
The Impact of Oil and Natural Gas Price Volatility on the Transport Sector: Economic Implications and Policy Perspectives

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Abstract:

Purpose: The aim of this study is to examine the impact of oil and natural gas price volatility on the transport sector, with particular emphasis on operational costs, competitiveness, and strategic decision-making across key transport modes, including road, rail, maritime, and aviation.

Design/Methodology/Approach: The study employs a sectoral and comparative analysis based on secondary data sources, including reports from international institutions and existing academic literature. The research integrates statistical insights and literature review to assess the sensitivity of transport systems to fluctuations in energy prices and to identify adaptation mechanisms used by transport operators.

Findings: The results indicate that volatility in oil and natural gas prices significantly affects transport operating costs, pricing strategies, and market dynamics. High fuel price instability increases financial risk, disrupts logistics planning, and influences modal competitiveness. At the same time, it accelerates the adoption of fuel-efficient technologies, alternative energy sources, and operational optimization strategies. The effects vary across transport modes depending on their energy intensity and level of dependence on fossil fuels.

Practical Implications: The findings highlight the importance of price stability for effective financial and operational planning in the transport sector. The study provides insights for policymakers and industry stakeholders on the need to support energy diversification, improve resilience of transport systems, and promote sustainable infrastructure investments in the context of energy transition and environmental regulations.

Originality/Value: This paper contributes to the literature by providing a comprehensive and sector-specific overview of the economic and strategic implications of energy price volatility in transport. It integrates perspectives across multiple transport modes and links market dynamics with policy and sustainability considerations.

Keywords: Transport, price, volatility, oil, gas.

JEL Classification: E32, Q41, R40.

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1. Introduction

For over a century, crude oil has constituted a fundamental energy source for the global economy, and its derivatives—such as gasoline, diesel fuel, kerosene, and fuel oil—remain the primary fuels powering various branches of transportation: road, maritime, aviation, and, to a lesser extent, rail. The modern transport sector, responsible for approximately 25% of global energy consumption and over 90% of total petroleum product usage, is highly dependent on the dynamics of the oil market.

Fluctuations in crude oil prices can be both short-term (driven by factors such as OPEC decisions, geopolitical tensions, or seasonal demand changes) and structural (linked to energy transition, technological advancement, and climate policy). Their consequences extend across the entire logistics chain, determining operational costs, carrier competitiveness, and the economic and environmental efficiency of transport systems (Bilal *et al.*, 2025; Thalassinos *et al.*, 2022).

Oil prices affect the transport sector directly through fuel costs—which represent one of the largest expenditure items for transport operators—and indirectly through other effects such as electricity prices (in systems reliant on oil- or gas-fired power plants), the cost of technical components (e.g., tires, lubricants, synthetic materials), and inflationary pressures in logistics services.

At the same time, oil price volatility influences investment decisions regarding infrastructure development (e.g., construction of LNG terminals, expansion of charging networks), fleet modernization (e.g., replacement of internal combustion vehicles with electric or hybrid ones), and the shaping of transport and fiscal policy (e.g., fuel taxes, subsidies, emission fees).

The transport industry responds to crude oil price fluctuations with varying levels of flexibility, depending on the market segment. Road transport, which is particularly reliant on diesel fuel, is most directly exposed to fuel price spikes, which influence the cost of transport services and ultimately the prices of consumer goods. Maritime transport implements fuel consumption optimization strategies such as slow steaming and investments in more energy-efficient vessels.

Civil aviation, in turn, actively develops price-hedging instruments and seeks alternative aviation fuels (SAF) to reduce cost-related risks. Rail transport—although increasingly electrified—still relies on diesel traction in many parts of the world (e.g., the United States, India), making it susceptible to oil market volatility.

In the face of growing environmental regulations, energy transition, and decarbonization policies, oil price volatility has become not only an economic factor but also a strategic one. It can accelerate or delay modernization processes, influence the direction of infrastructure and technology investments, and shape the relative

competitiveness of different modes of transportation. Therefore, analyzing the impact of crude oil price fluctuations on the transport sector requires a systemic and interdisciplinary approach, considering market, regulatory, technological, and environmental factors.

2. Literature Review

Over the past two decades, the issue of fuel price fluctuations and their impact on the broadly understood transport sector – from individual mobility and business logistics to environmental implications – has become one of the most frequently explored areas in transport economics and energy studies.

The following literature review systematizes the existing body of research, focusing on four key themes:

- (1) the impact of oil price changes on transport demand,
- (2) the effects on logistics chains and related sectors,
- (3) the consequences of the outbreak of the war in Ukraine on changes in oil and gas prices, and
- (4) regulations influencing the market and potential new solutions aimed at mitigating the impact of oil and gas prices on the transport industry.

3. Research Methodology

The aim of this study was to determine the impact of changes in crude oil and natural gas prices on the transport industry in four selected segments: road, maritime, air and rail. The research methods employed comprised comparative analysis, statistical analysis, and a review of academic and expert literature.

The specific objectives were to:

- assess the sensitivity of operating costs in each transport mode to fluctuations in oil and gas prices;
- identify the adjustment mechanisms adopted by transport companies;
- determine the consequences of energy prices for the competitiveness of individual transport branches;
- analyse the influence of energy prices on emissions and decarbonisation initiatives in the transport sector.

The source material was secondary and included data from reports issued by international institutions (Eurostat, the International Energy Agency, OECD, ITF),

scientific literature, industry studies and market statistics (e.g., Brent/WTI quotations, freight indices, LNG/LPG prices).

A sectoral analysis approach was adopted, examining four key segments separately:

- Road transport, focusing on the effect of fuel prices on freight haulage, urban logistics, and bus services.
- Shipping, with particular attention to fuel costs, LNG market dynamics, and shifts in commodity shipping.
- Rail, viewed through the lens of electricity and gas costs for traction and freight operations.
- Aviation, analyzing how fluctuations in aviation fuel (Jet A1) prices translate into operating costs.

4. Research Results and Discussion

High energy commodity prices cause a significant increase in operating costs for carriers in the road, maritime, rail, and air transport sectors. As a result, rising fuel prices often lead to increases in freight and transport rates, which can limit demand for transport services, especially in the short term.

Low fuel prices reduce operational costs in the transport industry, promoting higher transport activity and lowering transport service prices. Cheap fuel can enhance the competitiveness of road and maritime transport, facilitating the growth of both international and domestic trade.

On the other hand, low fuel prices can often indicate an economic slowdown, which will affect the performance of transport companies.

For the transport sector, price stability of oil and gas is crucial, as it enables better financial, operational, and investment planning. Price volatility leads to significant economic risk, which can result in unpredictable costs, difficulties in setting transport tariffs, and challenges to the profitability of transport enterprises.

Stable prices support efficient supply chain management and route optimization, which translates into lower unit costs and better market competitiveness. For investors, stability is key when making decisions about implementing new technologies, developing infrastructure, and modernizing fleets. Moreover, price stability of energy commodities reduces inflationary pressure in the transport sector, positively impacting the entire economy by enabling more stable growth in trade and logistics services.

Volatility in energy commodity prices affects spatial and logistical planning — for example, the selection of distribution center locations, optimization of transport routes, and the development of transport hubs.

A clear illustration of this is the changing attractiveness of seaports and airports, depending on their access to low-cost fuel sources or LNG infrastructure.

4.1 Road Transport

In Europe and many OECD countries, diesel remains the dominant fuel in road freight transport, powering over 90% of trucks and buses. In the case of passenger vehicles, the share of diesel is lower, yet still significant. In the fleet sector (logistics, long-distance transport), the importance of gaseous fuels such as LNG (Liquefied Natural Gas) and CNG (Compressed Natural Gas) is steadily increasing – mainly due to environmental and economic considerations.

Fuel costs account for 25% to even 40% of total operating expenses in road freight transport, depending on the type of vehicle, distance traveled, road infrastructure, and engine efficiency. Consequently, crude oil prices – which directly influence diesel prices – are one of the main cost drivers for transport companies.

An increase in oil prices leads to an immediate rise in operating costs, particularly for carriers engaged in long-distance international transport. For example, a 30% increase in fuel prices can raise total transport costs by 10–15%, which significantly reduces operational margins and forces companies to increase service prices or cut costs in other areas.

To mitigate the risk associated with fuel price fluctuations, many operators use a fuel surcharge – an additional fee added to the base freight rate. However, it is not always possible to fully pass on the increase in costs to the final customer, especially in a highly competitive market or where price elasticity of demand is high.

Fuel price fluctuations also affect market supply structures – during prolonged periods of high prices, older and less efficient vehicles tend to be withdrawn from service, while there is growing interest in low-emission transport solutions (e.g., CNG/LNG-powered, electric, or hybrid vehicles).

Natural gas – both CNG and LNG – is gaining importance as an alternative fuel in road transport, especially in the heavy-duty segment. Its use is associated with lower emissions of CO₂, NO_x, and particulate matter, and often – in the long term – lower operating costs.

Long-term fuel price increases act as an impetus for fleet modernization – through the purchase of more fuel-efficient models and the implementation of supportive systems such as adaptive cruise control, fleet management systems (fleet telematics), or vehicle aerodynamics enhancements.

Oil and gas price volatility also influences the transport and energy policies of individual countries. During periods of high prices, governments may introduce fuel

subsidies or reduce excise taxes to ease inflationary pressure. On the other hand, high prices accelerate actions supporting the green transition, such as the development of charging infrastructure, support for LNG/CNG adoption, and investments in rail transport as an alternative to road freight.

4.2 Rail Transport

Rail transport, as one of the most energy-efficient and low-emission forms of land transport, plays a key role in implementing sustainable mobility strategies and decarbonizing the transport sector. However, its operation—contrary to common assumptions—is significantly dependent on fluctuations in the global fossil fuel market, including crude oil and natural gas.

This impact manifests both in the direct operational costs of traction units and in the costs of electric energy, the structure of infrastructure investments, as well as competitiveness relative to other transport modes, primarily road and air transport. Depending on the country and the degree of railway electrification, the share of fossil fuels in powering railways varies.

In the European Union countries, approximately 55–60% of total transport work is performed by electric locomotives, while the remainder is carried out by diesel-powered vehicles, mainly with high-speed diesel engines. In countries such as the United States, India, or China, a significant part of the rolling stock consists of diesel locomotives, which increases the sector's direct sensitivity to crude oil price fluctuations.

Diesel locomotives, especially in freight transport, consume considerable amounts of diesel fuel. Fuel costs constitute approximately 15 to 30% of the total operational costs for carriers operating on non-electrified railway lines. Therefore, increases in crude oil prices directly translate into higher transport costs, limiting the profitability of rail services, particularly on low-traffic routes or those serving peripheral areas.

In the U.S., where over 90% of freight trains are diesel-powered, shock increases in oil prices (such as during 2007–2008 and 2021–2022) led to freight rate hikes, decreased profitability of bulk transport, and the necessity to renegotiate long-term contracts with clients.

In energy systems where natural gas plays a significant role in the energy mix, rising gas prices lead to higher wholesale electricity prices, including traction energy supplied to railways. In Poland, where gas-fired and coal-fired power plants jointly produce most electricity and gas prices affect the balancing market, this effect is particularly pronounced. Railway carriers, as large energy consumers, feel this impact through rising MWh tariffs, increasing their operational costs.

Additionally, gas prices influence the CO₂ emissions market (EU ETS), because

when gas prices are high, some power operators revert to coal combustion, increasing demand for emission allowances. This indirectly affects electricity prices for railways. At the same time, even electric rail transport is not entirely independent of energy commodity prices—since traction electricity prices depend on the overall energy market situation, including natural gas prices, which in many countries play a crucial role in electricity generation (notably in energy systems with a significant share of gas-fired sources, such as Germany, Poland, Italy, or the USA).

Rising oil prices increase costs in road transport, which is more energy-intensive and dependent on liquid fuels than rail. This, in turn, improves the relative attractiveness of rail freight, especially for bulk and container transport over medium and long distances. For example, in 2022–2023, a sharp rise in diesel prices led to the shift of some cargo from roads to rails in Central Europe.

High fuel prices encourage investments in low-emission rolling stock and the development of alternative technologies. Examples include hybrid locomotives (diesel-electric), units with energy storage (traction batteries), or vehicles powered by fuel cells (hydrogen). Price volatility of oil and gas also influences decisions regarding the expansion of electrified rail networks—electrification becomes more cost-effective over the long term when fossil fuel costs are high and unpredictable.

In Germany, France, and the Benelux countries, rising diesel and natural gas prices have prompted public operators to accelerate the phase-out of diesel rolling stock and replace it with electric or hydrogen-powered units.

In the context of striving for climate neutrality, rail is seen as a preferred sector for developing low-emission transport. Nevertheless, its ability to fully decouple from fossil fuels is limited by the national energy structure, availability of alternative technologies, and fiscal policies and subsidies.

Fluctuations in crude oil and natural gas prices represent a significant challenge for the economic stability of the rail sector—both directly (through fuel and energy costs) and indirectly (through changes in customer behavior, modal shifts, and impacts on infrastructure investments).

Conversely, decreases in oil prices may lead to lower road transport costs and weaken rail's position, especially on non-electrified routes or those served by electrically powered locomotives with high maintenance costs.

4.3 Sea Transport

Maritime transport constitutes a key pillar of global trade, accounting for approximately 80–90% of the volume of worldwide cargo movement. Its operations are closely tied to the global fuel market, particularly to the prices of crude oil and natural gas, which determine operating costs, freight rate competitiveness, and the

profitability of long-distance maritime routes. Fluctuations in the prices of these commodities affect not only the cost structure of shipping companies but also fleet management strategies, energy efficiency, and demand dynamics for various classes of vessels.

Fuel costs represent one of the largest expenditure components in the operational structure of maritime carriers. For typical cargo vessels (e.g., container ships, bulk carriers, or tankers), fuel—mainly in the form of Heavy Fuel Oil (HFO) or Very Low Sulfur Fuel Oil (VLSFO)—can account for 40–60% of total operating expenses.

In the case of vessels powered by Liquefied Natural Gas (LNG), the recent trend toward decarbonization and the drive to meet International Maritime Organization (IMO) standards, such as MARPOL Annex VI (regulations concerning SO_x and NO_x emissions), have increased the importance of natural gas prices as a key determinant of operating costs.

In practice, maritime carriers apply fuel adjustment mechanisms, such as the Bunker Adjustment Factor (BAF), which allow them to pass a portion of fuel price increases on to customers. However, the ability to fully offset these costs is limited by market competition and the elasticity of demand for shipping services.

An increase in oil prices typically leads to higher freight rates (especially in the short term), which affects the prices of goods in international trade. For example, an analysis of the 2007–2008 period shows that a sharp rise in oil prices (to over \$140 per barrel) caused a steep increase in the cost of container and bulk shipping (e.g., on the Asia–Europe route, by as much as 20–30%).

High fuel prices force changes in operational strategy: shipowners adopt slow steaming (reducing vessel speed), which lowers fuel consumption but increases transit time. At the same time, there is a growing interest in investing in more energy-efficient vessels (eco-ships) and alternative power sources (e.g., LNG, methanol, hydrogen).

Rising fuel prices can make some longer routes (e.g., through the Suez Canal) less economical. Ships may then opt for routes around the Cape of Good Hope, which are slower but more fuel-efficient under slow steaming conditions. Increases in oil and gas prices enhance the competitiveness of alternative fuels and auxiliary propulsion systems (e.g., auxiliary sails, hybrid drives, photovoltaics). Examples include ships equipped with Flettner rotors (Magnus effect) or e-methanol propulsion.

The attractiveness of regional transshipment ports and LNG hubs (e.g., Rotterdam, Singapore) is also changing.

Currently, increasing environmental regulations (e.g., IMO 2020, Fit for 55) are promoting the shift away from traditional HFO toward low-carbon fuels, including LNG. Nevertheless, LNG remains a transitional fuel on the path to decarbonizing the maritime sector, and its price volatility influences investment decisions in new fleets and the development of bunkering infrastructure.

4.4 Aviation

The aviation industry, encompassing both cargo and passenger transport, is one of the most sensitive sectors to fluctuations in fossil fuel prices, particularly crude oil and natural gas. Aviation fuel, primarily jet fuel (kerosene), constitutes a key operational cost for airlines, often accounting for 20–40% of total operating expenses.

Fluctuations in crude oil prices, which is the main raw material for jet fuel production, directly translate into changes in operational costs, which in turn affect fare policies, fleet strategies, and market dynamics. In the aviation industry, jet fuel, derived from crude oil, is the primary fuel powering jet and turboprop engines.

Fluctuations in oil prices have an immediate effect on the unit costs of air transport. During periods of rising fuel prices, airlines often must increase ticket prices and freight charges to compensate for growing costs. At times, sharp spikes in oil prices have led to significant slowdowns in passenger demand growth and declines in air cargo volumes, especially in low-margin cargo segments.

Rising fuel prices motivate carriers to optimize fuel consumption by implementing more efficient technologies, such as next-generation aircraft with better fuel performance (e.g., Boeing 787, Airbus A350), as well as to change operational strategies, including route optimization, increasing load factors, and applying economical piloting practices (e.g., continuous descent, speed optimization).

Although the direct use of natural gas in aviation is limited, gas prices indirectly influence the industry through energy costs at airports (e.g., powering ground infrastructure), production of synthetic fuels, and the development of alternative technologies such as biomass-based aviation fuels (SAF – Sustainable Aviation Fuels) or hydrogen.

Dynamic changes in natural gas prices affect the profitability of producing these fuels and investments in airport infrastructure and future fleets, which is critical in the context of tightening environmental regulations (e.g., CORSIA, the European Green Deal). In the cargo sector, where margins are often lower and competition intense, rising oil prices increase freight costs, which may lead to shifting some cargo to more energy-efficient transport modes like maritime or rail transport. Fuel price fluctuations also influence the dynamics of international trade by changing the cost-efficiency of air transport compared to other transport sectors.

Furthermore, high fuel prices often delay investments in new aircraft and encourage extending the service life of older models, despite their lower fuel efficiency, which impacts operational costs and emissions. Airlines employ various hedging mechanisms in the fuel market aimed at mitigating financial risks associated with oil price volatility.

However, the effectiveness of these strategies is limited by market unpredictability and hedging costs. High fuel price volatility requires carriers to maintain flexible cost and pricing management models, as well as to strongly adapt to global trends such as the COVID-19 pandemic or geopolitical crises affecting commodity markets.

4.5 Consequences of the War in Ukraine on Changes in Oil and Gas Prices

The outbreak of the full-scale Russian–Ukrainian war in February 2022 triggered a series of geopolitical and economic shocks, one of the most significant of which was the sharp destabilization of global energy commodity markets—particularly crude oil and natural gas. As a result of sanctions imposed on the Russian Federation by the European Union, the United States, and other Western countries, serious disruptions occurred in energy supply chains, including the limitation of imports of Russian oil and gas.

In 2022, Brent crude oil prices temporarily exceeded USD 120 per barrel, while natural gas prices on European markets (e.g., TTF) reached record levels of over EUR 300/MWh. This extraordinary situation had both direct and indirect impacts on all segments of the transport sector—cost-wise, logistically, and strategically.

High fossil fuel prices drastically increased operational costs in road, maritime, air, and rail transport. Transport operators experienced a significant rise in diesel prices, which in Central Europe surged by more than 50% year-on-year at the peak of 2022. Transport companies were forced to introduce fuel surcharges, renegotiate contracts with clients, and cut back on operations. The most vulnerable were small and medium-sized road carriers, for whom fuel costs often represent over 40% of total operating expenses.

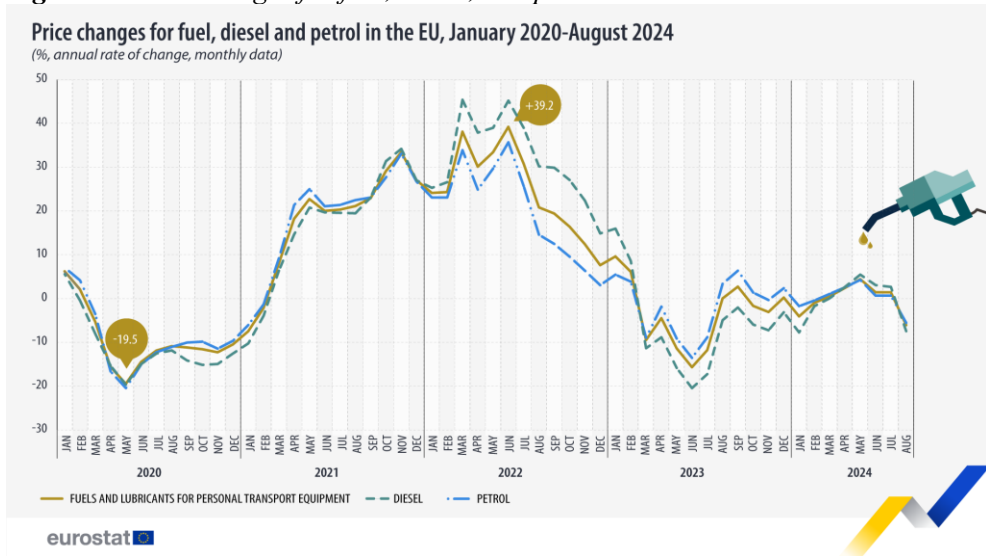
The volatility and unpredictability of energy prices led to disruptions in existing supply chains, particularly those directly dependent on Russian energy and transport infrastructure. Many logistics companies were compelled to revise their strategies—for example, by relocating warehouses and distribution centers to regions with more stable energy access, shortening delivery routes (reshoring, nearshoring), and reorienting trade geographically, especially along the East–West axis.

In maritime transport—particularly on short routes and in the Baltic Sea region—increased costs of LNG and Very Low Sulfur Fuel Oil (VLSFO) led to higher freight rates and a reduction in the number of sailings. Similar phenomena occurred in

aviation—especially in the cargo and short-haul sectors—where rising jet fuel (Jet A-1) prices resulted in a sharp increase in ticket prices and a reduction in flight operations.

The energy crisis also forced a revision of public policies in the areas of transport and energy. EU member states implemented temporary mechanisms for capping fuel prices, reducing fuel taxes, and providing subsidies for public and freight transport operators. At the same time, there was an intensified emphasis on integrating transport policy with energy and climate policy, which is reflected in increased support for public transport, rail, and intermodality.

Figure 1. Price changes for fuel, diesel, and petrol in the EU



Source: Eurostat.

Since the beginning of 2020, the fuel market in the European Union has undergone two major shocks — the COVID-19 pandemic and Russia’s aggression against Ukraine — both of which have clearly impacted the annual rate of change in prices for petrol, diesel, and the broader category of “fuels and lubricants for personal transport equipment” (Eurostat data, year-on-year, monthly).

A turning point came in February 2022, when Russia invaded Ukraine. At the time, the EU was dependent on Russia for around 25–30% of its crude oil and nearly 50% of its diesel (Europe was importing close to 700,000 barrels per day of finished diesel from Russia). The market immediately began pricing in the scenario of a lasting, politically driven supply shock.

Brent crude prices jumped from around \$90 per barrel in January to over \$120 per barrel in March 2022. Refining margins (crack spreads) for diesel in Europe

increased several times over, as Russian semi-finished products (vacuum gasoil) and finished diesel became toxic assets for Western traders. The war forced an accelerated diversification of imports and sped up energy policy reforms (REPowerEU).

Today's slowdown in price growth does not signal a return to the "old normal" — rather, it marks a transition into a period of structural volatility, in which fuel prices will remain more vulnerable to geopolitical shocks than they were before February 2022.

4.6 Regulations Impacting the Industry

Environmental regulations, including emission limits, fuel quality requirements, and standards for extraction technologies, have a direct impact on the costs of crude oil and gas extraction and refining. Tightening CO₂ emission standards and other pollutants (e.g., methane) leads to increased operational costs in the upstream and midstream sectors, which translates into higher production costs and, consequently, increased prices of raw materials. On the other hand, climate and energy regulations such as emissions trading systems (ETS), carbon taxes, or bans on the use of fossil fuels in certain sectors affect the reduction of demand for oil and gas.

Simultaneously, in recent years, the transport sector has been subject to a range of regulations at national, regional, and global levels. The most significant among these include:

- IMO 2020—limiting sulfur content in marine fuels to 0.5%, which increased demand for more expensive low-sulfur fuels (e.g., VLSFO) or alternatives such as LNG;
- “Fit for 55” package (EU) – aims to reduce greenhouse gas emissions by at least 55% by 2030 (compared to 1990 levels), including covering maritime and road transport under the EU Emissions Trading System (EU ETS);
- AFIR (Alternative Fuels Infrastructure Regulation) – mandates the development of alternative fuel infrastructure in road and maritime transport;
- CORSIA (Carbon Offsetting and Reduction Scheme for International Aviation) – a global mechanism for offsetting CO₂ emissions in civil aviation;
- National hydrogen and methane strategies – promoting the transition away from oil and gas as primary energy sources.

The implementation of emission standards in transport, promotion of alternative fuels (e.g., biofuels, hydrogen, electricity), and increasing energy efficiency lead to the gradual replacement of traditional fossil fuels. These regulations encourage the development of low- and zero-emission technologies, which over time may

significantly reduce global demand for oil and gas, especially in the transport and energy sectors. As a result, long-term regulatory pressure may lead to a decline in commodity prices, although the pace of this process depends on the speed of the transition and technological capabilities.

An example includes regulations limiting methane emissions during gas extraction, which require investments in advanced monitoring and emission reduction technologies, as well as bans on exploiting deposits that do not meet environmental standards.

Furthermore, decarbonization policies introduced in OECD countries often result in restrictions on new exploration and production investments, leading to reduced supply of raw materials and upward price pressure in the medium and long term.

5. Conclusions, Proposals, Recommendations

Crude oil prices play a crucial role in the functioning of the transport market, affecting both operational costs and investment strategies, as well as the demand dynamics for transport services. Price fluctuations of oil are complex and multifaceted, encompassing a direct impact on fuel expenditures for transport enterprises, as well as indirect economic and environmental effects. High oil prices result in a significant increase in fuel costs, which translates into higher freight rates, reduced demand, and the necessity to implement solutions that optimize energy consumption.

From the perspective of the transport industry, the most important aspect is price stability, which allows for effective financial, operational, and strategic planning, minimizing economic risks associated with cost unpredictability. Stable prices also support long-term investments in modern technologies and infrastructure, which are key to increasing efficiency and reducing the environmental impact of transport.

Moreover, oil price volatility affects global supply chains by influencing decisions related to the location of transport hubs, route optimization, and the supply-demand structure for transport services. In the long term, environmental regulations and decarbonization policies, combined with a dynamic fuel market, will continue to shape the nature of the transport market, affecting costs, demand structures, and technological innovations within the sector.

Future forecasts of oil price impacts on the transport market indicate further evolution driven strongly by energy transition, environmental regulations, and geopolitical changes in the energy commodity markets. It is expected that in the medium and long term, oil prices will undergo significant fluctuations, related both to limited investments in new extraction sources and to the growing importance of alternative fuels and low-emission technologies. As decarbonization policies intensify and new emission standards are introduced, pressure to reduce fossil fuel

consumption in transport will increase, potentially limiting demand for oil and thereby influencing price stabilization or even decline.

At the same time, constrained resource supply and geopolitical risks may lead to periodic price spikes, forcing the transport industry to undertake further adaptive measures—such as investments in energy efficiency, development of alternative fuel infrastructure (e.g., LNG, hydrogen, biofuels), and implementation of advanced digital solutions supporting logistics and energy consumption optimization.

Price stability will remain a key factor enabling effective sector planning and development, and the transport industry will increasingly need to integrate price risk management strategies with sustainability and climate neutrality goals.

Consequently, the future of the transport market will be determined by a complex interaction of economic, regulatory, and technological factors, where the role of crude oil will gradually diminish, but its influence on the global economy and transport systems will remain significant in the short- and medium-term perspective.

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