

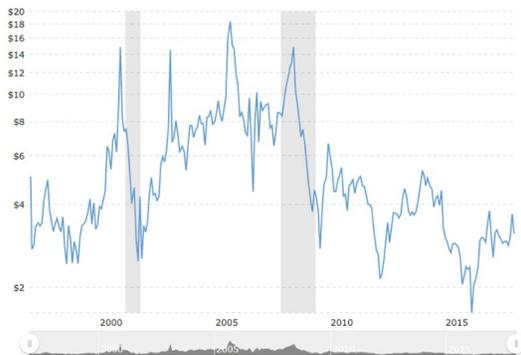


Natural Gas in Underground Storage

The weekly EIA Natural Gas Storage Report advised that there was an **injection of 81Bcf** (billion cubic feet) into Underground Storage for the week ending October 12th, 2018.

This is 1Bcf below the median forecast of an 82Bcf injection, the average prediction of sector analysts and traders in the Dow Jones Newswires weekly survey. The injection one year ago was 50Bcf and the 5-year average injection is 79Bcf. Storage is **601Bcf below last year** for the same week and **605Bcf below the 5-year average**. Working gas in storage stands at 3,037Bcf.

[Read More](#)



Natural Gas Pricing

As of 9:20AM CST, November 2018, (the prompt month) Natural Gas was trading at \$3.24, +\$0.03 from one week ago and the 1-Year Spread average was \$2.95, unchanged from one week ago.

Crude Oil Pricing

As of 9:17AM CST, November, 2018, (the prompt month) Light, Sweet Crude on the NYMEX was at **\$69.08**, **-\$2.87** from one week ago.

Crude Oil & Natural Gas

INDEX	UNITS	PRICE	CHANGE	%CHANGE	CONTRACT	TIME (EDT)	2 DAY
CL1.COM WTI Crude Oil (Nymex)	USD/bbl	69.08	-0.67	-0.96%	Nov 2018	10:01 AM	
CO1.COM Brent Crude (ICE)	USD/bbl	79.28	-0.77	-0.96%	Dec 2018	10:01 AM	
CP1.COM Crude Oil (Tokyo)	JPY/bbl	53,180.00	-480.00	-0.89%	Mar 2019	10:05 AM	
NG1.COM Natural Gas (Nymex)	USD/MMBtu	3.24	+0.03	+2.50%	Nov 2018	10:01 AM	

U.S. Petroleum Balance Sheet, Week Ending 10/12/2018

Petroleum Stocks (Million Barrels)	Current Week	10/5/18
	10/12/18	
Crude Oil	1,074.1	1,068.7
Commercial (Excluding SPR) ¹	416.4	410.0
Strategic Petroleum Reserve (SPR) ²	657.6	658.7
Total Motor Gasoline ³	234.2	236.2
Reformulated	0.0	0.0
Conventional	24.6	23.7
Blending Components	209.5	212.5
Fuel Ethanol	24.1	24.0
Kerosene-Type Jet Fuel	45.5	47.4
Distillate Fuel Oil ³	132.6	133.5
15 ppm sulfur and Under ³	117.3	119.5
> 15 ppm to 500 ppm sulfur	4.6	4.3
> 500 ppm sulfur	10.7	9.7
Residual Fuel Oil	29.4	29.0
Propane/Propylene	62.3	60.3
Other Oils ⁴	298.4	299.7
Unfinished Oils	92.8	93.1
Total Stocks (Including SPR) ^{2,3}	1,920.6	1,918.7
Total Stocks (Excluding SPR) ³	1,263.0	1,260.0

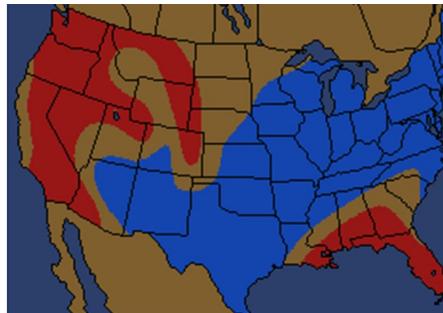
Crude Oil Inventory

US crude inventories **increased by 6.4 million barrels** to 416 million barrels for the week ended October 12th, according to data released yesterday morning by the US Department of Energy. Traders in the Reuters poll projected an increase of 2.5 million barrels.

U.S. Rotary Rigs

U.S. Rotary Rigs drilling for natural gas were +4 at 193 for the week of October 12th. The number of rigs currently drilling for Natural Gas was +8 from last year. US Rigs drilling for oil were +8 at 869. There are 126 more rigs targeting oil than last year. Canadian rigs were +13 at 195 for the week. Rigs targeting oil remain 82% of all US drilling activity.

North American Rig Count				Change		Percent Change	
	10/12/2018	10/05/2018	10/13/2017	Weekly	Annual	Weekly	Annual
Total U.S.	1,063	1,052	928	11	135	1.0%	14.5%
Offshore	23	23	20	0	3	0.0%	15.0%
Land	1,040	1,029	908	11	132	1.1%	14.5%
Inland Waters	3	3	1	0	2	0.0%	200.0%
Oil	869	861	743	8	126	0.9%	17.0%
Percent	81.7%	81.8%	80.1%	-0.1%	1.7%		
Gas	193	189	185	4	8	2.1%	4.3%
Percent	18.2%	18.0%	19.9%	0.2%	-1.8%		
Directional	70	66	79	4	-9	6.1%	-11.4%
Horizontal	927	919	786	8	141	0.9%	17.9%
Vertical	66	67	63	-1	3	-1.5%	4.8%
Gulf of Mexico	22	22	20	0	2	0.0%	10.0%
Gulf Oil	16	17	17	-1	-1	-5.9%	-5.9%
Percent	72.7%	77.3%	85.0%	-4.5%	-12.3%		
Gulf Gas	6	5	3	1	3	20.0%	100.0%
Percent	27.3%	22.7%	15.0%	4.5%	12.3%		
Canada	195	182	212	13	(17)	7.1%	-8.0%
Oil	127	119	112	8	15	6.7%	13.4%
Percent	65.1%	65.4%	52.8%	-0.3%	12.3%		
Gas	68	63	100	5	(32)	7.9%	-32.0%
Percent	34.9%	34.6%	47.2%	0.3%	-12.3%		
North America	1,258	1,234	1,140	24	118	1.9%	10.4%
Prices							
Oil \$/bbl.	\$73.35	\$75.13	\$50.75 (\$1.79)	\$22.59		-2.4%	44.5%
Oil \$/mmbtu	\$12.65	\$12.95	\$8.75 (\$0.31)	\$3.90		-2.4%	44.5%
Gas \$/mmbtu	\$3.25	\$3.14	\$2.92	\$0.10	\$0.32	3.3%	11.1%



Geopolitical

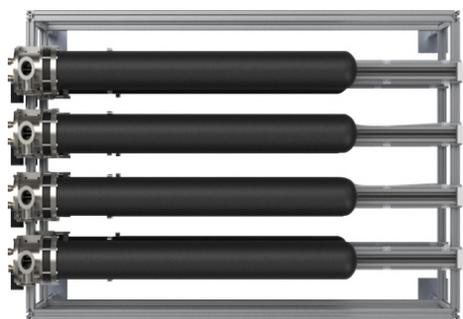
China prepares for life without US LNG: On 24 September, China released a second list of goods which will attract a 10% tariff on imports from the US. Interestingly, LNG did not feature in the first list, but it was included in the second. China also indicated that it may eventually impose a 25% tariff on the US LNG imports. In this piece, we examine how China is preparing to cope without US LNG imports, and what are the implications for US LNG exporters given this recent move.

Weather

The AccuWeather 1-5 day Outlook forecasts below-normal temps for the Northeast quarter of the US and Texas plus the surrounding states. The Northwest and Southeast look to be above-normal. The 6-10 Day Outlook shows a similar forecast.

11-15 Day Outlook forecasts Florida, Texas and much of the South-Central US at below-normal temps with above-normal temps for California, Nevada and parts of other Western states. The 30-day Outlook projects normal temps for most of the US with the exception of the

In 2017, Chinese LNG imports from the US created theoretical demand for just five LNG carriers, so it could be argued that the imposition of a tariff on LNG imports from the US is more symbolic than material. Certainly, imports from the US will be more expensive, as a 10% tariff will push the costs of US LNG to over \$11.00/MMBtu. At this price Chinese buyers will look for alternatives, which is precisely the purpose of tariff. To this end, China is already...

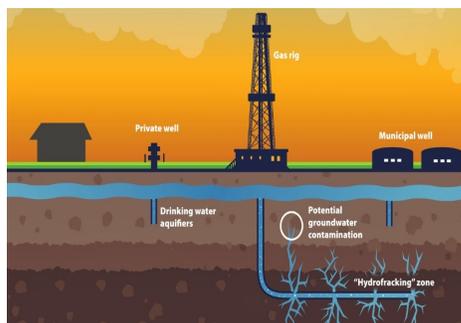


Sustainability and Renewables

Converting Heat Directly into Electricity: Around the world, a vast amount of heat energy is wasted on a daily basis. And yet waste heat represents an enormous and nearly untapped source of plentiful low-cost energy. The largest contributions to this potential energy pool come from electricity generation, transportation, and industrial processes. Current approaches to energy recapture are large, costly and complex, so more than 95% of manufacturing waste heat has no energy recovery solution deployed to capture it. The result – most industrial waste heat is allowed to escape into the atmosphere. A new approach is required to address the capture and conversion of this large and valuable energy resource.

Southeast coastal states and a small part of the West, which are expected to be at above-normal temperatures. There will also be below-normal temps for a swath of the Central states.

The 90-Day Outlook shows normal temps for the entire country, with the exception of the Northeast and Far-North Central States, which are expected to be above-normal.



This Week's Key Take-Away

NYMEX Crude has dropped below \$70 as inventory has ballooned. The pause in pumping in the Gulf of Mexico due to Hurricane Michael was offset by the demand destruction on land and had little affect on overall crude production.

Interesting then that Natural Gas has been trading in a narrow bandwidth around \$3.30, bearing in mind that 3 months ago, it was trading below \$2.80. This \$0.50 movement in Natural Gas translates to approximately a \$0.005 rise in electric prices. However, we have seen a greater rise than that in retail pricing, even as Heat Rates have dropped. The reason (technical) is the concern that Natural Gas prices could rise even more, should winter

60%: Energy lost as heat

95%: Waste heat untapped

14GW: Wheat energy waste

15M: Homes powered

**US manufacturing and household energy data*

MTPV has developed an advanced technology solution to directly convert heat to electricity. The EBLADE™ Power Platform is our solution to meet the ever-growing global demand for electricity, using a 100% clean energy source, while also reducing industrial thermal emissions...

could be in excess of current predictions. With Natural Gas inventory over 600 Billion Cubic Feet below last year, Retail Energy Providers are hedging their bets against a significant rise in prices as US temps and inventory drop.

There used to be a correlation between Natural Gas prices and Crude prices, as there is a 6-1 (Btu) ratio relationship between Crude and Natural Gas. With Crude at \$69, Natural Gas should be at \$11.50. But the 2 no longer move in lock-step and are in fact, decoupled at this point. Crude used to drag Natural Gas with it but we now see that this is no longer the case.

Next Day On-Peak Power (traded for 10/17/2018)		
ISO-NE Mass Hub \$36.87	MISO Indiana Hub \$36.61	NYISO Zone G \$36.35
PJM West Hub \$31.65	ERCOT North \$35.76	CAISO SP15 \$44.32



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