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WPB

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BITUMEN MAGAZINE

THE WORLD OF PETROLEUM AND BITUMEN

亚洲沥青生产商与消费者之间的桥梁

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+98 21 8856 7938,
Fax: +98 21 8856 7930

Export sales:
+98 912 834 9508

Email :
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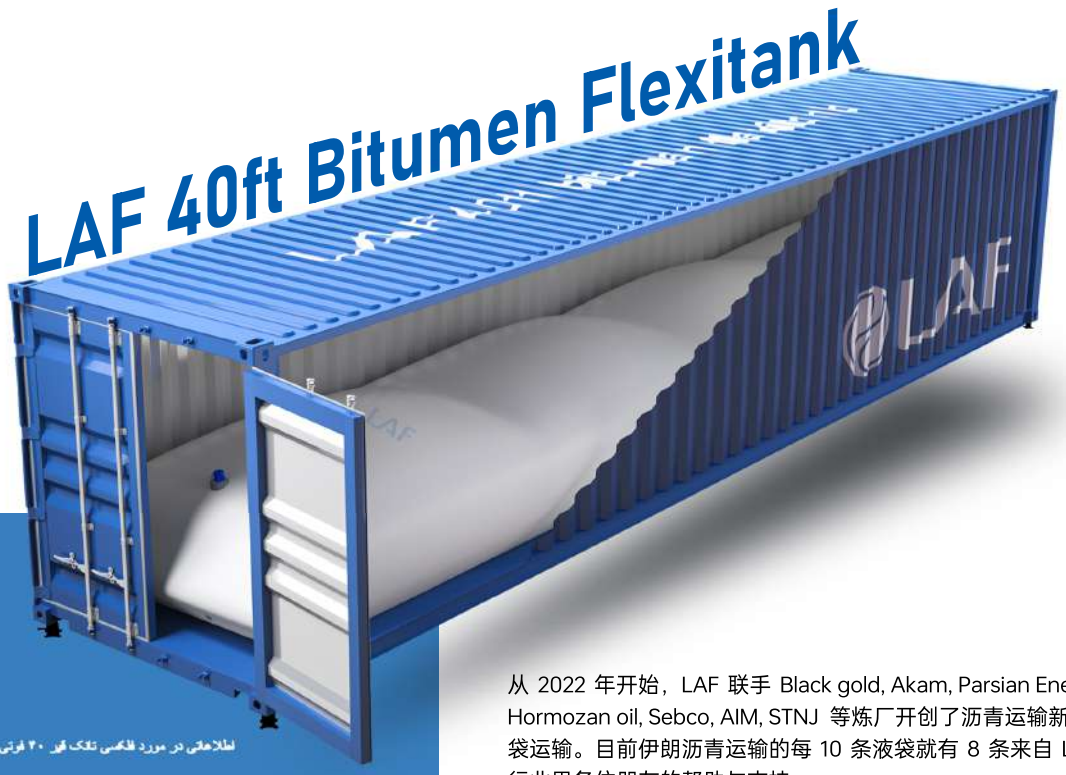
Pack Safe, Delivery Save

LAF 40ft Bitumen Flexitank



اطلاعاتی در مورد فلکسی تانک قیر ۴۰ فوتی:

وزن قابل حمل: ۲۵ تن
انواع (گریدهای) قیر قابل حمل: شامل ۶۰/۷۰، ۸۵/۱۰۰، ۲۰۰/۳۰۰
مدت بارگیری: ۳۰ دقیقه
مدت تخلیه: ۲۰ تا ۳۰ دقیقه

装运重量：25 吨
装运型号：60/70, 85/100, 200/300
装货时间：30 分钟
卸货时间：20-40 分钟
配置：液袋 +2 卷瓦楞纸，无需挡板系统

Some details about 40' Bitumen Flexitank:
Payload: 25 tons
Grades shipped: 60/70, 85/100, 200/300
Loading time: 30 minutes
Discharging time: 20–40 minutes
Kit: flexitank + 2 rolls of corrugated paper, no bulkhead system required

从 2022 年开始，LAF 联手 Black gold, Akam, Parsian Energy, Oxin, Hormozan oil, Sebco, AIM, STNJ 等炼厂开创了沥青运输新模式 - 液袋运输。目前伊朗沥青运输的每 10 条液袋就有 8 条来自 LAF。感谢行业里各位朋友的帮助与支持。

现在，我们真切的了解到市面上缺少 20 尺集装箱的现实情况。历经三年，我们终于打造了一款能够满足装货和卸货的 40 尺沥青液袋。加快沥青运输速度。

Since 2022, LAF has joined forces with refineries such as Black Gold, Akam, Parsian Energy, Oxin, Hormozan Oil, Sebco, AIM, STNJ (to name just a few) to utilize a new model for bitumen transport; flexitank shipping. Today, eight out of every ten bitumen flexitanks in Iran are supplied by LAF. Many thanks to all friends in the industry for their help and support.

We now clearly see the market reality: 20-ft containers are in short supply. After three years of development, we have finally created a 40-ft bitumen flexitank which not only addresses the issue of 20' containers shortage but also streamlines both loading and unloading process which leads to accelerating bitumen transport.

از سال ۲۰۲۲، شرکت LAF با همکاری شرکتهایی نظیر طلای سیاه، آکام، پارسیان انرژی، اکسین، نفت هرمزان، سبکو، عایق اصفهان، شیمی تجارت (تنها چند نمونه) استفاده از فلکسی تانک مخصوص قیر را توسعه داده اند و در حال حاضر ۸ فلکسی تانک از ۱۰ فلکسی تانک استفاده شده در ایران توسط LAF تامین میشود. از همه دوستان در این صنعت سپاسگزاریم.

اما اکنون بازار با چالش کمبود کانتینر ۲۰ فوتی وبروست و ما پس از ۳ سال تحقیق و توسعه، فلکسی تانک قیر ۴۰ فوتی را طراحی و ارایه کرده ایم که نه تنها پاسخگوی مشکل کمبود کانتینر ۲۰ فوتی است بلکه با ساده کردن فرایند تخلیه و بارگیری باعث افزایش سرعت حمل قیر خواهد بود.

LAF 20ft Bitumen Flexitank

Contact Information

China LAF factory:
Chandler Chen +86 151 9277 6158 chandlerchen@flexitank.net.cn
Iran agent:
Peyman Mozaffarifard +971 56 596 1010 ceo.peyman@qtransglobal.co

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- Soda Ash

UNITED ARAB EMIRATES ,CLUSTER,F,JLT, DUBAI

+971558843913

info@altaieragroup.com

www.altaieragroup.com

IMMEDIATE SIGNALS ACROSS ENERGY SUPPLY, BITUMEN PRICING, AND MARITIME RISK

According to WPB, the lack of a formally signed ceasefire agreement involving Iran would immediately register across Middle Eastern and global markets, sustaining elevated uncertainty in energy supply, maritime movement, and regional trade continuity. In the absence of a binding document, markets would not interpret any de-escalation as durable, and pricing mechanisms would continue to incorporate risk premiums tied to potential disruptions. This condition would be most visible in crude oil benchmarks and extend directly into downstream products such as bitumen, while also influencing transaction security and shipping dynamics in strategically sensitive waterways.

Crude oil markets would remain firm under such conditions, as the absence of a signed agreement leaves open the possibility of renewed hostilities or intermittent disruptions. Supply expectations from the Persian Gulf would continue to be assessed conservatively, particularly given the strategic importance of the region in global oil flows. This sustained uncertainty would support higher crude prices, which in turn would maintain upward pressure on bitumen. As a refinery-derived product dependent on heavy residues, bitumen pricing closely tracks feedstock costs, making it highly responsive to geopolitical instability.

Iran's position in the bitumen market would remain constrained. Even prior to any escalation, exports had been shaped by sanctions, logistical limitations, and restricted access to financial systems. Damage to refining infrastructure during conflict would further complicate production recovery timelines, reducing output consistency. In the absence of a formal ceasefire, the likelihood of rapid restoration in export volumes remains low. Buyers in traditional destination markets such as South Asia and East Africa would be forced to secure supply from alternative producers, increasing demand for material originating from the United Arab Emirates, Saudi Arabia, Bahrain, and India. This redirection of demand would have broader pricing implications. Suppliers in these regions would operate under improved margins due to reduced competition from Iranian exports. At the same time, freight costs and insurance premiums would remain elevated, contributing to higher delivered prices.

For import-dependent markets, particularly those with ongoing infrastructure development programs, the cumulative effect would be an increase in project costs and potential delays in execution schedules.

Financial transaction security would continue to present a significant constraint. Without a formal agreement, international banking institutions would maintain strict compliance measures when dealing with Iranian entities. The risk of sanctions enforcement or sudden regulatory shifts would discourage direct financial engagement. As a result, trade participants would rely on indirect settlement mechanisms, including third-country intermediaries, non-dollar currencies, or barter arrangements. These methods, while functional, introduce inefficiencies, increase

transaction costs, and extend settlement timelines.

Shipping activity in the Persian Gulf and the Strait of Hormuz would remain exposed to operational risk. Even in the absence of large-scale conflict, the lack of a signed agreement sustains the probability of localized incidents, including vessel inspections, temporary detentions, or security alerts. Shipping companies would factor these risks into routing decisions, and insurers would maintain higher premium levels for vessels operating in the ???????.

This environment discourages full-capacity utilization of shipping lanes and may lead to periodic congestion or rerouting, further affecting delivery timelines.

The probability of non-compliance represents a central concern in this scenario. Historical precedent indicates that partial implementation or delayed adherence to commitments has occurred in prior arrangements involving Iran. In a post-conflict environment marked by infrastructure damage and economic strain, domestic priorities may limit the government's capacity or willingness to fully adhere to informal or undeclared ceasefire conditions. This introduces a layer of unpredictability that markets cannot easily quantify, reinforcing cautious behavior among buyers and traders.

Contractual structures in the bitumen trade would adjust accordingly. Buyers would prioritize flexibility, opting for shorter contract durations and incorporating protective clauses related to delivery guarantees and penalty mechanisms. Long-term agreements with Iranian suppliers would be approached with caution, given the elevated risk profile. Instead, procurement strategies would shift toward diversification, even if this entails higher costs, in order to secure continuity of supply.

Regional political dynamics would further complicate the outlook. Neighboring countries, particularly those with existing tensions with Iran, may implement informal or formal restrictions on trade engagement. These could include tighter customs controls, limitations on transit routes, or increased scrutiny of cargo documentation. Such measures would restrict the movement of Iranian goods and reduce the efficiency of export channels, including those used for bitumen shipments.

At the same time, competing exporters in the region would seek to consolidate their positions. By offering more predictable supply conditions and clearer financial channels, these producers could attract buyers seeking stability. This competitive environment would not necessarily lower prices, given the overall risk context, but it would redistribute market share away from Iran in the short to medium term.

The absence of a formal monitoring and verification mechanism would also weigh on market sentiment. Without an internationally recognized system to oversee compliance, confidence in any informal ceasefire would remain limited. Institutional investors, large trading firms, and infrastructure developers typically require clear assurances before committing capital. In this environment, investment decisions linked to energy supply chains and construction materials would likely be delayed or scaled down.

From a broader economic perspective, the continuation of uncertainty would suppress recovery momentum in the region. Infrastructure projects that depend on stable input costs and reliable material supply could face budget revisions or postponements. Bitumen demand may remain present due to ongoing development needs, but procurement would become more cautious and fragmented.

In summary, the absence of a signed ceasefire agreement involving Iran would sustain a high-risk environment across energy and trade markets. Bitumen prices would remain supported by elevated crude costs and constrained supply conditions, while financial transactions and shipping operations would continue to face structural challenges. Concerns regarding compliance, combined with regional political pressure and infrastructure damage, would limit the pace of normalization. Markets would operate in a state of guarded continuity, with participants prioritizing risk mitigation over expansion.

Ceasefire under a shadow of doubt, accompanied by a limited retreat by Washington

According to WPB, the immediate global significance of the latest U.S.-Iran ceasefire development lies less in the political theater around Donald Trump and more in the sudden repricing of geopolitical risk across the Middle East energy map. If markets conclude that Washington has stepped back from escalation and that Tehran has secured even a partial recognition of its red lines, the first and fastest consequence will be a moderation in the war premium embedded in crude, tanker insurance, and refined product freight. For the Gulf, this matters because the Strait of Hormuz remains the central transmission belt of global energy trade.

For Asia and Europe, it matters because even a temporary de-escalation can reduce fears of supply interruption. For bitumen markets, especially in South Asia, East Africa, and parts of Southeast Asia that depend on Iranian-origin or Iran-linked trade flows, the story is even more specific: a political pause can quickly alter export sentiment, arbitrage routes, and price expectations, even before formal sanctions architecture changes.

As of now, however, the headline claim circulating in some channels — that Trump has accepted all of Iran's conditions to end the war — is not confirmed by the most credible news organizations. Reuters reported that Trump agreed to a two-week ceasefire with Iran shortly before a deadline tied to reopening the Strait of Hormuz, and that he also stepped back from threats to broaden attacks on Iranian infrastructure. That is materially important, but it is not the same as a verified comprehensive acceptance of Tehran's demands. Bloomberg's reporting is even more precise: Iran was described as demanding a permanent end to the war, sanctions relief, reconstruction commitments, and safe-passage arrangements related to Hormuz, but the available reporting does not establish that Washington

formally signed off on the full package. Reuters had earlier said Iran was reviewing a U.S. proposal and that Tehran's position included conditions that could open the door to a negotiated end, yet again, that language falls well short of full U.S. acceptance of every Iranian condition.

That distinction is crucial for any serious economic reading. Markets do not trade on slogans; they trade on enforceability. A two-week ceasefire can calm prices. A legally or diplomatically structured settlement can reset prices. Those are different regimes. If this remains only a tactical pause, oil may initially fall, then rebound sharply if the truce fails or if the Strait of Hormuz remains constrained. Reuters has emphasized that Trump's ceasefire move came against the backdrop of pressure linked to Hormuz, while broader reporting has repeatedly highlighted that the waterway carries roughly a fifth of the world's oil flows. Bloomberg likewise documented that the war had already triggered a severe energy shock, with traffic through Hormuz disrupted and global markets rattled. In plain market terms, the geopolitical premium is now more vulnerable to a correction, but not yet eliminated.

For crude oil, the base case under a credible ceasefire is straightforward: Brent and Dubai benchmarks would likely face downward pressure as immediate disruption fears ease, freight risk softens, and speculative length unwinds. Yet the magnitude of that decline depends on whether physical flows normalize. If Hormuz traffic remains politically hostage, or if insurers continue charging elevated war-risk premiums, then the decline in outright crude could be limited while regional spreads remain distorted. In other words, front-month futures may soften faster than delivered cargo economics. That is why traders will watch not only diplomatic language but also tanker movement, insurance rates, loading schedules at Gulf terminals, and statements from shippers.

The oil market's second layer is Iranian supply itself. If the ceasefire evolves into a broader political accommodation and sanctions enforcement is informally relaxed — even before a formal legal rollback — buyers in Asia may test the boundaries of procurement. This would not necessarily appear first in official customs declarations. It could surface through more aggressive discounting, higher floating storage turnover, increased ship-to-ship transfers, or stronger demand for intermediated cargoes. That matters because Iranian barrels have historically influenced regional pricing through discount pressure rather than just headline volume. Even a perception that Iranian exports will become easier to move can weigh on sour crude differentials in the Gulf.

This is where bitumen becomes especially important. Iran is not merely an oil story; it is one of the world's most commercially relevant bitumen supply centers for price-sensitive import markets. Iranian bitumen has long been deeply embedded in tenders and spot procurement across India, Bangladesh, Sri Lanka, East Africa, the UAE re-export chain, and segments of Southeast Asia because of its competitive pricing and flexible shipment patterns. In wartime conditions, bitumen is often treated as a secondary casualty of sanctions, shipping disruption, banking friction, and port uncertainty. But in de-escalation, bitumen is one of the earliest petroleum derivatives to reflect changing sentiment because buyers can move quickly, and because the market is highly responsive to arbitrage opportunities. If the current ceasefire matures into a more stable arrangement, the immediate effect on bitumen will likely be a narrowing of panic premiums rather than a collapse in prices.

During conflict, bitumen prices tend to rise not only because of feedstock stress from vacuum bottom and vacuum gasoil balances, but also because logistics become unpredictable. Freight becomes harder to fix, letters of credit become more complicated, and buyers price in execution risk. A ceasefire reduces that friction. For Iranian bitumen exporters, especially those selling via Bandar Abbas or through re-export corridors, even a temporary reduction in military risk can improve offer confidence, vessel nomination, and payment discussions. That can pressure regional benchmarks lower, particularly in markets where buyers had been forced to substitute with more expensive cargoes from Bahrain, Singapore, or other Gulf refiners.

Still, a serious journalistic assessment must avoid oversimplification. Not every peace headline is bearish for bitumen. If post-war reconstruction enters the picture — inside Iran, in affected border logistics zones, or across regional infrastructure repair corridors — bitumen demand can rise materially. Roads, airport surfaces, industrial yards, urban rehabilitation, and logistics corridors all consume bituminous products directly or indirectly. If Tehran secures reconstruction support or reallocates domestic budget toward transport rehabilitation, internal demand could increase and partially absorb exportable supply. That would create a more nuanced pricing picture: lower geopolitical premium, but firmer medium-term physical demand. In that scenario, export discounts may narrow less than traders initially expect.

Politically, the ceasefire also creates a paradox for Trump. If he is seen as backing away from maximalist war objectives without achieving a clear strategic settlement, critics in Washington and allied capitals may describe the pause as tactical retreat. Bloomberg has already highlighted the inconsistency in Trump's rhetoric during the conflict, including earlier insistence that Hormuz reopening was a condition for a ceasefire and later signals of a softer off-ramp. Reuters likewise framed the latest step as a late-stage pullback from wider attacks rather than a clean diplomatic breakthrough. That matters because oil markets price not only today's ceasefire but also the probability of renewed confrontation. If traders think the White House remains politically tempted to re-escalate, then the risk premium decays slowly.

For Iran, even a limited U.S. retreat can be marketed domestically as strategic endurance. If Tehran can claim that Washington paused attacks without forcing capitulation on enrichment, regime continuity, or full maritime control concessions, that strengthens its internal narrative. Yet the same outcome may not guarantee economic normalization. Sanctions law, shipping compliance, and financial restrictions are not dissolved by political messaging. Until there is clarity on enforcement, insurers, banks, and major commodity houses will remain selective. Therefore, the economic dividend for Iran may begin first in gray-market trade, opportunistic cargoes, and sentiment-driven discount compression, not in full reintegration.

For regional governments, especially Gulf producers, the ceasefire is both relief and warning. Relief, because sustained conflict near Hormuz threatened state revenue planning, fiscal assumptions, and sovereign financing sentiment. Warning, because the episode has again demonstrated how rapidly geopolitical disruption can overwhelm carefully managed supply policy. OPEC-linked exporters may welcome calmer prices if volatility eases, but they also lose some of the windfall that war premium briefly created. Importing nations, by contrast, will likely see the ceasefire as a direct inflation stabilizer. Lower or less volatile crude reduces pressure on transport fuels, freight, petrochemicals, and infrastructure input costs, including bitumen.

What it does support is a narrower but still significant reality — a temporary ceasefire, a visible U.S. step back from broader attacks, and a fresh opening for negotiation under acute energy-market pressure.

If the truce holds, oil is likely to shed part of its geopolitical premium, tanker risk may gradually ease, and Iranian-linked bitumen trade could regain pricing confidence faster than many mainstream observers expect. If the truce fails, the rebound in crude, freight, and bitumen premiums could be swift and severe. For now, the real story is not that the war is conclusively over. The real story is that energy markets have been handed a fragile pause — and in oil and bitumen, fragile pauses are tradable, but not yet trustworthy.

在疑虑阴影下的停火，伴随着华盛顿的有限退让

根据 WPB，这场最新的美伊停火动向，对全球最直接的意义，并不在于围绕唐纳德·特朗普的政治喧嚣，而在于市场正在迅速重新评估中东地缘政治风险。如果交易员和金融机构认为，华盛顿暂时从升级对抗的路线后退，而德黑兰至少让对方在部分红线问题上作出了让步，那么最先出现的结果，就是原油价格、油轮战争保险以及石油产品运费中的“战争溢价”会有所回落。对海湾国家来说，这一点极其敏感，因为霍尔木兹海峡仍然是全球最关键的能源通道。对欧洲和亚洲而言，即便只是短暂停火，也能在一定程度上缓解对供应中断的担忧。至于沥青市场，尤其是南亚、东非以及部分东南亚地区，这一消息的含义更加具体，因为这些地区对伊朗货源或与伊朗相关的贸易链高度依赖。即使正式制裁结构尚未发生变化，政治上的短暂停顿也足以改变价格预期、出口路径和采购行为。

不过，从国际主流媒体目前可以核实的信息来看，关于“特朗普已经接受伊朗结束战争的全部条件”这一说法，尚无明确且权威的确认。现阶段更接近事实的描述，并不是一项全面而最终的协议，而是一种短期停火，以及美国从更大规模军事打击路线上的有限回撤。因此，必须严格区分“全面接受德黑兰所有要求”和“同意短暂停火以控制危机”这两件完全不同的事情。这个差别对任何严肃的经济分析都至关重要。能源市场不会仅仅因为耸动标题而永久定价；它真正关注的是协议是否可执行、能否维持，以及冲突是否可能迅速重燃。两周停火可以暂时安抚市场，但只有具有政治与执行保障的安排，才可能真正建立新的价格区间。

从石油市场角度看，如果当前停火被视为可信且具有延续性，那么最直接的情景非常清楚：此前因战争而进入油价的那部分风险成本将开始释放。在这种情况下，布伦特原油以及地区性基准价格都可能面临下行压力，因为市场对即时供应中断的恐惧减弱，运输风险成本下降，投机性多头仓位也会被部分平掉。但下跌幅度有一个关键前提：海湾地区的实际出货是否恢复正常。如果霍尔木兹海峡仍然受到限制、威胁或延误，那么价格回落可能只会先体现在纸面市场，而未必立刻反映在实体货物交付中。换句话说，短月合约可能先跌，但真正把货送到目的地的成本未必同步下降。因此，专业交易人士不会只盯着政治声明，他们会同时关注油轮动态、战争保险费率、海湾装港节奏以及航运公司的实际操作。

石油市场的第二层逻辑，来自伊朗自身的出口能力。如果这次停火不只是短暂停顿，而是逐渐走向更宽松的政治默契，同时美国在执行制裁方面出现某种非正式放松，那么即使法律层面没有立即调整，一些亚洲买家也可能扩大采购意愿。这种变化未必第一时间出现在海关统计里，它更可能先表现为更积极的折价销售、更快的浮仓周转、更复杂的海上转运，以及对中间渠道货源更高的兴趣。问题的关键在于，伊朗原油过去影响地区市场，不只是靠出口量，更靠对海湾高硫原油价格差的压制作用。即使只是市场形成一种预期，认为伊朗出口会变得更顺畅，也足以让部分海湾原油品种的价差承压。

WPB Global Bitumen Price

Week 2 of April 2026

Bitumen markets across all fourteen observed countries recorded clear week-on-week price increases, driven primarily by higher production expenses, firmer crude-linked inputs, and persistent cost-push pressures. Refinery operating costs rose in several regions, while currency dynamics and import premiums further contributed to upward adjustments in international markets. Supply chains in many jurisdictions are adapting slowly, resulting in limited short-term capacity for price stabilization.

Regional demand remained firm, with infrastructure activity and industrial consumption supporting both procurement volumes and price resilience. Multiple markets including Europe, Asia, and the Middle East, reported tightening supply availability, accompanied by logistical constraints and revised sourcing strategies. This combination has reinforced a broadly bullish sentiment across key producers and import-dependent countries alike. Contract pricing in several regions has already begun to reflect the higher benchmarks.

Forward assessments indicate sustained upward momentum across most monitored grades, with limited indications of immediate downward correction. Inventory levels in certain markets may narrow further if demand persists at current levels, while broader international pricing trends continue to influence domestic adjustments. Overall, market projections point toward continued firmness, as underlying structural drivers remain largely unchanged from the previous week.

Iran

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (Drum)	449 ±5	FOB Bandar Abbas
	60/70 (Bulk)	350 ±5	FOB Bandar Abbas
	60/70 (Jumbo Bag)	410 ±5	FOB Bandar Abbas
	60/70 (Drum)	400 ± 5	Ex-work Bandar Abbas
	60/70 (Bulk)	330±5	Ex-work Bandar Abbas
	60/70 (Jumbo Bag)	365 ±5	Ex-work Bandar Abbas

Bitumen prices in Iran recorded a clear upward movement compared to last week. Market participants report stronger domestic demand alongside firmer feedstock costs. The overall trajectory indicates sustained upward pressure across all monitored grades. Additional monitoring suggests that supply chains are adjusting slowly to the new pricing environment.

Singapore

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	488±5	CIF Singapore
	60/70 (bulk)	451 ± 5	FOB Singapore

Singapore's bitumen market showed a consistent price rise relative to the previous week. The increase is linked to tighter regional supply conditions and higher crude-related inputs. Current indicators suggest a firm short-term pricing environment. Market signals show limited likelihood of near-term price easing.

China

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	470±5	CFR Chongqing
	60/70 (drum)	461±5	CFR Hong Kong
	60/70 (drum)	449 ± 5	CFR Ningbo
	60/70 (drum)	461 ± 5	CFR Huangpu
	60/70 (drum)	460±5	CFR Yunfu
	60/70 (drum)	450±5	CFR Tianjin
	60/70 (drum)	456 ± 5	CFR Dalian
	60/70 (drum)	462 ± 5	CFR Guangzhou
	60/70 (drum)	457±5	CFR Nansha
	60/70 (drum)	449±5	CFR Zhuhai

Bitumen prices in China advanced further week-on-week. The escalation reflects elevated refinery operating costs and steady consumption across key sectors. Market data points to a stable upward momentum in the near term. Industry observers note that procurement volumes remain robust despite higher costs.

UAE

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	418 ± 5	FOB Jebel Ali
	60/70 (drum)	451 ± 5	CFR Jebel Ali

UAE bitumen values posted a measured but definite increase from last week. Supply adjustments and higher production expenses contributed to this shift. Pricing trends remain aligned with broader regional strength. Preliminary assessments confirm persistent upward tendencies across major grades.

Sri Lanka

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	474±5	CFR Colombo

Sri Lanka reported a noticeable week-to-week uptick in bitumen prices. Import-driven cost pressures and currency-linked factors played a role in this rise. Market expectations indicate continued firmness. Stakeholders anticipate further adjustments in response to international pricing signals.

Iraq

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	455 ± 5	FOB Bandar Abbas
	60/70 (bulk)	370±5	FOB Bandar Abbas

Bitumen pricing in Iraq moved upward compared to the previous week. The adjustment is attributed to stronger procurement activity and rising input costs. Current patterns support a moderately bullish outlook. Recent evaluations show consistent alignment with regional market trends.

Australia

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	549 ± 5	CIF Brisbane
	60/70 (bulk)	490 ± 5	CIF Brisbane

Australia registered a new weekly increase in bitumen prices. The upward movement stems from logistics costs and tightening supply availability. Market assessments reflect a steady incline across multiple categories. Data suggests sustained demand from infrastructure projects continues to support the trend.

South Korea

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	441 ± 5	CFR Busan
	60/70 (drum)	453 ± 5	CIF Busan

South Korean bitumen prices climbed above last week's levels. This rise correlates with refinery cost dynamics and consistent industrial demand. Preliminary forecasts maintain an upward bias. Current indicators imply that inventory levels may tighten if demand persists.

India

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	486±5	CFR Chennai
	60/70 (drum)	477 ±5	CFR Cochin
	60/70 (drum)	506 ± 5	CFR Haldia
	60/70 (drum)	461±5	CFR Mundra
	60/70 (drum)	449 ± 5	CFR Kandla
	60/70 (drum)	450 ± 5	CFR Nhava sheva
	60/70 (drum)	487±5	CFR Tuticorin
	60/70 (drum)	496±5	CFR Kolkata

India's bitumen market showed a fresh price increase relative to the week before. The escalation is linked to firm domestic consumption and elevated crude-based inputs. Overall, the short-term trajectory remains upward. Analysts note that procurement patterns remain unaffected by the higher price range.

Malaysia

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	475 ± 5	CFR Penang
	60/70 (drum)	524 ±5	CFR Kota Kinabalu
	60/70 (drum)	451 ±5	CFR port Klang
	60/70 (drum)	459 ± 5	CFR Pasir Gudang

Bitumen prices in Malaysia advanced compared to last week's reference levels. Contributing factors include refinery adjustments and regional cost inflation. Market sentiment stays

Vietnam

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	451 ±5	CFR Haiphong
	60/70 (drum)	452 ±5	CFR Ho chi Minh

Vietnam experienced a further weekly rise in bitumen prices. Higher import premiums and supply constraints influenced the movement. Indicators suggest limited downward correction ahead. Market observers highlight that sourcing strategies are being revised to accommodate the increases.

Germany

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	(465-500)	CFR Hamburg
	60/70 (bulk)	(395-420)	CFR Hamburg

Germany reported an incremental but clear increase in bitumen prices versus last week. Production-related expenses and transport factors supported the upward shift. Projections indicate stable price firmness. Updated assessments suggest cost stabilization is unlikely in the immediate term.

Spain

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	(455-495)	CFR Barcelona
	60/70 (bulk)	(370-400)	CFR Barcelona
	60/70 (drum)	(460-490)	CFR Valencia
	60/70 (bulk)	(375-405)	CFR Valencia

Spanish bitumen prices rose again on a week-over-week basis. The increase is tied to cost-push pressures across several production segments. Short-term outlook continues to lean toward further strengthening. Industry feedback shows that contract pricing is gradually aligning with these upward changes.

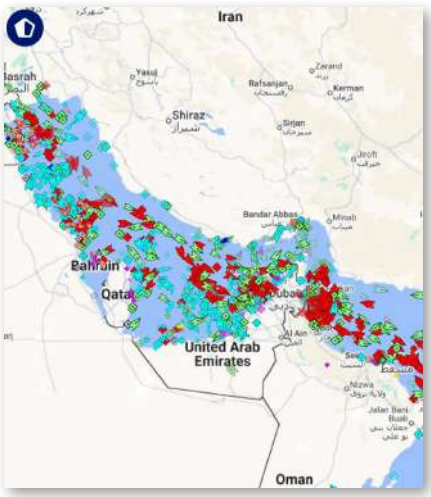
Italy

Date	Bitumen Grade	Price (USD/MT)	Price Basis
Week 2 of April 2026	60/70 (drum)	(450-495)	CFR Genoa
	60/70 (bulk)	(375-395)	CFR Genoa
	60/70 (drum)	(455-500)	CFR La Spezia
	60/70 (bulk)	(370-400)	CFR La Spezia

Italy's bitumen market registered another weekly price gain. The upward trend results from broader European cost dynamics and supply management decisions. Current evaluations highlight continued price resilience. Market projections show limited downside risk given present demand fundamentals.

From Risk Explosion to Fragile Ceasefire: How the Middle East War Rewrote the Oil and Bitumen Markets in Less Than Six Weeks.

Ahmad Reza Yousefi - Razieh Gilani
Infinity Galaxy




Cargo ships in the Persian Gulf, near the Strait of Hormu

From February 28, 2026, onward, the energy and bitumen markets no longer operated under normal logic. What initially looked like a geopolitical shock quickly turned into a crisis that put pressure not only on oil prices, but also on shipping chains, insurance, exports, refinery feedstocks, and ultimately the bitumen market across several regions at the same time.

Anyone looking only at crude oil might have assumed this was a temporary spike. But what actually happened was a rapid rewrite of market logic: from East Asia to the Persian Gulf, from Europe to India, prices no longer moved only on traditional supply and demand. They were increasingly shaped by war risk, disruption in the Strait of Hormuz, hesitation among shipowners, rising war-risk insurance, and above all, the real executability of trade.

The outbreak of war on February 28 caught the market off guard. In the first days, the main impact was seen more clearly in oil and fuel oil markets. The Strait of Hormuz was pushed almost completely out of normal operation, ships either stopped or waited cautiously before attempting passage, and the market quickly understood that this time the risk was not just a headline.

As a result, Brent, which had still been trading at lower levels beforehand, jumped sharply in a short period and later reports even placed it above the $110 range. At the same time, fuel oil in Singapore and the Persian Gulf also surged. During that same period, it became clear that petroleum products were reacting even faster than crude oil itself, because traders knew that any disruption in the Strait of Hormuz would directly affect shipping, inventories, delivery times, and the overall fluidity of trade.

In the first week of March, many still hoped the market would absorb the initial shock. But the data emerging from Singapore, the Persian Gulf, and East Asia showed that this had already moved beyond short-term fear. In less than two weeks, gasoline, naphtha, kerosene, and jet fuel recorded jumps that in some cases approached a doubling in price. That spike in fuel oil quickly entered the bitumen formula. The bitumen market, especially in Singapore and South Korea, initially reacted with some delay, but once concerns over feedstock, tighter supply, and production disruptions in Southeast Asia became serious, prices rose rapidly.

Singapore bitumen moved from the mid-$300 range to above $500 in a short time and then approached the $600 mark. South Korea followed a similar path. The market message was clear: this was no longer just a war in the Middle East, but a crisis at the core of a global energy and trade corridor.

At the same time, Iran's situation became more complicated than that of most others. On the surface, Iran could have benefited from rising global prices. In practice, however, war, shutdowns, port disruption, security concerns, shipping and insurance restrictions, and later the Nowruz holidays meant that for Iran, the key issue was not price but execution.

In the weekly reports of Infinity Galaxy, it became clear that during this six-week period it was possible to announce prices on paper, but for any serious buyer the real questions were whether a vessel would come, whether the port was operating smoothly, whether insurance coverage for the cargo existed, whether the shipment would truly pass through the Strait of Hormuz, and whether the seller could carry the commitment through to completion. It was from this point that a new concept took shape in the market: the gap between paper price and executable price. Nowhere was that gap more visible than in Iran.

By March 13, the crisis had moved beyond the initial shock, and the market had effectively entered its second phase: the phase of a war of attrition. Oil reached the $100 mark and then went beyond it, fuel oil in Singapore and the Persian Gulf stayed sharply elevated, and bitumen in the world's main export markets posted unusually strong increases. Europe, which at first may have seemed geographically farther from the center of the conflict, was quickly affected as well.

The reason was clear: European refineries were sensitive both to feedstock and to the fuel oil market. As Basrah and other bitumen-rich feedstocks came under pressure and the market began pricing in tighter crude flows from the Middle East, European bitumen prices also moved away from previous levels and in the following weeks rose above $600. That was the moment it became clear that the war was not only lifting the Middle Eastern market but was simultaneously shaking the pricing structure of bitumen across several continents.

In the second half of March, another layer was added to the crisis: infrastructure. News of attacks on energy facilities and damage to important lines and hubs caused the market not only to price in risk, but also the probability of real physical damage to supply. Brent reached the $112 to $113 range, and the market became increasingly unwilling to believe in any serious price decline. At the same time, Singapore HSFO 180 climbed above $700 per ton, while Persian Gulf HSFO 180 stabilized at similarly heavy levels.

Singapore bitumen moved toward $620, South Korea reached around $545, and the East Asian market, despite relatively soft demand, was effectively being driven by supply shortage and seller caution. In files from that same period, it was repeatedly noted that the spot market was no longer liquid and smooth. In other words, prices were not just high, it had also become harder to obtain firm and real offers.

By the end of March, the crisis entered a stage that for the market became even more important than the war itself: whether the Strait of Hormuz would actually reopen or not. This was the point at which traders became even more cautious. On one side, hopes emerged for a ceasefire or de-escalation. On the other side, actual vessel traffic was still limited and talk of reopening was far from the reality of execution. That gap allowed oil prices to ease somewhat from their peaks, but bitumen did not retreat. On March 27, Singapore bitumen stood around $630 to $640, South Korea around $540 to $550, and the Persian Gulf had also moved higher compared with previous weeks.

India also began sending an important signal: not only did this market not retreat, but at the beginning of April Indian refiners implemented an unusually strong increase. For the regional market, this was one of the most important signals, because India is not only a major consumer, but also a psychological pricing reference point for South Asia.

The transition into April pushed the crisis into its third phase: a fragile ceasefire.

By April 8 and 9, the main development was that Iran, the United States, and Israel entered a two-week pause, one shaped with Pakistan's involvement and intended to open a window for negotiation. But the market did not read this ceasefire as the end of the crisis. The reason was straightforward: after the ceasefire announcement, the Strait of Hormuz reopened only partially for a limited period, a few ships crossed under coordination, but it quickly became clear that there was no free and normal passage.

The requirement for coordination, uncertainty over possible transit charges, hesitation from shipping lines, and caution from insurers led the market to conclude that the Strait of Hormuz had moved only from total blockage to limited and controlled passage, nothing more. That perception kept the entire market in a defensive mode.

Oil made this shift in phase very clear in just one week. The weekly average Brent price up to April 2 was around $111. Then, with the ceasefire news, it dropped to around $92 by April 8, but that decline did not last and by April 9 it had returned to around $97. This volatility showed that the market was not willing to treat a ceasefire as peace. The same was true in fuel oil.

On April 7, Singapore HSFO 180 was around $730 per ton and Persian Gulf HSFO 180 around $660. In other words, even as part of the war premium came out of crude oil, products, and especially fuel oil, remained at levels showing that the market did not consider the region normal.

In bitumen, the result was even clearer. In the week ending April 9, Singapore bitumen stood in the $668 to $679 range and South Korean bitumen in the $560 to $570 range. Bahrain, despite the closure of the Strait of Hormuz, remained fixed at $550, a number that more than anything showed that the issue was not price alone, but also the absence of smooth export flow and the limits on real trade execution.

India, despite its unprecedented price increases at the start of April, remained active and demand was still visible in the market. In Europe, prices moved above $600.

Turkey, Greece, Italy, Spain, and Rotterdam were all trading at levels that before the war few would have considered a sustainable market base. In other words, the ceasefire neither returned oil to full stability nor made bitumen cheap again. What has happened so far is only a temporary pause in wartime acceleration, not a return of the market to its pre-war logic.

If we want to summarize these six weeks in one sentence, it is this: from February 28 to April 9, 2026, the global bitumen market shifted from a price-driven market to an execution-driven market.

During this period, the lowest price was no longer necessarily the best choice. Professional buyers gradually understood that in an environment shaped by war, the Strait of Hormuz, insurance, vessel availability, feedstock issues, force majeure, and a fragile ceasefire, the core question is no longer who gives the cheapest quote, but who can actually supply, manage, and deliver the cargo.

And that is exactly where the line between analyst and exporter becomes clear. In such a market, a company like Infinity Galaxy is not defined only by market analysis, but by real presence, daily monitoring, an understanding of conditions inside Iran, practical knowledge of shipping risk, and the ability to execute. The market offered one clear lesson during these weeks: in major crises, information matters, but information without execution capability is not enough.

That reality is probably the most important lesson that trade journals and international buyers should take from this period.

Bamboo Fiber Moves into Stone Mastic Asphalt

According to WPB, A newly published scientific study is drawing immediate attention across the asphalt and bitumen sector because it addresses two pressures that now define road construction in many regions, especially in the Middle East, Asia, and rapidly expanding logistics corridors: the need for more durable surfacing under severe thermal stress, and the demand for lower-impact material systems that can reduce dependence on conventional stabilizing additives.

The research, focused on bamboo fiber-reinforced stone mastic asphalt (SMA) designed through mastic theory, points to a practical and industrially relevant pathway for improving rutting resistance, mixture stability, and internal structural performance in bitumen-rich SMA systems without moving away from mainstream paving practice. For countries where pavement temperatures can rise sharply and heavy freight traffic continues to intensify, the implications are immediate. If validated at scale, this work may influence how contractors, refiners, additive suppliers, and highway authorities think about the next generation of high-performance bituminous surfacing.

The paper, published under the title "Design and Performance of Bamboo Fiber-Reinforced Stone Mastic Asphalt Mixture Based on Mastic Theory," arrives at a time when SMA remains one of the most technically attractive but operationally demanding asphalt formulations in the bitumen industry. Stone mastic asphalt has long been valued for its coarse aggregate skeleton, high binder content, and strong resistance to permanent deformation.

Yet those same strengths also create a familiar engineering challenge: the richer bitumen phase that gives SMA its durability and crack resistance can also increase the risk of binder drain down during production, transport, and placement. That has made fibers, fillers, and stabilizing systems a critical part of the SMA equation. The significance of this new study lies not in simply testing another fiber, but in treating the mixture as a structured material system in which the bitumen mastic phase is central to performance. That distinction matters.

In standard practice, many fiber studies stop at broad comparisons of mechanical outcomes. This research takes a more rigorous route. By grounding the design in mastic theory, the authors examine the way bamboo fiber interacts with the fine aggregate, filler, and bitumen matrix that governs the cohesion, viscosity, and stress transfer characteristics of SMA. In practical terms, that means the fiber is not treated as an isolated additive but as an active component inside the bituminous microstructure. For asphalt laboratories, this is important because the future of advanced bitumen formulation increasingly depends on understanding internal phase behavior rather than relying solely on conventional volumetrics and empirical trial-and-error.

The industrial relevance of bamboo fiber is equally notable. In many asphalt markets, cellulose and mineral fibers are already used to control drain down in stone mastic asphalt. However, supply cost, import dependence, and sustainability accounting are becoming more visible in procurement frameworks.

Bamboo introduces a compelling alternative because it is renewable, relatively abundant in several major construction regions, and potentially compatible with broader low-carbon materials strategies. From a bitumen-sector perspective, this is not just a sustainability story. It is also a supply-chain story.

The more options the industry has for stabilizing high-binder mixes with regionally accessible materials, the more resilient asphalt production becomes under fluctuating raw-material conditions.

According to the study's reported focus, bamboo fiber was incorporated into SMA with the objective of improving structural integrity through controlled interaction with the bitumen mastic. This is where the research becomes especially relevant for hot-climate markets. In Gulf countries, parts of North Africa, South Asia, and other warm-region corridors, high pavement temperatures can push bituminous mixtures toward softening behavior that accelerates rutting under heavy axle loads.

SMA is often selected precisely because it offers a stronger stone-on-stone framework and improved surface durability, but its performance still depends heavily on how effectively the binder-rich mastic is stabilized. A fiber that enhances mastic retention, reinforces internal cohesion, and helps maintain mixture consistency during production can directly support field performance where thermal loading is severe.

What appears to distinguish the study is its effort to connect material selection with performance logic rather than novelty for novelty's sake. Bamboo fiber is not presented as a fashionable bio-based insertion into asphalt. It is examined as a functional engineering material with consequences for bitumen distribution, mastic stiffness, and likely resistance to segregation and binder migration. That framing is exactly what technical editors, road authorities, and commercial decision-makers want to see in 2026. The asphalt market is full of sustainability claims, but adoption only happens when those claims survive the hard filter of plant operability, mix consistency, compaction behavior, and lifecycle maintenance economics.

For bitumen suppliers and asphalt producers, one of the most important implications is the possible rebalancing of additive strategies in premium surfacing grades. SMA has traditionally required careful handling because the binder content that gives it durability can also make production less forgiving than dense-graded asphalt.

If bamboo fiber can reliably help manage binder stability while preserving or enhancing high-temperature mechanical performance, it opens a pathway for refining plant recipes without compromising field confidence. That matters for contractors delivering airport aprons, expressways, freight routes, port access roads, urban arterials, and industrial corridors where rut resistance and long service intervals are commercially critical.

There is also a strategic angle for refiners and modified bitumen formulators. As performance expectations rise, bitumen is increasingly expected to do more with less room for operational error. In high-specification pavements, the binder is no longer merely a glue phase; it is a performance-governing medium whose rheology, aging response, adhesion behavior, and compatibility with additives must all be tuned.

A study built around mastic theory reinforces the idea that the future of asphalt innovation will not come only from polymer modification at the refinery level. It will also come from better orchestration between binder chemistry, mineral structure, fibers, fillers, and mixture architecture. That is a significant editorial point because it broadens the innovation map for the bitumen business.

The Middle East may be one of the most relevant regions for watching this line of research. Road authorities in hot and heavily trafficked environments continue to look for mixtures that can resist rutting, reduce maintenance closures, and tolerate harsh thermal cycles without escalating material costs. Polymer-modified bitumen remains central in many specifications, but additive combinations that improve stability at the mix-design level can create valuable flexibility. Bamboo fiber will not replace PMB or established stabilizers overnight.

But if future validation confirms durable performance, it could become part of a more diversified toolkit for bituminous surfacing, especially in markets seeking local or regionally sourced inputs and stronger ESG alignment in infrastructure procurement.

The study also arrives amid growing pressure on the asphalt sector to justify every component in the mix. Public clients increasingly want evidence that sustainability measures do not compromise engineering reliability. Bamboo fiber fits the current policy direction only if it can prove repeatable gains in measurable performance categories such as rutting resistance, drain down control, stiffness balance, moisture tolerance, and long-term durability.

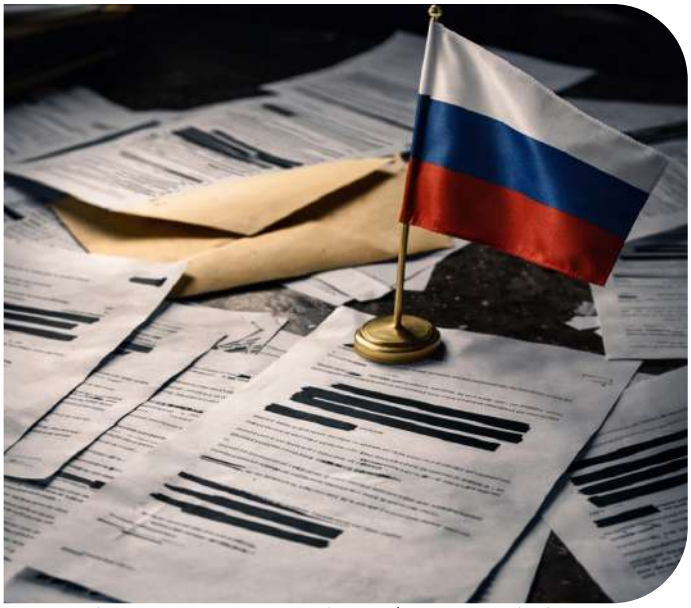
That is why the research's methodological emphasis matters. By tying the design to mastic theory, the work moves the conversation away from surface-level material substitution and toward a more defensible engineering basis for adoption.

This is the kind of study that deserves close technical attention because it sits at the intersection of formulation science and commercial relevance. It is not a headline about speculative green asphalt. It is a focused contribution to a real problem in bituminous pavement engineering. The market has been searching for materials that can support richer binder systems, stronger skeleton structures, and more resilient high-stress surfacing without introducing unnecessary operational complexity. Bamboo fiber, if the reported findings continue to hold under broader validation, may now belong in that conversation.

The next stage, however, will determine whether this remains a strong academic result or becomes a practical specification candidate. Asphalt plants and highway laboratories will want to see how bamboo fiber behaves under different binder grades, aggregate sources, mixing temperatures, storage durations, and compaction windows. They will also want to know whether its benefits persist under moisture conditioning, oxidative aging, and repeated loading across realistic service intervals. That is where the bitumen industry should focus next. A promising fiber in a controlled study is important. A stable, scalable, specification-ready stabilizing system for SMA is far more important.

Even so, the publication date matters. This study entered the technical record at a moment when the asphalt sector is actively reassessing how it designs premium bitumen mixtures for hotter climates, heavier freight, and stricter sustainability benchmarks. In that context, the report is more than another materials paper. It is a signal that the next meaningful gains in asphalt may come from disciplined redesign of the bitumen mastic environment itself, using materials that are commercially realistic rather than conceptually fashionable. For anyone covering bitumen, paving technology, or road materials this week, that makes this one of the more consequential scientific releases on the board.

Global Energy Disruptions Amplify Market Pressure, Strike Russian Oil Facilities as U.S.–Iran Diplomacy Unfolds



According to WPB, Ukraine's expanded campaign targeting critical Russian energy infrastructure, set against escalating geopolitical strain in the Middle East and mounting economic stresses across Europe, is exerting a measurable influence on global energy markets, fiscal policy responses, and financial asset performance. The cumulative effect of these developments underscores the deep interdependence of military conflict, energy supply channels, and economic stability from the Black Sea to the Mediterranean and beyond.

In the early hours of April 6, a coordinated assault by Ukrainian armed forces struck key oil export facilities at the Russian Black Sea port of Novorossiysk, including significant components of the Sheskharis oil transshipment terminal – one of southern Russia's largest crude and fuel export hubs. Reports from Russian authorities and independent sources confirm that drone strikes damaged multiple oil storage tanks, loading berths, and associated infrastructure that are integral to Russia's ability to export crude and petroleum products; fires were observed across sectors of the facility and emergency crews were mobilized to contain damage. Local officials also noted collateral impacts on residential and industrial zones adjacent to the port. The complex is linked to the Caspian Pipeline Consortium network, which handles a notable percentage of global crude flows from Russia and Kazakhstan to international markets.

These attacks form a sustained intensification of Ukraine's broader campaign against Russian energy nodes, part of a strategy intended to degrade revenue streams that underwrite Moscow's war effort. By striking major export points along both the Baltic Sea and Black Sea coasts, Kyiv seeks to reduce the volume of oil that contributes to budgetary inflows, a tactic that has repeatedly disrupted normal export activity. Analysts note that interruptions to these facilities add complexity to an energy landscape already unsettled by supply concerns and elevated commodity pricing.

The strikes on Russian oil export infrastructure unfold amidst heightened geopolitical tension triggered by the ongoing conflict involving the United States and Iran. Negotiations aimed at securing a ceasefire framework have been underway, with reports of discussions about a potential 45-day truce that could pave the way for more permanent cessation of hostilities. However, Iran has officially rejected a temporary arrangement, emphasizing the need for a lasting resolution. Meanwhile, U.S. political leadership has issued stern warnings aimed at pressuring Iran to reopen the crucial Strait of Hormuz – a maritime chokepoint through which nearly one-fifth of global oil shipments transit.

Threats of further military action if the strait remains impeded have introduced additional risk into energy markets.

Global oil prices reflected these overlapping drivers on April 6, with crude benchmarks – including U.S. West Texas Intermediate and Brent crude – edging lower in volatile trading, even as market participants remained sensitive to ongoing geopolitical risk and potential supply discontinuities.

The modest dip in prices comes against the backdrop of elevated price levels that have been sustained by supply concerns tied to Middle Eastern conflict dynamics, disrupted shipping routes, and structural uncertainties across producing regions.

Simultaneously, financial markets exhibited cautious optimism as equity indices recorded slight gains, reflecting a tentative investor preference for risk assets amid speculation that diplomatic engagement might ease acute conflict pressures. Major U.S. indexes such as the Dow Jones Industrial Average, S&P 500, and Nasdaq all posted marginal increases, although concerns about inflationary pressures and sustained energy price volatility tempered broader market enthusiasm. The dollar experienced modest weakening against key currency pairs as global capital flowed into a mix of assets in response to shifting risk perceptions.

The interconnection between these geopolitical events and domestic economic policymaking has been evident across Europe. In Athens, the government of Greece announced a substantial multi-year support package designed to insulate industrial sectors from the ongoing shock to energy costs. The plan includes annual aid of €100 million to help firms in energy-intensive industries such as aluminum, cement, and iron cope with steep rises in energy expenditures. Additional subsidies secured through the European Union's Modernization Fund aim to underwrite energy-efficiency investments. Policymakers cited the broader Middle Eastern crisis as a key factor driving persistent energy price pressures that directly affect the competitiveness of Greek industry.

This policy response comes amid broader social and economic pressures as households and businesses alike confront sharply higher costs for fuel and electricity, linked to both supply-side constraints abroad and elevated global commodity prices. In addition to industry-focused support, Athens has launched direct consumer subsidies such as a "fuel pass" program designed to offset the financial burden on drivers amid rising petrol and diesel prices.

Taken together, these developments reflect a global energy environment in flux. The intensification of conflict-related attacks on oil infrastructure in the Black Sea region, combined with diplomatic standoffs in the Middle East and economic interventions by regional governments, continues to shape near-term market dynamics.

For energy markets, the reallocation of supply routes, disruption of export hubs, and geopolitical risk premiums embedded in pricing signals are likely to persist until substantive progress in conflict resolution or a stabilization in supply chains emerges. For broader economies, the ripple effects on inflation, industrial competitiveness, and monetary policy frameworks underscore the central role that energy has assumed in the current global economic narrative.

全球能源中断受俄罗斯石油设施袭击及美伊外交动态影响

根据 WPB，近期全球能源市场的不稳定清晰显示出地缘政治、军事行动和经济政策的相互交织。乌克兰近期对俄罗斯关键能源基础设施——诺沃罗西斯克港口的袭击，加上石油市场压力增加及美国与伊朗的积极外交，已经对全球价格、贸易流和经济政策产生了显著影响。这些发展显示了从黑海到地中海及更远地区能源安全、经济稳定与地缘政治条件的相互依赖。 4月6日凌晨，乌克兰武装部队对诺沃罗西斯克港口的石油出口设施发动了协调攻击。这次行动包括重要的（Sheskharis）石油码头，该码头是俄罗斯南部最大的原油和石油产品出口枢纽之一。俄罗斯和独立消息源报告称，无人机袭击造成储油罐、装载码头及相关基础设施受损。设施部分区域发生火灾，应急人员迅速展开救援。地方官员还指出，港口附近的居民区和工业区也受到影响。该码头连接里海管道联盟网络，承担俄罗斯和哈萨克斯坦向国际市场输送原油的重要任务。

The “Stone Age” threat and the war that raised costs from the Strait of Hormuz to the asphalt market

According to WPB, the latest U.S. threats against Iran are no longer a rhetorical sideshow; they are now a direct variable in global energy security, regional military risk, maritime insurance, and the supply chains that feed everything from crude cargoes to asphalt and bitumen exports. By early April 2026, the conflict had moved well beyond symbolic strikes and political signaling.

The Strait of Hormuz, even where partially navigable, remains functionally constrained, major commercial shipping routes are still operating under extraordinary war-risk assumptions, and oil markets are reacting to each sentence issued from Washington, Tehran, and Tel Aviv. In that setting, Donald Trump’s statement that the United States could send Iran “back to the Stone Ages” has become more than a headline. It is now part of the operating environment for refiners, traders, insurers, and transport planners across the Middle East and Asia.

Reuters reported on April 1 that Trump said Washington would hit Iran “extremely hard” over the next two to three weeks, while other coverage confirmed the “Stone Age” formulation in his broader public messaging around the war.

Trump did issue a threat framed in “Stone Age” terms in connection with the ongoing U.S.-Israeli war on Iran. Reuters on April 1 and April 2 documented the White House line that the United States was prepared to intensify operations sharply and that Trump was escalating public language as he tried to present the war as nearing its military goals. Reuters also noted on April 2 that his “bomb Iran back to the Stone Age” language had sharply raised the stakes in a war already deep into its second month.

jet—identified by U.S. sources as an F-15E—was shot down over Iran, the first known confirmed American combat aircraft loss over Iranian territory in this war. One crew member was recovered, while search efforts for the second continued. The same Reuters reporting noted that U.S. intelligence still assessed Iran as retaining a significant portion of its missile and drone capabilities despite weeks of bombardment. That directly undermines the political message that Iran's ability to retaliate has been largely broken. If Tehran can still contest airspace, still threaten U.S. rescue operations, and still keep a meaningful missile inventory, then this is not a clean coercive operation. It is a continuing war with widening strategic costs.

This means the viral claim is not fabricated; it is a simplified rendering of a real and highly inflammatory U.S. threat.

Iran's answer has also been explicit and unusually pointed. A widely cited response from Brigadier General Seyed Majid Moosavi rejected the threat as delusional and historically illiterate. In a public response carried by NDTV on April 2, Moosavi said it was the United States, not Iran, that was sending its own soldiers "to their graves," and he mocked the idea that a country with roughly 250 years of state history could threaten a civilization he described as more than 6,000 years old.

That response matters because it signals that Tehran is not merely denying battlefield damage; it is framing the conflict as a contest of endurance and legitimacy rather than a short coercive campaign. Separately, Reuters reported on March 25 that Iran had told intermediaries any ceasefire framework must also include Lebanon, showing that Tehran is still negotiating in regional rather than purely bilateral terms.

The military balance on the ground and in the air suggests that Washington's public confidence exceeds the available evidence. On April 3, Reuters reported that a U.S. fighter

As for losses so far, the most solid figure available from Reuters by April 3 concerns the United States. Reuters reported that the war had already killed 13 U.S. service members and injured more than 300. Secondary reporting citing CENTCOM has put the wounded figure at roughly 303, with most returning to duty, but the Reuters number is the cleanest benchmark for a journalistic summary.

That is a substantial toll for Washington in barely five weeks of open conflict and one that helps explain why Reuters/Ipsos polling published on April 3 found broad public fatigue and strong support for ending direct U.S. involvement quickly. The American public may still support punitive rhetoric, but the appetite for a prolonged campaign is visibly weak.

For Iran and Israel, there is still no single universally verified and stable cross-theater casualty count that can be cited with the same confidence as the U.S. military

figure, at least not from one consolidated Reuters tally available in the latest April 3 reporting stream. What can be stated responsibly is that both sides have taken sustained losses, infrastructure damage is mounting, and the conflict is no longer confined to direct bilateral strikes. Reuters reported on April 3 that Israeli operations were still hitting Beirut heavily and that the Lebanon front had become the most violent spillover of the war. A Reuters-sourced March 25 report cited by regional outlets said Israeli strikes in Lebanon since March 2 had killed more than 1,000 people and displaced more than a million. That is not a complete Iran or Israel casualty ledger, but it is a hard indicator that the regional cost of the war is already severe and expanding beyond the primary battlefield.

Where this goes next depends on three variables. First, whether Washington treats the downing of the F-15E as justification for broader infrastructure strikes. Reuters reported on April 3 that Trump threatened to target bridges and electric power plants in Iran. That is a major escalation because it moves the war more openly toward civilian-linked infrastructure. Second, whether Tehran continues to ration access through Hormuz rather than formally reopening it. Third, whether any ceasefire channel can accommodate Iran's insistence on linking its own war front to Lebanon. If those three variables move in the wrong direction at the same time, the war can still widen materially even if neither side formally announces a larger campaign.

The energy effect is already visible and measurable. Reuters reported on April 2 that oil prices had been reacting sharply to every signal about whether Washington might pull back or intensify, and that analysts at J.P. Morgan warned Brent could move above $150 a barrel if disruption persisted into mid-May. Even when futures temporarily eased on hopes of de-escalation, the market remained structurally risk-loaded because Hormuz had not normalized. Reuters also reported on April 3 that only select vessels without U.S. or Israeli links were moving more freely as Iran partially loosened its chokehold. That is not a restored market. It is selective throughput under political screening. For energy traders, that distinction is everything.

This is where bitumen becomes more important than many general political reports admit. Bitumen is not just a construction input; in the Gulf and South Asia trade system it is a downstream product deeply exposed to refinery runs, heavy crude availability, marine freight, vessel availability, war-risk insurance, and delivery reliability into seasonal road-building programs. If Hormuz remains constrained, the immediate problem for bitumen is not only crude price direction. The larger issue is logistics. Cargoes can be delayed, insurance can be repriced aggressively, chartering can become selective, and buyers in India, East Africa, and Southeast Asia may face widening delivery uncertainty even before refinery output itself is cut. A market can stay technically supplied and still become commercially dysfunctional if shipowners, insurers, and banks stop treating voyages as routine. Reuters' April 3 reporting that neutral or non-U.S.-linked vessels were the ones getting through underlines exactly that risk.

The most realistic near-term outlook is not an immediate regional ceasefire, but a compressed period of higher military pressure paired with backchannel bargaining. Trump's public line suggests he wants a short war narrative, not an open-ended occupation-style commitment. Iran's line suggests it wants to absorb pressure while preserving deterrence, regional linkages, and enough maritime leverage to stay relevant in any settlement. Israel appears committed to maintaining pressure on associated fronts, especially Lebanon.

That combination points to a dangerous interim phase: more strikes, more infrastructure threats, limited maritime passage, volatile energy pricing, and a continuing premium on anything moved through Gulf routes. For bitumen and related heavy products, that means the next few weeks are likely to be defined less by headline crude levels and more by freight friction, insurance stress, loading delays, and buyer caution. The war has already crossed the threshold where political language, military events, and commodity logistics are fused into a single market story.

Bitumen Trade at a Crossroads: Expanding Export Horizons as European Supply Structures Tighten

According to WPB, Global and Middle Eastern energy-linked markets are entering a phase where supply concentration and regional limitations are shaping trade decisions, with bitumen increasingly positioned at the center of infrastructure-driven demand. The current configuration of supply chains, particularly in Europe, is prompting exporters to reassess geographic focus and prioritize access to new destinations. This shift is not driven solely by opportunity, but by structural necessity as traditional markets become more regulated, competitive, and operationally constrained.

The European bitumen market operates within a highly regulated environment, where quality specifications, environmental compliance, and product traceability are strictly enforced. Unlike emerging markets that prioritize price competitiveness, European buyers emphasize conformity with technical standards, consistency in supply, and alignment with sustainability requirements. As a result, access to this market is limited to suppliers capable of meeting a comprehensive set of criteria, both in production and logistics.

Supply within Europe is largely secured through a combination of domestic refining capacity and imports from nearby regions. Countries such as Germany, the Netherlands, Italy, and Spain maintain established refining systems that produce bitumen as part of broader crude oil processing operations. However, European refining capacity has faced gradual reductions in recent years due to environmental policies, energy transition strategies, and economic pressures. Several refineries have either reduced output or shifted toward alternative products, indirectly tightening bitumen availability within the region.

This reduction in internal supply has increased Europe's reliance on imports, particularly from countries in the Mediterranean basin and beyond. Key sources include Turkey, Greece, and certain Middle Eastern exporters, alongside occasional shipments from North Africa. These supply routes are supported by relatively short maritime distances and established logistics networks. However, geopolitical developments, shipping risks, and regulatory constraints continue to influence the reliability and cost of these flows.

One of the defining features of the European market is its adherence to strict technical standards. Bitumen supplied

to European countries must comply with EN specifications, particularly EN 12591 for paving grade bitumen. This standard defines parameters such as penetration value, softening point, viscosity, and durability characteristics. In addition, polymer-modified bitumen used in advanced road construction must meet EN 14023 requirements, which impose further constraints on performance consistency and elasticity.

Environmental regulations add another layer of complexity. European Union policies increasingly require reductions in carbon emissions across the supply chain, including production, transportation, and application of bitumen.

Suppliers are expected to provide documentation related to carbon footprint, production methods, and compliance with sustainability benchmarks. This has created barriers for exporters whose production systems are not aligned with these expectations.

Traceability is also a critical requirement. European buyers demand clear documentation of origin, refining processes, and quality assurance procedures. Any inconsistency in documentation or deviation from declared specifications can result in rejection of shipments or financial penalties. This level of scrutiny necessitates a high degree of operational discipline from suppliers.

Against this backdrop, the strategic question for bitumen exporters, particularly those in the Middle East, is whether entry into new markets is optional or unavoidable. Current conditions suggest that diversification is no longer a strategic preference but an operational requirement. Reliance on a limited number of traditional markets exposes exporters to demand fluctuations, pricing pressure, and geopolitical risk. Markets in Africa, Southeast Asia, and parts of Latin America are increasingly being evaluated as alternative destinations. These regions are characterized by expanding infrastructure programs, urbanization trends, and growing demand for road construction materials. While regulatory requirements in these markets are generally less stringent than in Europe, competition is intensifying as multiple exporters target the same destinations.

At the same time, access to these emerging markets is not without challenges. Logistical constraints, currency risks, and political instability can affect trade flows. In addition, pricing sensitivity in these regions requires exporters to maintain cost efficiency while ensuring acceptable quality levels. This creates a balancing requirement between compliance and competitiveness.

For exporters seeking to maintain or expand presence in Europe, investment in quality control systems, certification processes, and environmental compliance is essential. Upgrading refining capabilities to produce consistent grades that meet EN standards is a prerequisite for sustained market access. In parallel, developing transparent documentation systems and aligning with European sustainability expectations can enhance credibility and reduce entry barriers.

In contrast, exporters focusing on new markets must prioritize flexibility and adaptability. This includes tailoring product specifications to local requirements, optimizing logistics to reduce delivery times, and establishing partnerships with regional distributors. Market intelligence becomes a critical tool in identifying demand patterns and pricing dynamics.

The shift toward market diversification also has implications for research and development priorities. Instead of focusing exclusively on product optimization within existing frameworks, there is a growing need to align research efforts with market expansion strategies. This includes studying regional construction practices, climate conditions affecting material performance, and regulatory trends in target markets. Such an approach enables exporters to position their products more effectively and respond to localized demand.

In practical terms, this means that research functions within bitumen-producing organizations must become more market-oriented. Technical development should be linked to commercial objectives, ensuring that product innovation supports entry into new destinations. This represents a departure from traditional models where research operated

Export Orientation of Singapore and South Korea Bitumen: Destination Patterns Across Asia and Emerging Infrastructure Markets

According to WPB, Asian supply hubs are playing an increasingly visible role in stabilizing global availability of petroleum-derived construction materials, particularly in regions where infrastructure expansion is accelerating. Within this landscape, Singapore and South Korea have established themselves as key refining and distribution centers for bitumen, supported by advanced refining capacity, strategic geographic positioning, and integrated logistics networks. Their export structures are not broadly dispersed but instead concentrated toward specific high-demand regions, primarily across Asia-Pacific, parts of Africa, and selected markets in Oceania.

Singapore functions primarily as a trading and blending hub rather than a large-scale crude producer. Its refining system is optimized for flexibility, allowing for the processing of diverse crude slates and the production of consistent-grade bitumen suitable for export. Bitumen originating from Singapore is typically directed toward Southeast Asian markets, including Indonesia, Vietnam, the Philippines, and Malaysia. These destinations are characterized by ongoing infrastructure development, including road construction, urban expansion, and port upgrades, which sustain steady demand for paving-grade material.

In addition to Southeast Asia, Singapore-based exports also reach South Asian markets such as Sri Lanka and Bangladesh. These countries rely on imports to meet domestic demand due to limited refining capacity. Singapore's advantage in these markets is driven by logistical efficiency, shorter delivery times, and the ability to supply standardized grades aligned with project specifications.

The port infrastructure in Singapore supports high-frequency shipments, allowing for responsive supply adjustments based on project timelines.

South Korea operates under a different structure, with large-scale refining complexes capable of producing significant volumes of bitumen as a byproduct of crude oil processing. Korean exports are more diversified geographically but remain concentrated in Asia. China represents a major destination, particularly during periods of domestic supply tightening or when import arbitrage becomes economically viable. In addition, South Korea supplies bitumen to Southeast Asia, often competing directly with Singapore-origin material.

Singapore–Vietnam Bitumen Corridor Expands as Trade Volumes Surge Beyond Forecasts

According to WPB, the constrained movement of vessels through the Strait of Hormuz on April 11, 2026, combined with a large accumulation of tankers awaiting clearance and renewed geopolitical uncertainty, is exerting immediate influence on global energy logistics with direct implications for the Middle East. The restricted maritime throughput has introduced operational delays across crude oil and petroleum product shipments, including bitumen feedstock flows, thereby tightening supply continuity for downstream markets. This situation is not confined to crude oil movements; it extends into refined products and construction materials derived from heavy residues, reinforcing the strategic sensitivity of maritime chokepoints in sustaining industrial supply chains.

Shipping data and field reports indicate that vessel traffic through the Strait remains significantly below normal operating levels despite the announcement of a ceasefire. The number of transiting ships has been reduced to a limited flow, while a backlog exceeding several hundred vessels has accumulated across anchorage zones in the Persian Gulf. This congestion includes crude tankers, product carriers, and vessels transporting vacuum residue and other feedstocks used in bitumen production. The delay in vessel clearance has disrupted scheduling integrity, leading to cascading effects across chartering cycles, port operations, and refinery intake planning.

The backlog has introduced measurable inefficiencies into freight utilization. Tankers positioned in holding patterns are effectively removed from active circulation, tightening vessel availability in the spot market. This has operational implications beyond freight rates, extending into contractual delivery risks and refinery throughput adjustments. Refineries dependent on timely feedstock arrival are facing recalibration requirements, particularly those configured to process heavy crude fractions into asphalt and bituminous materials. The delay in feedstock arrival reduces output predictability, directly affecting supply commitments to infrastructure sectors in Asia and Africa.

The situation is further complicated by the presence of additional security protocols governing vessel passage. Maritime authorities and naval forces are implementing controlled transit mechanisms, which involve inspection procedures, convoy scheduling, and routing restrictions. These measures, while intended to maintain navigational safety, are contributing to extended waiting times. The operational window for passage through the Strait has effectively narrowed, creating a bottleneck that amplifies even minor disruptions into system-wide delays.

Parallel to these logistical constraints, monitoring groups have reported continued activity of sanctioned or semi-documented tanker fleets operating within the region. These vessels, often engaged in indirect trade flows, are contributing to congestion within anchorage areas. Their presence complicates traffic management and introduces additional layers of verification for port and maritime authorities. The coexistence of regulated and unregulated shipping activity increases administrative burden and slows down clearance processes, further extending turnaround times.

Hormuz

Hormuz Flow Constraints and Maritime Backlog Redefine Energy Logistics Across Gulf Export Channels 2026

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From a commercial standpoint, the reduced flow rate through Hormuz is influencing procurement strategies across importing regions. Buyers in Asia are reassessing shipment schedules

RESEARCHERS HAVE INTRODUCED A NEW APPROACH TO REDUCING ASPHALT POLLUTION AND ANALYZING ITS CHEMICAL AGING PROCESS.

According to WPB, Recent scientific work published in recent days signals an important development in the science of asphalt materials and emissions management. Two independent research directions—photocatalytic removal of volatile organic compounds (VOCs) from bitumen using sulfur-doped phenol-rich bio-oil, and a newly reported chemical fingerprinting framework for aged asphalt—have introduced analytical and environmental tools that may carry significant implications for road infrastructure worldwide, including rapidly expanding transport networks across the Middle East. With large-scale highway construction underway across Gulf states and increasing scrutiny of atmospheric emissions from petroleum-derived materials, innovations that simultaneously address durability, recyclability, and emission control are receiving close attention from researchers and regulators.

Bitumen, the binding phase in asphalt pavements, remains one of the most widely used petroleum products in civil infrastructure. Yet its environmental footprint has long been tied to the release of volatile organic compounds, especially during high-temperature production, pavement laying, and early service life. VOC emissions from asphalt mixtures contribute to photochemical smog formation and expose construction workers to complex hydrocarbon mixtures.

At the same time, long-term exposure of pavements to oxygen, heat, and ultraviolet radiation drives chemical aging in bitumen, gradually increasing stiffness and brittleness. These parallel challenges—emissions during production and chemical aging during service—have historically been studied separately. The newest studies indicate that advances in materials chemistry and analytical science may allow both problems to be addressed with unprecedented precision.

The first development centers on a photocatalytic strategy that incorporates sulfur-doped bio-oil enriched with phenolic compounds into bituminous materials. Bio-oil derived from biomass pyrolysis has been investigated for more than a decade as a partial substitute for petroleum bitumen components. However, most previous efforts focused on mechanical properties or sustainability metrics rather than emission chemistry. The new work introduces a functionalized bio-oil formulation in which phenolic fractions and sulfur dopants cooperate under solar radiation to initiate photocatalytic reactions capable of degrading volatile organic compounds emitted from the bitumen matrix.

In laboratory experiments, researchers prepared a phenol-rich bio-oil fraction extracted from biomass feedstock and chemically modified it with sulfur species that act as catalytic centers when exposed to sunlight. When incorporated into asphalt binder systems, the modified bio-oil exhibited photocatalytic activity that accelerated the breakdown of VOC molecules released from heated bitumen surfaces. Spectroscopic monitoring indicated that several common emission species—including aromatic hydrocarbons and light oxygenated compounds—underwent oxidation reactions on the catalyst surface. Instead of accumulating in the surrounding air, these molecules were converted into less volatile intermediates or mineralized products.

The importance of solar radiation in this mechanism is notable. Road surfaces experience intense sunlight in many climates, particularly in arid and semi-arid regions such as the Middle East.

The photocatalytic process harnesses this ambient solar energy as the driving force for chemical reactions that would otherwise require external catalysts or active treatment systems. In effect, the asphalt surface itself becomes a passive emission mitigation platform. Early results suggest that sulfur-doped phenolic bio-oil additives could reduce VOC release during both laboratory heating cycles and simulated outdoor exposure conditions.

Beyond emission control, the study also examined how the additive interacts with the aging chemistry of bitumen under solar radiation. Ultraviolet light and oxygen typically trigger oxidation reactions in asphalt binder molecules, generating carbonyl and sulfoxide groups that gradually stiffen the material. Preliminary findings indicate that the phenolic bio-oil component may provide partial stabilization against these oxidative processes, likely due to the radical-scavenging characteristics of phenolic structures. Although long-term field validation remains necessary, the concept introduces a dual-function additive capable of addressing both environmental emissions and aging performance within a single formulation.

Parallel to this materials innovation, another research effort published in 2026 proposes a detailed framework for decoding the chemical fingerprints of aged asphalt. Aging in bituminous materials is a complex, multi-stage process involving oxidation, volatilization, polymerization, and structural rearrangement within the mixture of thousands of hydrocarbon molecules that compose asphalt binder. Because of this complexity, determining the history and condition of a pavement sample has historically required indirect mechanical tests rather than direct chemical identification.

The newly reported fingerprinting approach combines high-resolution mass spectrometry with advanced chemometric analysis to map characteristic molecular patterns in aged asphalt samples. Researchers analyzed binders extracted from pavements at different stages of service life, including fresh materials, long-term aged asphalt, and reclaimed asphalt pavement (RAP) that had already undergone recycling. By identifying clusters of molecular markers associated with specific aging pathways, the method establishes a reproducible chemical signature for different stages of bitumen oxidation and structural evolution.

This analytical framework has particular relevance for forensic investigations in pavement engineering. Infrastructure agencies often need to determine whether pavement deterioration results from environmental aging, construction defects, or material incompatibility. Chemical fingerprinting provides a tool capable of distinguishing these scenarios by examining molecular evidence embedded within the binder. For example, elevated concentrations of oxygenated aromatic species may indicate prolonged oxidative aging, while distinct patterns of polymerized hydrocarbons may signal excessive thermal exposure during mixing.

Analysis of the Factors Behind OPEC's Downward Revision of Oil Demand Forecasts

According to WPB, Global energy markets entered a new phase of uncertainty in mid-April 2026 as the escalation of military confrontation involving Iran and the subsequent disruption around the Strait of Hormuz forced major forecasting institutions and financial firms to reassess short-term demand and supply dynamics for crude oil and refined products, including bitumen. The Organization of the Petroleum Exporting Countries (OPEC) lowered its forecast for global oil demand growth in the second quarter by around 500,000 barrels per day, citing the combined effects of regional conflict, trade route disruption and deteriorating sentiment among key consumers. At the same time, investment bank Morgan Stanley and several peer institutions warned that the impact of supply interruptions linked to the partial closure and militarization of the Hormuz transit corridor could persist for months, even if a political de-escalation is achieved on a shorter timescale.

According to officials familiar with OPEC's internal deliberations, the revised quarterly outlook reflects a cautious stance driven by both physical and financial constraints in the market. On the demand side, higher price volatility, elevated freight costs and heightened uncertainty around shipping insurance are prompting refiners in Asia and Europe to adjust crude intake plans and delay some purchases. On the supply side, producers inside and outside OPEC are facing logistical challenges in redirecting cargoes away from routes perceived as high risk, while term buyers seek more flexible delivery conditions. The decision to reduce the demand forecast by roughly half a million barrels per day is described by OPEC sources as a "risk management adjustment" rather than a fundamental shift in the assessment of medium-term consumption trends.

Market analysts note that the Strait of Hormuz normally handles a substantial share of global seaborne crude and condensate exports, in addition to volumes of refined products such as fuel oil and bitumen feedstocks. The recent disruption, marked by temporary closures of shipping lanes,

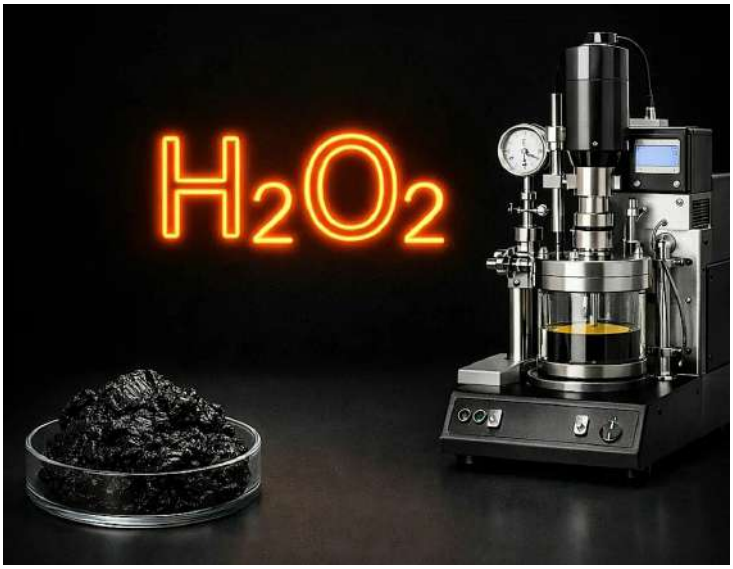
heightened naval presence and intermittent interruptions to tanker movements, has triggered a rise in freight rates and extended voyage times for vessels attempting to reroute via longer paths. This development has immediate implications for countries in the Middle East, South Asia and East Africa for which Gulf-origin crude and heavy residues are central to refinery operations and bitumen production chains.

Morgan Stanley's commodity research division, in a note circulated to institutional clients, argued that the current imbalance in seaborne supply is unlikely to be fully resolved within a short period.

The bank estimates that, even under a scenario where direct hostilities diminish over the coming weeks, it could take several months for shipping patterns, inventory levels and hedging structures to stabilize. The analysts pointed to the need for refiners and trading houses to rebuild confidence in transit security, renegotiate charter contracts and re-establish normal risk premia in freight and insurance markets. As long as these adjustments are in progress, the bank expects a persistent risk of localized shortages, particularly for heavier crude grades and the vacuum residues that serve as primary feedstock for bitumen production.

From a price perspective, the immediate reaction in benchmark futures has been characterized by sharp intraday swings and frequent reversals as traders attempt to reconcile weaker demand projections with the potential for prolonged supply constraints.

High-Efficiency Microbubble Oxidation Method Advances Bitumen Recovery Beyond Conventional Limits



According to WPB, A newly emerging extraction technique based on microbubble-assisted oxidation is beginning to draw attention across the global bitumen and heavy oil sector, particularly for its potential implications in regions such as the Middle East where unconventional reserves and heavy crude upgrading remain strategic priorities. The integration of microbubble dynamics with controlled hydrogen peroxide activation introduces a measurable increase in recovery efficiency, offering a pathway that may influence upstream operational decisions in bitumen-rich environments. This development arrives at a time when extraction optimization is becoming as critical as resource availability, especially in areas where environmental constraints and water usage are under increasing scrutiny.

The research centers on a hybrid process that combines microbubble generation with oxidative chemistry to improve the detachment and mobilization of bitumen from mineral surfaces. Unlike traditional hot water extraction or solvent-based methods, which often require high energy input and generate secondary environmental burdens, this method leverages the physicochemical properties of microbubbles to enhance contact efficiency at the interface between bitumen and surrounding media. The addition of hydrogen peroxide serves as an oxidizing agent, altering the surface characteristics of bitumen and reducing adhesion forces that typically hinder efficient separation.

Laboratory-scale studies indicate that microbubbles, due to their high surface area-to-volume ratio and prolonged residence time in suspension, significantly increase the probability of interaction with bitumen particles. This results in improved flotation behavior and more effective separation. When hydrogen peroxide is introduced in controlled concentrations, it initiates partial oxidation of heavy hydrocarbon fractions, leading to a decrease in viscosity and an increase in hydrophilicity at the bitumen interface. These combined effects facilitate a recovery rate that has been reported to approach or exceed seventy percent under optimized conditions.

This figure represents a notable improvement compared to conventional extraction techniques, particularly in low-grade ores or tailings where recovery rates are typically constrained. The implications for industrial-scale application are substantial, as even marginal increases in recovery efficiency can translate into significant economic gains when applied to large reservoirs. In addition, the reduction in thermal requirements associated with this method may contribute to lower operational costs and reduced greenhouse gas emissions.

From a technical perspective, the generation of microbubbles is achieved through specialized nozzles or electrochemical processes that produce bubbles in the micron range. These microbubbles exhibit unique behaviors, including slow rise velocity and high stability, which allow them to remain suspended in the extraction medium for extended periods.

The broader impact of this development extends beyond bitumen extraction. The principles underlying microbubble-assisted oxidation may be applicable to other areas of resource recovery and environmental remediation. For example, similar techniques could be used to enhance the removal of contaminants from wastewater or to improve the efficiency of mineral processing operations. This cross-disciplinary potential adds another layer of interest to the research.

In terms of market dynamics, the introduction of more efficient extraction technologies can influence supply patterns and competitiveness within the bitumen sector. Producers that adopt such innovations may gain an advantage in terms of cost structure and environmental compliance, positioning themselves more favorably in a market that is increasingly sensitive to sustainability considerations. This is particularly relevant for countries with large bitumen reserves, where the ability to extract and process resources more efficiently can have significant economic implications.

The Middle East, while traditionally associated with lighter crude oils, has been expanding its focus on heavier fractions and downstream integration. The adoption of advanced extraction techniques could support this transition by enabling more effective utilization of diverse hydrocarbon resources. In addition, the region's emphasis on technological modernization and efficiency aligns with the objectives of this research.

It is important to note that the current findings are based primarily on controlled experimental conditions. Further research is needed to validate the performance of the method under real-world operating scenarios. Pilot projects and field trials will play a crucial role in bridging the gap between laboratory success and industrial application. These efforts will need to address not only technical performance but also economic viability and regulatory compliance.

The pace at which this technology progresses will depend on a combination of factors, including research funding, industry interest, and policy support. Collaboration between academic institutions, technology providers, and energy companies will be essential to accelerate development and deployment. In this context, the role of innovation ecosystems becomes increasingly important, as they provide the framework for translating scientific advances into practical solutions.

In conclusion, the microbubble-assisted hydrogen peroxide extraction method represents a significant step forward in the field of bitumen recovery. By combining physical and chemical mechanisms, it offers a more efficient and potentially more sustainable approach to extracting one of the most challenging hydrocarbon resources. While there are still hurdles to overcome, the initial results suggest that this technology could play an important role in shaping the future of bitumen production.

WHY BITUMEN CARGOES MAY BE THE NEXT TRADE STORY TO WATCH

According to WPB, the expiry of temporary authorizations tied to Russian and Iranian oil shipments, combined with the detention of a tanker linked to Russia's shadow fleet after an oil spill incident in Swedish waters, has created a new point of concern for energy logistics across Europe, the Middle East, and parts of Asia. For refiners, shipowners, insurers, and cargo buyers, the immediate issue is not merely the legal status of crude already loaded aboard tankers. The broader consequence lies in how these two developments may tighten scrutiny over vessel history, beneficial ownership, marine insurance quality, and port acceptance standards at a time when petroleum products such as fuel oil, vacuum residue, and bitumen feedstocks remain deeply exposed to the same freight ecosystem.

In the Middle East, the implications are especially relevant because any increase in caution around Iranian-linked cargoes can quickly ripple into freight availability, insurance pricing, and counterparty behavior across adjacent product streams, including bitumen exports that often depend on flexible tanker scheduling, indirect routing, and commercially sensitive discharge arrangements.

The timing is critical. Temporary sanctions-related allowances have functioned as a narrow legal corridor for some cargoes that were loaded under prior permissions but remained in transit or awaiting discharge under a rapidly shifting regulatory framework. Once those permissions expire, market participants are forced into a more exacting compliance environment in which even cargoes already on the water can become commercially stranded, legally ambiguous, or financially discounted. This is not a theoretical concern. In physical commodity trade, the legal status of a barrel does not end at loading. It follows the cargo through financing, marine insurance validation, vessel nomination, transfer documentation, customs treatment, discharge approval, and post-delivery settlement. A tanker that left port under one set of assumptions may arrive under another. That gap between departure and arrival is where risk multiplies.

The separate detention of a vessel associated with the Russian shadow fleet reinforces this risk in a more visible way. When a tanker is stopped following an oil spill allegation in the Baltic region and is simultaneously tied to sanctions-sensitive trade, the event becomes larger than a local maritime enforcement matter. It signals that European authorities are increasingly prepared to examine not only paperwork, but also operational conduct, environmental exposure, and ownership opacity in a single enforcement frame. That matters because the shadow fleet has survived not only through jurisdictional complexity but also through fragmentation of accountability. If coastal states begin combining pollution enforcement, port state control, sanctions screening, and insurance verification into a more integrated process, the cost of operating older, obscurely owned, or weakly insured tonnage rises sharply.

This is where the story intersects directly with bitumen. Bitumen rarely attracts the same headlines as crude, LNG, or headline benchmark products, yet in several export corridors it relies on the same shipping logic: small to mid-sized tankers, opportunistic freight booking, transshipment flexibility, and a buyer universe that often includes emerging-market importers with price-sensitive procurement structures. In practice, bitumen cargoes can be disproportionately vulnerable when sanctions enforcement intensifies because they often sit lower on the priority ladder of vessel allocation.

GEOECONOMIC ALIGNMENT IN CIS BITUMEN DEMAND AND TRADE VOLUMES

According to WPB, the current configuration of global supply chains has intensified attention on how the bitumen market in the Commonwealth of Independent States (CIS) evolves under shifting logistical conditions across Eurasia. The region's consumption patterns, import flows, and intra-bloc distribution corridors now carry measurable implications for construction activity in neighboring territories, including parts of the Middle East where road-building and infrastructure financing are influenced by the availability and pricing stability of bitumen in upstream markets.

As procurement centers in Eastern Europe and Central Asia revise their sourcing models, the downstream effects extend beyond their borders, shaping cost structures and contractual timelines for several adjacent economies.

The CIS region, composed of Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Uzbekistan, and Turkmenistan as an associated participant, represents a distinct zone of bitumen demand driven by road rehabilitation, industrial expansion, and seasonal state-funded infrastructure programs. Annual requirements across these countries continue to follow a cyclical model in which procurement intensifies between late spring and early autumn, while import dependency varies markedly between land-locked Central Asian states and those with established refining assets. Despite internal heterogeneity, a consolidated view of trade volumes indicates that the region collectively consumes an estimated 7.5 to 8.2 million tons of bitumen per year, with notable fluctuations tied to budget reallocations, weather constraints, and refinery maintenance cycles.

Russia maintains the largest domestic production capacity in the CIS, supplying most of its own needs and exporting to nearby markets. Its annual bitumen output typically exceeds 4.5 million tons, though usable export volumes shift due to refinery upgrades and domestic prioritization for road investment programs. Kazakhstan produces between 900,000 and 1.1 million tons annually, with developing refineries in Atyrau and Shymkent shaping regional distribution. Uzbekistan has expanded its asphalt-grade output through modernization at the Bukhara facility, generating between 300,000 and 350,000 tons yearly. However, despite these advancements, several CIS members still rely substantially on imports due to insufficient refining throughput, operational disruptions, or geographically isolated construction corridors that make local supply inconsistent.

Among import-dependent states, Armenia, Kyrgyzstan, Tajikistan, and Moldova collectively draw between 600,000 and 750,000 tons per year from external origins. Their procurement patterns increasingly incorporate flexible delivery agreements, spot contracts, and coordinated logistic partnerships routed through Georgian, Russian, or Kazakh terminals. Armenia imports approximately 120,000 to 150,000 tons annually, depending on federal project allocations. The majority of its supply reaches the country via transit routes linked to Georgian ports and road networks, with additional smaller volumes sourced from Iran during high-demand phases. Kyrgyzstan's annual need of 200,000 to 230,000 tons is met primarily through Kazakhstan and Russia, although procurement diversity has grown as construction entities test alternative supply corridors to stabilize seasonal shortages.

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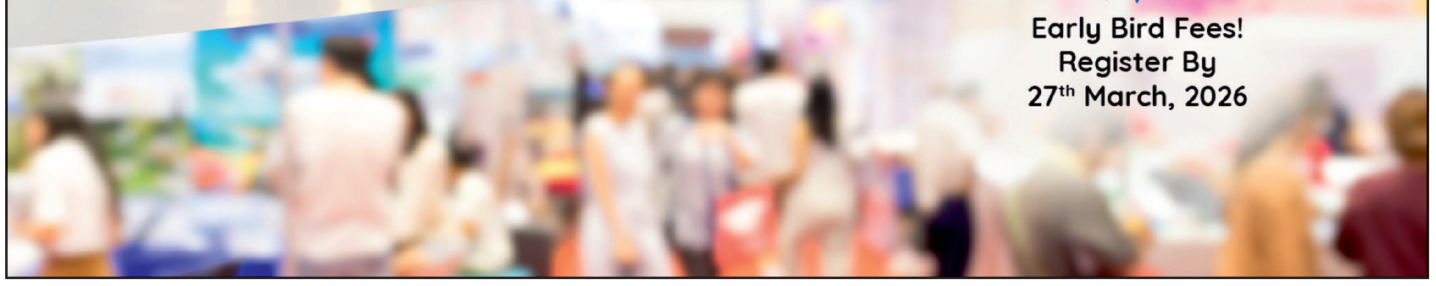

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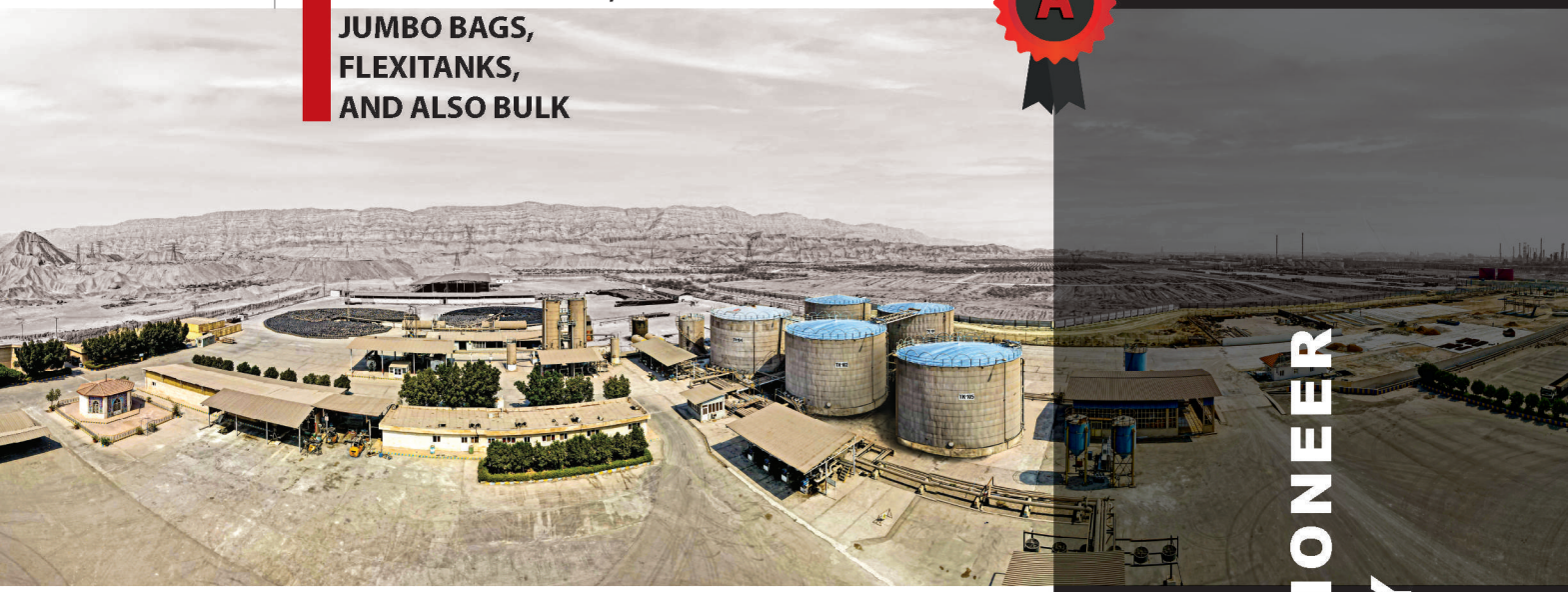

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Factory/Hormozan St., North side of Bandar Abbas Refinery, Bandar Abbas, Iran.
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