WEBINAR 7th April 2020 | 2 pm - 2.45 pm BST

The global olefins market in 2020: What is in store for the industry?

Speakers

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Global Olefin Developments

WEBINAR – The global olefins market in 2020: What is in store for the industry?

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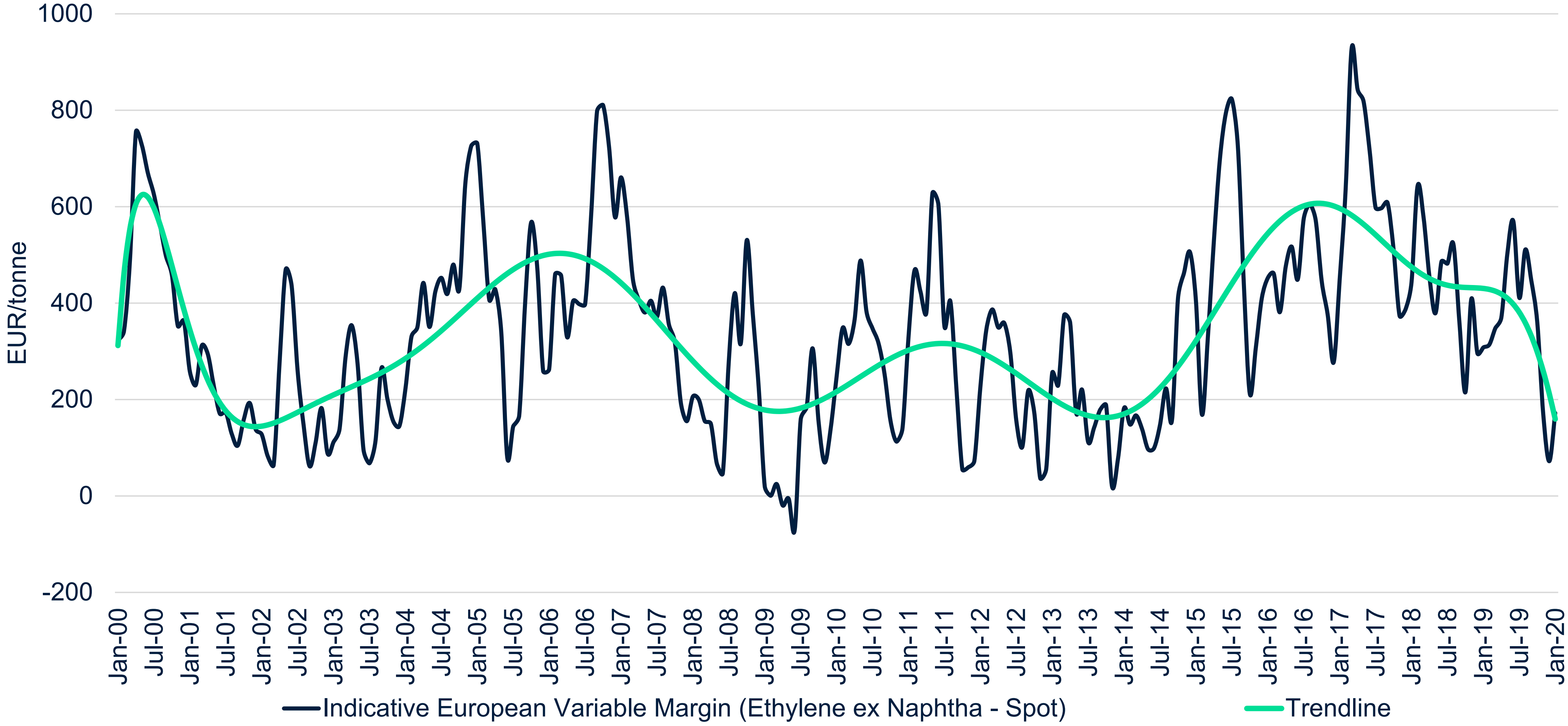
Agenda

01 Changes to cost of production

02 Ethylene supply and demand

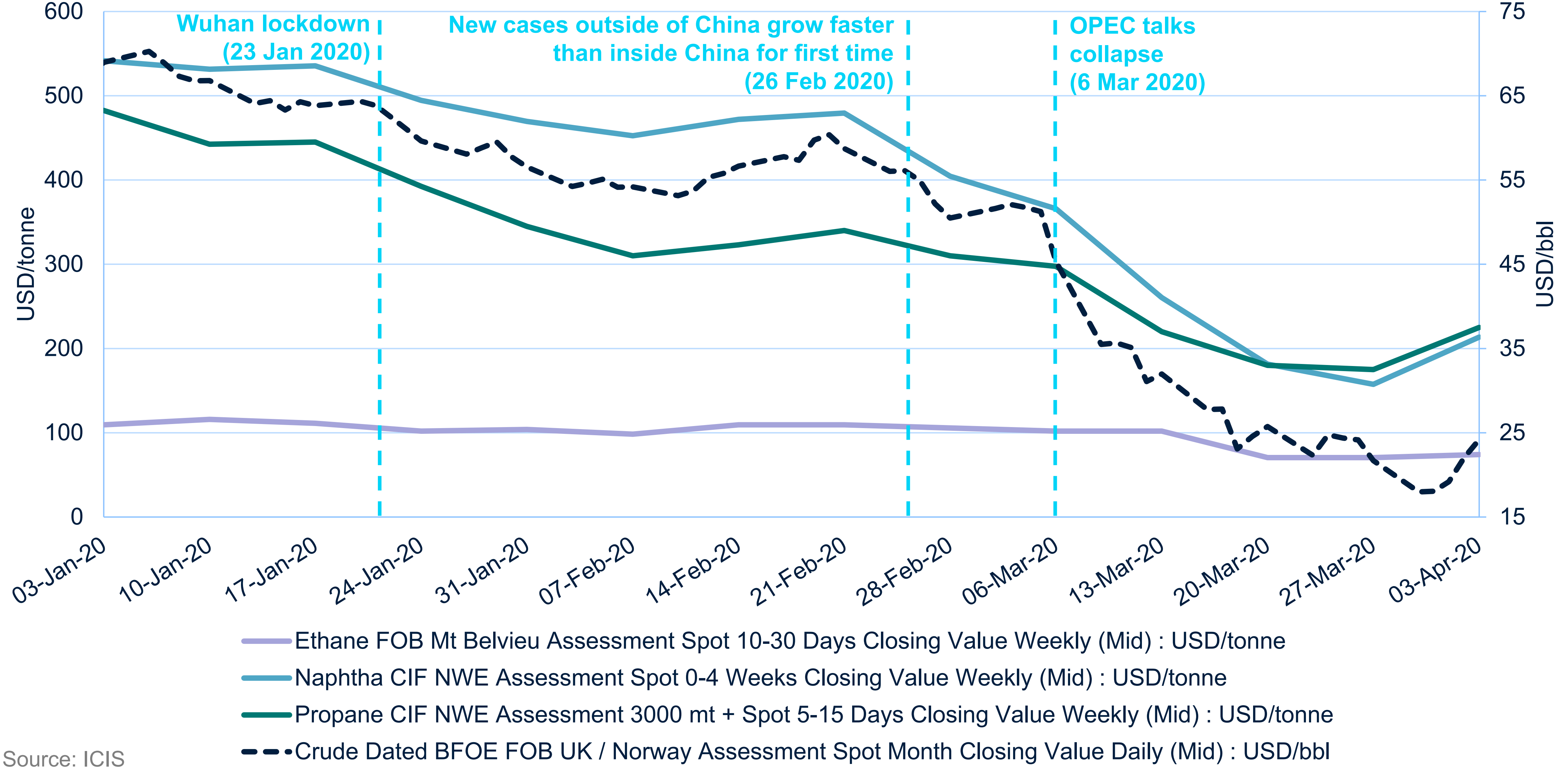
03 Future implications for olefins market

Historical European Ethylene Margins



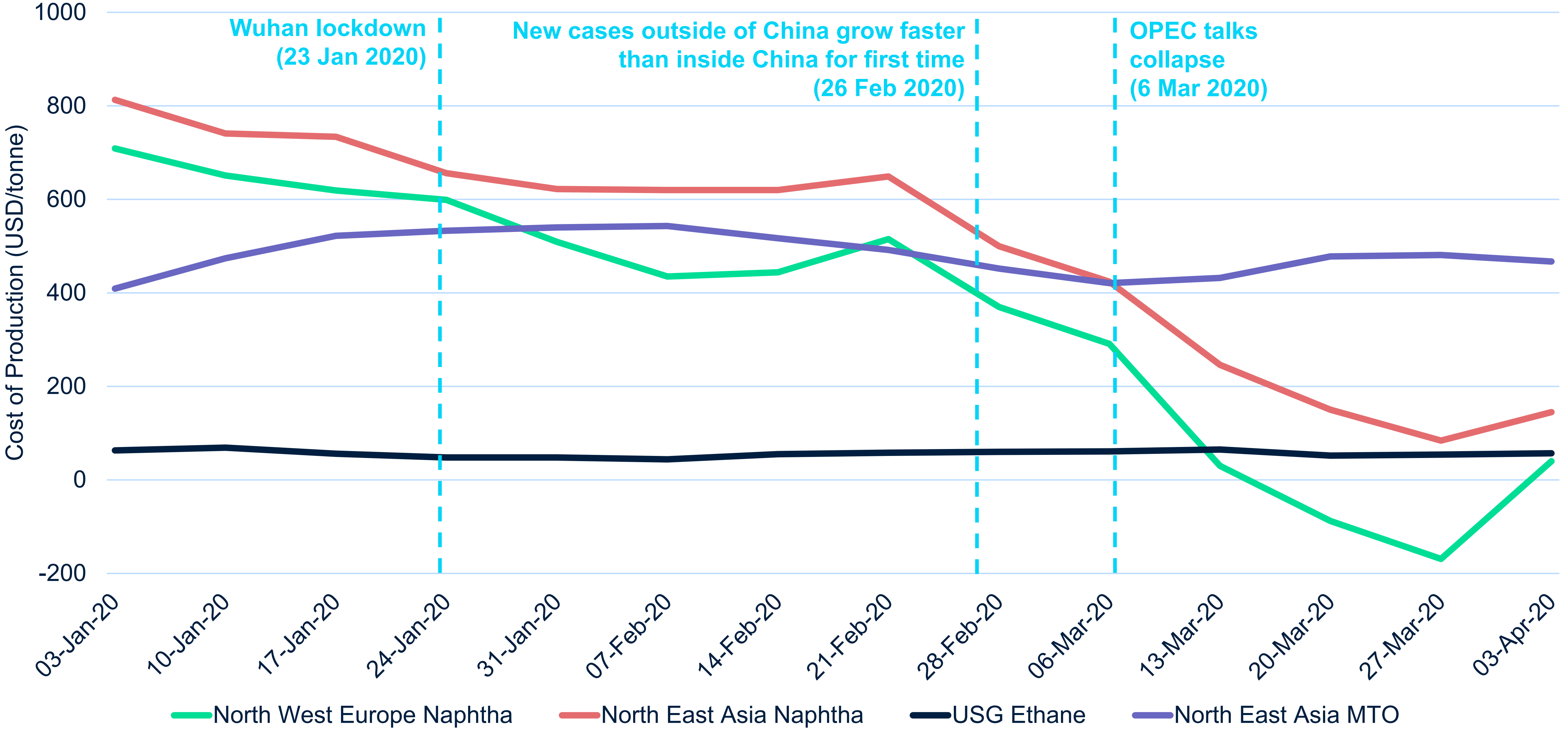
Source: ICIS Analytics

Crude & Cracker Feedstock Pricing



Source: ICIS

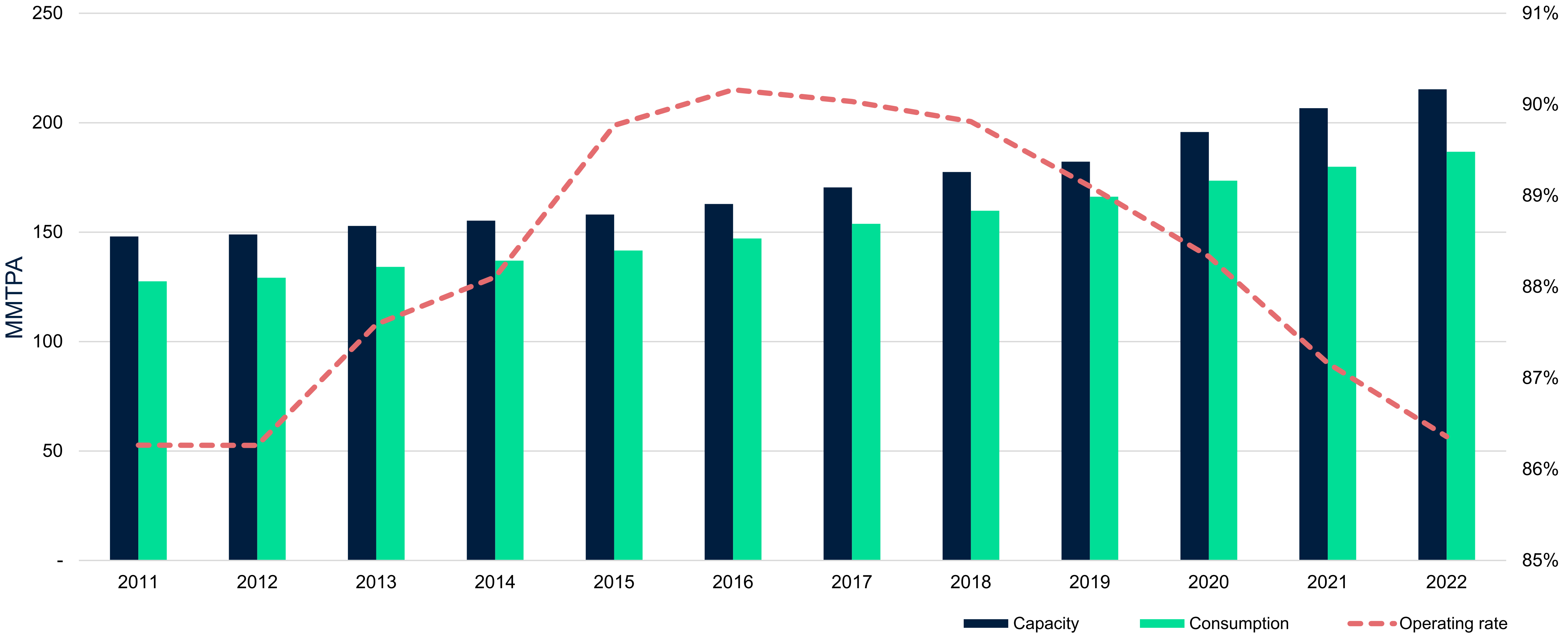
Ethylene Cost of Production



Source: ICIS Analytics

Ethylene Supply & Demand

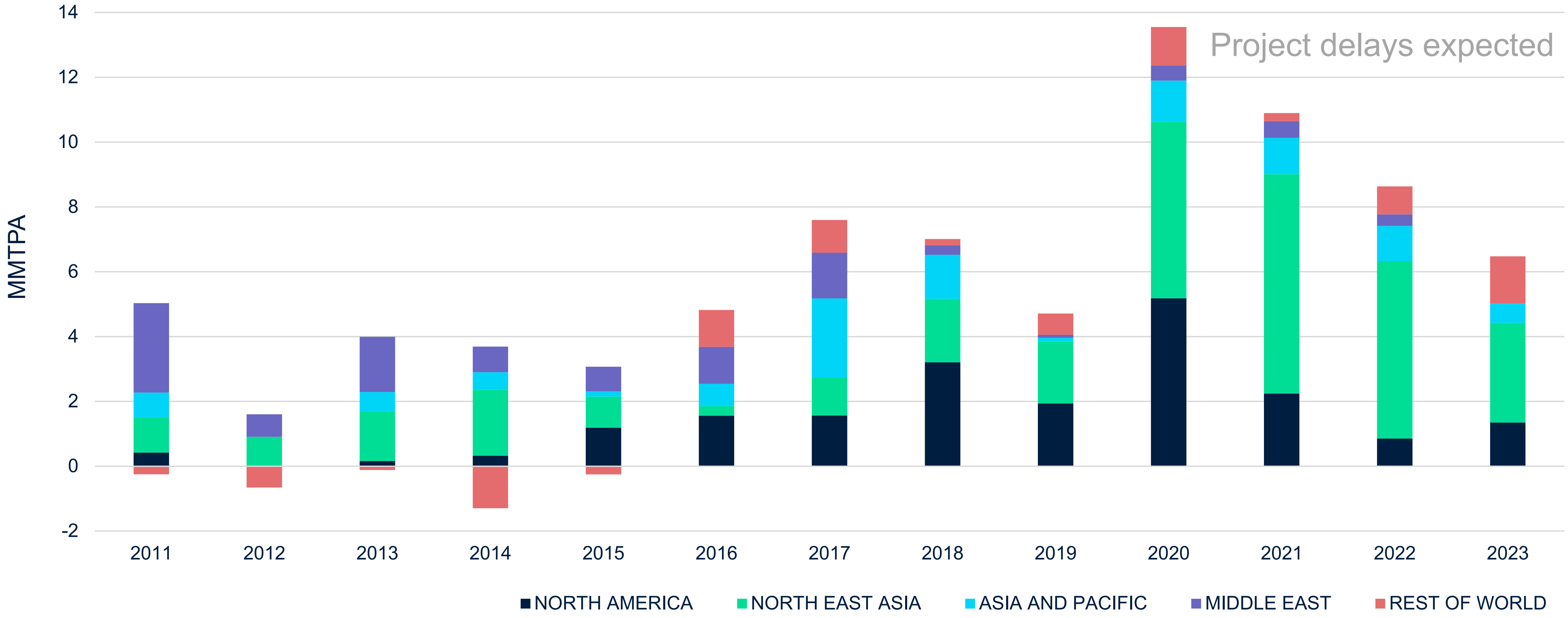
View from late-2019



Source: ICIS Supply & Demand Database

Ethylene Capacity Growth

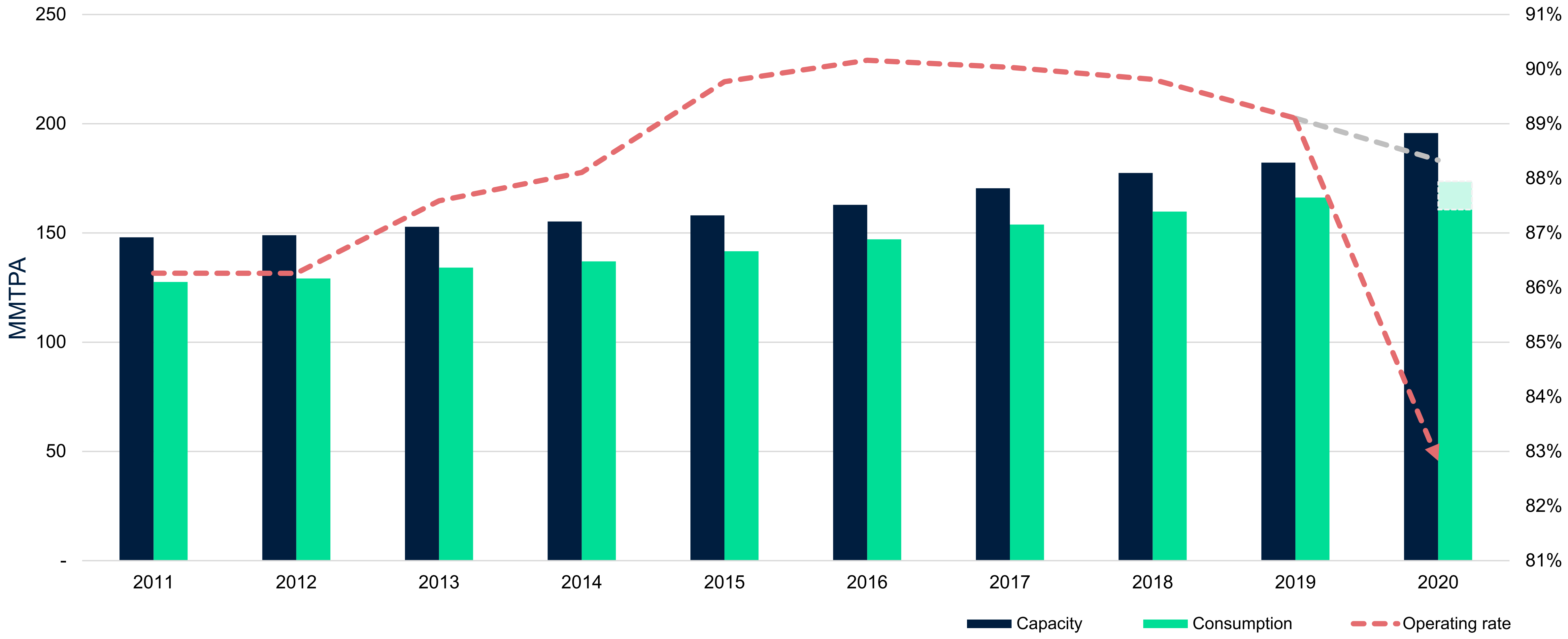
Incremental Ethylene Capacity Additions by Region (view from January 2020)



Source: ICIS Supply & Demand Database

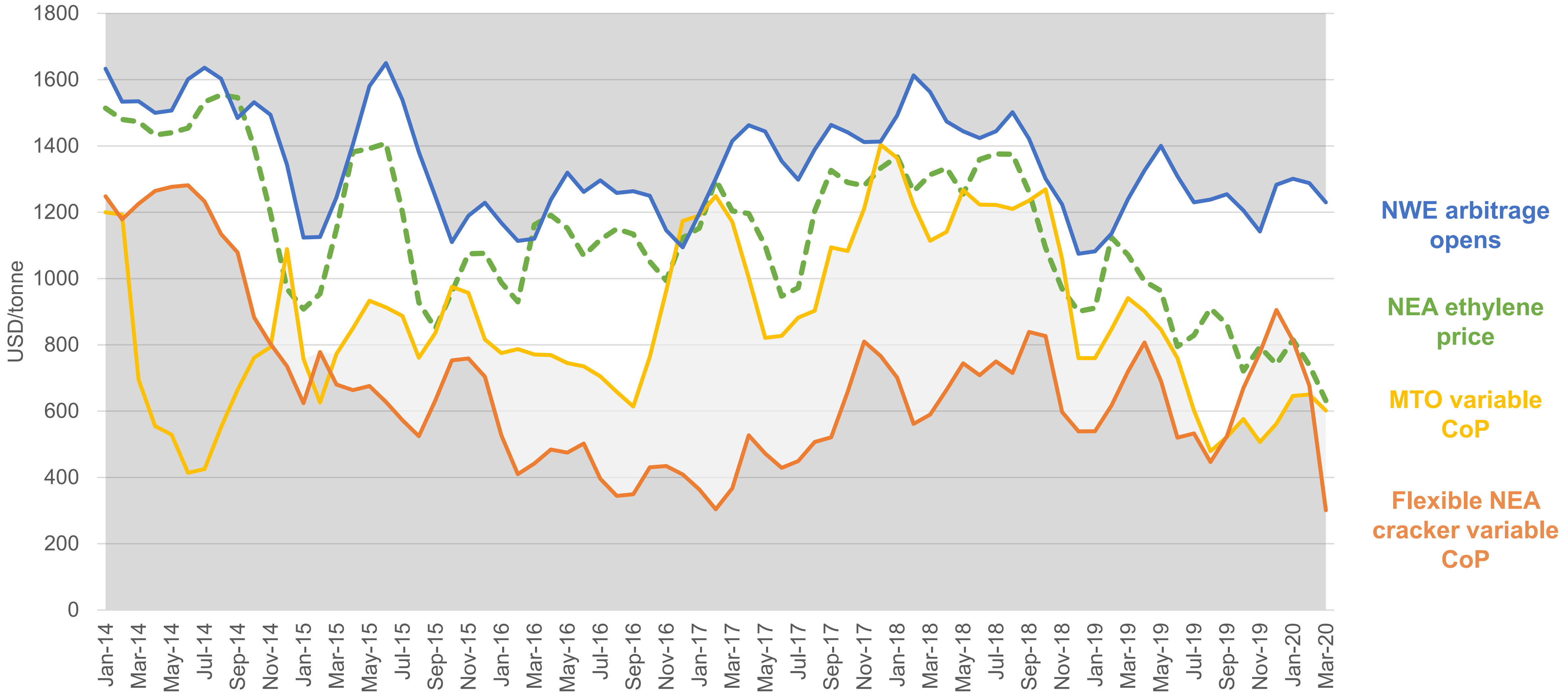
Ethylene Supply & Demand

Preliminary view from late-March 2020



Source: ICIS Supply & Demand Database, ICIS Analytics

Supply Limits – NEA Ethylene Price



Source: ICIS Analytics

Conclusions

- Low crude pricing means regional advantages previously held by producers start to disappear
- Current disruptions mean European and Asian producers struggle to take advantage of crude pricing situation
- Demand hit for 2020 remains unclear, developments remain fluid, likely to see subdued demand growth in 2021 as recovery takes place
- Wave of new capacities planned for early 2020s, those projects with steel in the ground considered likely to continue, however significant delays to start-up times to be expected
- Non FID-made projects look very uncertain
- Changing shape of cost curve puts different producers at risk compared to just a couple of months ago
- Significant implications for olefin pricing structures for 2020 and beyond

US cracker investment wave
Outlook for 2020 and beyond amid crisis

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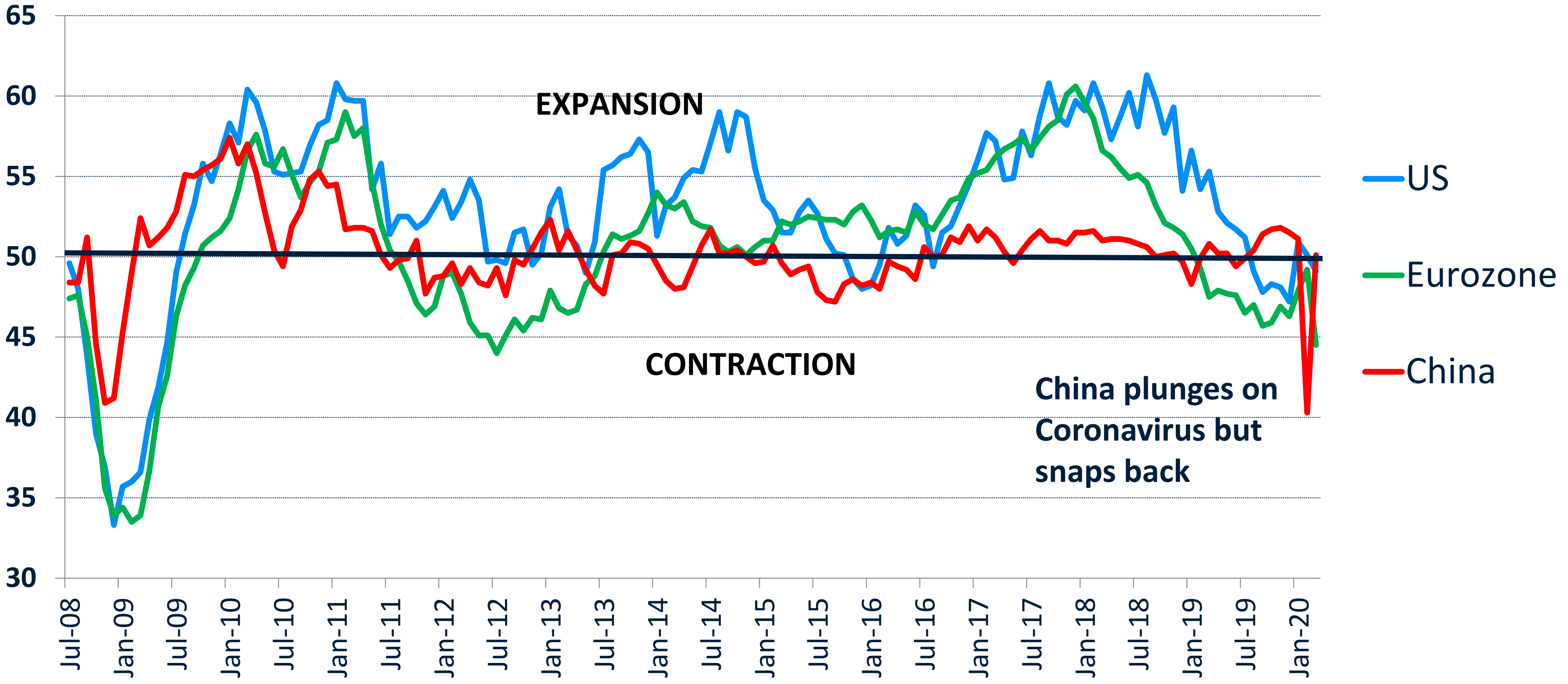
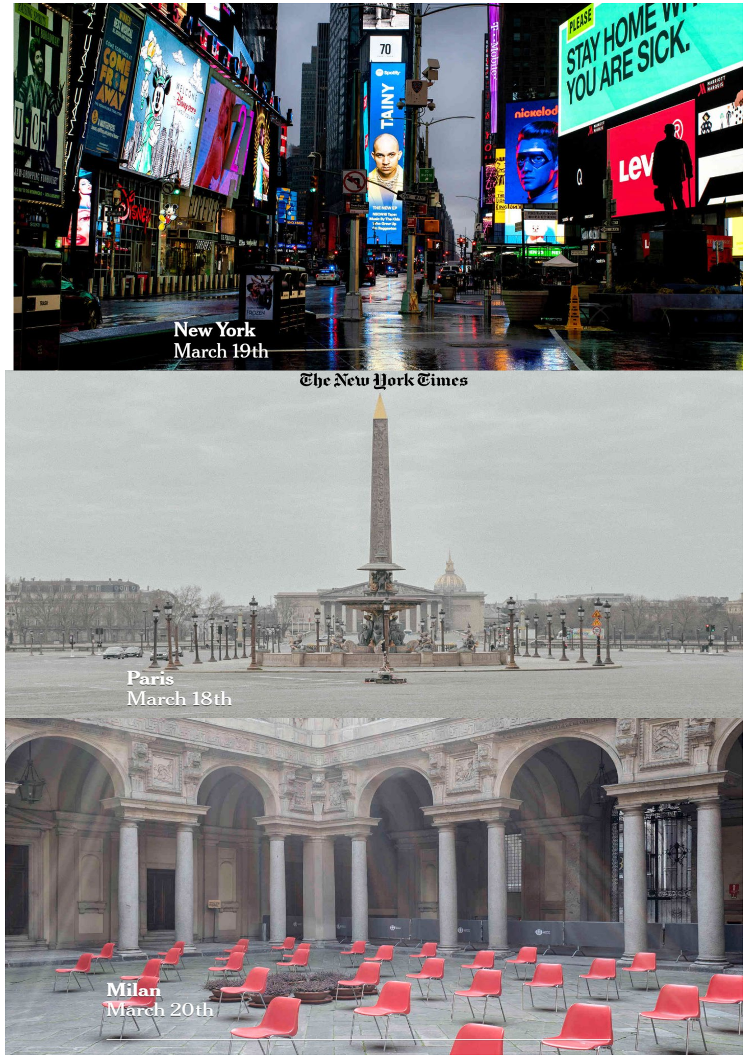
Global Manufacturing PMI



NOTE: Figures through Mar 2020, US = ISM, Eurozone = IHS Markit, China = Caixin

Macro developments – coronavirus takes over outlook

- Global manufacturing activity collapses, but in stages
  - China recovering but now Europe, US in lockdown, demand collapsing as non-essential activities halted
- US GDP – Q2 forecasts in -25-35% range, jobless claims explode
- Focus shifts from supply chain disruptions to demand
- Central banks throwing the kitchen sink with policy tools
  - Zero/negative rates, direct grants and loans to businesses, industry bailouts (airlines) unlimited QE and expansion to corporate and muni bonds.
- Crude oil collapse, currencies plunge vs US dollar



US ethylene, PE expansion wave

New US crackers complete, under construction through 2020

Company	Ethylene capacity (kt/year)	Downstream (kt/year)	Location	Start-up
OxyChem/Mexichem	544	Feed existing VCM plant of 1,050	Ingleside, Texas	Q1 2017
Dow Chemical	1,500	ELITE PE (400); LDPE (350) – Plaquemine, Louisiana; EPDM (200); elastomers (320)	Freeport, Texas	Q3 2017
Chevron Phillips Chemical	1,725	Bimodal HDPE (500), mLLDPE (500) at Old Ocean	Cedar Bayou, Texas	Q1 2018
ExxonMobil Chemical	1,500	mLLDPE plus LLDPE (650 x2) at Mont Belvieu	Baytown, Texas	Q3 2018
Lotte/Westlake	1,000	MEG (760) by Lotte, feed into existing PVC for Westlake	Lake Charles, Louisiana	Q2 2019
Shintech	500	VCM (400), PVC (290), caustic soda (270)	Plaquemine, Louisiana	Q4 2019
Sasol	1,500	LLDPE (470), LDPE (420), EO/EG (300/250), ethoxylates, detergent alcohols (300)	Lake Charles, Louisiana	Q3 2019
Formosa Plastics	1,200	HDPE (400), LDPE (400), EG (800)	Point Comfort, Texas	Q1 2020

8 new crackers 2017-2020 = 9.5m tonnes/year

The 2nd wave of US crackers

Company	Capacity (kt/year)	Downstream (kt/year)	Location	Start-up	Status
Total/Borealis/ NOVA	1,000	Borstar PE (625) + existing PE (400)	Port Arthur, Texas	2021	Under construction
Shell	1,500	HDPE/LLDPE (2x 550), HDPE (500)	Monaca, Pennsylvania	2021	Under construction
SABIC/ ExxonMobil	1,800	PE (2 units), MEG	Corpus Christi, Texas	H1 2022	Under construction
FG LA LLC (Formosa) – Phase 1	1,200	LLDPE (400), HDPE (400), EG (800)	St James Parish, Louisiana	2023	Site prep Q1 2020
PTTGC/Daelim	1,500	HDPE (700), HDPE/LLDPE (450), LLDPE/mLLDPE (450)	Belmont County, Ohio	2024	FID Q2 2020
Chevron Phillips/ Qatar Petroleum	2,000	HDPE 2,000 (2 units)	US Gulf Coast	2024	FID no later than 2021
Motiva (Saudi Aramco)	NA	PE	Port Arthur, Texas	End 2024	FID 2020

New crackers 1st and 2nd waves + expansions
= 20.5m tonnes/year or 72% of existing US capacity by 2024

US PE capacity additions

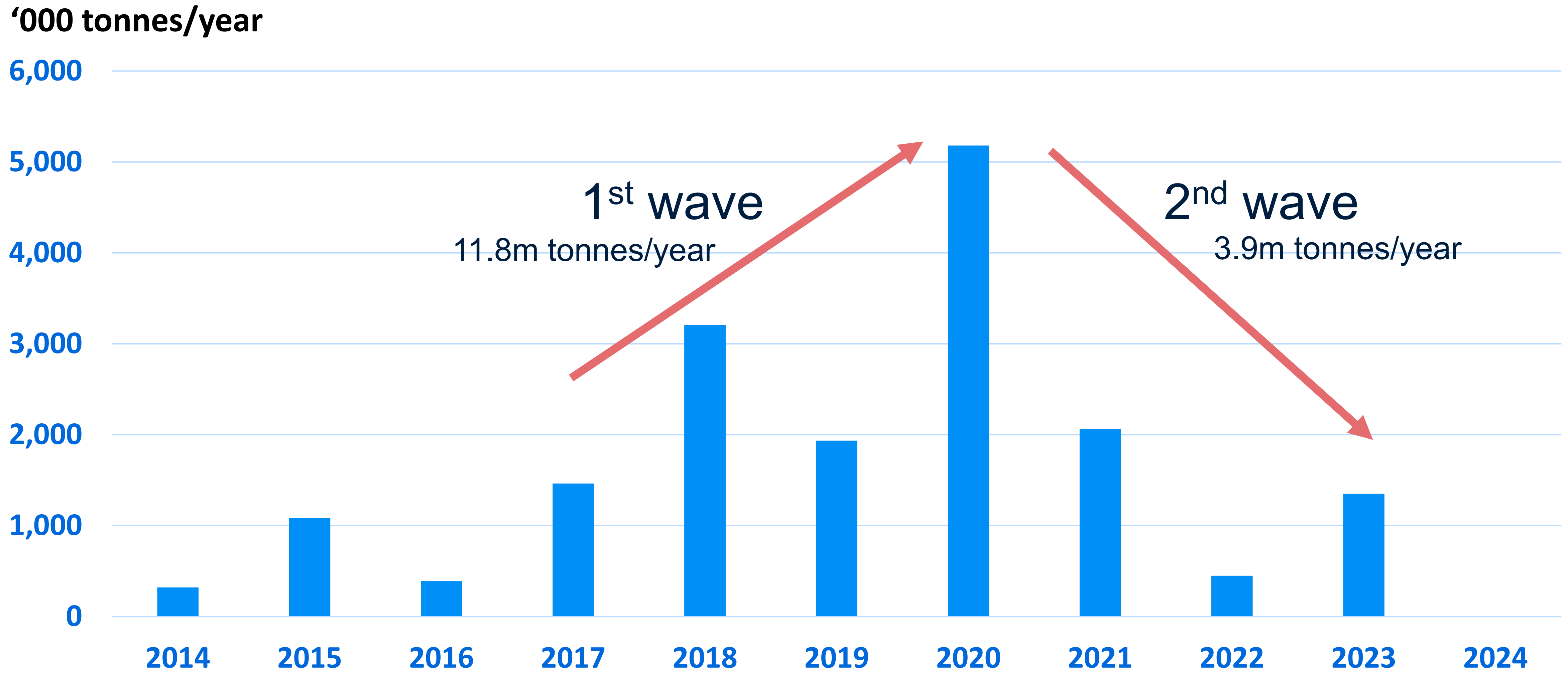
Company	PE capacity (kt/year)	PE type	Location	Start-up
Dow	400	ELITE PE	Freeport, Texas	Q3 2017
Dow	350	LDPE	Plaquemine, Louisiana	Q4 2017
Chevron Phillips	1,000	Bimodal HDPE (500), mLLDPE (500)	Old Ocean, Texas	Q3 2017
ExxonMobil	1,300	mLLDPE plus LLDPE (650 x2)	Mont Belvieu, Texas	Q4 2017
INEOS/Sasol	470	HDPE	La Porte, Texas	Q4 2017
ExxonMobil	650	mLLDPE plus LLDPE	Beaumont, Texas	Q3 2019
Sasol	890	LLDPE (470), LDPE (420)	Lake Charles, Louisiana	Q1 2019/Q2 2020
LyondellBasell	500	Hyperzone HDPE	La Porte, Texas	Q1 2020
Formosa Plastics	800	HDPE (400), LDPE (400)	Point Comfort, Texas	Q3 2019/Q2 2020
Total/Borealis	625	Borstar PE	Bayport, Texas	2021
Shell	1,600	HDPE/LLDPE (2x 550), HDPE (500)	Monaca, Pennsylvania	2021
NOVA	430	LLDPE	Sarnia, Ontario	2022
SABIC/ExxonMobil*	N/A	2 unspecified PE units	Corpus Christi, Texas	H1 2022
Dow	600	Unspecified	US Gulf Coast	H2 2022
FG LA LLC (Formosa) – Phase 1	800	LLDPE (400), HDPE (400)	St James Parish, Louisiana	2023
PTTGC/Daelim	1,600	HDPE (700), HDPE/LLDPE (450), LLDPE/mLLDPE (450)	Belmont County, Ohio	2024
CP Chem/Qatar Petroleum	2,000	HDPE (2x1,000)	US Gulf Coast	2024
Motiva (Saudi Aramco)	N/A	Unspecified	Port Arthur, Texas	2024

Through 2020 = 6.5m tonnes/year (+41% US capacity)

Through 2024 = 14.6m tonnes/year (+96% US capacity)

* Assuming 1,300kt PE for SABIC/ExxonMobil

US ethylene capacity additions



Source: ICIS Supply and Demand Database

Oil, chemical companies to slash capex for growth projects

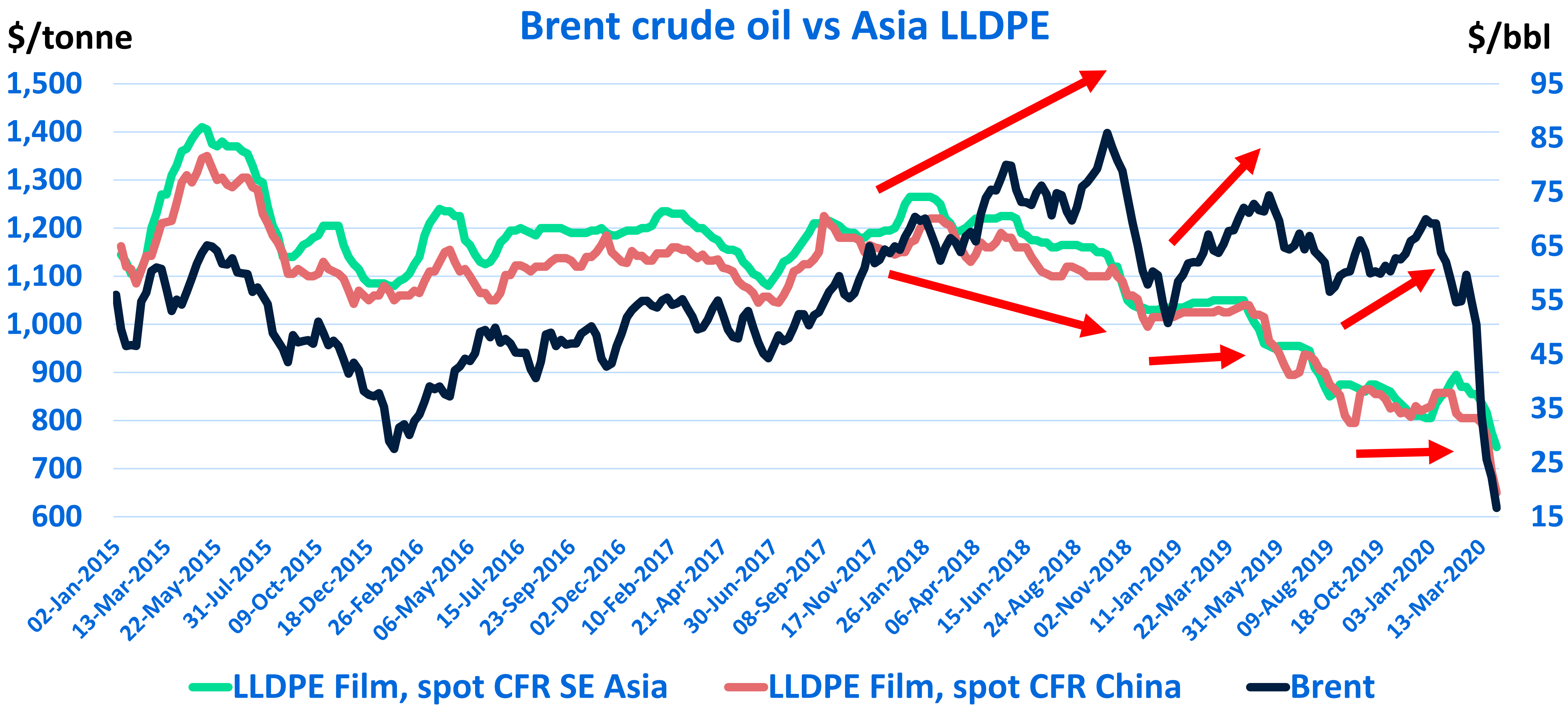
- Crude oil collapse leads to big capex cuts by oil companies, also impacting their petrochemical expansion plans
- US midstream energy companies also aggressively cut capex, slowing down the natgas fractionation and pipeline buildout
- Only a handful of chemical companies have announced capex cuts, but more to come
- Shell halts work on Pennsylvania cracker, LyondellBasell on Texas PO/TBA – Covid-19 safety

Company	Capex 2020 original	Capex 2020 revised	% Change
Shell	$25bn	$20bn or less	-20%
Chevron	$20bn	$16bn	-20%
Total	$18bn	Less than $15bn	-20%
Saudi Aramco	$35-40bn	$25-30bn	-27%
Eastman	$450-475m	$325-375m	-24%
Methanex	$550m	$325m*	-41%
Trinseo	$100m	$80-85m	-18%
Targa Resources	$1.2-1.3bn	$800-900m	-32%
Pembina Pipeline	C$2.3bn	C$1.2-1.4bn	-43%

* ICIS estimate based on company guidance, statements

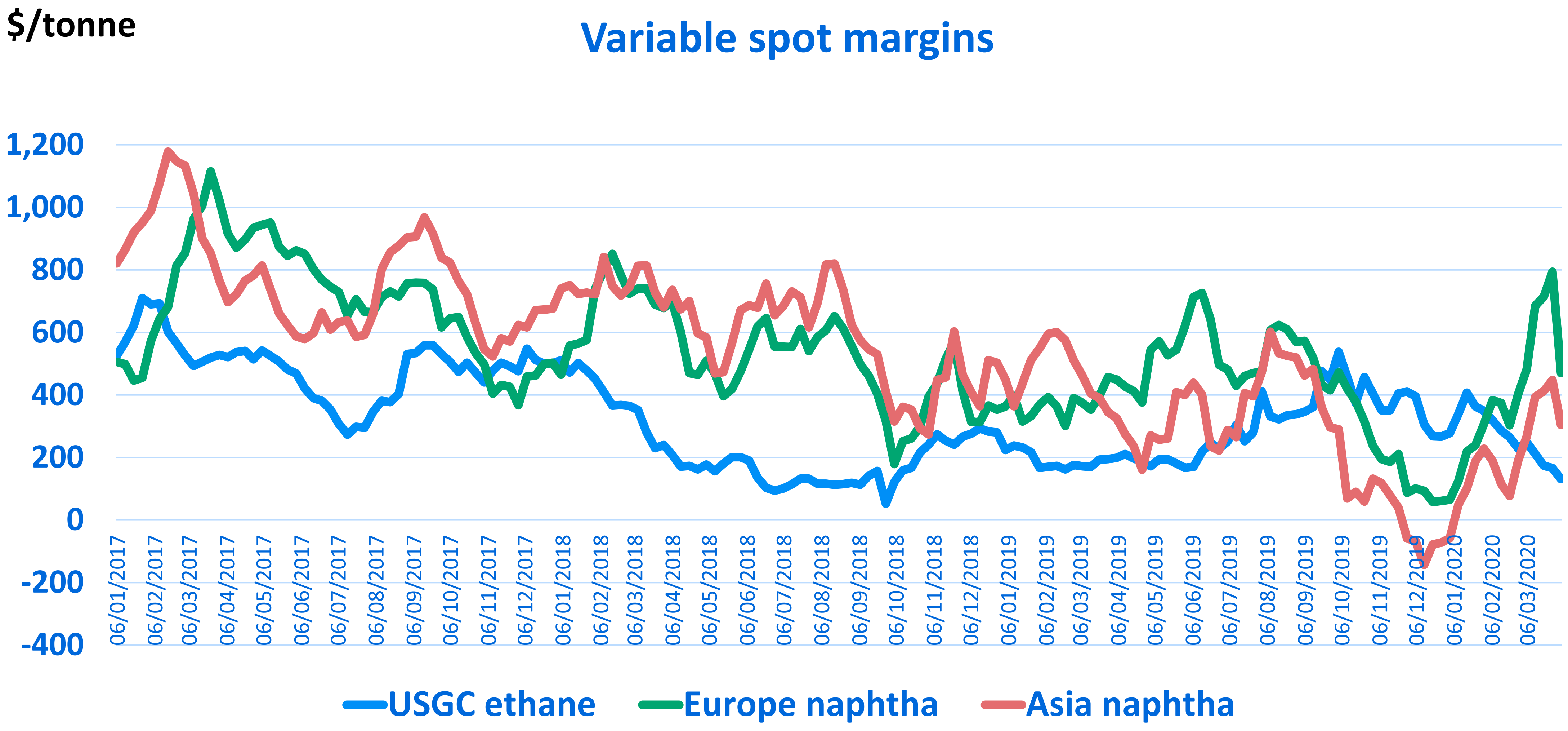
Global ethylene, PE dynamics

Asia LLDPE decouples from Brent on upside



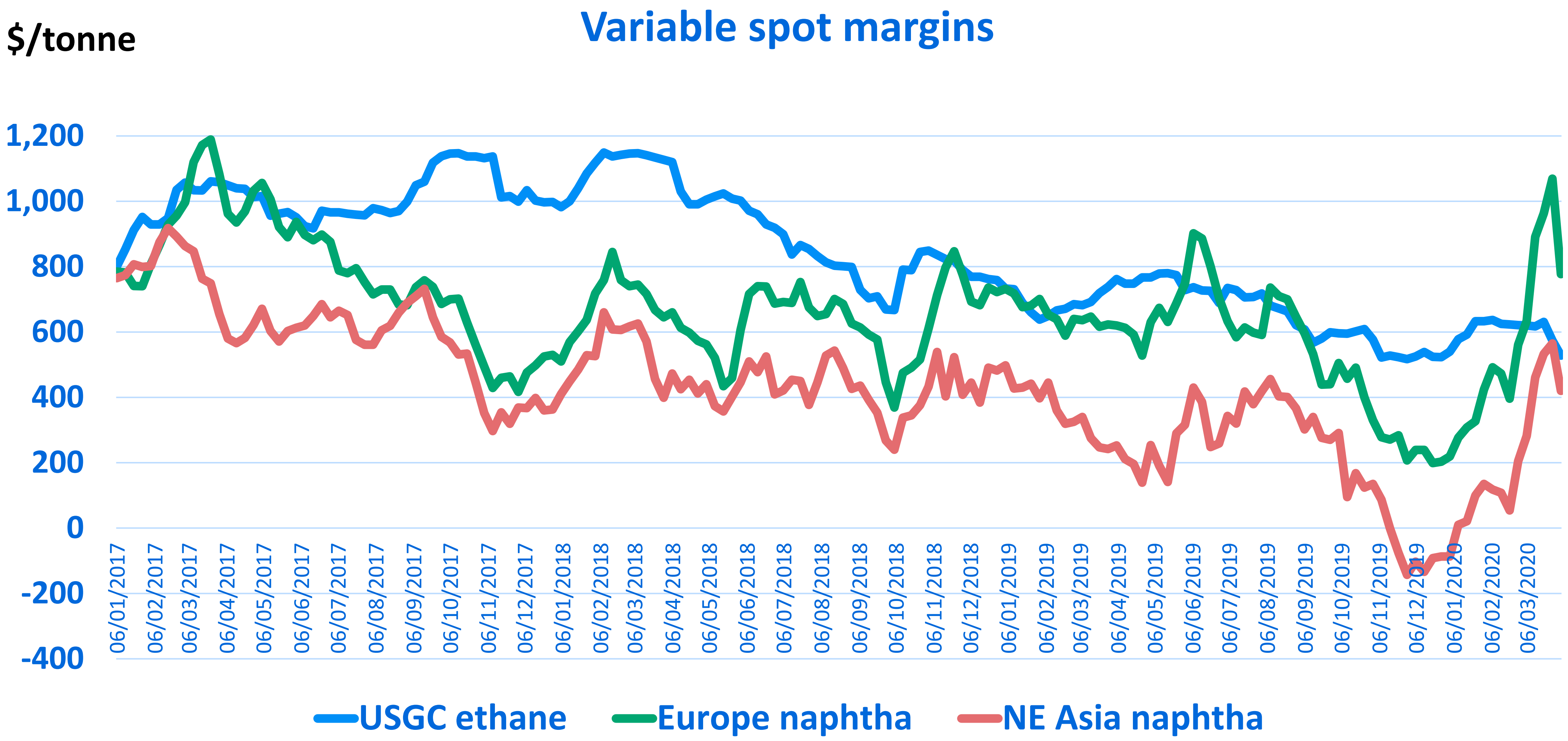
Source: ICIS

Global ethylene spot margins – Europe, Asia surge



Source: ICIS Petrochemical Analytics

Global HDPE margins – US loses feedstock advantage



Source: ICIS Petrochemical Analytics

Summary

- US ethylene and PE expansion wave to slow considerably amid extended global economic downturn
- Lower for longer crude oil means compressed, disadvantaged margins for US PE/crackers – cannot justify billion dollar projects
- In an economic crisis, growth capex is the 1st expense to be cut. Look for project slowdowns, cancellations
- Crude oil collapse – oil companies cutting capex more severely. These have been the most aggressive in building new projects

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Thank you

Q & A

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