



Petroleum and Petrochemical Economics

Petroleum Profitability Forecast

Asia Pacific

November 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	SCENARIOS	1-4
1.3	REFINING MARGINS	1-5
1.4	PRICE PROJECTIONS.....	1-8
1.5	KEY PETROLEUM PRODUCT PRICE ISSUES	1-9
1.5.1	Gasoline	1-9
1.5.2	Naphtha.....	1-10
1.5.3	Diesel/Gas Oil	1-11
1.5.4	Fuel Oils	1-12
2	Forecast Methodology.....	2-1
2.1	INTRODUCTION.....	2-1
2.2	ASSUMPTIONS	2-2
2.2.1	Scenarios	2-2
2.2.2	Price Basis	2-5
2.3	PRICE SETTING MECHANISMS	2-6
2.3.1	Refining Configurations.....	2-6
2.3.2	Refining Industry Margin Drivers.....	2-11
2.3.3	Pricing Relationships.....	2-11
3	Crude Oil	3-1
3.1	CRUDE OIL SCENARIOS	3-1
3.2	REGIONAL CRUDE OILS.....	3-4
4	Oil Refinery Margins.....	4-1
4.1	HISTORIC OIL REFINERY PROFITABILITY	4-1
4.2	GLOBAL OIL REFINING MARGINS	4-5
4.2.1	Global Trends.....	4-5
4.2.2	Western Europe	4-9
4.2.3	United States	4-10
4.3	ASIAN REFINERY MARGIN PROJECTIONS	4-11
5	Price Projections	5-1
5.1	REFINED PRODUCT PRICES	5-1
5.1.1	Gasoline	5-3

5.1.2	Naphtha.....	5-7
5.1.3	Diesel/Gas Oil	5-11
5.1.4	Kerosene/Jet Fuel	5-15
5.1.5	Fuel Oils	5-19
5.2	NATURAL GAS LIQUIDS (NGLs) AND LIQUEFIED PETROLEUM GAS (LPG)	5-23
5.2.1	Background	5-23
5.2.2	Global LPG Trading Centres.....	5-23
5.2.3	Asian Pricing	5-27
5.2.4	Propane.....	5-27
5.2.5	Butane	5-31

Appendix	Page
-----------------	-------------

A	Petroleum & Petrochemical Feedstock Prices	A-1
---	--	-----

Figure	Page
---------------	-------------

1.1	Crude Oil Price Scenarios.....	1-4
1.2	Refining Margin Forecasts – Medium Oil Scenario.....	1-6
1.3	Singapore Refined Product Price Projections – Medium Oil Scenario	1-8
1.4	USGC and Singapore Premium Gasoline Prices – Medium Oil Scenario	1-9
1.5	Premium Gasoline and Naphtha Prices – Medium Oil Scenario	1-10
1.6	Premium Gasoline & Diesel/Gas Oil Prices – Medium Oil Scenario	1-11
1.7	Singapore Upgrading Incentive High Sulphur Fuel Oil & Gas Oil – Medium Oil Scenario	1-12
2.1	Simplified Flow Diagram of a Typical Complex Refinery	2-9
2.2	Typical Refinery Yields.....	2-10
2.3	Singapore Refined Product Prices and Dubai Crude Oil Price	2-12
3.1	Crude Oil Price Scenarios	3-3
4.1	Singapore Cash Cost Refining Margins	4-1
4.2	Upgrading Margins – Singapore	4-3
4.3	Global Refining Margin Comparison – Medium Oil Scenario.....	4-5
4.4	Annual Changes in Global Refining Capacity and Oil Demand.....	4-6
4.5	Singapore Cash Cost Refining Margins – Medium Oil Scenario	4-11
4.6	Topping/Visbreaking Margin - Singapore – Medium Oil Scenario	4-12
4.7	Asian Refined Product Price Difference to Crude Oil – Medium Oil Scenario.....	4-14
5.1	Asian Refined Product Price Projections – Medium Oil Scenario.....	5-1
5.2	USGC & Singapore Premium Gasoline Prices – Medium Oil Scenario.....	5-5

5.3	Global Premium Gasoline Prices – Medium Oil Scenario.....	5-5
5.4	Singapore Premium Gasoline Price Scenarios.....	5-7
5.5	Premium Gasoline and Naphtha Prices – Medium Oil Scenario	5-8
5.6	Global Naphtha Prices – Medium Oil Scenario.....	5-10
5.7	Singapore Naphtha Price Scenarios	5-11
5.8	Premium Gasoline & Diesel/Gas Oil Prices – Medium Oil Scenario	5-12
5.9	Global Gas Oil Prices – Medium Oil Scenario	5-14
5.10	Asian Gas Oil Price Scenarios	5-14
5.11	Kerosene and Gas Oil Prices – Medium Oil Scenario	5-16
5.12	Singapore Product Price Differentials – Medium Oil Scenario	5-18
5.13	Global Kerosene Prices – Medium Oil Scenario	5-18
5.14	Singapore Kerosene Price Scenarios	5-19
5.15	Singapore High Sulphur Fuel Oil and Gas Oil Prices – Medium Oil Scenario.....	5-20
5.16	Global Fuel Oil Prices – Medium Oil Scenario.....	5-21
5.17	Singapore Fuel Oil Price Scenarios	5-22
5.18	Propane Price Influences – Medium Oil Scenario	5-28
5.19	Relative Value of Propane – Medium Oil Scenario	5-29
5.20	Global Propane Prices – Medium Oil Scenario.....	5-30
5.21	Asian Propane Price Scenarios	5-31
5.22	Butane Pricing Trends – Medium Oil Scenario	5-32
5.23	Global Butane Prices – Medium Oil Scenario.....	5-33
5.24	Singapore Butane Price Scenarios	5-34

Table	Page
3.1 Crude Oil Price Scenarios	3-5
5.1 Asian Refined Product Price Projections – Medium Oil Scenario.....	5-2