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# 2024 CRUDE AND REFINED PRODUCTS OUTLOOK



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**Crude and Refined Products Outlook  
September 2024  
Demand Outlook  
Appendix 1**



**Appendix 1 - Table 1  
Petroleum Products Demand Outlook  
United States**

<b>Thousands of Barrels per Day</b>	Actual <sup>1</sup>						Forecast																			
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																										
Other Gasoline / Naphtha <sup>2</sup>																										
Total Light Distillates																										
Distillate Fuel Oil																										
Jet Fuel/Kerosene																										
Other Diesel/Gasoil																										
Total Middle Distillates																										
Residual Fuels <sup>3</sup>																										
Ethane and LPGs																										
Other <sup>4</sup>																										
Total Petroleum Products																										
<b>Average Annual Growth Rates</b>																										
Motor Gasoline																										
Other Gasoline / Naphtha <sup>2</sup>																										
Total Light Distillates																										
Distillate Fuel Oil																										
Jet Fuel/Kerosene																										
Other Diesel/Gasoil																										
Total Middle Distillates																										
Residual Fuels <sup>3</sup>																										
Ethane and LPGs																										
Other <sup>4</sup>																										
Total Petroleum Products																										

(1) Historical data from US DOE/EIA.

(2) Naphtha feedstock and aviation gasoline.

(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.

(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 1-1  
Petroleum Products Demand Outlook  
PADD 1**

<b>Thousands of Barrels per Day</b>	Actual <sup>1</sup>						Forecast																			
	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																										
Other Gasoline / Naphtha <sup>2</sup>																										
Total Gasoline / Naphtha																										
Distillate Fuel Oil																										
Jet Fuel/Kerosene																										
Other Diesel/Gasoil																										
Total Middle Distillates																										
Residual Fuels <sup>3</sup>																										
Ethane and LPGs																										
Other <sup>4</sup>																										
Total Petroleum Products																										
<b>Average Annual Growth Rates</b>																										
Gasolines																										
Middle Distillates																										
Residual Fuels <sup>3</sup>																										
Ethane and LPGs																										
Other <sup>4</sup>																										
Total Petroleum Products																										

(1) Historical data from US DOE/EIA.  
(2) Naphtha feedstock and aviation gasoline.  
(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.  
(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 1-2  
Petroleum Products Demand Outlook  
PADD 2**

<b>Thousands of Barrels per Day</b>	<u>Actual<sup>1</sup></u>						<u>Forecast</u>																		
	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>	<u>2029</u>	<u>2030</u>	<u>2031</u>	<u>2032</u>	<u>2033</u>	<u>2034</u>	<u>2035</u>	<u>2036</u>	<u>2037</u>	<u>2038</u>	<u>2039</u>	<u>2040</u>	
Motor Gasoline																									
<u>Other Gasoline / Naphtha<sup>2</sup></u>																									
Total Gasoline / Naphtha																									
Distillate Fuel Oil																									
Jet Fuel/Kerosene																									
<u>Other Diesel/Gasoil</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other<sup>4</sup></u>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Gasolines																									
Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
Other <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from US DOE/EIA.  
(2) Naphtha feedstock and aviation gasoline.  
(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.  
(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 1-3  
Petroleum Products Demand Outlook  
PADD 3**

<b>Thousands of Barrels per Day</b>	<u>Actual<sup>1</sup></u>						<u>Forecast</u>																		
	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>	<u>2029</u>	<u>2030</u>	<u>2031</u>	<u>2032</u>	<u>2033</u>	<u>2034</u>	<u>2035</u>	<u>2036</u>	<u>2037</u>	<u>2038</u>	<u>2039</u>	<u>2040</u>	
Motor Gasoline																									
<u>Other Gasoline / Naphtha<sup>2</sup></u>																									
Total Gasoline / Naphtha																									
Distillate Fuel Oil																									
Jet Fuel/Kerosene																									
<u>Other Diesel/Gasoil</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other<sup>4</sup></u>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Gasolines																									
Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
Other <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from US DOE/EIA.  
(2) Naphtha feedstock and aviation gasoline.  
(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.  
(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 1-4  
Petroleum Products Demand Outlook  
PADD 4**

<b>Thousands of Barrels per Day</b>	<u>Actual<sup>1</sup></u>						<u>Forecast</u>																		
	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>	<u>2029</u>	<u>2030</u>	<u>2031</u>	<u>2032</u>	<u>2033</u>	<u>2034</u>	<u>2035</u>	<u>2036</u>	<u>2037</u>	<u>2038</u>	<u>2039</u>	<u>2040</u>	
Motor Gasoline																									
<u>Other Gasoline / Naphtha<sup>2</sup></u>																									
Total Gasoline / Naphtha																									
Distillate Fuel Oil																									
Jet Fuel/Kerosene																									
<u>Other Diesel/Gasoil</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other<sup>4</sup></u>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Gasolines																									
Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
Other <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from US DOE/EIA.  
(2) Naphtha feedstock and aviation gasoline.  
(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.  
(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 1-5  
Petroleum Products Demand Outlook  
PADD 5**

<b>Thousands of Barrels per Day</b>	<u>Actual<sup>1</sup></u>					<u>Forecast</u>																			
	<u>2017</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>	<u>2028</u>	<u>2029</u>	<u>2030</u>	<u>2031</u>	<u>2032</u>	<u>2033</u>	<u>2034</u>	<u>2035</u>	<u>2036</u>	<u>2037</u>	<u>2038</u>	<u>2039</u>	<u>2040</u>	
Motor Gasoline																									
<u>Other Gasoline / Naphtha<sup>2</sup></u>																									
Total Gasoline / Naphtha																									
Distillate Fuel Oil																									
Jet Fuel/Kerosene																									
<u>Other Diesel/Gasoil</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other<sup>4</sup></u>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Gasolines																									
Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
Other <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from US DOE/EIA.  
(2) Naphtha feedstock and aviation gasoline.  
(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.  
(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 2  
Petroleum Products Demand Outlook  
Mexico & Canada**

<u>Thousands of Barrels per Day</u>	Actual <sup>1</sup>						Forecast																		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																									
<u>Other Gasoline / Naphtha<sup>2</sup></u>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other<sup>4</sup></u>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Motor Gasoline																									
<u>Other Gasoline / Naphtha<sup>2</sup></u>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other<sup>4</sup></u>																									
Total Petroleum Products																									

(1) Historical data from BP Statistical Review and JODI

(2) Naphtha feedstock and aviation gasoline.

(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.

(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 3  
Petroleum Products Demand Outlook  
South and Central America**

<u>Thousands of Barrels per Day</u>	Actual <sup>1</sup>						Forecast																		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from BP Statistical Review and JODI

(2) Naphtha feedstock and aviation gasoline.

(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.

(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.



**Appendix 1 - Table 4  
Petroleum Products Demand Outlook  
Europe**

<u>Thousands of Barrels per Day</u>	Actual <sup>1</sup>						Forecast																		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>3</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>4</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>5</sup>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>3</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>4</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>5</sup>																									
Total Petroleum Products																									

- (1) Excludes CIS; Includes Turkey
- (2) Historical data from BP Statistical Review and JODI
- (3) Naphtha feedstock and aviation gasoline.
- (4) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.
- (5) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 5  
Petroleum Products Demand Outlook  
Africa**

<u>Thousands of Barrels per Day</u>	Actual <sup>1</sup>						Forecast																		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from BP Statistical Review and JODI

(2) Naphtha feedstock and aviation gasoline.

(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.

(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 6  
Petroleum Products Demand Outlook  
Middle East**

<u>Thousands of Barrels per Day</u>	Actual <sup>1</sup>						Forecast																		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from BP Statistical Review and JODI

(2) Naphtha feedstock and aviation gasoline.

(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.

(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 7  
Petroleum Products Demand Outlook  
Commonwealth of Independent States (CIS)**

<u>Thousands of Barrels per Day</u>	Actual <sup>1</sup>						Forecast																		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from BP Statistical Review and JODI

(2) Naphtha feedstock and aviation gasoline.

(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.

(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 8  
Petroleum Products Demand Outlook  
Asia Pacific**

<b>Thousands of Barrels per Day</b>	Actual <sup>1</sup>						Forecast																		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																									
Other Gasoline / Naphtha <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
Jet/Kero																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
Other <sup>4</sup>																									
Total Petroleum Products																									
<b>Average Annual Growth Rates</b>																									
Motor Gasoline																									
Other Gasoline / Naphtha <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
Jet/Kero																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
Other <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from BP Statistical Review and JODI

(2) Naphtha feedstock and aviation gasoline.

(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.

(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 1 - Table 9  
Petroleum Products Demand Outlook  
Total World**

<b>Thousands of Barrels per Day</b>	Actual <sup>1</sup>						Forecast																		
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									
<b><u>Average Annual Growth Rates</u></b>																									
Motor Gasoline																									
<u>Other Gasoline / Naphtha</u> <sup>2</sup>																									
Total Light Distillates																									
Diesel/Gasoil																									
<u>Jet/Kero</u>																									
Total Middle Distillates																									
Residual Fuels <sup>3</sup>																									
Ethane and LPGs																									
<u>Other</u> <sup>4</sup>																									
Total Petroleum Products																									

(1) Historical data from BP Statistical Review and JODI

(2) Naphtha feedstock and aviation gasoline.

(3) Includes resid bunker fuels, No. 6 oil and crude oil used directly as fuel.

(4) Includes other petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Crude and Refined Products Outlook  
September 2024  
Probable Projects  
Appendix 2**

# Appendix 2 - Table 1 Planned Refinery Projects Crude and Product Capacity Increases

(Unit Capacities in Thousands of Barrels per Day)

	Crude Capacity					Gasoline	Mid. Dist.	Resid	Other Prod.	Total Products	New Refineries	Total Projects	Total Cost - \$MM
	Heavy	Medium	Lt. Sour	Lt. Swt.	Total								
U.S.													
Canada/Mexico													
Latin America													
Europe													
Middle East													
Africa													
CIS													
Asia Pacific													
<b>World Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**March 2023 Outlook**



**Appendix 2 - Table 2**  
**Planned Refinery Projects**  
**Conversion Unit Capacity Changes**  
 (Unit Capacities in Thousands of Barrels per Day)

	<u>Coking</u>	<u>FCC</u>	<u>Hydrocracking</u>	<u>Total Conv. Units</u>
U.S.				
Canada/Mexico				
Latin America				
Europe				
Middle East				
Africa				
CIS				
Asia Pacific				
<b>World Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**March 2024 Outlook**

**Appendix 2 - Table 3**  
**Planned Refinery Projects**  
**Octane Unit Capacity Changes**  
 (Unit Capacities in Thousands of Barrels per Day)

	<u>Reforming</u>	<u>Alky/Poly</u>	<u>C5/C6 Isomerization</u>	<u>Total Octane Units</u>
U.S.				
Canada/Mexico				
Latin America				
Europe				
Middle East				
Africa				
CIS				
Asia Pacific				
<b>World Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**March 2024 Outlook**

**Appendix 2 - Table 4**  
**Planned Refinery Projects**  
**Other Unit Capacity Changes**  
 (Unit Capacities in Thousands of Barrels per Day)

	<u>Hydrotreating</u>	<u>Asphalt</u>	<u>Hydrogen</u> <u>MMSCF/D</u>	<u>Sulfur</u> <u>LT/D</u>
U.S.				
Canada/Mexico				
Latin America				
Europe				
Middle East				
Africa				
CIS				
Asia Pacific				
<b>World Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**March 2024 Outlook**

**Appendix 2 - Table 5a**  
**Planned Refinery Projects**  
**Crude Capacity Increases By Year**  
 (Unit Capacities in Thousands of Barrels per Day)

	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>
U.S. PADD I					
U.S. PADD II					
U.S. PADD III					
U.S. PADD IV					
U.S. PADD V					
U.S. PADD VI					
<b>Total U.S.</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Canada/Mexico					
Latin America					
Europe					
Middle East					
Africa					
CIS					
Asia Pacific					
<b>Total non-U.S.</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>World Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**March 2024 Outlook**

**Appendix 2 - Table 5b**  
**Planned Refinery Projects**  
**Heavy Crude Capacity Increases By Year**  
 (Unit Capacities in Thousands of Barrels per Day)

	<u>2023</u>	<u>2024</u>	<u>2025</u>	<u>2026</u>	<u>2027</u>
U.S. PADD I					
U.S. PADD II					
U.S. PADD III					
U.S. PADD IV					
U.S. PADD V					
U.S. PADD VI					
<b>Total U.S.</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Canada/Mexico					
Latin America					
Europe					
Middle East					
Africa					
CIS					
Asia Pacific					
<b>Total non-U.S.</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>World Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**March 2024 Outlook**

## Appendix 2 - Table 6a Planned Construction Outlook United States

(Unit Capacities in Thousands of Barrels per Day)

State	Company	Location	Expected Compl'n	Change to Crude Capacity					Change to Product Make					Cost \$MM	
				Heavy	Medium	Lt. Sour	Lt. Swt.	Total	Gasoline <sup>1</sup>	Distillates	Resid.	Other <sup>2</sup>	Total		
<b>PADD I</b>															
				0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD II</b>															
	WI OK			0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD III</b>															
	TX TX TX			0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD IV</b>															
				0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD V</b>															
				0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD VI</b>															
				0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>				0	0	0	0	0	0	0	0	0	0	0	0

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

(3) Port Arthur coker expansion also allows for 21 MBPD increase in resid purchases and reduction of 47 MBPD of VGO purchases.

## Appendix 2 - Table 6b Planned Construction Outlook United States

(Unit Capacities in Thousands of Barrels per Day)

State	Company	Location	Expected	New	Vacuum	Coking	FCC	HCU	Reform	Alky/Poly	C5/C6	HDS	Asphalt	Hydrogen	Sulfur	
			Compl'n	Refinery?							Isom			MMSCF/D	LT/D	
<b>PADD I</b>																
			0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD II</b>																
WI																
OK			0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD III</b>																
TX																
TX																
TX			0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD IV</b>																
			0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD V</b>																
			0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>PADD VI<sup>3</sup></b>																
			0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>			0	0	0	0	0	0	0	0	0	0	0	0	0	0

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

(3) Port Arthur coker expansion also allows for 21 MBPD increase in resid purchases and reduction of 47 MBPD of VGO purchases.

## Appendix 2 - Table 7a Planned Construction Outlook Canada & Mexico

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected Compl'n</u>	<u>Change to Crude Capacity</u>					<u>Change to Product Make</u>					<u>Cost \$MM</u>	
				<u>Heavy</u>	<u>Medium</u>	<u>Lt. Sour</u>	<u>Lt. Swt.</u>	<u>Total</u>	<u>Gasoline<sup>1</sup></u>	<u>Distillates</u>	<u>Resid.</u>	<u>Other<sup>2</sup></u>	<u>Total</u>		
Mexico															
Mexico															
<b>Total</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.



# Appendix 2 - Table 7b Planned Construction Outlook Canada & Mexico

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected Compl'n</u>	<u>New Refinery?</u>	<u>Vacuum</u>	<u>Coking</u>	<u>FCC</u>	<u>HCU</u>	<u>Reform</u>	<u>Alky/Poly</u>	<u>C5/C6 Isom</u>	<u>HDS</u>	<u>Asphalt</u>	<u>Hydrogen MMSCF/D</u>	<u>Sulfur LT/D</u>
	Pemex														
	Pemex														
<b>Total</b>					0	0	0	0	0	0	0	0	0	0	0

(1) Includes naphtha and aviation gasoline.  
 (2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 8a Planned Construction Outlook Europe (excl. Former Soviet Union)

(Unit Capacities in Thousands of Barrels per Day)

Country	Company	Location	Expected Compl'n	Change to Crude Capacity					Change to Product Make					Cost \$MM	
				Heavy	Medium	Lt. Sour	Lt. Swt.	Total	Gasoline <sup>1</sup>	Distillates	Resid.	Other <sup>2</sup>	Total		
France															
Croatia															
UK															
<b>Total</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 8b Planned Construction Outlook Europe (excl. Former Soviet Union)

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected Compl'n</u>	<u>New Refinery?</u>	<u>Vacuum</u>	<u>Coking</u>	<u>FCC</u>	<u>HCU</u>	<u>Reform</u>	<u>Alky/Poly</u>	<u>C5/C6 Isom</u>	<u>HDS</u>	<u>Asphalt</u>	<u>Hydrogen MMSCF/D</u>	<u>Sulfur LT/D</u>
France															
Croatia															
UK															
<b>Total</b>				0	0	0	0	0	0	0	0	0	0	0	0

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 9a Planned Construction Outlook Latin America

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	Expected <u>Compl'n</u>	<u>Change to Crude Capacity</u>					<u>Change to Product Make</u>					Cost <u>\$MM</u>	
				<u>Heavy</u>	<u>Medium</u>	<u>Lt. Sour</u>	<u>Lt. Swt.</u>	<u>Total</u>	<u>Gasoline<sup>1</sup></u>	<u>Distillates</u>	<u>Resid.</u>	<u>Other<sup>2</sup></u>	<u>Total</u>		
Peru															
<b>Total</b>				<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 9b Planned Construction Outlook Latin America

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected Compl'n</u>	<u>New Refinery?</u>	<u>Vacuum</u>	<u>Coking</u>	<u>FCC</u>	<u>HCU</u>	<u>Reform</u>	<u>Alky/Poly</u>	<u>C5/C6 Isom</u>	<u>HDS</u>	<u>Asphalt</u>	<u>Hydrogen MMSCF/D</u>	<u>Sulfur LT/D</u>
Peru															
<b>Total</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 10a Planned Construction Outlook Middle East

(Unit Capacities in Thousands of Barrels per Day)

Country	Company	Location	Expected Compl'n	Change to Crude Capacity					Change to Product Make					Cost \$MM		
				Heavy	Medium	Lt. Sour	Lt. Swt.	Total	Gasoline <sup>1</sup>	Distillates	Resid.	Other <sup>2</sup>	Total			
Saudi Arabia																
Kuwait																
Iraq																
Iran																
UAE																
Iran																
Oman																
UAE																
Iran																
Bahrain																
Iraq																
Iraq																
Iran																
<b>Total</b>					0	0	0	0	0		0	0	0	0	0	0

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 10b Planned Construction Outlook Middle East

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected Compl'n</u>	<u>New Refinery?</u>	<u>Vacuum</u>	<u>Coking</u>	<u>FCC</u>	<u>HCU</u>	<u>Resid HCU</u>	<u>Reform</u>	<u>Alky/Poly</u>	<u>C5/C6 Isom</u>	<u>HDS</u>	<u>Asphalt</u>	<u>Hydrogen MMSCF/D</u>	<u>Sulfur LT/D</u>
Saudi Arabia																
Kuwait																
Iraq																
Iran																
UAE																
Iran																
Oman																
UAE																
Iran																
Bahrain																
Iraq																
Iraq																
Iran																
<b>Total</b>																

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 11a Planned Construction Outlook Africa

(Unit Capacities in Thousands of Barrels per Day)

Country	Company	Location	Expected Compl'n	Change to Crude Capacity					Change to Product Make					Cost \$MM		
				Heavy	Medium	Lt. Sour	Lt. Swt.	Total	Gasoline <sup>1</sup>	Distillates	Resid.	Other <sup>2</sup>	Total			
Egypt																
Nigeria																
Egypt																
Senegal																
Angola																
Algeria																
Morocco																
<b>Total</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>		<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.



## Appendix 2 - Table 11b Planned Construction Outlook Africa

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected Compl'n</u>	<u>New Refinery?</u>	<u>Vacuum</u>	<u>Coking</u>	<u>FCC</u>	<u>HCU</u>	<u>Reform</u>	<u>Alky/Poly</u>	<u>C5/C6 Isom</u>	<u>HDS</u>	<u>Asphalt</u>	<u>Hydrogen MMSCF/D</u>	<u>Sulfur LT/D</u>
	MIDOR														
	Dangote Group														
	EGPC / AORC														
	SAR														
	Sonangol/GemCorp. Capital														
	Sonatrach														
	Mya Energy														
<b>Total</b>			<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 12a Planned Construction Outlook Commonwealth of Independent States

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	Expected <u>Compl'n</u>	<u>Change to Crude Capacity</u>					<u>Change to Product Make</u>					Cost <u>\$MM</u>	
				<u>Heavy</u>	<u>Medium</u>	<u>Lt. Sour</u>	<u>Lt. Swt.</u>	<u>Total</u>	<u>Gasoline<sup>1</sup></u>	<u>Distillates</u>	<u>Resid.</u>	<u>Other<sup>2</sup></u>	<u>Total</u>		
Azerbaijan															
Russia															
Uzbekistan															
Russia															
Uzbekistan															
Russia															
Russia															
Russia															
Russia															
<b>Total</b>					<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Appendix 2 - Table 12b**  
**Planned Construction Outlook**  
**Commonwealth of Independent States**

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected</u> <u>Compl'n</u>	<u>New</u> <u>Refinery?</u>	<u>Vacuum</u>	<u>Coking</u>	<u>FCC</u>	<u>HCU</u>	<u>Reform</u>	<u>Alky/Poly</u>	<u>C5/C6</u> <u>Isom</u>	<u>HDS</u>	<u>Asphalt</u>	<u>Hydrogen</u> <u>MMSCF/D</u>	<u>Sulfur</u> <u>LT/D</u>
Azerbaijan															
Russia															
Uzbekistan															
Russia															
Uzbekistan															
Russia															
Russia															
Russia															
Russia															
<b>Total</b>															

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 13a Planned Construction Outlook Asia Pacific

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected Completion</u>	<u>Change to Crude Capacity</u>					<u>Change to Product Make</u>					<u>Cost \$MM</u>	
				<u>Heavy</u>	<u>Medium</u>	<u>Lt. Sour</u>	<u>Lt. Swt.</u>	<u>Total</u>	<u>Gasoline<sup>1</sup></u>	<u>Distillates</u>	<u>Resid.</u>	<u>Other<sup>2</sup></u>	<u>Total</u>		
CHINA															
INDIA															

## Appendix 2 - Table 13a Planned Construction Outlook Asia Pacific

(Unit Capacities in Thousands of Barrels per Day)

Country	Company	Location	Expected Completion	Change to Crude Capacity					Change to Product Make					Cost \$MM	
				Heavy	Medium	Lt. Sour	Lt. Swt.	Total	Gasoline <sup>1</sup>	Distillates	Resid.	Other <sup>2</sup>	Total		
<b>INDONESIA</b>															
				0	0	0	0	0	0	0	0	0	0	0	0
<b>OTHER ASIA PACIFIC</b>															
		Singapore		0	0	0	0	0	0	0	0	0	0	0	0
		Thailand													
		Mongolia													
		Australia													
		Vietnam													
<b>Total</b>				0	0	0	0	0	0	0	0	0	0	0	0

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

## Appendix 2 - Table 13b Planned Construction Outlook Asia Pacific

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected Completion</u>	<u>New Refinery?</u>	<u>Vacuum</u>	<u>Coking</u>	<u>FCC</u>	<u>HCU</u>	<u>Resid HCU</u>	<u>Reform</u>	<u>Alky/Poly</u>	<u>C5/C6 Isom</u>	<u>HDS</u>	<u>Asphalt</u>	<u>Hydrogen MMSCF/D</u>	<u>Sulfur LT/D</u>
CHINA																
			0		0	0	0	0	0	0	0	0	0	0	0	0
INDIA																
			0		0	0	0	0	0	0	0	0	0	0	0	0

## Appendix 2 - Table 13b Planned Construction Outlook Asia Pacific

(Unit Capacities in Thousands of Barrels per Day)

<u>Country</u>	<u>Company</u>	<u>Location</u>	<u>Expected Completion</u>	<u>New Refinery?</u>	<u>Vacuum</u>	<u>Coking</u>	<u>FCC</u>	<u>HCU</u>	<u>Resid HCU</u>	<u>Reform</u>	<u>Alky/Poly</u>	<u>C5/C6 Isom</u>	<u>HDS</u>	<u>Asphalt</u>	<u>Hydrogen MMSCF/D</u>	<u>Sulfur LT/D</u>
<b>INDONESIA</b>																
			0		0	0	0	0	0	0	0	0	0	0	0	0
<b>OTHER ASIA PACIFIC</b>																
		Singapore														
		Thailand														
		Mongolia														
		Australia														
		Vietnam														
			0		0	0	0	0	0	0	0	0	0	0	0	0
<b>Total</b>			0		0	0	0	0	0	0	0	0	0	0	0	0

(1) Includes naphtha and aviation gasoline.

(2) Includes LPGs, petrochemical feedstocks, lubricants/waxes, petroleum coke, asphalt, refinery gas and other miscellaneous products.

**Crude and Refined Products Outlook  
September 2024  
Price Outlook  
Appendix 3**























**Crude and Refined Products Outlook  
September 2024  
RINs Outlook  
Appendix 4**

# Appendix 4 – Table 1 Price Outlook - RINS Renewable Identification Numbers (RINs)

(annual average dollars per RIN)

2023    2024    2025    2026    2027    2028    2029    2030    2031    2032    2033    2034    2035

Cellulosic Biofuel (D3)  
Biomass-Based Diesel (D4)  
Advanced Biofuel (D5)  
Renewable Fuel (D6)

## Appendix 4 – Table 2 September 2024 Historical RIN Pricing

(cents per RIN)

	Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based		
	Month: D3 RIN)	Diesel D4	Advanced Biofuel D5	Renewable Fuel D6
2011 Average	97	130	76	3
2012 Average	78	110	62	3
2013 Average	47	72	69	59
2014 Average	42	53	51	49
2015 Average	64	73	69	55
2016 Average	175	91	89	82
2017 Average	274	101	98	70
2018 Average	232	53	51	31
2019 Average	122	47	46	17
2020 Average	147	66	65	41
2021 Average	306	152	152	130
2022 Average	321	173	176	141
<hr/>				
Jan-11	113.0	80.4	75.7	3.0
Feb-11	113.0	103.9	68.9	2.8
Mar-11	113.0	114.7	51.0	3.8
Apr-11	113.0	130.2	49.6	3.3
May-11	113.0	128.9	65.9	2.0
Jun-11	113.0	137.0	68.0	3.6
Jul-11	113.0	134.5	79.3	3.4
Aug-11	113.0	154.7	99.3	3.3
Sep-11	113.0	178.1	116.3	2.9
Oct-11	113.0	130.2	81.5	1.9
Nov-11	113.0	136.7	71.8	0.8
Dec-11	113.0	126.7	80.3	0.4
Jan-12	78.0	149.7	76.9	2.0
Feb-12	78.0	143.0	69.7	2.1
Mar-12	78.0	142.7	73.8	2.4
Apr-12	78.0	143.8	73.1	2.0
May-12	78.0	136.5	79.5	1.7
Jun-12	78.0	117.6	82.2	1.3
Jul-12	78.0	121.0	64.6	3.8
Aug-12	78.0	102.8	43.3	4.0
Sep-12	78.0	93.5	41.8	2.8
Oct-12	78.0	55.2	39.2	3.5
Nov-12	78.0	54.1	45.8	3.9
Dec-12	78.0	59.6	49.6	5.1
Jan-13		44.7	40.4	12.4
Feb-13		53.3	52.9	32.3
Mar-13		85.7	83.3	76.5

# Appendix 4 – Table 2 September 2024 Historical RIN Pricing

(cents per RIN)

	Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based		
	Month: D3 RIN)	Diesel D4	Advanced Biofuel D5	Renewable Fuel D6
Apr-13		84.5	80.9	72.0
May-13		96.4	92.2	83.0
Jun-13		103.2	102.9	93.6
Jul-13		120.9	120.1	116.6
Aug-13		90.0	86.0	78.5
Sep-13		72.5	66.9	59.3
Oct-13		51.9	43.9	32.9
Nov-13		30.0	28.4	24.2
Dec-13		33.1	32.2	31.4
Jan-14		34.3	35.0	33.1
Feb-14		54.3	54.2	53.8
Mar-14		53.6	52.6	51.8
Apr-14		46.0	44.9	45.1
May-14		54.2	49.6	45.0
Jun-14		55.5	53.1	49.0
Jul-14		54.8	52.7	51.0
Aug-14		54.4	53.2	51.0
Sep-14		50.2	48.8	46.8
Oct-14		52.1	48.7	46.8
Nov-14		53.7	50.6	50.2
Dec-14		67.1	66.1	64.3
Jan-15		77.2	75.1	72.8
Feb-15		85.0	81.9	71.5
Mar-15		81.4	78.7	68.7
Apr-15		83.5	80.3	70.6
May-15		86.3	81.0	70.4
Jun-15		88.1	76.2	44.0
Jul-15		76.2	72.3	43.4
Aug-15		64.1	61.6	38.8
Sep-15		45.7	43.1	33.5
Oct-15		51.4	48.2	37.1
Nov-15		62.4	50.4	42.7
Dec-15		76.3	75.0	71.4
Jan-16		72.7	71.0	67.2
Feb-16		78.0	75.6	72.2
Mar-16		77.8	75.8	72.3
Apr-16		81.2	78.7	73.2
May-16	171.1	81.1	79.0	76.3
Jun-16	176.6	88.7	86.8	84.7
Jul-16	183.7	101.5	98.3	95.0
Aug-16	188.8	96.4	92.9	87.1

# Appendix 4 – Table 2 September 2024 Historical RIN Pricing

(cents per RIN)

	Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based		
	Month: D3 RIN)	Diesel D4	Advanced Biofuel D5	Renewable Fuel D6
Sep-16	197.7	98.8	97.7	87.6
Oct-16	221.4	105.5	105.3	91.8
Nov-16	238.6	102.4	101.5	87.2
Dec-16	254.0	110.5	109.8	93.3
Jan-17	246.0	98.5	98.5	68.4
Feb-17	269.8	93.2	88.4	47.1
Mar-17	261.7	96.6	89.6	44.6
Apr-17	255.0	99.6	95.5	51.2
May-17	253.0	103.1	100.3	54.1
Jun-17	258.0	107.1	105.2	73.1
Jul-17	276.1	110.9	109.1	78.6
Aug-17	294.5	109.0	106.7	88.0
Sep-17	301.8	104.5	103.2	81.9
Oct-17	288.6	99.5	98.5	83.2
Nov-17	296.5	103.3	102.3	91.0
Dec-17	284.8	85.3	84.3	74.0
Jan-18	269.8	75.9	74.9	65.4
Feb-18	255.6	83.7	82.7	65.4
Mar-18	247.7	75.1	74.1	45.5
Apr-18	246.5	60.3	59.0	36.4
May-18	244.7	50.8	47.8	30.6
Jun-18	236.9	47.8	44.8	24.3
Jul-18	231.1	43.1	39.4	22.6
Aug-18	227.0	42.4	38.3	20.4
Sep-18	226.0	39.1	34.6	18.6
Oct-18	206.8	33.3	29.2	10.8
Nov-18	193.7	39.0	36.0	9.1
Dec-18	194.1	48.4	45.4	19.7
Jan-19	185.9	52.7	49.7	17.9
Feb-19	182.2	55.3	53.8	21.9
Mar-19	176.2	42.5	39.2	16.8
Apr-19	159.4	36.3	33.8	11.5
May-19	145.9	33.6	32.5	14.5
Jun-19	120.2	43.3	42.3	19.2
Jul-19	109.0	42.4	41.4	22.4
Aug-19	73.0	45.9	44.7	15.7
Sep-19	62.3	49.3	47.4	19.4
Oct-19	77.7	56.4	54.6	17.3
Nov-19	80.3	62.3	61.4	13.0
Dec-19	83.0	50.4	48.5	12.0
Jan-20	99.7	44.0	43.0	9.7

# Appendix 4 – Table 2 September 2024 Historical RIN Pricing

(cents per RIN)

	Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based		Renewable Fuel
	Month: D3 RIN)	Diesel D4	Advanced Biofuel D5	D6
Feb-20	159.1	53.7	52.2	25.0
Mar-20	154.2	54.5	52.5	24.7
Apr-20	107.3	56.5	54.5	26.2
May-20	116.0	55.9	53.9	35.7
Jun-20	146.0	59.3	57.3	44.1
Jul-20	146.0	64.0	58.9	44.8
Aug-20	144.7	65.7	63.7	42.1
Sep-20	156.8	76.2	75.9	46.8
Oct-20	162.4	79.4	79.2	53.2
Nov-20	166.6	86.9	86.6	62.3
Dec-20	199.6	97.3	97.1	71.4
Jan-21	228.0	106.3	106.1	88.7
Feb-21	267.4	113.6	113.1	100.4
Mar-21	284.5	137.0	136.5	128.9
Apr-21	302.0	145.1	144.5	137.4
May-21	318.8	187.6	186.6	179.5
Jun-21	310.7	179.4	178.4	169.1
Jul-21	315.2	169.0	168.0	151.4
Aug-21	318.8	176.5	175.1	155.0
Sep-21	306.3	151.8	150.8	117.0
Oct-21	318.9	162.3	161.3	125.1
Nov-21	342.9	148.4	147.4	107.1
Dec-21	358.1	153.0	152.0	99.1
Jan-22	378.3	159.4	158.2	111.1
Feb-22	368.2	159.3	158.2	115.4
Mar-22	330.7	164.1	163.1	114.8
Apr-22	350.3	185.0	166.3	129.5
May-22	364.3	197.8	196.8	153.0
Jun-22	310.7	180.7	180.0	153.5

# Appendix 4 – Table 2

## September 2024

### Historical RIN Price Change

(cents per RIN - annual change)

	Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based		Renewable Fuel
	Month: D3 RIN)	Diesel D4	Advanced Biofuel D5	D6
2011 Average				
2012 Average	-20%	-15%	-18%	14%
2013 Average	-40%	-35%	11%	1867%
2014 Average	-11%	-26%	-26%	-17%
2015 Average	52%	38%	35%	12%
2016 Average	173%	25%	29%	49%
2017 Average	57%	11%	10%	-15%
2018 Average	-15%	-47%	-48%	-56%
2019 Average	-47%	-11%	-10%	-44%
2020 Average	20%	40%	42%	136%
2021 Average	109%	131%	135%	221%
2022 Average	5%	13%	16%	9%

Jan-11  
 Feb-11  
 Mar-11  
 Apr-11  
 May-11  
 Jun-11  
 Jul-11  
 Aug-11  
 Sep-11  
 Oct-11  
 Nov-11  
 Dec-11  
 Jan-12  
 Feb-12  
 Mar-12  
 Apr-12  
 May-12  
 Jun-12  
 Jul-12  
 Aug-12  
 Sep-12  
 Oct-12  
 Nov-12  
 Dec-12  
 Jan-13  
 Feb-13  
 Mar-13



# Appendix 4 – Table 2

## September 2024

### Historical RIN Price Change

(cents per RIN - annual change)

Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based Diesel	Advanced Biofuel D5	Renewable Fuel D6
Month: D3 RIN)	D4	D5	D6

Apr-13  
 May-13  
 Jun-13  
 Jul-13  
 Aug-13  
 Sep-13  
 Oct-13  
 Nov-13  
 Dec-13  
 Jan-14  
 Feb-14  
 Mar-14  
 Apr-14  
 May-14  
 Jun-14  
 Jul-14  
 Aug-14  
 Sep-14  
 Oct-14  
 Nov-14  
 Dec-14  
 Jan-15  
 Feb-15  
 Mar-15  
 Apr-15  
 May-15  
 Jun-15  
 Jul-15  
 Aug-15  
 Sep-15  
 Oct-15  
 Nov-15  
 Dec-15  
 Jan-16  
 Feb-16  
 Mar-16  
 Apr-16  
 May-16  
 Jun-16  
 Jul-16  
 Aug-16

# Appendix 4 – Table 2

## September 2024

### Historical RIN Price Change

(cents per RIN - annual change)

Cellulosic (Year: waiver credit / Month: D3 RIN) Month: D3 RIN)	Biomass-Based Diesel D4	Advanced Biofuel D5	Renewable Fuel D6
--	-------------------------------	------------------------	----------------------

Sep-16  
 Oct-16  
 Nov-16  
 Dec-16  
 Jan-17  
 Feb-17  
 Mar-17  
 Apr-17  
 May-17  
 Jun-17  
 Jul-17  
 Aug-17  
 Sep-17  
 Oct-17  
 Nov-17  
 Dec-17  
 Jan-18  
 Feb-18  
 Mar-18  
 Apr-18  
 May-18  
 Jun-18  
 Jul-18  
 Aug-18  
 Sep-18  
 Oct-18  
 Nov-18  
 Dec-18  
 Jan-19  
 Feb-19  
 Mar-19  
 Apr-19  
 May-19  
 Jun-19  
 Jul-19  
 Aug-19  
 Sep-19  
 Oct-19  
 Nov-19  
 Dec-19  
 Jan-20

# Appendix 4 – Table 2

## September 2024

### Historical RIN Price Change

(cents per RIN - annual change)

Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based Diesel D4	Advanced Biofuel D5	Renewable Fuel D6
--	-------------------------------	------------------------	----------------------

Feb-20  
 Mar-20  
 Apr-20  
 May-20  
 Jun-20  
 Jul-20  
 Aug-20  
 Sep-20  
 Oct-20  
 Nov-20  
 Dec-20  
 Jan-21  
 Feb-21  
 Mar-21  
 Apr-21  
 May-21  
 Jun-21  
 Jul-21  
 Aug-21  
 Sep-21  
 Oct-21  
 Nov-21  
 Dec-21  
 Jan-22  
 Feb-22  
 Mar-22  
 Apr-22  
 May-22  
 Jun-22

# Appendix 4 – Table 2

## September 2024

### Historical RIN Price Change

(cents per RIN - monthly change)

	Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based Diesel	Advanced Biofuel	Renewable Fuel
	Month: D3 RIN)	D4	D5	D6
2011 Average				
2012 Average				
2013 Average				
2014 Average				
2015 Average				
2016 Average				
2017 Average				
2018 Average				
2019 Average				
2020 Average				
2021 Average				
2022 Average				
<hr/> <hr/>				
Jan-11				
Feb-11	0.00%	29.22%	-8.86%	-5.76%
Mar-11	0.00%	10.40%	-26.09%	35.65%
Apr-11	0.00%	13.43%	-2.76%	-12.41%
May-11	0.00%	-0.99%	32.91%	-38.88%
Jun-11	0.00%	6.35%	3.18%	75.89%
Jul-11	0.00%	-1.89%	16.73%	-4.96%
Aug-11	0.00%	15.09%	25.13%	-4.70%
Sep-11	0.00%	15.11%	17.18%	-9.43%
Oct-11	0.00%	-26.88%	-29.93%	-36.72%
Nov-11	0.00%	4.96%	-11.90%	-59.17%
Dec-11	0.00%	-7.30%	11.88%	-43.85%
Jan-12	-30.97%	18.12%	-4.27%	356.01%
Feb-12	0.00%	-4.49%	-9.36%	7.69%
Mar-12	0.00%	-0.21%	5.94%	11.90%
Apr-12	0.00%	0.82%	-1.04%	-13.19%
May-12	0.00%	-5.09%	8.76%	-18.34%
Jun-12	0.00%	-13.82%	3.41%	-21.96%
Jul-12	0.00%	2.89%	-21.42%	190.29%
Aug-12	0.00%	-15.07%	-32.91%	7.20%
Sep-12	0.00%	-9.08%	-3.43%	-31.77%
Oct-12	0.00%	-40.93%	-6.27%	28.28%
Nov-12	0.00%	-1.98%	16.85%	10.42%
Dec-12	0.00%	10.02%	8.18%	29.22%
Jan-13	-100.00%	-24.91%	-18.50%	145.54%
Feb-13	#DIV/0!	19.30%	30.89%	160.59%
Mar-13	#DIV/0!	60.66%	57.46%	136.71%

# Appendix 4 – Table 2

## September 2024

### Historical RIN Price Change

(cents per RIN - monthly change)

	Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based		
	Month: D3 RIN)	Diesel D4	Advanced Biofuel D5	Renewable Fuel D6
Apr-13	#DIV/0!	-1.45%	-2.81%	-5.88%
May-13	#DIV/0!	14.18%	13.90%	15.18%
Jun-13	#DIV/0!	6.97%	11.65%	12.79%
Jul-13	#DIV/0!	17.19%	16.70%	24.61%
Aug-13	#DIV/0!	-25.51%	-28.40%	-32.65%
Sep-13	#DIV/0!	-19.51%	-22.26%	-24.48%
Oct-13	#DIV/0!	-28.37%	-34.31%	-44.46%
Nov-13	#DIV/0!	-42.21%	-35.22%	-26.64%
Dec-13	#DIV/0!	10.44%	13.28%	29.98%
Jan-14	#DIV/0!	3.56%	8.61%	5.34%
Feb-14	#DIV/0!	58.35%	54.81%	62.75%
Mar-14	#DIV/0!	-1.26%	-2.84%	-3.75%
Apr-14	#DIV/0!	-14.16%	-14.65%	-12.93%
May-14	#DIV/0!	17.76%	10.39%	-0.32%
Jun-14	#DIV/0!	2.31%	7.11%	9.03%
Jul-14	#DIV/0!	-1.27%	-0.74%	4.10%
Aug-14	#DIV/0!	-0.67%	0.97%	-0.11%
Sep-14	#DIV/0!	-7.70%	-8.27%	-8.15%
Oct-14	#DIV/0!	3.82%	-0.33%	-0.02%
Nov-14	#DIV/0!	3.00%	4.04%	7.19%
Dec-14	#DIV/0!	24.89%	30.52%	28.12%
Jan-15	#DIV/0!	15.12%	13.55%	13.14%
Feb-15	#DIV/0!	10.10%	9.07%	-1.72%
Mar-15	#DIV/0!	-4.29%	-3.88%	-3.98%
Apr-15	#DIV/0!	2.64%	2.07%	2.79%
May-15	#DIV/0!	3.34%	0.89%	-0.28%
Jun-15	#DIV/0!	2.14%	-5.92%	-37.47%
Jul-15	#DIV/0!	-13.54%	-5.13%	-1.30%
Aug-15	#DIV/0!	-15.85%	-14.89%	-10.61%
Sep-15	#DIV/0!	-28.76%	-29.93%	-13.67%
Oct-15	#DIV/0!	12.41%	11.71%	10.68%
Nov-15	#DIV/0!	21.44%	4.59%	15.09%
Dec-15	#DIV/0!	22.27%	48.82%	67.28%
Jan-16	#DIV/0!	-4.64%	-5.27%	-5.98%
Feb-16	#DIV/0!	7.33%	6.36%	7.52%
Mar-16	#DIV/0!	-0.27%	0.26%	0.06%
Apr-16	#DIV/0!	4.38%	3.91%	1.27%
May-16	#DIV/0!	-0.23%	0.33%	4.26%
Jun-16	3.24%	9.49%	9.89%	10.98%
Jul-16	3.99%	14.39%	13.22%	12.24%
Aug-16	2.82%	-5.03%	-5.47%	-8.37%

## Appendix 4 – Table 2

### September 2024

### Historical RIN Price Change

(cents per RIN - monthly change)

	Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based		
	Month: D3 RIN)	Diesel D4	Advanced Biofuel D5	Renewable Fuel D6
Sep-16	4.72%	2.53%	5.13%	0.60%
Oct-16	11.98%	6.76%	7.87%	4.76%
Nov-16	7.74%	-2.94%	-3.69%	-5.01%
Dec-16	6.44%	7.92%	8.26%	7.04%
Jan-17	-3.13%	-10.92%	-10.36%	-26.72%
Feb-17	9.67%	-5.37%	-10.24%	-31.07%
Mar-17	-3.00%	3.70%	1.40%	-5.38%
Apr-17	-2.56%	3.04%	6.52%	14.83%
May-17	-0.77%	3.55%	5.06%	5.58%
Jun-17	1.96%	3.84%	4.87%	35.25%
Jul-17	7.00%	3.62%	3.73%	7.51%
Aug-17	6.69%	-1.74%	-2.17%	11.96%
Sep-17	2.47%	-4.09%	-3.31%	-6.92%
Oct-17	-4.38%	-4.79%	-4.53%	1.53%
Nov-17	2.75%	3.83%	3.87%	9.35%
Dec-17	-3.97%	-17.43%	-17.60%	-18.67%
Jan-18	-5.25%	-11.07%	-11.20%	-11.56%
Feb-18	-5.26%	10.31%	10.44%	-0.03%
Mar-18	-3.09%	-10.27%	-10.40%	-30.43%
Apr-18	-0.48%	-19.71%	-20.38%	-20.00%
May-18	-0.73%	-15.75%	-18.98%	-15.93%
Jun-18	-3.19%	-5.91%	-6.28%	-20.59%
Jul-18	-2.45%	-9.83%	-12.05%	-7.00%
Aug-18	-1.77%	-1.62%	-2.79%	-9.73%
Sep-18	-0.44%	-7.78%	-9.66%	-8.82%
Oct-18	-8.50%	-14.83%	-15.61%	-41.94%
Nov-18	-6.33%	17.04%	23.29%	-15.74%
Dec-18	0.19%	24.16%	26.08%	116.70%
Jan-19	-4.19%	8.87%	9.45%	-9.28%
Feb-19	-2.00%	4.95%	8.27%	22.39%
Mar-19	-3.28%	-23.09%	-27.21%	-23.50%
Apr-19	-9.56%	-14.56%	-13.59%	-31.46%
May-19	-8.45%	-7.58%	-3.81%	26.21%
Jun-19	-17.62%	28.83%	29.85%	32.24%
Jul-19	-9.32%	-2.10%	-2.15%	16.75%
Aug-19	-33.03%	8.35%	8.00%	-29.95%
Sep-19	-14.73%	7.44%	6.14%	23.88%
Oct-19	24.88%	14.45%	15.19%	-10.80%
Nov-19	3.31%	10.35%	12.50%	-24.92%
Dec-19	3.34%	-18.99%	-21.06%	-7.60%
Jan-20	20.14%	-12.84%	-11.24%	-19.13%

## Appendix 4 – Table 2

### September 2024

### Historical RIN Price Change

(cents per RIN - monthly change)

	Cellulosic (Year: waiver credit / Month: D3 RIN)	Biomass-Based		
	Month: D3 RIN)	Diesel D4	Advanced Biofuel D5	Renewable Fuel D6
Feb-20	59.51%	22.11%	21.20%	157.35%
Mar-20	-3.06%	1.54%	0.68%	-1.09%
Apr-20	-30.39%	3.65%	3.79%	5.92%
May-20	8.12%	-0.99%	-1.03%	36.36%
Jun-20	25.81%	6.08%	6.30%	23.55%
Jul-20	0.00%	7.79%	2.66%	1.62%
Aug-20	-0.88%	2.65%	8.14%	-6.20%
Sep-20	8.34%	16.01%	19.26%	11.18%
Oct-20	3.56%	4.27%	4.28%	13.80%
Nov-20	2.58%	9.40%	9.43%	17.13%
Dec-20	19.82%	12.00%	12.03%	14.48%
Jan-21	14.25%	9.28%	9.27%	24.26%
Feb-21	17.29%	6.78%	6.60%	13.21%
Mar-21	6.39%	20.64%	20.73%	28.39%
Apr-21	6.14%	5.93%	5.87%	6.62%
May-21	5.58%	29.24%	29.10%	30.60%
Jun-21	-2.55%	-4.37%	-4.40%	-5.77%
Jul-21	1.45%	-5.79%	-5.81%	-10.45%
Aug-21	1.15%	4.46%	4.21%	2.34%
Sep-21	-3.93%	-13.98%	-13.85%	-24.51%
Oct-21	4.11%	6.89%	6.94%	6.89%
Nov-21	7.51%	-8.52%	-8.58%	-14.35%
Dec-21	4.45%	3.08%	3.10%	-7.52%
Jan-22	5.64%	4.20%	4.07%	12.11%
Feb-22	-2.67%	-0.12%	0.00%	3.91%
Mar-22	-10.18%	3.03%	3.10%	-0.52%
Apr-22	5.93%	12.76%	1.96%	12.80%
May-22	4.00%	6.92%	18.34%	18.15%
Jun-22	-14.71%	-8.67%	-8.54%	0.33%

**Crude and Refined Products Outlook  
September 2024  
Midstream Outlook  
Appendix 5**



## Appendix 5 - Table 1 Pipelines to Cushing

Operating Pipelines				
Operator	Origin	Name	Capacity (MBPD)	Completion
<b>Total Operating</b>				
Likely Expansions				
Operator	Origin	Name	Capacity (MBPD)	Completion
<b>Operating + Planned</b>				

<sup>(1)</sup>Expansion timing likely to coincide with Line 3 Replacement expansion and may be dependent on the outcome of Mainline contracting

## Appendix 5 - Table 2 Pipelines from Cushing and Patoka

### Operating Pipelines - from Cushing

Operator	Destination	Name	Capacity (MBPD)	Completion
----------	-------------	------	-----------------	------------

**Total Operating**

### Likely Expansions - from Cushing

Operator	Destination	Name	Capacity (MBPD)	Completion
----------	-------------	------	-----------------	------------

**Operating + Planned**

### Operating - from Patoka, IL / Memphis, TN

Operator	Destination	Name	Capacity (MBPD)	Completion
----------	-------------	------	-----------------	------------

### Likely Expansions - from Patoka, IL / Memphis, TN

Operator	Destination	Name	Capacity (MBPD)	Completion
----------	-------------	------	-----------------	------------

## Appendix 5 - Table 3 Permian Crude Oil Pipelines

Operating Pipelines				
Operator	Destination	Name	Capacity (MBPD)	Completion

---

**Total Operating**

Likely Expansions				
Operator	Origin	Name	Capacity (MBPD)	Completion

---

**Operating + Planned**

<sup>(1)</sup>Also know as "Seminole - Red"; Possible conversion back to NGL service at a future date

<sup>(2)</sup>Represents undivided joint interest in Wink-to-Webster Pipeline

# Appendix 5 - Table 4 Permian NGL Pipelines

Operating Pipelines				
Operator	Origin	Name	Capacity (MBPD)	Completion

---

**Total Operating**

Likely Expansions				
Operator	Origin	Name	Capacity (MBPD)	Completion

---

**Operating + Planned**

<sup>(1)</sup>Also know as Midland-to-Echo 2  
<sup>(2)</sup>Expected conversion originally planned for 2021, but now delayed indefinitely

## Appendix 5 - Table 5 Permian Natural Gas Pipelines

### Operating Pipelines

Operator	Destination	Name	Capacity (BCF/D)	Completion
----------	-------------	------	------------------	------------

**Total Operating**

### Likely Expansions

Operator	Destination	Name	Capacity (BCF/D)	Completion
----------	-------------	------	------------------	------------

**Operating + Planned**

### Cancelled / Deferred

Operator	Destination	Name	Capacity (BCF/D)	Completion
----------	-------------	------	------------------	------------

## Appendix 5 - Table 6 Bakken Crude Oil Pipelines

Operating Pipelines and other Takeaway Capacity				
Operator	Destination	Name	Capacity (MBPD)	Completion
<b>Total Operating</b>			<b>0</b>	
Proposed Expansions				
Operator	Destination	Name	Capacity (MBPD)	Completion
<b>Operating + Planned</b>			<b>0</b>	

<sup>(1)</sup> Terminate at Enbridge Mainline, which provides access to downstream markets

<sup>(2)</sup> Wider regional differentials would be necessary to incentivize sustained rail movements above ~250 MBPD

## Appendix 5 - Table 7

### Western Canadian Sedimentary Basin Crude Oil Pipelines

Operating Pipelines				
Operator	Destination	Name	Capacity (MBPD)	Completion
Likely Expansions				
Operator	Destination	Name	Capacity (MBPD)	Completion
Cancelled / Deferred				
Operator	Origin	Name	Capacity (MBPD)	Completion

<sup>(1)</sup>Represents portion available to WCSB crude / condensate; Includes Line 3 Replacement

<sup>(2)</sup>Represents portion available to WCSB crude / condensate; 10% of total capacity is assumed to be dedicated to refined products

<sup>(3)</sup>Represents portion available to WCSB crude / condensate; 5% of expansion capacity is assumed to be dedicated to refined products

**Crude and Refined Products Outlook  
September 2024  
Crude and NGL Production Outlook  
Appendix 6**



**Appendix 6 – Table 1**  
**U.S. Crude Production Outlook**  
 Thousand Barrels per Day

	2016	2017	2018	Actual 2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	Forecast 2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Appalachia																									
Bakken																									
Permian																									
Eagle Ford																									
Niobrara																									
Anadarko																									
Gulf of Mexico																									
Alaska																									
California																									
Other																									
<b>U.S. Total</b>								0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**Appendix 6 – Table 2**  
**U.S. NGL Production Outlook**  
 Thousand Barrels per Day

	Actual						Forecast																	
	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
PADD 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IN, IL & KY	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ND, SD, WI, MN	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
OK, KS, MO	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TX Inland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
New Mexico	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Texas Gulf Coast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LA Gulf Coast	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
N LA / AR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PADD 4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PADD 5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>U.S. Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

### Appendix 6 – Table 3 Canada Crude Production Outlook

Thousand Barrels per Day

	Actual			Forecast																		
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
Eastern Canada Light																						
Eastern Canada Hvy																						
<b>Total Eastern Canada</b>																						
W Canada Light																						
W Canada Condensate																						
W Canada Conv Hvy																						
W Canada Upgraded Bitumen <sup>(1)</sup>																						
<u>W Canada Non-Upgraded Bitumen</u>																						
<b>Total Western Canada</b>																						
<b>Total Canada Crude Oil Production</b>																						

(1) Includes partially and fully upgraded bitumen

**Appendix 6 – Table 4**  
**Western Canada Supply (Incl. Diluent)**

Thousand Barrels per Day

	Actual			Forecast																		
	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	
W Canada Lt																						
W Canada Condensate																						
W Canada Conv Hvy																						
W Canada Fully Upgraded Bitumen																						
Synthetic / Bitumen Blend (SynBit)																						
Partially Upgraded Bitumen(1)																						
W Canada Whole Bitumen																						
W Canada DilBit																						
Total Diluent Demand																						
Refinery Diluent Production																						
Local Condensate Used as Diluent																						
Local Lt Crude Used as Diluent																						
<u>Imported Diluent Demand</u>																						
<b>Total W Canadian Supply (Incl Imported Diluent)</b>																						
<b>Western Canadian Lt/Med Supply</b>																						
<b>Western Canadian Heavy Supply</b>																						