

Vol. 42 No. 9

Published October 19, 2018

September 2018

EXECUTIVE SUMMARY

As the U.S. produced a **record 11.0 million barrels per day (mb/d) in September**, U.S. liquid fuels production grew **2.2 mb/d** year-over-year (y/y), and the U.S. met virtually all global oil demand growth. As supply increased, crude oil inventories also rose in September but remained nearly 14 percent below those of September 2017.

With seasonal slowing after the summer driving season, U.S. petroleum demand slowed to 20.1 mb/d in September from 20.8 mb/d in August. Despite weaker demand, product inventories fell between August and September as refinery throughput slowed due to scheduled maintenance turnarounds.

Consequently, the market remained balanced in a way that continued to support prices. West Texas Intermediate (WTI) oil averaged \$70.23 per barrel in September, up \$2.17 per barrel from August. By contrast, international Brent crude oil prices averaged \$78.89 per barrel, up \$6.36 from August. Higher international prices reflected a market that has grappled with geopolitical uncertainties and the effects of Iranian sanctions.

Last month we highlighted U.S. petroleum exports decreased 1.3 mb/d between June and August. Census data confirm shifts by U.S. trading partners, especially China which purchased \$1 billion of U.S. petroleum in June but **none** in August. Decreases were also evident (in percent of value) for Brazil (56 percent), India (19 percent), Italy (54 percent), The Netherlands (60 percent), and Singapore (30 percent). We expected the U.S. would find alternative buyers, perhaps at discounted prices. Subsequently, the price difference between Brent and WTI crude oil nearly doubled to \$8.66 per barrel between August and September, and U.S. petroleum exports of 7.4 mb/d in September rose 0.9 mb/d from August, which was the largest monthly increase on record.

SEPTEMBER HIGHLIGHTS (Click hyperlinks to advance to any section)

Demand

- **U.S. petroleum demand slowed to 20.1 mb/d.**
 - Gasoline fell below year-ago levels.
 - Easing of strong recent diesel and freight-driven demand.
 - Strongest year-to-date jet fuel demand on record.
 - Residual fuel oil demand growth solid with accelerated marine shipping activity.
 - Refinery and petrochemical feedstock demand up more than 0.5 mb/d since September 2017.

Prices & Macroeconomy

- **Global and U.S. oil prices and volatility diverged.**
- **Interest rates rose along with a solid economy.**

Supply

- **New U.S. production crude oil production record (11.0 mb/d).**

International trade

- **U.S. petroleum exports rebounded.**

Industry operations

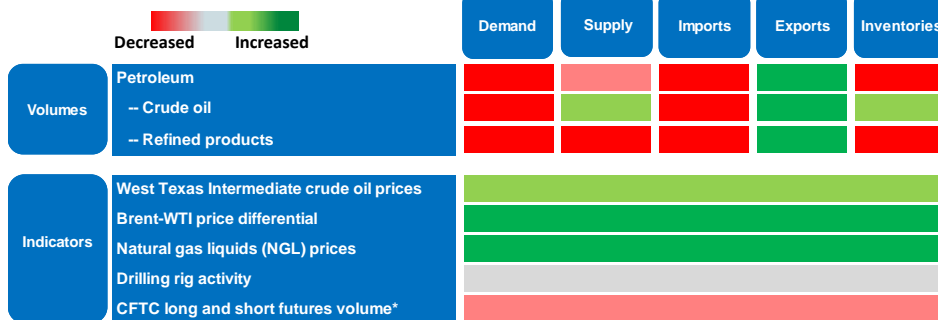
- **Record refinery throughput for September (17.4 mb/d) and year-to-date (17.9 mb/d).**

Inventories

- **U.S. petroleum inventories stable in the 5-year range.**

Monthly Statistical Report heat map – September 2018

Heat map of monthly percentage changes



* Boldest colored increases and decreases reflect changes vs. prior month that are in the top or bottom quartile for the past five years
sources: API Monthly Statistical Report, EIA, CFTC, Baker Hughes

Highlights for September 2018, compared with August 2018

- Exports recovered as U.S. oil prices were discounted up to \$10 per barrel below international ones
- Between August and September, total demand fell 730 kb/d while refinery throughput fell 580 kb/d
- Total inventories fell, but crude oil and refined products moved in opposite directions

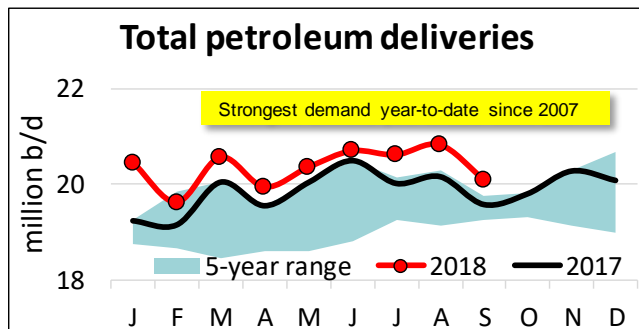


American Petroleum Institute

Details by section

Demand

U.S. petroleum demand slowed to 20.1 mb/d

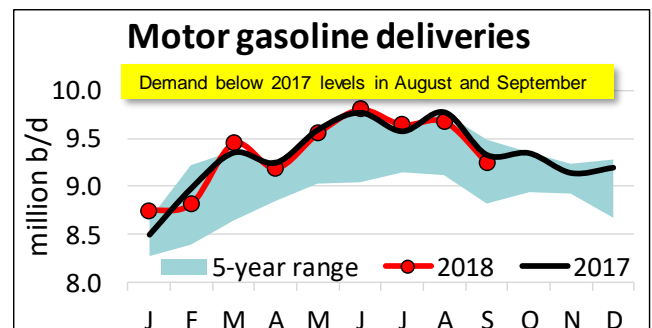


U.S. petroleum demand, as measured by total domestic petroleum deliveries, was 20.1 mb/d in September, down by 3.5 percent from August but up by 2.4 percent compared with September 2017. The 0.7 mb/d slowing between August and September was the most pronounced since 2012, but the overall level of demand continued to reflect solid economic activity.

Through the first three quarters of the year, petroleum demand remained at its strongest since 2007, averaging 20.4 mb/d. This was an increase of nearly 0.5 mb/d over the same period in 2017.

Gasoline

Gasoline demand fell below year-ago levels



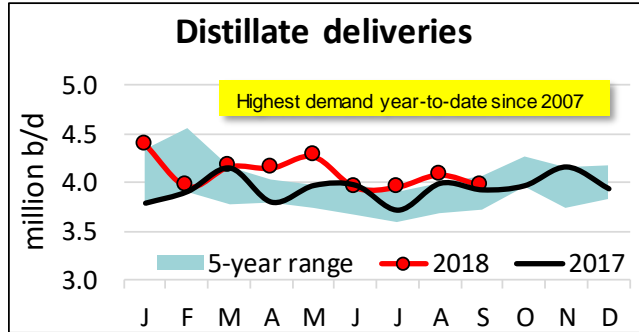
In 49 of the last 50 years, gasoline demand slowed between August and September as the summer driving season ended. This year was no different. Consumer gasoline demand, measured by total motor gasoline deliveries, was 9.3 mb/d in September, which was a decrease of 4.4 percent from August and 1.4 percent from September 2017.

September 2018 was the second consecutive month in which gasoline demand trailed 2017 levels. Although crude oil price rose, with lower demand the average price of regular-grade gasoline in September held steady at \$2.92 per gallon in September.

In September, demand for reformulated-type gasoline, which is consumed primarily in urban areas, increased by 3.8 percent y/y to 3.1 mb/d. By contrast, conventional gasoline is used more in rural areas and decreased 3.7 percent y/y to 6.2 mb/d.

Distillate Fuel Oil

Easing of strong recent diesel and freight-driven demand



In September, distillate deliveries of 4.0 mb/d decreased by 2.7 percent from August but remained up by 1.4 percent compared with September 2017. Through the first nine months of the year, distillate demand was at its highest since 2007.

About 97.0 percent of distillate demand in September was for ultra-low sulfur distillate (ULSD), which is driven by road freight transportation activity. The Bureau of Labor Statistics’ (BLS) Producer Price Index for freight trucking increased by 7.8 percent y/y in September but slowed for the third consecutive month.

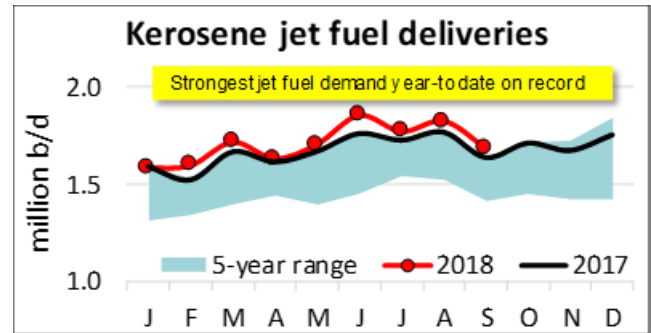
The remaining 3.0 percent of distillate demand was high sulfur distillate fuel (HSD), which is a heating fuel in the residential and commercial sectors and a marine fuel when blended to upgrade heavy fuel oil. In September, HSD deliveries decreased 31.1 percent from August and 35.4 percent versus September 2017. This was a decrease from unseasonally strong demand in August, and monthly changes in HSD demand have been volatile this year with one standard deviation being plus or minus 28 percent.

Kerosene Jet Fuel

Strongest year-to-date jet fuel demand on record

Jet fuel demand growth has remained solid. In September, kerosene jet fuel deliveries of 1.7 mb/d

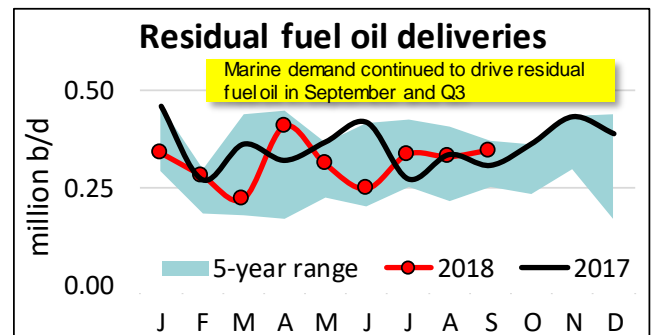
increased by 3.7 percent compared with September 2017. This was the second strongest September monthly demand on record and highest since 2000. Year-to-date through September, jet fuel demand is by a narrow margin at its highest on record.



The [International Air Transport Association \(IATA\)](#) reported that U.S. domestic air passenger kilometers increased by 5.2 percent in August compared with August 2017. The pace of annual growth slowed in recent months, but the IATA attributed it to “developments a year ago rather than any change in the current healthy trend.”

Residual Fuel Oil

Residual fuel oil demand growth solid with accelerated marine shipping activity

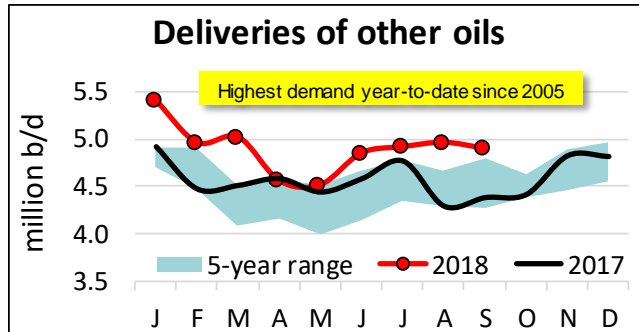


Residual fuel oil is used in electric power production, space heating, vessel bunkering and other industrial applications. Residual fuel oil was 348 thousand barrels per day (kb/d) in September, an increase of 5.1 percent from August and 15.2 percent above September 2017. In September, the number of heating degree days was similar one year ago, according to [EIA estimates](#). However, marine shipping activity has accelerated. As Zvi Schreiber, CEO of Freightos, [noted](#), “as the China-U.S. tariff war ratcheted up, many U.S. importers stocked up

in advance of the high-turnover Thanksgiving and Christmas season.”

Other Oils

Refinery and petrochemical feedstock demand up more than 0.5 mb/d since September 2017



Refining and petrochemical demand for liquid feedstocks, naphtha, and gasoil (“other oils”) was 4.9 mb/d in September, a decrease of 1.3 percent from August but still 12.1 percent — more than 0.5 mb/d— above September 2017. This reflected solid refining and petrochemical activity and was consistent solid growth suggested by American Chemistry Council’s [Chemical Activity Barometer](#) which rose 4.2 percent y/y in September.

Prices

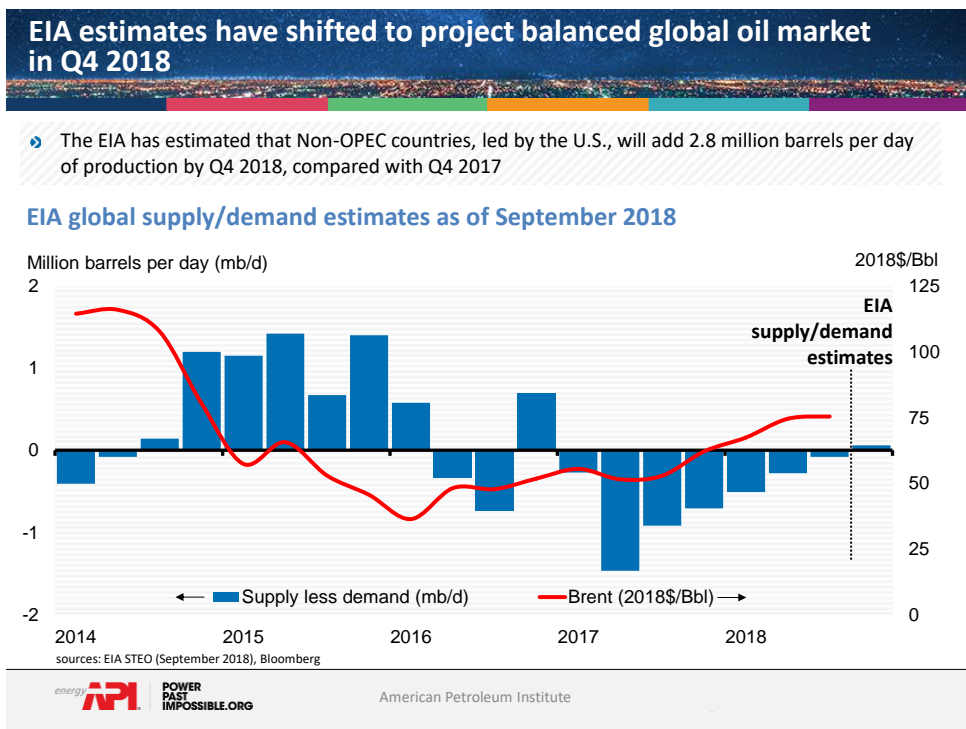
Global and U.S. oil prices and volatility diverged

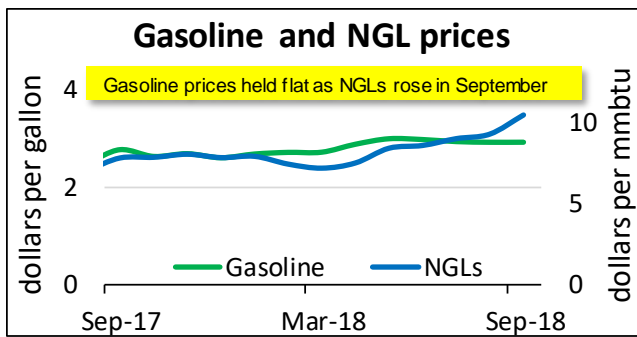
The [EIA](#) and [IEA](#) concurred the global oil market currently is in balance and should remain so in Q4 2018. However, prices escalated with a combination of solid economic and oil demand growth, lower inventories, geopolitical uncertainties, and imminent Iranian sanctions.

Domestic WTI crude oil prices averaged \$70.23 per barrel in September, which was an increase of \$2.17 per barrel from August. By comparison, international Brent crude oil prices averaged \$78.89 per barrel, up \$6.36 from August.

The difference between Brent and WTI crude oil prices widened to \$8.66 per barrel in September from \$4.47 per barrel in August, as strong domestic oil production helped cushion U.S. consumers from rising global prices.

As [EIA shows](#), crude oil remains the top input cost to produce gasoline. As WTI prices in September were within \$0.25 per barrel of where their prices in May, the average U.S. gasoline price varied narrowly within band of 7.0 cents per gallon between May and September, according to [AAA](#) reports. In general, recent U.S. gasoline price volatility has been reduced by strong domestic oil production and refining activity.





Separately, with increased refining and petrochemical demand, natural gas liquids (NGL) prices averaged \$10.45 per million BTU (MMBtu) in September, which was an increase of 12.7 percent from August. According to Bloomberg, each of the constituent NGL prices rose in September from August. Notably, ethane prices at Mt. Belview rose more than 33 percent m/m in September.

Macroeconomy

Interest rates rose along with a solid economy

In September, indicators of the business climate, consumer sentiment, and employment conditions were strong and helped underpin the Fed's decision to raise the Fed Funds rate for the third time in 2018, which stoked financial market volatility in early October.

Leading economic indicators continued to point toward expanding business conditions. The [Institute for Supply Management's Purchasing Managers Index \(PMI\)](#) registered 59.8 in September, which was a decrease of 1.5 percentage points from 61.3 in August. Any value above 50.0 suggests an expansion. New orders, production activity, and employment expanded. Growth occurred in 15 of the 18 manufacturing sectors surveyed, one fewer than in August.

Separately, the [University of Michigan's consumer sentiment index](#) decreased to 99.0 as of early October from a final reading of 100.1 in September. However, the preliminary October reading remained above that of August (96.2). The survey's Chief Economist, Richard Curtin, noted the levels remained favorable, but household income growth fell and price inflation expectations rose.

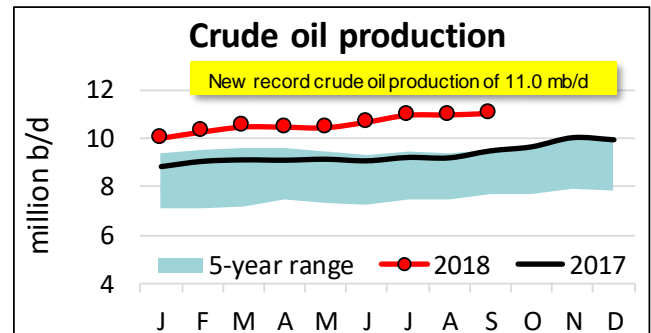
In September, the [Producer Price Index](#) for steel product manufacturing from purchased steel increased by 24.1 percent compared with September 2017 – nearly as much as the United States' 25 percent steel import tariffs.

Labor markets remained tight. U.S. non-farm payrolls grew by 134,000 in September, while the unemployment rate fell to 3.7 percent in September from 3.9 percent in August, according to the [Bureau of Labor Statistics \(BLS\)](#).

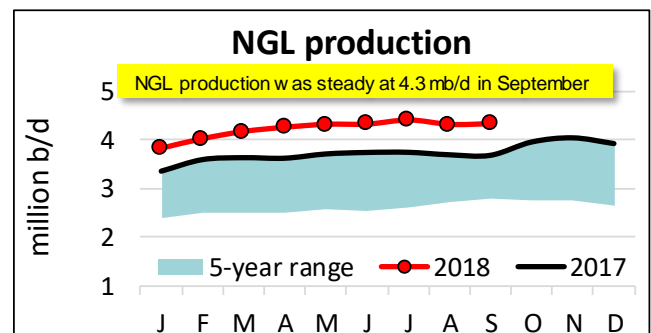
Supply

New U.S. crude oil production record (11.0 mb/d)

U.S. crude oil production expanded to a record 11.0 mb/d in September, up by 63 kb/d from August. The rising production has been consistent with Baker Hughes' reported increases in U.S. oil drilling activity, which increased to an average of 863 oil-targeted rigs in Q3 2018 from 843 in Q2 2018.

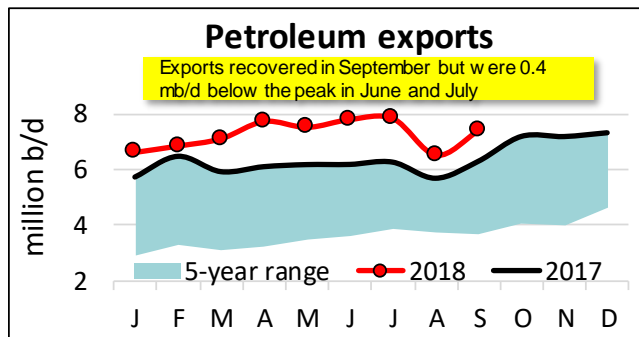


Natural gas liquids (NGL) production, a co-product of natural gas production, held steady near record levels with 4.3 mb/d in September, the same as in August and down 0.1 mb/d from July. Through the first three quarters of the year, NGL production has been the highest on record.



International trade

U.S. petroleum exports rebounded



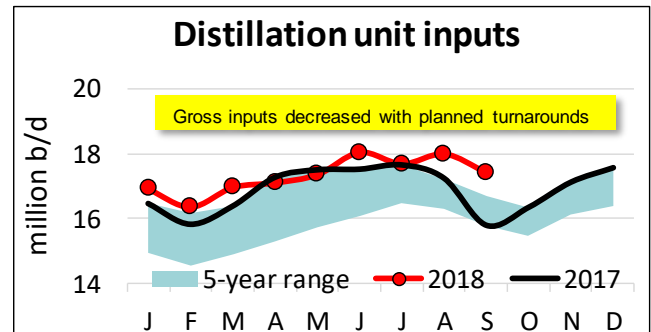
Last month we highlighted U.S. petroleum exports decreased 1.3 mb/d between June and August. [Census](#) data confirm shifts by U.S. trading partners, especially China which purchased \$1 billion of U.S. petroleum in June but none in August. Decreases were also evident (in percent of value) for Brazil (56 percent), India (19 percent), Italy (54 percent), The Netherlands (60 percent), and Singapore (30 percent).

After China and Canada, India has been the next largest market for U.S. petroleum exports. However, India’s oil minister reaffirmed the country will [continue to import Iranian crude](#) despite the re-imposition of sanctions. Jainam Shah of Pandit Deendayal Petroleum University additionally explained many Indian refineries are geared to take Iranian crude, and thanks to favorable credit terms and sale on a Cost Insurance and Freight (CIF) basis, where Iran pays costs for freight and insurance of crude delivered to India, India effectively receives a discount of about \$2.50 per barrel that makes Iranian crude oil hard for Indian refiners to replace.

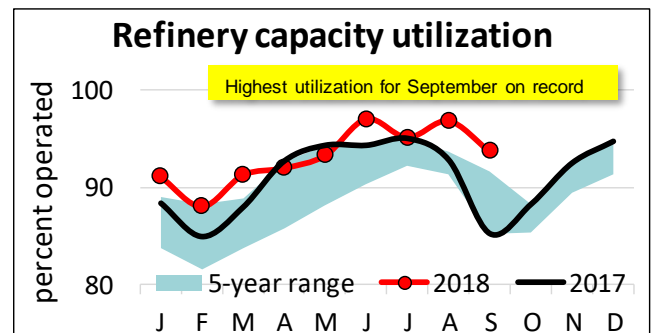
Global oil markets have tended to be resilient, however, so we expected the U.S. would find alternative buyers, perhaps at discounted prices. Subsequently, the price difference between Brent and WTI crude oil nearly doubled to \$8.66 per barrel between August and September, and U.S. petroleum exports of 7.4 mb/d rose by 0.9 mb/d from August, the largest monthly increase on record.

Industry operations

Record refinery throughput for September (17.4 mb/d) and year-to-date (17.9 mb/d)

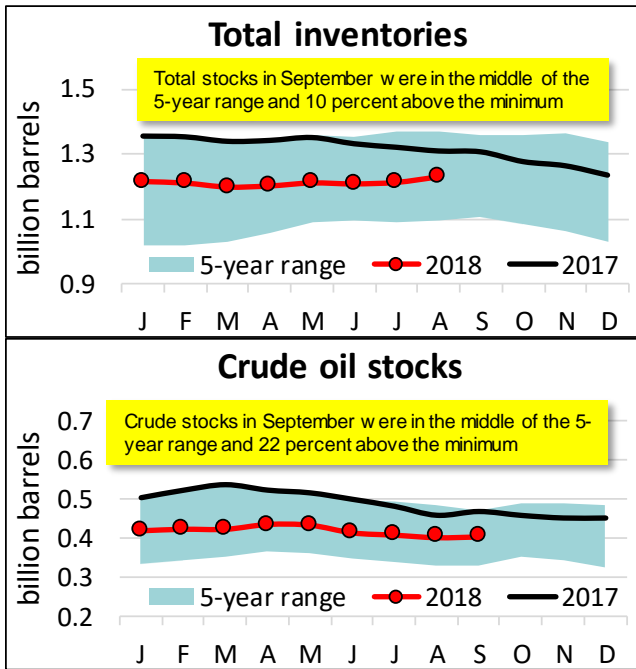


Refinery gross inputs decreased by 0.5 mb/d between August and September due to normal seasonality and scheduled maintenance turnarounds. However, U.S. refineries still set a record for the month of September with gross inputs of 17.4 mb/d and ran at their second highest percent of capacity operated (93.7 percent) for the month. Through the first three quarters of the year, refinery throughput of 17.9 mb/d is the highest on record.



Inventories

U.S. petroleum inventories stable in the 5-year range



Total petroleum inventories in September remained steady and in the middle of the five-year range at 1.21 billion barrels. With increased monthly crude oil production coupled with slowed refinery throughput between August and September, crude oil inventories increased 0.4 percent m/m but remained down 13.7 percent compared with September 2017.

ESTIMATED UNITED STATES PETROLEUM BALANCE¹
(Daily average in thousands of 42 gallon barrels)

Disposition and Supply	September			Year-to-Date		
	2018 ²	2017	% Change	2018 ³	2017	% Change
Disposition:						
Total motor gasoline.....	9,250	9,378	(1.4)	9,334	9,345	(0.1)
Finished reformulated.....	3,085	2,973	3.8	3,140	3,112	0.9
Finished conventional.....	6,165	6,404	(3.7)	6,209	6,234	(0.4)
Kerosene-jet.....	1,688	1,627	3.7	1,718	1,668	3.0
Distillate fuel oil.....	3,974	3,921	1.4	4,104	3,907	5.0
≤ 500 ppm sulfur.....	3,870	3,760	2.9	3,941	3,744	5.3
≤ 15 ppm sulfur.....	3,866	3,760	2.8	3,932	3,737	5.2
> 500 ppm sulfur.....	104	161	(35.4)	164	163	0.6
Residual fuel oil.....	348	302	15.2	311	341	(8.8)
All other oils (including crude losses)	4,898	4,368	12.1	4,902	4,621	6.1
Reclassified ⁴	(55)	45	na	21	29	na
Total domestic product supplied.....	20,103	19,641	2.4	20,391	19,912	2.4
Exports.....	7,419	6,289	18.0	7,232	6,044	19.7
Total disposition.....	27,522	25,929	6.1	27,623	25,956	6.4
Supply:						
Domestic liquids production						
Crude oil (including condensate).....	11,042	9,495	16.3	10,477	9,070	15.5
Natural gas liquids.....	4,334	3,731	16.2	4,182	3,656	14.4
Other supply ⁵	1,238	1,198	3.3	1,246	1,205	3.4
Total domestic supply.....	16,614	14,424	15.2	15,905	13,932	14.2
Imports:						
Crude oil (excluding SPR imports).....	7,892	7,324	7.8	7,976	8,108	(1.6)
From Canada.....	3,662	3,397	7.8	3,715	3,441	8.0
All other.....	4,230	3,926	7.7	4,260	4,667	(8.7)
Products.....	2,507	2,429	3.2	2,265	2,138	6.0
Total motor gasoline (incl. blend.comp)....	618	803	(23.0)	713	664	7.4
All other.....	1,889	1,626	16.2	1,552	1,474	5.3
Total imports.....	10,399	9,752	6.6	10,241	10,246	(0.0)
Total supply.....	27,013	24,176	11.7	26,146	24,178	8.1
Stock change, all oils.....	(509)	(1,753)	na	(1,477)	(1,778)	na
Refinery Operations:						
Input to crude distillation units.....	17,418	15,788	10.3	17,342	16,990	2.1
Gasoline production.....	9,985	9,778	2.1	10,012	9,888	1.3
Kerosene-jet production.....	1,861	1,665	11.8	1,816	1,706	6.4
Distillate fuel production.....	5,313	4,560	16.5	5,126	4,950	3.6
Residual fuel production.....	374	459	(18.5)	415	434	(4.3)
Operable capacity.....	18,599	18,496	0.6	18,584	18,583	0.0
Refinery utilization ⁶	93.7%	85.4%	na	93.3%	91.4%	na
Crude oil runs.....	17,131	15,460	10.8	17,004	16,660	2.1

1. Total supply, i.e., production plus imports adjusted for net stock change is equal to total disposition from primary storage. Total disposition from primary storage less exports equals total domestic products supplied. Information contained in this report is derived from information published in the API *Weekly Statistical Bulletin* and is based on historical analysis of the industry. All data reflect the most current information available to the API and include all previously published revisions.

2. Based on API estimated data converted to a monthly basis.

3. Data for most current two months are API estimates. Other data come from U.S. Energy Information Administration (including any adjustments).

4. An adjustment to avoid double counting resulting from differences in product classifications among different refineries and blenders.

5. Includes unaccounted-for crude oil, withdrawals from the SPR when they occur, processing gain, field production of other hydrocarbons and alcohol, and downstream blending of ethanol.

6. Represents "Input to crude oil distillation units" as a percent of "Operable capacity".

R: Revised. na: Not available.

ESTIMATED UNITED STATES PETROLEUM BALANCE¹
(Daily average in thousands of 42 gallon barrels)

	September 2018	August 2018	September 2017	% Change From	
				Month Ago	Year Ago
Stocks (at month-end, in millions of barrels):					
Crude oil (excluding lease & SPR stocks).....	405.1	403.3	469.6	0.4	(13.7)
Unfinished oils.....	89.6	88.1	91.6	1.7	(2.1)
Total motor gasoline.....	235.3	234.3	223.2	0.4	5.4
Finished reformulated.....	0.0	0.0	0.0	(0.1)	(2.8)
Finished conventional.....	24.7	23.3	21.7	6.0	13.7
Blending components.....	210.6	211.0	201.4	(0.2)	4.5
Kerosene-jet.....	46.8	41.1	43.6	13.9	7.2
Distillate fuel oil.....	135.6	133.1	137.3	1.9	(1.3)
≤ 500 ppm sulfur.....	127.3	125.1	125.7	1.8	1.2
≤ 15 ppm sulfur.....	124.0	121.8	119.0	1.8	4.3
> 500 ppm sulfur.....	8.3	8.0	11.6	3.8	(28.5)
Residual fuel oil.....	28.3	28.1	33.6	0.7	(15.8)
All other oils.....	264.0	276.2 R	305.8	(4.4)	(13.7)
Total all oils.....	1,204.7	1204.2 R	1,304.7	0.0	(7.7)