Supply chain disruption, feedstock constraints and opportunities in global pine chemicals

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A view of Argus

Headquartered in the UK, Argus has over 1,300 staff working in 29 offices in the world's principal commodity trading and production centres.

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- US crude oil
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- Asia-Pacific LPG
- Coal
- European steel
- US and European environmental markets

Agenda

- Global pine oleoresin, rosin and turpentine markets
  - Brazil: supply and demand dynamics
  - Southeast Asia industry analysis
  - Global turpentine supply-demand dynamics
- Crude tall oil complex and competing products
  - US and European CTO, TOFA and biofuel market dynamics
  - Hydrocarbon resins (HCR)
- Supply chain, feedstock risk and opportunities
  - Tapping markets: pine oleoresin supply security a must
  - Supply chain and tariff developments
  - Concluding thoughts

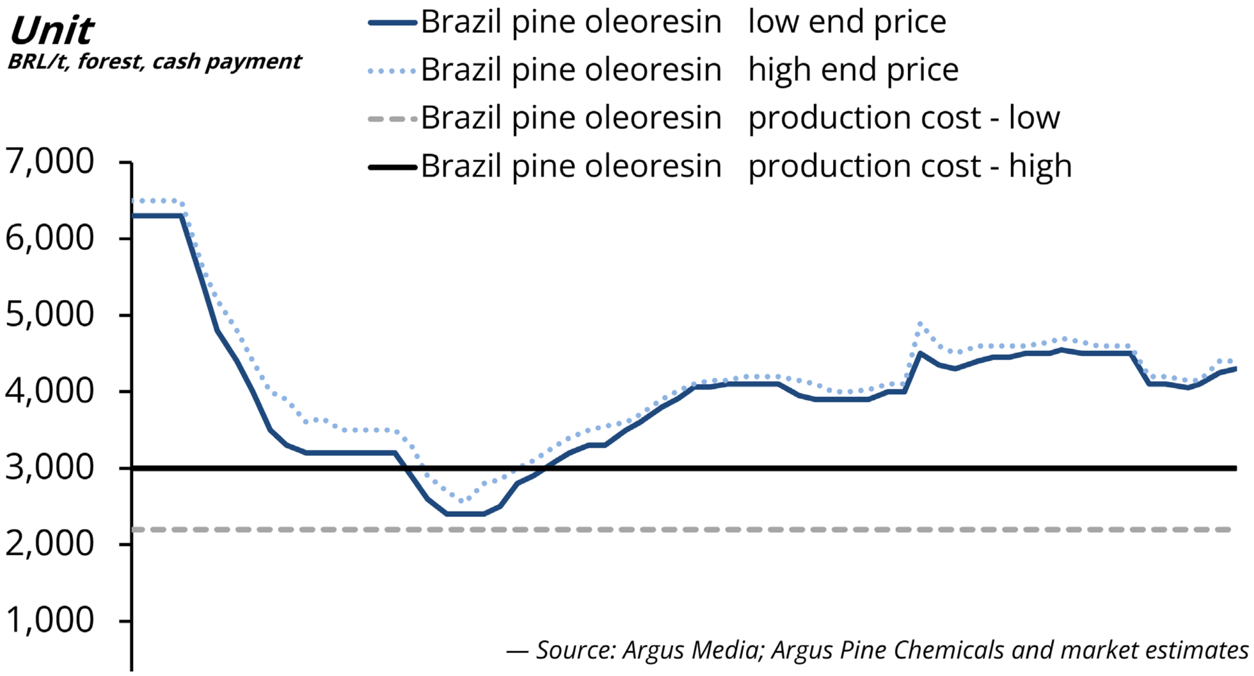
Global

pine oleoresin, rosin and turpentine markets

Brazil pine oleoresin: supply vs demand

- 2023 and 2024: Bear cycle. No reforesting, lower supply
- Rebound from 2024 and 2025 levels
- Less production, steady demand and off-season support firmer markets
- Feedstock risk: POR shorter after strong rise in demand. Can supply meet demand growth?

Brazil pine oleoresin margin history



— Source: Argus Media; Argus Pine Chemicals and market estimates

South American rosin markets

- Paraguay exports pine oleoresin for the first time
- Chinese firm investing in Corrientes, Argentina
- Brazil gum rosin markets up after US-Iran conflict started, but facing softness over lower-priced alternatives
- Short-term: rosin values to remain above pre-war levels, depending on geopolitical dynamics

INTERIOR

Empresa china invierte 30 millones de dólares en derivados de resina

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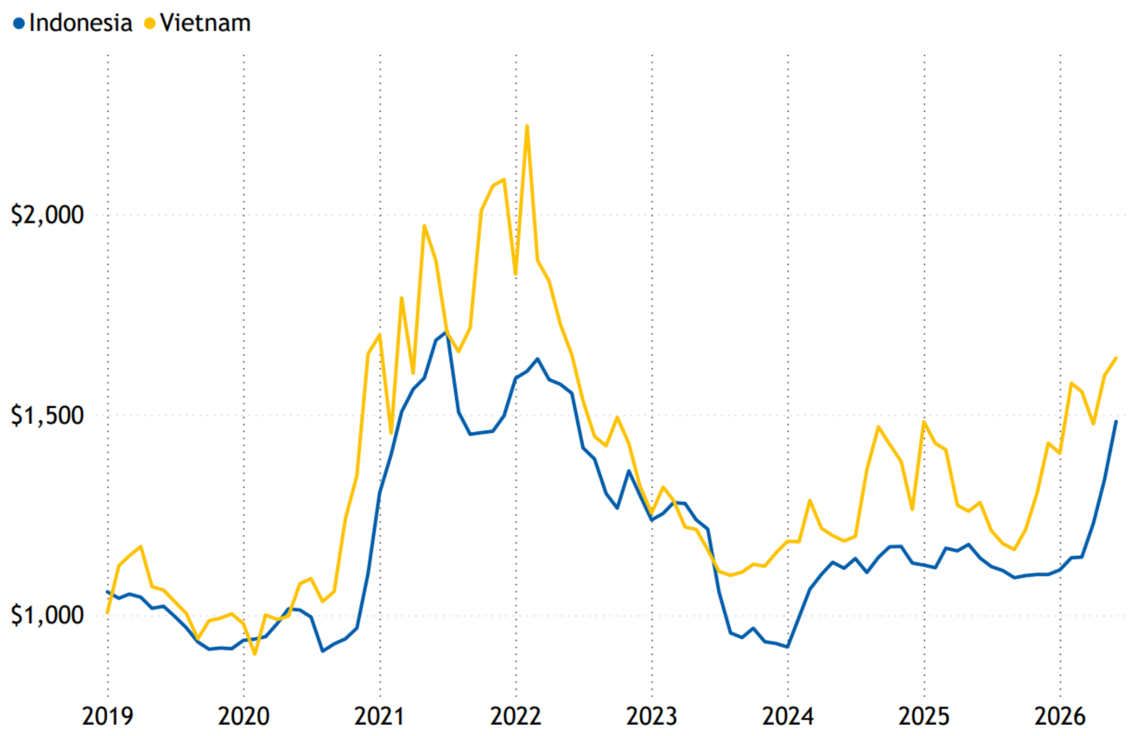
Primera exportación de resina de pino abre una nueva oportunidad para la industria forestal paraguaya

Southeast Asia industry analysis

- Typhoons affecting Indonesian, Vietnamese and Chinese pine oleoresin tapping and collection in late 2025 and 2026
- China likely to import less *elliottii* rosin from Brazil as they reach peak season
- Constrained Indonesian and Vietnamese oleoresin, rosin and turpentine volumes in 1H. Bottlenecks easing

China gum rosin import values

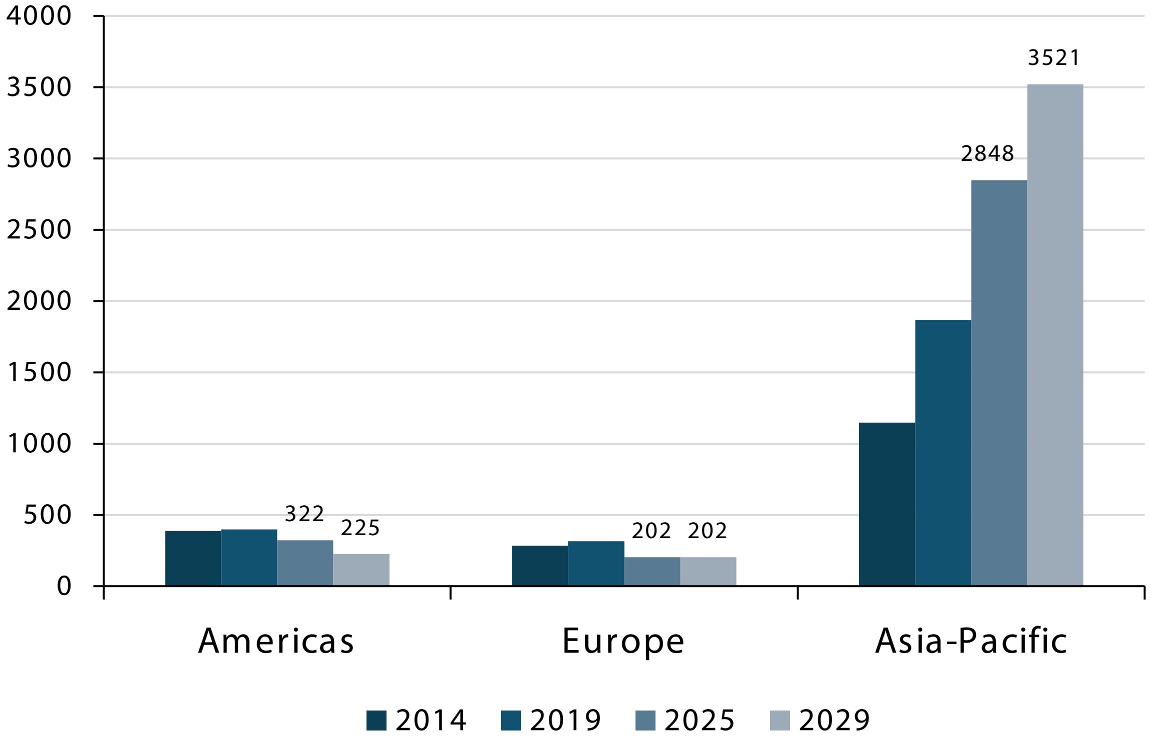


Source: Argus Media

Southeast Asia industry analysis

- Decline in Hormuz transit affects naphtha supply streams to China, shortens Chinese C5 HCR markets
- Chinese *elliottii* rosin and rosin esters firmer on rising C5 HCR markets, which increased to levels not seen in years
- Structural excess supply in Asia-Pacific HCR not going away soon

Global HCR capacity,000t

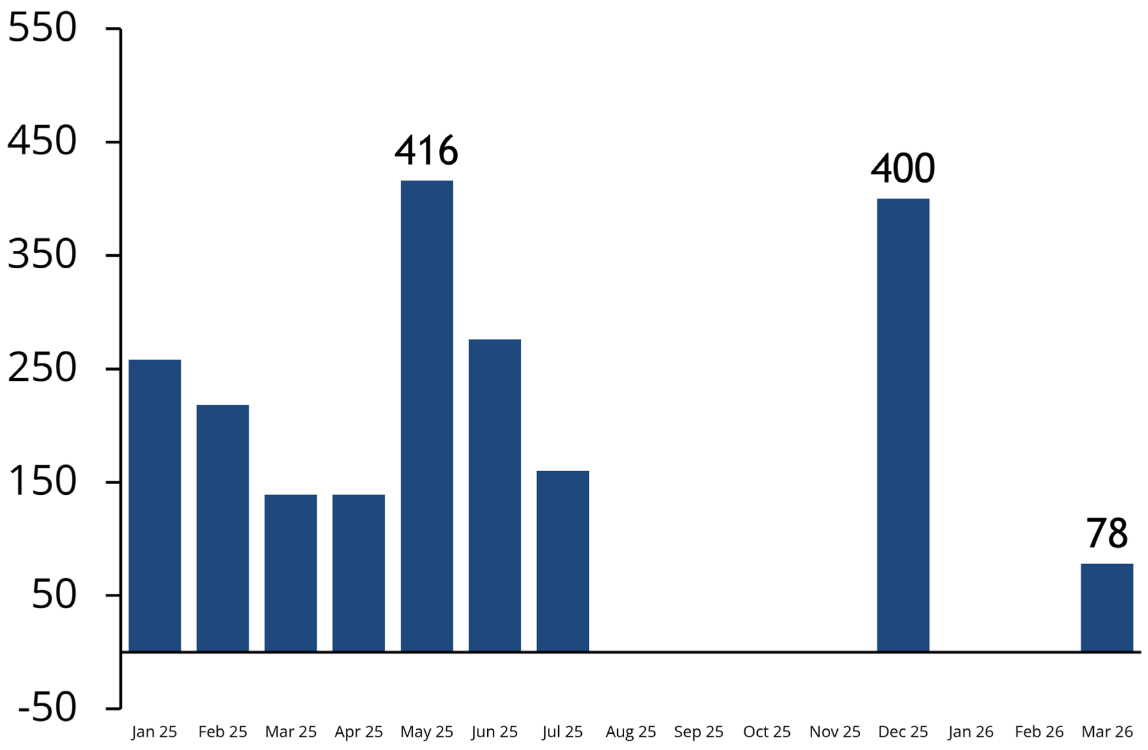


Sources: Argus Media; Argus Pine Chemicals and Argus C5 and Hydrocarbon Resins

Global turpentine market analysis

- Steady, firmer demand across end markets in 2026 relative to previous years
- Global supply shorter: Less US CST. Constrained Indonesian, Vietnamese and Chinese supply during 1H 2026.
- Reduced Brazil supplies. Tariffs cut Brazil volumes to the US
- Indian customers facing higher cost pressure. Uncertainty may lead to reduced appetite or demand destruction

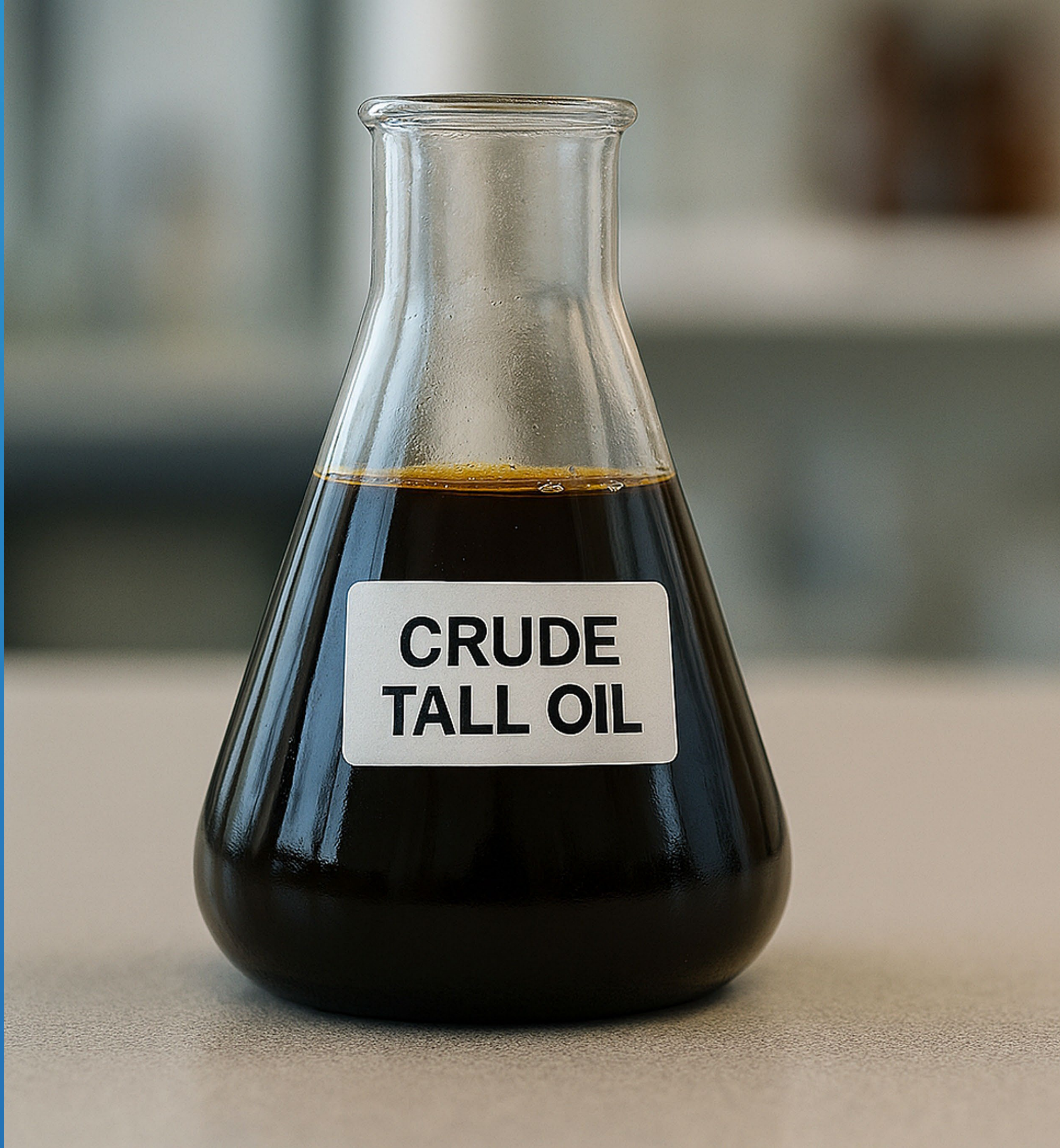
Brazil exports of gum turpentine to the US in metric tons



Sources: Argus Media; Argus Pine Chemicals and GTT

Crude tall oil

complex and competing products



Global CTO and CTO refining markets

- There is no “one-size fits all.” Economics vary between traditional vs biofuels-focused fractionators
- Global CTO supply-demand balances shorter on growing refining capacity into biofuels
- Higher Chinese, Brazil rosin levels supported firmer TOR markets into the 3Q in Europe
- Rising CTO costs may affect refiners’ ability to pass on higher TOR quotations and may eventually affect run rates

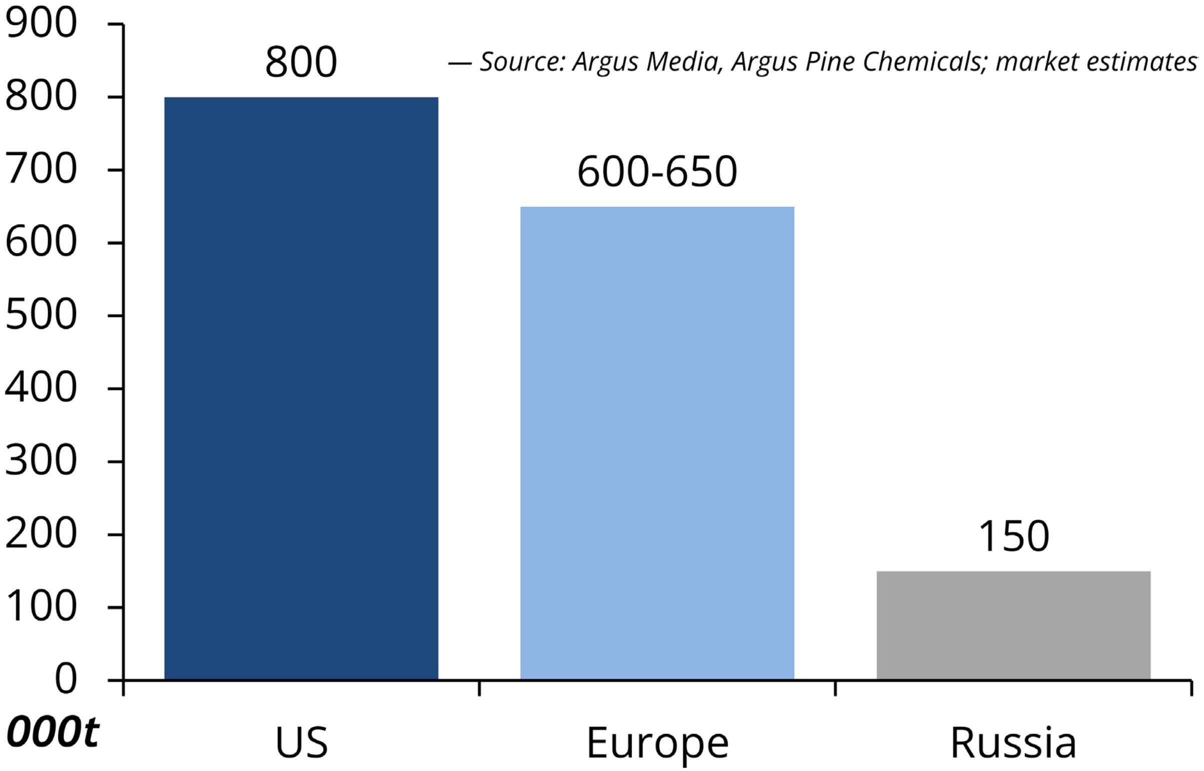
Same feedstock, different downstream dynamics

Traditional CTO fractionator	Biofuels-focused fractionator
CTO 🔴 Tighter supply, rising cost 🟡 US: tighter supply and bigger Europe pull	**CTO** 🔴 Tighter supply, rising cost 🟡 EU: insufficient Nordics supply, higher freight
TOR 🟡 🔴 Higher CTO, weak rosin limit upside 🟢 Can be upgraded into TOR esters 🟢 TOR esters competitive over GR esters	**TOR** 🟡 🔴 Higher CTO, weak rosin limit upside 🟢 No derivatives, but more interest into S. Europe 🟢 TOR competitive relative to BGR
TOFA 🟢 Higher value into chemical applications 🟡 Higher cost increases reformulation risk	**CFA** 🟢 REDIII supporting long-term 9A targets 🟡 Competes with lower-priced materials like UCO, technical corn oil and POME

US CTO and TOFA market dynamics

- US CTO fractionation less in 2023 and 2024 after shutdowns, but may increase after recent acquisitions
- US CTO supply sufficient to local refining capacity. Bigger pull into Europe and higher domestic demand driving supply-demand balances shorter
- US TOFA markets firmer on rising CTO costs and steady demand

US, European CTO Supply



Sources: Argus Media, Argus Pine Chemicals

European CTO and TOFA markets

- Nordics supply insufficient to address both traditional and biodiesel focused CTO refining capacities
- TOFA supply shorter on diverging CTO sourcing strategies and run rates, which have supported firmer markets in 1Q-3Q 2026
- TOR esters competitive relative to gum rosin esters but rising CTO costs may shift this dynamic

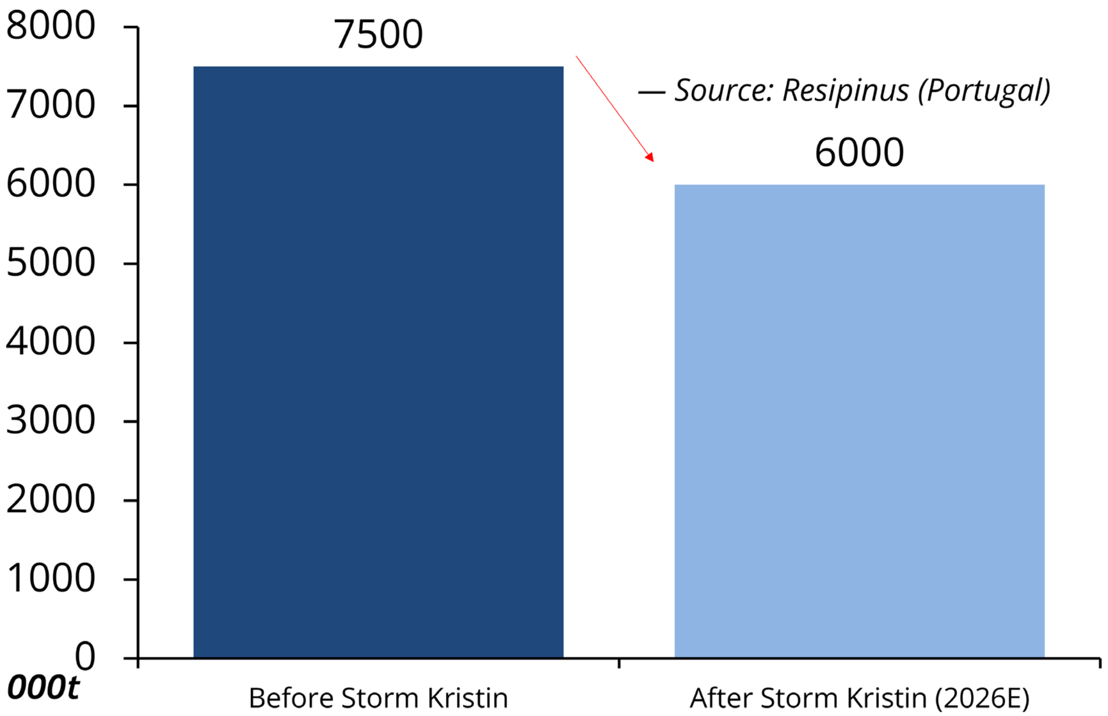
Sources: Argus Media, Argus Pine Chemicals

Supply chain, feedstock risk and opportunities

Tapping: pine oleoresin supply security a must

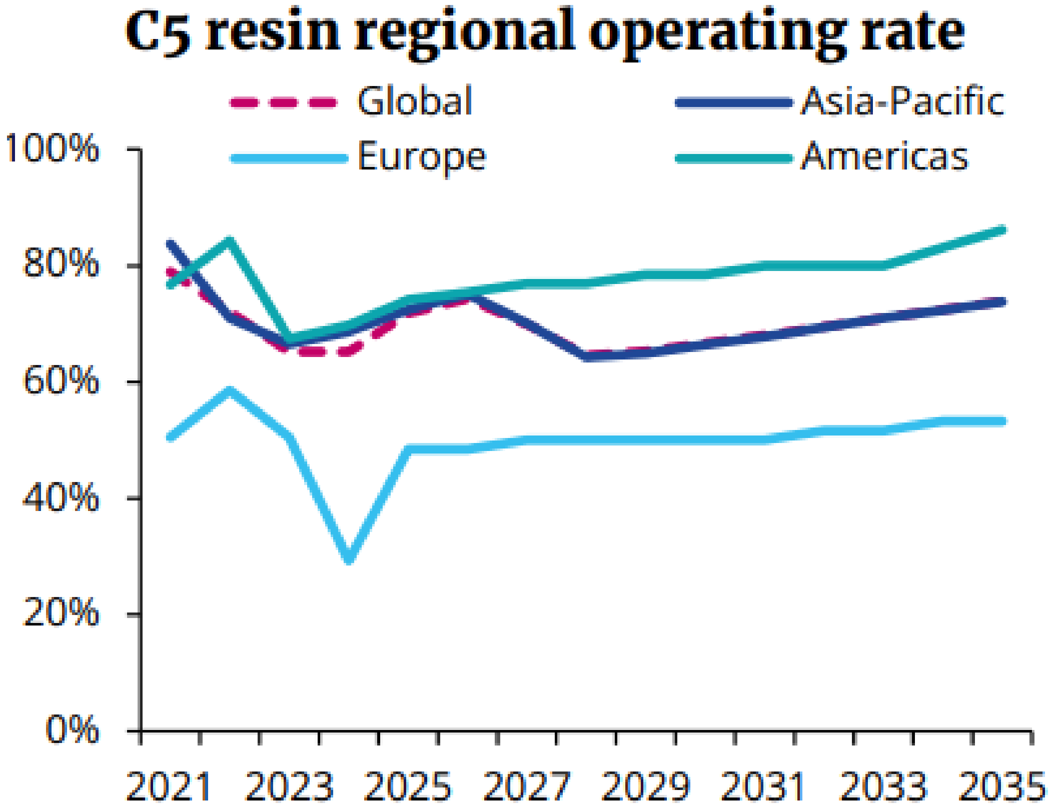
- Steady to declining pine oleoresin production in Brazil, China
- Weak reforesting activity in Brazil. Older plantations reaching their lifecycle
- Ongoing forest fire risk in Iberia region on top of gradually declining production
- Storm Kristin destroyed 20pc of Portuguese pine oleoresin production in late Jan 2026
- Greater dialogue needed between forest sector and factories

Portuguese pine oleoresin production



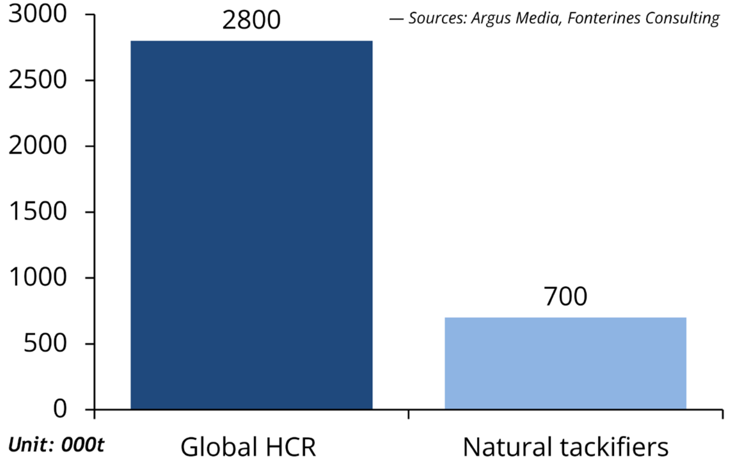
Supply chain and tariff developments

- US customers buying less rosin ester tackifiers and turpentine from Brazil on extended, uncertain US tariff policy
- Erratic US HCR imports, depending on tariff development
- Short-term: Tariffs on US HCR imports to divert flows to other regions
- US short of C5 HCR, C9 HCR and HHCR as consumers seek volumes, placing upward pressure on pricing



Source: Argus Hydrocarbon Resin Analytics

Global tackifying resins: HCR vs pine



Headwinds

- Pine oleoresin and CTO supply challenged at times of strong demand during abnormal times (e.g Covid, closures, US-Iran conflict)
- Excess HCR supply not going away
- More debate on where CTO belongs as more volumes go into biofuels

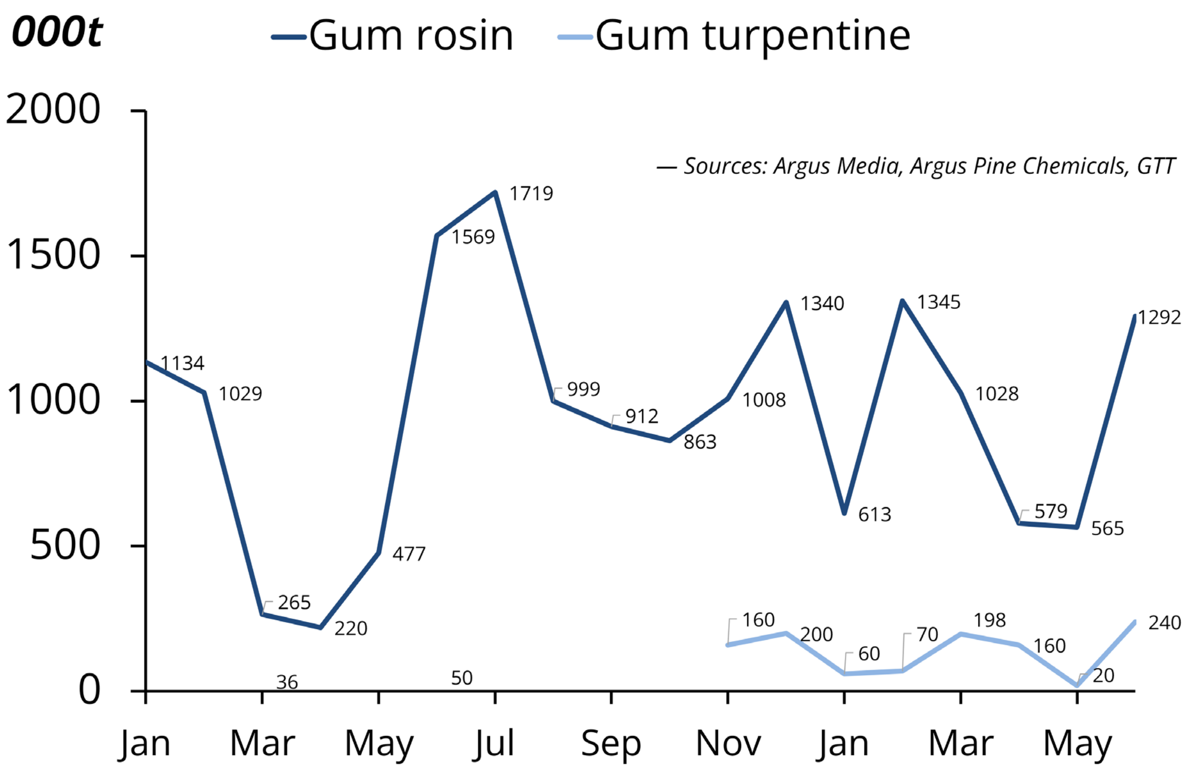
Upside

- Rosin to remain above pre-war levels in the short-term
- Natural tackifiers resilient and not Hormuz dependent
- New coprocessing technology being developed in Finland and trials for CTO-based material into SAF
- New markets: Use of Canadian CTO as a potential flotation reagent for lithium processing

Key trends in pine chemicals

- Chinese investors seeking new frontiers: Argentina, Uganda and Spain
- Feedstock access and verticalization taking place in South America and Europe through mergers and acquisitions
- More consolidation likely if run rates and margins remain challenged
- New coprocessing tech and markets being explored for CTO-based materials in Finland, Canada

Chinese imports from Uganda



Concluding thoughts

- Steady to declining pine oleoresin production in Brazil, China. Time to rethink long-term forest growth strategy
- Rosin markets firmer and likely to remain above pre-war levels for a while. But will they hold?
- Tariff uncertainty remains. Trade flows reshaped
- Turpentine supply constrained and demand firm. Buyers push back as margins shrink
- CTO and TOFA markets firm. Customers concerned over cost predictability
- Global CTO supply and demand balances shorter. More soap acidulation capacity needed if demand continues to grow
- More consolidation to take place if run rates and margins remain challenged

Thank you!

Further information

Let's get in touch and discuss the markets

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