

# The crude oil spectrum

S&P Global Platts has created a periodic table of oil highlighting the vast array of crude qualities that make up the global barrel. Eklavya Gupte and John-Laurent Tronche look at some of the key grades making waves in the market today

<b>Trg</b> 0.00% 73.10°	<b>Slp</b> 0.05% 69.70°	<b>Sah</b> 0.10% 43.19°	<b>ADCo</b> 0.11% 58.40°	<b>As</b> 0.17% 49.52°	<b>Nem</b> 0.21% 39.80°														
<b>Alg</b> 0.00% 68.70°	<b>Cos</b> 0.04% 48.20°	<b>Ba</b> 0.10% 42.80°	<b>Nio</b> 0.13% 40.00°	<b>EF</b> 0.17% 45.20°	<b>Ose</b> 0.20% 39.60°	<b>SP</b> 0.26% 58.40°	<b>Es</b> 0.37% 36.70°	<b>WTI</b> 0.42% 40.80°	<b>Mas</b> 0.51% 34.10°	<b>CPC</b> 0.54% 46.20°	<b>Mb</b> 0.79% 40.20°	<b>ArEL</b> 1.00% 39.21°	<b>QtL</b> 1.22% 41.30°	<b>IrL</b> 1.46% 33.60°	<b>Lav</b> 1.93% 34.00°	<b>Kir</b> 2.23% 34.30°	<b>Kw</b> 2.52% 31.00°	<b>Bashvy</b> 4.20% 23.55°	
<b>NWSC</b> 0.01% 63.00°	<b>Ag</b> 0.04% 47.88°	<b>Sha</b> 0.09% 42.20°	<b>Aga</b> 0.10% 37.40°	<b>BH</b> 0.17% 39.30°	<b>Eko</b> 0.19% 38.50°	<b>QDFC</b> 0.26% 57.00°	<b>LLS</b> 0.33% 36.67°	<b>BNB</b> 0.40% 37.50°	<b>Hi</b> 0.53% 33.00°	<b>Fo</b> 0.54% 37.31°	<b>Hu</b> 0.64% 28.30°	<b>Das</b> 1.11% 39.20°	<b>Ur</b> 1.25% 31.30°	<b>Pos</b> 1.67% 31.50°	<b>Uza</b> 1.84% 33.90°	<b>Db</b> 2.13% 30.40°	<b>ArM</b> 2.54% 30.90°	<b>Kl</b> 3.89% 21.30°	
<b>EFC</b> 0.04% 55.00°	<b>P44</b> 0.05% 44.00°	<b>P35</b> 0.05% 35.00°	<b>Ql</b> 0.13% 36.00°	<b>Az</b> 0.14% 35.01°	<b>Jb</b> 0.25% 37.60°	<b>Dr</b> 0.29% 33.00°	<b>Pl</b> 0.37% 33.20°	<b>Ko</b> 0.37% 31.70°	<b>Med</b> 0.47% 32.90°	<b>SiL</b> 0.57% 35.10°	<b>Gr</b> 0.70% 25.74°	<b>Ol</b> 0.89% 38.70°	<b>Om</b> 1.38% 30.50°	<b>Sue</b> 1.64% 29.90°	<b>ArL</b> 1.96% 33.30°	<b>ALS</b> 2.37% 28.06°	<b>BasL</b> 3.16% 28.80°	<b>WCS</b> 3.59% 20.90°	
<b>Alb</b> 0.02% 51.70°	<b>Nk</b> 0.04% 42.40°	<b>Se</b> 0.09% 34.50°	<b>Cab</b> 0.12% 32.62°	<b>Er</b> 0.16% 34.80°	<b>BL</b> 0.18% 32.75°	<b>Zaf</b> 0.25% 30.90°	<b>WR</b> 0.31% 30.00°	<b>Gir</b> 0.42% 29.70	<b>Sch</b> 0.44% 24.90°	<b>ESPO</b> 0.55% 34.70°	<b>Vs</b> 0.83% 24.27°	<b>Th</b> 0.90% 32.30°	<b>Cu</b> 1.38% 28.80°	<b>IrHvy</b> 1.77% 29.50°	<b>Ma</b> 1.82% 29.99°	<b>RGh</b> 2.50% 24.00°	<b>ArH</b> 2.75% 27.80°	<b>Sor</b> 3.38% 19.2°	
<b>ArSL</b> 0.04% 50.60°	<b>BHo</b> 0.04% 38.60°	<b>Rab</b> 0.07% 33.42°	<b>Daq</b> 0.11% 32.30°	<b>Co</b> 0.14% 30.68°	<b>CS</b> 0.20% 26.30°	<b>For</b> 0.28% 30.30°	<b>Dj</b> 0.34% 27.60°	<b>Paz</b> 0.41% 25.60°	<b>Cl</b> 0.47% 23.60°	<b>RnHvy</b> 0.61% 22.80°	<b>Captain</b> 0.70% 19.20°	<b>Sh</b> 0.84% 24.20°	<b>Al</b> 1.26% 19.60°	<b>Or</b> 1.63% 23.31°	<b>VnMdm</b> 1.85% 27.00°	<b>My</b> 2.30% 21.80°	<b>Miss</b> 2.95% 27.60°	<b>D16</b> 4.10% 16.00°	
<b>Tap</b> 0.03% 44.60°	<b>VG</b> 0.04% 16.70°	<b>Dob</b> 0.09% 21.40°	<b>Dar</b> 0.12% 24.99°	<b>Chm</b> 0.13% 26.90°	<b>Esc</b> 0.19% 24.10°	<b>Qin</b> 0.28% 16.50°	<b>Boz</b> 0.29% 16.90°	<b>Eb</b> 0.40% 19.80°	<b>Dal</b> 0.51% 23.20°	<b>Juba</b> 0.56% 17.10°	<b>Kr</b> 0.70% 14.00°	<b>Lo</b> 0.87% 23.30°	<b>Rub</b> 1.33% 12.70°	<b>Ca</b> 1.41% 17.45°	<b>VH1</b> 1.85% 23.50°	<b>Na</b> 1.96% 19.00°	<b>VH2</b> 2.50% 16.00°	<b>Sq</b> 3.50% 9.00°	

The global oil market is brimming with a smorgasbord of crudes, from the Canadian tar sands extracted with the help of steam and sand, to the lightest US condensates whose color mirrors a glass of fine white wine.

Each crude stream possesses its own unique characteristics, and when refined yields varying proportions of different refined products. Understanding crude quality has never been more important, following the dramatic rise in US shale output, which has transformed the composition of the global oil market.

To reflect this change, S&P Global Platts created a periodic table of oil cataloguing 120 of the most important grades on international markets. Like the periodic table of elements, the list starts with the lightest crudes and ends with the heaviest. The grades are classified by their specific gravity, or density, and sulfur content.

Light crude oils have an American Petroleum Institute gravity of 34 degrees or more, medium crudes have a gravity between API 25-34 degrees, and heavy grades are API 25 degrees or lower. Oil grades with sulfur content lower than 0.6% are considered sweet, while those with sulfur content above this level are classed as sour.

Here are a selection of grades that have recently come to the fore, in a turbulent year for the petroleum supply chain.

## Ba

### Bakken

Quality: **Light Sweet**  
Country: **US**  
Output (b/d): **1,249,000**  
Sulfur level (%): **0.10**  
Specific gravity (C): **42.80**

## Light sweet

Light sweets generally trade at a premium to Platts Dated Brent due to their strong yields of gasoline and distillates. Some

condensates are priced at a slight discount to Platts Dated Brent because of their high naphtha content.

The US crude oil production boom that has taken place over the past decade has drawn attention to West Texas and its flagship grade WTI. However, the Bakken-Three Forks formations of North Dakota and Wyoming, often

lumped together as “Bakken,” also produce a significant amount of light sweet crude that makes its way to refineries in the US Midwest and US Gulf Coast, and occasionally into the global market.

The field produces almost 1.5 million b/d of Bakken, a light sweet crude that typically has an API of between 41-43.7 degrees and a sulfur content of 0.12%. Its importance in both the domestic and international markets has grown significantly since the start-up of the Dakota Access Pipeline (DAPL) and its southern leg, the Energy Transfer Crude Oil Pipeline (ETCOP) in June 2017.

Together, these form a 570,000 b/d system that moves oil from the Williston Basin up near the US border with Canada, all the way down to the Texas Gulf Coast at Beaumont and Nederland. Bakken trades relative to NYMEX WTI from its point of origin down to the pipeline’s terminus. Along the US Gulf Coast, it has averaged a \$4.50/b premium to NYMEX WTI in 2019.

## Mb

### Murban

Quality: **Light Sour**  
Country: **UAE**  
Output (b/d): **1,584,000**  
Sulfur level (%): **0.79**  
Specific gravity (C): **40.20**

## Light sour

Light sour crudes boast a high fuel oil and gasoil content but are also high in sulfur. They normally trade at a slight premium to the

Platts Dubai sour benchmark.

Crudes that are both light and high in sulfur are a rarity and Murban, produced on shore from the Abu Dhabi emirate of the UAE, is one of the biggest streams of such oil. Due to its burgeoning production and popularity among Asian refiners, Murban is emerging as a key Middle East crude benchmark.

The crude accounts for more than half of UAE production at around 1.6 million b/d on average, and is one of the major streams in the Middle East with a large spot market. The Abu Dhabi National Oil Company and Intercontinental Exchange are in the process of

launching a futures contract for Abu Dhabi’s flagship Murban grade next year.

A surge in arbitrage flows into Asia, as well as rising US crude exports, have raised competition for Middle East producers at a time when Asian refiners are striving to diversify their crude sources. Murban is also a deliverable grade in the Platts benchmark Dubai and Oman crude assessment process. At least 40% of Murban onshore production is freely traded. The crude variety is exported from Jebel Dhanna and Fujairah.

## BL

### Bonny Light

Quality: **Medium Sweet**  
Country: **Nigeria**  
Output (b/d): **225,000**  
Sulfur level (%): **0.18**  
Specific gravity (C): **32.75**

## Medium sweet

Medium sweets are very attractive to both simple and complex refineries due to their high middle distillate yields, and are generally priced at a premium to Platts Dated Brent.

Bonny Light is one of the most prized crudes in the world due to its high gasoline content. Produced onshore in Nigeria’s oil rich-rich Niger Delta, it is very popular with refiners globally, and production has averaged around 250,000 b/d recently.

India, the main driver of oil demand growth, is the largest buyer of this Nigerian grade. However, militants in the Niger Delta have caused disruptions to pipelines, regularly targeting the key infrastructure tied to the crude and export flows. Bonny Light crude loadings have been under force majeure at least three different times in the past 12 months due to pipeline leaks caused by attacks by militants.

Many Nigerian crudes are either light or medium sweet, yielding generous amount of diesel, jet fuel and gasoline, making them more expensive than sour crudes. Crudes like Bonny Light are now competing with US shale, due to the quality similarities, and this has greatly altered the direction of crude flows globally.

## ArL

### Arab Light

Quality: **Medium Sour**  
Country: **Saudi Arabia**  
Output (b/d): **5,502,000**  
Sulfur level (%): **1.96**  
Specific gravity (C): **33.30**

## Medium sour

Medium sour crudes form the staple diet of complex refineries. They generally trade at a discount to Platts Dated Brent but recently prices for some grades have

strengthened, due to the supply tightness of such crudes globally.

Arab Light is the key export grade for Saudi Arabia, the world’s largest exporter of crude. This crude is a mainstay of the key Asian refining hubs of China, India, Japan and South Korea, making it very significant for the world oil market.

Despite being a high-sulfur crude, it boasts a medium-gravity API, making it a well-rounded grade for refiners to process. When refined it produces a wide variety of products, especially for those with complex processing units.

Arab Light is mainly produced from the giant Ghawar and Khurais fields, but it also contains volumes from other fields. The Saudi grades most affected by attacks on the country’s oil infrastructure in September were Arab Light and Arab Extra Light.

The Abqaiq facility, which was damaged in the attacks, helps process Arab Light and also Arab Extra Light. The Abqaiq plant has the ability to depressurize, desulfurize, and de-gas crude production, making it safe for pipeline transport.

## Dob

### Doba

Quality: **Heavy Sweet**  
Country: **Chad**  
Output (b/d): **150,000**  
Sulfur level (%): **0.09**  
Specific gravity (C): **21.40**

## Heavy sweet

Heavy sweets are traditionally priced at a discount to Platts Dated Brent but their popularity has broadened. They have

become more valuable ahead of the IMO 2020 sulfur cap due to their very low sulfur content.

Named after a city in southern Chad where vast amounts of oil was discovered, this crude has emerged as one of the coveted barrels as the clamor for cleaner fuels grows louder.



