

## *Methodology and Specifications Guide*

### *Daily Yield*

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**LATEST UPDATE: JANUARY 2008**

## INTRODUCTION

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).

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. Click [here](#) for an example summary table for Mars.

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. Port charges are not included in the tanker rates

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. For Urals and ANS netbacks, 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.

Ethanol is assumed to be 10% of the value of all reformulated gasoline in the US, and 5.7% of all US West Coast gasoline. Beginning March 1, 2008, Platts Daily Yield will assume ethanol to be 10% of all conventional gasoline in the US Midcontinent. Although ethanol is not blended into the final product until it is distributed at a rack, Platts Daily Yield takes the spot value of ethanol at its key refining centers and uses that figure for its calculation, rather than taking a rack 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. Click [here](#) to see a summary of major crude imports into the United States by PADD. 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:** Rotterdam, Singapore and US Gulf Coast yields and netbacks are provided daily. Other refining centers will rotate on the following basis: Monday, US Atlantic Coast; Tuesday, Caribbean; Wednesday, US Midcontinent; Thursday, Italy; Friday, US West Coast.

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

**Platts Oilgram Price Report:** The Feeder Crudes table yields and netbacks will be calculated using Thursday product prices and freight rates. Spot crude assessments are a five-day average of daily prices, or for weekly assessments, set via an assessed differential to the relevant benchmark, e.g., Gullfaks would be set against the dated Brent five-day average.

### FORWARD VALUES

**TM&C Crude Netback Forward Values:** Basically the same methodology to calculate present crude netback values is used to calculate forward values. The same yields plus forward product prices can be used for a forward crude yield value. In the rare case where a forward product price is not available, it can be correlated to a future price based on historical relationships.

[Click here](#) for a sample of this product in the United States Atlantic Coast. This product is still under development.

### COMPONENTS OF THE MODEL

Platts and Turner Mason have decided to release all of the products used to calculate Platts Daily Yield. However, unlike the previous model Platts used for yields and netbacks, 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. If you seek further information on detailed yield breakdowns, please contact Tom Hogan, Senior Vice President, at Turner, Mason and Company at +1-214-754-0898 or [Tomhogan@turnermason.com](mailto:Tomhogan@turnermason.com). John Kingston, Platts Global Director of Oil, also will take any questions and respond. If the expertise of a Turner, Mason consultant is needed to answer a question, he will work to provide those answers. He can be reached at [john\\_kingston@platts.com](mailto:john_kingston@platts.com) or in New York at +1-212-438-3040.

Listed below 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.

## US GULF COAST

[Click here](#) for a list of Platts symbols.

**Calculated crudes:** Arab Berri, Arab Light, Arab Medium, Arab Heavy, BCF 17, BCF 22, BCF 24, Basrah Light, ***Bonny Light***, ***Brass River***, Brent, Cano Limon, Cabinda, Cusiana, Escalante, ***Forcados***, Isthmus, Kuwait, LLS, Marlim, Mars, Maya, Meray, Mesa, Olmeca, Rabi Blend, ***Saharan Blend***, Soyo, Statfjord, Troll, Urals, WTI, WTS

- Values are calculated for coking and cracking, but 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 daily or weekly assessments are inputted, except where noted.

- Propane (spot/pipeline, Mt. Belvieu)
- Propylene Chem Grade (FOB USGC)
- Normal Butane (spot/pipeline Mt. Belvieu)
- Isobutane (spot/pipeline, Mt. Belvieu)
- RBOB 83.7 (spot/pipeline, Houston)
- RBOB 91.4 (spot/pipeline, Houston)
- Unl 87 (spot/waterborne, USGC)
- Prem unl 93 (spot/waterborne)
- Jet Kerosene 54 (spot/waterborne, USGC)
- LS No. 2 (spot/waterborne, USGC)
- No. 2 Oil (spot/waterborne, USGC)

- ULSD (spot/waterborne, USGC)
- No. 6 0.7% S (spot/waterborne, USGC)
- No. 6 1.0% S (spot/waterborne, USGC)
- No. 6 3.0% S (spot/waterborne, USGC)
- No. 6 3.5% S (spot/waterborne, USGC)
- Marine Fuel Oil 180 CST (Houston)
- Marine Fuel Oil 380 CST (Houston)

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

### Feedstocks

- Ethanol (spot, FOB USGC)
- Natural Gas to H2 Plant, MMBTU (Platts Natural Gas Market Report's Houston Ship Channel monthly average price)

### Variable operating costs

- Purchased fuel gas (Platts Natural Gas Market Report's Houston Ship Channel monthly average price.)
- Purchased electricity (Into Entergy Pk Fdtd)
- Catalyst and chemicals (Costs provided by Turner Mason, updated annually)

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## US ATLANTIC COAST

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[Click here](#) for a list of Platts symbols

**Calculated crudes:** Arab Light, Arab Medium, Arab Heavy, BCF 22, ***Bonny Light***, ***Brass River***, Brent, Cabinda, Cusiana, Ekofisk, Foinhaven, ***Forcados***, Gullfaks, Hibernia, Mesa, Oriente, Rabi Blend, Palanca (includes commingled Soyo stream), Statfjord, Troll

- Values are calculated for coking and cracking except the underlined 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

- Propane (spot/pipeline, Mt. Belvieu)

- Propylene Ref Grade (Ex Tank FOB USGC)
- Normal Butane (spot/pipeline, Mt. Belvieu;)
- Isobutane (spot/pipeline, Mt. Belvieu)
- RBOB UNL (spot/barge, NY)
- RBOB Prem (spot/barge, NY)
- Unl 87 (spot/barge, NY)
- Prem Unl 93 (spot/barge, NY)
- Jet Kerosene (spot/barge, NY)
- LS No. 2 (spot/barge, NY)
- No. 2 Oil (spot/barge, NY)
- ULSD (spot/barge, NY)
- No. 6 0.3% S high pour (spot/barge, NY)
- No. 6 0.7% S (spot/barge, NY)
- No. 6 1.0% S (spot/barge, NY)
- No. 6 2.2% S (spot/barge, NY)
- No. 6 3.0% S (spot/barge, NY)
- Marine Fuel Oil 180 CST (New York)
- Marine Fuel Oil 380 CST (New York)

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

### Feedstocks

- Ethanol (NYH 5-15 Days Brg)
- Natural Gas to H2 Plant, MMBTU (Platts Transco Zone 6 natural gas monthly average price)
- Variable operating costs
- Purchased fuel gas (Platts Transco Zone 6 natural gas monthly price)
- Purchased electricity (PSE&G retail electricity rates)
- Catalyst and chemicals (Price provided by Turner Mason, updated annually)

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## US MIDCONTINENT

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[Click here](#) for a list of Platts symbols

**Calculated crudes:** Arab Berri, Arab Light, ***BCF 24***, Basrah Light, ***Bonny Light***, ***Bow River***, Cabinda, Cano Limon, Cusiana, ***Forcados***, LLS, ***Maya***, Mesa, Canadian Mixed Light Sour,

Olmecca, 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

- Propane (Conway pipeline)
- Normal Butane (Conway pipeline)
- Isobutane (Conway pipeline)
- RBOB (Chicago pipe)
- PBOB (Chicago spot)
- Unl 87 (Chicago pipeline)
- Prem Unl 93 (Chicago pipeline)
- Jet Fuel (Chicago pipeline)
- LS No. 2 (Chicago pipeline)
- LS Off-Road (Chicago pipeline)
- ULSD (Chicago pipeline)
- No. 6 0.7% S (spot/waterborne, USGC)
- No. 6 1.0% S (spot/waterborne, USGC)
- No. 6 3.0% S (spot/waterborne, USGC)
- No. 6 3.5% S (spot/waterborne, USGC)

Note that RFG price equals 90% RBOB price plus 10% Ethanol price.

### Feedstocks

- Ethanol (Chicago spot)
- Natural Gas to H2 Plant, MMBTU (Price is Platts Natural Gas Market Report's Chicago city gate monthly average)
- Variable Operating Costs
- Natural gas (Platts Natural Gas Market Report's Chicago

city gate monthly average)

- Electricity (Commonwealth Edison retail rates)
- Catalyst and chemicals (Price provided by Turner Mason, updated annually)

## US WEST COAST

[Click here](#) for a list of Platts symbols

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

- Values are calculated for coking and cracking, but italicized crudes are modeled only in the coking 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

- Propane (spot/pipeline, Mt. Belvieu)
- Normal Butane (spot/pipeline, Mt. Belvieu)
- Isobutane (spot/pipeline, Mt. Belvieu)
- Unl 87 (spot/pipeline, Los Angeles)
- Prem Unl 92 (spot/pipeline, Los Angeles)
- CARBOB 85.5 (spot/pipeline, Los Angeles)
- CARBOB 90 (spot/pipeline, Los Angeles)
- Jet Kerosene (spot/pipeline, Los Angeles)
- ULSD (Los Angeles)
- CARB Diesel (spot/pipeline, Los Angeles)
- No. 6 0.5% S (spot/waterborne, West Coast)

- No. 6 1.0% S (spot/waterborne, West Coast)
- No. 6 2% S (spot/waterborne, West Coast)
- No. 6 1.0% S (spot/waterborne, USGC)
- No. 6 3.5% S (spot/waterborne, USGC)
- High sulfur No. 6 fuel oil. (This price is calculated by taking the Platts assessment for 380 CST spot/cargo Los Angeles less the difference between Houston 380 CST and Houston 3.5% S No. 6)
- 380 CST (spot/cargo, Los Angeles)

Note that CARB gasoline price equals 94.3% RBOB price plus 5.7% Ethanol price.

### Feedstocks

- Ethanol (southern CA rail)
- Natural Gas to H2 Plant, (based on Platts Natural Gas Market Report's SoCal border monthly average)

### Variable operating costs

- Natural gas (Platts Natural Gas Market Report's SoCal border monthly average)
- Electricity (SoCal Edison's industrial electricity price)
- Purchased diesel is assumed as a cutter stock in the bunker fuel where necessary, and a value is calculated.
- Catalyst and chemicals (Price provided by Turner Mason, updated annually)
- Chemicals (Costs provided by Turner Mason, updated annually)

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## AMSTERDAM-ROTTERDAM-ANTWERP

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[Click here](#) for a list of Platts symbols

**Calculated crudes:** Arab Heavy, Arab Light, Arab Medium, Azeri Light, Basrah Light, *Bonny Light*, *Brass River*, Brent, Ekofisk, Flotta, Forties, Gullfaks, Iran Heavy, Iran Light, *Kirkuk*, Kuwait, *Murban*, *Saharan Blend*, Statfjord, Urals, *Zueitina*

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

### Product slate

- Propane (spot, FOB ARA)

- Propylene Chem Grade (CIF NWE)
- Butane (spot, FOB ARA)
- Isobutane (Butane, spot, FOB ARA)
- Reg Unl (spot/barge, FOB Rotterdam)
- Prem Unl (spot/barge, FOB Rotterdam, for cracking yields (Premium unleaded is not part of the visbreaking model.)
- Naphtha (spot/barge, FOB Rotterdam)
- Jet Kerosene (spot/barge, FOB Rotterdam)
- Gasoil EN 590 (spot/barge, FOB Rotterdam)
- Gasoil 0.2% S (spot/barge, FOB Rotterdam)
- No. 6 1.0% S (spot/barge, Rotterdam)
- NO. 6 3.5% S (spot/barge, Rotterdam)
- No. 6 1.0% S (CIF Cargo, NWE)
- No. 6 3.5% S (CIF Cargo, NWE)
- 180 CST (Rotterdam)
- 380 CST (Rotterdam)
- VGO 1.5-1.6% S (Cargo,CIF Rotterdam)
- VGO 0.5-0.6% S (Cargo CIF North Africa/NWE)

### Feedstocks

- Methanol (spot, T1 FOB Rotterdam)
- Natural gas to hydrogen plant (Platts daily 1-month Zeebrugge natural gas price)

### Variable operating costs

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

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## ITALY

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[Click here](#) for a list of Platts symbols

**Calculated crudes:** Arab Heavy, Arab Light, Arab Medium, Azeri Light, Basrah Light, Es Sider, Gulf of Suez, Iran Heavy, Iran Light, *Kirkuk*, *Saharan Blend*, Urals, *Zueitina*

- Values are calculated for visbreaking and cracking.
- 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.

### Product slate

- Propane (spot, FOB W Med ex-ref/stor)
- Propylene chem grade (CIF NWE)
- Butane (spot, FOB W Med ex-ref/stor)
- Reg Unl (spot/cargo, FOB NWE)
- Prem Unl (spot/cargo, FOB Med)
- Prem 0.15 G/L (spot/cargo, FOB Med)
- Naphtha (spot/cargo, FOB Med)
- Jet Kerosene (spot/cargo, FOB Med)
- Gasoil EN 590 (spot/cargo, FOB Med)
- Gasoil 0.2% S (spot/cargo, FOB Med)
- VGO 2% S (Cargo CIF North Africa/NWE)
- VGO 0.5-0.6% S (Cargo CIF North Africa/NWE)
- No. 6 1.0% S (spot/cargo, FOB Med)
- No. 6 3.5% S (spot/cargo, FOB Med)
- 180 CST (spot, Genoa)
- 380 CST (spot, Genoa)

### Feedstocks

- Methanol (spot, T1 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 (Price provided by Turner Mason, updated annually)

## SINGAPORE

[Click here](#) for a list of Platts symbols

**Calculated crudes:** Arab Heavy, Arab Light, Arab Medium, Attaka, Dubai, Kuwait, Lower Zakum, Minas, Murban, Oman, Qatar Land, Qatar Marine, Tapis, Umm Shaif

- Values are calculated for visbreaking and cracking.
- Byproduct credits are assumed for sulfur. The price of sulfur will be adjusted annually by Turner Mason.

### Product slate

- Propane Mogas 92 Unl (spot/cargo, Singapore)
- Mogas 97 Unl (spot/cargo, Singapore)
- Jet Kerosene (spot/cargo, Singapore)
- Gasoil 0.25% S (spot/cargo, Singapore)
- LSWR Mixed/Cracked (spot/cargo, Indonesia)
- HSFO 180 CST 2% S (spot/cargo, Singapore)
- HSFO 180 CST (spot/cargo, Singapore)
- HSFO 380 CST (spot/cargo, Singapore)
- Naphtha (spot/cargo, Singapore)

### Feedstocks

- Methanol (spot, CFR Singapore)
- Natural Gas to H2 Plant, MMBTU (HSFO 180 CST 2% S spot/cargo, Singapore)

### Variable Operating Costs

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

## CARIBBEAN

[Click here](#) for a list of Platts symbols

**Calculated crudes:** Arab Berri, Arab Heavy, Arab Light, Arab Medium, BCF 17, BCF 22, BCF 24, Basrah Light, *Bonny Light*, *Brass River*, Brent, Cabinda, Cano Limon, Cusiana, Escalanta, *Forcados*, Isthmus, Kuwait, Maya, Merey, Mesa, Olmecca, Rabi Blend, Soyo, Statfjord, Troll

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

- Normal butane (Mont Belvieu)
- RBOB UNL (spot/barge, NY)
- RROB Prem (spot/barge, NY)
- Unl 87 (Spot/cargo, NY)
- Prem unl 93 (Spot/cargo, NY)
- Naphtha (spot/cargo, Caribbean)
- Jet Kerosene (spot/cargo, NY)
- LS No. 2 (spot/cargo, NY)
- ULSD (spot/cargo, NY)
- No. 2 Oil (spot/cargo, NY)
- No. 6 0.3% S high pour (spot/cargo, NY)

- No. 6 0.7% S (spot/cargo, NY)
- No. 6 1.0% S (spot/cargo, NY)
- No. 6 3.0% S (spot/barge, NY)
- No. 6 2.0% S (spot/cargo, Caribbean)
- No. 6 2.8% S (spot/cargo, Caribbean)
- Marine Fuel Oil 180 CST (formula - see note above)
- Marine Fuel Oil 380 CST (formula - see note above)

Note that RFG price equals 90% RBOB price plus 10% Ethanol price.

### Feedstocks

- Ethanol (spot, FOB USGC)
- Nat. Gas equiv. to H2 Plant, Bbls (No. 6 2.8% S, spot/cargo Caribbean)

### Variable Costs

- Fuel (No. 6 2.8% S, spot/cargo Caribbean)
- Catalyst and chemicals (Costs provided by Turner Mason, updated annually)