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# Physical Crude Oil Benchmarks & Futures Prices during COVID-19: The U.S. experience

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October 2020



illuminating the markets

Market Reporting

Consulting

Events

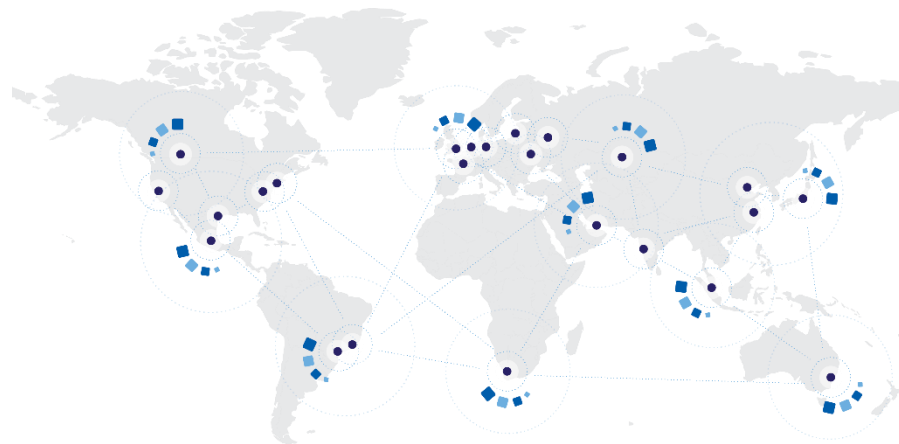
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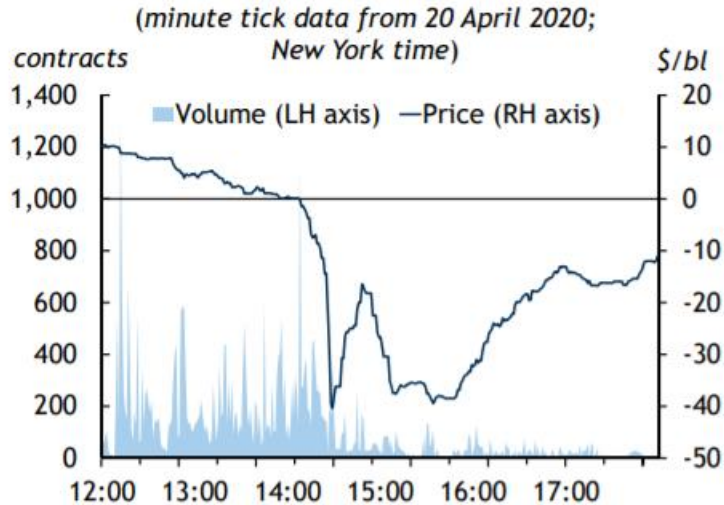
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# Agenda

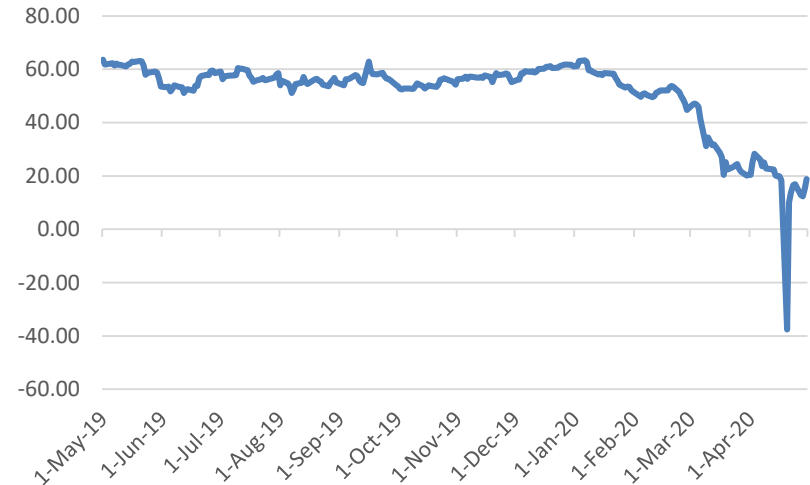
- April 20 and the response of market participants to negative pricing in physical markets
- US physical pricing bases and impact of negative M1 futures
- Alternative physical price mechanisms discussed post April 20

# The price crash of April 20, 2020

## Nymex May WTI crude futures

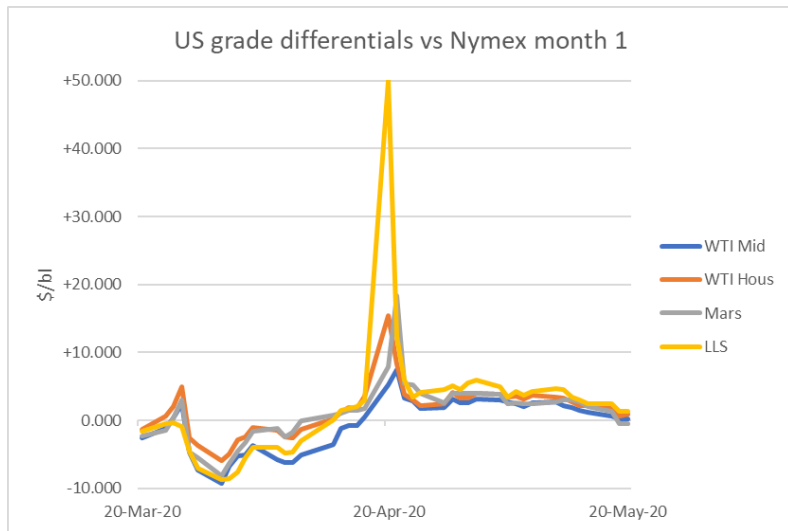


## Nymex light sweet crude settlement price

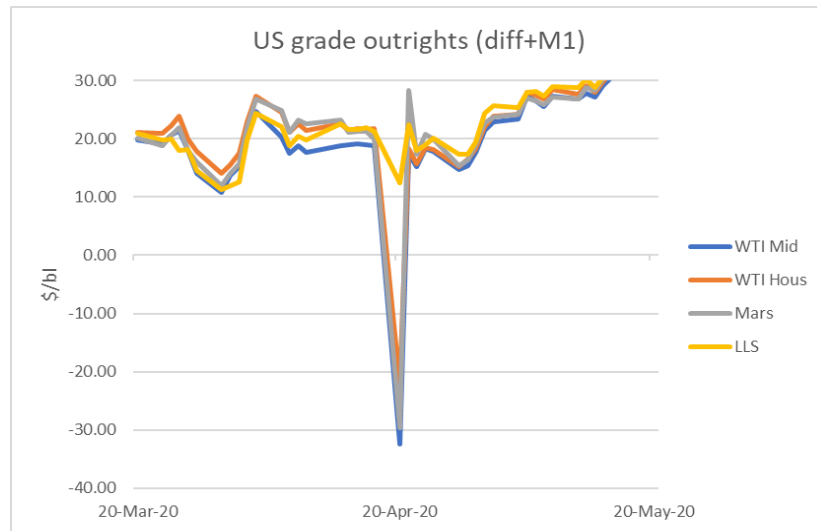


# How did physical benchmarks adapt?

## Differentials strengthen

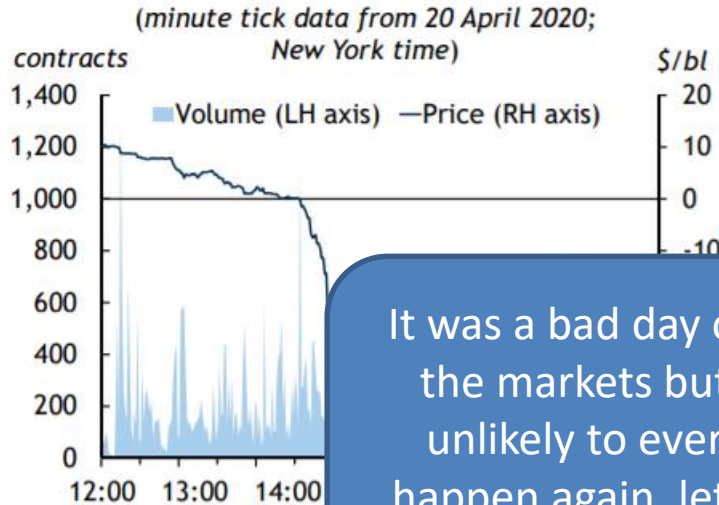


## Outright prices plunge



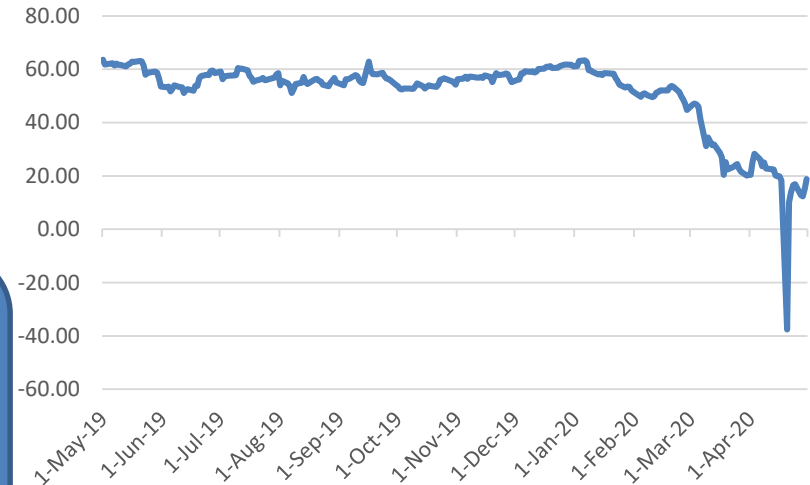
# Responses to April 20, 2020

## Nymex May WTI crude futures



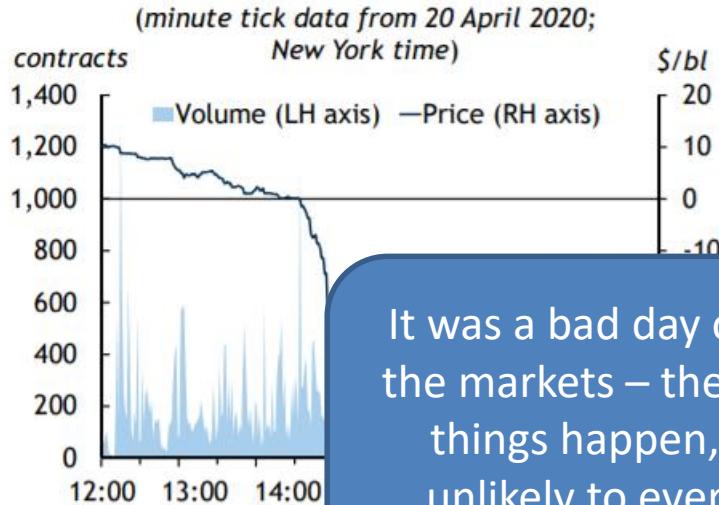
It was a bad day on  
the markets but  
unlikely to ever  
happen again, let's  
move on

## Nymex light sweet crude settlement price



# Responses to April 20, 2020

## Nymex May WTI crude futures



It was a bad day on the markets – these things happen, unlikely to ever happen again

## Nymex light sweet crude settlement price



How can my crude oil be worth less than zero? I want to stop this from ever happening again!

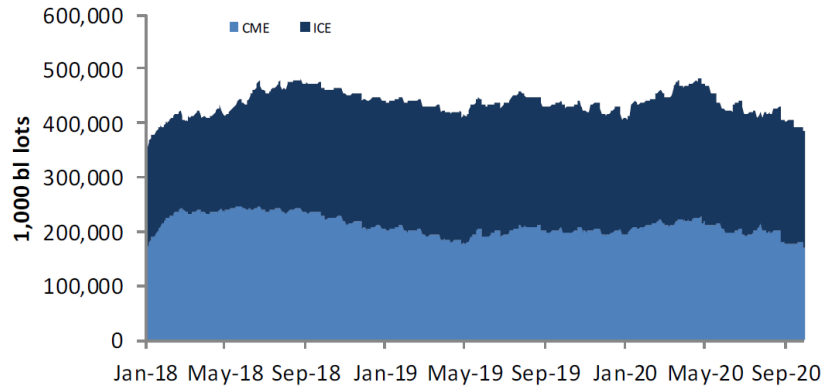


# How is spot crude oil priced in the domestic market?

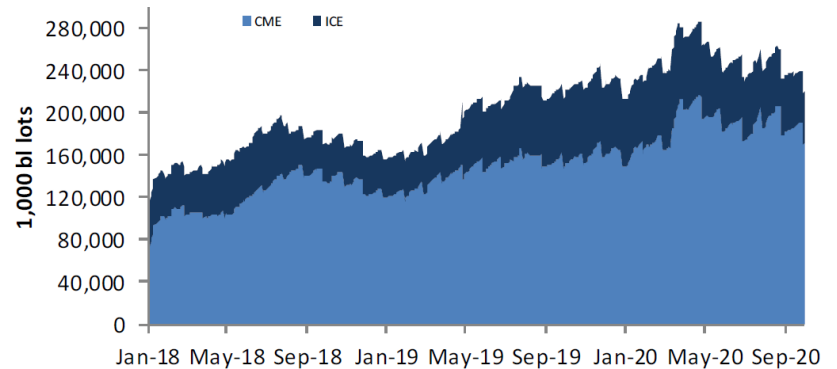
- Nymex M1 + agreed differential
  - Hedge by buying/selling physical barrels of WTI/DSW at Cushing
  - Or use Nymex futures and Argus swaps

# Argus swaps enable accurate hedging

## WTI Midland Open Interest



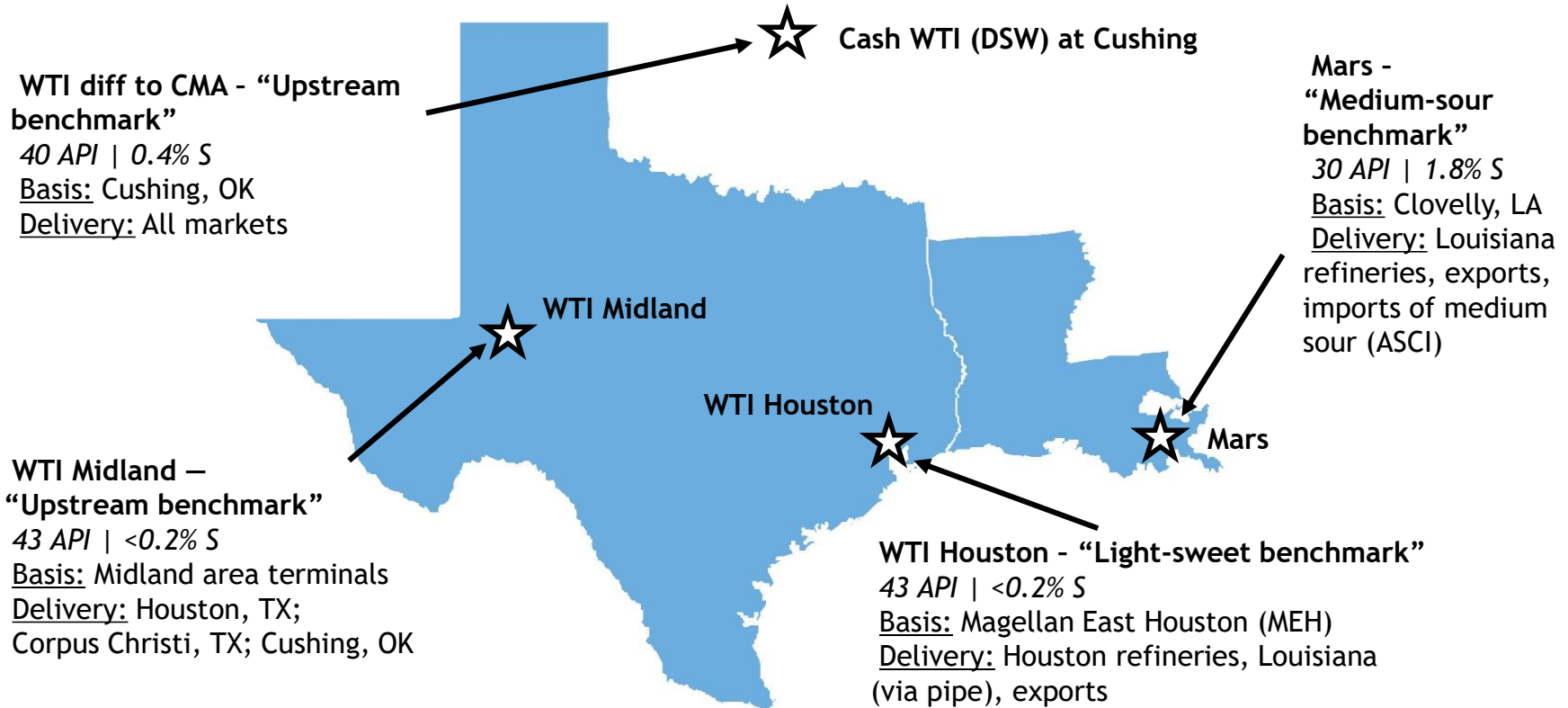
## WTI Houston Open Interest



# How is spot crude oil priced in the domestic market?

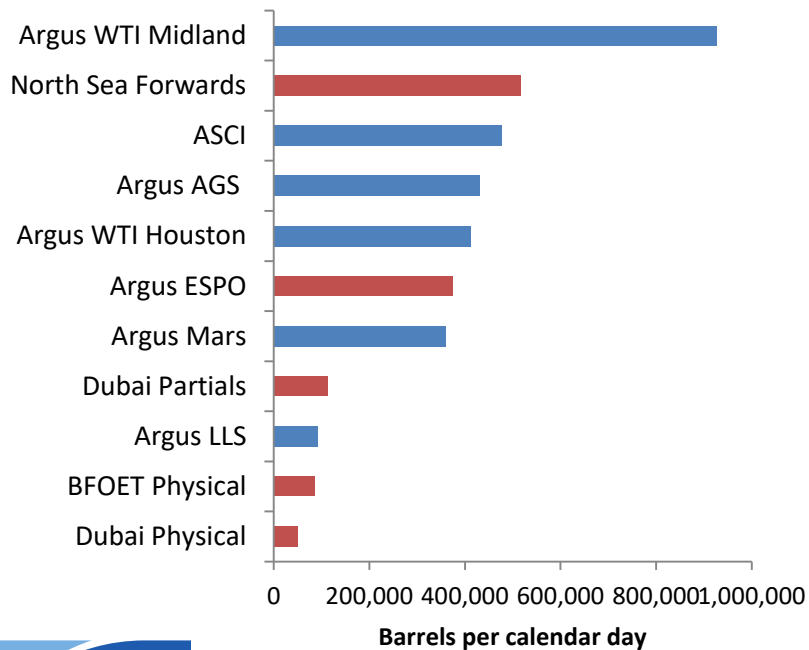
- Nymex M1 + agreed differential
- Nymex M1 + secondary benchmark (e.g. Argus WTI Houston/WTI Midland/Mars) + agreed differential
  - Hedged using Nymex futures or “barrels back” plus Argus swap

# "Secondary benchmarks" for US physical crude

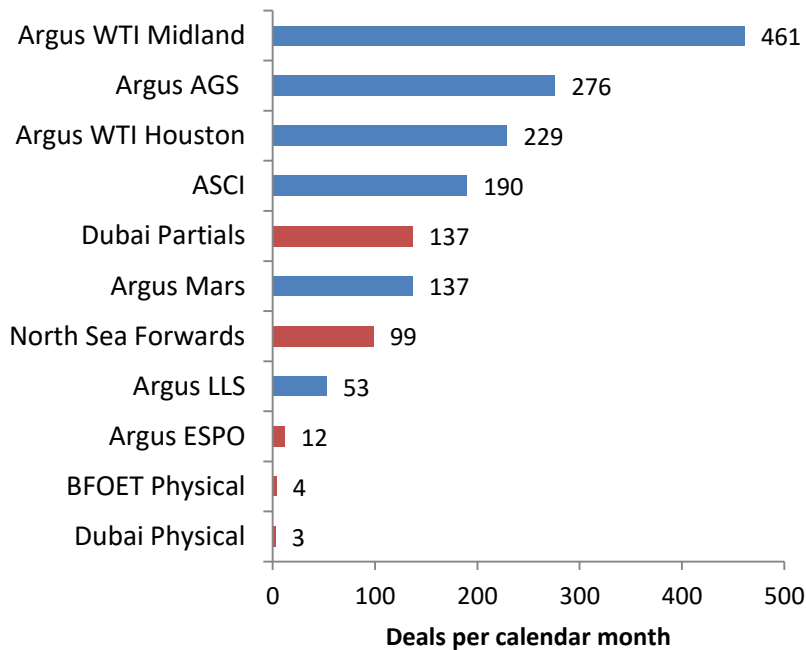


# US crude markets are large, liquid and transparent

**Average daily trade volume underlying benchmark**



**Average monthly deal count underlying benchmark**



# How is spot crude oil priced in the domestic market?

- Nymex M1 + agreed differential
- Nymex M1 + secondary benchmark (e.g. Argus WTI Houston/WTI Midland/Mars) + agreed differential
- Nymex Calendar Month Average (CMA) + agreed differential
  - Hedge with Nymex
  - CMA is further along forward curve, stayed in firmly positive territory on April 20

# Nymex CMA is the basket of M2, M3 futures settlements prices that will set the cash physical price in July

July 2020

July delivery days  
when August Nymex  
futures is prompt

July delivery days  
when September  
Nymex futures is  
prompt

SUN	MON	TUE	WED	THU	FRI	SAT
28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1

- Physical crude delivered rateably at Cushing all month
- In July, roughly 2/3 of days price on August futures, last 1/3 prices on September
- Nymex publishes a prospective July CMA reflecting that ratio

## How is spot crude oil priced in the domestic market?

- Nymex M1 + agreed differential
- Nymex M1 + secondary benchmark (e.g. Argus WTI Houston/WTI Midland/Mars) + agreed differential
- Nymex Calendar Month Average (CMA) + agreed differential
- Nymex CMA + either Argus WTI diff to CMA or "Nymex roll" + agreed differential
  - Hedge with Nymex, Argus swap



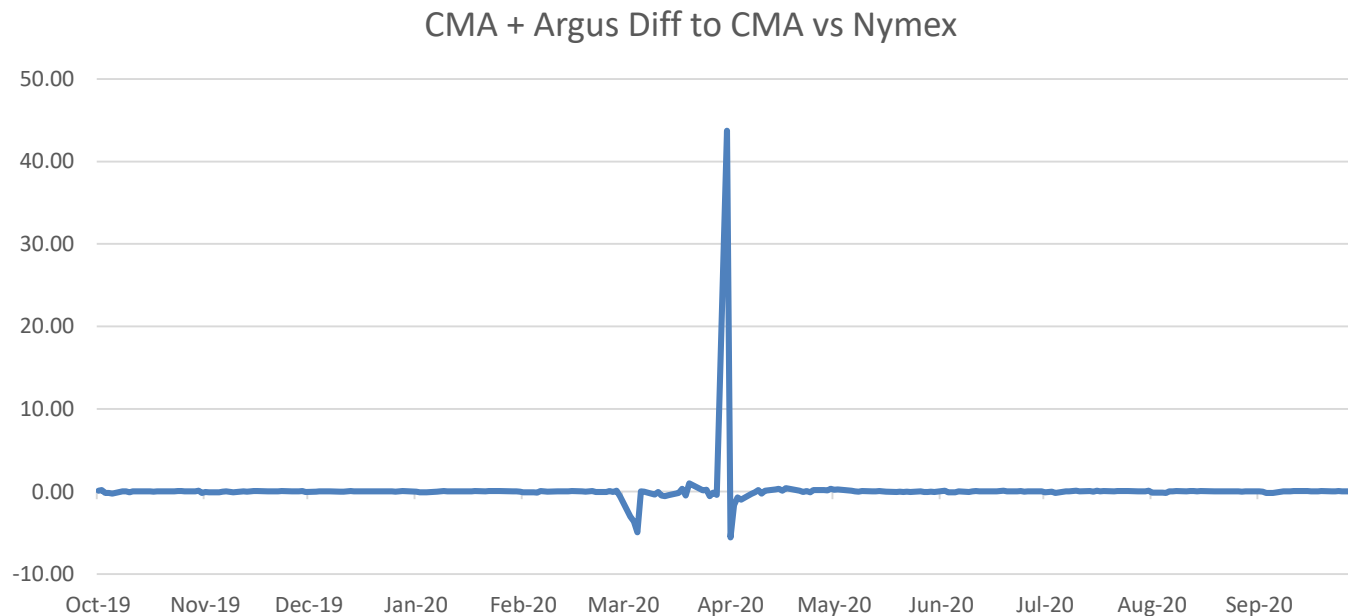
# WTI diff to CMA converts futures to physical price

- Argus diff to CMA accounts for the contango or backwardation in the market structure.
- The market trades multiple times a day the difference between:
  - the CMA futures (Aug & Sep) that will be the basis for July and
  - the actual physical price for crude to be delivered in July.

## Trades for the WTI Cushing “diff to CMA” on 13 April

Southern Green Canyon	Nederland / Texas City	May	May	WTI	-2.00	5,000
Southern Green Canyon	Nederland / Texas City	May	May	WTI	-1.50	7,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-8.45	2,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-8.30	1,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-8.30	4,839
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-8.25	1,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-8.10	3,100
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-8.05	2,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-7.95	2,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-7.90	1,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-7.90	2,500
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-7.90	3,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-7.90	5,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-7.90	8,000
WTI	Cushing Oklahoma	May	May	CMA Nymex trade days	-7.90	10,000
WTI	Magellan East Houston	May	May	WTI	0.00	1,000
WTI	Magellan East Houston	May	May	WTI	0.00	1,000

# Convergence: Cash WTI/DSW realigns with M1 futures



# Physical market pricing solutions discussed post-April 20

- Circuit breakers
- Use of Nymex CMA + Argus diff to CMA
- Use of a standalone USGC marker like Argus AGS

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# Thank You!



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