

Refining and Refined Products – Downstream Sovereignty of Kazakhstan

Introduction

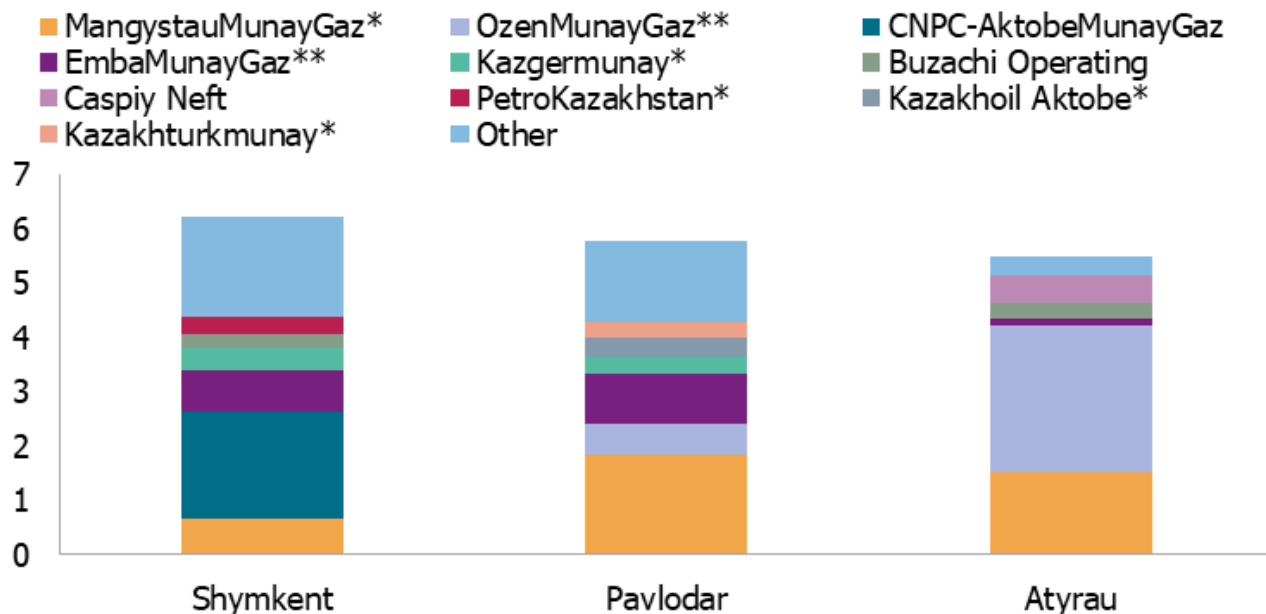
As one of the world's leading oil producers and a major supplier to regional and global markets, Kazakhstan has built its economic prosperity mostly on hydrocarbon extraction and export. Yet beneath the surface of ambitious refining capacity expansion plans lies a more complex reality: the ability to transform crude oil into refined products that meet domestic demand remains constrained by structural vulnerabilities, inherited infrastructure dependencies, and institutional arrangements that insulate the downstream sector (oil refining and refined products) from market forces. Importantly, Kazakhstan's refined products balance is structurally positive - the country operates as a net exporter of refined products for most of the year. The challenge, therefore, is not aggregate capacity but the resilience and flexibility of the downstream infrastructure to maintain a stable domestic supply under various scenarios of demand and supply changes.

This article examines Kazakhstan's downstream sector through the dual lenses of refined products security and energy sovereignty. The first section provides an overview of refining capacity, expansion projects, and the balance of refined products. The second section applies a methodological framework developed in our earlier [energy sovereignty analysis](#) to identify constraints, assess risks across four critical dimensions (diversification, infrastructure integrity, geopolitical and physical security, and demand-side policy), and evaluate options available to policymakers. As Kazakhstan pursues its [long-term refining strategy for 2025-2040](#), the fundamental challenge is whether the country can build the institutional flexibility, commercial independence, and enduring resilience necessary to convert refining capacity into energy sovereignty.

Kazakhstan's Downstream Sector in 2024-2025

The largest suppliers of crude oil to the domestic market are Mangistaumunaigas, Ozenmunaigas, CNPC-Aktobemunaigas, Embamunaigas, and Kazgermunai. These five companies supplied 61% of all crude oil deliveries to Kazakhstan's oil refineries in 2025.

Crude oil deliveries to major Kazakh refineries by producer in 2025 (MMt)



*KMG JV; **KMG fully-owned subsidiary.

Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC.

The three major refineries (in Shymkent, Pavlodar, and Atyrau) that form the backbone of Kazakhstan's refining capacity collectively processed 91% of the country's total crude throughput in 2025. The issue of stable feedstock (crude oil) supply remains a critical vulnerability for all three refineries throughout the outlook period¹. The Pavlodar and Atyrau facilities currently benefit from relatively secure crude oil supplies from KazMunayGas production assets. The Shymkent refinery faces the most insecure supply situation, as it relies primarily on crude oil from non-KazMunayGas sources. This vulnerability is compounded by the fact that [production at mature oilfields continues to decline](#), requiring government authorities to explore new approaches to ensuring uninterrupted crude deliveries.

All three refineries continue to operate under a regulated processing (tolling-style) scheme introduced to finance the large-scale modernization programs completed around 2014 and 2018, which required several billion dollars of investment. Under this arrangement, crude oil suppliers pay for refining services while retaining ownership of the refined products, which they subsequently market themselves. While this model has enabled the refineries to service their substantial debt obligations from the modernization projects, it effectively insulates

¹ The forecast of crude oil refining volumes at refineries and the forecast balance of petroleum products are presented in the section "Refining and refined product market dynamics" of [the Kazakhstan Energy Outlook 2025](#) by ENERGY Insights & Analytics

them from market mechanisms and may dampen incentives to further improve operational efficiency. As refineries' debt burdens ease and loan repayments are completed, the transition to a market-based model whereby refineries would purchase crude oil and market refined products on their own.

The Shymkent refinery, currently the largest facility in the country, maintained its position as the leading motor gasoline producer with a throughput of 6.23 million metric tons of crude oil [MMt]. Moreover, the Shymkent refinery became the primary source of diesel fuel as well (the Pavlodar refinery in 2024 was the largest producer of diesel fuel). The Pavlodar refinery processed 5.78 MMt and moved to second place as the primary source of diesel, while the Atyrau refinery handled 5.48 MMt with notable increases in gasoline and diesel fuel production and reductions in jet fuel and mazut output.

Output of primary refined products by the major Kazakhstan refineries (MMt)

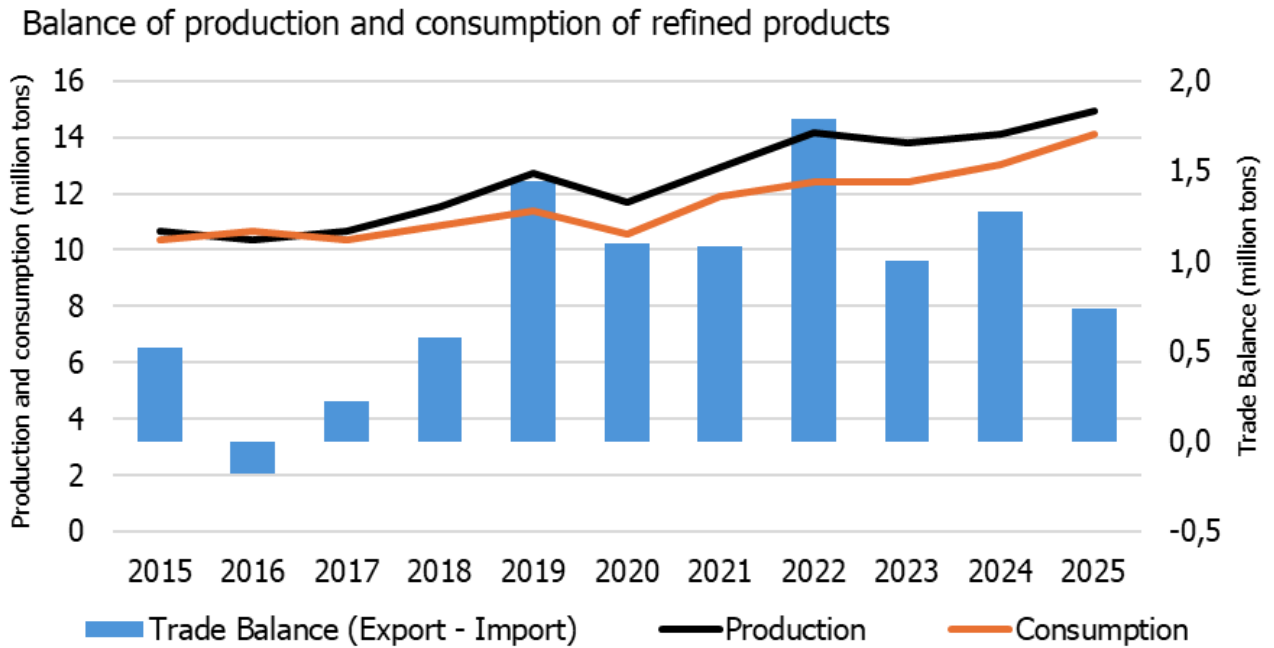
	<u>2024</u>	<u>2025</u>	<u>Percent change (2024-25)</u>
Shymkent			
Crude throughput	5.74	6.23	8.4
Motor gasoline	2.09	2.28	9.4
Diesel	1.81	2.11	16.7
Jet fuel	0.32	0.34	6.3
Mazut	0.77	0.69	-10.2
Pavlodar			
Crude throughput	5.50	5.78	5.1
Motor gasoline	1.62	1.67	2.9
Diesel	1.91	2.09	9.4
Jet fuel	0.24	0.21	-10.1
Mazut	0.43	0.32	-27.2
Atyrau			
Crude throughput	5.55	5.48	-1.2
Motor gasoline	1.65	1.80	9.0
Diesel	1.68	1.92	14.3
Jet fuel	0.19	0.17	-8.0
Mazut	0.75	0.56	-25.0

Source: ENERGY Insights & Analytics, RoK Ministry of Energy / SAC FEC

Crude oil throughput at Kazakhstan's refineries increased in 2025 by 10% to 19.3 MMt with a simultaneous rise in domestic demand for refined products. Primary refineries are pursuing ambitious expansion and modernization programs to address growing domestic demand and improve product quality. These expansion and modernization projects on the refineries are discussed in detail in our flagman report [Kazakhstan Energy Outlook 2025](#).

The major refined products produced from crude oil supplied by domestic producers include gasoline, diesel, kerosene (mostly jet fuel), and mazut. The breakdown of refined products produced in 2025 is as follows: 42% diesel, 40% gasoline, 13% mazut, and 5% kerosene.

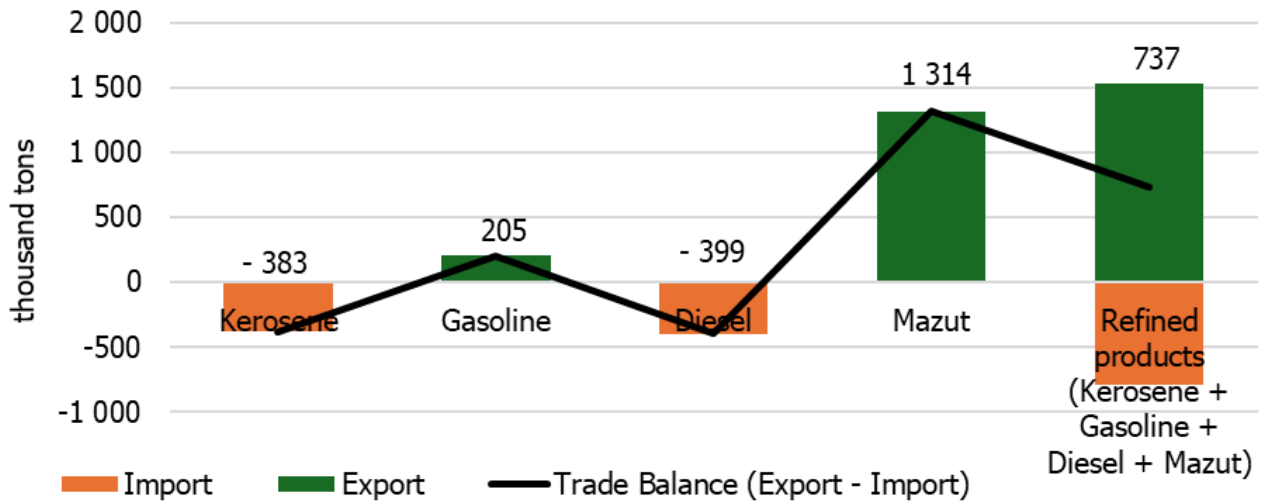
The figure below illustrates the dynamics of production (shipments from oil refineries), consumption, and the trade balance (exports minus imports) of refined products. The production of refined products increased by 6%, reaching 14.9 million tons in 2025. Consumption also rose, but by a higher 8%, from 13.0 million tons in 2024 to 14.1 million tons in 2025.



Source: ENERGY Insight & Analytics, Ministry of Energy of Kazakhstan / SAC FEC RK

The gap between the consumption and production of refined products is explained by changes in the trade balance. As shown in the figure below, there is a positive trade balance of 737 thousand tons in 2025, primarily driven by the export of mazut and, to a lesser extent, gasoline. At the same time, Kazakhstan imported 383 thousand tons of kerosene and 399 thousand tons of diesel.

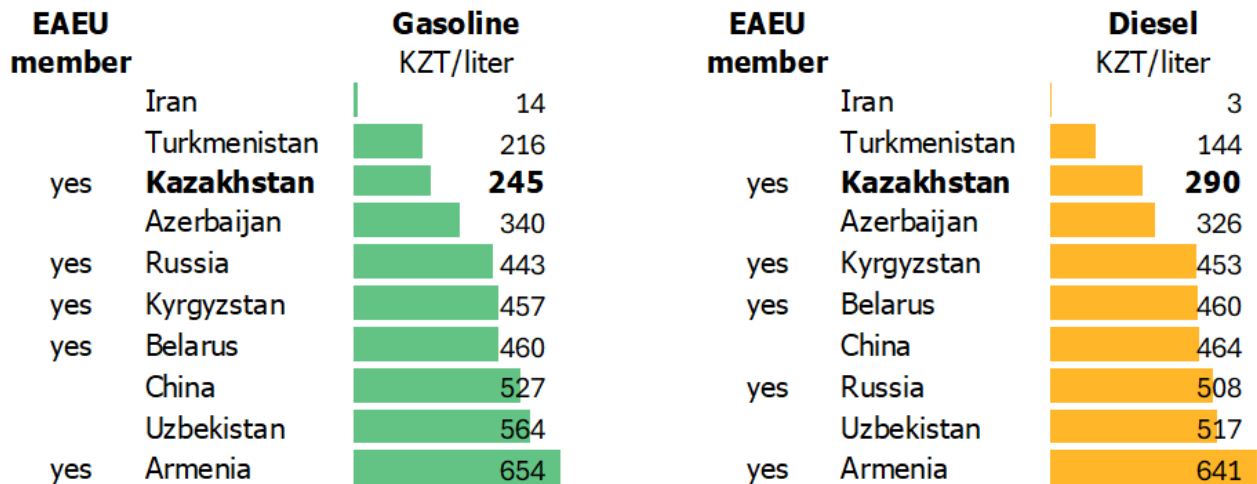
Details of the trade balance of refined products in 2025



Source: ENERGY Insight & Analytics, Ministry of Energy of Kazakhstan / SAC FEC RK

The availability of international trade in refined products is crucial for the proper functioning of Kazakhstan's refined products market. Kazakhstan traditionally imports the necessary refined products from the Russian Federation, and as part of the Eurasian Economic Union [EAEU], it is planned to establish common markets for crude oil and refined products within the EAEU by approximately 2027. Though, Kazakhstan regularly extends the ban on the export of gasoline and diesel outside the EAEU's customs territory due to the disparity in motor fuel prices with neighboring countries. Additionally, it [restricts \(with some exceptions\) the export of refined products by automobile and railway transport from Kazakhstan](#). The figure below presents a comparison of gasoline and diesel prices in countries that, along with Kazakhstan, are members of the EAEU, share a common land border with Kazakhstan, or border the Caspian Sea.

Prices for gasoline and diesel



Source: Global Petrol Prices - 26.01.2026

Downstream Sovereignty

True energy sovereignty requires not merely the physical capacity to extract and process crude oil, but the institutional flexibility to allocate crude and refined products, the technical resilience to withstand supply disruptions, and the commercial independence to respond to market signals without external dependencies. This section applies the methodological framework outlined in our earlier [energy sovereignty analysis](#) to the downstream sector, identifying the key constraints, emerging risks, and strategic options available to Kazakhstan as it seeks to balance the competing demands of energy security, equity, and sustainability.

Diversification

Diversification, as established in [the energy sovereignty framework](#), refers to the strategic distribution of supply sources, processing facilities, and market channels to minimize dependence on single points of failure. In the downstream context, diversification incorporates feedstock sourcing, geographic distribution of capacity, product slate optimization, and market access routes. True diversification creates redundancy and optionality, enabling the system to absorb shocks in any single supply chain without cascading failures across the entire network.

While the three major refineries have collectively increased their throughput capacity to almost 17.5 MMt (an all-time high value), structural vulnerabilities persist beneath this surface-level growth. The core constraint lies in feedstock supply security, particularly for

the Shymkent refinery, which remains heavily dependent on crude deliveries from CNPC-Aktobemunaigas and other independent (non-KazMunayGas) oil producers. This dependence creates a single point of failure in the southern supply chain, where any disruption in crude flows directly translates into domestic fuel shortages in the country's most populous region. Product slate diversification remains limited, with permanent structural imbalances between what refineries produce and what domestic markets consume. As a result, persistent and recurring imports of jet fuel and diesel, alongside the export of surplus mazut production.

The [January 2026 diversion of Kashagan crude to domestic refineries](#), prompted by the Caspian Pipeline Consortium [CPC] pipeline bottlenecks, illustrates how quickly concentration vulnerabilities can materialize into operational disruptions. This incident forced sudden adjustments to refinery feedstock plans and exposed the system's limited flexibility when primary supply routes face disruption. The absence of diversified feedstock contracts means refineries cannot quickly pivot to alternative suppliers during disruptions, while the lack of product slate flexibility forces continued imports of high-value products even as low-value residuals are plentiful.

Achieving meaningful diversification requires action across multiple dimensions. Kazakhstan should establish multi-source feedstock supply arrangements for each major refinery, ensuring that no facility depends on a single producer or pipeline corridor for more than 60-70% of its crude intake. Geographic diversification should prioritize capacity expansion in underserved regions, particularly the south, where demand growth outpaces local refining capacity. Product slate optimization through targeted upgrading investments (particularly units to convert heavy residuals into middle distillates) would reduce the structural mismatch between production and consumption patterns. Developing complementary export/import routes for surplus/deficit refined products would create market diversification, reducing dependence on any single trading partner or transit corridor.

Infrastructure integrity

Infrastructure integrity, within [the energy sovereignty framework](#), involves the physical reliability, technical resilience, and operational continuity of critical energy assets. For refining, this extends beyond the processing units themselves to include feedstock supply pipelines, product distribution networks, storage facilities, and supporting utilities. Infrastructure integrity determines whether capacity exists only on paper or can be reliably deployed when needed, particularly during stress scenarios when obvious options may be unavailable.

Kazakhstan's refining infrastructure carries the legacy of Soviet-era design and decades of deferred maintenance, despite recent modernization efforts. The concentration of capacity in three facilities means that any major technical failure, unplanned maintenance shutdown, or accident at a single site immediately reduces national processing capacity by 25-35%. Pipeline infrastructure connecting crude sources to refineries shows similar concentration,

with limited redundancy or bypass options. Storage capacity for both crude feedstock and refined products remains insufficient relative to throughput volumes, providing a modest ([25-31 days](#) to cover the demand) buffer against supply disruptions or demand surges.

The aforementioned [January 2026 diversion of Kashagan crude to domestic refineries](#) underscores also how external infrastructure constraints can force sudden operational adjustments that stress refinery systems designed for stable, predictable feedstock flows. While this diversion temporarily improved feedstock availability, it also exposed the system's limited flexibility and the absence of strategic buffer mechanisms that could absorb such shocks without emergency interventions. The planned [capacity additions at Shymkent refinery](#) will increase absolute throughput but do not fundamentally alter the geographic concentration or reduce dependence on a small number of critical pipeline corridors. Scheduled preventive maintenance, which has once again become an annual occurrence despite modernization at the main refineries, appears to reflect the accumulated depreciation of technological lines.

Strengthening infrastructure integrity requires both institutional reforms and tangible investments. Officially established minimum storage requirements for both crude and refined products would create operational buffers, with targets set at levels sufficient to resolve supply disruptions and secure alternative sources without materially affecting ongoing operations. [New refinery in Mangistau](#) should place add surplus (10 MMt) capacity for crude processing near the major oil producers and export infrastructure. Pipeline redundancy should be prioritized for the most vulnerable corridors, particularly crude supply routes to Shymkent, potentially through new pipeline construction or developing rail transport alternatives as backup. Implementing predictive maintenance programs using modern monitoring technologies (as it was intended by refineries' modernization programs) would shift from reactive repairs to proactive interventions, reducing unplanned downtime and extending asset lifespans.

Geopolitical and physical security

Geopolitical and physical security, within [the energy sovereignty framework](#), addresses the vulnerability of energy systems to external political pressures, territorial disputes, sabotage, accidents, and natural disasters. For the downstream sector, this dimension examines how international relationships, border dynamics, and physical threats can disrupt operations or constrain strategic decision-making. True security requires not only physical protection of assets but also diplomatic and commercial arrangements that preserve operational autonomy even amid shifting geopolitical landscape.

Kazakhstan's downstream sector operates within complex geopolitical constraints shaped primarily by the country's geographic position and deep economic integration with Russia across multiple energy vectors, including crude oil, natural gas, refined products, and electricity. This multidimensional energy interdependence limits sovereign decision-making

and creates both importing vulnerabilities due to ongoing war conflict and opportunities for Russia's redundancy capacities. Physical security measures for refineries and connecting infrastructure, for obvious reasons, are still protected for peace-time conditions without elaborate protection protocols, redundancy systems, or emergency response capabilities against drone and/or sabotage.

The evolving geopolitical landscape introduces critical security considerations for Kazakhstan's downstream sector, with the primary risk being the potential incapacitation of refineries and critical crude supply pipelines. Kazakhstan's geographic position adjacent to active conflict zones creates an unavoidable exposure that cannot be mitigated through relocation - the country's refining infrastructure should operate where it stands, regardless of regional instabilities. Tensions between major powers increasingly manifest through targeted attacks on energy infrastructure, as demonstrated by systematic strikes on pipelines and refineries in various conflict zones globally. This proximity means Kazakhstan's refineries and connecting pipelines face realistic threats of operational disruption or destruction, whether through direct targeting, collateral damage, or spillover effects from regional military conflicts. [Current stocks of refined products in Kazakhstan](#) are built under the peacetime assumptions and are primarily intended to ensure the smooth passage of scheduled preventive maintenance at refineries. Overall, these stocks even exceed [the International Energy Agency standards](#) (coverage of 90 days of net imports). However, in the event of an emergency or "black swan" scenario, the accumulated stockpile may prove insufficient while the region's neighbors would be unable to resupply Kazakhstan.

Enhancing geopolitical and physical security requires diplomatic, commercial, and technical measures informed by lessons from ongoing regional conflicts, particularly the demonstrated vulnerability of energy infrastructure to wartime disruptions. Kazakhstan should negotiate feedstock supply agreements that include explicit force majeure provisions and alternative sourcing mechanisms, ensuring that commercial contracts contain safeguards against politically motivated infrastructure interruptions. Establishing a strategic refined products stockpile, with sufficient capacity to resolve supply shocks and secure alternative sources without materially affecting ongoing operations, would provide crucial buffer capacity during disruptions. Physical security enhancements should include comprehensive risk assessments for all major facilities on the basis of a comprehensive assessment of the country's "margin of safety", implementation of modern monitoring and protection systems, and development of rapid response protocols for various threat scenarios.

Demand-side policy

Demand-side policy, within [the energy sovereignty framework](#), encompasses the regulatory, fiscal, and institutional mechanisms that shape consumption patterns, manage demand during supply constraints, and align market behavior with energy security objectives. Unlike supply-side interventions that focus on production and infrastructure, demand-side policies

recognize that sovereignty includes the capacity to influence how energy is consumed, allocated during scarcity, and priced to reflect true costs and strategic priorities. Effective demand-side policy creates flexibility in the system, enabling authorities to manage consumption during shocks without resorting to crude rationing or market disruptions.

Kazakhstan's demand-side policy framework for the downstream sector remains underdeveloped as a sovereignty tool. Motor fuel pricing policies, while recently reformed to reduce subsidies, still lack the flexibility to send clear market signals during supply stress or to incentivize conservation during shortages. The regulatory framework provides limited tools for demand management during crises, with no published protocols for allocation priorities, rationing mechanisms, or emergency consumption restrictions. Consumer protection regulations, designed to prevent prices gouging, can constrain supply responses during shortages by preventing prices from rising to clear markets.

Kazakhstan faces chronic deficits in jet fuel and diesel (the products most critical for transportation and economic activity) while producing surplus mazut that has limited domestic use. Central Asian countries, including Kazakhstan, have [experienced fuel supply disruptions from regional refineries](#), forcing them to seek alternative but costlier suppliers. Furthermore, Kazakhstan regularly enforces fuel export bans as a proactive measure against potential fuel shortages, as the Ministry of Energy did in [January 2025](#) and [September 2025](#). Rapid motorization and economic growth drive fuel demand increases that outpace refining capacity additions, particularly in southern regions. The lack of demand management tools means authorities face binary choices during supply crises: either allow prices to spike, creating political backlash and equity concerns, or impose price controls that lead to queues, hoarding, and black markets.

Among refined products, jet fuel represents a distinct and structurally constrained segment. Unlike diesel, shortages of jet fuel in Kazakhstan are not merely seasonal but reflect limitations in product slate configuration and incentives within the existing refining model. This constraint has direct implications for the development of cargo and transit aviation, effectively limiting Kazakhstan's ability to leverage its geographic position as a regional air logistics hub.

Kazakhstan should establish a comprehensive strategic refined product reserve system, targeting sufficient capacity to resolve supply disruptions and secure alternative sources without materially affecting ongoing operations, managed by an authority with clear release protocols. Implementing dynamic export licensing for refined products would enable authorities to redirect domestic production during shortages without permanent export bans that could undermine long-term trade relationships. Fuel pricing reform should introduce greater flexibility, allowing prices to reflect supply conditions while protecting vulnerable consumers through targeted subsidies. The [2025-2040 refinery development strategy's](#) ambitious capacity targets represent necessary but insufficient conditions for sovereignty;

without addressing demand-side policies, expanded capacity may simply scale up existing vulnerabilities rather than resolve them.

The Bottom Line

Kazakhstan's downstream sector has achieved notable capacity expansion, with crude throughput reaching 19.3 million metric tons in 2025 and ambitious plans to reach 39 million tons annually by 2040. The completion of modernization programs at all three major refineries, planned capacity doubling at Shymkent, and a new refinery in Mangistau demonstrate the government's commitment to meeting domestic demand and export opportunities. However, capacity expansion alone does not constitute sovereignty. The persistent vulnerabilities identified in this analysis reveal that structural reform has lagged behind physical expansion. The [January 2026 diversion of Kashagan crude to domestic refineries due to CPC pipeline bottlenecks](#) exposed the system's limited flexibility and reactive approach to supply security. The continued deficit in jet fuel and diesel, coupled with surplus mazut production, demonstrates that product slate needs optimization.

China crossed a structural threshold in 2025, with non-diesel vehicles accounting for most new sales in heavy trucks and industrial equipment. This shift suggests that growth in diesel demand across Asia may slow sooner than previously expected, increasing the risk of structural oversupply and export competition. In contrast, demand for aviation fuel is likely to remain comparatively resilient, reinforcing the strategic importance of addressing jet fuel availability within Kazakhstan's downstream sector. Kazakhstan's persistent jet fuel deficit thus represents not merely a current inconvenience but a strategic misalignment with future market dynamics, where aviation fuel may offer more stable demand and better export prospects than other refined products.

Sovereignty of the downstream sector requires simultaneous action across multiple dimensions. But most critically, Kazakhstan should develop metrics for its downstream sector's "margin of safety" by quantifying how long the system can meet domestic demand under various disruption scenarios, including feedstock supply interruptions, pipeline outages, and refinery downtime. The definition and measurement of this "margin of safety" will necessarily depend on the strategic options selected: a system relying on strategic refined products reserves will have different resilience characteristics than one prioritizing feedstock diversification or regional capacity redundancy. Each strategic pathway produces a distinct "margin of safety" profile that should be explicitly quantified and monitored. This transparency would enable evidence-based policy decisions, public accountability, and proactive rather than reactive crisis management. The [2025-2040 refining strategy, with its \\$15-19 billion in projected investments](#), represents a necessary but insufficient condition for actual sovereignty. The downstream sector's evolution from passive processor to strategic

asset will determine whether Kazakhstan achieves not merely self-sufficiency in refined products but the institutional capacity to make independent decisions about fuel allocation, respond flexibly to supply disruptions, and balance competing demands of energy security, economic efficiency, and sustainability.

ENERGY Insights & Analytics

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The key tool and product of ENERGY Insight & Analytics is internally developed software - [the Analytical Platform EXia](#), aimed to identify, localize, format, and present data most efficiently for the specified use cases.

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