New and emerging price benchmarks in the Americas

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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.

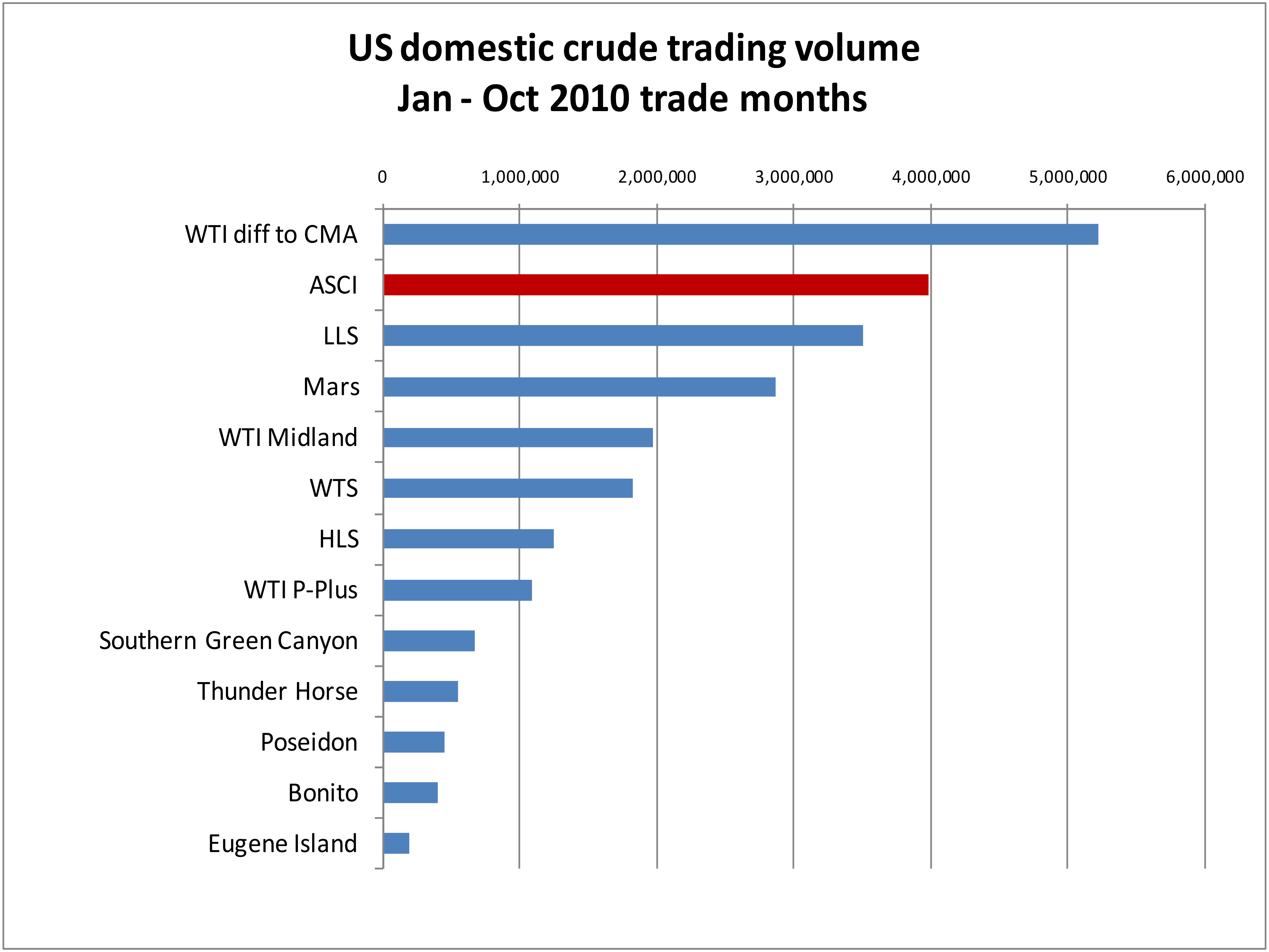
2005-present: Steady growth in production and trading in medium sour crude at US Gulf coast (Mars, Poseidon, SGC).

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
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
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.

Argus Americas Crude

Argus Americas Crude market prices and analysis Issue 10P- 206

WTI

WTI Cushing	1:30pm CST		Intermonth Roll	
	Bid/Ask	Delta		
November	81.75/81.79	+2.28	Nov/Dec	-0.77
December	82.52/82.56	+2.38	Dec/Jan	-0.72
January	83.24/83.28	+2.38	Jan/Feb	-0.58
February	83.82/83.86	+2.31		

Nymex Lt Sweet	Open	Low	High	Settle	Delta
Nov	79.48	79.35	82.03	81.77	+2.28
Dec	79.93	79.90	82.58	82.54	+2.38
Jan	80.73	80.63	83.28	83.26	+2.38
Feb	81.32	81.32	83.85	83.84	+2.31
Dec 2011				86.70	+1.91
Dec 2012				87.72	+1.60
Dec 2013				87.92	+1.19
Dec 2014				88.27	+0.76
Dec 2015				89.12	+0.43

Nymex Roll	
Nov/Dec	-0.77
Dec/Jan	-0.72
Jan/Feb	-0.58

WTI/N Sea	5:30pm London
Nov	-1.08
Dec	-1.17
Jan	-0.86

WTI Markers	Timing	Base	Low/High	Wtd Avg	MTD WAvg
Diff CMA Nym	Nov	CMA	-0.78/-0.68	-0.74	-1.01
Postings-Plus	Nov	Pst	+2.56/+2.65	+2.61	+2.34

"Wtd Avg" is volume weighted average of deals done during the entire trading day

In the News Page 6

Industry
- PHMSA considers broader, stricter pipeline oversight
- US judge throws out drilling regulation
- New Suezmax, VLCC orders soar in 2010
- Higher oil, NGL prices improve E&P outlook
- Marathon takes positions in four blocks in Iraq

Infrastructure
- Tesoro restarts Anacortes refinery
- Valero's Wilmington refinery has breakdown
- CVR Energy has malfunction at Coffeyville
- French strikes continue, vessel queue grows

Overview

November and December L
tive to concurrent WTI in a
prices for foreign crude ship
firmed today. At the US wes
(ANS) crude traded in late
the region. The Latin Ameri
an industry event earlier in
away from their desks. The
entered its monthly lull as th
tions deadline struck this m

US Gulf Coast & Midco

November and December LL
concurrent WTI in a busy day
delivered cargo prices rose fo

Front-month LLS saw nearly
erage by about 10¢/bl as it tra
December LLS was nearly 20
average pushed above $3/bl o

The get-done number for Nov
sticking close to yesterday's v
sour November Mars' weight
firmer than yesterday, but the
was at the weak end of yester
Activity was about the same a
b/d done. December Mars nar
15¢/bl to trade at WTI -2.40 a

November Poseidon was stea
done at WTI -3.35 and -3.25, keeping it around $1/bl under Mars. November SGC was exchanged at 50¢/bl under Mars in conversion trades.

Light sour Thunder Horse nar
14¢/bl to trade between Nove
Horse had started weakening
active selling mentioned in th

November Bonito got done at
yesterday's assessed value. Sc
on Eugene Island in a wide ra
the Argus assessment was nar
to Bonito steady.

In West Texas, November WTI Midland continued to widen its

US Gulf Coast

Pipeline	Timing	Base	Low/High	Diff Wtd Avg	Diff MTD WAvg	Low/High	Wtd Avg
LLS	Nov	Nov	+3.10/+3.25	+3.21	+3.75	84.87/85.02	84.98
LLS	Dec	Dec	+2.95/+3.10	+3.02	+3.17	85.49/85.64	85.56
HLS	Nov	Nov	+2.20/+2.30	+2.25	+2.48	83.97/84.07	84.02
Thunder Horse	Nov	Nov	-1.20/-0.90	-1.13	+0.17	80.57/80.87	80.64
Bonito	Nov	Nov	+0.05/+0.25	+0.15	+1.47	81.82/82.02	81.92
Eugene Island	Nov	Nov	+0.40/+0.55	+0.48	+1.70	82.17/82.32	82.25
WTI Midland	Nov	Nov	-0.55/-0.50	-0.52	-0.33	81.22/81.27	81.25
WTS	Nov	Nov	-2.65/-2.55	-2.60	-2.48	79.12/79.22	79.17
WTS	Dec	Dec	-2.55/-2.45	-2.50	-2.53	79.99/80.09	80.04
Poseidon	Nov	Nov	-3.35/-3.25	-3.32	-1.65	78.42/78.52	78.45
Mars	Nov	Nov	-2.40/-2.20	-2.26	-1.06	79.37/79.57	79.51
Mars	Dec	Dec	-2.40/-2.35	-2.39	-1.64	80.14/80.19	80.15
So Grn Canyon	Nov	Nov	-2.90/-2.70	-2.80	-1.73	78.87/79.07	78.97

"Wtd Avg" is volume weighted average of deals done during the entire trading day. Trades included in weighted averages are also listed in the back of this report, available in a sortable csv-format datafile.

WTI Markers	Timing	Base	Low/High	Wtd Avg	MTD WAvg
Diff CMA Nym	Nov	CMA	-0.78/-0.68	-0.74	-1.01
Postings-Plus	Nov	Pst	+2.56/+2.65	+2.61	+2.34

"Wtd Avg" is volume weighted average of deals done during the entire trading day

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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*.

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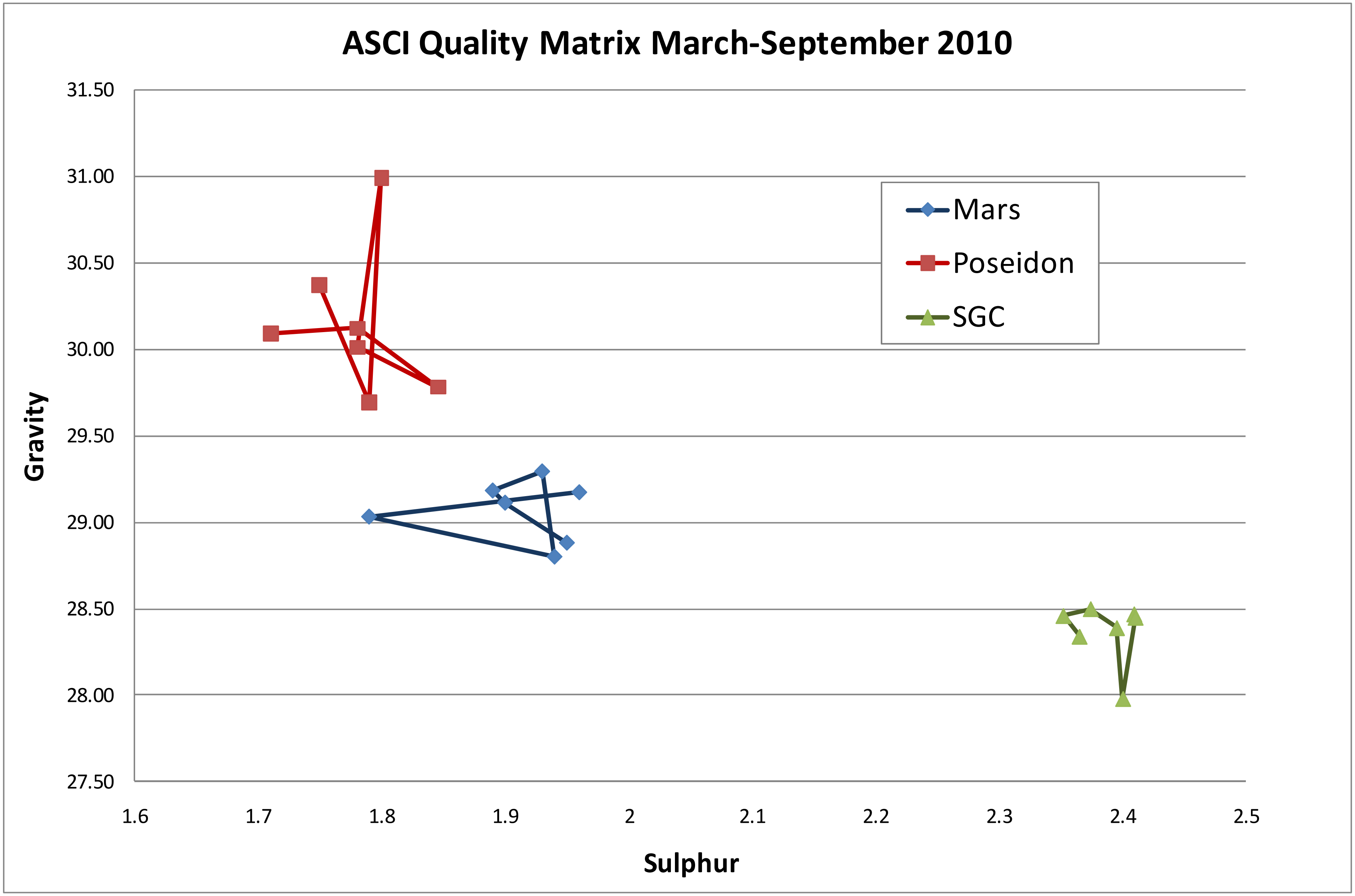
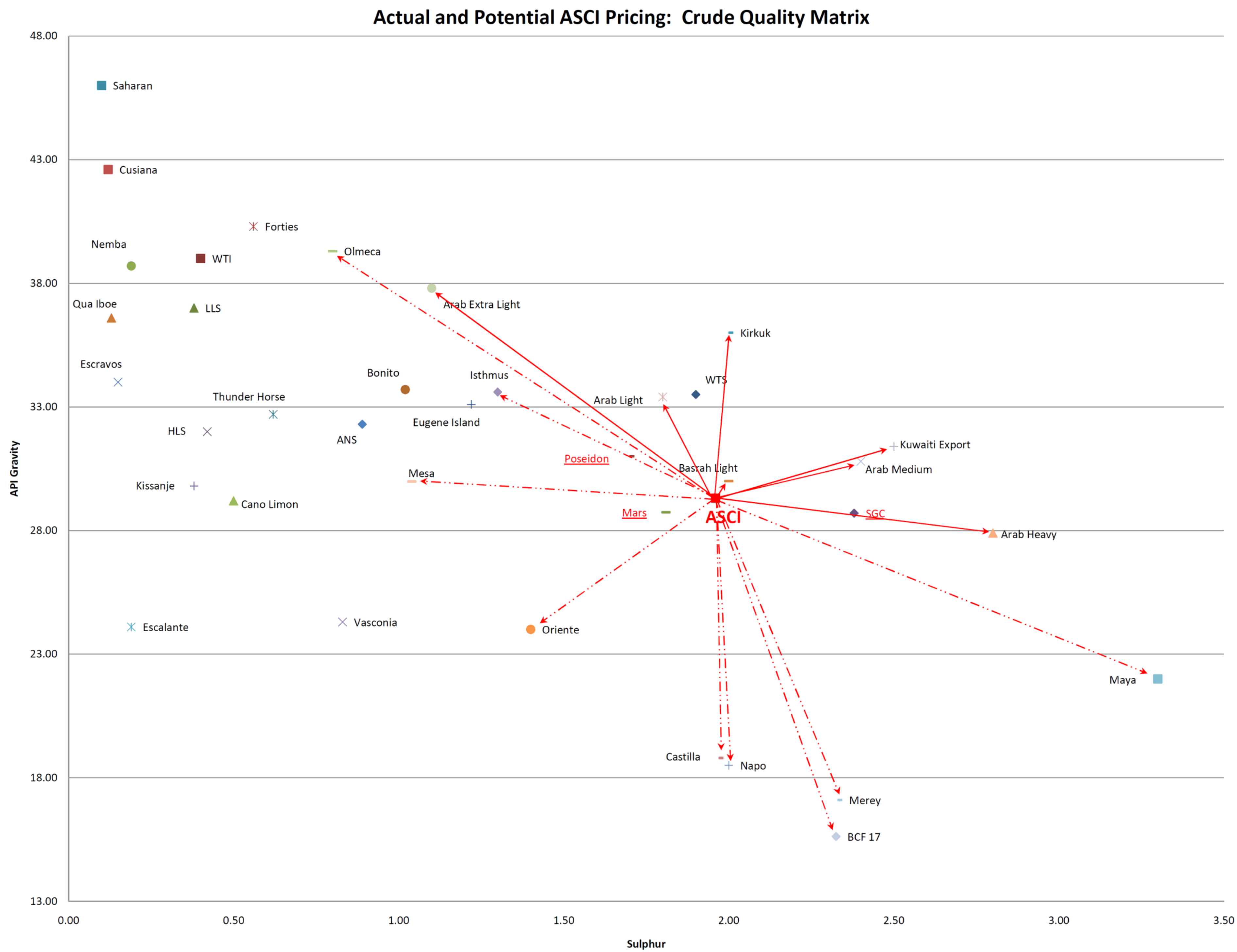
ASCI: Calculating the index

Date	Crude	Trade Month	Basis	Differential Price ($/bl)	Volume (b/d)	(Price)*(Volume)/Total Volume
2-Jun-10	Mars	July	July WTI	-0.30	1,000	-0.0133
2-Jun-10	Mars	July	July WTI	-0.25	2,000	-0.0222
2-Jun-10	Mars	July	July WTI	-0.65	1,000	-0.0289
2-Jun-10	Mars	July	July WTI	-0.30	1,000	-0.0133
2-Jun-10	Mars	July	July WTI	-0.30	500	-0.0067
2-Jun-10	Mars	July	July WTI	-0.75	2,000	-0.0667
2-Jun-10	Mars	July	July WTI	-0.40	1,000	-0.0178
2-Jun-10	Mars	July	July WTI	-0.40	1,000	-0.0178
2-Jun-10	Mars	July	July WTI	-0.45	1,000	-0.0200
2-Jun-10	Mars	July	July WTI	-0.50	1,000	-0.0222
2-Jun-10	Mars	July	July WTI	-0.60	1,000	-0.0267
2-Jun-10	Mars	July	July WTI	-0.65	1,000	-0.0289
2-Jun-10	Poseidon	July	July WTI	-0.25	1,000	-0.0111
2-Jun-10	Poseidon	July	July WTI	-0.25	1,000	-0.0111
2-Jun-10	Poseidon	July	July WTI	-0.30	1,000	-0.0133
2-Jun-10	Poseidon	July	July WTI	-0.25	1,000	-0.0111
2-Jun-10	SGC	July	July WTI	-0.75	2,000	-0.0667
2-Jun-10	SGC	July	July WTI	-0.75	1,000	-0.0333
2-Jun-10	SGC	July	July WTI	-0.90	1,000	-0.0400
2-Jun-10	SGC	July	July WTI	-0.70	1,000	-0.0311
				Total Volume:	**22,500**	
				***ASCI* Differential:**		**-0.50**
				July WTI Formula Basis:		**72.86**
				***ASCI* Price:**		**72.36**


ASCI Quality Matrix March-September 2010
31.50
31.00
30.50
30.00
29.50
29.00
28.50
28.00
27.50
Gravity
1.6
1.7
1.8
1.9
2
2.1
2.2
2.3
2.4
2.5
Sulphur
Mars
Poseidon
SGC


Actual and Potential ASCI Pricing: Crude Quality Matrix
API Gravity
Sulphur
48.00
43.00
38.00
33.00
28.00
23.00
18.00
13.00
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
Saharan
Cusiana
Forties
Nemba
WTI
Olmeca
Arab Extra Light
Qua Iboe
LLS
Kirkuk
Escravos
Bonito
Isthmus
WTS
Arab Light
Thunder Horse
Eugene Island
HLS
ANS
Kuwaiti Export
Poseidon
Arab Medium
Basrah Light
Mesa
Kissanje
Cano Limon
Mars
ASCI
SGC
Arab Heavy
Escalante
Vasconia
Oriente
Maya
Castilla
Napo
Merey
BCF 17

Why ASCI?

The growing authority of the US Gulf coast market

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

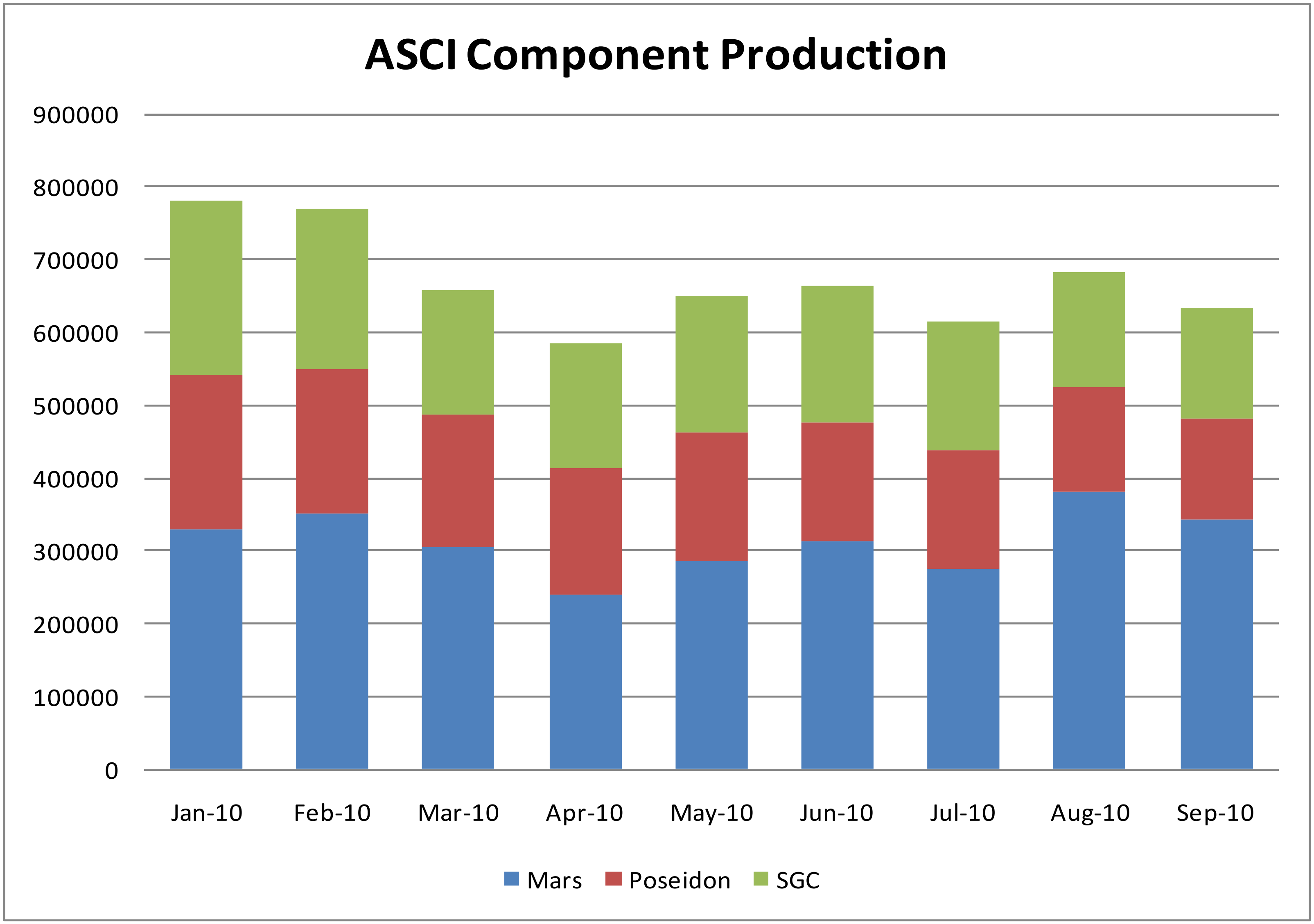
Pipeline interconnectivity, and the combination of three grades in ASCI, makes disruption events far less likely.

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

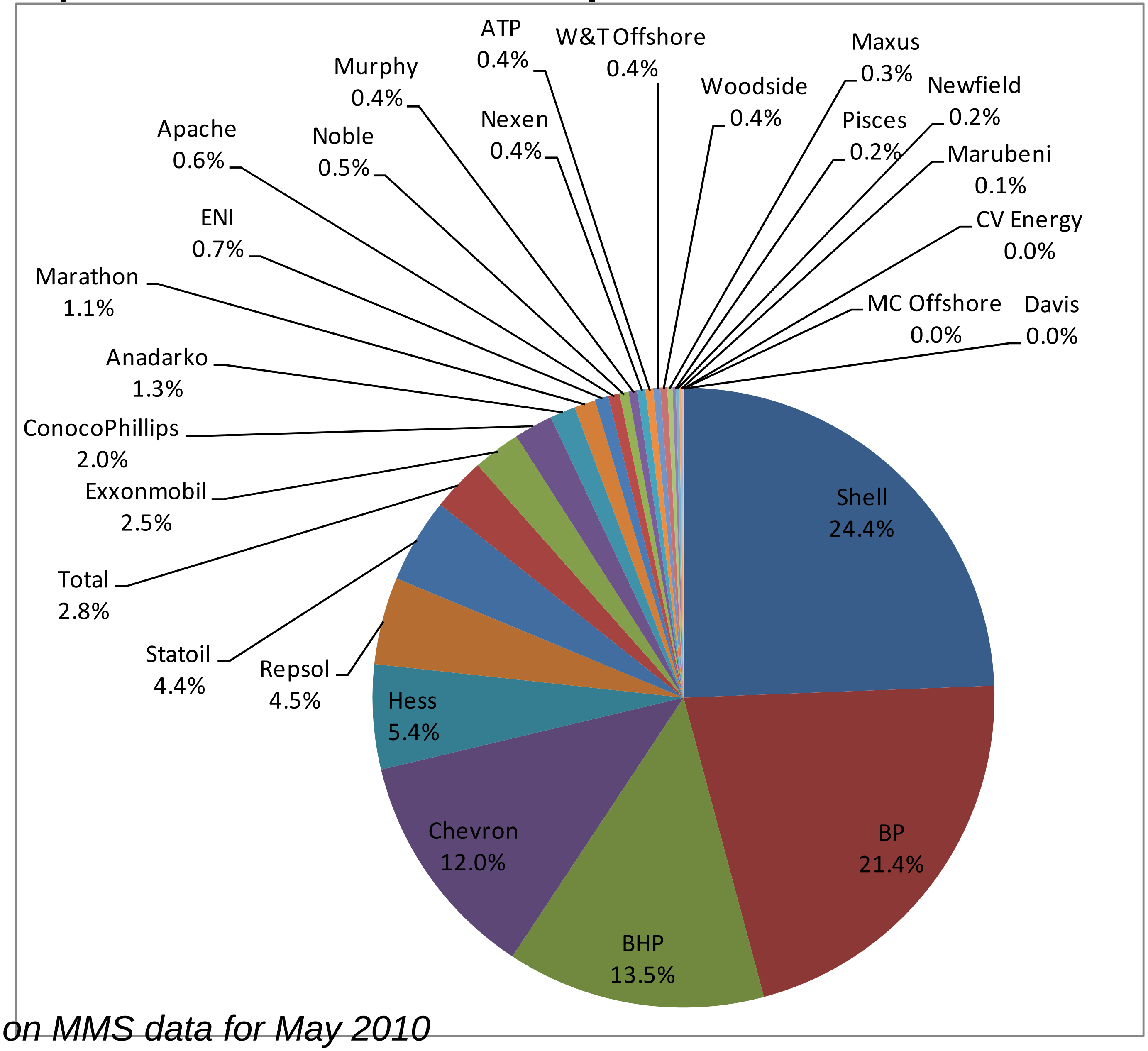
- The most actively traded.
- The most diverse in number of participants.
- The broadest ownership structure.
- One of the fastest growing production regions.

The Gulf coast market has become increasingly independent of the US midcontinent market.

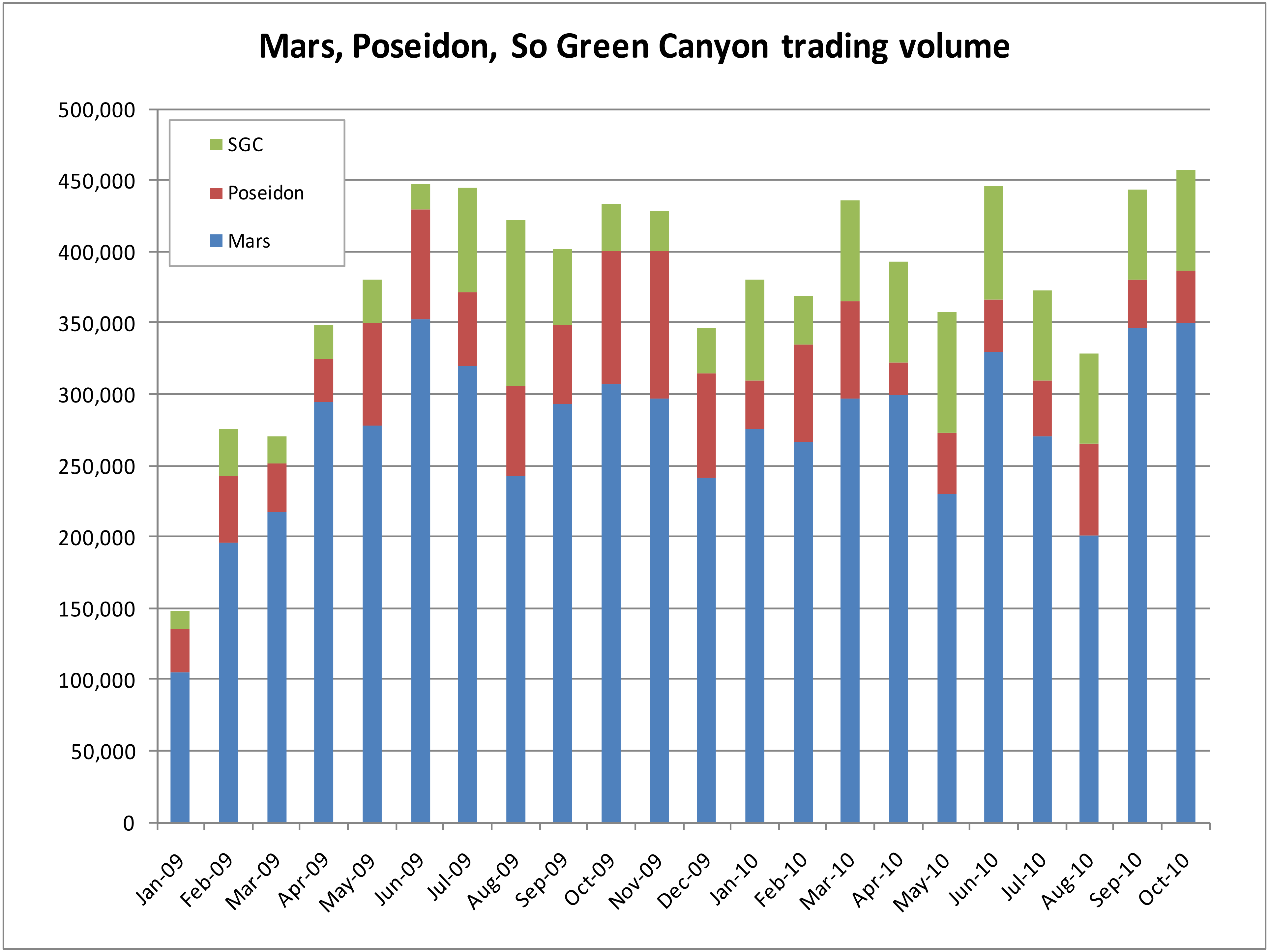
ASCI: Consistent production profile

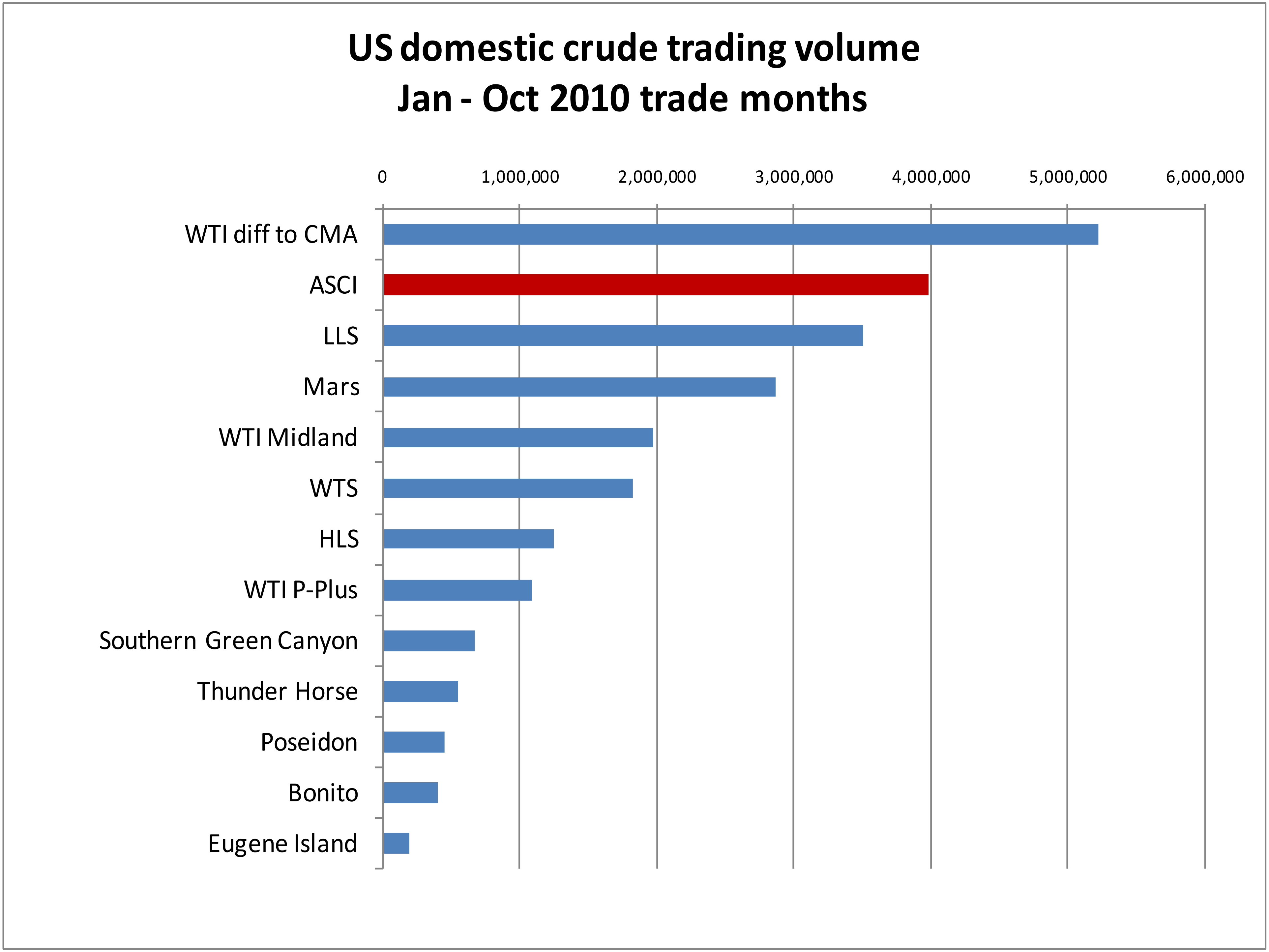


ASCI: Diverse production ownership

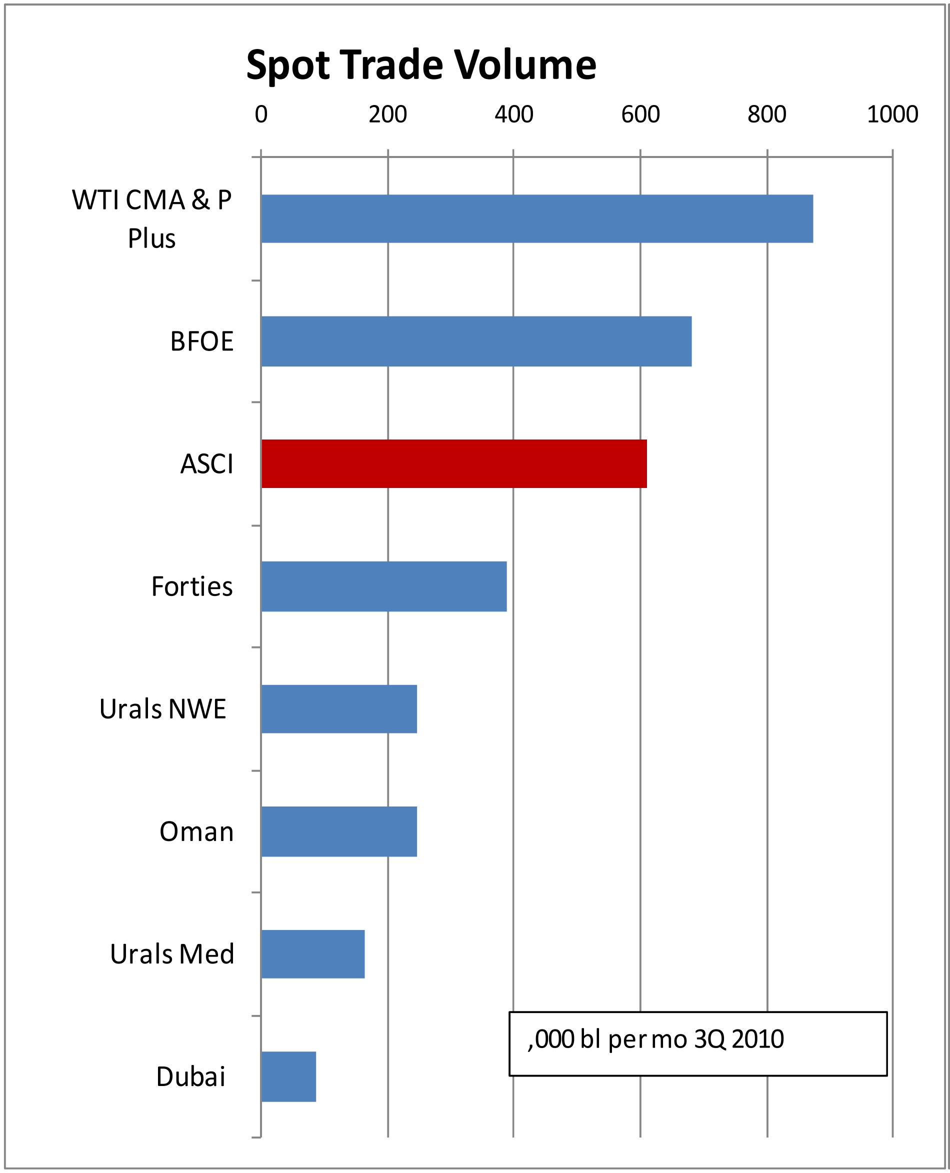


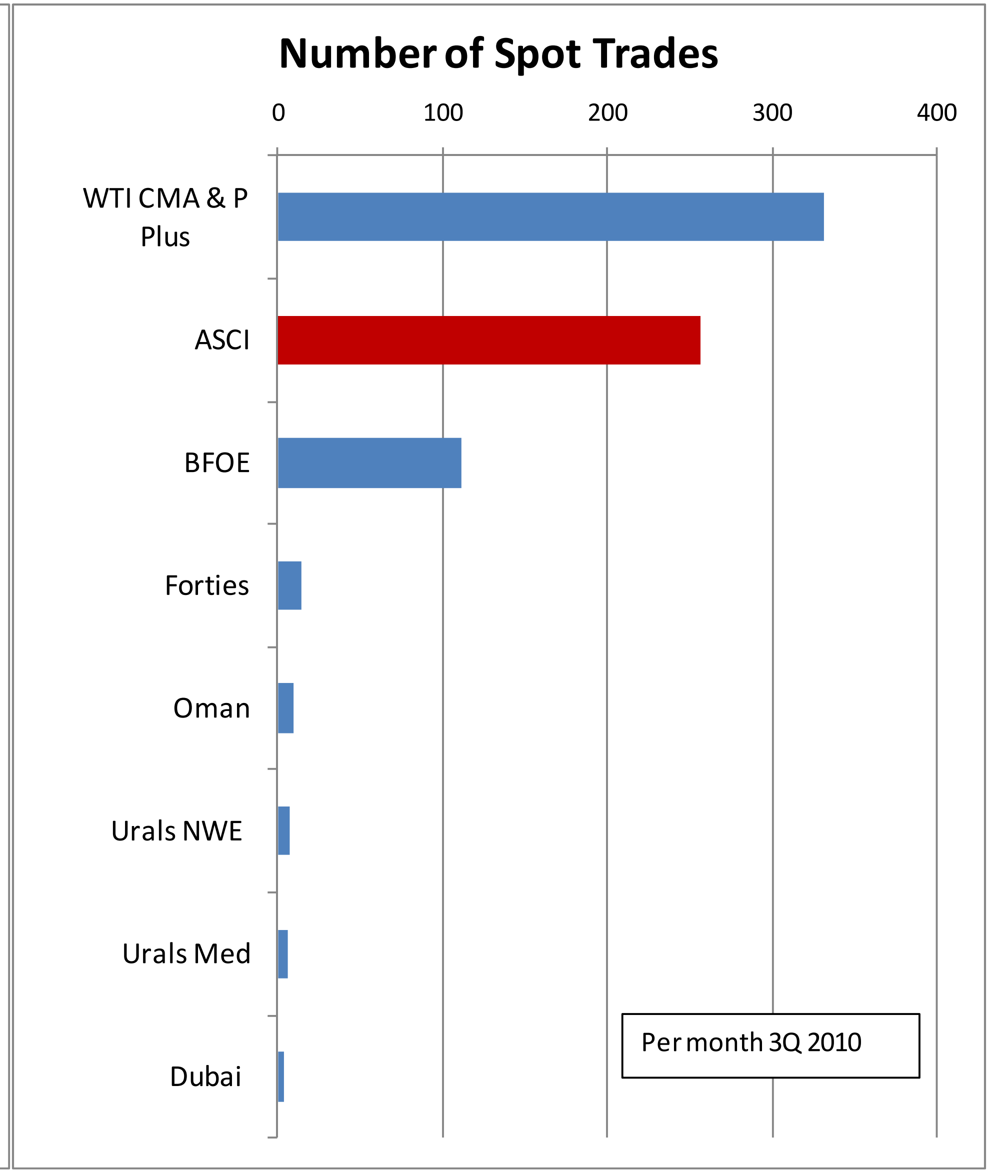
Argus estimates based on MMS data for May 2010


Mars, Poseidon, So Green Canyon trading volume
SGC
Poseidon
Mars
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Apr-10
May-10
Jun-10
Jul-10
Aug-10
Sep-10
Oct-10

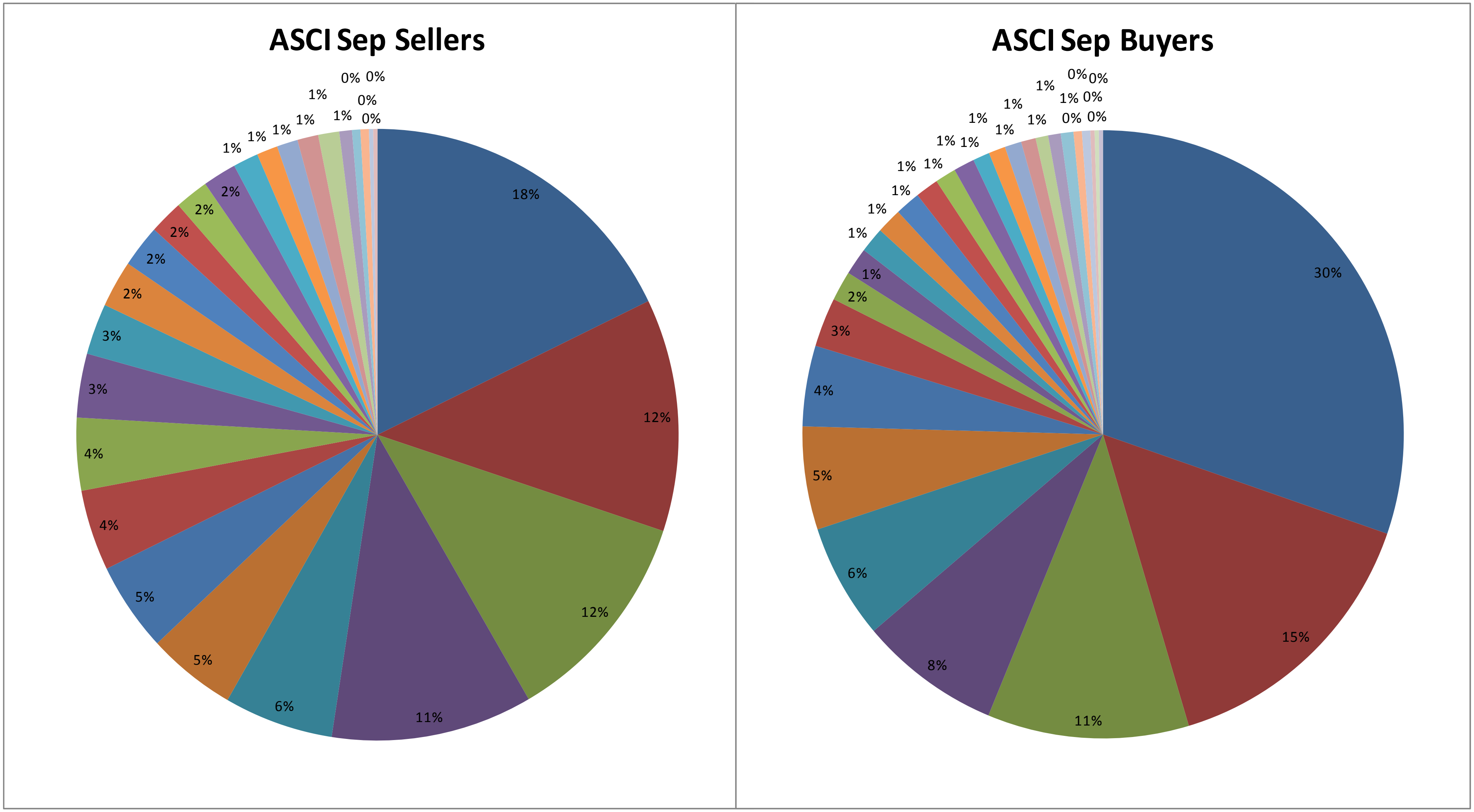

US domestic crude trading volume
Jan - Oct 2010 trade months
0
1,000,000
2,000,000
3,000,000
4,000,000
5,000,000
6,000,000
WTI diff to CMA
ASCI
LLS
Mars
WTI Midland
WTS
HLS
WTI P-Plus
Southern Green Canyon
Thunder Horse
Poseidon
Bonito
Eugene Island

Spot market volumes in other world markets

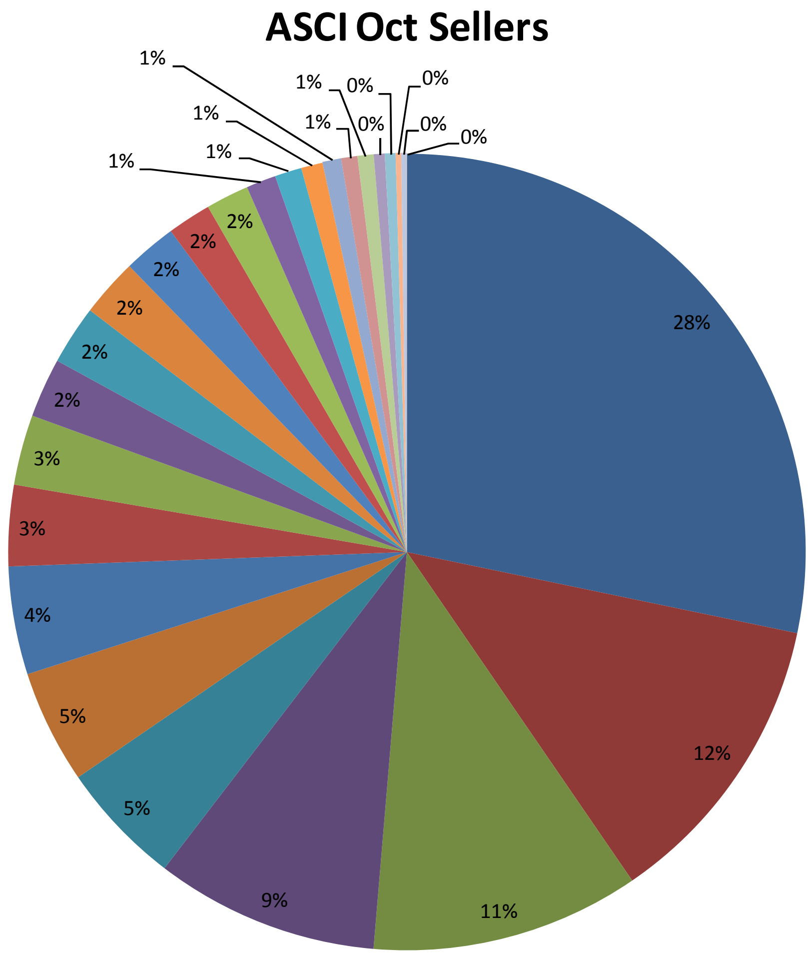


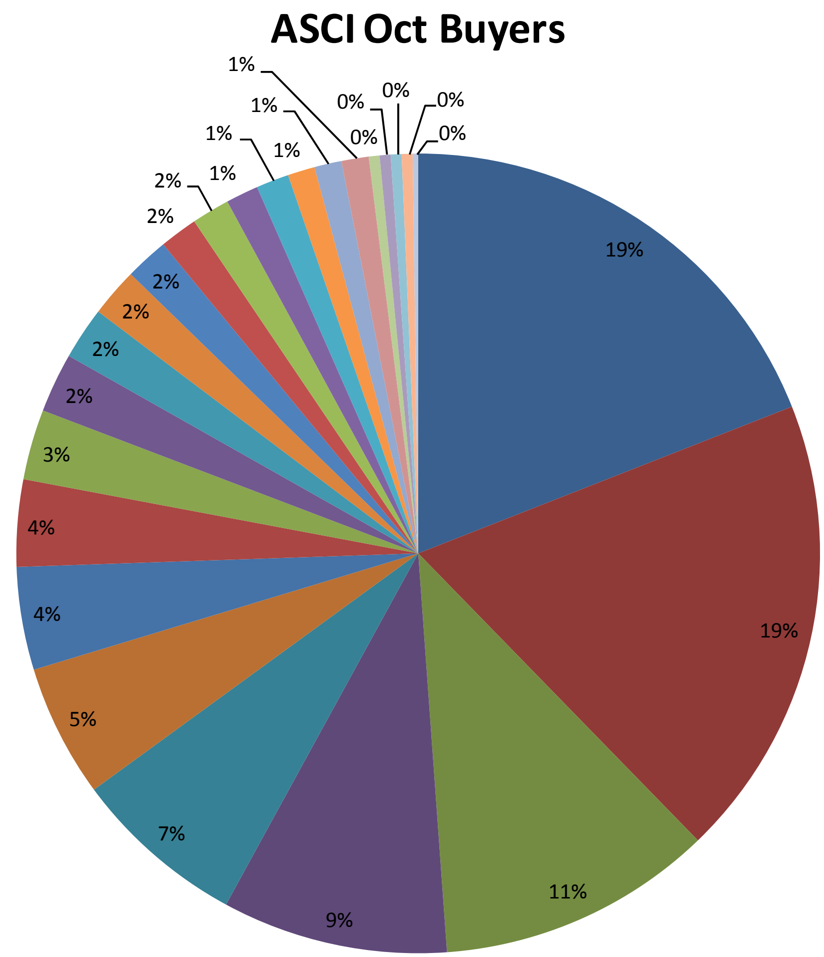


ASCI: Diverse trading participation



ASCI: Diverse trading participation





How does the ASCI price compare?

Considerations

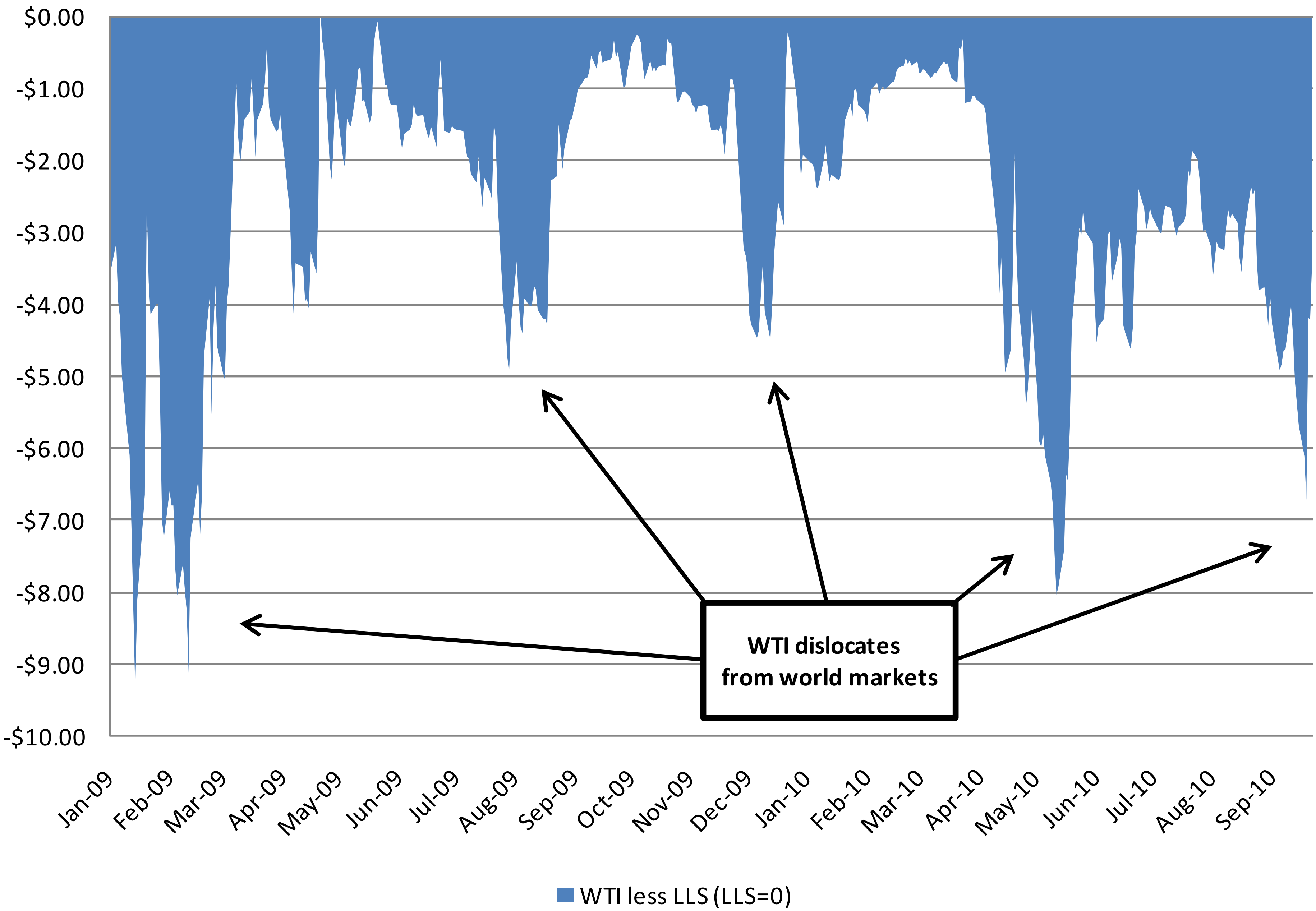
ASCI reflects the value of the domestic crudes that non-US crudes are competing against in the delivered market.

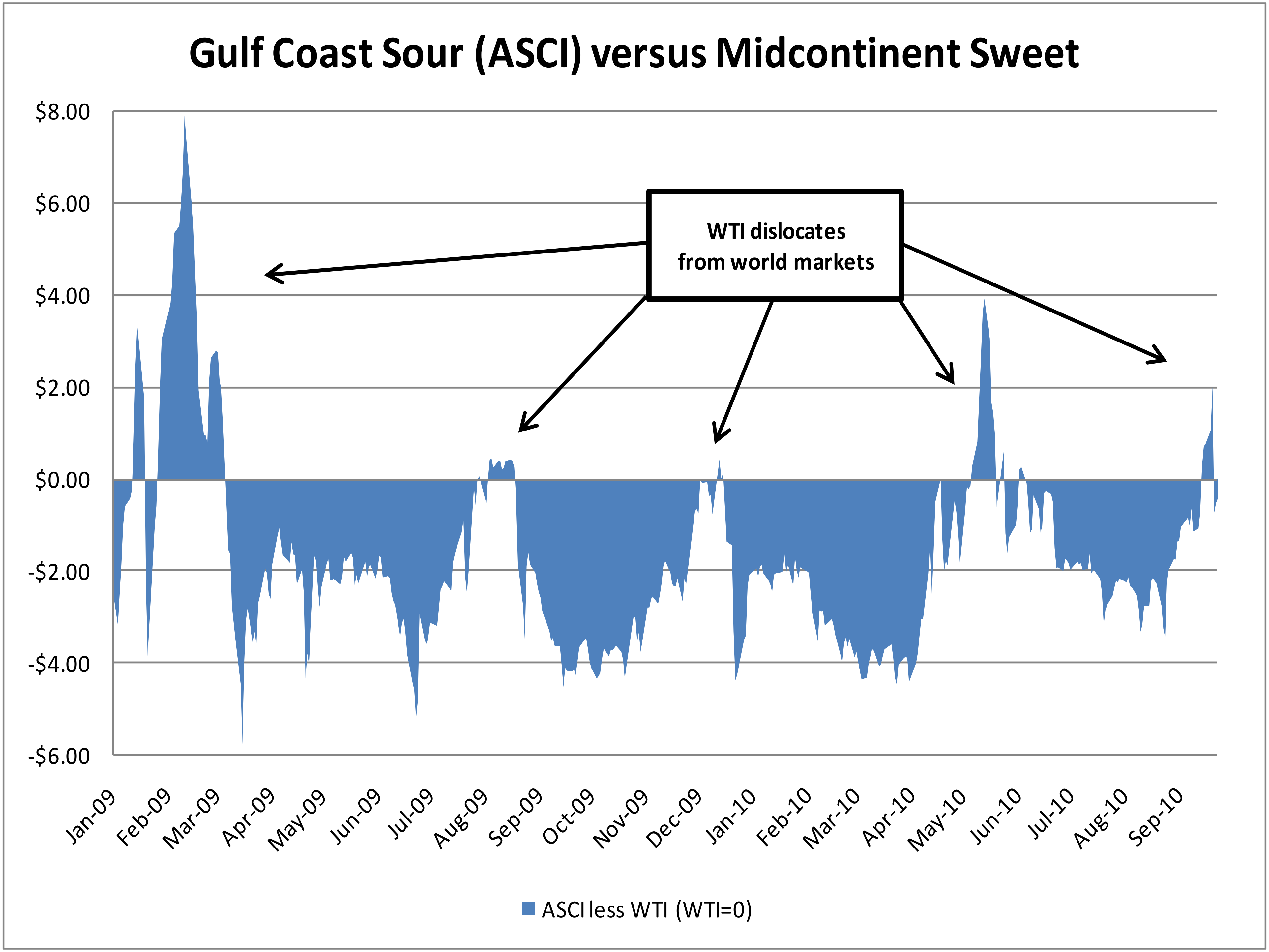
US refiners are very happy with ASCI as it aligns the timing and value of their baseload purchases with the timing and value of their spot/equity purchases.

WTI dislocations are expected to become more frequent.

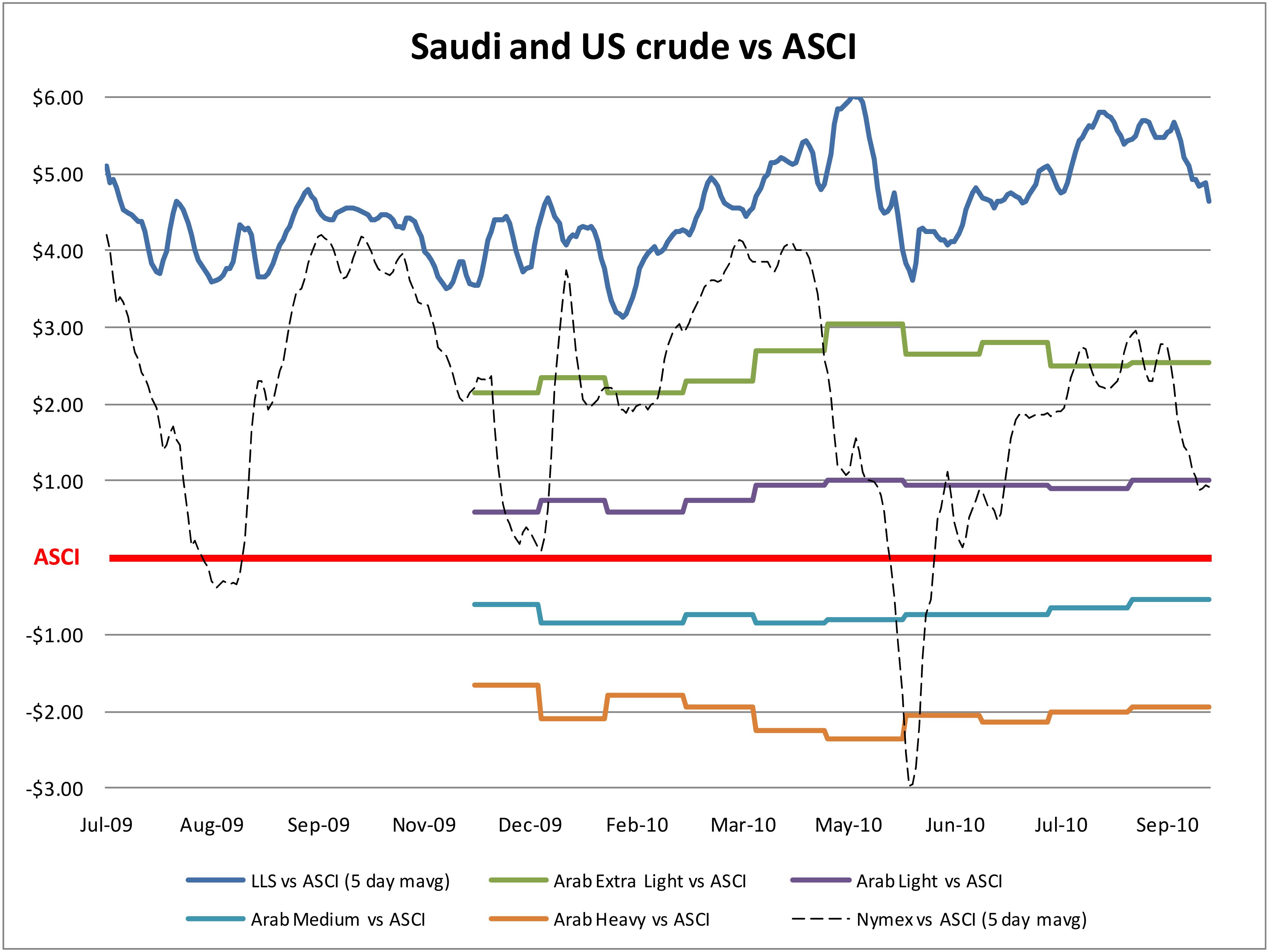
ASCI removes the volatility associated with using WTI as a pricing mechanism.

Gulf Coast Sweet versus Midcontinent Sweet

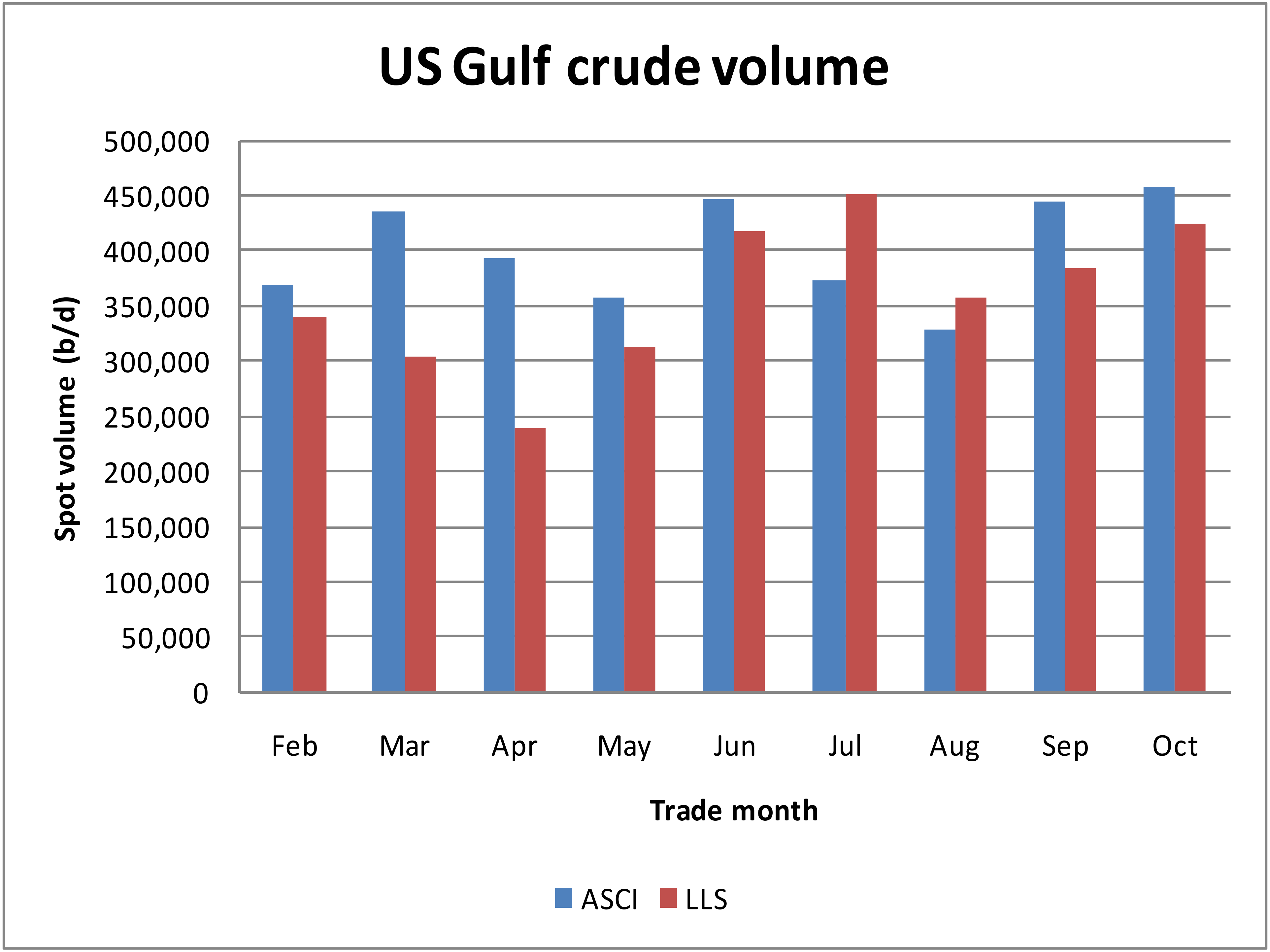


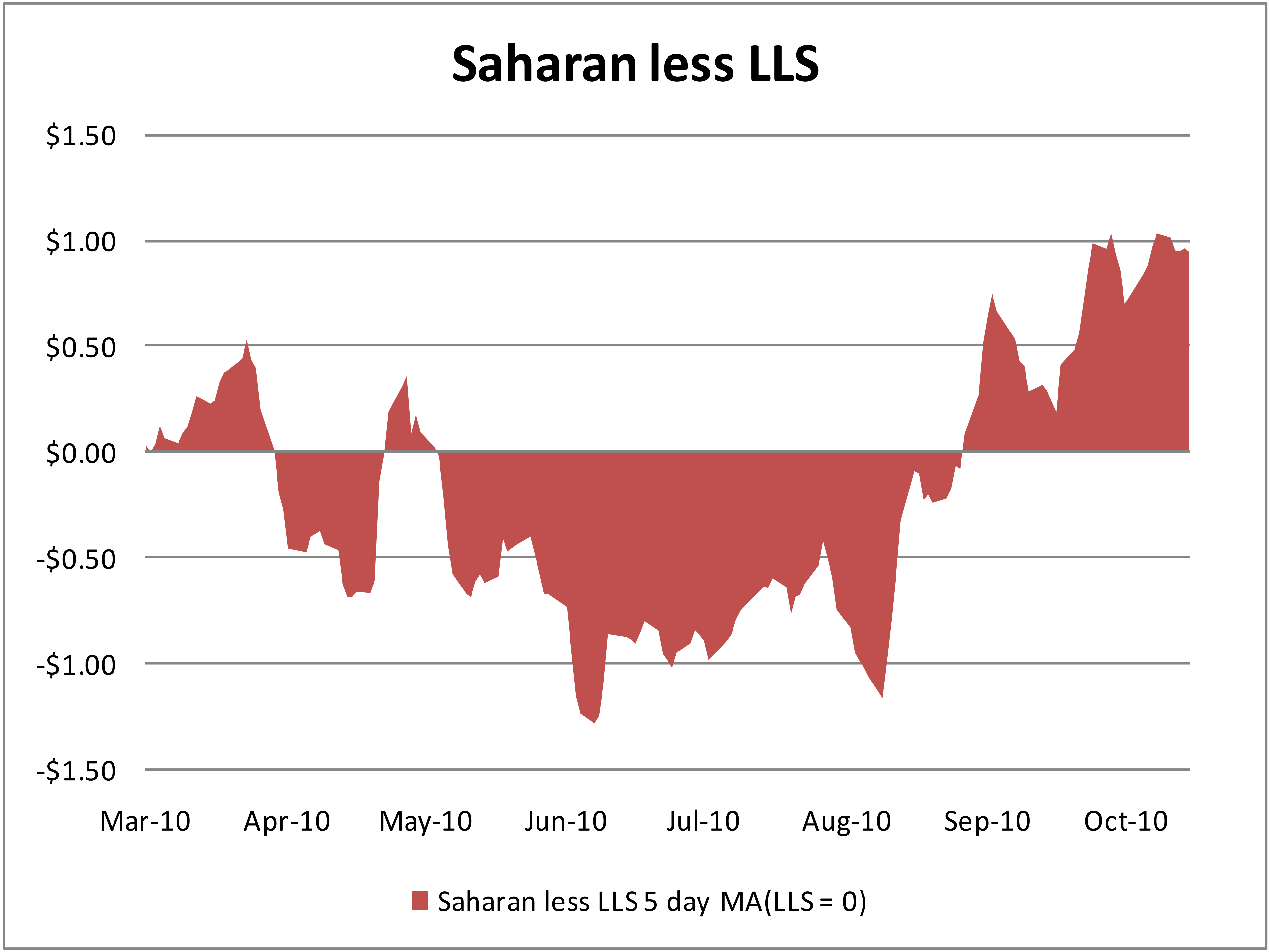


Gulf Coast Sour (ASCI) versus Midcontinent Sweet
WTI dislocates from world markets
$8.00
$6.00
$4.00
$2.00
$0.00
-$2.00
-$4.00
-$6.00
Jan-09
Feb-09
Mar-09
Apr-09
May-09
Jun-09
Jul-09
Aug-09
Sep-09
Oct-09
Nov-09
Dec-09
Jan-10
Feb-10
Mar-10
Apr-10
May-10
Jun-10
Jul-10
Aug-10
Sep-10
ASCI less WTI (WTI=0)


Saudi and US crude vs ASCI
$6.00
$5.00
$4.00
$3.00
$2.00
$1.00
ASCI
-$1.00
-$2.00
-$3.00
Jul-09
Aug-09
Sep-09
Nov-09
Dec-09
Feb-10
Mar-10
May-10
Jun-10
Jul-10
Sep-10
LLS vs ASCI (5 day mavg)
Arab Extra Light vs ASCI
Arab Light vs ASCI
Arab Medium vs ASCI
Arab Heavy vs ASCI
Nymex vs ASCI (5 day mavg)

LLS as a sweet marker?


US Gulf crude volume
500,000
450,000
400,000
350,000
300,000
250,000
200,000
150,000
100,000
50,000
0
Spot volume (b/d)
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Trade month
ASCI
LLS


Saharan less LLS
$1.50
$1.00
$0.50
$0.00
-$0.50
-$1.00
-$1.50
Mar-10
Apr-10
May-10
Jun-10
Jul-10
Aug-10
Sep-10
Oct-10
Saharan less LLS 5 day MA(LLS = 0)

Canadian crude indexation evolving

Canadian crude indices in flux

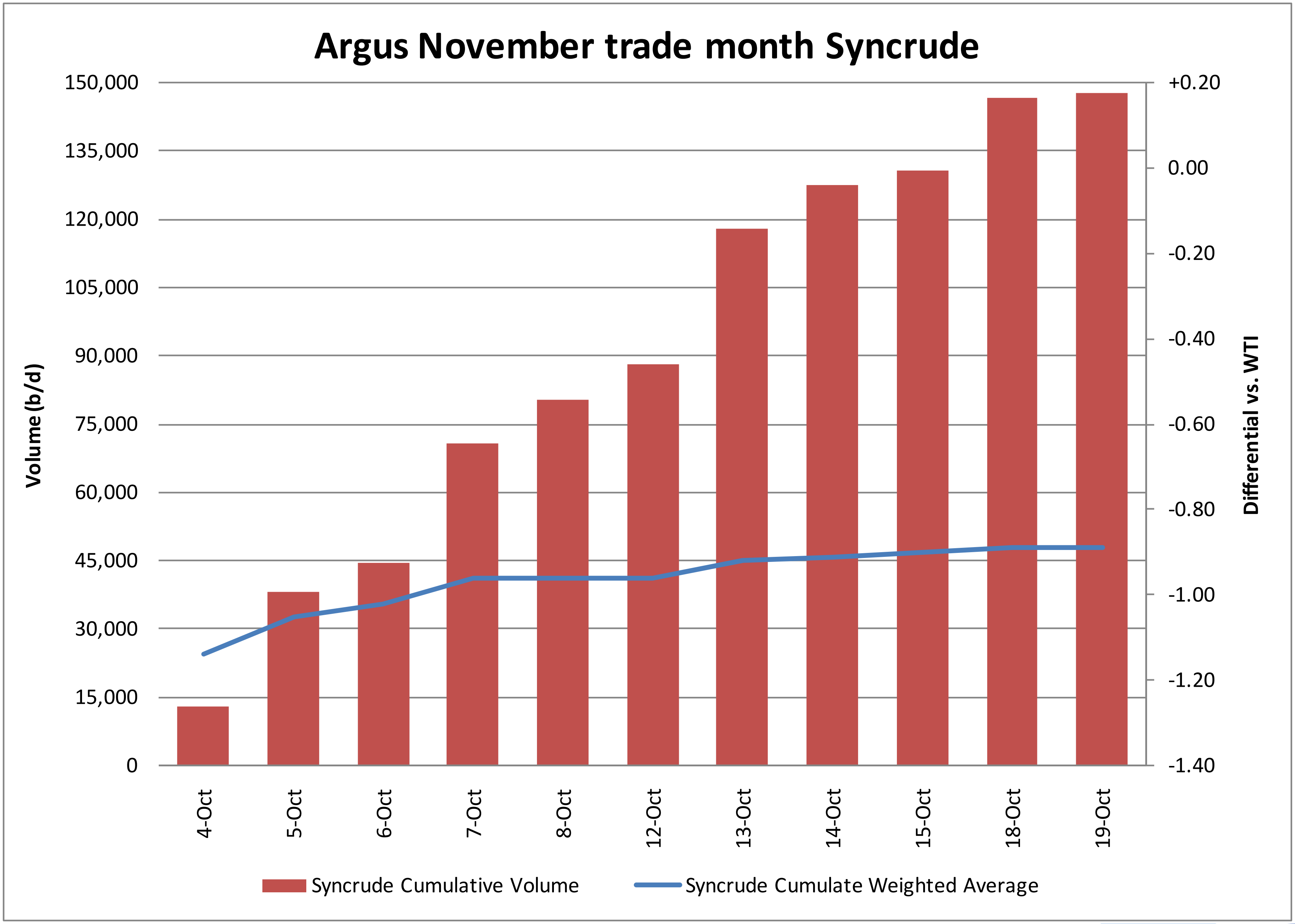
Competing index prices currently produced from electronic exchange, and from broker shops.

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

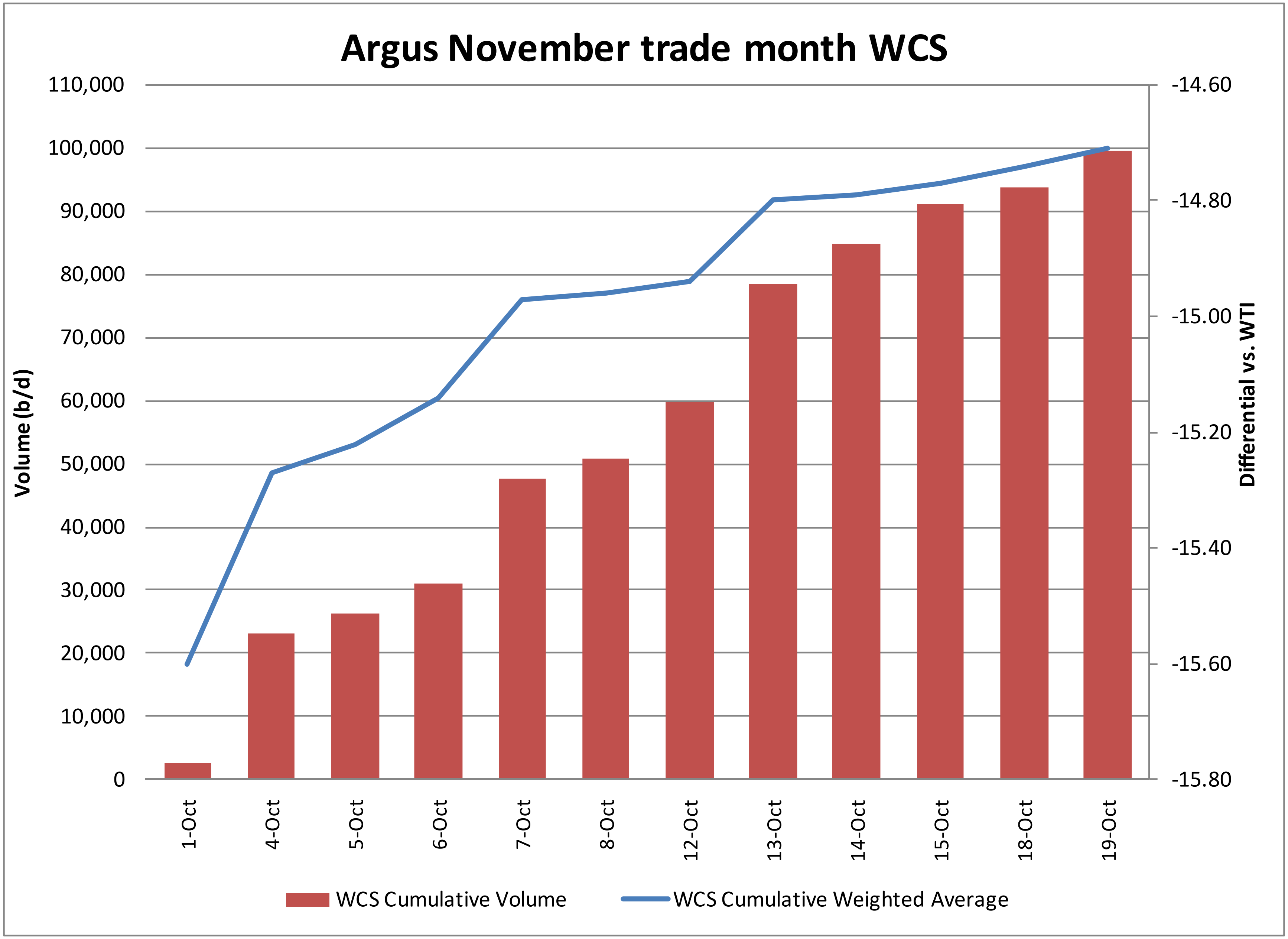
- Removes opportunity to shift volumes between index platforms.
- Participants need not have a commercial agreement to participate in index formation.

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
150,000
135,000
120,000
105,000
90,000
75,000
60,000
45,000
30,000
15,000
0
+0.20
0.00
-0.20
-0.40
-0.60
-0.80
-1.00
-1.20
-1.40
4-Oct
5-Oct
6-Oct
7-Oct
8-Oct
12-Oct
13-Oct
14-Oct
15-Oct
18-Oct
19-Oct
Syncrude Cumulative Volume
Syncrude Cumulate Weighted Average


Argus November trade month WCS
Volume (b/d)
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Differential vs. WTI
-14.60
-14.80
-15.00
-15.20
-15.40
-15.60
-15.80
1-Oct
4-Oct
5-Oct
6-Oct
7-Oct
8-Oct
12-Oct
13-Oct
14-Oct
15-Oct
18-Oct
19-Oct
WCS Cumulative Volume
WCS Cumulative Weighted Average

Observations

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.

argus

More information at www.argusmedia.com/ASCI

www.argusmedia.com

London, Houston, Washington, New York, Portland, Santiago, Singapore, Beijing, Tokyo, Sydney, Dubai, Moscow, Astana, Kiev, Berlin and Johannesburg