New and emerging price benchmarks in the Americas

London, Houston, Washington, New York, Portland, Santiago, Bogota, Calgary, Singapore, Beijing, Tokyo, Sydney, Dubai, Moscow, Astana, Kiev, Berlin and Johannesburg
What is the spot market story for crude?

The US crude oil market center is shifting to the US Gulf coast as WTI infrastructure makes it unresponsive.
The spot markets for crude oil are actively traded and contain a diverse array of participants.
New US benchmarks are emerging that will be used as tools for international trade.
New Canadian benchmarks are emerging that will facilitate a growth in spot market breadth and depth.
A short history of US crude price indexation

2005-2008: Steady transition from Platts to Argus for indexation or US domestic crudes, based on differences in methodology.


2008-present: WTI crude price routinely falls in value relative to other global crude benchmarks.

2009: Argus creates Argus Sour Crude Index (ASCI) as a pricing tool representing the US Gulf coast medium sour market.

2009: Saudi Aramco replaces Platts WTI with Argus ASCI for all sales to US customers.

2010: Kuwait and Iraq drop WTI for Argus ASCI for sales to US.
US domestic crude trading volume
Jan - Oct 2010 trade months

- WTI diff to CMA
- ASCI
- LLS
- Mars
- WTI Midland
- WTS
- HLS
- WTI P-Plus
- Southern Green Canyon
- Thunder Horse
- Poseidon
- Bonito
- Eugene Island
Argus Methodology
Who is Argus?

Global firm covering all energy commodities.
Over 60 different publications.
Over 300 staff and numerous international offices.
Used as a price reference in contracts.
Only business is reporting market prices, market analysis, and news.
November and December LLS was weak, with a volume weighted average of Europecs traded at $84.98. Similar trend was observed at Bonito, with a volume weighted average of $81.92.

For WTI Midland, a slight increase in volume weighted average was observed, at $81.25. However, WTI Midland delivered both month-to-month and week-to-week gains.

Frankenfeld LLS saw nearly 10 cents lower than the December LLS, with a volume weighted average of $80.84. This trend was consistent across the board, with a notable gap between the delivered and low/high prices.

In the US Gulf Coast, the tight supply continued to push prices higher. Bonito Horse had a significant price increase, with a volume weighted average of $81.82. This was followed by Thunder Horse, with a volume weighted average of $80.57.

The reported volumes and price movements indicated a strong demand for light sweet crude, driven by industrial consumption. The increasing volume weighted averages suggested a tightening of the markets, with no signs of supply relief in the near future.
Argus US domestic crude prices

Price is volume-weighted average of all deals over entire trading day.
  – All deals are counted regardless of volume.

Differential averages are applied to Nymex settlement price (and to WTI Cushing after expiry).

Argus widely used for contract pricing in the US domestic market since 2005.
What is ASCI?
The Argus Sour Crude Index (ASCI)

The ASCI index is the volume-weighted average of all trades for Mars, Poseidon, and Southern Green Canyon (SGC).

WTI crude (Nymex settlement) forms the underlying fixed price.

The total trade in the three components must reach 6,000 b/d (about 180,000 barrels).

- If not, index calculated using a proportional assessment based on the individual price assessments.

Launched in May 2009:

Used by Saudi Aramco, Iraq (Somo), Kuwait (KPC).

Nymex and ICE have launched various swaps and futures for trading and clearing based on the ASCI.
## ASCI: Calculating the Index

<table>
<thead>
<tr>
<th>Date</th>
<th>Crude</th>
<th>Trade Month</th>
<th>Basis</th>
<th>Differential Price ($/bl)</th>
<th>Volume (b/d)</th>
<th>(Price)*(Volume)/Total Volume</th>
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<td>Mars</td>
<td>July</td>
<td>July WTI</td>
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<td>-0.0133</td>
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<td>July WTI</td>
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<td>Poseidon</td>
<td>July</td>
<td>July WTI</td>
<td>-0.25</td>
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<td>2-Jun-10</td>
<td>SGC</td>
<td>July</td>
<td>July WTI</td>
<td>-0.75</td>
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<td>-0.0667</td>
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<td>July WTI</td>
<td>-0.70</td>
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</table>

**Total Volume:** 22,500

**ASCI Differential:** -0.50

**July WTI Formula Basis:** 72.86

**ASCI Price:** 72.36
Why ASCI?
The growing authority of the US Gulf coast market

Growth in offshore production over last 10 years has created new opportunities.

Pipeline interconnectivity, and the combination of three grades in ASCI, makes disruption events far less likely.

Compared to other world markets, the US domestic crude market has become

- The most actively traded.
- The most diverse in number of participants.
- The broadest ownership structure.
- One of the fastest growing production regions.

The Gulf coast market has become increasingly independent of the US midcontinent market.
ASCI: Consistent production profile

ASCI Component Production

Jan-10  Feb-10  Mar-10  Apr-10  May-10  Jun-10  Jul-10  Aug-10  Sep-10
Mars  Poseidon  SGC

argus
ASCI: Diverse production ownership

Argus estimates based on MMS data for May 2010
Mars, Poseidon, So Green Canyon trading volume

- SGC
- Poseidon
- Mars
US domestic crude trading volume
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Spot market volumes in other world markets

### Spot Trade Volume

- **WTI CMA & P Plus**: 800,000 bl per mo 3Q 2010
- **BFOE**: 600,000 bl per mo 3Q 2010
- **ASCI**: 500,000 bl per mo 3Q 2010
- **Forties**: 400,000 bl per mo 3Q 2010
- **Urals NWE**: 200,000 bl per mo 3Q 2010
- **Oman**: 100,000 bl per mo 3Q 2010
- **Urals Med**: 50,000 bl per mo 3Q 2010
- **Dubai**: 20,000 bl per mo 3Q 2010

### Number of Spot Trades

- **WTI CMA & P Plus**: 300
- **ASCI**: 250
- **BFOE**: 150
- **Forties**: 50
- **Oman**: 20
- **Urals NWE**: 10
- **Urals Med**: 5
- **Dubai**: 2

Per month 3Q 2010
ASCI: Diverse trading participation

ASCI Sep Sellers

ASCI Sep Buyers
ASCI: Diverse trading participation

ASCI Oct Sellers

ASCI Oct Buyers
How does the ASCI price compare?
Considerations

ASCI reflects the value of the domestic crudes that non-US crudes are competing against in the delivered market.

US refiners are very happy with ASCI as it aligns the timing and value of their baseload purchases with the timing and value of their spot/equity purchases.

WTI dislocations are expected to become more frequent.

ASCI removes the volatility associated with using WTI as a pricing mechanism.
Gulf Coast Sweet versus Midcontinent Sweet

WTI dislocates from world markets

WTI less LLS (LLS=0)
Gulf Coast Sour (ASCI) versus Midcontinent Sweet

WTI dislocates from world markets

ASC1 less WTI (WTI=0)
LLS as a sweet marker?
US Gulf crude volume

Spot volume (b/d)

Trade month

Feb  Mar  Apr  May  Jun  Jul  Aug  Sep  Oct

ASCI  LLS
Saharan less LLS

Mar-10 Apr-10 May-10 Jun-10 Jul-10 Aug-10 Sep-10 Oct-10

Saharan less LLS 5 day MA(LLU = 0)
Canadian crude indices in flux

Competing index prices currently produced from electronic exchange, and from broker shops.

Argus believes benchmark prices should be provided by an independent third party.

– Removes opportunity to shift volumes between index platforms.
– Participants need not have a commercial agreement to participate in index formation.

Argus now publishing total market volume-weighted price indexes for SYN and WCS.

– Includes both brokered and non-brokered deals; draws from a wider sub-set of spot trade than broker indexes.
– Indexes reflect whole month of trade, resulting in more-consistent volumes.
Argus November trade month Syncrude

Volume (b/d)

Differential vs. WTI

Syncrude Cumulative Volume
Syncrude Cumulate Weighted Average

4-Oct
5-Oct
6-Oct
7-Oct
8-Oct
12-Oct
13-Oct
14-Oct
15-Oct
18-Oct
19-Oct

0
15,000
30,000
45,000
60,000
75,000
90,000
105,000
120,000
135,000
150,000
+0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
-1.20
-1.40
Argus November trade month WCS

- WCS Cumulative Volume
- WCS Cumulative Weighted Average
Benchmark pricing over the next decade

The US Gulf coast is emerging as a pricing center. Canada is also establishing clear indexation parameters.

The quality of crude remains vitally important… But combinations of crudes of different quality can make indexes more reliable.

Trusted benchmark prices produce more spot market liquidity, which leads to better transparency and accuracy.

Liquid benchmark prices also spin off more derivative mechanisms, which lead to better hedging of price risk.

All this leads to more stable revenue, and feeds back into investment growth in upstream development.
More information at www.argusmedia.com/ASCI