

# Chinese Methanol Outlook - Countering Pandemic Headwinds

*Prepared for*

**2020 International Methanol Conference – Looking Beyond The Pandemic  
Online - October 21<sup>st</sup> – 22<sup>nd</sup> 2020**

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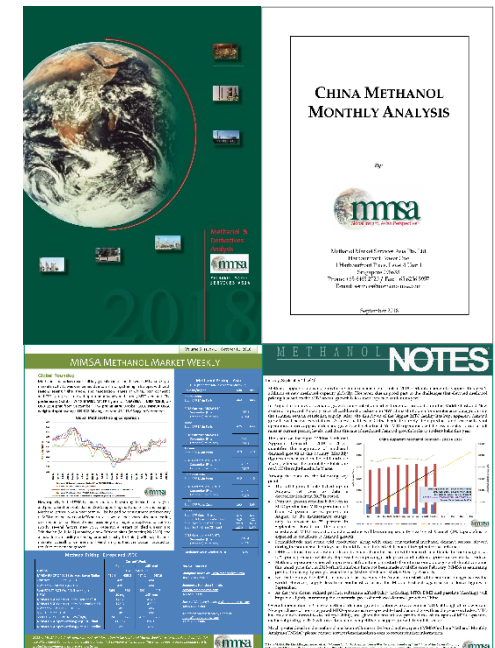


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  - Methanol (including “low carbon” meOH), Acetic Acid, Formaldehyde, MMA, MTBE
- **MMSA IMPCA International Methanol Conference – October 21 – 22, 2020**
- **Renewable Methanol Conference – Spring/Summer 2021**

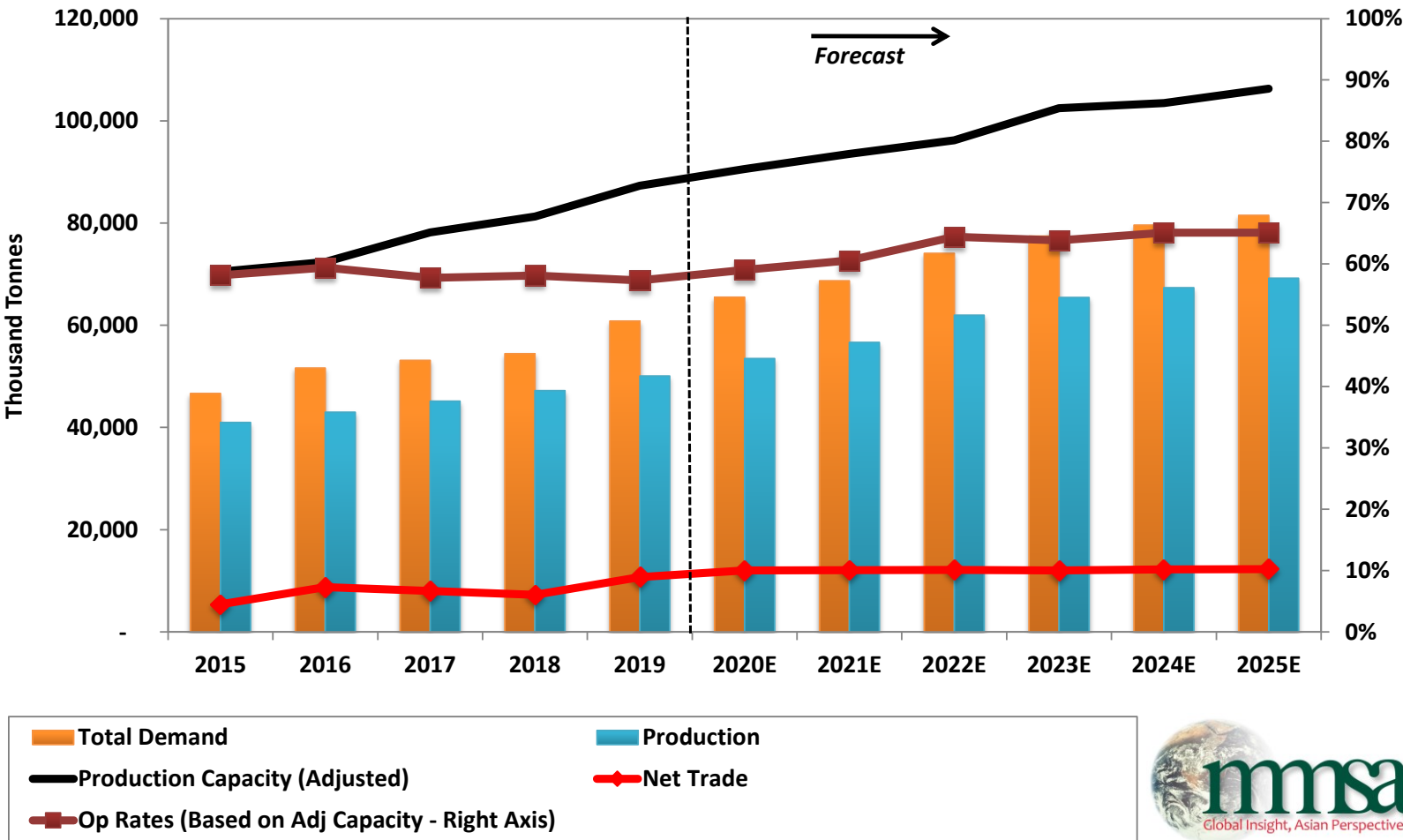


- China methanol demand into MTO is driving world methanol demand recovery.
- COVID-19 remains a strong head wind for the industry in early 2020 for China.
  - Demand destruction, followed by supply reduction, leading to price collapse, in 1Q & 2Q 2020.
- China demand is growing in 2H 2020, after a dent made by COVID-19.
  - Demand recovery, slightly outperformed restarts of methanol capacities since late 3Q. Markets are slightly balanced to tight.
  - MTO economics improved compared with naphtha cracker economics.
  - Both traditional and energy substitute sectors are recovering, especially since September since after the domestic cases decreased to zero, at the expense of lower pricing, margins
  - China absorbed most optional molecules as ex-China demand retreated. Chinese methanol imports and inventory levels set records, with inventories falling.
- Methanol price and margin stability disappears as global trade uncertainty upsets
  - Short term - COVID-19 and geopolitical issues remain market depressants
  - Longer term – supply not keeping track with non-traditional demand
  - Global methanol price and margins boundaries have dropped.

# China methanol demand is growing in 2H 2020, after a dent made by COVID-19 in 1H



Methanol Supply and Demand - China  
4Q2020 Update



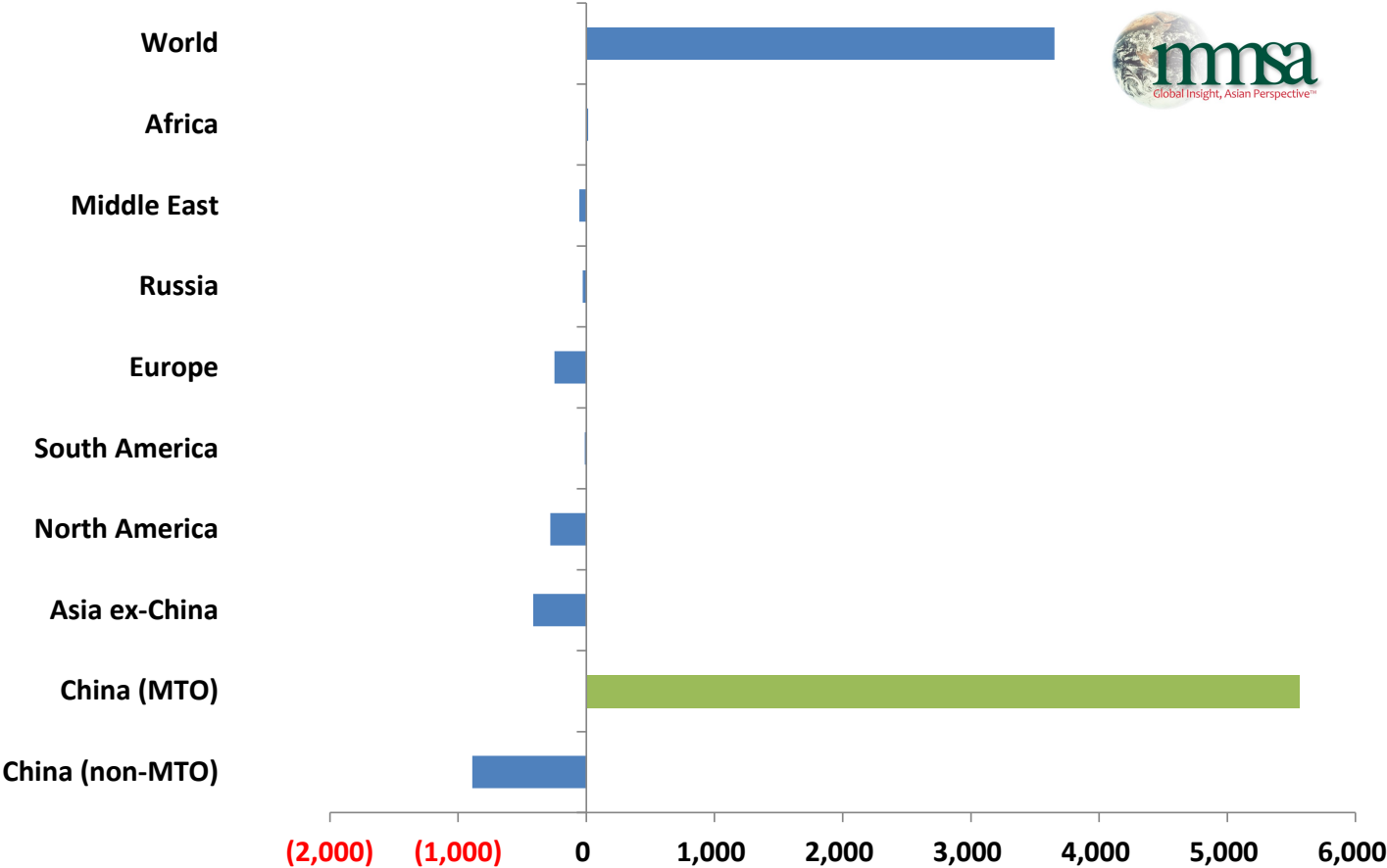
- Demand growth takes a pause amid COVID-19 impact and US-China geopolitical concern.
- Demand will resume growth since 2H 2019 thanks to the winning against COVID-19, thanks to MTO demand.
- Increasing demand met by increasing imports especially from Iran, and the Americas.



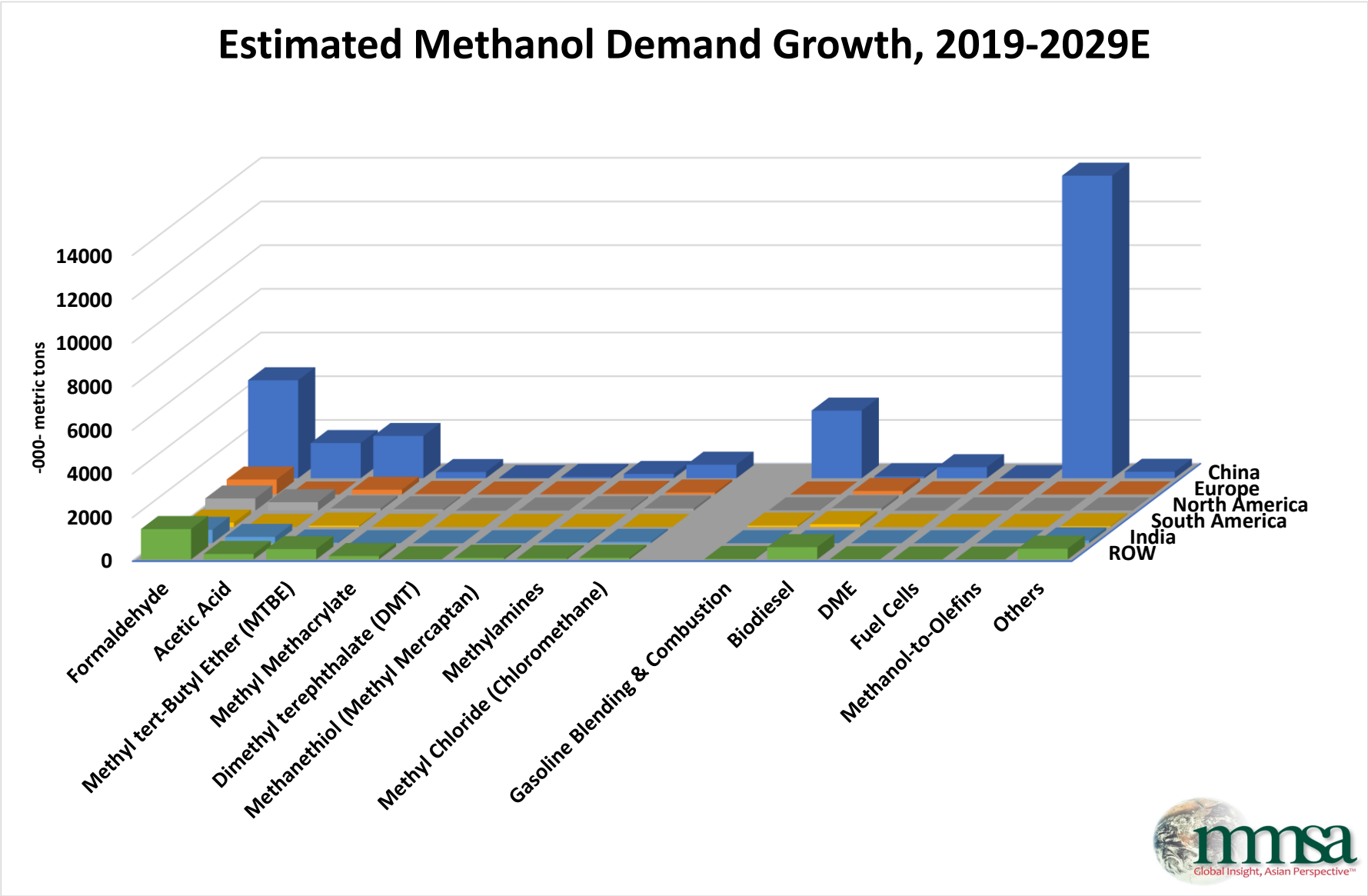
# China Methanol Demand Drives World Markets



**Methanol Demand Growth, 2020E v 2019, By Region**  
(-000- Metric Tons) - MMSA 4Q2020 Update



# China Methanol Demand Drives World Markets



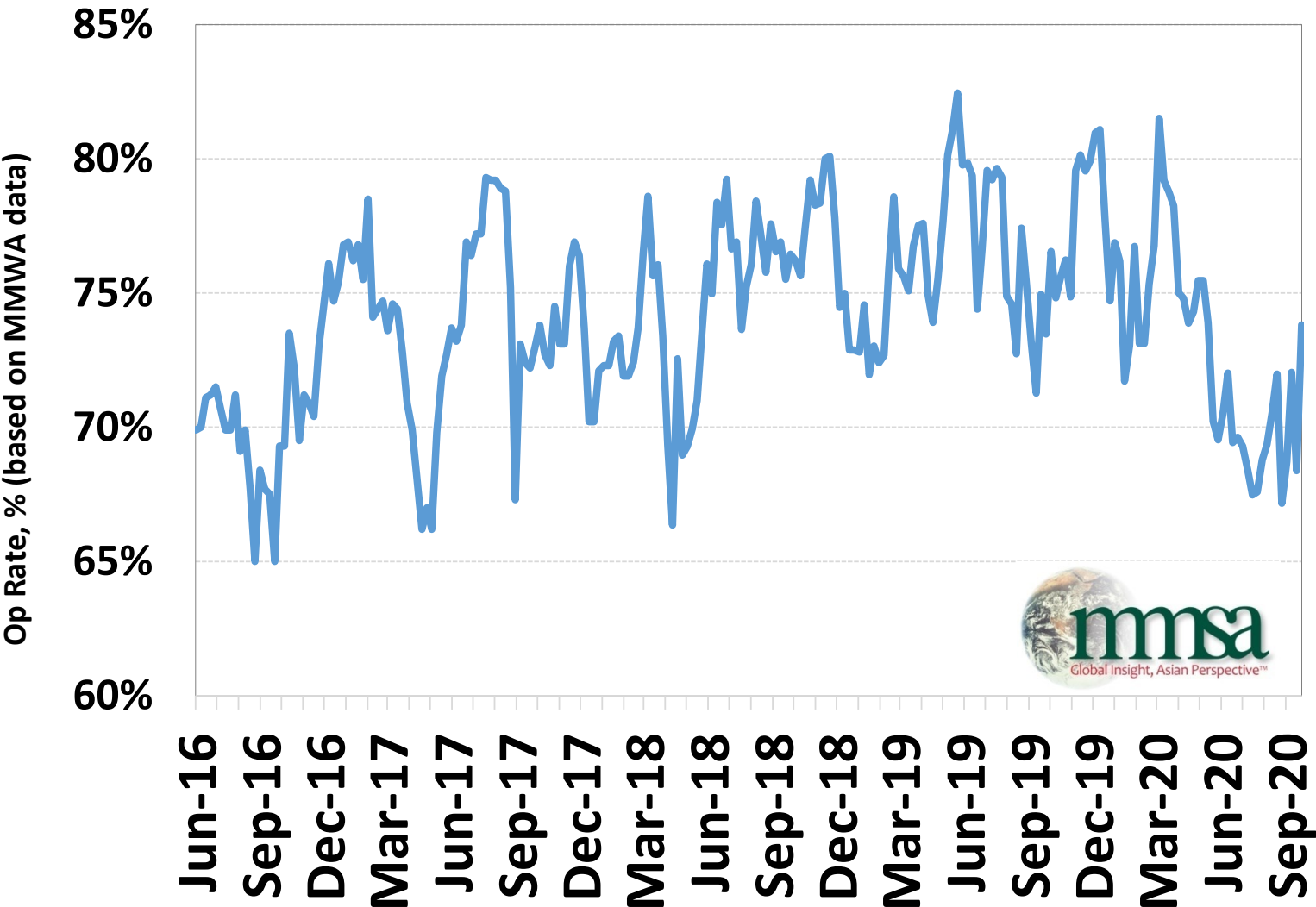
# COVID-19 impact early 2020: Demand loss trumped production loss from COVID – 19

Chinese Methanol & Derivatives Industry Operation Rates			
Industry	Before COVID-19	After COVID-19	Comment
Coal Mine		<b>down by 10%+</b>	Several coal mines delayed restarts on lack of labor force or quarantine. Coal is the only commodity which firmed up due to virus.
Methanol	<b>76%</b>	<b>65%</b>	Major CTO run to plan. Many merchant methanol reduced ops or shut down on poor sales in major producing regions as quarantine restrict logistics.
Formaldehyde	<b>45%</b>	<b>30%</b>	Most of the small to medium size producers shut down during LNY and used to plan to restart post LNY, however which have been delayed. Even major producers in East China shut down on poor sales and quarantine.
Acetic acid	<b>85%</b>	<b>65%</b>	Major acetic acid producers reduced ops on poor sales and the quarantine restrict the logistics.
MTO	<b>84%</b>	<b>57%</b>	Major MTO reduced ops in Shandong and Three in coastline announced shutdown plans including Fude, Xingxing, and Chengzhi No.2 in March. See MTO operation table in MMWA for details.
Others		<b>down by 60%+</b>	Most of the outdoors activities have been suspended, including construction and real estate industry, which will eventually hurt the demand to most of commodity including furniture, formaldehyde, polymers, and iron & steel.

# Demand loss trumped China supply production loss, restarts in Middle East supplant production loss in China

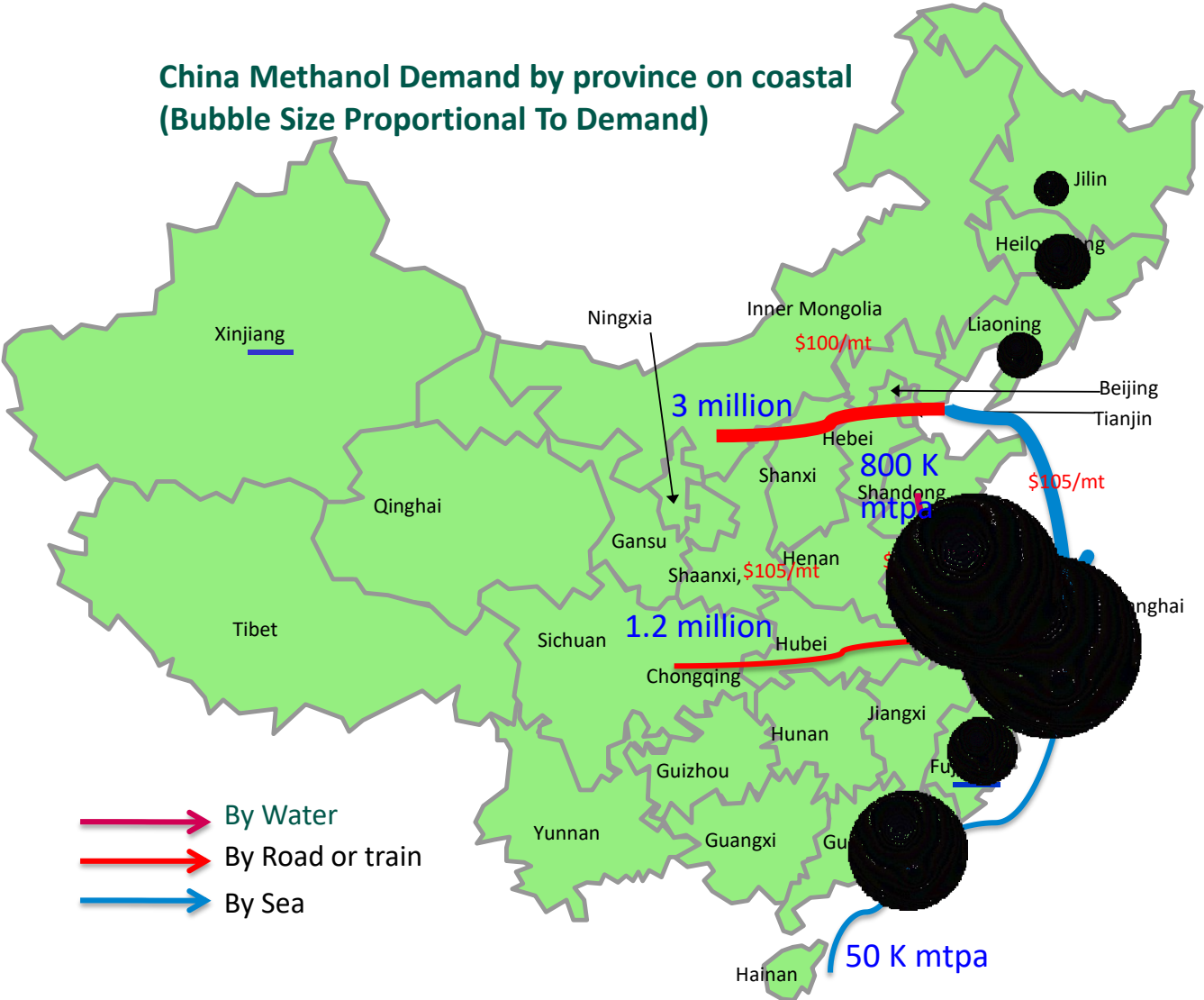


Major Global Methanol Producer Aggregate Op Rate





# The facilities in Middle East and America supplanted the marginal producers in China, trade from Inland China to Coast intercepted

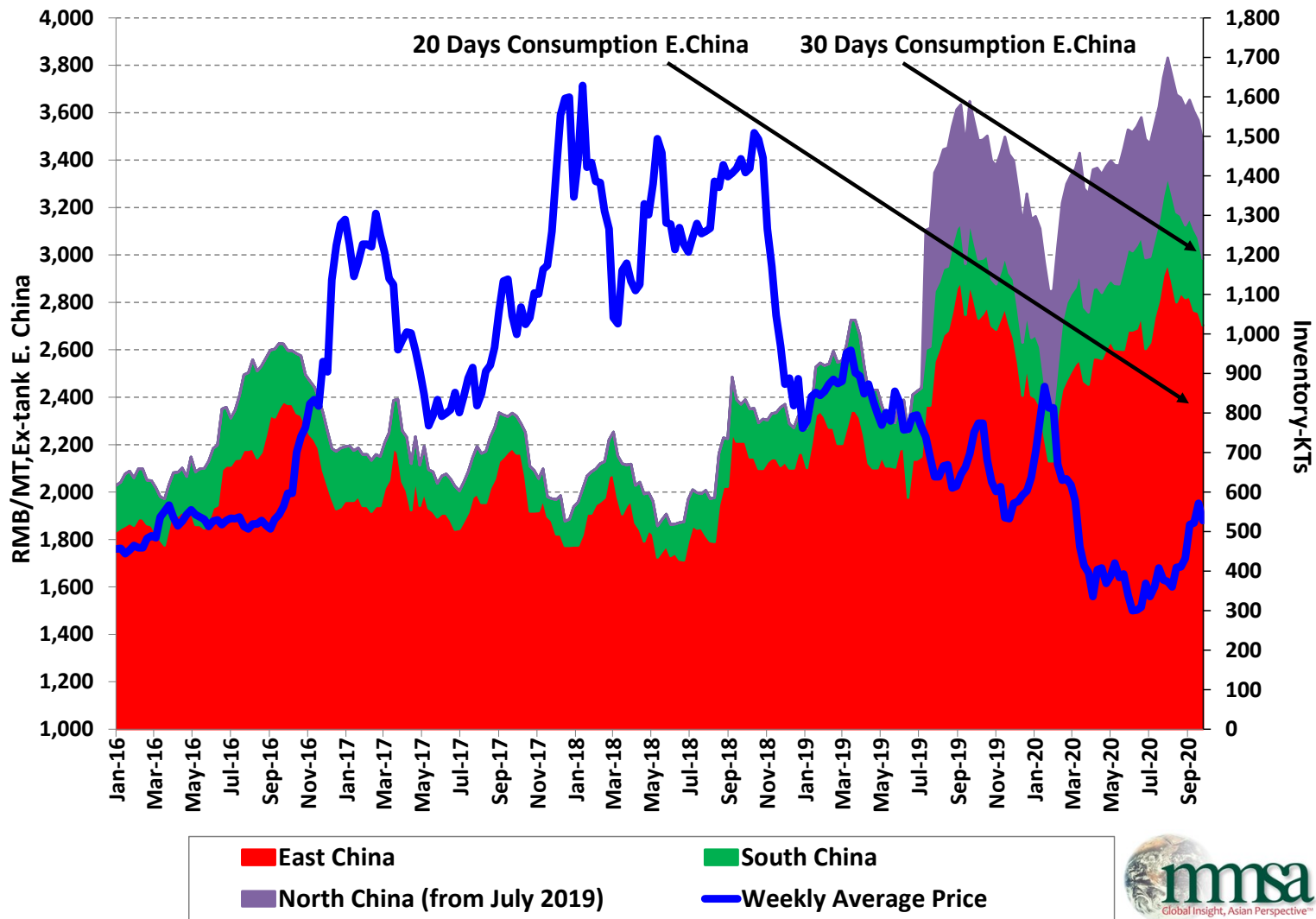


- NW-East  
3 million---50kts
- SW-East  
1.2 million—80kts
- South-East  
50kt—50kts
- Shandong-East  
800kt--0

Lower global demand pushed more international material into China, record high inventory became “new norm”.



### China Methanol Coastal Inventory vs Pricing



# China struggling to recover from COVID – 19, with geopolitical issues remaining a depressant

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- However, some signs of containment are encouraging markets across China, including methanol, with hopes for restart across industries.
- Both supply and demand are recovering from the dent caused by COVID-19.
- Recently, demand recovery has slightly trumped methanol restarts pace, supporting price increase.
- Major derivative producers restarted. A table summarizing coal, methanol, and derivative impacts is provided here.

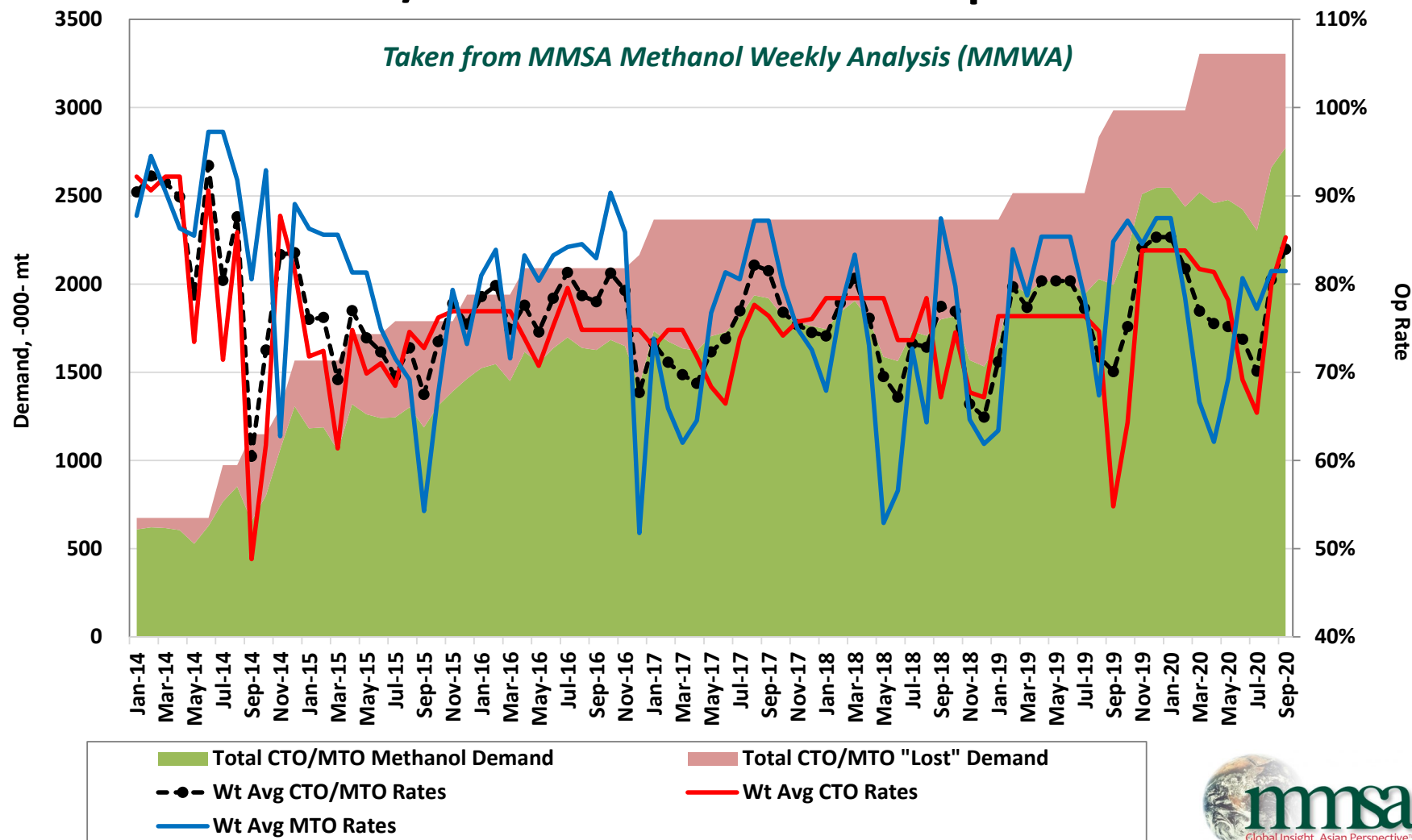
# China's recovery from COVID-19 accelerated since September 2020, with room for improvement.



Chinese Methanol & Derivatives Industry Operation Rates				
Industry	Jan-20 (Before COVID-19)	Feb-20(After COVID-19)	Sep-20	Comment
Coal		<b>down by 10%+</b>	<b>down by 5%+</b>	Several coal mines delayed restarts on lack of labor force or quarantine. Coal is the only commodity which witness price increase
Methanol	<b>76%</b>	<b>65%</b>	<b>68%</b>	Major CTO facilities run to plan. Some merchant methanol producers runs at reduced rates as they're still "under water".
Formaldehyde	<b>45%</b>	<b>30%</b>	<b>40%</b>	Major producers runs to plan. Still lag behind other derivatives.
Acetic acid	<b>85%</b>	<b>65%</b>	<b>82%</b>	Major acetic acid producers runs to plan.
MTO	<b>84%</b>	<b>57%</b>	<b>81%</b>	Major MTO facilities runs at full capacity rates thanks to the higher olefin prices and advantage compared with naphtha based. See MTO operation table in MMWA for details.
Others		<b>down by 60%+</b>	<b>down by 20%</b>	Most outdoor activities resumed, including construction and real estate, which help improve the demand to most of commodity including furniture, formaldehyde, polymers, and iron & steel.

# MTO operations remain depressed op early 2020 amid COVID-19, but recovered afterwards

## CTO/MTO Methanol Consumption



# MTO ops have improved significantly

Coal and Methanol-To-Olefins (CTO and MTO)						
Company	Location	Methanol (mtpa)	Olefin (mtpa)	Start Up	Operation Remarks	
Integrated Projects (CTO):						
Shenhua Group	Baotou, Inner Mongolia	1.8	0.6	2010 Aug	Runs well	
Shenhua Ningmei	Ningxia	1.7	0.5	2011 Apr		
Datang International	Duolun, Inner Mongolia	1.7	0.5	2011		Restarted from outage commencing Jul 28 <sup>th</sup> , yet full capacity rates
Yanchang Zhongmei (Chinacoal) Yulin Nengyuan (Energy)	Yulin (Jingbian), Shaanxi	1.8	0.6	2014 Jun		Shut down Jun 21 <sup>st</sup> through early August for 45 days
Zhongmei Shaanxi Yulin Energy Chemical Co., Ltd	Yulin, Shaanxi	1.8	0.6	2014 Jul		Shut down Jun 29 <sup>th</sup> through early August for 40 days
Shenhua Ningmei Phase II	Yinchuan, Ningxia	1.8	0.6	2014 Aug		Near full rates
Ningxia Baofeng Energy Group	Ningxia	1.8	0.6	2014 Oct		Limited op rates
Shaanxi Pucheng Clean Energy	Weinan, Shaanxi	1.8	0.7	end 2014		Shut down May 10 <sup>th</sup> . Methanol restarted Jun 24 <sup>th</sup> , MTO restarted Jun 27 <sup>th</sup>
Mengda New Energy	Inner Mongolia	1.8	0.6	4/15/2016		Near full rates
Yan'an Energy Chemical	Yan'an, Shaanxi	1.8	0.6	8/29/2018		Shut down methanol unit unexpectedly for a couple of days. Have to purchase methanol to feed olefin unit
Zhongtian Hechuang	Inner Mongolia	1.8	0.7	2017 Sep	Shut down methanol unit unexpectedly for 10 days. Have to purchase methanol to feed olefin unit	
Shenhua Xinjiang	Urumqi, Xinjiang	1.8	0.7	2016 Oct	Commissioned end July 2019. Resumed from an unexpected outage Apr 8 <sup>th</sup> - 13 <sup>th</sup>	
Zhongan Lianhe CTO	Anhui	1.7	0.6	2019 Jul		
Ningxia Baofeng Energy Co. Ltd (MTO Facility)	Ningxia	1.8	0.6	2019 Jul	MTO comissioned Sep 19 <sup>th</sup> , full operation expected in Mar 20 <sup>th</sup> . Methanol May 29 <sup>th</sup> , 2020. Shut down early July through early August	
Qinghai Salt Lake Industry Co. Ltd	Golmud, Qinghai	1.0	0.3	1Q 2019	CTM Nov 2018; MTO Jan 30 <sup>th</sup> 2019, remains shutdown	
Erdos Sanwei Chemical Co. Ltd	Inner Mongolia	0.4	0.1	2019	Methanol started end 2018, MTO is comissioning, currently offline	
Shandong Luxi Chemical Co. Ltd.	Shandong	0.8	0.3	end 2019		
Sinopec & Henan Coal Chemical	Hebi, Henan	1.8	0.6	2021		
Gansu Pingliang Hua Hong Hui Jin Coal Chemical Co. Ltd	Pingliang, Gansu	1.8	0.7	2021		
Yanchang Zhongmei (Chinacoal) Yulin Nengyuan (Energy)	Yan'an, Shaanxi	1.8	0.6	2021		
Sinopec	Ningxia	1.8	0.6	2023		
Sinopec	Guizhou	1.8	0.6	2023		
Zhongtai Chemical	Xinjiang	1.8	0.6	2022		
Qinghai Kuangye	Qinghia	1.8	0.6	2023		
Tongmei Guangfa	Datong, Shanxi	1.8	0.6	2023		
Non-Integrated Projects (MTO):						
Zhongyuan Petrochemical (Sinopec)	Puyang, Henan	0.6	0.2	2011 Oct	Shut down for maintenance Jul 24 <sup>th</sup> to Oct 22 <sup>nd</sup>	
Ningbo Fude	Ningbo, Zhejiang	1.8	0.6	2012 4Q	Restarted from turnaround commencing Feb 17 <sup>th</sup> through 29 <sup>th</sup>	
Nanjing Chengzhi Clean Energy Company	Nanjing, Jiangsu	0.9	0.3	3Q 2013	Restarted from 2-week turnaround outage	
Shandong Yuhuang	Dongming, Shandong	0.3	0.1	2014 Sep	Shut down early 2016	
Shandong Shenda (Legend Holdings)	Zaozhuang, Shandong	1.0	0.4	2014 Oct	Reduced operation to 70 percent rates on technical issue in June	
Zhejiang Xingxing New Energy	Jiaxing, Zhejiang	1.8	0.6	2015 Apr	Restarted from outage commencing Mar 3 <sup>rd</sup>	
Shandong Yangmei Hengtong Chemical Co., Ltd	Linyi, Shangdong	0.9	0.3	6/28/2015	Shut down Apr 5 <sup>th</sup> for 20 days	
Shenhua Yulin	Yulin, Shaanxi	1.8	0.6	12/15/2015	Shut down Apr 5 <sup>th</sup> through May 25 <sup>th</sup> for turnaround	
Jiangsu Shenghong Group	Lianyungang, Jiangsu	2.4	0.8	12/27/2016	Restarted end July from 15 - 20 days on technical issue. 40 - days turnaround outage planned end September	
Jiutai Energy (Zhungeer) Co., Ltd	Erdos, Inner Mongolia	1.0	0.3	3/20/2019	Reduced to 70 percent on poor sales	
Nanjing Chengzhi Clean Energy Company	Nanjing, Jiangsu	1.8	0.6	2019 Jun	Restarted from turnaround outage Apr 15 <sup>th</sup> - 30 <sup>th</sup>	
Ningbo Fude	Changzhou, Jiangsu	0.9	0.3	12/25/2016	Down from March 2017. To restart May 2020	
Better Clean Energy	Shandong	0.9	0.3	2020	Under construction	
Connell Chemical	Jilin	0.9	0.3	end 2020	Commissioned Apr 15 <sup>th</sup> 2020. Shut down end September on economics	
Qinghai Damei	Xining, Qinghai	1.8	0.6	2021	Methanol project has been postponed. Effectively becomes non-integrated MTO	
Tianjin Bohai Chemical Industry	Tianjin	1.8	0.6	early 2021	To commission November. Under construction	
Wison	Taizhou, Jiangsu	2.7	0.9	2023	Pending	
Operational	Integrated	27.1	9.2			
	Non-Integrated	14.3	4.8			

# Pricing to sustain lower, but reinvestment-enabling, margins

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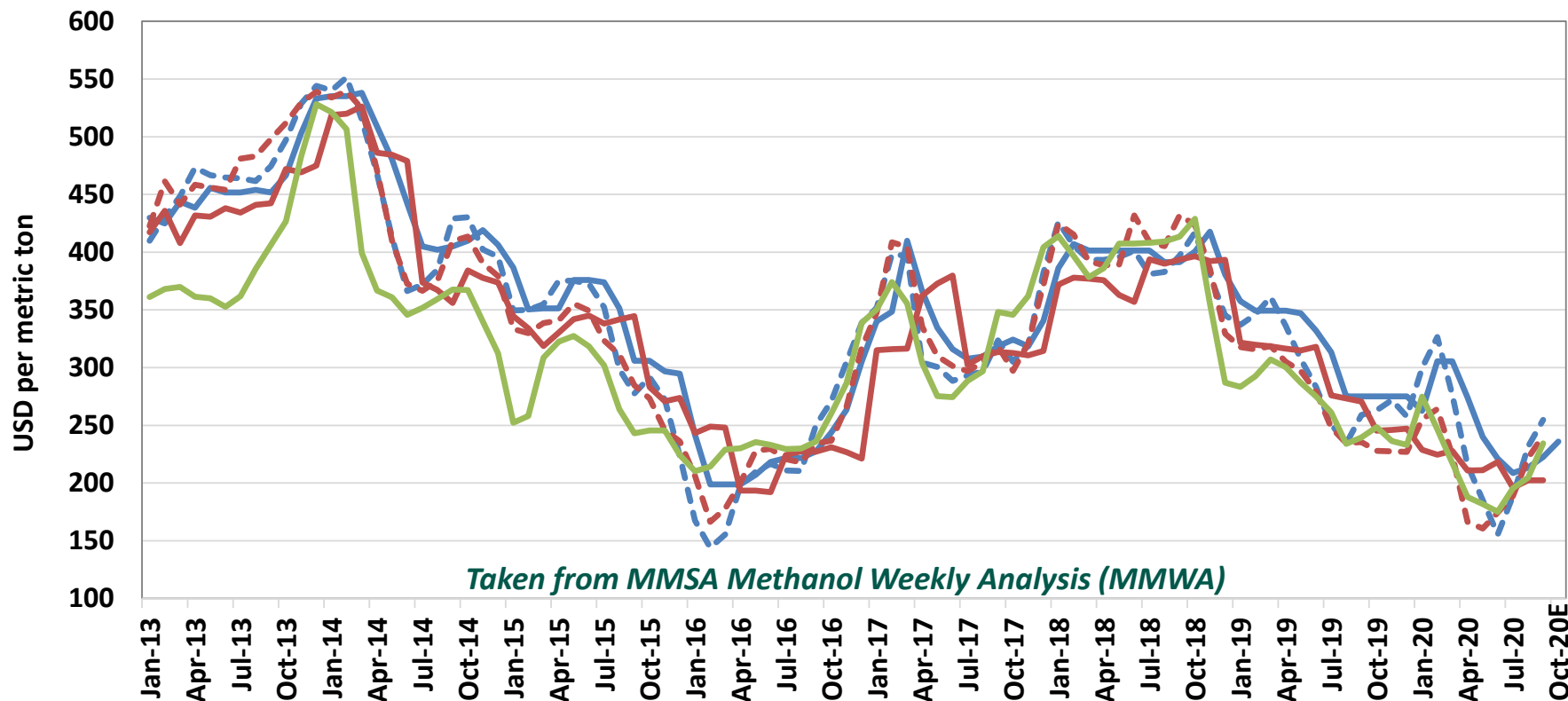
- Prices Limited on high side by derivative affordability
  - MTO now the “marginal buyer” of product
- Prices Limited on low side by marginal cost of supply
  - Firmly located in China, based on coal feed, increasingly low, flat
- Short term, most of the producers in China are still “below water” amid COVID-19 threat, but the support of marginal producers cost limit any further price decrease and support further rebound, to above reinvestment level.
- Longer term, until more capacity appears, pull from energy, MTO demand will keep supply tight and support prices, after demand recovering from COVID-19 3Q.
- Prices are connected globally – optional molecules to remain centered in Middle East until “Methanol Bridge” is fully functional
  - China will be world’s “relief valve” until more significant US – China trade patterns emerge



# Global methanol pricing: Chinese values began to recover, although still restricted by COVID–19

## Global Methanol Pricing Comparison

(monthly through October '20E)

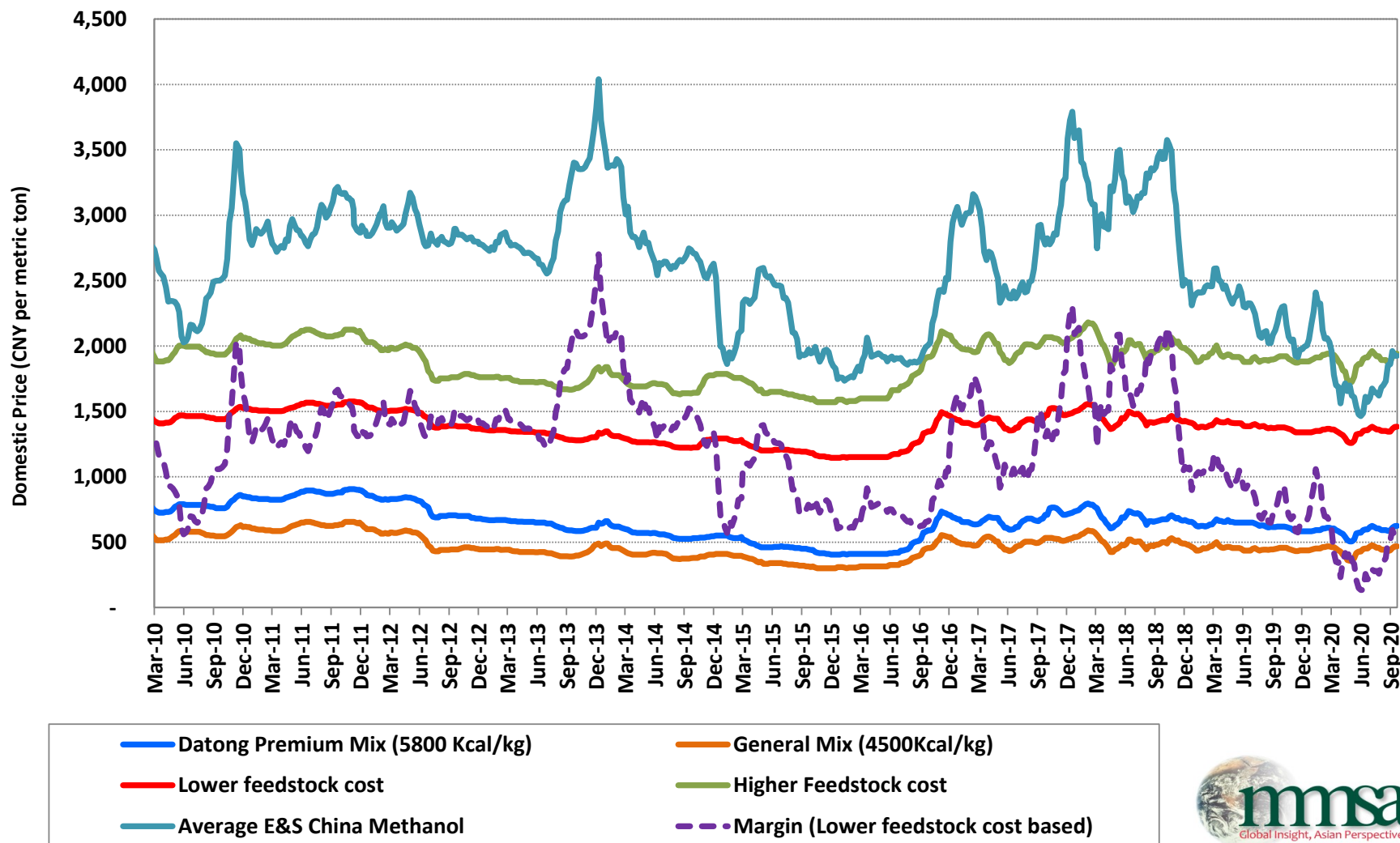


- Methanol US MMSA Contract Index, Avg Realized Price FOB USGC USD/metric ton
- - - Methanol US MMSA US Spot USGC Barge Wtd Avg FOB USGC USD/metric ton
- Methanol West Europe Contract (T2), Avg Realized Price FOB Rotterdam USD/metric ton
- - - Methanol West Europe MMSA Spot Avg FOB Rotterdam USD/metric ton
- Methanol NEA/SEA MMSA Contract NTR Weighted Region Avg. USD/metric ton

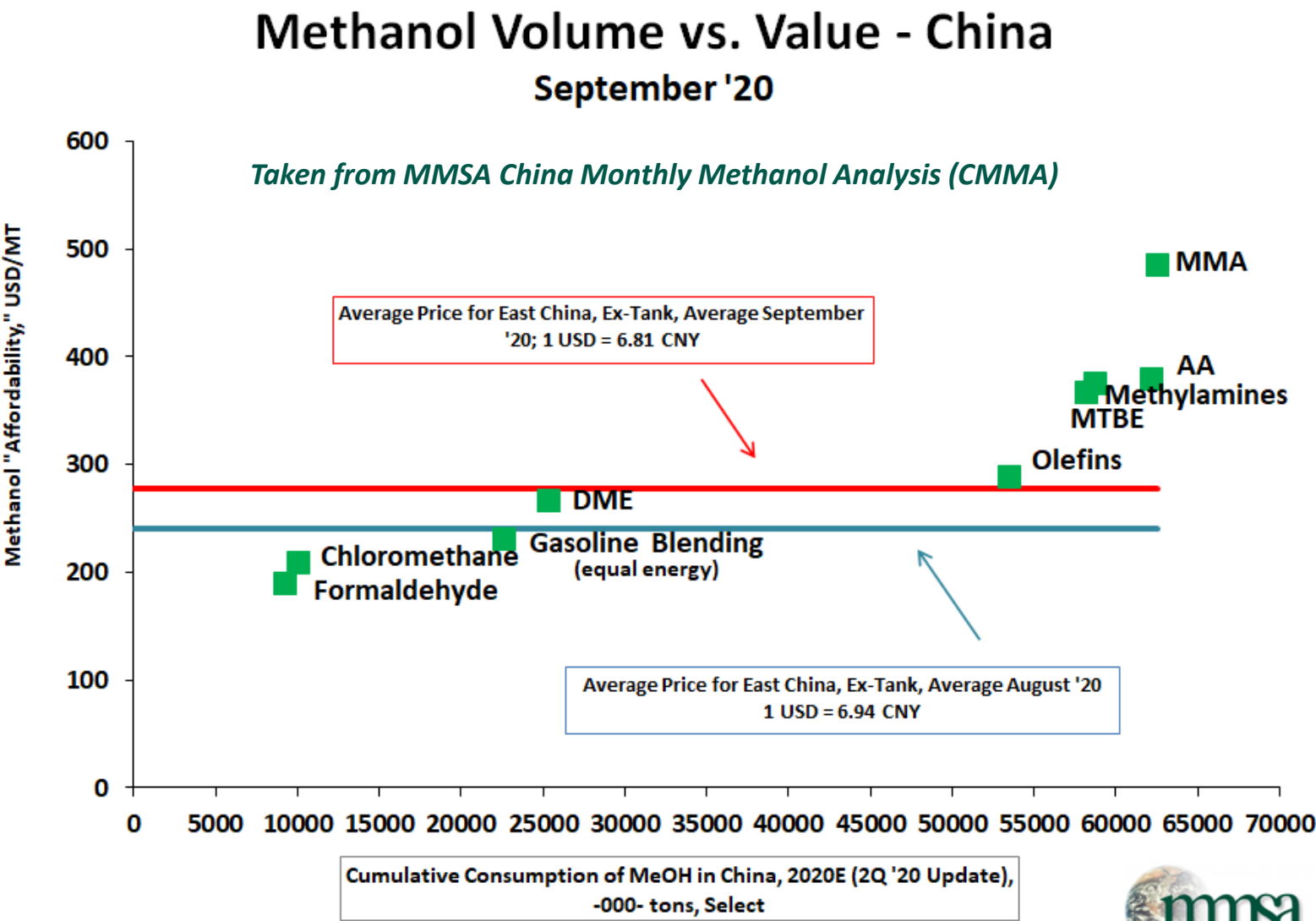


# Chinese producer cash margins remain “under water” for most coal based ops, limiting price decrease

## Coal Cash Cost vs. Methanol Price



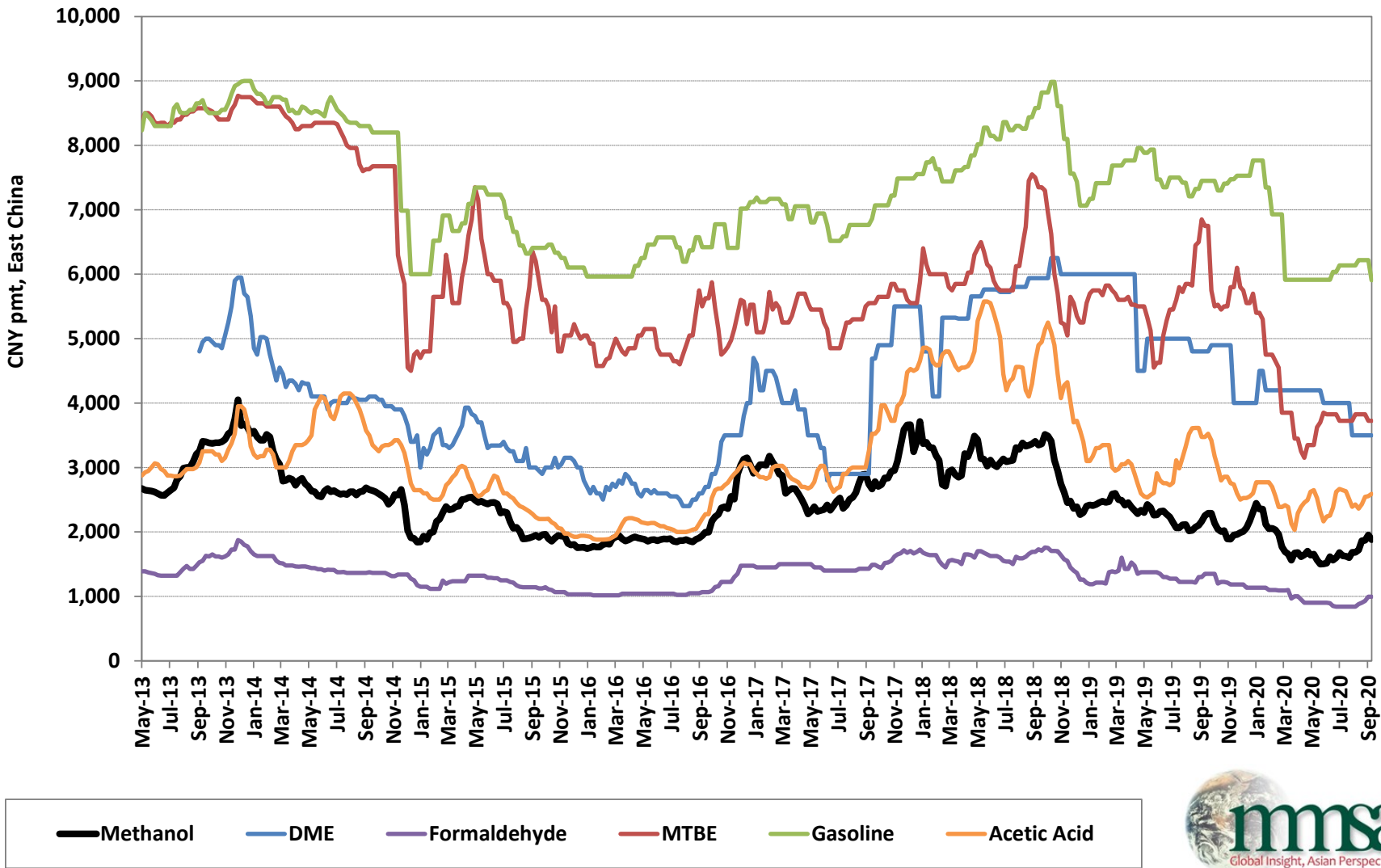
# Methanol affordability's heavy ceiling is slowly lifting upwards



# Methanol affordability improved slowly with recent derivatives recovery



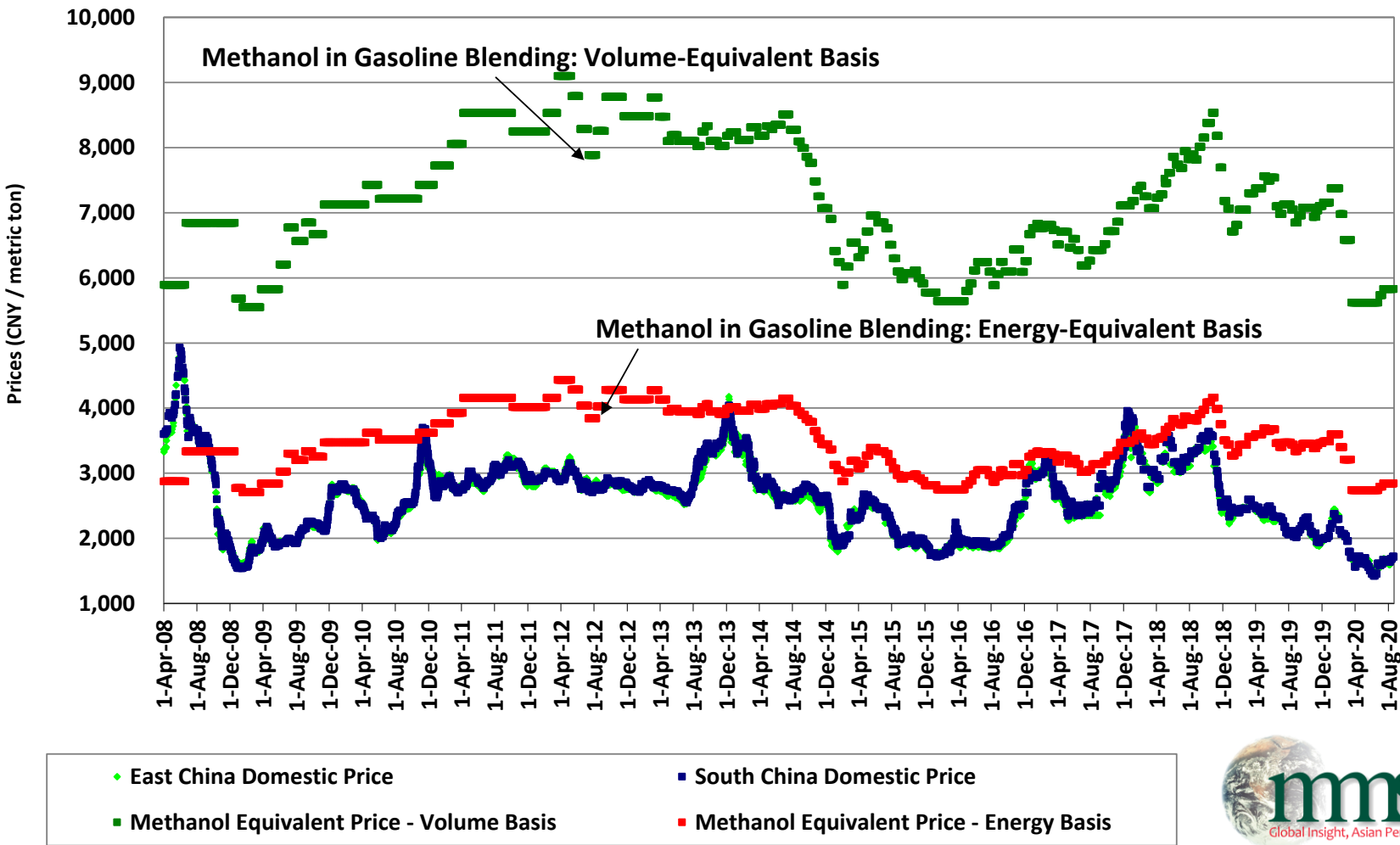
## Chinese Methanol and Derivative Prices



# Pre-tax gasoline blending is barely advantaged in China, limiting growth near term



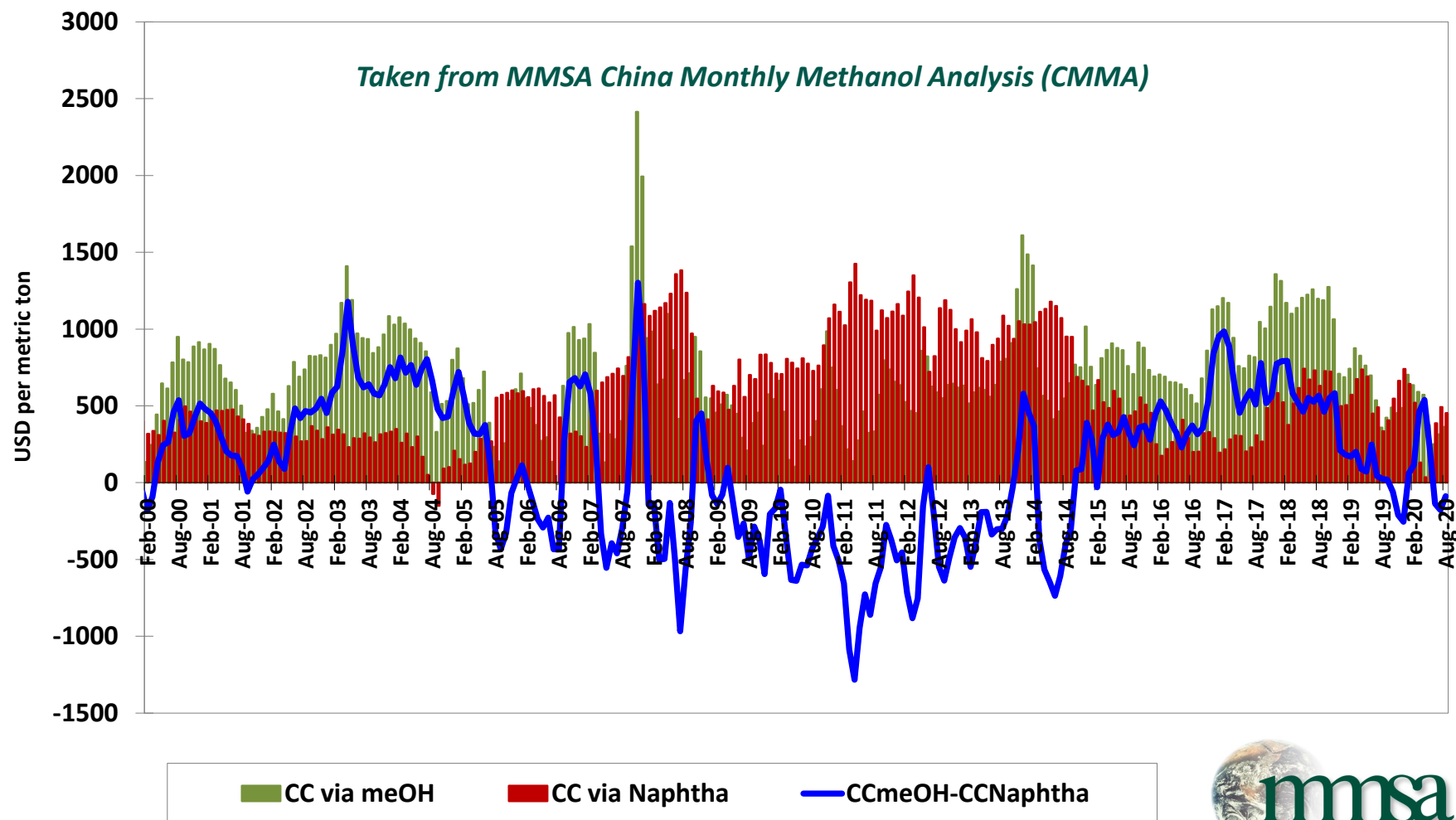
Methanol Prices vs Methanol Energy and Volume Equivalences:  
Gasoline Blending



MeOH has become more competitive vs naphtha, reflecting strong naphtha, olefin, supporting methanol prices

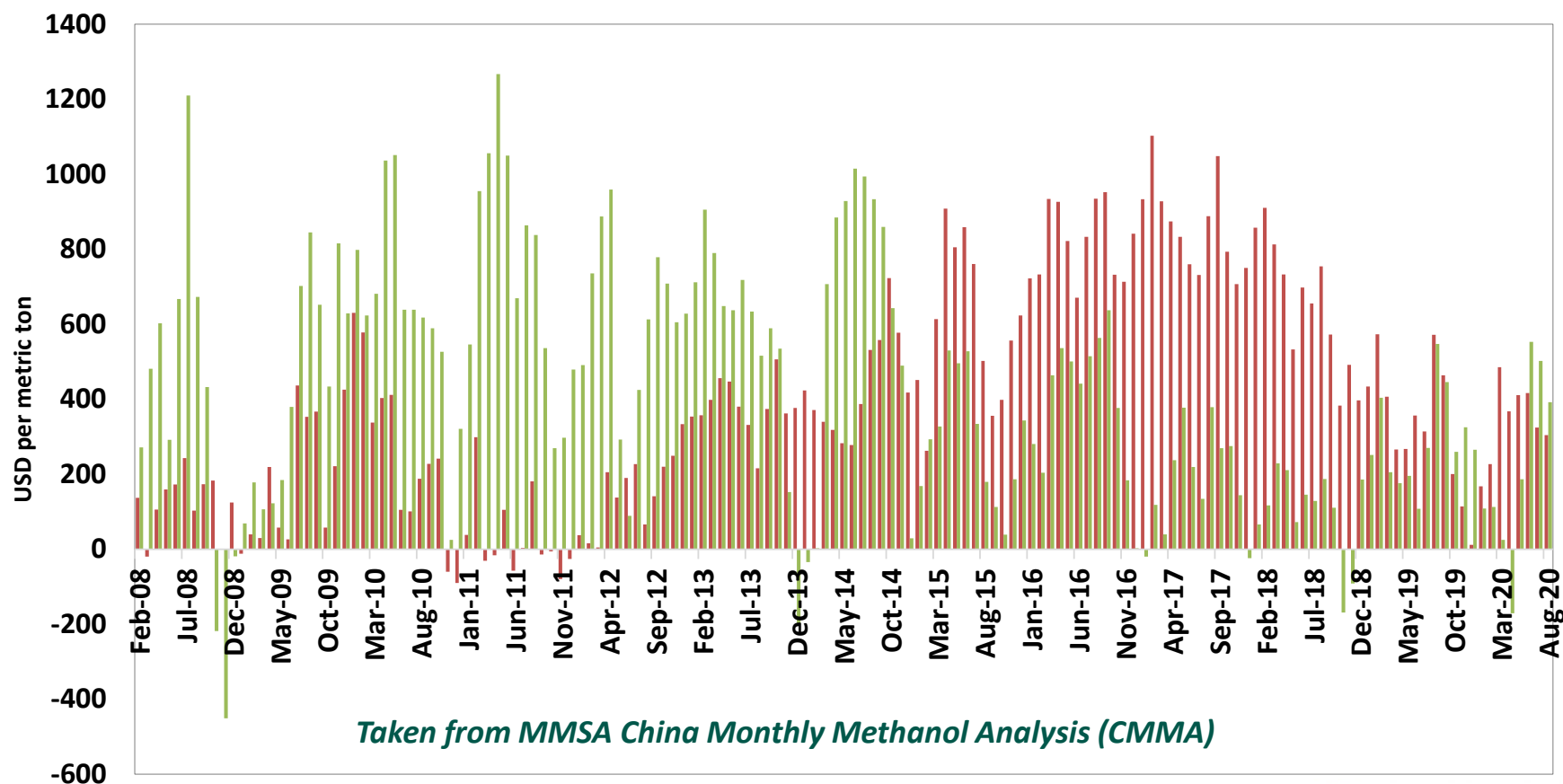
## Ethylene Cash Cost vs. Feed Type

Hypothetical Asia, 1.2 tonnes propylene/tonne ethylene



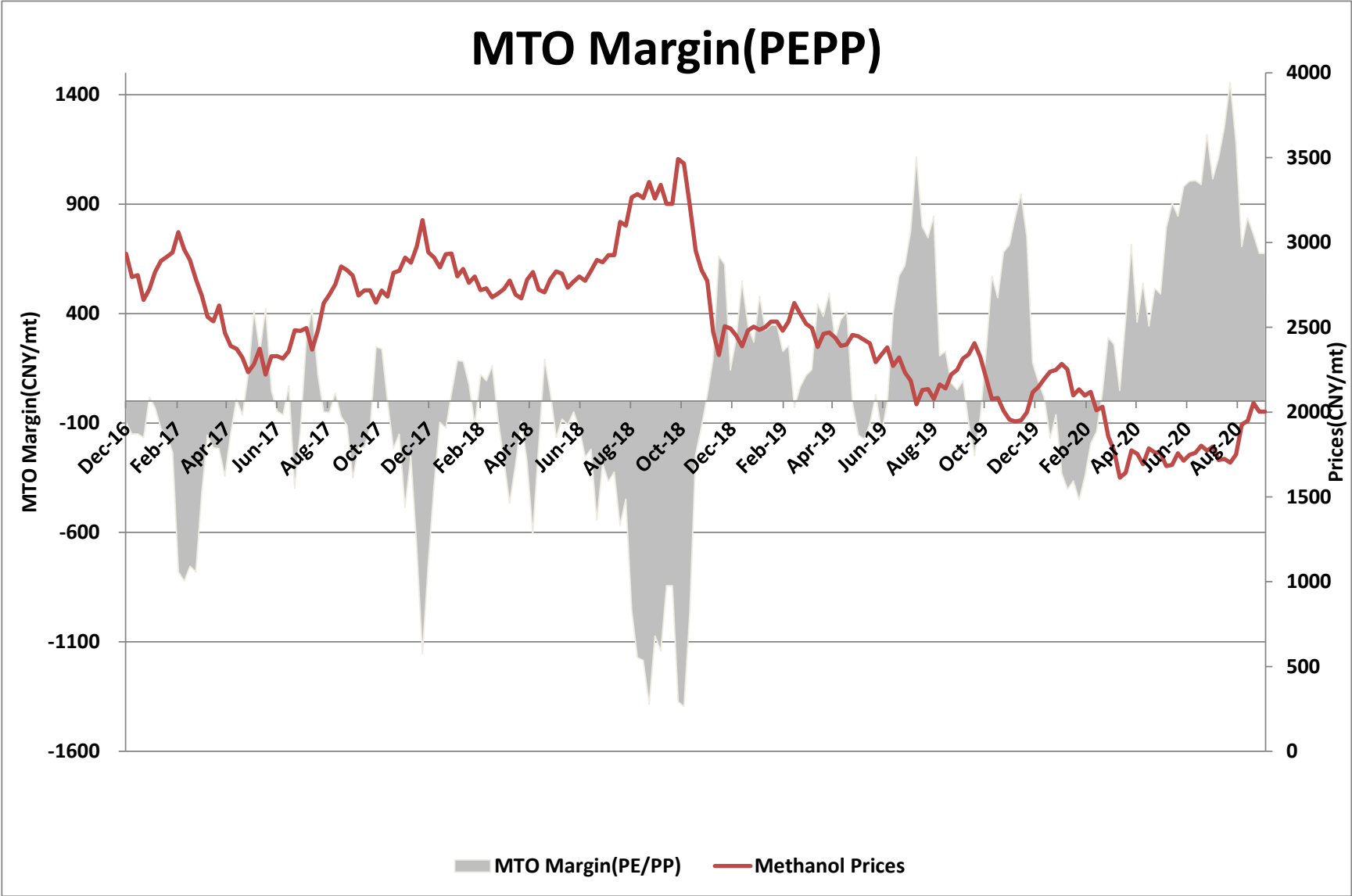
# MTO cash margins on ethylene remain positive, enabling operations

## Cash Margins on Ethylene, MTO vs Naphtha Hypothetical Asia, 1.2 tonnes propylene/tonne ethylene

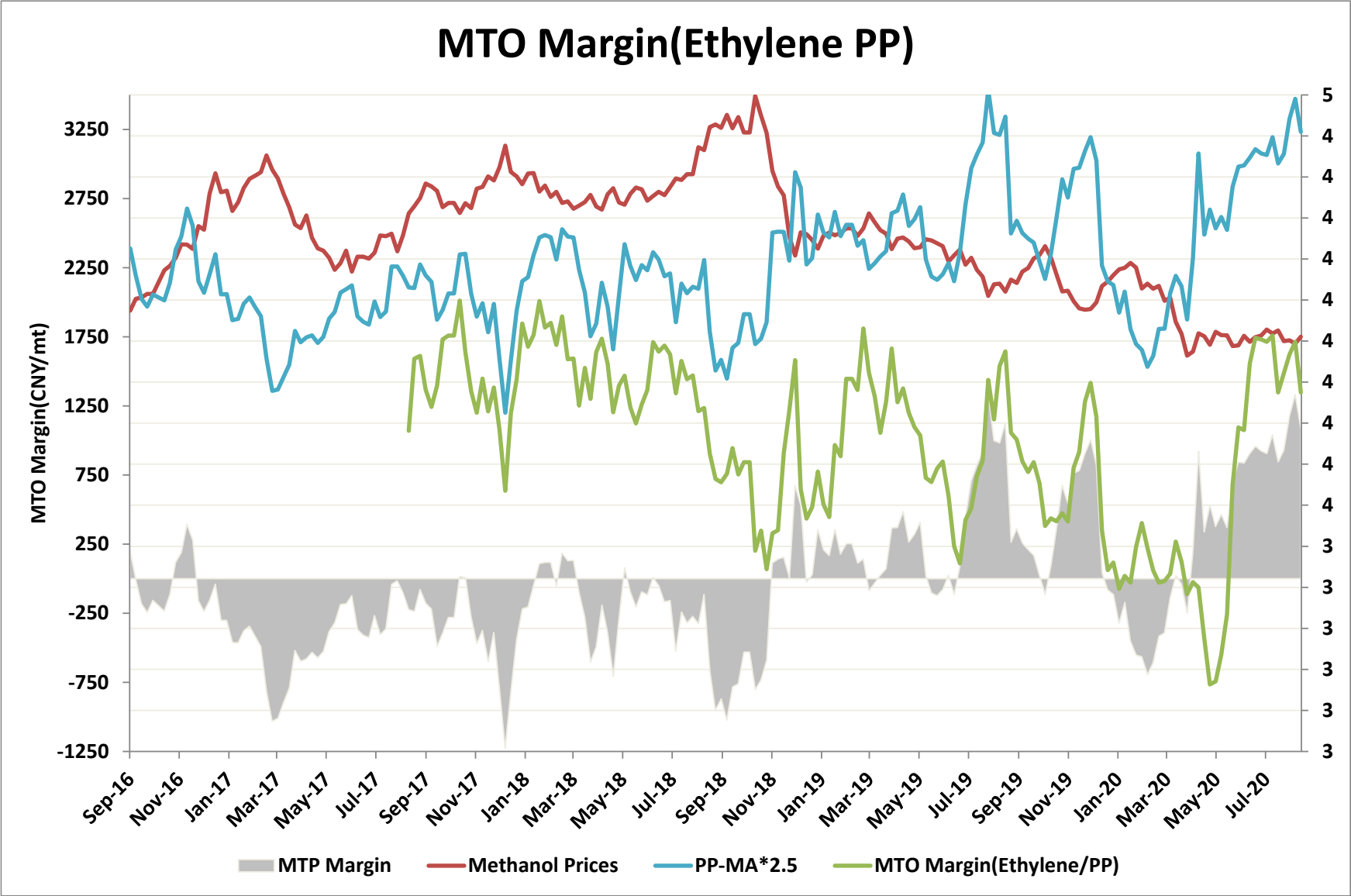


■ Cash Margin - Ethylene NE Asia Spot Basis via Naphtha  
■ Cash Margin - Ethylene NE Asia Spot Basis via MeOH

# Integrated MTO margins have improved along with higher olefin derivatives prices



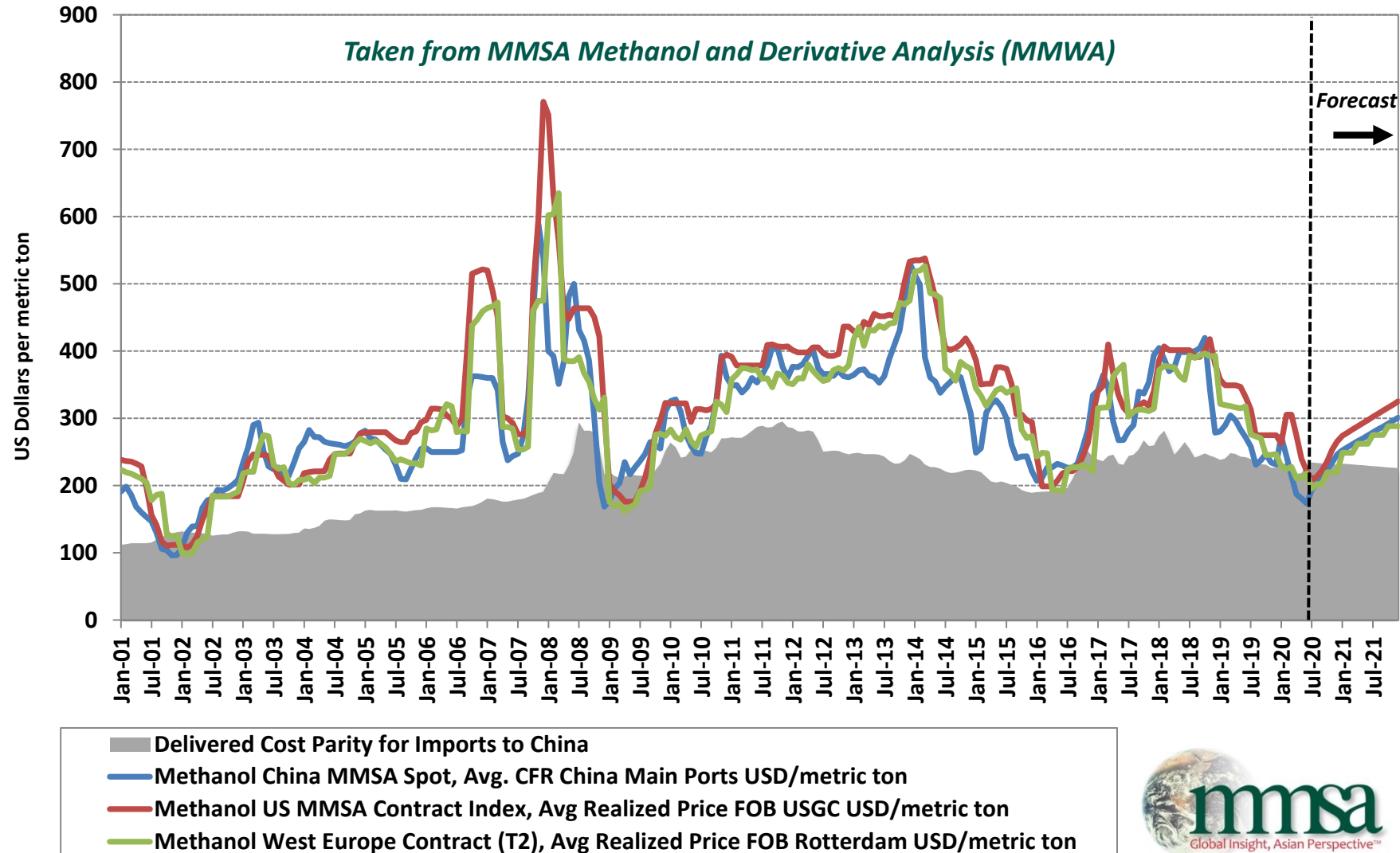
# MTO margins have improved along with higher crude and derivatives prices





# Methanol prices to improve 2H 2020 on the support of marginal production cost and the demand recovery

## Global Methanol Pricing



# 2020 International Methanol Conference – Looking Beyond The Pandemic

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- Thank you for joining us today!
- Please submit your questions in the Q&A Chat box on your screen
- We'll be with you shortly for the Live Q&A session where we will answer any questions submitted by attendees