product Net Trade .....	1-13
1.11	Middle East Refined Product Net Trade .....	1-14

1.12	Saudi Arabia Refined Product Net Trade.....	1-15
1.13	Iran Refined Product Net Trade .....	1-15
1.14	Africa Refined Product Net Trade .....	1-17
1.15	Asia Refined Product Net Trade .....	1-19
1.16	China Refined Product Net Trade .....	1-19
1.17	India Refined Product Net Trade.....	1-20
2.1	GDP Growth Forecast.....	2-4
3.1	Global Refined Product Demand by Region .....	3-2
3.2	Incremental Global Oil Product Demand, 2017-2035 .....	3-3
3.3	Electric Vehicles by Type .....	3-7
3.4	Electric Vehicles by Region.....	3-8
3.5	Electric Vehicles by Region.....	3-9
3.6	Vehicle Fleet by Region .....	3-10
3.7	Electric Vehicle Growth by Region.....	3-11
3.8	Electric Vehicle Growth by Region.....	3-11
3.9	Global Bunker Fuel Demand by Region, 2000-2035 .....	3-14
3.10	Global Bunker Fuel Demand by Fuel Type, 2000-2035.....	3-16
3.11	Global Bunker Fuel Demand by Fuel Type, 2000-2035.....	3-16
3.12	Current and Projected Global Refining Capacity .....	3-18
3.13	Global Refining Capacity, Throughput & Operating Rate .....	3-19
3.14	Global Net Refinery Capacity Additions .....	3-19
3.15	Refinery Utilisation by Region .....	3-21
3.16	Global Net Trade in Refined Products .....	3-24
3.17	Global Net Trade in LPG .....	3-25
3.18	Global Net Trade in Naphtha .....	3-25
3.19	Global Net Trade in Gasoline.....	3-26
3.20	Global Net Trade in Kerosene/Jet Fuel.....	3-26
3.21	Global Net Trade in Diesel/Gas Oil .....	3-27
3.22	Global Net Trade in Residual Fuel Oil.....	3-27
3.23	Maximum Sulphur Limits in Gasoline Worldwide, 2017.....	3-30
3.24	Maximum Sulphur Limits in On-Road Diesel Worldwide, 2017 .....	3-32
4.1	North America Refined Product Demand by Product .....	4-3
4.2	North America Refined Product Demand Growth Rates as Compared to GDP .....	4-4
4.3	North America Refined Product Demand.....	4-4
4.4	North America Refining Capacity, Throughput & Operating Rate .....	4-6
4.5	North America Net Refinery Capacity Additions .....	4-6

4.6	North American Refined Product Net Trade .....	4-9
4.7	United States Refined Product Demand by Product .....	4-12
4.8	United States Refined Product Demand .....	4-13
4.9	United States Refined Product Net Trade .....	4-16
5.1	South America Refined Product Demand by Product .....	5-3
5.2	South America Refined Product Demand Growth Rates as Compared to GDP .....	5-3
5.3	South America Refined Product Demand .....	5-4
5.4	South America Refining Capacity, Throughput & Operating Rate .....	5-6
5.5	South America Net Refinery Capacity Additions .....	5-6
5.6	South American Refined Product Net Trade .....	5-9
5.7	Brazil Refined Product Demand by Product .....	5-11
5.8	Brazil Refined Product Demand .....	5-11
5.9	Brazil Refined Product Net Trade .....	5-14
6.1	Western Europe Refined Product Demand by Product .....	6-3
6.2	Western Europe Refined Product Demand Growth Rates as Compared to GDP .....	6-3
6.3	Western Europe Refined Product Demand .....	6-4
6.4	Western Europe Refining Capacity, Throughput & Operating Rate .....	6-5
6.5	Western Europe Net Refinery Capacity Additions .....	6-6
6.6	Western Europe Refined Product Net Trade .....	6-8
7.1	Central & Eastern Europe Refined Product Demand by Product .....	7-3
7.2	Central & Eastern Europe Refined Product Demand Growth Rates as Compared to GDP .....	7-4
7.3	Central & Eastern Europe Refined Product Demand .....	7-4
7.4	Central & Eastern Europe Refining Capacity, Throughput & Operating Rate .....	7-6
7.5	Central & Eastern Europe Net Refinery Capacity Additions .....	7-7
7.6	Central & Eastern Europe Refined Product Net Trade .....	7-9
7.7	Russia Refined Product Demand by Product .....	7-11
7.8	Russia Refined Product Demand .....	7-12
7.9	Russia Refined Product Net Trade .....	7-16
8.1	Middle East Refined Product Demand by Product .....	8-4
8.2	Middle East Refined Product Demand Growth Rates as Compared to GDP .....	8-4
8.3	Middle East Refined Product Demand .....	8-5
8.4	Middle East Refining Capacity, Throughput & Operating Rate .....	8-7
8.5	Middle East Net Refinery Capacity Additions .....	8-8
8.6	Middle East Refined Product Net Trade .....	8-10
8.7	Saudi Arabia Refined Product Demand by Product .....	8-13
8.8	Saudi Arabia Refined Product Demand .....	8-13

8.9	Saudi Arabia Refined Product Net Trade.....	8-16
8.10	Iran Refined Product Demand by Product .....	8-19
8.11	Iran Refined Product Demand.....	8-19
8.12	Iran Refined Product Net Trade .....	8-22
9.1	Africa Refined Product Demand by Product .....	9-2
9.2	Africa Refined Product Demand Growth Rates as Compared to GDP .....	9-3
9.3	Africa Refined Product Demand.....	9-3
9.4	Africa Refining Capacity, Throughput & Operating Rate .....	9-5
9.5	Africa Net Refinery Capacity Additions .....	9-6
9.6	Africa Refined Product Net Trade .....	9-8
10.1	Asia Refined Product Demand by Product .....	10-6
10.2	Asia Refined Product Demand Growth Rates as Compared to GDP .....	10-6
10.3	Asia Refined Product Demand.....	10-7
10.4	Asia Refining Capacity, Throughput & Operating Rate.....	10-8
10.5	Asia Net Refinery Capacity Additions .....	10-8
10.6	Asia Refined Product Net Trade .....	10-12
10.7	China Refined Product Demand by Product .....	10-15
10.8	China Refined Product Demand .....	10-15
10.9	China Refined Product Net Trade .....	10-22
10.10	India Refined Product Demand by Product.....	10-24
10.11	India Refined Product Demand .....	10-25
10.12	India Refined Product Net Trade.....	10-28

<b>Table</b>	<b>Page</b>	
1.1	Global Refined Product Demand by Product .....	1-2
1.2	Global Refined Product Supply & Demand by Region.....	1-4
2.1	Key Drivers for Refined Product Growth .....	2-3
3.1	Global Refined Product Demand by Product .....	3-2
3.2	Global Bunker Fuel Demand by Region, 2000-2035 .....	3-13
3.3	Global Refined Product Supply & Demand by Region.....	3-22
3.4	Principal Product Quality Parameters .....	3-29
3.5	Maximum Sulphur Content of Marine Bunker Fuel .....	3-33
3.6	MARPOL Options – Shipping Industry.....	3-34
3.7	MARPOL Options – Refining Industry.....	3-34
4.1	North America – Supply, Demand & Trade.....	4-8
4.2	United States – Supply, Demand & Trade .....	4-15

5.1	South America – Supply, Demand & Trade .....	5-8
5.2	Brazil – Supply, Demand & Trade.....	5-13
6.1	Western Europe – Supply, Demand & Trade.....	6-7
7.1	Central & Eastern Europe – Supply, Demand & Trade.....	7-8
7.2	Russia – Supply, Demand & Trade.....	7-14
8.1	Middle East – Supply, Demand & Trade.....	8-9
8.2	Saudi Arabia – Supply, Demand & Trade .....	8-15
8.3	Iran – Supply, Demand & Trade.....	8-21
9.1	Africa – Supply, Demand & Trade.....	9-7
10.1	Asia – Supply, Demand & Trade.....	10-11
10.2	China – Supply, Demand & Trade .....	10-20
10.3	India – Supply, Demand & Trade .....	10-27