

Methodology and Specifications Guide

Global Crude Refinery Values and Netbacks

Latest update: January 2021

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INTRODUCTION

Platts' methodologies are designed to produce price assessments that are representative of market value, and of the particular markets to which they relate. Methodology documents describe the specifications for various products reflected by Platts' assessments and indexes, the processes and standards Platts adheres to in collecting data, and the methods by which Platts arrives at final assessment values for publication.

Platts discloses publicly the days of publication for its price assessments and indexes, and the times during each trading day in which Platts considers transactions in determining its assessments and index levels. This schedule of publication is available on Platts' website, at the following link: <http://www.platts.com/HolidayHome>.

The dates of publication and the assessment periods are subject to change in the event of outside circumstances that affect Platts' ability to adhere to its normal publication schedule. Such circumstances include network outages, power failures, acts of terrorism and other situations that result in an interruption in Platts' operations at one or more of its worldwide offices. In the event that any such circumstance occurs, Platts will endeavor, whenever feasible, to communicate publicly any changes to its publication schedule and assessment periods, with as much advance notice as possible.

All Platts methodologies reflect Platts' commitment to maintaining best practices in price reporting.

Platts' methodologies have evolved to reflect changing market conditions through time and will continue to evolve as markets change. A revision history, a cumulative summary of changes to this and future updates, is included at the end of the methodology.

How this methodology statement is organized

This description of methodology for indexes and assessments is divided into seven major parts (I-VII) that parallel the entire process of producing the end-of-day price values.

- Part I describes what goes into Platts indexes and price values, including details on what data market participants are expected to submit, the process for submitting data, criteria for timeliness of market data submissions, as well as the components of published data.
- Part II describes any security and confidentiality practices that Platts uses in handling and treating data, including the separation between Platts price reporting and its news reporting.
- Part III is a detailed account of how Platts collects bids, offers, trades and other market data, and what Platts does with the data to formulate its indexes and assessments. It includes descriptions of the methods that Platts uses for reviewing data, and the methods used to convert raw data into indexes and assessments, including the procedures used to identify anomalous data. This section describes how and when judgment is applied in this process, the basis upon which transaction data may be excluded from a price assessment, and the relative importance assigned to each criterion used in forming the price assessment. This section describes the minimum amount of transaction data required for a particular price assessment to be published, and the criteria for determining which values are indexes, and which are assessments, based on reported transactions and other market information. Finally, this section describes how Platts addresses assessment periods where one or more reporting entities submit market data that constitute a significant proportion of the total data upon which the assessment is based.

- Part IV explains the process for verifying that published prices comply with Platts' standards.
- Part V lays out the verification and correction process for revising published prices and the criteria Platts uses to determine when it publishes a correction.
- Part VI explains how users of Platts assessments and indexes can contact Platts for clarifications of data that has been published, or to share a complaint. It also describes how to find out more about Platts' complaints policies.
- Part VII is a list of detailed specifications for the trading locations and products for which Platts publishes indexes or assessments in this commodity. This section describes why specific units of measurement are used, and what conversion factors are used to move between units of measurement, where relevant.

PART I: DATA QUALITY AND DATA SUBMISSION

Platts' objective is to ensure that the submission of transactional information and other data inputs that editors use as the basis for their price assessments is of the highest quality. Ensuring that data used in Platts assessments is of high quality is crucial to maintaining the integrity of Platts' various price assessment processes.

Platts Daily Yield is a crude oil yield and netback valuation system built on Platts' daily refined product assessments for refined petroleum and petrochemical products, and refinery models constructed by [Turner, Mason & Co.](#), Dallas-based consulting engineers specializing in the global downstream petroleum business, using its Turner Mason Modeling System (TMMS).

As such, Platts standards concerning data quality and data submission in the underlying refined petroleum and petrochemical prices can be found in the specification guides for those commodities.

PART II: SECURITY AND CONFIDENTIALITY

Data is stored in a secure network, in accordance with Platts' policies and procedures. Platts and Turner Mason have decided to release all of the products used to calculate Platts Daily Yield. However, the actual weightings given to particular products in a refining center—for example, the amount of gasoline from Urals refined in Italy—will remain proprietary.

PART III: CALCULATING INDEXES AND MAKING ASSESSMENTS

The purpose of Platts Daily Yield is to provide an estimate of the value of the products produced from refining a barrel of crude in eight major refining regions, with a netback to the origination point of the crude, based on prevailing freight rates. Platts Daily Yield builds its published yield and netback models through a multi-step process:

Platts and Turner Mason together have been producing Platts Daily Yield since 2002. In that time, together we have engaged in a continual process to identify the world's key crudes, determine what crudes are being refined at what locations, and build models to account for those movements. Turner Mason draws from its extensive knowledge of refinery economics and modeling to build typical cracking, visbreaking and coking refinery models for each of the 8 Platts' refining regions: US Atlantic Coast; US Gulf Coast; US West Coast; US Midcontinent; Caribbean; Amsterdam-Rotterdam-Antwerp (ARA); Italy; and Singapore.

The choice of crudes modeled in each of the regions varies

depending upon the grades of crude generally refined in that region. Most crudes are modeled in 2 modes in a region, cracking and coking or cracking and visbreaking. Some crudes are modeled in only one mode since they would not be processed in the other mode. For example, Forcados, Brass River and Bonny Light are rarely put through a coker. So a coking yield or netback is not provided for those crudes in some areas.

Turner Mason then builds models for all of the crudes, based on assays and other information, to represent what each crude will yield in a region's typical coking, cracking or visbreaking refinery. The main difference among regional models is dictated by regional product specifications and regional refinery complexities. Every crude at every location has a winter model and a summer model. The summer models run from March 1 through August 31; the winter models runs the balance of the year. The difference in models reflects the general practice of refineries maximizing gasoline, naphtha and other light ends during the summer, and maximizing heating oil and distillate output during the winter. They also reflect the different gasoline RVP specifications between summer and winter.

By plugging Platts' daily assessments into the Turner Mason models, Platts Daily Yield provides a yield estimate for all of the crudes modeled at an individual location. Product assessments are normalized to a \$/barrel figure where necessary, and that product's percentage of the total yield is multiplied by its price to provide a valuation. So if the Platts Daily Yield model determines that ULSD is 15% of the output of a barrel of Brent refined in a typical coking refinery on the US Atlantic Coast, the daily Platts ULSD assessment, normalized to \$/barrel, will be multiplied by 0.15. The output of that calculation will be added to similar calculations for all products produced from that barrel. The final number, less refinery variable operating costs, is the yield for that crude. The Platts crude assessment is not part of determining the crude's yield. For example, to determine the cracking yield of Brent at Rotterdam, only product assessments and operating costs are utilized; the price of Brent is not. However, note that the crude netback minus its spot price gives

you the refinery margin.

Crude needs to be transported from an originating port or pipeline terminal. In the case of freight, Platts takes its daily dirty tanker assessments for relevant routes, such as UK Continent to US Gulf, which is expressed as a percentage of the Worldscale 100 rate for a specific route. Worldscale 100 is expressed in \$/mt. The assessment is then divided by 100 and multiplied against the Worldscale 100 base rate for a specific route. So if the Worldscale 100 rate for a given route is \$7 per metric ton, and the Platts' dirty tanker assessment for that route is 150, \$7 is multiplied by 1.5, for a figure of \$10.50 per metric ton. The barrels per metric ton ratio for a specific crude is then divided into \$10.50 to produce a \$/barrel freight figure.

Where spot tanker rates are not relevant, such as for US pipeline grades, a regular survey of current pipeline tariffs will be conducted by Platts to keep transportation variables current. Where crude is sold on a delivered basis, no freight component will be calculated.

The TMMS models include variable costs for purchased fuel gas, electricity and catalyst and chemicals. These costs are specific to each crude, in each region, in a specific operating mode (coking, cracking or visbreaking), in each season. That is, there are close to 600 different models and each model has unique operating costs. The purchased fuel gas and electricity usages for each crude are multiplied by the latest Platts assessment much like the product yields are multiplied by the Platts assessment. The total operating costs are then subtracted from the product yield values to result in the crude yield value.

Platts and Turner Mason collaborate semiannually before the winter/summer switchovers to review changes that have been made in Platts' product assessments, plan for future changes, discuss changes in government specifications that may affect the models, discuss new crudes that are refined in a region, and so on.. Changes and additions are made to the model(s) at the start of each season as needed. Beyond these specific

times for collaboration, Platts and Turner Mason are in constant communication, discussing industry feedback and trends to make the Platts Daily Yield valuations more accurate.

Where Platts Daily Yield can be found

Platts Daily Yield calculations are produced every day for all locations. They are available through several Platts' products.

Platts Dispatch: A daily data feed for all locations is available through Platts Dispatch.

Crude Oil Marketwire: All seasonal yields and netbacks will be found in Crude Oil Marketwire. All crudes from all eight refining centers are published each day.

Platts Global Alert: All seasonal yields and netbacks will be found in Global Alert. All crudes from all eight refining centers are published each day.

Platts Oilgram Price Report: The Weekly Feeder Crudes table reflect Monday through Friday weekly averages of daily yields, netbacks and relevant crude prices.

Components of the model

Platts and Turner Mason have decided to release all of the products used to calculate Platts Daily Yield. However, the actual weightings given to particular products in a refining center—for example, the amount of gasoline from Urals refined in Italy—will remain proprietary. Platts and Turner Mason are providing the breakdown for Arab Light crude under the winter cracking model in ARA, because we believe that by readers seeing the complexity in one model they will be assured that a similar degree of complexity is being used for other crudes in all locations. Please click the link [here](#) to see the breakdown.

Listed below in Part VII are each of the individual refining regions, the crudes modeled in each of those areas, and various

cost and other input factors assumed in the Turner, Mason TMMS model.

PART IV: PLATTS EDITORIAL STANDARDS

All Platts' employees must adhere to the S&P Global Code of Business Ethics (COBE), which has to be signed annually. The COBE reflects S&P Global's commitment to integrity, honesty and acting in good faith in all its dealings.

In addition, Platts requires that all employees attest annually that they do not have any personal relationships or personal financial interests that may influence or be perceived to influence or interfere with their ability to perform their jobs in an objective, impartial and effective manner.

Market reporters and editors are mandated to ensure adherence to published methodologies as well as internal standards that require accurate records are kept in order to document their work.

Platts has a Quality & Risk Management (QRM) function that is independent of the editorial group. QRM is responsible for ensuring the quality and adherence to Platts' policies, standards, processes and procedures. The QRM team conduct regular assessments of editorial operations, including checks for adherence to published methodologies.

S&P Global's internal auditor, an independent group that reports directly to the parent company's board of directors, reviews the Platts' risk assessment programs.

PART V: CORRECTIONS

Platts is committed to promptly correcting any material errors. When corrections are made, they are limited to corrections to data that was available when the index or assessment was

calculated.

Platts crude yields and netbacks reflect the underlying petroleum, petrochemical, natural gas, power and transportation prices available at the time of publication. When underlying prices are corrected, Platts will consider corrections to its yields and netbacks on a case by case basis.

PART VI: REQUESTS FOR CLARIFICATIONS OF DATA AND COMPLAINTS

Platts strives to provide critical information of the highest standards, to facilitate greater transparency and efficiency in physical commodity markets.

Platts customers raise questions about our methodologies and the approach we take in our price assessments, proposed methodology changes and other editorial decisions in relation to our price assessments. These interactions are strongly valued by Platts and we encourage dialogue concerning any questions a customer or market stakeholder may have.

However, Platts recognizes that occasionally customers may not be satisfied with responses received or the services provided by Platts and wish to escalate matters. Full information about how to contact Platts to request clarification around an assessment, or make a complaint, is available on our website, at: <http://www.platts.com/ContactUs/Complaints>.

If you seek further information on detailed yield breakdowns, please contact Robert Auers, Senior Consultant, at Turner, Mason and Company at +1-915-490-4314 or rauers@turnermason.com. Please contact Anthony Starkey, Senior Advisor, Platts Analytics, for any Platts-related questions at anthony.starkey@spglobal.com or in Houston at +1-713-655-2206.

PART VII: DEFINITIONS OF THE TRADING LOCATIONS FOR WHICH PLATTS PUBLISHES DAILY INDEXES OR ASSESSMENTS

US GULF COAST

Assessment	YIELDS CODE	Mavg	Pavg	Wavg	NETBACKS CODE	Mavg	Pavg	Wavg	CODE	CURRENCY	UOM
Arab Berri Coking	TYAAJ00	TYAAJ03		FYAAJ00	TNAAJ00	TNAAJ03		FNAAJ00	TNAAJMR	US \$	Barrels
Arab Berri Cracking	TYAAL00	TYAAL03		FYAAL00	TNAAL00	TNAAL03		FNAAL00	TNAALMR	US \$	Barrels
Arab Heavy Coking	TYABP00	TYABP03		FYABP00	TNABP00	TNABP03		FNABP00	TNABPMR	US \$	Barrels
Arab Heavy Cracking	TYABR00	TYABR03		FYABR00	TNABR00	TNABR03		FNABR00	TNABRMR	US \$	Barrels
Arab Light Coking	TYACN00	TYACN03		FYACN00	TNACN00	TNACN03		FNACN00	TNACNMR	US \$	Barrels
Arab Light Cracking	TYACP00	TYACP03		FYACP00	TNACP00	TNACP03		FNACP00	TNACPMR	US \$	Barrels
Arab Medium Coking	TYADT00	TYADT03		FYADT00	TNADT00	TNADT03		FNADT00	TNADTMR	US \$	Barrels
Arab Medium Cracking	TYADV00	TYADV03		FYADV00	TNADV00	TNADV03		FNADV00	TNADVMR	US \$	Barrels
Bakken Cracking	TYASG00	TYASG03		FYASG00	TNASG00	TNASG03		FNASG00	TNASGMR	US \$	Barrels
BCF 22 Coking	TYAEZ00	TYAEZ03		FYAEZ00	TNAEZ00	TNAEZ03		FNAEZ00	TNAEZMR	US \$	Barrels
BCF 22 Cracking	TYAFB00	TYAFB03		FYAFB00	TNAFB00	TNAFB03		FNAFB00	TNAFBMR	US \$	Barrels
BCF 24 Coking	TYAFH00	TYAFH03		FYAFH00	TNAFH00	TNAFH03		FNAFH00	TNAFHMR	US \$	Barrels
BCF 24 Cracking	TYAFJ00	TYAFJ03		FYAFJ00	TNAFJ00	TNAFJ03		FNAFJ00	TNAFJMR	US \$	Barrels
Basrah Light Coking	TYAGB00	TYAGB03		FYAGB00	TNAGB00	TNAGB03		FNAGB00	TNAGBMR	US \$	Barrels
Basrah Light Cracking	TYAGD00	TYAGD03		FYAGD00	TNAGD00	TNAGD03		FNAGD00	TNAGDMR	US \$	Barrels
Bonny Light Cracking	TYAGR00	TYAGR03		FYAGR00	TNAGR00	TNAGR03		FNAGR00	TNAGRMR	US \$	Barrels
Brent Coking	TYAHR00	TYAHR03		FYAHR00	TNAHR00	TNAHR03		FNAHR00	TNAHRMR	US \$	Barrels
Brent Cracking	TYAHT00	TYAHT03		FYAHT00	TNAHT00	TNAHT03		FNAHT00	TNAHTMR	US \$	Barrels
Cabinda Coking	TYAID00	TYAID03		FYAID00	TNAID00	TNAID03		FNAID00	TNAIDMR	US \$	Barrels
Cabinda Cracking	TYAIF00	TYAIF03		FYAIF00	TNAIF00	TNAIF03		FNAIF00	TNAIFMR	US \$	Barrels
Eagle Ford Cracking	TYASC00	TYASC03		FYASC00	TNASC00	TNASC03		FNASC00	TNASCMR	US \$	Barrels
Escalante Coking	TYAKH00	TYAKH03		FYAKH00	TNAKH00	TNAKH03		FNAKH00	TNAKHMR	US \$	Barrels
Escalante Cracking	TYAKJ00	TYAKJ03		FYAKJ00	TNAKJ00	TNAKJ03		FNAKJ00	TNAKJMR	US \$	Barrels
Forcados Cracking	TYAKX00	TYAKX03		FYAKX00	TNAKX00	TNAKX03		FNAKX00	TNAKXMR	US \$	Barrels
Isthmus Coking	TYAMP00	TYAMP03		FYAMP00	TNAMP00	TNAMP03		FNAMP00	TNAMPMR	US \$	Barrels
Isthmus Cracking	TYAMR00	TYAMR03		FYAMR00	TNAMR00	TNAMR03		FNAMR00	TNAMRMR	US \$	Barrels
Kuwait Coking	TYANJ00	TYANJ03		FYANJ00	TNANJ00	TNANJ03		FNANJ00	TNANJMR	US \$	Barrels
Kuwait Cracking	TYANL00	TYANL03		FYANL00	TNANL00	TNANL03		FNANL00	TNANLMR	US \$	Barrels
LLS Coking	TYANN00	TYANN03		FYANN00	TNANN00	TNANN03		FNANN00	TNANNMR	US \$	Barrels
LLS Cracking	TYANP00	TYANP03		FYANP00	TNANP00	TNANP03		FNANP00	TNANPMR	US \$	Barrels
Marlim Coking	TYAUE00	TYAUE03		FYAUE00	TNAUE00	TNAUE03		FNAUE00	TNAUEMR	US \$	Barrels
Marlim Cracking	TYAUG00	TYAUG03		FYAUG00	TNAUG00	TNAUG03		FNAUG00	TNAUGMR	US \$	Barrels
Mars Coking	TYANZ00	TYANZ03		FYANZ00	TNANZ00	TNANZ03		FNANZ00	TNANZMR	US \$	Barrels
Mars Cracking	TYAOB00	TYAOB03		FYAOB00	TNAOB00	TNAOB03		FNAOB00	TNAOBMR	US \$	Barrels
Maya Coking	TYAOH00	TYAOH03		FYAOH00	TNAOH00	TNAOH03		FNAOH00	TNAOHMR	US \$	Barrels
Maya Cracking	TYAOJ00	TYAOJ03		FYAOJ00	TNAOJ00	TNAOJ03		FNAOJ00	TNAOJMR	US \$	Barrels

US GULF COAST

Assessment	YIELDS CODE	Mavg	Pavg	Wavg	NETBACKS CODE	Mavg	Pavg	Wavg	CODE	CURRENCY	UOM
Meray Coking	TYAOX00	TYAOX03		FYAOX00	TNAOX00	TNAOX03		FNAOX00	TNAOXMR	US \$	Barrels
Meray Cracking	TYAOZ00	TYAOZ03		FYAOZ00	TNAOZ00	TNAOZ03		FNAOZ00	TNAOZMR	US \$	Barrels
Mesa Coking	TYAPJ00	TYAPJ03		FYAPJ00	TNAPJ00	TNAPJ03		FNAPJ00	TNAPJMR	US \$	Barrels
Mesa Cracking	TYAPL00	TYAPL03		FYAPL00	TNAPL00	TNAPL03		FNAPL00	TNAPLMR	US \$	Barrels
Olmecca Coking	TYAQD00	TYAQD03		FYAQD00	TNAQD00	TNAQD03		FNAQD00	TNAQDMR	US \$	Barrels
Olmecca Cracking	TYAQF00	TYAQF03		FYAQF00	TNAQF00	TNAQF03		FNAQF00	TNAQFMR	US \$	Barrels
Troll Coking	TYATJ00	TYATJ03		FYATJ00	TNATJ00	TNATJ03		FNATJ00	TNATJMR	US \$	Barrels
Troll Cracking	TYATL00	TYATL03		FYATL00	TNATL00	TNATL03		FNATL00	TNATLMR	US \$	Barrels
Urals Coking	TYAUI00	TYAUI03		FYAUI00	TNAUI00	TNAUI03		FNAUI00	TNAUIMR	US \$	Barrels
Urals Cracking	TYAUK00	TYAUK03		FYAUK00	TNAUK00	TNAUK03		FNAUK00	TNAUKMR	US \$	Barrels
WCS Coking	TYASI00	TYASI03		FYASI00	TNASI00	TNASI03		FNASI00	TNASIMR	US \$	Barrels
WTI Coking	TYATV00	TYATV03		FYATV00	TNATV00	TNATV03		FNATV00	TNATVMR	US \$	Barrels
WTI Cracking	TYATX00	TYATX03		FYATX00	TNATX00	TNATX03		FNATX00	TNATXMR	US \$	Barrels
WTS Coking	TYAUD00	TYAUD03		FYAUD00	TNAUD00	TNAUD03		FNAUD00	TNAUDMR	US \$	Barrels
WTS Cracking	TYAUF00	TYAUF03		FYAUF00	TNAUF00	TNAUF03		FNAUF00	TNAUFMR	US \$	Barrels

US Gulf Coast

Calculated crudes: Arab Berri, Arab Light, Arab Medium, Arab Heavy, *Bakken*, BCF 22, BCF 24, Basrah Light, *Bonny Light*, Brent, Cabinda, *Eagle Ford*, Escalante, *Forcados*, Isthmus, Kuwait, LLS, Marlim, Mars, Maya, Meray, Mesa, Olmecca, , Troll, Urals, WCS, WTI, WTS

- Valued are calculated for coking and cracking, but underlined crudes are only modeled in the coking mode and italicized crudes are only modeled in the cracking mode.
- Byproduct credits are assumed for sulfur and petroleum coke. Turner Mason will supply annual updates on the value of both.
- A product quality adjustment is assumed for decant oil.

Product slate

The following products are assumed as the oil products produced by the refinery. In all cases, Platts spot daily assessments are inputted, except where noted.

- Propane pipeline, Mt. Belvieu
- Propylene Chem Grade (Weekly FOB USGC)
- Normal Butane pipeline Mt. Belvieu
- Isobutane (pipeline, Mt. Belvieu)
- RBOB 83.7 (pipeline, Houston)
- RBOB 91.4 (pipeline, Houston)
- Unl 87 (waterborne, USGC)
- Prem unl 93 (waterborne, USGC)
- CBOB 87 (pipeline, Houston)
- Jet Kerosene 54 (waterborne, USGC)
- No. 2 Oil (waterborne, USGC)
- ULSD (/waterborne, USGC)
- No. 6 Slurry Oil (/waterborne, USGC)
- No. 6 1.0% S (/waterborne, USGC)
- No. 6 3.0% S (/waterborne, USGC)

Feedstocks

- Natural Gas to H2 Plant, MMBTU (Henry Hub)
- Natural Gasoline (Henry Hub)

Variable operating costs

- Purchased fuel gas (Henry Hub)
- Purchased electricity (Into Entergy 1-Mo)
- Cellulosic Biofuel RIN (Cal Year 1 and Cal Year 2)
- Advanced Biofuel RIN (Cal Year 1 and Cal Year 2)
- Biodiesel RIN (Cal Year 1 and Cal Year 2)
- Ethanol RIN (Cal Year 1 and Cal Year 2)
- Catalyst and chemicals (Costs provided by Turner Mason, updated annually)

US ATLANTIC COAST

Assessment	YIELDS CODE	Mavg	Pavg	Wavg	NETBACKS CODE	Mavg	Pavg	Wavg	CODE	CURRENCY	UOM
Arab Heavy Coking	TYABL00	TYABL03		FYABL00	TNABL00	TNABL03		FNABL00	TNABNMR	US \$	Barrels
Arab Heavy Cracking	TYABN00	TYABN03		FYABN00	TNABN00	TNABN03		FNABN00	TNABNMR	US \$	Barrels
Arab Light Coking	TYACJ00	TYACJ03		FYACJ00	TNACJ00	TNACJ03		FNACJ00	TNACJMR	US \$	Barrels
Arab Light Cracking	TYACL00	TYACL03		FYACL00	TNACL00	TNACL03		FNACL00	TNACLMR	US \$	Barrels
Arab Medium Coking	TYADP00	TYADP03		FYADP00	TNADP00	TNADP03		FNADP00	TNADPMR	US \$	Barrels
Arab Medium Cracking	TYADR00	TYADR03		FYADR00	TNADR00	TNADR03		FNADR00	TNADRMR	US \$	Barrels
Bakken Cracking	TYASE00	TYASE03		FYASE00	TNASE00	TNASE03		FNASE00	TNASEMR	US \$	Barrels
Bonny Light Cracking	TYAGP00	TYAGP03		FYAGP00	TNAGP00	TNAGP03		FNAGP00	TNAGPMR	US \$	Barrels
Brass River Cracking	TYAHB00	TYAHB03		FYAHB00	TNAHB00	TNAHB03		FNAHB00	TNAHBMR	US \$	Barrels
Brent Coking	TYAHN00	TYAHN03		FYAHN00	TNAHN00	TNAHN03		FNAHN00	TNAHNMR	US \$	Barrels
Brent Cracking	TYAHP00	TYAHP03		FYAHP00	TNAHP00	TNAHP03		FN AHP00	TNAHPMR	US \$	Barrels
Cabinda Coking	TYAHZ00	TYAHZ03		FYAHZ00	TNAHZ00	TNAHZ03		FN AHZ00	TNAHZMR	US \$	Barrels
Cabinda Cracking	TYAIB00	TYAIB03		FYAIB00	TNAIB00	TNAIB03		FN AIB00	TNAIBMR	US \$	Barrels
Ekofisk Coking	TYAJZ00	TYAJZ03		FYAJZ00	TNAJZ00	TNAJZ03		FN AJZ00	TNAJZMR	US \$	Barrels
Ekofisk Cracking	TYAKB00	TYAKB03		FYAKB00	TNAKB00	TNAKB03		FN AKB00	TNAKBMR	US \$	Barrels
Forcados Cracking	TYAKV00	TYAKV03		FYAKV00	TNAKV00	TNAKV03		FN AKV00	TNAKVMR	US \$	Barrels
Hibernia Coking	TYALR00	TYALR03		FYALR00	TNALR00	TNALR03		FN ALR00	TNALRMR	US \$	Barrels
Hibernia Cracking	TYALT00	TYALT03		FYALT00	TNALT00	TNALT03		FN ALT00	TNALTMR	US \$	Barrels
Oriente Coking	TYAQP00	TYAQP03		FYAQP00	TNAQP00	TNAQP03		FN AQP00	TNAQPMR	US \$	Barrels
Oriente Cracking	TYAQR00	TYAQR03		FYAQR00	TNAQR00	TNAQR03		FN AQR00	TNAQRM	US \$	Barrels
Statfjord Coking	TYASL00	TYASL03		FYASL00	TNASL00	TNASL03		FN ASL00	TNASLMR	US \$	Barrels
Statfjord Cracking	TYASN00	TYASN03		FYASN00	TNASN00	TNASN03		FN ASN00	TNASNMR	US \$	Barrels
Troll Coking	TYATF00	TYATF03		FYATF00	TNATF00	TNATF03		FN ATF00	TNATFMR	US \$	Barrels
Troll Cracking	TYATH00	TYATH03		FYATH00	TNATH00	TNATH03		FN ATH00	TNATHMR	US \$	Barrels

US Atlantic Coast

Calculated crudes: Arab Light, Arab Medium, Arab Heavy, *Bakken, Bonny Light, Brass River, Brent, Cabinda, Ekofisk, Forcados, , Hibernia, Oriente, Statfjord, Troll*

- Values are calculated for coking and cracking except the italicized crudes are only modeled in the cracking mode.
- Byproduct credits are assumed for sulfur and petroleum coke.

Turner Mason will supply annual updates on the value of both.

- A product quality adjustment is assumed for decant oil.
- No transportation adjustment for propylene is assumed from the Gulf Coast, nor is an adjustment made for NGLs from Mont Belvieu.

Product slate

The following products are assumed as the oil products produced by the refinery. In all cases, Platts spot daily assessments are inputted, except where noted.

- Propane (/pipeline, Mt. Belvieu)
- Propylene Ref Grade (USGC)

- Normal Butane (/pipeline, Mt. Belvieu;)
- Isobutane (pipeline, Mt. Belvieu)
- RBOB UNL (barge, NY)
- RBOB Prem (/barge, NY)
- CBOB (barge, NY)
- Jet Kerosene (barge, NY)
- No. 2 Oil (/barge, NY)
- ULSD (/barge, NY)
- No. 6 0.3% S high pour (/cargo, NY)
- No. 6 1.0% S (cargo, NY)
- No. 6 3.0% S (cargo, NY)

Note that the finished RFG valuation is calculated using 90% RBOB and 10% ethanol.

Feedstocks

- Natural Gas to H2 Plant, MMBTU (TX Eastern M-3)
- Natural Gasoline (FOB Mt. Belvieu)

Variable operating costs

- Purchased fuel gas (TX Eastern M-3)
- Purchased electricity (PJM West Pk Fdt)
- Cellulosic Biofuel RIN (Cal Year 1 and Cal Year 2)
- Advanced Biofuel RIN (Cal Year 1 and Cal Year 2)
- Biodiesel RIN (Cal Year 1 and Cal Year 2)
- Ethanol RIN (Cal Year 1 and Cal Year 2)
- Catalyst and chemicals (Costs provided by Turner Mason, updated annually)

US MIDCONTINENT

Assessment	YIELDS CODE	Mavg	Pavg	Wavg	NETBACKS CODE	Mavg	Pavg	Wavg	CODE	CURRENCY	UOM
Bakken Cracking	TYASA00	TYASA03		FYASA00	TNASA00	TNASA03		FNASA00	TNASAMR	US \$	Barrels
Bow River Coking	TYAGV00	TYAGV03		FYAGV00	TNAGV00	TNAGV03		FNAGV00	TNAGVMR	US \$	Barrels
LLS Coking	TYANR00	TYANR03		FYANR00	TNANR00	TNANR03		FNANR00	TNANRMR	US \$	Barrels
LLS Cracking	TYANT00	TYANT03		FYANT00	TNANT00	TNANT03		FNANT00	TNANTMR	US \$	Barrels
Mixed Light Sour Coking	TYAPV00	TYAPV03		FYAPV00	TNAPV00	TNAPV03		FNAPV00	TNAPVMR	US \$	Barrels
Mixed Light Sour Cracking	TYAPX00	TYAPX03		FYAPX00	TNAPX00	TNAPX03		FNAPX00	TNAPXMR	US \$	Barrels
Mixed Light Sweet Coking	TYAQX00	TYAQX03		FYAQX00	TNAQX00	TNAQX03		FNAQX00	TNAQXMR	US \$	Barrels
Mixed Light Sweet Cracking	TYAQZ00	TYAQZ03		FYAQZ00	TNAQZ00	TNAQZ03		FNAQZ00	TNAQZMR	US \$	Barrels
Syncrude Cracking	TYAUR00	TYAUR03		FYAUR00	TNAUR00	TNAUR03		FNaur00	TNAURMR	US \$	Barrels
WCS Coking	TYAVG00	TYAVG03		FYAVG00	TNAVg00	TNAVg03		FNAVg00	TNAVgMR	US \$	Barrels
WTI Coking	TYATZ00	TYATZ03		FYATZ00	TNATZ00	TNATZ03		FNATZ00	TNATZMR	US \$	Barrels
WTI Cracking	TYAUB00	TYAUB03		FYAUB00	TNAUB00	TNAUB03		FNAUB00	TNAUBMR	US \$	Barrels
WTS Coking	TYAUH00	TYAUH03		FYAUH00	TNAUH00	TNAUH03		FNAUH00	TNAUHR	US \$	Barrels
WTS Cracking	TYAUJ00	TYAUJ03		FYAUJ00	TNAUJ00	TNAUJ03		FNAUJ00	TNAUJMR	US \$	Barrels

US Midcontinent

Calculated crudes: Bakken, Bow River, LLS, Canadian Mixed Light Sour, Canadian Mixed Light Sweet, Syncrude, WCS, WTI, WTS

- Valued are calculated for coking and cracking, but underlined crudes are only modeled in the coking mode and italicized crudes are only modeled in the cracking mode.
- Byproduct credits are assumed for sulfur and petroleum coke. Turner Mason will supply annual updates on the value of both.
- Residual fuel prices are netted from the Gulf Coast, which is a more liquid market. Barge rates will be checked on a semi-annual basis.
- No transportation adjustment is assumed between Conway and the Chicago area for LPG.

Product slate

The following products are assumed as the oil products produced by the refinery. In all cases, Platts spot daily assessments are inputted, except where noted.

- Propane (Conway pipeline)
- Normal Butane (Conway pipeline)
- Isobutane (Conway pipeline)
- RBOB (Chicago pipe)
- PBOB (Chicago pipeline)
- CBOB (Chicago pipe)
- Unl 87 (Chicago pipeline)

- Prem Unl 91 (Chicago pipeline)
- Jet Fuel (Chicago pipeline)
- ULSD (Chicago pipeline)
- No. 6 Slurry Oil (waterborne, USGC)
- No. 6 3.0% S (/waterborne, USGC)

Feedstocks

- Natural Gas to H2 Plant, MMBTU (Chicago city gate)
- Natural Gasoline (Conway pipeline)

Variable operating costs

- Natural gas (Chicago city gate)

- Electricity (N IL Hub Pk FD)
 - Cellulosic Biofuel RIN (Cal Year 1 and Cal Year 2)
 - Advanced Biofuel RIN (Cal Year 1 and Cal Year 2)
 - Biodiesel RIN (Cal Year 1 and Cal Year 2)
 - Ethanol RIN (Cal Year 1 and Cal Year 2)
 - Catalyst and chemicals (Costs provided by Turner Mason, updated annually)
-

US WEST COAST

Assessment	YIELDS CODE	Mavg	Pavg	Wavg	NETBACKS CODE	Mavg	Pavg	Wavg	CODE	CURRENCY	UOM
ANS Coking	TYAAB00	TYAAB03		FYAAB00	TNAAB00	TNAAB03		FNAAB00	TNAABMR	US \$	Barrels
ANS Cracking	TYAAD00	TYAAD03		FYAAD00	TNAAD00	TNAAD03		FNAAD00	TNAADM	US \$	Barrels
Arab Berri Coking	TYAAR00	TYAAR03		FYAAR00	TNAAR00	TNAAR03		FNAAR00	TNAARM	US \$	Barrels
Arab Berri Cracking	TYAAT00	TYAAT03		FYAAT00	TNAAT00	TNAAT03		FNAAT00	TNAATMR	US \$	Barrels
Arab Light Coking	TYACV00	TYACV03		FYACV00	TNACV00	TNACV03		FNACV00	TNACVM	US \$	Barrels
Arab Light Cracking	TYACX00	TYACX03		FYACX00	TNACX00	TNACX03		FNACX00	TNACXMR	US \$	Barrels
Arab Medium Coking	TYADW00	TYADW03		FYADW00	TNADW00	TNADW03		FNADW00	TNADWM	US \$	Barrels
Arab Medium Cracking	TYADY00	TYADY03		FYADY00	TNADY00	TNADY03		FNADY00	TNADYMR	US \$	Barrels
Bakken Cracking	TYASK00	TYASK03		FYASK00	TNASK00	TNASK03		FNASK00	TNASKMR	US \$	Barrels
Basrah Lt Coking	TYAGJ00	TYAGJ03		FYAGJ00	TNAGJ00	TNAGJ03		FNAGJ00	TNAGJMR	US \$	Barrels
Basrah Lt Cracking	TYAGL00	TYAGL03		FYAGL00	TNAGL00	TNAGL03		FNAGL00	TNAGLM	US \$	Barrels
Escalante Coking	TYAKL00	TYAKL03		FYAKL00	TNAKL00	TNAKL03		FNAKL00	TNAKLM	US \$	Barrels
Escalante Cracking	TYAKN00	TYAKN03		FYAKN00	TNAKN00	TNAKN03		FNAKN00	TNAKNMR	US \$	Barrels
Kern River Coking	TYAMT00	TYAMT03		FYAMT00	TNAMT00	TNAMT03		FNAMT00	TNAMTMR	US \$	Barrels
Kern River Cracking	TYAMV00	TYAMV03		FYAMV00	TNAMV00	TNAMV03		FNAMV00	TNAMVM	US \$	Barrels
Line 63 Coking	TYANV00	TYANV03		FYANV00	TNANV00	TNANV03		FNANV00	TNANVM	US \$	Barrels
Line 63 Cracking	TYANX00	TYANX03		FYANX00	TNANX00	TNANX03		FNANX00	TNANXM	US \$	Barrels
Marlim Coking	TYAVD00	TYAVD03		FYAVD00	TNAV00	TNAV03		FNAV00	TNAVDM	US \$	Barrels
Marlim Cracking	TYAVC00	TYAVC03		FYAVC00	TNAVC00	TNAVC03		FNAVC00	TNAVCM	US \$	Barrels
Minas Coking	TYATA00	TYATA03		FYATA00	TNATA00	TNATA03		FNATA00	TNATAM	US \$	Barrels
Minas Cracking	TYATC00	TYATC03		FYATC00	TNATC00	TNATC03		FNATC00	TNATCM	US \$	Barrels
Mixed Light Sweet Coking	TYARB00	TYARB03		FYARB00	TNARB00	TNARB03		FNARB00	TNARBMR	US \$	Barrels
Mixed Light Sweet Cracking	TYARD00	TYARD03		FYARD00	TNARD00	TNARD03		FNARD00	TNARDMR	US \$	Barrels
Oriente Coking	TYAQT00	TYAQT03		FYAQT00	TNAQT00	TNAQT03		FNAQT00	TNAQTM	US \$	Barrels
Oriente Cracking	TYAQV00	TYAQV03		FYAQV00	TNAQV00	TNAQV03		FNAQV00	TNAQVM	US \$	Barrels
Thums Coking	TYASX00	TYASX03		FYASX00	TNASX00	TNASX03		FNASX00	TNASXM	US \$	Barrels
Thums Cracking	TYASZ00	TYASZ03		FYASZ00	TNASZ00	TNASZ03		FNASZ00	TNASZMR	US \$	Barrels

US West Coast

Calculated crudes: ANS, Arab Berri, Arab Light, Arab Medium, Bakken, Basrah Light, Escalante, Kern River, Line 63, Marlim, Minas, Oriente, Canadian Mixed Light Sweet, THUMS

- Values are calculated for coking and cracking except the italicized crudes are only modeled in the cracking mode.

- Byproduct credits are assumed for sulfur and petroleum coke. Turner Mason will supply annual updates on the value of both.
- Propane, normal butane and isobutane are not netted back from Mt. Belvieu.
- No freight component for ANS is calculated, since it is always purchased delivered. A comparison of the cost of the crude

and the yield would therefore not include a freight component.

- The refinery model is constructed from refinery patterns found in all major refining areas of the West Coast. As a result, crude yields are supplied for Canadian mixed light sweet crude, even though the Puget Sound area is the only West Coast region where it is refined. However, Seattle light ends prices are used for the Canadian Mixed Light Sweet assessments where possible.

Product slate

The following products are assumed as the oil products produced by the refinery. In all cases, Platts spot daily assessments are inputted, except where noted.

- Propane (/pipeline, Mt. Belvieu)
- Normal Butane (/pipeline, Mt. Belvieu)
- Isobutane (/pipeline, Mt. Belvieu)
- Unl 84 (pipeline, Los Angeles)
- Prem Unl (/pipeline, Los Angeles)
- CARBOB 84 (/pipeline, Los Angeles)
- CARBOB 88.5 (/pipeline, Los Angeles)
- Unl Suboctane (pipeline, Seattle)

- Prem Unl Suboctane (pipeline, Seattle)
- Jet Kerosene (/pipeline, Los Angeles)
- Jet Kerosene (pipeline, Seattle)
- ULSD (/pipeline, Los Angeles)
- CARB Diesel (/pipeline, Los Angeles)
- ULSD (pipeline, Seattle)
- No. 6 2% S (spot/waterborne, West Coast)

Feedstocks

- Natural Gas to H2 Plant SoCal Gas Pk TDt Abs)
- Natural gasoline (FOB Mt. Belvieu)

Variable operating costs

- Natural Gas (SoCal Gas Pk TDt Abs)
- Electricity (North Path 15 Pk FDT)
- Cellulosic Biofuel RIN (Cal Year 1 and Cal Year 2)
- Advanced Biofuel RIN (Cal Year 1 and Cal Year 2)
- Biodiesel RIN (Cal Year 1 and Cal Year 2)
- Ethanol RIN (Cal Year 1 and Cal Year 2)
- Catalyst and chemicals (Costs provided by Turner Mason, updated annually)

CARIBBEAN

Assessment	YIELDS CODE	Mavg	Pavg	Wavg	NETBACKS CODE	Mavg	Pavg	Wavg	CODE	CURRENCY	UOM
BCF 22 Coking	TYAER00	TYAER03		FYAER00	TNAER00	TNAER03		FNAER00	TNAERM	US \$	Barrels
BCF 22 Cracking	TYAET00	TYAET03		FYAET00	TNAET00	TNAET03		FNAET00	TNAETMR	US \$	Barrels
BCF 24 Coking	TYAFD00	TYAFD03		FYAFD00	TNAFD00	TNAFD03		FNAFD00	TNAFDMR	US \$	Barrels
BCF 24 Cracking	TYAFF00	TYAFF03		FYAFF00	TNAFF00	TNAFF03		FNAFF00	TNAFFMR	US \$	Barrels
Escalante Coking	TYAKC00	TYAKC03		FYAKC00	TNAKC00	TNAKC03		FNAKC00	TNAKCMR	US \$	Barrels
Escalante Cracking	TYAKE00	TYAKE03		FYAKE00	TNAKE00	TNAKE03		FNAKE00	TNAKEMR	US \$	Barrels
Isthmus Coking	TYAML00	TYAML03		FYAML00	TNAML00	TNAML03		FNAML00	TNAMLMR	US \$	Barrels
Isthmus Cracking	TYAMN00	TYAMN03		FYAMN00	TNAMN00	TNAMN03		FNAMN00	TNAMNMR	US \$	Barrels
Maya Coking	TYAOD00	TYAOD03		FYAOD00	TNAOD00	TNAOD03		FNAOD00	TNAODMR	US \$	Barrels
Maya Cracking	TYAOF00	TYAOF03		FYAOF00	TNAOF00	TNAOF03		FNAOF00	TNAOFMR	US \$	Barrels
Merrey Coking	TYAOT00	TYAOT03		FYAOT00	TNAOT00	TNAOT03		FNAOT00	TNAOTMR	US \$	Barrels
Merrey Cracking	TYAOV00	TYAOV03		FYAOV00	TNAOV00	TNAOV03		FNAOV00	TNAOVMR	US \$	Barrels
Mesa Coking	TYAPB00	TYAPB03		FYAPB00	TNAPB00	TNAPB03		FNAPB00	TNAPBMR	US \$	Barrels
Mesa Cracking	TYAPD00	TYAPD03		FYAPD00	TNAPD00	TNAPD03		FNAPD00	TNAPDMR	US \$	Barrels
Olmecca Coking	TYAPZ00	TYAPZ03		FYAPZ00	TNAPZ00	TNAPZ03		FNAPZ00	TNAPZMR	US \$	Barrels
Olmecca Cracking	TYAQB00	TYAQB03		FYAQB00	TNAQB00	TNAQB03		FNAQB00	TNAQBMR	US \$	Barrels

Caribbean

Calculated crudes: BCF 22, BCF 24, Escalante, Isthmus, Maya, Merrey, Mesa, Olmecca

- Values are calculated for coking and cracking.
- Byproduct credits are assumed for sulfur and petroleum coke. Turner Mason will supply annual updates on the value of both.
- Light ends and NY harbor residual fuel prices are netted back from NY harbor using Platts spot freight assessments in conjunction with Worldscale 100 rates.
- The marine fuel 180 CST AND 380 CST prices are based on the price relationships of marine fuels in Houston compared to the high sulfur residual fuel prices in the US Gulf Coast.

Product slate

The following products are assumed as the oil products produced by the refinery. In all cases, Platts spot daily assessments are inputted, except where noted.

- Normal butane (Mont Belvieu)
- RBOB UNL (/barge, NY)
- RRQB Prem (/barge, NY)
- Unl 87 (/cargo, NY)
- Prem unl 93 (/cargo, NY)
- Naphtha (cargo, Caribbean)
- Jet Kerosene (barge, NY)

- ULSD (barge , NY)
- No. 2 Oil (barge, NY)
- No. 6 0.3% S (/cargo, NY)
- No. 6 0.7% S (cargo, NY)
- No. 6 2.8% S (/cargo, Caribbean)
- MTBE (FOB USGC)

Feedstocks

- Natural Gasoline (FOB Mt. Belvieu)
- Nat. Gas equiv. to H2 Plant, Bbls (No. 6 2.8% S, cargo Caribbean)

Variable Costs

- Fuel (No. 6 2.8% S, cargo Caribbean)
- Cellulosic Biofuel RIN (Cal Year 1 and Cal Year 2)
- Advanced Biofuel RIN (Cal Year 1 and Cal Year 2)
- Biodiesel RIN (Cal Year 1 and Cal Year 2)
- Ethanol RIN (Cal Year 1 and Cal Year 2)
- Catalyst and chemicals (Costs provided by Turner Mason, updated annually)

AMSTERDAM-ROTTERDAM-ANTWERP

Assessment	YIELDS CODE	Mavg	Pavg	Wavg	NETBACKS CODE	Mavg	Pavg	Wavg	CODE	CURRENCY	UOM
Arab Heavy Cracking	TYAAV00	TYAAV03		FYAAV00	TNAAV00	TNAAV03		FNAAV00	TNAAVMR	US \$	Barrels
Arab Light Cracking	TYABT00	TYABT03		FYABT00	TNABT00	TNABT03		FNABT00	TNABTMR	US \$	Barrels
Arab Medium Cracking	TYACZ00	TYACZ03		FYACZ00	TNACZ00	TNACZ03		FNACZ00	TNACZMR	US \$	Barrels
Azeri Light Cracking	TYAEB00	TYAEB03		FYAEB00	TNAEB00	TNAEB03		FNAEB00	TNAEBMR	US \$	Barrels
Basrah Light Cracking	TYAFP00	TYAFP03		FYAFP00	TNAFP00	TNAFP03		FNAFP00	TNAFPMR	US \$	Barrels
Brass River Cracking	TYATS00	TYATS03		FYATS00	TNATS00	TNATS03		FNATS00	TNATSMR	US \$	Barrels
Brent Cracking	TYAHF00	TYAHF03		FYAHF00	TNAHF00	TNAHF03		FNAHF00	TNAHFMR	US \$	Barrels
Cabinda Cracking	TYAVK00	TYAVK03		FYAVK00	TNAVK00	TNAVK03		FNAVK00	TNAVKMR	US \$	Barrels
Eagle Ford Cracking	TYEAB00				TNEAB00				TNEABMR	US \$	Barrels
Ekofisk Cracking	TYAJV00	TYAJV03		FYAJV00	TNAJV00	TNAJV03		FNAJV00	TNAJVMR	US \$	Barrels
Flotta Cracking	TYAKP00	TYAKP03		FYAKP00	TNAKP00	TNAKP03		FNAKP00	TNAKPMR	US \$	Barrels
Forties Cracking	TYALB00	TYALB03		FYALB00	TNALB00	TNALB03		FNALB00	TNALBMR	US \$	Barrels
Gulfaks Cracking	TYALF00	TYALF03		FYALF00	TNALF00	TNALF03		FNALF00	TNALFMR	US \$	Barrels
Hungo Cracking	TYAVI00	TYAVI03		FYAVI00	TNAVI00	TNAVI03		FNAVI00	TNAVIMR	US \$	Barrels
Iran Heavy Cracking	TYALV00	TYALV03		FYALV00	TNALV00	TNALV03		FNALV00	TNALVMR	US \$	Barrels
Iran Light Cracking	TYAMD00	TYAMD03		FYAMD00	TNAMD00	TNAMD03		FNAMD00	TNAMDMR	US \$	Barrels
Kirkuk Cracking	TYATU00	TYATU03		FYATU00	TNATU00	TNATU03		FNATU00	TNATUMR	US \$	Barrels
Kuwait Cracking	TYAMX00	TYAMX03		FYAMX00	TNAMX00	TNAMX03		FNAMX00	TNAMXMR	US \$	Barrels
Light Houston Sweet Cracking	TYEAE00				TNEAE00				TNEAEMR	US \$	Barrels
Murban Cracking	TYATQ00	TYATQ03		FYATQ00	TNATQ00	TNATQ03		FNATQ00	TNATQMR	US \$	Barrels
Oseberg Cracking	TYAVJ00	TYAVJ03		FYAVJ00	TNAVJ00	TNAVJ03		FNAVJ00	TNAVJMR	US \$	Barrels
Saharan Blend Cracking	TYATY00	TYATY03		FYATY00	TNATN00	TNATN03		FNATN00	TNATNMR	US \$	Barrels
Statfjord Cracking	TYASD00	TYASD03		FYASD00	TNASD00	TNASD03		FNASD00	TNASDMR	US \$	Barrels
Urals Cracking	TYATN00	TYATN03		FYATN00	TNATN00	TNATN03		FNATN00	TNATNMR	US \$	Barrels
Zueitina Cracking	TYAUC00	TYAUC03		FYAUC00	TNAUC00	TNAUC03		FNAUC00	TNAUCMR	US \$	Barrels

Amsterdam-Rotterdam-Antwerp

Calculated crudes: Arab Heavy, Arab Light, Arab Medium, Azeri Light, Basrah Light, Brass River, Brent, Cabinda, Eagle Ford, Ekofisk, Flotta, Forties, Gullfaks, Hungo, Iran Heavy, Iran Light, Kirkuk, Kuwait, Light Houston Sweet, Murban, Oseberg, Saharan Blend, Statfjord, Urals, Zueitina

- Values are calculated for cracking mode only.

- Byproduct credits are assumed for sulfur. The price of sulfur will be adjusted annually by Turner Mason.

The following products are assumed as the oil products produced by the refinery. In all cases, Platts spot daily assessments are inputted, except where noted.

Product slate

- Propane (FOB ARA)
- Propylene Refinery Grade (CIF NWE)
- Butane (FOB ARA)
- Eurobob (FOB ARA barge)

- Prem Unl 10ppm S (FOB ARA barge)
- Naphtha (FOB Rotterdam barge)
- Jet Kerosene (FOB Rotterdam barge)
- ULSD 10 ppm (FOB ARA barge)
- Gasoil 0.1%S (FOB ARA barge)
- No. 6 1.0% S (Rotterdam barge)
- NO. 6 3.5% S Rotterdam barge)
- No. 6 1.0% S (CIF Cargo, NWE) (used for resid sulfur adjustment when resid sulfur is greater than 3.5%)
- No. 6 3.5% S (CIF Cargo, NWE) (used for resid sulfur adjustment when resid sulfur is greater than 3.5%)
- 180 CST Bunker 3.5% (Rotterdam)

- 380 CST Bunker 3.5% (Rotterdam)
- VGO 2% max S (CIF NWE cargo)
- VGO 0.5-0.6% S (Cargo, CIF NWE)

Feedstocks

- Methanol (T2 FOB Rotterdam)
- Natural gas to hydrogen plant (Platts daily 1-month Zeebruge natural gas price)

Variable operating costs

- Natural Gas (Platts daily 1-month Zeebruge natural gas price)
- Electricity (Platts daily 1-mo Netherlands system base price)
- Catalyst and chemicals (Costs provided by Turner Mason, updated annually)

ITALY

Assessment	YIELDS CODE	Mavg	Pavg	Wavg	NETBACKS CODE	Mavg	Pavg	Wavg	CODE	CURRENCY	UOM
Arab Heavy Cracking	TYABD00	TYABD03		FYABD00	TNABD00	TNABD03		FNABD00	TNABDMR	US \$	Barrels
Arab Light Cracking	TYACB00	TYACB03		FYACB00	TNACB00	TNACB03		FNACB00	TNACBMR	US \$	Barrels
Arab Medium Cracking	TYADH00	TYADH03		FYADH00	TNADH00	TNADH03		FNADH00	TNADHMR	US \$	Barrels
Azeri Light Cracking	TYAEF00	TYAEF03		FYAEF00	TNAEF00	TNAEF03		FNAEF00	TNAEFMR	US \$	Barrels
Basrah Light Cracking	TYAFX00	TYAFX03		FYAFX00	TNAFX00	TNAFX03		FNAFX00	TNAFXMR	US \$	Barrels
CPC Blend Cracking	TYAVN00	TYAVN03		FYAVN00	TNAVN00	TNAVN03		FNAVN00	TNAVNMR	US \$	Barrels
Eagle Ford Cracking	TYEAC00				TNEAC00				TNEACMR	US \$	Barrels
Es Sider Cracking	TYAKD00	TYAKD03		FYAKD00	TNAKD00	TNAKD03		FNAKD00	TNAKDMR	US \$	Barrels
Iran Heavy Cracking	TYALZ00	TYALZ03		FYALZ00	TNALZ00	TNALZ03		FNALZ00	TNALZMR	US \$	Barrels
Iran Light Cracking	TYAMH00	TYAMH03		FYAMH00	TNAMH00	TNAMH03		FNAMH00	TNAMHMR	US \$	Barrels
Kirkuk Cracking	TYAMU00	TYAMU03		FYAMU00	TNAMU00	TNAMU03		FNAMU00	TNAMUMR	US \$	Barrels
Light Houston Sweet Cracking	TYEAF00				TNEAF00				TDEAFMR	US \$	Barrels
Saharan Blend Cracking	TYAR000	TYAR003		FYAR000	TNAR000	TNAR003		FNAR000	TNAROMR	US \$	Barrels
Suez Blend Cracking	TYAU000	TYAU003		FYAU000	TNAU000	TNAU003		FNAU000	TNAUOMR	US \$	Barrels
Urals Cracking	TYATR00	TYATR03		FYATR00	TNATR00	TNATR03		FNATR00	TNATRMR	US \$	Barrels
WCS Coking	TYEAI00				TNEAI00				TDWFRMR	US \$	Barrels
Zueitina Cracking	TYAUL00	TYAUL03		FYAUL00	TNAUL00	TNAUL03		FNAUL00	TNAULMR	US \$	Barrels

Italy

Calculated crudes: Arab Heavy, Arab Light, Arab Medium, Azeri Light, Basrah Light, CPC Blend, Eagle Ford, Es Sider, Iran Heavy, Iran Light, Kirkuk, Light Houston Sweet, Saharan Blend, Suez Blend, Urals, WCS, Zueitina

- Valued are calculated for cracking only, but underlined crudes are only modeled in the coking mode.
- Byproduct credits are assumed for sulfur. The price of sulfur will be adjusted annually by Turner Mason.
- Regular and premium unleaded gasoline is netted back from the Platts FOB NWE price.

The following products are assumed as the oil products produced by the refinery. In all cases, Platts spot daily assessments are inputted, except where noted.

Product slate

- Propane (FOB W Med ex-ref/stor)
- Propylene refinery grade (CIF NWE)
- Butane (FOB W Med ex-ref/stor)
- Eurobob (FOB ARA barge)
- Prem Unl 10 ppm (FOB Med barge)

- Naphtha (FOB Med cargo)
- Jet Kerosene (FOB Med cargo)
- ULSD 10ppm (FOB Med cargo)
- Gasoil 0.1% S (FOB Med cargo)
- VGO 2% max S (CIF cargo)
- VGO 0.5-0.6% S (CIF cargo)
- No. 6 1.0% S (FOB Med cargo)
- No. 6 3.5% S (FOB Med cargo)

- 180 CST Bunker 3.5% (Genoa)
- 380 CST Bunker 3.5% (Genoa)

Feedstocks

- Methanol (spot, T2 FOB Rotterdam)
- Natural gas to hydrogen plant (Platts daily 1-month Zeebrugge natural gas price)

Variable operating costs

- Electricity (Switzerland Laufen Base rate, initially quoted by Platts in Euros per megawatt hour, converted using prevailing euro/\$ rates)
- Fuel gas (Platts daily 1-month Zeebrugge natural gas price)
- Catalyst and chemicals (Costs provided by Turner Mason, updated annually)

SINGAPORE

Assessment	YIELDS CODE	Mavg	Pavg	Wavg	NETBACKS CODE	Mavg	Pavg	Wavg	CODE	CURRENCY	UOM
Al Shaheen Cracking	TYEAA00				TNEAA00				TDEAAMR	US \$	Barrels
Arab Heavy Cracking	TYABH00	TYABH03		FYABH00	TNABH00	TNABH03		FNABH00	TNABHMR	US \$	Barrels
Arab Light Cracking	TYACF00	TYACF03		FYACF00	TNACF00	TNACF03		FNACF00	TNACFMR	US \$	Barrels
Arab Medium Cracking	TYADL00	TYADL03		FYADL00	TNADL00	TNADL03		FNADL00	TNADLMR	US \$	Barrels
Attaka Cracking	TYADX00	TYADX03		FYADX00	TNADX00	TNADX03		FNADX00	TNADXMR	US \$	Barrels
Cabinda Cracking	TYAVF00	TYAVF03		FYAVF00	TNAV00	TNAV03		FNAV00	TNAV0MR	US \$	Barrels
Das Blend Cracking	TYDSH00	TYDSH03		FYDSH00	TNDSH00	TNDSH03		FNDSH00	TNDSHMR	US \$	Barrels
Dubai Cracking	TYAJN00	TYAJN03		FYAJN00	TNAJN00	TNAJN03		FNAJN00	TNAJNMR	US \$	Barrels
Duri Cracking	TYAJR00	TYAJR03		FYAJR00	TNAJR00	TNAJR03		FNAJR00	TNAJRMR	US \$	Barrels
Forties Cracking	TYEAD00				TNEAD00				TNEADM	US \$	Barrels
Kuwait Cracking	TYANF00	TYANF03		FYANF00	TNANF00	TNANF03		FNANF00	TNANFMR	US \$	Barrels
Minas Cracking	TYAPR00	TYAPR03		FYAPR00	TNAPR00	TNAPR03		FNAPR00	TNAPRMR	US \$	Barrels
Murban Cracking	TYAPY00	TYAPY03		FYAPY00	TNAPY00	TNAPY03		FNAPY00	TNAPYMR	US \$	Barrels
Oman Cracking	TYAQL00	TYAQL03		FYAQL00	TNAQL00	TNAQL03		FNAML00	TNAQLMR	US \$	Barrels
Qatar Land Cracking	TYARA00	TYARA03		FYARA00	TNARA00	TNARA03		FNARA00	TNARAMR	US \$	Barrels
Qatar Marine Cracking	TYARE00	TYARE03		FYARE00	TNARE00	TNARE03		FNARE00	TNAREMR	US \$	Barrels
Tapis Cracking	TYAST00	TYAST03		FYAST00	TNAST00	TNAST03		FNAST00	TNASTMR	US \$	Barrels
Upper Zakum Cracking	TYEAG00				TNEAG00				TNEAGMR	US \$	Barrels

Singapore

Calculated crudes: Al Shaheen, Arab Heavy, Arab Light, Arab Medium, Attaka, Cabinda, Das Blend, Dubai, Duri, Forties, Kuwait, Minas, Murban, Oman, Qatar Land, Qatar Marine, Tapis, Upper Zakum

- Values are calculated for visbreaking and cracking, but italicized crudes are modeled only in the cracking mode.
- Byproduct credits are assumed for sulfur. The price of sulfur will be adjusted annually by Turner Mason.

The following products are assumed as the oil products produced by the refinery. In all cases, Platts spot daily assessments are inputted, except where noted.

Product slate

- Propane (CFR Japan cargo)
- Mogas 92 Unl (Singapore cargo)
- Mogas 97 Unl (Singapore cargo)
- Jet Kerosene (Singapore cargo)
- Gasoil 0.25% S (Singapore cargo)
- Gasoil 0.05% S (Singapore cargo)
- Gasoil 50 ppm S (Singapore cargo)

- FO 180 CST 2% S (Singapore cargo)
- FO 180 CST3.5% S (Singapore cargo)
- FO 380 CST 3.5% S (Singapore cargo)
- Naphtha (Singapore cargo)

Feedstocks

- Methanol (CFR SE Asia)
- Natural Gas to H2 Plant, MMBTU (FO 180 CST 2% S Singapore cargo)

Variable Operating Costs

- Purchased Electricity (Singapore retail rates)
 - Purchased Fuel Gas (FO 180 CST 2% S Singapore cargo)
 - Catalyst and chemicals (Costs provided by Turner Mason, updated annually)
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REVISION HISTORY

January 2021: Platts updated the crude slate list for each of the regions

December 2020: Platts updated the crude slate list for each of the regions

November, 2015: Platts revised its Yields and Netbacks Methodology Guide in October 2015 to reflect additions/deletions in crude yields, as well as changes to underlying product slates.

August, 2013: Platts revamped all Oil Methodology And Specifications Guides, including its Yields and Netbacks guide, in August 2013. This revamp was completed to enhance the clarity and usefulness of all guides, and to introduce greater consistency of layout and structure across all published methodology guides. Methodologies for market coverage were not changed through this revamp, unless specifically noted in the methodology guide itself.