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Olefins Margins

January 2024



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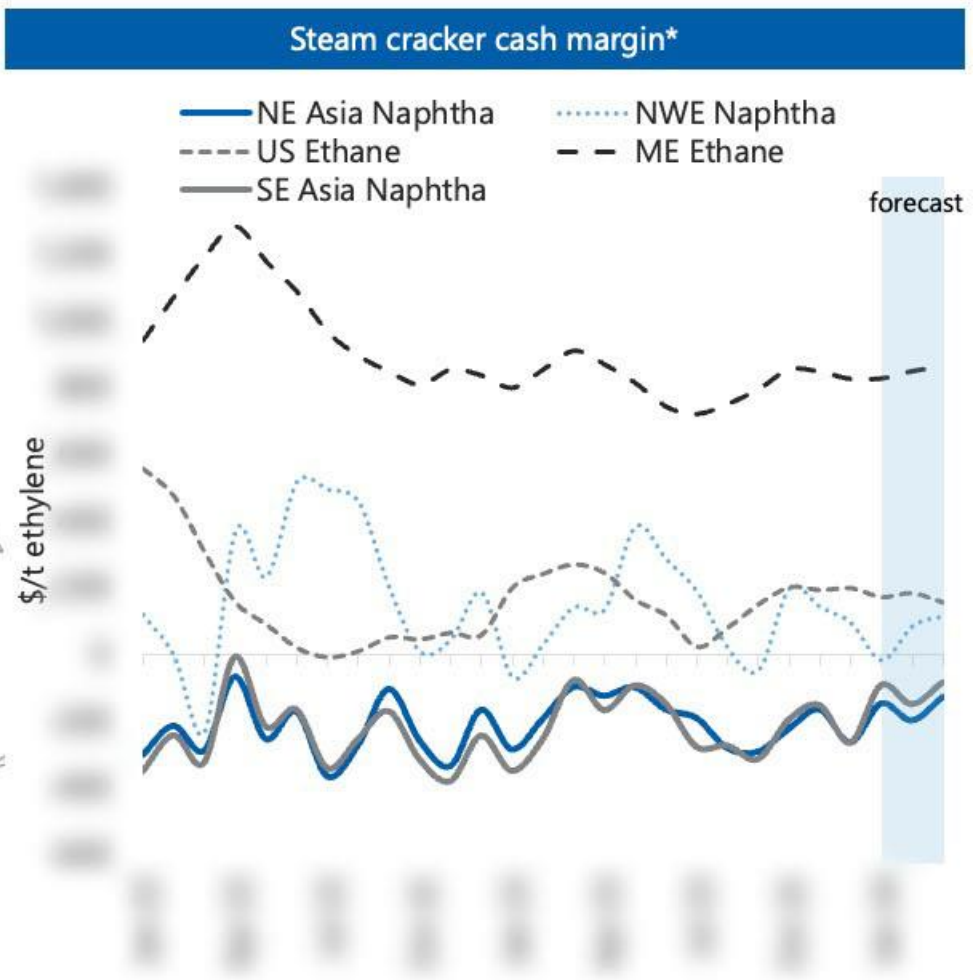
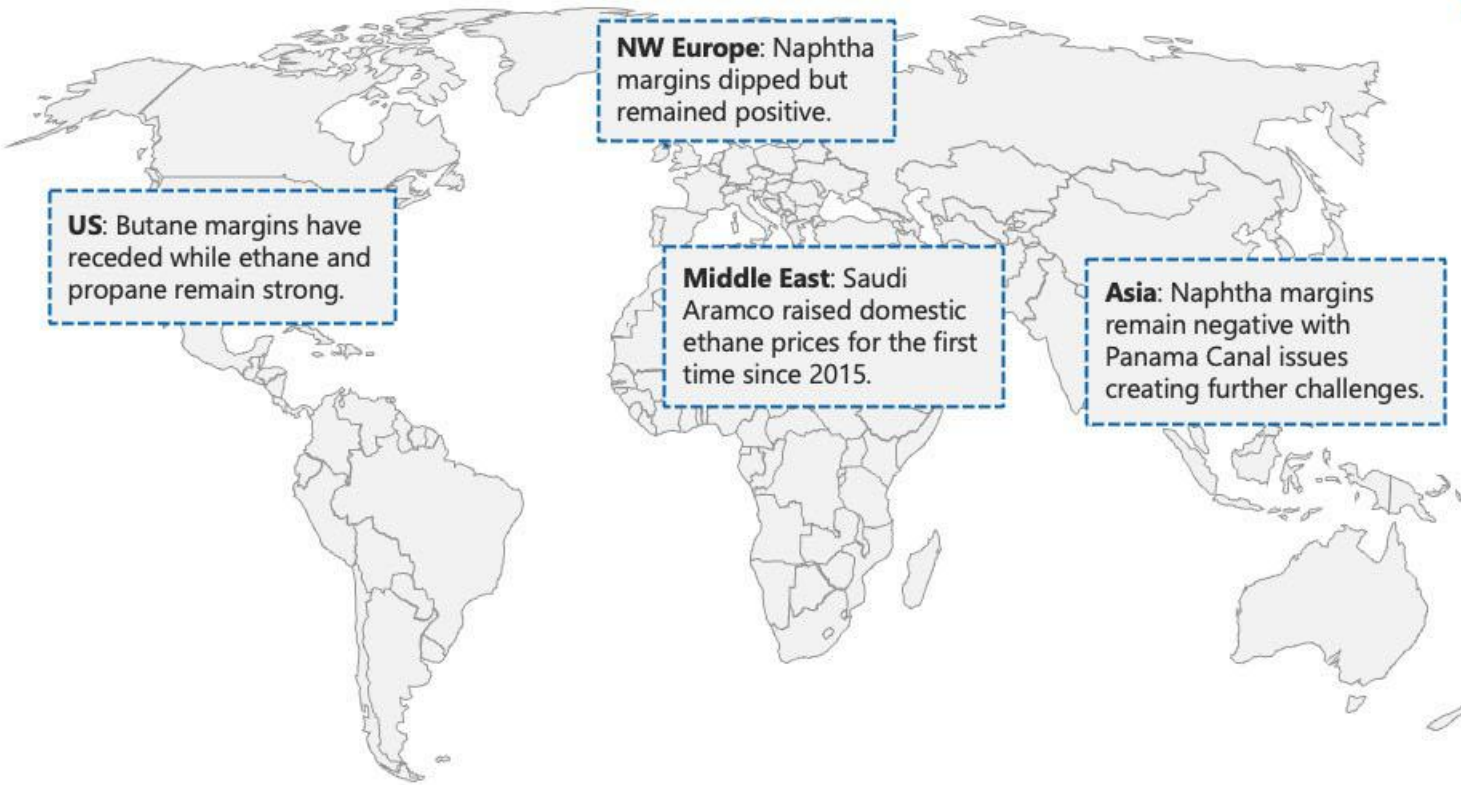
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Olefins Margins January 2024: Executive Summary

Panama and Suez Canal disruptions impacting global trade flows, costs and margins.



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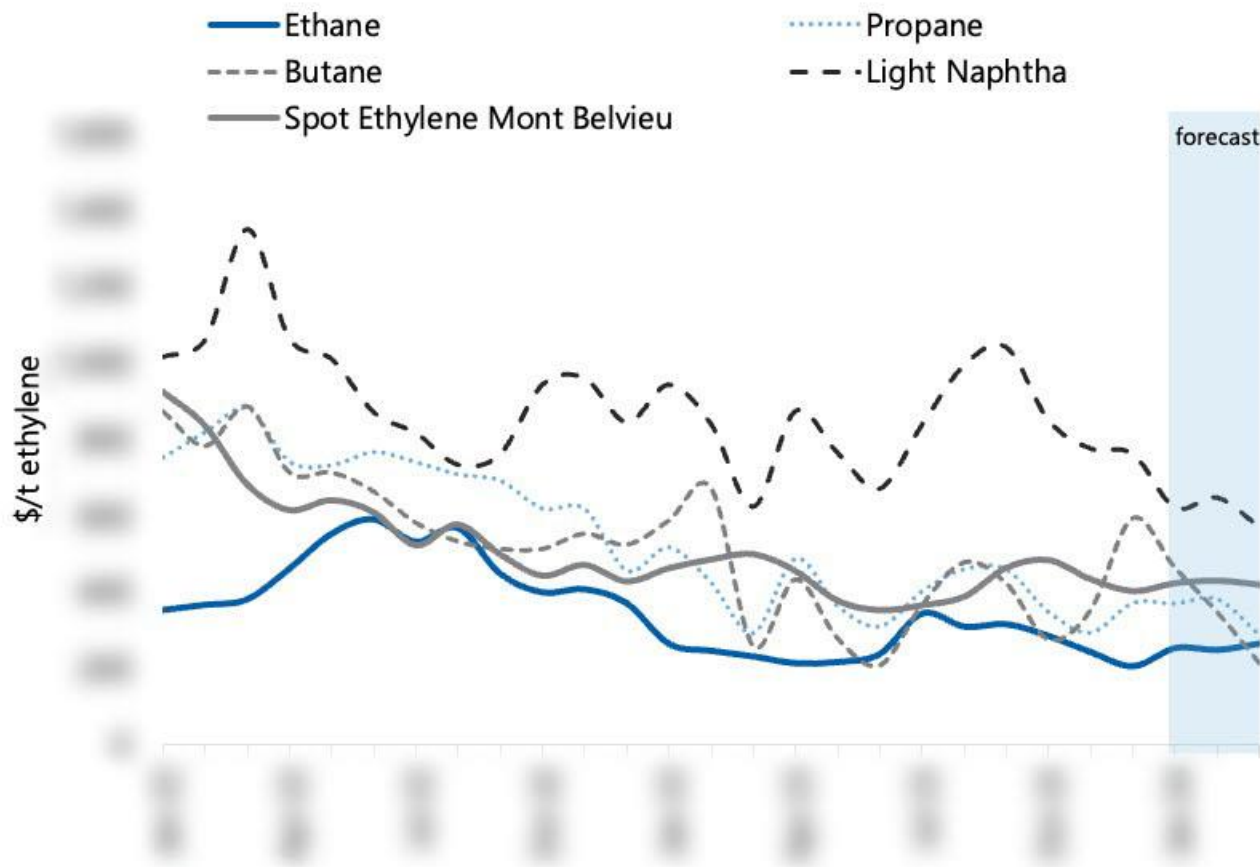
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US: Cash costs

Ethane remains the most cost advantaged feedstock.

US steam cracker cash costs



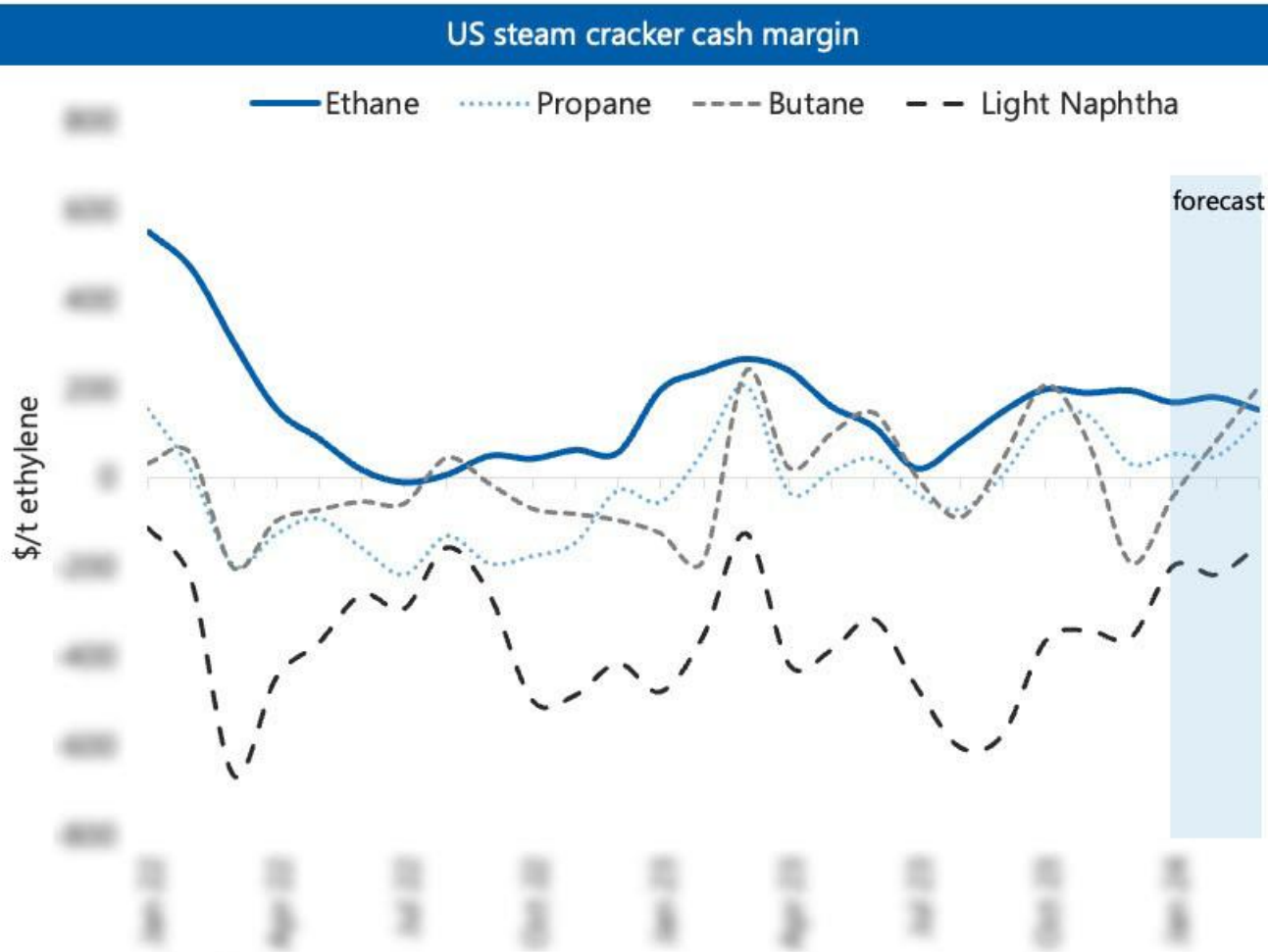
- Higher than expected heating demand caused propane prices to inch higher in December. Once heating demand dissipates in February there should be some downward pressure on propane prices.
- Ethane cash costs reduced slightly in December but are expected to rise back slightly over the rest of the winter months.
- Butane prices have been less affected by Panama Canal disruption than propane plus they have found support from the gasoline sector as winter blending encourages more butane use.

US feedstock price month-on-month change (Nov to Dec)

	Unit		Change
WTI Cushing	\$/bl	▼	-5.35
Ethane mt.B. Enterprise	USC/USG	▼	-4.15
Propane front month mt.B. Enterprise	USC/USG	▲	+4.88
Butane front month	USC/USG	▲	+18.69
Light Naphtha	\$/t	▼	-20.06

US: Cash margins

Ethylene prices are expected to follow ethane feedstock prices in 2024 to maintain margins.



- Ethylene prices are expected to follow ethane feedstock prices in 2024 to maintain margins.
- There will be a supply tightness in propylene due to two major PDH turnarounds during the February to April timeframe, causing US propylene prices to spike.
- Butane margins are forecast to rise sharply due to butane costs decreasing coupled with propylene prices increasing.

US product price (Nov to Dec)

	Unit		Change
Ethylene spot	USC/lb	▼	-1.39
Propylene polymer grade spot	USC/lb	▼	-1.00
Butadiene fob US contract month	USC/lb	▼	-3.00
Raffinate-1 - US	USC/USG	▼	-22.07
Pygas - US	USC/USG	▼	-1.37



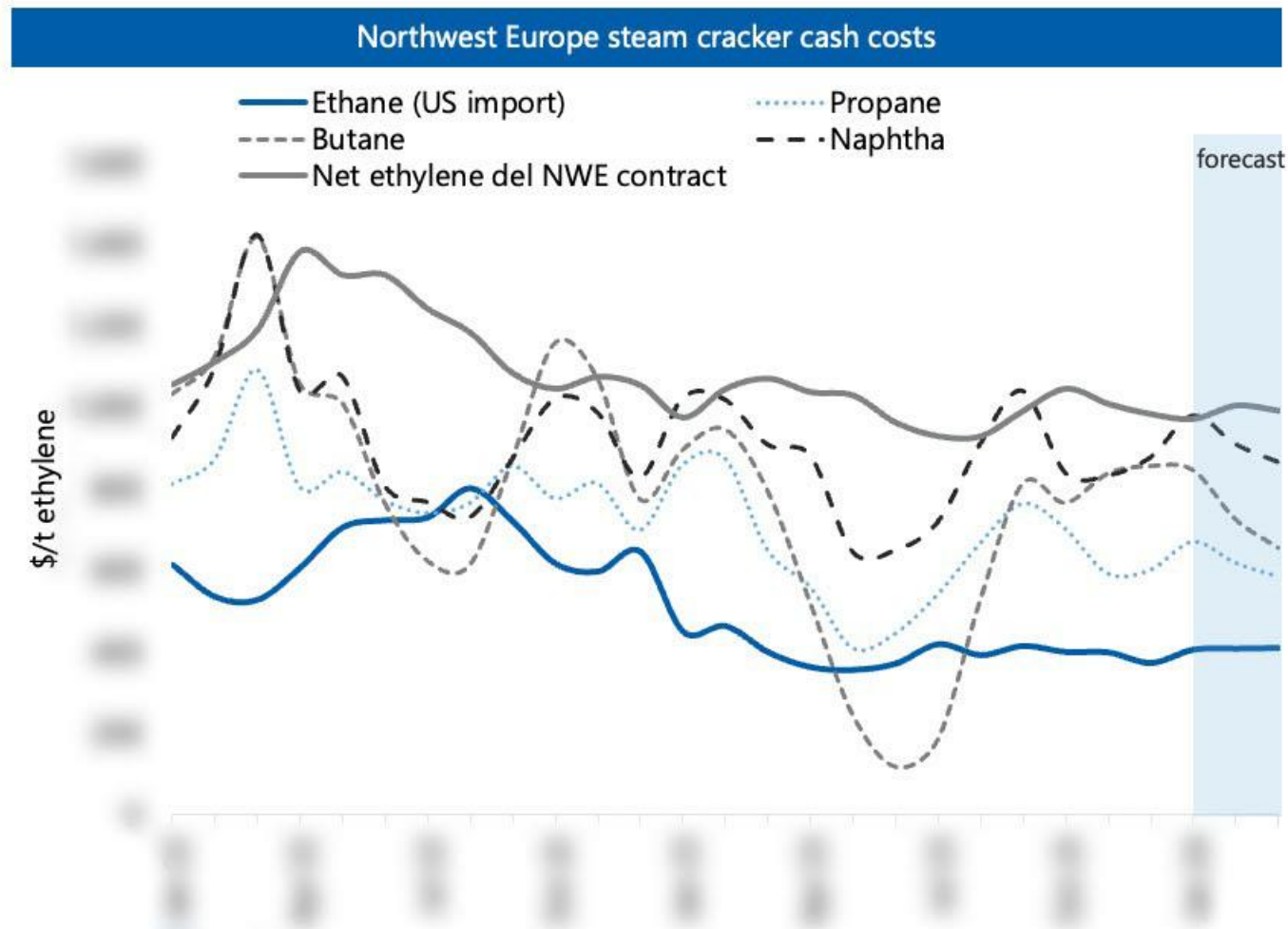
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Northwest Europe: Cash costs

US imported ethane price drops while all other feedstock prices remained stable in December.



- All feedstock costs in December remained fairly unchanged except for US imported ethane, which fell by 10pc on a cfr basis with freight included.
- The decrease in December US imported ethane price was driven by the combination of export restrictions from the Panama Canal building up supply in the US and warmer than normal weather which lowered demand and prices for natural gas.
- Imported US ethane is expected to remain the lowest feedstock cost, although ethane is used by a limited number of crackers in Europe, as naphtha is the primary feedstock. Naphtha is forecast to remain elevated over the forecast period making it the highest feedstock cost.

NWE feedstock price month-on-month change (Nov to Dec)

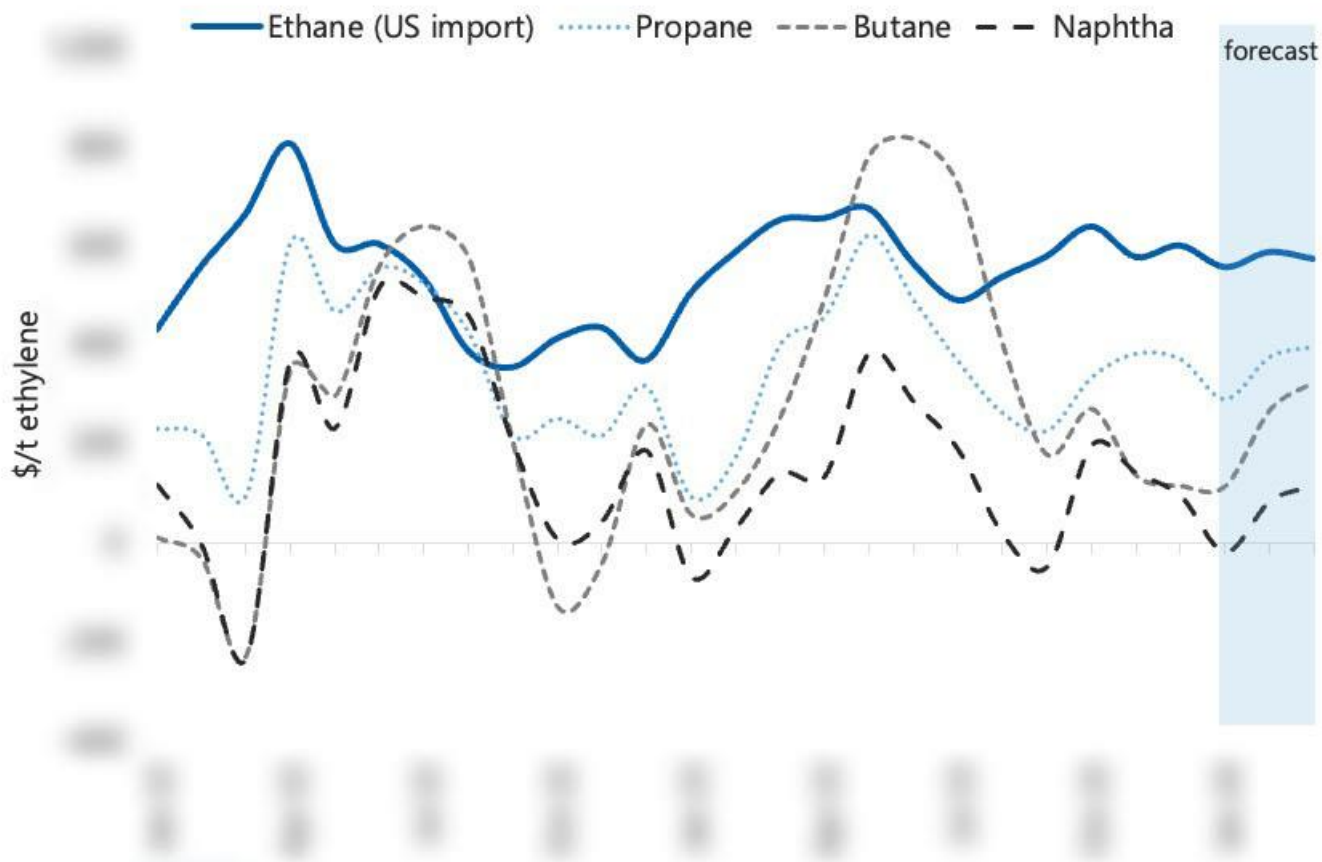
	Unit		Change
North Sea Dated Brent	\$/bl	▼	-5.21
Ethane (US import)	US\$/USG	▼	-4.15
Propane ARA large cargo	€/t	▲	+1.96
Butane ARA coaster	€/t	▲	+4.45
Naphtha 65 para NWE	€/t	▲	+2.84



Northwest Europe: Cash margins

Naphtha margins reduced but remained positive in December and are expected to turn negative in January.

Northwest Europe steam cracker cash margin



- *Argus'* cracker model shows a decrease across all margins in December except for US imported ethane and gasoil, based on a non-integrated generic cracker. Producers integrated upstream or downstream may be experiencing higher margins.
- December naphtha margins dropped by €47/t (33pc) but remained positive for three consecutive months owing to the decrease of product prices. Ethylene and propylene decreased by 2pc and 3pc, respectively, driving weaker margins.
- *Argus* forecast naphtha margins to turn negative in January driven by the forecast naphtha price increasing further than the forecast product prices. Naphtha margins are expected to turn positive from February onward, owing to the combination of reduced naphtha and increased product forecast prices.

NWE product price (Nov to Dec) (net), €/t

	Change
Ethylene del NWE contract	▼ -30.00
Propylene polymer grade del Europe contract (MCP)	▼ -30.00
Butadiene delivered NWE contract month	▼ -10.00
Raffinate-1	▲ +3.12
Pygas	▼ -43.99

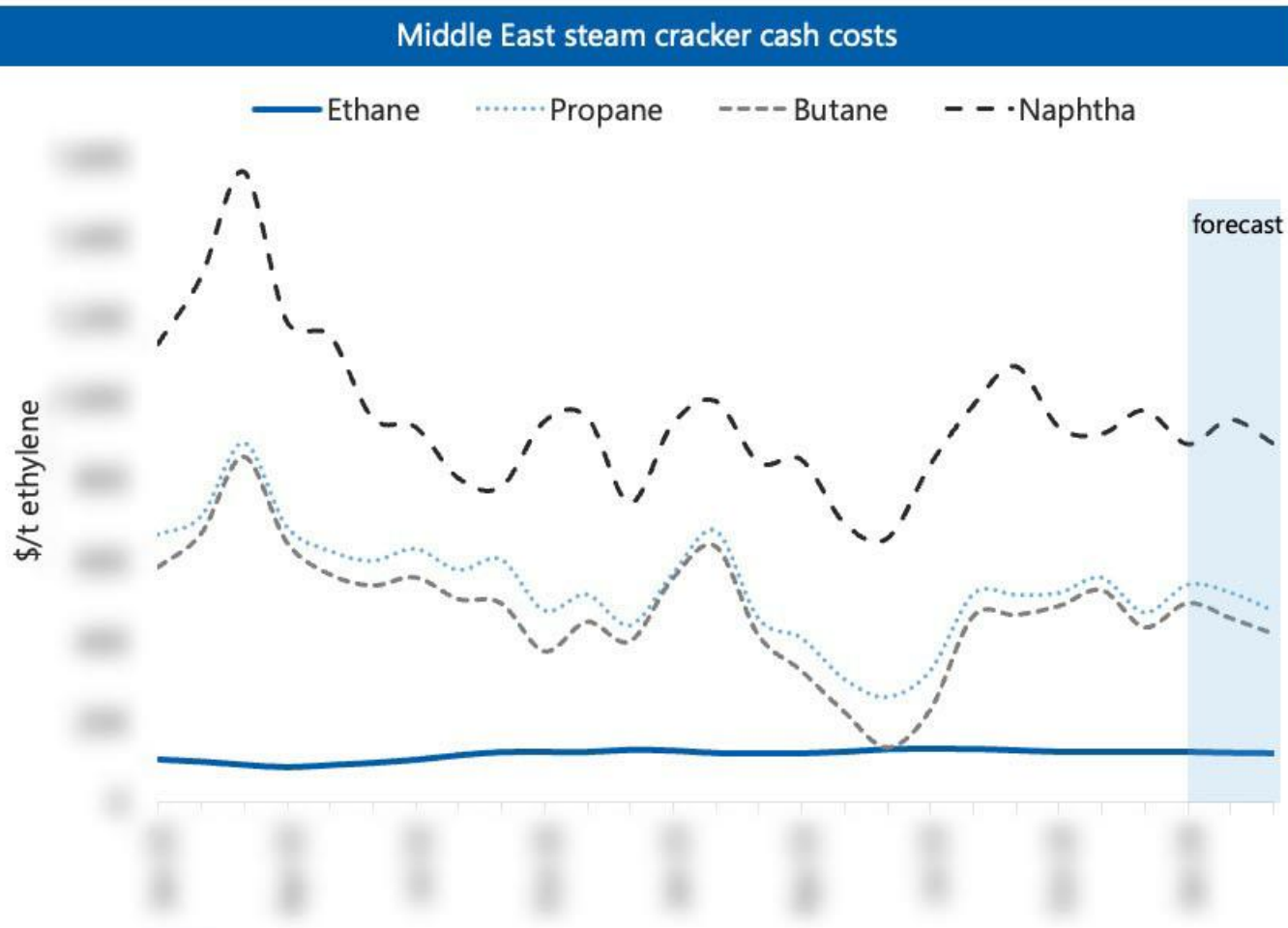


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Middle East: Cash costs

Impact of Saudi Aramco's domestic ethane price increase is unclear in near term.



- Aramco increased ethane prices as of 1 January from \$1.75/mmBtu to \$2.50/mmBtu. However, some petrochemical producers likely have contracts that delay the immediate impact of the change. Further price increments are expected.
- Propane cash costs decreased by 15pc in December but are expected to increase near November levels for January and February.
- Butane cash costs decreased by 17pc in December and will not increase significantly in the forecast period.

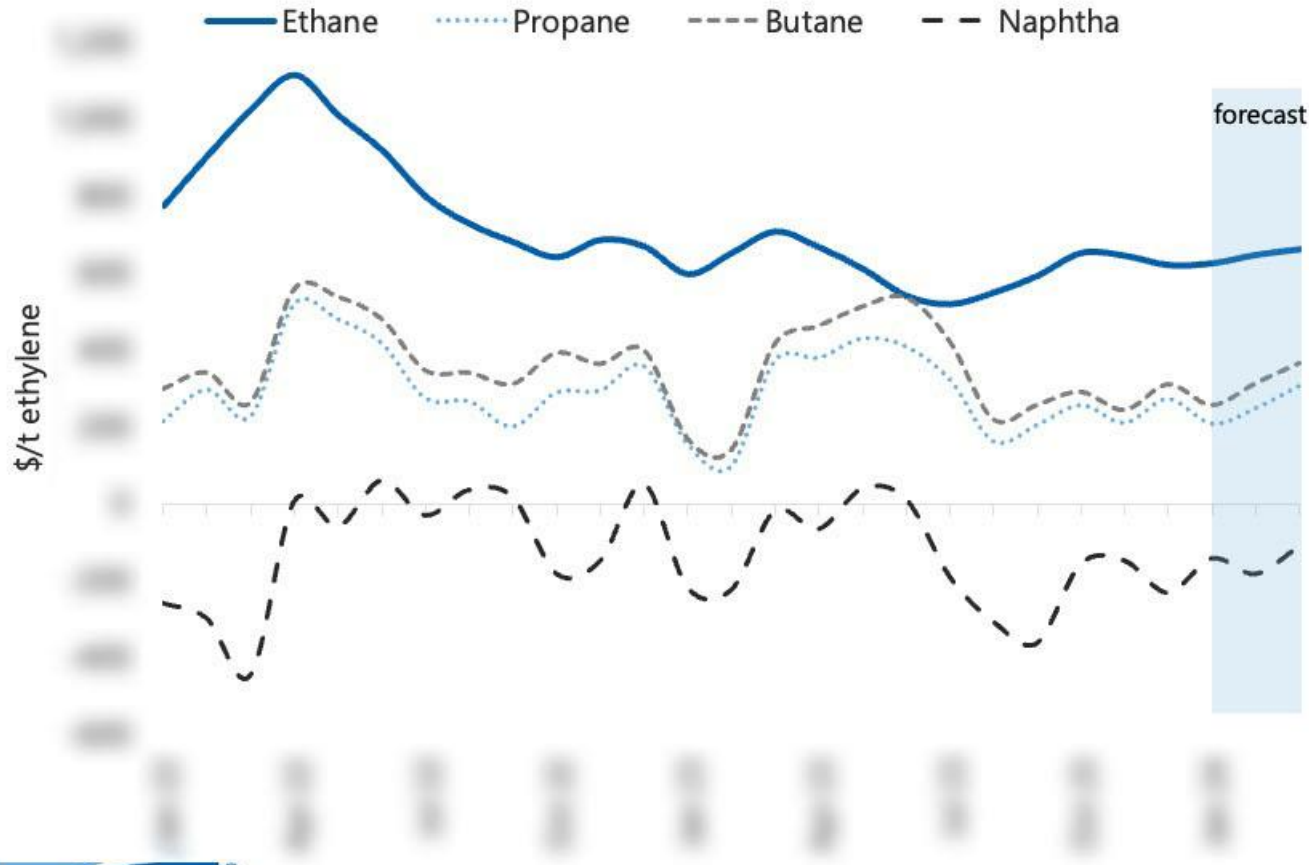
Middle East feedstock price month-on-month change (Nov to Dec)

	Unit		Change
Dubai crude	\$/bl	▼	-6.10
Propane Far East Index (AFEI)	\$/t	▼	-69.91
Butane Far East Index (AFEI)	\$/t	▼	-66.44
Naphtha LR1 Mideast Gulf fob	\$/t	▲	+14.85

Middle East: Cash margins

Suez Canal disruptions could restrict activities for some producers.

Middle East steam cracker cash margins



- Ethylene prices are expected to increase by less than 5pc through March, supporting small upticks in cash margins. Coproduct prices are also on the rise.
- Propane and butane cash margins each increased by 30pc in December due to lower feedstock costs but are expected to soften in January.

Middle East cash margin, (Nov to Dec) \$/t

		Change
Ethane	▼	-21.36
Propane	▲	+65.59
Butane	▲	+70.89
Naphtha	▼	-79.49

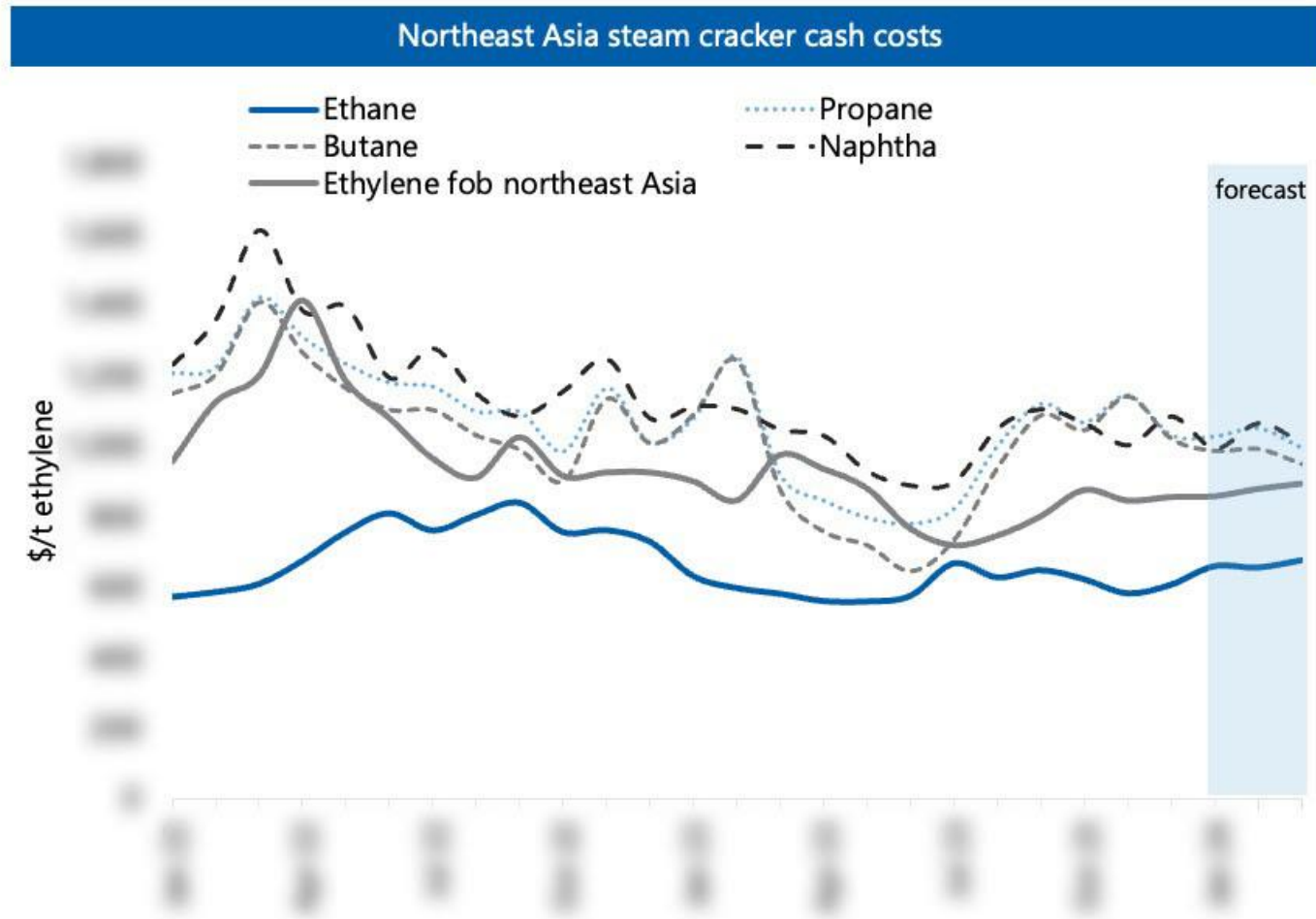
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Northeast Asia: Cash costs

Naphtha cash costs increased with higher naphtha feedstock prices.



- Naphtha and US imported ethane costs worsened in December, though LPG cash costs improved with dropped feedstock costs.
- Ethane feedstock costs will increase over the winter, meanwhile Panama Canal restrictions will also result in increase in freight costs, while ethane remains the lowest cost feedstock, supporting ethane crackers over the next three months. Only a limited number of crackers in northeast Asia use imported US ethane.
- *Argus* forecasts that lower naphtha and LPG costs in Q1 will slightly ease the pressure on margins. Naphtha remains the most widely used cracker feedstock in the region.

NE Asia feedstock price month-on-month change (Nov to Dec)

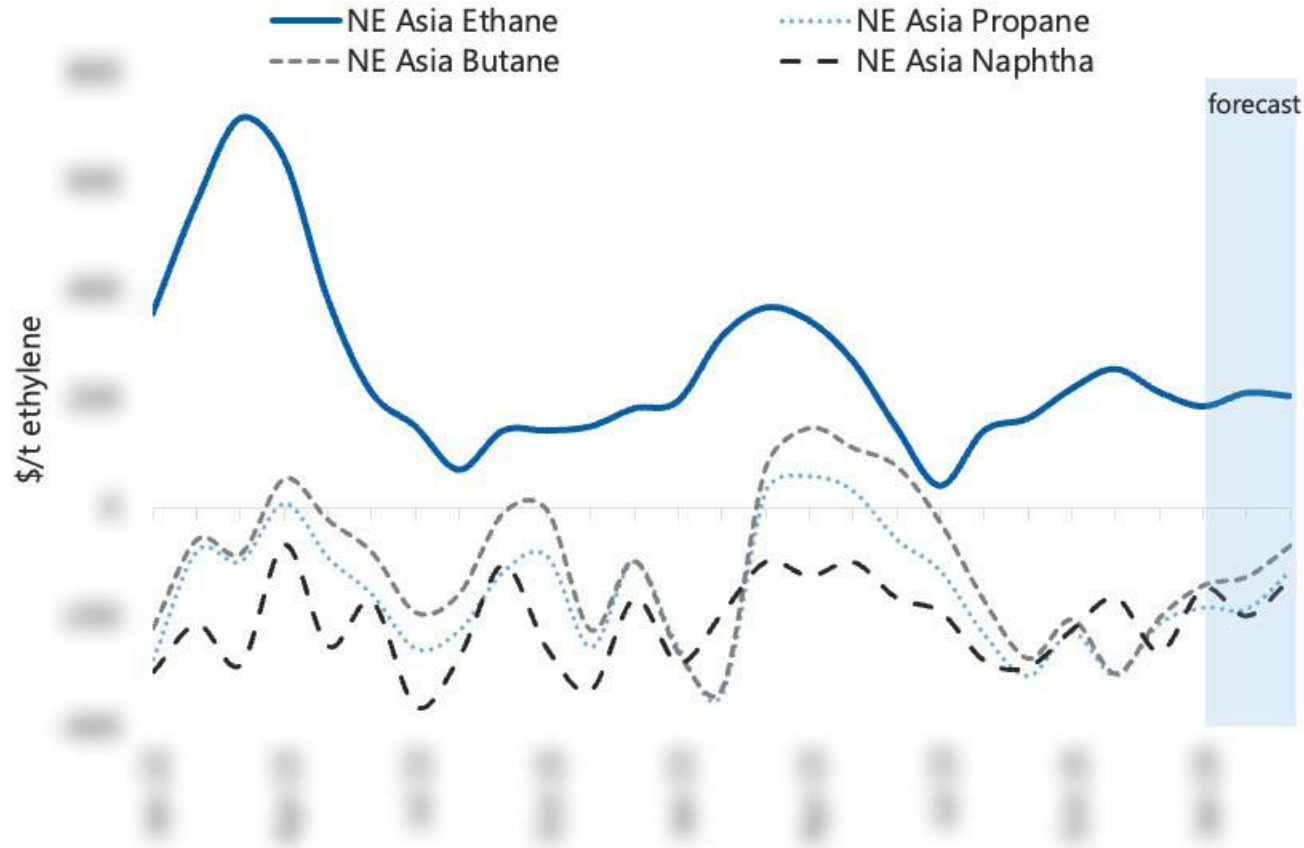
	Unit		Change
Dubai crude	\$/bl	▼	-6.10
Ethane (US import)	USC/USG	▼	-4.15
Propane Japan cargo	\$/t	▼	-56.50
Butane Japan cargo	\$/t	▼	-54.22
Naphtha Japan c+f	\$/t	▲	+19.75



Northeast Asia: Cash margins

Naphtha and LPG margins will improve in the first quarter with lower cash costs and stable ethylene values.

Northeast Asia steam cracker cash margins



- *Argus'* cracker model shows US imported ethane margins dropped slightly in December mainly because of higher logistics costs but remained the only positive margin.
- Naphtha margins remained negative and dropped by 60pc in December because of higher costs and lower coproduct values.
- Ethane margins will stay positive owing to its cost advantage, but other margins are projected to remain negative owing to the slow pace of demand recovery and oversupply in the region.

NE Asia product price (net), (Nov to Dec) \$/t

Ethylene fob Northeast Asia	▼	-17.75
Propylene polymer grade fob Northeast Asia	▼	-21.00
Butadiene fob Northeast Asia	▼	-73.88
Raffinate-1	▲	+21.72
Pygas	▲	+5.39



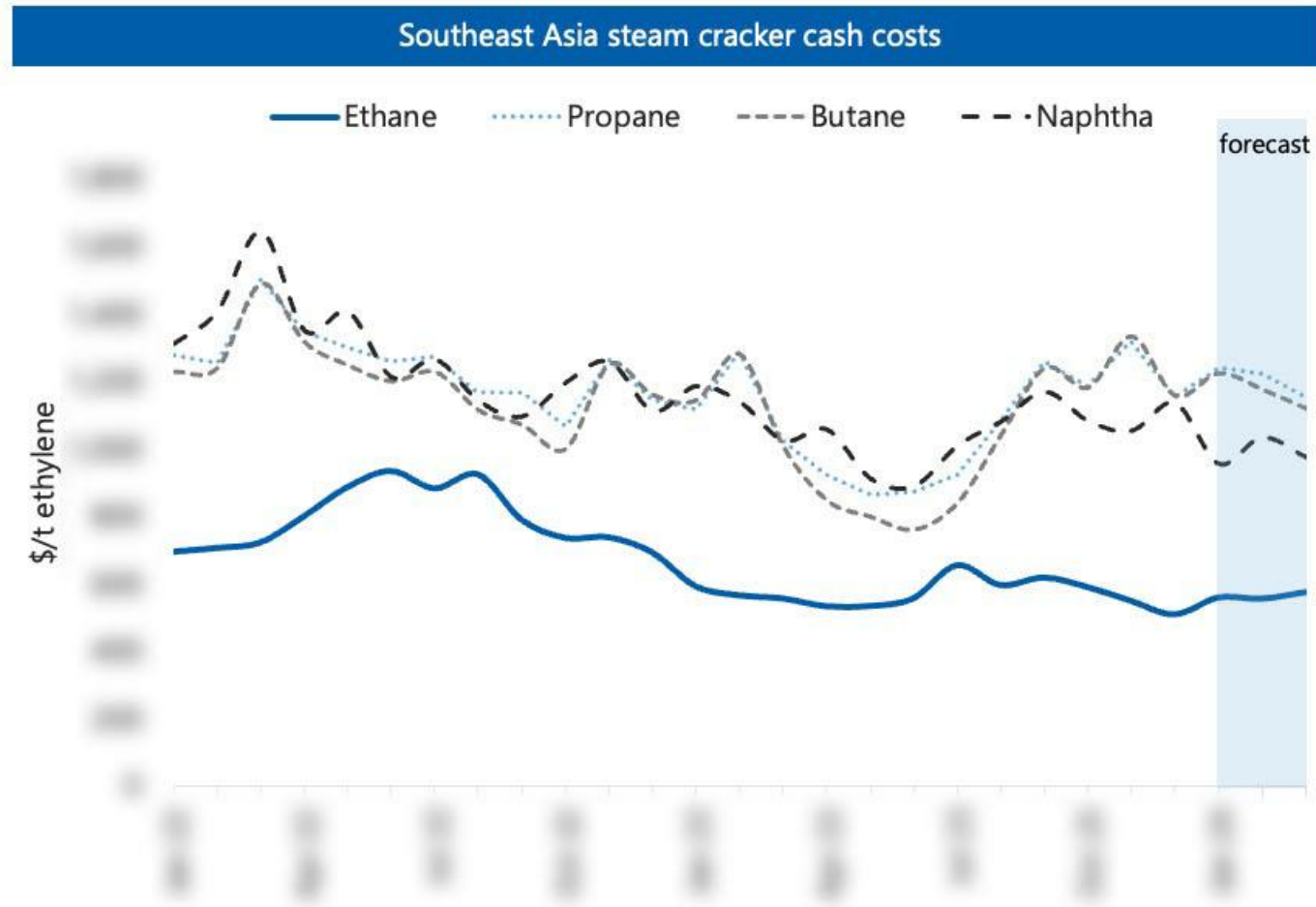
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Southeast Asia: Cash costs

Naphtha cash costs rose 8pc in December.



- Naphtha is the primary feedstock in the region, though future projects will add capacity for other feedstocks.
- Propane and butane cash costs are expected to increase in January due to increasing feedstock costs but are forecast to soften in February and March.

SE Asia feedstock price month-on-month change (Nov to Dec)

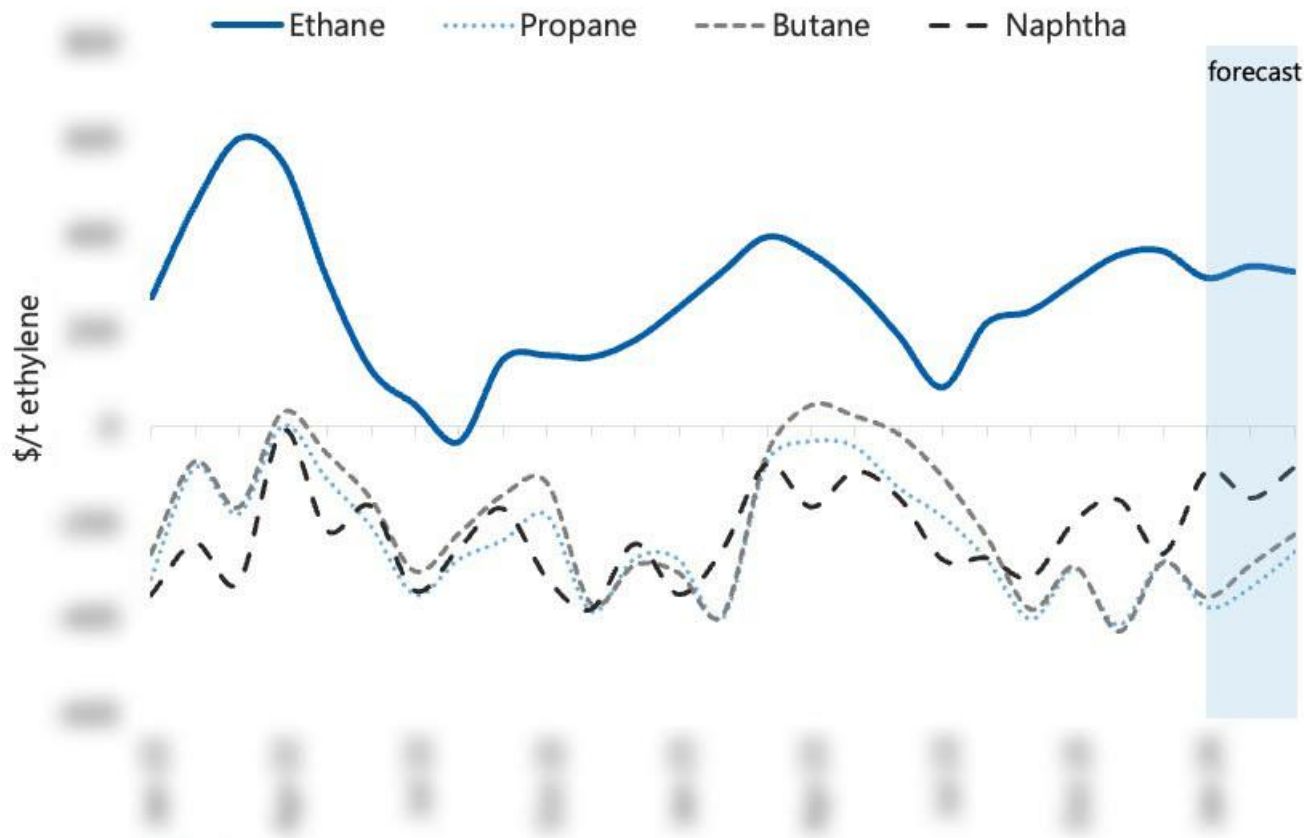
	Unit		Change
Dubai crude	\$/bl	▼	-6.10
Ethane (US import)	USC/USG	▼	-4.15
Propane Far East Index (AFEI)	\$/t	▼	-69.91
Butane Far East Index (AFEI)	\$/t	▼	-66.44
Naphtha Japan c+f	\$/bl	▲	+19.75



Southeast Asia: Cash margins

Panama Canal issues impacting ethylene freight rates.

Southeast Asia steam cracker cash margins



- Ethylene prices decreased 3pc in December and are expected to fall further in January before recovering in February and March. Propylene and butadiene prices also fell in December.
- Naphtha cash margins fell in December due to increased feedstock costs and lower product prices.
- All feedstock margins remain negative with the exception of US-imported ethane.

SE Asia cash margins, (Nov to Dec) \$/t

		Change
Ethane (US import)	▲	+8.65
Propane	▲	+132.89
Butane	▲	+144.11
Naphtha	▼	-113.10
Gasoil	▲	+123.32



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Assumptions

Argus Western Europe Steam Cracker Model is based on a fully flexible mixed-feed cracker located on the ARG pipeline with a nameplate capacity of 500,000 t/yr and fully integrated downstream.

Net product prices are based on monthly contract prices; average discounts are based on market consultation.

Pygas modelled as equivalent to 35pc benzene cif NWE contract/65pc naphtha 65 para NWE minus \$84/t

Raffinate-1 is taken as 1.1*naphtha 65 para NWE

Argus US Steam Cracker Model is based on a fully flexible mixed-feed cracker with capacity of 700,000 t/yr located on the Texas grid, fully integrated downstream.

Product prices are based on spot values.

US Pygas = (0.35 x benzene US Gulf coast \$/t) + (0.65 x gasoline 87 conv USGC waterborne fob lowest RVP not 7.8 or 7.0) - \$84/t (the \$84/t is a discount)

Raffinate-1 is taken as 1.1*naphtha full-range USGC waterborne del

Argus Northeast Asia Steam Cracker Model is based on a fully flexible mixed-feed coastal Chinese cracker with a nameplate capacity of 600,000 t/yr and fully integrated downstream.

Product prices are based on spot values.

Pygas modelled as equivalent to 35pc benzene fob South Korea/65pc naphtha Japan c+f minus \$70/t

Raffinate-1 is taken as 1.1*naphtha Japan c+f

Argus Middle East Steam Cracker Model is based on a fully flexible mixed-feed cracker with capacity of 1,000,000 t/yr.

Product prices are assumptions calculated based on spot values for Europe and Asia.

Pygas modelled as equivalent to 35pc benzene /65pc naphtha minus \$70/t

Raffinate-1 is taken as 1.1*naphtha LR1 Mideast Gulf fob

Argus Southeast Asia Steam Cracker Model is based on a fully flexible mixed-feed cracker with capacity of 800,000 t/yr.

Product prices are based on spot values.

Pygas modelled as equivalent to 35pc benzene /65pc naphtha minus \$70/t

Raffinate-1 is taken as 1.1*naphtha Singapore fob

For full details download:

[Reference and Modelling Approach](#)



Argus Olefins Experts



Craig Barry
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Ethylene and
Derivatives

Craig leads the global ethylene team focused on integrated global forecasts. He has over 30 years experience in the olefins industry including with Dow Chemical and ExxonMobil. Throughout his career Craig has worked across the world with major olefins and derivative producers. His experience also includes olefins feedstocks and refinery integration with the petrochemical industry. He holds a chemical engineering degree from The Ohio State University and an MBA from Rice University.



Sarah Rae
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Sarah Rae is Argus' propylene consultant focusing primarily on Europe and the Middle East. For 17 years prior to joining Argus, Sarah held senior strategic purchasing management positions at Ineos, Tessenderlo Chemie and Rhodia, responsible for a wide range of materials including olefins, fertilizers and commodity raw materials. Before this, Sarah held various management and project roles covering most aspects of the chemical business, including business management, sales, planning and logistics. She graduated with a degree in geology from Leicester University.



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Craig is a member of the Argus Media olefins team focusing on propylene and associated derivatives. He contributes to the monthly Olefins Outlook report, the biannual Propylene Analytics report, and provides support to both internal stakeholders and external clients. Craig has nearly 25 years' experience in the petrochemical industry including roles with producers and consultants. The variety of products covered in his career include polymers, olefins, aromatics, asphalt, methanol, inorganics, OXO Alcohols, and electricity.



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Deputy Analyst
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Dhanish is a deputy analyst manager in Argus' London consulting team, focusing mainly on olefins, polyolefins and chlor-alkali. His experience includes roles working in power generation, project management, agriculture and analytics. He also spent time at an edible oil refinery in operations and managed projects with high-pressure biomass boilers, steam turbines, water treatment, and fuel management. He holds a degree in chemical engineering and a masters in finance analytics.



Becky Zhang
Editor, Olefins
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Becky works as an editor for Asian olefins and methanol markets. She has 10 years experience of real-time market editor work. She also spent two years in consulting services as a project manager focusing on the Chinese market and led projects in various industries, including refining, olefins, polymers, coal and methanol. Becky is a chemical engineering graduate from the East China University of Science and Technology and has two masters' degrees, in environmental and energy engineering from the University of Sheffield and in Entrepreneurship from the University of Nottingham.



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Analyst, Olefins
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