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Research Article

The Logistics of Dependence: Securing Kazakh Oil Flows to the European Union

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Abstract: This study analyses Kazakhstan's strategic role in the European Union's (EU) energy security in the context of recent international tensions and disruptions to global oil supply chains. As the EU's third-largest crude oil supplier, Kazakhstan occupies a critical position but remains heavily dependent on Russian transit infrastructure, exposing its exports to significant risks. The research employs a qualitative methodology, combining semi-structured interviews with 10 industry and policy experts and an extensive literature review, to assess the economic, political, and infrastructural dimensions of Kazakhstan's crude oil export system. The findings highlight persistent reliance on the Caspian Pipeline Consortium and the Transneft network, the limited capacity, and higher costs of alternative routes such as the Trans-Caspian International Transport Route, and the implications of recent conflicts for maritime security. While alternative routes are unlikely to replace Russian transit in the period until 2030, their strategic value is increasing as the EU seeks to diversify supplies under the REPowerEU agenda. This study contributes to understanding Kazakhstan's export constraints and opportunities, offering insights into the interplay between energy policy, infrastructure, and geopolitics in shaping the EU's future energy resilience.

Keywords: Kazakhstan; crude oil exports; crude supply risks; EU energy security; transit routes; Caspian region.

I. INTRODUCTION

Kazakhstan, a landlocked nation in Central Asia, holds an important position in global energy markets. The country possesses substantial proven oil reserves, estimated at 30 billion barrels, positioning it among the top fifteen countries worldwide by oil reserves [1]. It is the second largest post-Soviet energy producer with the economy highly dependent on its hydrocarbon sector and crude oil and refined product exports. Kazakhstan's crude reserves have solidified its position as a key supplier to the global market. In 2023, Kazakhstan exported over 1.3 million barrels per day making it the 10th largest oil exporter in the world [2]. The same source reports that "In 2023, the main destinations of Kazakhstan's Crude Petroleum exports were: Italy ($3.95B), China ($3.81B), South Korea ($3.65B), Netherlands ($3.18B), and France ($3.14B)." Over the last years, the share of Kazakh crude exports directed to Europe varies between 63 to 84% [3].

The significance of crude oil supplies from Kazakhstan is underscored by the EU's urgent call to diversify energy imports following international disruptions, such as the ongoing conflict in Ukraine, the emerging threats in maritime routes from the Houthi attacks in the Red Sea and the recent conflict between Iran and Israel. We address these topics further below. Kazakhstan is now a key player in the European Union's energy landscape, standing as its third-largest crude oil supplier in 2024, following the United States and Norway [4]. However, this critical energy relationship is built upon a fundamental vulnerability: Kazakhstan's profound dependence on export corridors that transit Russian territory. This vulnerability has increased since February 2022.

There are three major export corridors via which the Kazakh crude is delivered to the EU. Kazakhstan's key oil export infrastructure, encompassing both traditional and alternative routes, is presented in **Fig. 1**.

Figure 1. *Kazakhstan's key oil export infrastructure*

Throughout this paper, export corridors crossing the Russian Federation are referred to as "traditional," in contrast to "alternative" routes that do not. Historically, the Atyrau-Samara pipeline and other legacy Soviet-era infrastructure, along with the post-Soviet Caspian Pipeline Consortium (CPC), have facilitated Kazakhstan's primary access to European markets through the Russian territory. While these routes offer economic efficiencies, they also introduce considerable strategic vulnerabilities due to transiting the Russian territory. [5] rightly mentions in this regard that "In Central Asia, despite the post-Soviet transition, Soviet infrastructures have perpetuated Russian control over regional energy exports, hampered Central Asian states' development and caused regional tension."

The brief description of these routes is provided below. Their major risks are described in the Results and Discussion section.

1. CPC Pipeline

This route connects the major Kazakhstan oil fields, which are developed with strong involvement of Western oil companies, with the Russian Black Sea port of Novorossiysk from where crude is transported by tankers mostly to Italian ports. About 80% of Kazakh crude export volumes are transported via this pipeline annually. The pipeline has its quality bank. The tariffs are competitive with those offered by the Russian oil pipeline monopoly Transneft and are equal to US$38 per metric ton. Several big oil companies operating in Kazakhstan have shares in this pipeline. Despite obvious advantages, the pipeline is at risk, and we address it further below.

2. Transneft system

This route involves crude transportation via the Atyrau-Samara section of Transneft system and then further transportation to Europe. The share of the Transneft system in Kazakh crude export is equal to around 17% annually. As reported in [6] "Most of the KEBCO (Kazakhstan Export Blend Crude Oil delivered via the Russian Transneft system) crude is currently exported via the Black Sea port of Novorossiysk, but more than 20% is sent via Ust-Luga on the Gulf of Finland, and 15% by pipeline to Germany". The Transneft system does not have a quality bank and is subject to international sanctions. KEBCO has been so far exempted. The respondents agreed that the future of these supplies is very uncertain.

3. Trans-Caspian International Transport Route (TITR)

This route also known as the Middle Corridor emerged in response to the obvious need to diversify export routes for the Kazakh crude The most obvious option was transporting crude across the Caspian Sea to Azerbaijani ports from where it can be shipped via the Baku-Tbilisi-Ceyhan (BTC) pipeline that crosses Azerbaijan, Georgia, and Turkey and then by sea to one of European ports. There are other options to ship crude from Baku, namely rail and Baku-Supsa oil pipeline, which allow to deliver crude to the Georgian Black Sea ports of Batumi and Supsa. These routes operate at a small capacity [7], but there are plans to increase shipments.

While various factors have historically influenced Kazakhstan's crude oil exports, there remains a notable gap in comprehensive research specifically examining the profound impact of evolving international tensions, particularly the war in Ukraine, on these crucial energy flows. Considering the mutual dependence of the EU and Kazakhstan, inherent vulnerabilities of existing crude export infrastructure, the increasing threats along key sea routes, and other important factors, a more integrated and analytical understanding of the situation is required. Therefore, this study aims to address this critical gap by providing an analytical review of Kazakhstan's supplies to the EU and its crude oil export routes. This study analyzes the challenges and opportunities associated with the supply of Kazakh crude oil to the European Union (EU). The analysis considers the complex interplay of economic, logistical, and political factors, particularly in the context of emerging trade corridors.

In view of the above, we selected the following objectives of our research:

- To define the strategic drivers and extent of mutual dependence in the energy relationship between the European Union and Kazakhstan in the post-2022 landscape.
- To examine the interplay between the strategic importance and the practical challenges of developing non-Russian export routes for Kazakhstan's energy diversification.

To evaluate the respective risks of traditional and alternative export corridors and determine which poses a greater threat to the stability of Kazakhstan's oil exports to the EU in the period after 2030.

II. LITERATURE REVIEW

We should start this section by mentioning that the body of academic literature on the topic remains limited. However, there are several scientific papers which studied the topic, and we attempted to cover them here. We would like to start with [8], which points out that "For the Caspian oil producers, the critical problem was – and to some extent remains – their reliance on evacuation routes that run through Russia. Diversification of export routes was recognized as an important goal after 1991 but was impeded by the geopolitical difficulties…". Certainly, there are more recent publications, which are covered below.

1. The EU policy to diversify its energy imports and its relation to Kazakhstan

Also, among the first attempts to study this topic, we should mention [9], which studied "the significance of Caspian oil and gas for diversifying energy imports to the Visegrad Group countries". Important point was made in [10] that "the EU and Kazakhstan have complementary interests for a mutually beneficial cooperation in the energy sector." The same source continues that "Kazakhstan is a welcome supplier for the EU independent from Russia and the Middle East." In general, Kazakhstan's strategic role in global energy markets has gained significant importance as Europe diversifies its energy import sources away from Russian hydrocarbons. As a result, the Russia's share in extra-EU oil imports decreased from 25% in 2021, the year before the invasion of Ukraine, to less than 3% in 2024 [11]. This new EU policy is called the REPowerEU Plan and has phasing out Russian fossil fuel imports as one of its goals [12]. Moving in this direction the European Union concluded a strategic partnership with Kazakhstan on raw materials, batteries and renewable hydrogen [13], while "the European Investment Bank entered into MoUs with the Central Asian countries on 29 January 2024, including with Kazakhstan, to co-finance transport projects to implement the EU's Global Gateway initiative (GGI). Continuing the GGI topic, we would like to mention the Global Gateway Investment Forum for EU-Central Asia Transport Connectivity, which took place in January 2024. During this forum, special attention was paid to the TITR, and it was "announced that European and international financial institutions present at the Forum will commit €10 billion in support and investments towards sustainable transport connectivity in Central Asia" [14]. It should be noted here that though the TITR is primarily for containers and other general cargo shipments, it is also used for oil transportation [15].

Other reasons, which enhance the need in diversifying energy supplies to the EU is the above-mentioned impact of Houthi attacks on navigation in the Red Sea and the June 2025 Twelve-Day War between Iran and Israel that have severely impacted global shipping lanes. As [16] points out "The Red Sea crisis is yet another major disruption affecting the dynamics in shipping and logistics." The influence of the Twelve-Day War was probably even bigger and affected the EU through "Brent crude oil prices spiked by over 10% following the escalation, reaching approximately $78.50 per barrel" and the risk of closure of the Strait of Hormuz, which could pose 'the most significant threat to global logistics. Approximately 20% of the world's oil passes through this narrow passage daily." [17].

2. The EU Logistics Sector

Given the topic of our research, it is essential to examine developments in the logistics sector of the European Union, particularly focusing on one of its most significant aspects, which is sustainability, described as "a crucial dimension of our life at the beginning of the third millennium." This issue is addressed in several publications. For instance, [18] "aims to define a new concept: the cognitive

sustainability domain" while [19] conducted "a content analysis of sustainability reports in the logistics sector". Another work in this direction is [20] "presents a study about the urban-rural-highway separation, which is widely used and crucial for the sustainability assessment".

Despite growing sustainability concerns, hydrocarbons continue to play an important role in the EU energy balance. Topics related to the use of hydrocarbons are discussed in works such as [21], [22] and several other related publications.

A broader review of different aspects of the EU logistics sector is presented in [23] who argue "that the human factor is far more important for improving the logistics performance index than infrastructure and institutions". Additional contributions include [24] who examined the industrial dynamics within the EU logistics sector and [25], who outlined "the fundamental trends in the European logistics industry" along with several other relevant studies.

3. Dependence on transit via Russia and problems associated with it

Kazakhstan is a landlocked country, and this circumstance affects its connectivity and trade seriously. As [26] reports "Kazakhstan exports 70% of its total oil production, of which 98% is sent via two routes – the Caspian Pipeline Consortium and the Uzen – Atyrau – Samara oil pipeline (**Fig. 1**). This creates a dependence on one country and risks in case of escalation of conflict in the region". Unfortunately, the international environment, particularly influenced by the Russo-Ukrainian conflict and associated sanctions, has exposed pervasive vulnerabilities within Kazakhstan's energy export system, which largely relies on traditional routes transiting through Russia [27]. Among other publications on this topic, we can mention [28] that studied the importance of the Caspian countries for the European Union energy security, [29] that highlighted "the significance of cooperation not only between the EU and the Caspian region, but also with energy-transporting countries such as Ukraine, Georgia, and Turkey, as well as of finding alternative routes that bypass countries with low levels of political stability, such as through the Trans-Caspian Pipeline" and [30- 32], which analyzed the reasons for the dependence on Russian transit and considered alternative routes. It is worth noting that the latter three sources provide a retrospective analysis of Kazakhstan's crude oil and refined product deliveries to the EU over the past seven years. This is important because the logistics of these supplies from Kazakhstan to the EU have been changing rapidly and therefore require periodic reassessment.

The main export outlet for Kazakh crude is the Caspian Pipeline Consortium pipeline (CPC), which transits Russia (**Fig. 1**). Approximately 80% of Kazakhstan's oil exports transit via CPC to the Black Sea port of Novorossiysk, underscoring a significant reliance on this route [33]. This dependence has consequently exposed Kazakhstan to considerable geopolitical risks, including potential regulatory interventions and physical disruptions. A notable incident occurred in July 2022, when a Russian court ordered a temporary suspension of CPC operations due to alleged environmental violations affecting its Black Sea moorings. Although the order was swiftly appealed and operations restored [34], this event, alongside more recent disruptions like a drone attack in February 2025 [35] and regulatory fines in April 2025 [36], clearly underscores the inherent fragility of Kazakhstan's key export infrastructure.

4. Kazakhstan's efforts to diversify its export routes

We have already addressed the EU's efforts to diversify its oil import routes. Now, we will consider publications that study Kazakhstan's diversification efforts. They include, but are not limited to [37], which mentions that the country's economic "growth remains heavily dependent on exports of primary commodities, especially fossil fuels". It continues that "Kazakhstan's export diversification ambitions have not yet realized their potential benefits." [38] specifically considered diversifying Kazakhstan's oil exports away from Russia.

However, alternative routes non-passing through the Russian Federation, while bearing high strategic significance, incur a premium cost compared to the CPC route. As [39] reports, "The cost of transportation via the BTC–approximately $120 per ton–is three times higher than the Caspian Pipeline Consortium (CPC) route, which transports oil from the Tengiz field to Russia's Novorossiysk port." The same source continues that "Although experts acknowledge the BTC has the potential to bypass Russia entirely, they note it is underutilised despite its capacity to handle up to 60 million tonnes annually. Expanding the pipeline's use requires significant infrastructure investments." Nevertheless, maintaining and developing this corridor is vital for Kazakhstan's export resilience, especially as the EU seeks to mitigate the use of energy supply as a political tool by Russia [40]. [41] focuses "on the shipment of petroleum products via the TITR" and advises that "despite the absence of restrictions on the transit of goods to Europe through Russia (for Kazakhstani goods), there are serious challenges to increasing the delivery time."

As mentioned above, though comprehensive academic literature on global energy geopolitics is extensive, scholarly publications specifically addressing the evolving dynamics of Kazakhstan's crude oil export to the European Union amidst recent geopolitical disruptions remain limited. This necessitates drawing upon a diverse range of

reputable non-academic sources, including analytical reports from international organizations, expert commentaries, and specialized news outlets, to provide a holistic understanding. This article, therefore, endeavors to contribute to bridging this specific research gap by synthesizing available information and offering an in-depth analysis of these critical regional issues.

III. DATA AND METHODOLOGY

Our qualitative study employed a combined methodology, integrating primary data obtained through semi-structured expert interviews with relevant secondary data obtained through literature review. This research design was specifically selected to gain in-depth insight into the complex economic, strategic, and infrastructural factors shaping Kazakhstan's crude oil supplies to the EU. Such an approach is particularly appropriate for investigating complex issues and their future trajectories.

1. Secondary Data Collection

Secondary data were collected from a variety of reliable and current sources, encompassing academic publications, market analyses, policy papers, and institutional reports released in recent years. To mitigate potential bias and ensure objective insights, various sources originating from Europe, Kazakhstan, other countries, and international organizations were rigorously examined. The identification of relevant literature involved targeted Google Scholar keyword searches, including but not limited to "EU Kazakhstan energy cooperation," "EU oil imports from Kazakhstan," "Kazakhstan oil exports," and "Kazakhstan oil export infrastructure." Subsequently, the collected literature was analysed for recurrent themes and emerging trends pertaining to EU crude imports, strategic infrastructure investments, logistical vulnerabilities, EU policy initiatives, and Kazakhstan's export corridors.

The insights gained from this literature review directly informed the preparation for interviews and the formulation of specific interview questions, ensuring a targeted approach for primary data collection.

2. Primary Data Collection

The interviews were aimed at better understanding the existing situation, exploring potential mitigation strategies and ascertaining the future dynamics and opportunities. They are especially meaningful when (as we mentioned above) the body of academic literature on the topic remains limited. While the literature review provided a broad understanding of the geopolitical and infrastructural context, the semi-structured interviews offered in-depth, real-world insights that are not available in published sources. In sum, the primary data provided essential information that was critical for achieving the research objectives.

3. Selecting interviewees

Purposive sampling was used to select experts based on their familiarity with crude oil logistics and supplies, particularly from Kazakhstan to international markets including the EU, and their direct involvement in Kazakhstan's energy, transport, and logistics sectors.

Initially, we approached 45 individuals, which were selected based on their knowledge of the topic and relevant work experience. Among these 45 individuals there were those who were recommended by experts approached earlier. However, 35 of them either declined to participate or demonstrated insufficient knowledge of the subject matter. It should be noted here that the number of people knowledgeable in the topic is per se quite small. At the end we interviewed 10 individuals. Their profiles are given Appendix 1. In spite of the limited sample size, we reached data saturation, i.e., adding additional interviewees discontinued providing any further insights.

4. Difficulties encountered during the interviews

- Most of the respondents are very busy people, so the time we had was usually very limited. In some cases, this resulted in short answers to our questions.
- Certain issues, particularly those relevant to government policies and actions, were considered sensitive by some respondents. We dealt with this through assuring that their answers would remain anonymous.

5. Questionnaire for Expert Interviews

1. Given the major geopolitical shifts since 2022, particularly the war in Ukraine and increased maritime instability, Kazakhstan has become the EU's third-largest oil supplier. From your perspective, could you elaborate on the key strategic drivers that make this energy relationship so crucial and mutually dependent for both the European Union and Kazakhstan?
2. Considering existing and potential constraints, how do you assess the practical viability of developing alternative export routes like the Middle Corridor, and what is the strategic importance of pursuing them for Kazakhstan, even if they remain a secondary option to Russian transit?
3. Could you compare the primary risks of Kazakhstan's Russian-reliant corridors (CPC, Transneft) versus the alternative routes? Which set of risks do you believe poses a greater long-

term threat to the stability of oil exports to the EU? In the context of this article, the term "long term" refers to the period after 2030.

6. Processing and Analysis of Collected Information

To ensure reliability of our data, we compared interview findings with insights from the literature review, we asked our respondents to comment on the opinions of other respondents or expressed in literature sources. Every effort was made to identify and resolve potential contradictions. The triangulation of the interview with secondary sources provided a more nuanced view of Kazakhstan's strategic position. The chosen approach allowed the research to delve into the more complex structural and strategic reactions of the EU and Kazakhstan to shifting international dynamics as well as made it possible to look into future prospects and possible solutions.

Both the literature review and the interview findings were then integrated. This holistic approach facilitated the triangulation of information, validating insights across different data sources and enabling a comprehensive understanding of the research problem. The outcomes of this integrated analysis were then presented in the Results and Discussion section, where findings were interpreted and critically examined in relation to the established research objectives.

IV. Results and Discussion

This study identifies the key strategic drivers, mutual dependencies, and operational constraints defining the Kazakhstan-EU energy relationship. Our analysis, synthesizing expert interviews and literature, reveals that while the relationship is crucial for both parties, offering the EU diversification and Kazakhstan a stable market, it is fundamentally constrained by Kazakhstan's high dependence on Russian transit infrastructure and the significant risks this entails.

In response to the first question of our questionnaire "Given the major geopolitical shifts since 2022, particularly the war in Ukraine and increased maritime instability, Kazakhstan has become the EU's third-largest oil supplier. From your perspective, could you elaborate on the key strategic drivers that make this energy relationship so crucial and mutually dependent for both the European Union and Kazakhstan?", our interviewees initially highlighted that political instability in the region and around it, infrastructural bottlenecks, and European energy diversification have significantly impacted Kazakhstan's crude oil supplies to the EU. They further elaborated on the mutually beneficial nature of these supplies, providing supporting reasons. Significantly, these interviewee perspectives align with the literature review findings. A summary of our findings is provided below.

Several key factors drive the European Union's import of Kazakh crude oil:

- EU's Energy Diversification Strategy: The EU's policy to reduce reliance on Russian hydrocarbons in the face of escalating sanctions and the pressing need for enhanced energy security, significantly boosts the demand for alternative suppliers. We already mentioned in the Literature Review section that implementing this policy, European and international financial institutions committed €10 billion in support and investments towards sustainable transport connectivity in Central Asia. These investments are not only political declarations, but also practical steps aimed at improving the technical capacity, interoperability, and resilience of existing routes such as the TITR. Although some of these corridors remain economically marginal at present, targeted EU financing and institutional support could gradually enhance their reliability and reduce Kazakhstan's dependence on Russian transit in the period after 2030. Importantly, this comes at a time when Europe's oil consumption is on the rise. [42] reports that it "is 2% higher than it was at the start of Russia's invasion of Ukraine."
- Kazakhstan is currently the third-largest supplier of crude oil to the European Union. Its significance has increased notably since the start of the war in Ukraine, as the country ranked only fifth in 2022.
- There is a chance that Kazakhstan will replace Norway as the 2nd largest crude supplier to the EU. As [43] reports "Kazakh crude oil exports to the EU continue to grow and approach those of Norway." It continues that "the EU imported 9.1 million barrels of oil per day (boe) last year. The first sources were the United States, with 1.4 million boe, Norway with 1.1 million boe and, very close, Kazakhstan, with 1.05 million boe."
- Geographical proximity: Kazakhstan's major oil deposits (Karachaganak, Kashagan and Tengiz) are situated substantially closer to the EU in comparison with the Middle East oil deposits.
- Despite all political complications, Kazakhstan has so far managed to maintain a certain level of neutrality. This fact increases its credibility as a reliable energy partner.
- Kazakhstan's KEBCO crude oil possesses a similar quality profile to Russia's Urals, making it highly compatible with many European refineries specifically designed to process this type of crude [3]. Kazakhstan launched its own brand in 2022 to differentiate its oil from Urals after sanctions were imposed on the Russian crude.

The broader international landscape has further complicated the situation, particularly concerning maritime security. Operations conducted by the Houthi movement have significantly impacted shipping lanes, notably in the Red Sea, resulting in increased shipping costs and extended delivery times. Adding to this volatility, the recent conflict between Iran and Israel has raised further concerns regarding the stability of critical Middle Eastern chokepoints, such as the Strait of Hormuz, and global oil supply lines.

Such an environment, marked by increased uncertainty and a heightened need for reliable energy supplies, could have created a significant opportunity for Kazakhstan to solidify its position as a stable oil exporter to European markets. However, the ongoing war between Russia and Ukraine has simultaneously complicated Kazakhstan's export capabilities, particularly through its traditional routes, affecting its ability to fully capitalize on this potential advantage. This complex geopolitical climate therefore amplifies the urgency for Kazakhstan to secure diverse export corridors and simultaneously strengthen its energy partnerships, especially with European nations.

What are the reasons for Kazakhstan to export its crude to the EU?

- Market size and geographical proximity: The EU is the largest and closest major importer of Kazakh crude oil.
- Established Market and Infrastructure: The EU has served as Kazakhstan's principal crude oil importer not only in recent years but also as a traditional, long-standing partner. Critically, the existing oil transportation infrastructure, including pipelines, has been specifically designed for export to the EU market. In contrast, the pipeline to China remains underutilized, primarily serving producers from Russia's West Siberia, while rail shipments to neighboring countries are relatively insignificant.
- Long-Term Market Stability: As noted in [44], "In the long term, Europe is likely to import mostly non-Russian barrels from Kazakhstan and Azerbaijan. However, the long-term outlook is uncertain and flows of Russian barrels to some European countries cannot be excluded in the medium and long term, given a possible peace agreement related to the conflict in Eastern Europe. Nevertheless, it is unlikely that crude and condensate flows of Russian crude to Europe will reach pre-conflict levels even in the longer term."

The second interview question "Considering existing and potential constraints, how do you assess the practical viability of developing alternative export routes like the Middle Corridor, and what is the strategic importance of pursuing them for Kazakhstan, even if they remain a secondary option to Russian transit?" generated interesting though pessimistic discussion. Its main points were:

- Economic constraints: The routes bypassing Russia entail substantially higher costs, and we specifically discussed this topic with our respondents. The most optimistic opinion was that they are 30% more expensive. However, all other interviewees rejected this estimation as too optimistic. It is important to explain why there is a discordance of experts' opinions. This is because for some well-established routes like CPC tariffs are well known. However, for other routes, especially for rail ones or for trial pipeline shipments tariffs are often discounted and kept confidential. The higher costs are stipulated by much more sophisticated logistics: multimodality, which creates the need in several trans-shipments, ship demurrage because of difficult weather conditions at the Caspian Sea, shallowing of this sea, etc.
- Logistical constraints: The Russian Transneft pipeline system gives an opportunity to deliver crude oil from Kazakhstan to the EU directly without any trans-shipment (**Fig. 1**). This was the main way to supply Soviet crude to Eastern and Central European countries.
- Political constraints: Potential unwillingness of the Russian side to allow the transit of Kazakh crude is possible. The chances of such an outcome will significantly grow if the political situation deteriorates. There was the case when Russia "halted supplies of oil to Poland… The supply halt via the pipeline – exempted from EU sanctions imposed on Russia following its full-scale invasion of Ukraine – came a day after Poland delivered its first Leopard tanks to Ukraine." [45]
- Infrastructure constraints: In case, the Kazakh crude supplies to the EU will have to bypass the Russian territory via the Middle Corridor, the existing infrastructure will be able to accommodate not more than 10% of the current volumes. There are several reasons for this situation, the primary ones being economic. The Russian transit has been and will remain the best option. This is why Kazakh oil producers did not want to invest in alternative infrastructure.

Despite all these constraints, having an alternative route is very important, especially if the political situation in the region continues to deteriorate. This point was stressed by all our respondents who referred to a possibility when supplies, which will avoid the Russian territory become the only available option. This is why it is of utmost importance to preserve and develop it.

Answers to the third interview question "Could you compare and contrast the primary risks of Kazakhstan's Russian-reliant corridors (CPC, Transneft) versus the alternative routes? Which set

of risks do you believe poses a greater long-term threat to the stability of oil exports to the EU?" revealed insights on Kazakhstan's oil export corridors and associated risks, the summary of which is presented below.

The authors synthesized data from expert interviews and a literature review to develop a summary of the risks associated with each corridor, as outlined in **Table 1**.

Since the onset of the conflict in Ukraine, Kazakhstan's oil export operations have experienced heightened risks and disruptions, particularly influenced by Western sanctions targeting Russia's energy sector. This period of disruption underscored an urgent imperative for Kazakhstan to re-evaluate and diversify its energy export routes, thereby reducing its dependence on Russian transit infrastructure.

Over these years, the dependency of Kazakhstan on transit via Russia has been perhaps the most important problem. This is why, Kazakhstan has sought alternative ways to address these concerns without being exposed to dependence on Russian transit routes. The most obvious of them is transporting crude across the Caspian Sea to Azerbaijan ports from where it can be shipped through the Baku-Tbilisi-Ceyhan (BTC) pipeline that crosses Azerbaijan, Georgia, and Turkey and then to by sea to one of European ports. There are other options mentioned above (rail and Baku-Supsa oil pipeline). We also mentioned earlier that the cost of transportation via the BTC is three times higher than via the CPC. Additionally, these routes suffer from capacity limitations in shipping and port infrastructure throughout the Caspian Sea, political complexities, and inconsistent investment from international sources in its development described above. However, they can be regarded strategically as a long-term investment in energy security for Kazakhstan. Notably, cargo transportation along the TITR has been consistently growing since 2022 and the EU committed to invest 10 billion euros to develop transport links in Central Asia, including new commitments for the TITR [45].

The interviews revealed doubts about the route's scalability without multilateral cooperation from Azerbaijan, Georgia, Kazakhstan and Turkey.

Nevertheless, our interviewees expressed cautious optimism regarding the future of export routes (CPC Pipeline and Transneft system) crossing the Russian territory, though they did not rule out a possibility of complete cessation of transportation via these routes by the Russian side in case of worsening of political situation or strengthening anti-Russian sanctions. They agreed that this move will mean a collapse of the Kazakh oil industry though considered the probability of this risk as low.

The other alternatives were rejected by the interviewees on political (shipments via Iran) or geographic grounds (via China).

V. CONCLUSIONS

To summarize the above-mentioned, we would like to point out the following:

- The EU's strategy to become independent from Russian oil through initiatives such as REPowerEU creates new opportunities for Kazakhstan.
- Kazakh oil attracts more and more European states' attention. Germany, Italy, and Romania are significantly increasing imports from Kazakhstan as countries are searching for safe and politically neutral energy suppliers.
- The interviewees generally expressed skepticism regarding significant improvements in regional security, largely anticipating a further intensification of sanctions pressure on Russia and a broader deterioration of the political landscape. Therefore, Kazakhstan's role as a non-OPEC, non-Russian supplier for Europe becomes even more critical in guaranteeing uninterrupted energy flows.
- Because of the reasons described above, primarily cost considerations, the routes

Table 1. *Kazakhstan's oil export corridors and associated risks*

Corridor	*Destination*	*Transit Countries*	*Destination*	*Capacity (bpd)*	*Risk Level*	*Notes*
CPC Pipeline (Russia)	Southern Europe	Russia	Southern Europe	~1.4 million	High	Subject to sanctions and air attacks
Atyrau-Samara (Russia)	Europe	Russia	Eastern Europe	~400,000	High	Subject to sanctions
TITR (Turkey or Black Sea)	Southern Europe	Azerbaijan, Georgia	Southern Europe	~45,000	Medium*	High exposure to regional instability
Kazakhstan-China Pipeline	China	None	China	~400,000	Low	Stable but limited capacity

* Until very recently, the TITR was considered relatively safe, a status largely unaffected even by the conflict between Azerbaijan and Armenia. However, this perception was challenged on July 24, 2025, when the first case of crude oil contamination was revealed in the BTC pipeline, forcing the diversion of crude oil exports [44].

bypassing Russia will remain marginal. This marginality is the main reason why investors abstain from developing them.

- While Kazakhstan has several theoretical alternatives to decrease its dependence on the CPC pipeline, practical odds (from technical capacity and political risks to infrastructure gaps) create major obstacles for these alternatives.
- Currently, the Middle Corridor is not as capacitated and efficient as the other more established routes, but it is slowly growing in terms of strategic importance.

All the conclusions listed above are derived from the results of our analysis and are consistent with the views expressed by the interviewed experts. These expert assessments provided the empirical basis for interpreting the strategic, economic, and infrastructural aspects of Kazakhstan's role in the EU's evolving energy landscape.

This research study has investigated Kazakhstan's role as a strategic partner in the EU's energy supply reconfiguration following Europe's efforts to wean itself off Russian hydrocarbons. With the major shifts resulting from the war in Ukraine, the EU's REPowerEU agenda and other developments, Kazakhstan has emerged as one of the main alternative suppliers due to its huge oil reserves, geographical proximity, well-established track-record of crude supplies to the EU, etc. However, the landlocked nature of the country and dependence on Russian transit infrastructure complicates the reliability of Kazakh crude supplies to the EU.

1. Practical implications

Our results may be useful for policymakers, businesses, and international organizations from the region, the neighboring countries and international organizations.

2. Theoretical implications

Our results also contribute to the existing literature on this topic, which is very limited in comparison to developed countries.

3. Research limitations

- Limited availability of data: this study relies on literature sources and expert opinions rather than statistical analysis. This is because the existing statistics are often either distorted or simply unavailable.
- Potential bias in expert responses: perspectives may vary based on institutional affiliations. As already mentioned, to address this limitation we compared interview findings with insights from the literature review, we asked our respondents to comment on the opinions of other respondents or expressed in literature sources. Every effort was made to identify and resolve potential contradictions.

AUTHOR CONTRIBUTIONS

E. Akhmedov: Conceptualization, Theoretical analysis, Writing, Review and editing.

A.-C. Diewert: Collecting information, Theoretical analysis, Writing, Review and editing.

Y. Bagdaulet: Conceptualization, Methodology, Writing.

E. Vígh: Collecting information, Theoretical analysis.

DISCLOSURE STATEMENT

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APPENDIX 1

List of interviewees

1. Senior employee, Ministry of Transport of Kazakhstan.
2. Former senior employee, Ministry of Transport of Kazakhstan.
3. Mid-level manager, Kazakhstan Transport Association.
4. Manager, Kazakh transport and logistics company.
5. Manager, European oil company.
6. Officer, international financial institution operating in Kazakhstam.
7. Rail manager, international transport and logistics company operating in the Central Asian region.
8. Head of transport operations, international oil company operating in Kazakhstan.
9. Manager, international oil analytics company.
10. Director, international consulting company.

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