# GEOPOLITICS AND THE ENERGY TRANSITION: SHELL AND GAZPROM'S STRATEGIC RESPONSES TO THE 2022 ENERGY CRISIS

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**Abstract:**

This thesis examines how governance structures and ownership models influence energy transition strategies in the oil and gas sector through a comparative case study of Shell and Gazprom from 2020 to 2024. Amid the global energy crisis triggered by Russia's invasion of Ukraine, Shell and Gazprom faced similar market shocks but adopted sharply divergent strategies. Shell, operating in a regulatory-heavy, investor-responsive environment, relaxed short- and mid-term climate goals but retained its long-term net-zero ambition, pivoting toward LNG expansion. Gazprom, by contrast, reinforced its traditional gas-centric model, prioritizing geopolitical over commercial objectives, with minimal adaptation to decarbonization pressures. The findings illustrate that while market forces and climate policy shape corporate behavior, structural factors, like ownership model, political entanglement, and regulatory environment, are decisive in steering firm trajectories. This research highlights the limits of market-driven transition narratives and emphasizes the critical role of state and institutional frameworks in shaping the future of global decarbonization.

**Исполнительное Резюме:**

В данной работе рассматривается влияние структур управления и моделей собственности на стратегии перехода к энергетике в нефтегазовом секторе на примере компаний Shell и "Газпром" в период с 2020 по 2024 год. В условиях глобального энергетического кризиса, вызванного вторжением России в Украину, Shell и "Газпром" столкнулись с аналогичными рыночными потрясениями, но избрали резко отличающиеся стратегии. Shell, работающая в условиях жесткой нормативно-правовой базы и чуткого отношения инвесторов, снизила краткосрочные и среднесрочные цели в области изменения климата, но сохранила свои долгосрочные амбиции, направленные на расширение производства СПГ. "Газпром", напротив, укрепил свою традиционную модель, ориентированную на газ, отдавая приоритет геополитическим целям, а не коммерческим, с минимальной адаптацией к требованиям декарбонизации. Полученные результаты показывают, что в то время как рыночные силы и климатическая политика формируют корпоративное поведение, структурные факторы, такие как модель собственности, политическая запутанность и нормативно-правовая среда, играют решающую роль в определении траекторий развития фирм. Это исследование выявляет пределы рыночных представлений о переходном периоде и подчеркивает важнейшую роль государственных и институциональных структур в формировании будущего глобальной декарбонизации.

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**Glossary:**

- Brent Crude ($/b): a global benchmark for crude oil pricing
- $CO_2$: carbon dioxide
- ESG: Environmental, Social, and Governance; standards used to evaluate corporate sustainability
- EU TTF ($/MMBtu): European Title Transfer Facility; a key benchmark for European natural gas prices
- FSRU: Floating Storage Regasification Unit; ships used to regasify and store LNG
- Henry Hub ($/MMBtu): the U.S. benchmark for natural gas prices, based on deliveries to the Henry Hub pipeline system in Louisiana
- IOC: International Oil Company
- IRR (%): Internal Rate of Return; the expected annualized return on an investment, expressed as a percentage
- JCC ($/b): Japanese Crude Cocktail or Japanese Custom-cleared Crude; Japan's crude oil import price benchmark, often used to price LNG in Asia
- LNG: Liquefied Natural Gas
- NOC: National Oil Company
- O&G: Oil and Gas; the fossil fuel sector including petroleum and natural gas industries
- RES: Renewable Energy Sources; includes wind, solar, and hydroelectric
- Scope 1 Emissions: Direct emissions from company-owned sources
- Scope 2 Emissions: Indirect emissions from purchased energy
- Scope 3 Emissions: Indirect emissions from a company's value chain (e.g., customer use of products)
- West Texas Intermediate ($/b): a major U.S. benchmark for crude oil pricing, based on oil extracted primarily from Texas and surrounding states

**Units of Measure:**

- $gCO_2e/MJ$: Grams of $CO_2$ equivalent per Megajoule
- kboe/d: Thousand Barrels of Oil Equivalent per Day
- Mtoe: Million Tons of Oil Equivalent
- MMBtu: Million British Thermal Units
- MWh: Megawatt-hour
- $/b: U.S. dollars per barrel
- $/MMBtu: U.S. dollars per million British Thermal Units

**1.0 Introduction**:

A small group of energy companies has historically wielded outsized influence over the global economy, geopolitics, and the trajectory of climate change. International oil companies (IOCs) and national oil companies (NOCs) manage trillions in assets, dominate energy markets, and shape industry trends through vast production capacity and political leverage. Among the world's largest firms by market capitalization, these oil and gas (O&G) giants operate across continents and extend deep into policymaking circles and disruptions in the sector ripple across global energy markets and the industries they sustain. Today, amid the pressures of energy transition, de-globalization, and rising geopolitical tensions, these companies face an unprecedented challenge as they balance preserving traditional business models with adapting to a changing world. Against this backdrop, this thesis examines how institutional and governance structures shape corporate energy transition strategies during geopolitical crises. It investigates how Shell and Gazprom as two contrasting case studies diverged in their responses to the post-Ukraine energy crisis, and how differences in ownership, stakeholder pressures, and institutional environments explain their distinct approaches. By comparing Shell and Gazprom from 2020 to 2024, with Russia’s full-scale invasion of Ukraine in 2022 as a key inflection point, this study highlights the limits of market forces alone in driving the energy transition and underscores the critical role of governance structures, regulatory frameworks, and political entanglements in shaping corporate strategy.

Europe, traditionally a leader in the climate and sustainability sphere, and a major energy market home to many O&G majors, now finds itself caught between energy security and sustainability. In the wake of Russia's full-scale invasion of Ukraine in February 2022, Europe has had to contend with extreme changes to its energy security and supply. Altered dynamics

within the European energy system and the energy giant that is Russia have changed global energy dynamics greatly. O&G firms are certainly not immune, as many of them had extensive partnerships and relationships with Russia and certainly operated within the European market.

Two of the largest players within this dynamic market are UK-based Shell plc and Russia's Gazprom PJSC (Russian: ПАО "Газпром"). Shell is a British Dutch multinational IOC and is one of the largest publicly traded companies in the world.[1] Shell is highly diversified geographically and has made significant investments in clean energy technologies, positioning itself as a leader in the global energy transition. Gazprom, on the other hand, is a Russian NOC that is majority-owned by the Russian government, serving as the nation's exclusive natural gas exporter.[2] It is the world's largest producer of natural gas and plays a central role in Russia's economy and geopolitical strategy, particularly with regards to Europe and Asia. As two of the largest players in the European market, Shell and Gazprom were among the most severely impacted by Russia's 2022 invasion of Ukraine and the resulting energy crisis. During this period, Gazprom as a key instrument of Russia's geopolitical strategy, ramped up its energy disruptions, further weaponizing its control of gas supplies to Europe.

In the background of growing geopolitical tensions and an increasingly complex and fragmented energy market, climate change remains an ever-present threat. Fossil fuel companies have historically been among the world's largest carbon emitters, surpassing the emissions of most individual countries. These companies now face both an opportunity and necessity to transform their business models to ensure future profitability as fossil fuel demand begins to

[1] "Our Company History," Shell Global, accessed April 22, 2025, https://www.shell.com/who-we-are/our-history/our-company-history.html.
[2] ПАО «Газпром», "Годовой отчет за 2020 год." (Москва: ПАО «Газпром», 2021).

wane. The EU had been the primary driver of this transition before Russia's invasion of Ukraine in 2022, but the subsequent energy crisis has significantly altered EU energy policy priorities, shifting focus from sustainability toward security.

The hypotheses of this research are as follows:

Gazprom, historically a laggard in the clean energy space, has continued to avoid meaningful strategic adaptation during the period from 2020 to 2024, prioritizing Russia's geopolitical objectives over long-term adaptation to a changing energy market. As a state-owned firm, Gazprom faces strong political constraints that limit its ability to diversify or invest significantly in renewable energy.

In contrast, Shell, shaped by the more stringent regulatory environment of the UK and EU and its climate-conscious customer base, has historically been more responsive to energy transition pressures. However, despite its positioning as an industry sustainability leader, Shell is expected to have decelerated its green investment trajectory during this period, reacting more strongly to immediate market dynamics and energy security concerns than to geopolitical strategies which is enabled by its more dynamic positioning as an IOC.

The strategic choices of Shell and Gazprom thus serve as case studies illustrating how structural differences between IOCs and NOCs, and their respective domestic policy environments, shape energy transition strategies. More broadly, this research hypothesizes that the success of the global energy transition depends not only on market forces, but also on national political priorities, particularly in the case of state-owned firms.

The significance of this research lies in its exploration of how geopolitical upheaval, shifts in government energy policy, and energy markets influence the strategic approaches of

fossil fuel majors toward the green energy transition. By examining Shell and Gazprom as representative cases displaying the structural differences between NOCs and IOCs and the differential pressures of pro-climate and climate-agnostic domestic markets, this study provides insight into the divergent paths energy companies may take when balancing regulatory pressures, market forces, and national agendas. This research contributes to both policy and academic debates on energy security and climate change, investigating how market and policy shifts either hinder or accelerate the green transition. Ultimately, it seeks to inform policymakers, investors, activists, and those invested in the green transition about the evolving role of major incumbent energy companies in addressing the climate crisis amidst complex geopolitical dynamics.

## 2.0 Literature Review:

### 2.1 Ownership Structures and the Energy Transition:

The differential pressures facing IOCs and NOCs are fundamental to understanding their divergent strategic responses to the energy transition. Guo develops a conceptual framework illustrating that IOCs, as publicly traded firms embedded in global financial markets, are acutely exposed to investor activism, stranded asset risk, and regulatory scrutiny, driving greater responsiveness to decarbonization imperatives.[3] In contrast, NOCs, backed by sovereign governments, prioritize domestic energy security and economic stability, often insulating them from short- to medium-term climate pressures.[4]

[3] Yue Guo et al., "Globalization and Decarbonization: Changing Strategies of Global Oil and Gas Companies," *WIREs Climate Change* 14, no. 6 (2023): e849, https://doi.org/10.1002/wcc.849.
[4] Guo et al.

Bricout et al. add that the geopolitical influence of IOCs has diminished as NOCs have captured a larger share of global oil and gas markets, reducing the strategic leverage of European supermajors like Shell.[5] This divergence is reinforced at the governance level: Shojaeddini et al. note that governance structures shape how firms pursue diversification strategies, although the specific mechanisms differ based on ownership[6]. Van Benthem et al. further highlight that climate-related financial risks increasingly influence the investment and disclosure practices of IOCs, whereas NOCs, less beholden to private capital markets, face comparatively muted financial transition risks.[7] Together, these studies suggest that ownership structure, exposure to financial market pressures, and evolving geopolitical roles jointly mediate the strategic flexibility of energy firms during periods of market and policy disruption.

**2.2 Energy Transition Strategic Classification Frameworks:**

A range of scholars have developed frameworks to categorize how fossil fuel firms approach the energy transition. Guo distinguishes between "hydrocarbon stalwarts" and "net-zero pioneers," emphasizing how ownership structure and exposure to external pressures like stranded asset risk shape strategic responsiveness.[8] Pickl offers a complementary categorization based on capital allocation patterns, identifying renewable “leaders” such as Shell, BP, and TotalEnergies, and “laggards” such as ExxonMobil, who continue to prioritize hydrocarbons.[9] Hartmann et al.

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[5] Aymeric Bricout et al., “From the Geopolitics of Oil and Gas to the Geopolitics of the Energy Transition: Is There a Role for European Supermajors? - ScienceDirect,” accessed April 10, 2024, https://www.sciencedirect.com/science/article/pii/S2214629622001384.
[6] Ensieh Shojaeddini et al., “Oil and Gas Company Strategies Regarding the Energy Transition,” *Progress in Energy* 1, no. 1 (July 2019): 012001, https://doi.org/10.1088/2516-1083/ab2503.
[7] Arthur A. van Benthem et al., “The Effect of Climate Risks on the Interactions between Financial Markets and Energy Companies,” *Nature Energy* 7, no. 8 (August 2022): 690–97, https://doi.org/10.1038/s41560-022-01070-1.
[8] Guo et al., “Globalization and Decarbonization.”
[9] Matthias J. Pickl, “The Renewable Energy Strategies of Oil Majors – From Oil to Energy?,” *Energy Strategy Reviews* 26 (November 1, 2019): 100370, https://doi.org/10.1016/j.esr.2019.100370.

add nuance by proposing five behavioral archetypes, ranging from passive spectators to proactive transition leaders, based on firms' normative alignment with climate imperatives.[10] Zhong and Bazilian similarly map corporate strategies along axes of operational integration of renewables and business model transformation, capturing the diversity of adaptation pathways.[11] Shojaeddini et al. further expand this typology by identifying four primary strategic mechanisms through which IOCs enter the renewables space: acquisitions, venture capital investments, direct ownership of renewable assets, and internal R&D.[12] These mechanisms reflect differing strategic emphases based on the firm's organizational capabilities and stakeholder pressures.

Despite this substantial theoretical groundwork, these frameworks focus primarily on strategic divergence under relatively stable market conditions. Few address firm-level behavior during acute geopolitical shocks. This thesis extends the literature by comparing Shell and Gazprom's responses during the profound market and policy disruptions following the 2022 full-scale invasion of Ukraine.

### 2.3 Geopolitical Shocks and Energy Policy:

Geopolitical shocks fundamentally reshape corporate strategy, particularly for energy companies, partially based upon shifting energy policy. The outbreak of the Ukraine war in 2022 catalyzed a radical shift in European energy priorities, with security concerns rapidly eclipsing climate targets.

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[10] Julia Hartmann, Andrew Inkpen, and Kannan Ramaswamy, "The Oil and Gas Industry: Finding the Right Stance in the Energy Transition Sweepstakes," *Journal of Business Strategy* 43, no. 1 (January 21, 2021): 17–27, https://doi.org/10.1108/JBS-07-2020-0156.
[11] Minjia Zhong and Morgan D. Bazilian, "Contours of the Energy Transition: Investment by International Oil and Gas Companies in Renewable Energy," *The Electricity Journal* 31, no. 1 (January 1, 2018): 82–91, https://doi.org/10.1016/j.tej.2018.01.001.
[12] Shojaeddini et al., "Oil and Gas Company Strategies Regarding the Energy Transition."

Osicka and Cernoch characterize this shift as a full "paradigm shift" in European energy policy, where energy security supplanted sustainability as the dominant framing principle.[13] Zakeri et al. emphasize that policymakers largely responded to the crisis with short-term measures, such as expanding fossil fuel supplies and supporting incumbents, at the expense of long-term structural decarbonization efforts.[14] At the national level, Hille demonstrates that exposure to geopolitical risk, particularly through coal and gas imports, has accelerated renewable energy deployment across Europe.[15] However, these findings largely remain at the macro-policy level without tracing impacts on individual corporate strategies.

While these analyses capture how market conditions and policy priorities shift during crises, they offer limited insight into how firms interpret and act upon these changes. As this thesis argues, corporate adaptation is filtered through organizational structure: Shell, as an IOC accountable to investors and regulators, responded to security-driven policy shifts differently than Gazprom, whose actions are closely aligned with Russian state objectives.

**2.4 Energy Policy and Firm-Level Behavior:**

Firm-level strategies in the energy transition are also conditioned by the broader institutional environments in which companies operate. Levy and Kolk find that European oil majors like Shell and BP embraced climate policy reforms earlier and more proactively than their

[13] Jan Osička and Filip Černoch, "European Energy Politics after Ukraine: The Road Ahead," *Energy Research & Social Science* 91 (September 1, 2022): 102757, https://doi.org/10.1016/j.erss.2022.102757.
[14] Behnam Zakeri et al., "Pandemic, War, and Global Energy Transitions," *Energies* 15, no. 17 (January 2022): 6114, https://doi.org/10.3390/en15176114.
[15] Erik Hille, "Europe's Energy Crisis: Are Geopolitical Risks in Source Countries of Fossil Fuels Accelerating the Transition to Renewable Energy?," *Energy Economics* 127 (November 1, 2023): 107061, https://doi.org/10.1016/j.eneco.2023.107061.

U.S. counterparts, driven by stronger regulatory frameworks and public environmental concern.[16] Similarly, Lobov shows that while national environmental policies only weakly correlate with oil and gas firms' operational indicators overall, companies operating in more stringent policy environments exhibit somewhat greater responsiveness to sustainability mandates.[17] Thus, while regulatory structures and financial market signals broadly set the direction of strategic change, ownership structure and national institutional context fundamentally mediate how energy firms interpret, prioritize, and act upon external pressures.

**2.5 Literature Gap:**

Despite the richness of existing research, two critical gaps remain in the literature.

First, there is a lack of direct comparative analyses of IOCs and NOCs during overlapping crises. Most frameworks, including those developed by Guo, Pickl, and Hartmann et al., implicitly assume a relatively stable external environment. Yet crises like Russia's full-scale invasion of Ukraine produce asymmetric shocks that reveal underlying organizational rigidities, strategic path dependencies, and governance constraints that are not captured in peacetime models.

Second, most studies tend to isolate specific drivers, whether geopolitical risk (Hille), policy change (Osicka and Cernoch), or financial pressure (Van Benthem et al.), without integrating these forces into a coherent, dynamic model of firm-level adaptation. Only Firdaus and Mori take some initial steps in this direction, examining how stranded asset risk interacts

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[16] David L. Levy and Ans Kolk, "Strategic Responses to Global Climate Change: Conflicting Pressures on Multinationals in the Oil Industry," *Business and Politics* 4, no. 3 (November 2002): 275–300, https://doi.org/10.2202/1469-3569.1042.
[17] V. I. Salygin and D. S. Lobov, "Defining Major Oil and Gas Companies' Development Strategies in the Era of Energy Transition," *MGIMO Review of International Relations* 14, no. 5 (November 1, 2021): 149–66.

with energy transition pathways, though their focus remains more on sectoral trends than on firm-specific strategic behavior.[18]

This thesis addresses both gaps by offering a comparative, firm-level analysis of Shell and Gazprom's post-2022 strategic adaptations across three key dimensions: climate commitments, investment portfolio shifts, and market reorientation. It demonstrates how ownership model (public vs. state), stakeholder environment, and geopolitical positioning co-produce divergent corporate trajectories under simultaneous regulatory, market, and security shocks. Given these gaps, this study undertakes a comparative case study of Shell and Gazprom from 2020 to 2024. By analyzing how these two firms, operating under distinct ownership models and embedded in divergent institutional environments, responded to the overlapping shocks of the Ukraine war and shifting European energy policy, this research offers new insight into how organizational structure, stakeholder pressures, and geopolitical positioning jointly shape corporate trajectories in the energy transition.

**3.0 Methodology:**

This thesis seeks to answer the question: How have Shell and Gazprom's strategies diverged in response to the post-Ukraine energy crisis, and how do differences in ownership structure, stakeholder pressures, and institutional environments explain their distinct approaches to the energy transition in the face of similar market shifts? The goal of this research is to analyze how shifting European energy policy and market dynamics from 2020 to 2024 influenced the strategic behavior of two major fossil fuel companies, highlighting the differential

[18] Nur Firdaus and Akihisa Mori, "Stranded Assets and Sustainable Energy Transition: A Systematic and Critical Review of Incumbents' Response," *Energy for Sustainable Development* 73 (April 1, 2023): 76–86, https://doi.org/10.1016/j.esd.2023.01.014.

effects of institutional and governance structures on corporate adaptation during geopolitical crises.

To conduct this analysis, this study adopts a comparative case study design. Given the breadth of the fossil fuel industry, narrowing the focus to a few companies was necessary to maintain analytical depth. Shell and Gazprom were selected because they offer a sharp contrast: Shell is a leading publicly traded European oil major, while Gazprom operates as a state-owned energy producer and an instrument of Russian geopolitical strategy. Both were key players in the European energy market prior to the 2022 war in Ukraine and were initially exposed to strong EU pro-climate regulatory pressure, though Gazprom's domestic Russian market lacks such an environment. Shell, headquartered in the United Kingdom and listed on major Western stock exchanges, faces significant investor, regulatory, and public pressure to advance the green transition. In contrast, Gazprom, majority-owned by the Russian state, prioritizes national strategic objectives over market-driven imperatives and faces limited decarbonization pressure. Both companies were heavily involved in pre-2022 European energy systems, notably through projects like Nord Stream 2, and were profoundly impacted by the energy crisis following Russia's invasion of Ukraine. Their similar market exposures and contrasting structures make them ideal for analyzing the intersection of corporate strategy, market forces, and political constraints.

By comparing these two firms, this research examines how institutional and governance factors condition corporate responses to the same external market and security shocks. It investigates the effects of the pressures of different ownership models (IOCs and NOCs), domestic institutional and regulatory environments, geopolitical positioning, and a changed energy market and policy landscape on O&G strategic renewal. Thus, this study analyzes firm

behavior across three key dimensions: (1) Climate Rhetoric, including announcements, targets, and revisions of green energy goals, (2) Investment Portfolio and Production Shifts, including changes in capital expenditure allocations and productivity across renewable and fossil fuels assets, and (3) Strategic or Market Reorientation, encompassing adjustments in either business strategy or geographic and customer focus, especially in response to European market exits and supply disruptions. This analysis is also supported by firm-level financial and emissions performance data.

The study focuses on the period from 2020 to 2024, capturing both the immediate prelude to and the aftermath of Russia's full-scale invasion of Ukraine in 2022. This period marks a critical inflection point, reshaping global and European energy policy, supply chains, and corporate strategies. The Ukraine war created an acute geopolitical shock, dramatically altering energy security priorities in Europe and forcing firms to reevaluate their long-term transition strategies. Analyzing firm behavior across this window provides insight into both immediate strategic responses and evolving longer-term adjustments.

This research hypothesizes that Shell will scale back prior climate commitments because of market shifts that reward fossil fuels with high oil and gas prices, and a loosening of European regulatory attitudes over this time period. But, Shell, as a publicly traded IOC exposed to stronger pro-climate regulatory and investor pressures, will maintain a greater long-term commitment to the energy transition relative to Gazprom, even after the energy security crisis increased short-term incentives to prioritize fossil fuels.

It also expects that Gazprom will continue to underinvest in the green transition, sacrificing long-term strategic planning in favor of short-term gains from high fossil fuel prices and a shift toward less climate-conscious markets. Gazprom, as a Russian state-owned NOC, will

show minimal strategic adaptation toward decarbonization, prioritizing national political objectives over market-driven or environmental considerations due to its governance structure.

Thus, this thesis anticipates that the strategic divergence between Shell and Gazprom will reflect broader structural patterns: IOCs, like Shell, are more responsive to external market, regulatory, and public pressures, enabling strategic flexibility in the face of competing external pressures; NOCs, like Gazprom, are constrained by domestic political imperatives, resulting in a strategic stalemate where external market forces are secondary to state-driven priorities, even at the expense of long-term corporate viability.

The data sources for this research include company communications, such as investor statements, annual reports, financial reports, sustainability reports, and green transition strategy documents (e.g., Shell's Energy Transition Strategy Plan and Gazprom's Social Impact Report), and secondary analyses from industry reports, policy documents, and relevant academic literature.

Expert interviews were conducted with approximately 20 individuals ranging from academics focused on the European energy sector, energy economics, and energy security, to European government officials and think tank experts specializing in EU energy policy, and energy industry executives. The insight gained from these conversations, while not directly quoted throughout this thesis, was used to inform and shape the arguments and understanding of the state of the global and European energy sectors, the attitudes of European policymakers towards the energy trilemma, the role of O&G firms in the energy transition, the long term outlook on Gazprom's fate, and the energy transition as a whole.

Several limitations should be acknowledged. First, this analysis relies primarily on publicly available documents and secondary reports; internal decision-making processes and unpublished strategic deliberations are inaccessible. As a publicly traded company, much of Shell's strategic decision-making is by law required to be published. Gazprom, while also publicly traded, is primarily beholden to the Russian state and much of its strategic thinking is obfuscated. Furthermore, to date, the 2024 Annual Report for Gazprom has yet to be released, thus presenting a large missing data bank. This missing data was supplemented by news reports and mid-year releases. Second, while efforts have been made to identify causal relationships between policy changes, market dynamics, and corporate strategy, firm behavior is influenced by complex and often opaque internal considerations. Finally, geopolitical events remain fluid, and strategic adjustments continue to evolve beyond the 2024 window analyzed in this thesis.

## 4.0 Background:

### 4.1 Energy Markets, Globalization, and a Push Towards the Future:

Energy underpins our world. It forms the bedrock for every industry and product we rely on, fueling economic development, technological progress, and globalization itself. The evolution of energy markets has been shaped by advancements in extraction, infrastructure, and geopolitical shifts. As of the end of 2023, the global energy mix remained heavily dependent on fossil fuels, with oil (29.78%), natural gas (21.89%), and coal (24.87%) making up the vast majority of energy sources.[19] Non-fossil energy sources, such as nuclear (3.72%), hydroelectric

[19] Hannah Ritchie and Pablo Rosado, "Energy Mix," *Our World in Data*, July 10, 2020, https://ourworldindata.org/energy-mix.

(6.01%), wind (3.3%), and solar (2.33%), play a growing but still relatively minor role.[20] These percentages, however, vary significantly across regions. Europe, for example, leads the global push for renewable energy, while the United States and China maintain high fossil fuel reliance.[21]

Energy has historically been both a driver and a product of globalization. For most of human history, we have subsisted on low-energy-density fuels like wood and charcoal. However, advances in energy extraction techniques have led to an ever-increasing supply of hydrocarbons over the last few centuries. The discovery and commercialization of coal, followed by oil and natural gas, triggered successive industrial revolutions. Coal, the dominant fuel of the 19th century, gave way to oil and natural gas in the 20th century, with major breakthroughs including the commercialization of internal combustion engines, large-scale electrification, and the development of global supply chains.[22] Over the past century, advancements in energy extraction and transportation, particularly in oil, gas, and coal, have enabled economic expansion on an unprecedented scale. The development of long-distance gas and oil pipelines, liquefied natural gas (LNG), and integrated electricity grids has bound nations together in interdependent energy relationships.[23] However, this globalization of energy markets has also created vulnerabilities, as demonstrated by the energy crises of the 1970s and 80s and the recent supply shocks caused by Russia's invasion of Ukraine.

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[20] Ritchie and Rosado.
[21] Ritchie and Rosado.
[22] "History of Energy from 1850 to 1900 | EBSCO Research Starters," accessed April 27, 2025, https://www.ebsco.com/research-starters/power-and-energy/history-energy-1850-1900.
[23] Margarita M. Balmaceda, *Russian Energy Chains The Remaking of Technopolitics from Siberia to Ukraine to the European Union*, 2021.

From a demand-perspective, energy is needed everywhere, but demand has shifted over time from East to West and to the East again, following regional economic booms. Prior to WWII, Europe was the locus of energy demand and had the largest energy needs of any region.[24] After the second World War however, in the wake of the wide-spread destruction of large swaths of European territory and industry, the largest consumer of energy became North America, consuming 861 million tons of oil equivalent (Mtoe) of energy in 1950, compared with just 691 Mtoe in Europe in the same year,[25] driven by the United States' war-time and post-war industrial booms. Global energy demand has since shifted eastward. In the 1970s Asia's economic explosion began, and the energy needs of countries like Japan, South Korea, Taiwan, China, and India grew exponentially, driven by economic growth and rapidly multiplying populations. From 1960 to 1990, Asia's energy needs grew exponentially, jumping from 707 Mtoe in 1960 to 2,392 Mtoe in 1990, a 338% jump, overtaking North America as the most energy-hungry region of the world.[26] Despite no longer consuming the most energy globally, Europe still constitutes a large portion of global energy demand, as the third largest energy consumer globally after the Asia Pacific and North American regions, making up approximately 13% of world primary energy consumption in 2023.[27]

The newest advent in the energy sector are renewable energy sources (RES), such as solar and wind, which offer a sustainable and economical source of energy. RES made up 14.6% of the global energy mix in 2023, the largest of which was hydropower (47.2% of global renewable

[24] Marion Gueydan, "World Energy Consumption 1800-2000: The Results," *Encyclopédie de l'énergie* (blog), March 14, 2022, https://www.encyclopedie-energie.org/en/world-energy-consumption-1800-2000-results/.
[25] Gueydan.
[26] Gueydan.
[27] Energy Institute, "Statistical Review of World Energy 2024," 2024, https://www.energyinst.org/statistical-review.

generation), followed by wind (25.9%) and solar (18.3%) which have grown exponentially in recent years.[28]

**4.2 Policy Pushing Towards the Future:**

The global adoption of renewables at both a firm level and national level has been driven by both policy and economics. As the levelized cost of energy (LCOE), the average net present cost of electricity generation over an asset's lifetime, for RES has fallen, they have become cost-competitive with traditional electricity generation methods like coal and gas fired power plants. Furthermore, as a carbon-free energy source, RES work to combat climate change and help companies, communities, and countries decarbonize and meet their emission targets. RES proliferation has exploded in the EU, driven by their sustainability mandate, and in the Asia Pacific, with countries like China and India investing billions in solar and wind systems to meet their voracious demand for energy as their economies continues to grow.[29] Furthermore, policymakers are increasingly making the case for RES as a way to achieve energy independence, and to decouple their energy systems from the geopolitics and volatility associated with global oil and gas markets.[30]

The rapid rise of renewable energy sources has not occurred in a vacuum. Rather, it has been significantly accelerated by a wave of legislation and regulatory initiatives that have

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[28] Hannah Ritchie, Max Roser, and Pablo Rosado, "Renewable Energy," *Our World in Data*, December 17, 2020, https://ourworldindata.org/renewable-energy.
[29] "Massive Global Growth of Renewables to 2030 Is Set to Match Entire Power Capacity of Major Economies Today, Moving World Closer to Tripling Goal - News," IEA, October 9, 2024, https://www.iea.org/news/massive-global-growth-of-renewables-to-2030-is-set-to-match-entire-power-capacity-of-major-economies-today-moving-world-closer-to-tripling-goal.
[30] Oxford Institute for Energy Studies, "The Geopolitics of Energy: Out With the Old, In With the New?," *Oxford Energy Forum*, no. 126 (February 2021), https://www.oxfordenergy.org/wpcms/wp-content/uploads/2021/02/OEF-126.pdf.

reshaped global energy markets and investment priorities since the late 2000s. In the United States, the landmark 2022 Inflation Reduction Act (IRA) committed over $369 billion to support domestic clean energy production, offering generous tax credits, grants, and incentives to de-risk renewable energy projects and stimulate low-carbon industrial development.[31] Across the Atlantic, the 2019 European Green Deal and the legally binding 2021 European Climate Law, which binds the EU to a 55% reduction in greenhouse gas emissions by 2030, enshrine the EU's ambition to reach net-zero emissions by 2050.[32] These overarching frameworks are operationalized through more targeted initiatives such as the Fit for 55 Package, which includes reforms to the EU Emissions Trading System (ETS), increased renewable targets, and stringent sectoral emissions reductions.[33]

At the heart of many of these efforts are market-based mechanisms like carbon pricing and emissions trading schemes, which internalize the cost of carbon emissions and enhance the competitiveness of zero-emission technologies. Programs like the EU ETS, China's national carbon market, and regional cap-and-trade systems in the United States, such as California's program, create structured markets for emissions allowances, giving utilities and industry a financial incentive to invest in clean energy. In parallel, earlier policies such as feed-in tariffs -- which guarantee renewable energy producers a fixed, often above-market rate for electricity fed into the grid -- played a critical role in scaling wind and solar technologies. Though now largely replaced by competitive auctions, these mechanisms helped establish a viable market for

[31] United States Senate Democrats, "Inflation Reduction Act One Page Summary," August 7, 2022, https://www.democrats.senate.gov/imo/media/doc/inflation_reduction_act_one_page_summary.pdf.
[32] "European Climate Law - European Commission," accessed April 27, 2025, https://climate.ec.europa.eu/eu-action/european-climate-law_en.
[33]"Fit for 55: Reform of the EU Emissions Trading System," Consilium, accessed April 27, 2025, https://www.consilium.europa.eu/en/infographics/fit-for-55-eu-emissions-trading-system/.

renewables by reducing investment risk and providing long-term revenue certainty in the early stages of commercial development of these RES.

The EU has also adopted a suite of sector-specific regulations to promote sustainability across the energy value chain. The Corporate Sustainability Reporting Directive (CSRD) and the proposed Corporate Sustainability Due Diligence Directive (CSDDD) require firms to disclose environmental impacts and integrate sustainability into governance and risk management. Instruments like the Carbon Border Adjustment Mechanism (CBAM) aim to prevent carbon leakage by imposing a carbon price on certain imports, while regulations such as the Methane Regulation, the Deforestation-free Products Regulation, the Batteries Regulation, and the Critical Raw Materials Act address lifecycle emissions, environmental degradation, and supply chain resilience. New financial instruments such as Carbon Contracts for Difference (CCfDs) aim to de-risk investments in clean technologies by providing revenue stability tied to carbon prices. Meanwhile, cybersecurity initiatives like the NIS2 Directive ensure that digitalized, decarbonized energy infrastructure remains secure and resilient.[34]

Importantly, this policy landscape does not just incentivize clean energy, it also creates significant challenges for fossil fuel incumbents. Increasingly strict cap-and-trade programs, methane emission limits, and climate-related financial disclosure requirements (such as those under CSRD and proposed U.S. SEC rules) have added regulatory complexity and administrative costs to oil and gas operations. In many jurisdictions, fossil fuel majors face restrictions or delays in permitting, exploration, and new drilling, whether through outright moratoriums or more stringent environmental review processes. Even where hydrocarbon production remains legal,

[34] "EU Action to Address the Energy Crisis - European Commission," accessed April 26, 2025, https://commission.europa.eu/topics/energy/eu-action-address-energy-crisis_en.

evolving standards around carbon accounting, climate risk disclosures, and Scope 3 emissions are reshaping how companies manage and report their emissions, influencing investor sentiment and altering long-term capital allocation strategies.

Together, these legislative efforts and regulatory shifts are reshaping the economic and strategic calculus of global energy markets alongside broader geopolitical and technological developments. They have created both opportunities and constraints, rewarding low-carbon innovation while penalizing carbon-intensive legacy assets. For incumbent oil and gas companies, these forces present a critical inflection point. However, despite these factors driving the energy industry towards change, the role of O&G majors in it has been and remains a complicated one.

### 4.3 O&G Industry Structure:

The current market and geopolitical structures of the O&G industry were forged over the last two centuries, as IOCs and NOCs emerged, technological shifts expanded and changed market and demand structures, and price shocks shifted company strategy and structures.

Easily transportable, and energy dense, oil became a global commodity, and a global necessity in the centuries following its discovery in key markets like the United States, the Middle East, and Russia.[35] Unlike oil, which can be transported relatively easily across the globe, natural gas has traditionally been constrained by rigid pipeline infrastructure. Gas pipelines, such as those running from Russia to Europe or from Canada to the United States, represent major long-term capital investments that create semi-permanent supplier-consumer relationships and a

[35] Natalie Burclaff, "Research Guides: Oil and Gas Industry: A Research Guide: History of the Industry," research guide, accessed April 22, 2025, https://guides.loc.gov/oil-and-gas-industry/history.

static supply chain heavily dependent on long-term supplier and consumer contracts. Historically, this made natural gas markets more localized compared to the globally traded oil market. These two energy types were the so-called bread and butter of the oil and gas industry, making up the core of their business structure.

The development of liquified natural gas (LNG) technology in the late 1960s helped introduce some flexibility into gas markets, and created a global commodity market for natural gas, similar to oil, creating another driver of value for O&G firms.[36] The production of LNG involves cooling natural gas to -162°C (-260°F), converting it into a liquid that can be transported via specialized tankers.[37] This technological innovation has allowed natural gas to be traded globally, reducing reliance on pipeline networks and giving import-dependent nations greater flexibility in choosing suppliers. The expansion of LNG infrastructure in Asia, Europe, and North America has helped to create a more liquid global gas market, though significant barriers such as high capital costs and long development timelines remain.[38]

Throughout these technological shifts, the geopolitical and market landscape of the oil and gas industry has been shaped by major Western firms and state-owned nationalized firms in turn. Historically, fossil fuel resources were largely controlled by publicly traded Western IOCs like ExxonMobil and Chevron in the U.S., and BP, Shell, and TotalEnergies in Europe. However, their control slowly began to wane in 1918 when the Soviet Union nationalized its oil and gas

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[36] Margarita M. Balmaceda, *Russian Energy Chains The Remaking of Technopolitics from Siberia to Ukraine to the European Union*.
[37] "What Is Liquefied Natural Gas? LNG Explained," National Grid Group, accessed April 27, 2025, https://www.nationalgrid.com/stories/energy-explained/what-is-liquefied-natural-gas-lng.
[38] "Global Energy Perspective 2023: Natural Gas Outlook" (McKinsey), accessed April 27, 2025, https://www.mckinsey.com/industries/oil-and-gas/our-insights/global-energy-perspective-2023-natural-gas-outlook.

reserves, forming the predecessors to Gazprom and Rosneft.[39] This trend accelerated in the post-war period, as countries reclaimed control of their energy reserves from colonial and foreign powers by creating state-owned NOCs or nationalizing existing firms – such as Egypt's formation of the General Petroleum Corporation in 1956 and Saudi Arabia's full takeover of Aramco in 1980. Western IOCs controlled about 90% of the world's reserves of hydrocarbons in the 1970s.[40] Now, the majority of hydrocarbon assets are held by NOCs, and in 2019 IOCs controlled just 14% of world reserves.[41]

NOCs have near-exclusive rights to their national oil and gas supplies, and for many countries like the Gulf States, extraction is easy and cheap, and reserves are almost limitless. They are backed by not only their own hefty balance sheets, but also those of their home countries, making them slightly more insulated from market shocks than IOCs. IOCs have a much more global footprint, engaging in higher return projects, and pushing the boundaries of the energy industry, pioneering offshore drilling, shale fracking, and even battery and solar technologies, and operating independently of any singular national agenda. While both IOCs and NOCs are profit-seeking, their core characteristics are starkly different, each operating under starkly different strategic priorities with regards to national energy security, geopolitical influence, and purely profit-seeking market-based decisions. These differential priorities also lead to a divergence in their overall strategic goals, especially with regard to climate change.

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[39] Stephen J. Kobrin, "The Nationalisation of Oil Production, 1918–80," in *Risk and the Political Economy of Resource Development*, ed. David W. Pearce, Horst Siebert, and Ingo Walter (London: Palgrave Macmillan UK, 1984), 137–64, https://doi.org/10.1007/978-1-349-06980-4_9.
[40] Aymeric Bricout et al., "From the Geopolitics of Oil and Gas to the Geopolitics of the Energy Transition: Is There a Role for European Supermajors? - ScienceDirect."
[41] Aymeric Bricout et al.

Over time, both IOCs and NOCs have undergone successive strategic renewals in response to market shifts and oil and natural gas price shocks. The oil crises of the 1970s triggered a wave of consolidation and diversification into minerals, nuclear, coal, and early renewable energy, [42] but by the 1990s, firms shifted back toward a focus on shareholder value, retrenching around core oil, gas, and chemical sectors and restructuring internally toward product-based divisions like upstream and downstream. [43] This period also saw increased cooperation between firms, with Shell pioneering the now-common practice of allowing its refineries to purchase crude oil from other companies. [44]

The oil price collapse of 1998 sparked another wave of mergers and acquisitions, creating the 'megamajors' that dominate today.[45] The early 2000s were marked by surging global demand, particularly from China and other industrializing economies, pushing prices upward and fueling investment into capital-intensive projects like deepwater drilling, Arctic exploration, and oil sands development. [46] Rising geopolitical instability, particularly in the Middle East during the 2000s and the Arab Spring in 2010, further heightened concerns over security of energy supply.[47] This collapse exposed the vulnerability of high-cost projects and ushered in a new industry focus in the late 2010s on capital discipline, cost efficiency, and the divestment of non-core assets. [48]

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[42] Renato Cibin and Robert M. Grant, "Restructuring Among the World's Leading Oil Companies, 1980–92," *British Journal of Management* 7, no. 4 (1996): 283–307, https://doi.org/10.1111/j.1467-8551.1996.tb00120.x.
[43] Levy and Kolk, "Strategic Responses to Global Climate Change."
[44] Levy and Kolk.
[45] Levy and Kolk.
[46] Lee Tunstall, "2000s Oil Crisis," EBSCO Research Starters (EBSCOhost, 2022), https://www.ebsco.com/research-starters/economics/2000s-oil-crisis.
[47] Khalid Khan, Adnan Khurshid, and Javier Cifuentes-Faura, "Energy Security Analysis in a Geopolitically Volatile World: A Causal Study," *Resources Policy* 83 (June 1, 2023): 103673, https://doi.org/10.1016/j.resourpol.2023.103673.
[48] Deloitte, "2016 Outlook on Oil and Gas," 2016.

This era also marked the beginning of a more public-facing shift toward environmental, social, and governance (ESG) concerns. Investor pressure and growing climate awareness led some European majors, notably Shell and BP, to begin articulating low-carbon strategies – although these remained small relative to core fossil fuel operations.[49] NOCs, notably, lagged behind in this effort in the 2010s, with some only releasing climate plans in the 2020s or not at all.[50]

Although IOCs and NOCs have coexisted in the global energy system and responded to shared price and demand shocks, developing technologically in parallel, their strategic paths have been shaped by fundamentally different institutional logics. These differences, rooted in institutional structures, geopolitical alignments, and firm-level characteristics, have resulted in increasingly divergent pressures placed on IOCs and NOCs. This is becoming increasingly evident as their climate and energy transition strategies have diverged especially in the post-2022 energy crisis context.

### 4.4 O&G Majors and Climate Change:

The fossil fuel industry, since the early stages of discovery of the climate crisis, has played an antagonistic role, largely refusing to acknowledge both the existence of human-caused climate change, and their involvement in it. Famously, Exxon scientists played a key role in discovering the link between fossil fuel emissions and global warming in 1977, 10 years before that information became known to the general public, yet the firm also led aggressive lobbying

[49] Christopher Wright and Daniel Nyberg, "Corporations and Climate Change: An Overview," *WIREs Climate Change* 15, no. 6 (2024): e919, https://doi.org/10.1002/wcc.919.
[50] Guo et al., "Globalization and Decarbonization."

and misinformation campaigns at the same time.[51] Common stories pushed by the industry include the claim that climate change is a hoax, that it is simply a natural occurrence, and that the onus falls on individuals rather than companies to solve it, with BP pioneering the idea of a 'personal carbon footprint,' amongst others.[52] From 1998 to 2023, the fossil fuel industry spent $2.3 billion lobbying the U.S. federal government alone via industry groups like the American Fuel and Petrochemical Manufacturers, U.S. Chamber of Commerce, and the American Petroleum Institute,[53] to prevent the spread of narratives and creation of policy that could harm an industry entirely dependent on extracting, processing, and burning the carbon and methane at the core of the climate crisis.

The specific attitude of each O&G company varies according to its own particular context, ownership structure, and characteristics. Broadly, these firms adopt strategies supported by a clear business case and meet only the minimum legal requirements for sustainability and emissions when no such business case is present. Most NOCs have made minimal climate commitments, with only a few, like the UAE's ADNOC and China's CNPC, announcing net-zero goals in 2021, some time after most IOCs, which began doing so as early as 2017 and more widely by 2020.[54, 55] Some IOCs have made inroads, especially in the last decade or so, like Shell and other European majors, into the renewable energy market due to investor attitudes, the stringent EU regulatory framework, and changed economic projections for both O&G and RES.

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[51] Shannon Hall, "Exxon Knew about Climate Change Almost 40 Years Ago," *Scientific American*, accessed April 22, 2025, https://www.scientificamerican.com/article/exxon-knew-about-climate-change-almost-40-years-ago/.
[52] "How Big Oil Helped Push the Idea of a 'Carbon Footprint'" (NPR Illinois), accessed April 22, 2025, https://www.nprillinois.org/2023-12-18/how-big-oil-helped-push-the-idea-of-a-carbon-footprint.
[53] "Climate Change," OpenSecrets, accessed March 22, 2025, https://www.opensecrets.org/news/issues/climate-change.
[54] "UAE, a Major Carbon Emitter, Aims to Go Net Zero by 2050," *Al Jazeera*, accessed April 27, 2025, https://www.aljazeera.com/economy/2021/10/7/uae-a-major-carbon-emitter-aims-to-go-net-zero-by-2050.
[55] Ben Cahill and Ryan McNamara, "Chinese National Oil Companies Face the Energy Transition," August 26, 2021, https://www.csis.org/analysis/chinese-national-oil-companies-face-energy-transition.

In terms of strategic classification, most firms fall into intermediate categories such as Hartmann's "cautious defenders" or Guo's "green followers," engaging in selective decarbonization efforts without fully embedding climate goals into their core business models, and only a rare few undergo true strategic renewal.

The only oil and gas major to have successfully fully pivoted from traditional energy to renewables is Ørsted, previously DONG Energy, the Danish national oil company which has successfully divested from all of its oil and gas assets and become the world's largest developer of offshore wind and power.[56] In many ways, Ørsted is an outlier, and its exact pathway is unable to be replicated by other oil and gas majors. As a national oil company, DONG was insulated from short-term market pressures and dividend-seeking shareholders, allowing it to prioritize long-term strategic goals aligned with Denmark's ambitious climate policies.[57] Furthermore, Denmark is uniquely positioned to take advantage of and pioneer offshore wind due to its location on the North and Baltic Seas which have shallow waters and strong winds near to the Danish shore.[58] At the same time, Denmark's fossil fuel production had been in steep decline already, making the economics of continued fossil fuel production less attractive.[59] Together, these factors made the strategic pivot to offshore wind both environmentally and economically sound. However, the unique alignment of political will, resource geography, and market timing

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[56] "About Our Name," Orsted, accessed April 27, 2025, https://orsted.com/en/who-we-are/our-purpose/about-our-name.
[57] Samson Afewerki, "Firm Agency and Global Production Network Dynamics," *European Planning Studies* 27, no. 8 (August 3, 2019): 1483–1502, https://doi.org/10.1080/09654313.2019.1588857.
[58]"Is Denmark the Blueprint for Global Offshore Wind Expansion?," GAC, accessed April 27, 2025, https://www.gac.com/insights/is-denmark-the-blueprint-for-global-offshore-wind-expansion.
[59] Poul Thøis Madsen et al., "Abandoning Fossil Fuel Production: What Can Be Learned from the Danish Phase-out of Oil and Gas?," *Energy Research & Social Science* 103 (September 1, 2023), https://doi.org/10.1016/j.erss.2023.103211.

that enabled Ørsted's transformation is unlikely to be easily replicated by other NOCs or any IOCs operating under different constraints.

It is important to note however, that for many countries with NOCs, there is simply a different state-owned electricity or power firm that is making progress in the renewable space, such as China's State Power Investment Corporation (SPIC). However, at the same time, there is little to no slowing of operations from NOCs, like China's CNPC and Sinopec or those in Russia and the Gulf States. Towards IOCs like Shell, these national power firms are present as competitors. With regards to Gazprom and Russia specifically, Russia's renewables industry is underdeveloped, with the only present national 'champion' being Rosatom, the national nuclear energy firm which has dabbled in wind power, but not to a significant degree. Thus while there is a national renewable energy champion it is quite underdeveloped and has not truly taken a leadership role within the renewable energy space in Russia.

**4.5 Ukraine and a Changed World:**

In 2022, Europe and its energy landscape went through a remarkable change, set off by the full-scale invasion of Ukraine by Russia. This was a more extreme action than the 2014 Russian annexation of Crimea, and involved, along with the start of full-scale hostilities in Ukraine, the intensification of hybrid warfare, and increasingly forceful use of the Russian energy weapon against a vulnerable Europe. Historically, despite political and even militaristic conflicts, over the last 75 years, the USSR and Russia had been perceived as reliable energy partners for Europe, although this narrative did not truly match reality. But as a result, Europe developed a long-standing dependency on Russian gas as a core supplier in its energy mix. Thus,

before the start of the conflict, in 2021, Europe's energy mix consisted of 26.7% natural gas,[60] 157 billion cubic meters (bcm) of which was Russian gas, making up about half of the EU's gas imports.[61]

After the invasion, gas and oil prices spiked, as fears of supply disruptions and sanctions against Russian energy emerged. Oil prices stabilized due to the highly fungible nature of its supply chain, but gas prices rose and stayed high due to a supply chain largely based on static pipeline gas.[62] Russia, acting through Gazprom, escalated the crisis by strategically restricting gas flows to Europe, leveraging its energy exports as a geopolitical tool. Previously, Russia via Gazprom had become a key player in creating flexibility in the European energy supply, allowing long-term contract holders to nominate purchases with up to 20% variation in contracted volume and also providing additional gas on the European spot market.[63] Gazprom largely stopped selling excess gas on the spot market or entering into short term sales contracts by April of 2021, and was supplying only what was required under its long term contracts by the start of the invasion in February 2022.

The invasion marked the start of the 2022 energy crisis, which was compounded by (1) a requirement for consumers to pay for Russian gas in rubles which many European customers refused causing their supply to be cut off, (2) the closure of the Nord Stream 1 pipeline for supposed maintenance and subsequent September 2022 explosions damaging both Nord Streams 1 and 2, and (3) Polish sanctions on Gazprom causing the closure of the Yamal pipeline

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[60] "Europe – Countries & Regions," IEA, accessed April 22, 2025, https://www.iea.org/regions/europe/energy-mix.
[61] Ugne Keliauskaite, Simone Tagliopietra, and Georg Zachmann, "Europe Urgently Needs a Common Strategy on Russian Gas" (Breugel), accessed April 22, 2025, https://www.bruegel.org/analysis/europe-urgently-needs-common-strategy-russian-gas.
[62] James Henderson, "The Impact of the Russia-Ukraine War on Global Gas Markets," *Current Sustainable/Renewable Energy Reports* 11, no. 1 (2024), https://doi.org/10.1007/s40518-024-00232-x.
[63] Henderson.

supplying Russian gas through Belarus and Poland in March of 2022.[64] As a result of Russian gas cutoffs, sanctions, and sabotage, Russian gas supplied to Europe fell to 63 bcm in 2022, a decrease equating to 24% of total European and UK demand. After this period the only Russian gas flowing into Europe was via the Brotherhood (Druzhba) pipeline in Ukraine due to long standing transit contracts, the Turkish TurkStream pipeline into the Balkans, and some Russian LNG shipments sent to Spain, France, Belgium, and The Netherlands.[65] From 2021 to 2024, European reliance on Russian gas fell from 43% to just 18%.[66]

Until the advent of LNG, gas supply was highly inelastic, limited by fixed pipeline infrastructure requiring coordination among supplier, transit, and consumer states. LNG introduced some flexibility and enabled the emergence of a gas spot market that exists separately from existing pipeline routes, but its infrastructure remains capital-intensive and cannot fully replace traditional pipelines. Participation in the LNG spot market is still constrained by the need for liquefaction and regasification facilities. For a state to be able to utilize LNG, it must have the necessary infrastructure to liquefy gas supplies or re-gasify LNG for consumers at LNG-specific export/import terminals. These liquefaction and regassification plants are in and of themselves highly capital intensive, costing between $1.5 billion and $3 billion and taking 3 to 5 years on average to construct a single facility.[67] The construction of and creation of contracts with floating storage and regassification units (FSRUs) can help to speed up this process, as they

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[64] Joseph Majkut et al., "Security Implications of Nord Stream Sabotage" (CSIS, September 29, 2022), https://www.csis.org/analysis/security-implications-nord-stream-sabotage.
[65] Ugne Keliauskaite, Simone Tagliopietra, and Georg Zachmann, "Europe Urgently Needs a Common Strategy on Russian Gas."
[66] Ugne Keliauskaite, Simone Tagliopietra, and Georg Zachmann.
[67] Tetsuji Uemura and Keitaro Ishigami, "Investment in LNG Supply Chain Infrastructure Estimation," in *Formulating Policy Options for Promoting Natural Gas Utilization in the East Asia Summit Region Volume II: Supply Side Analysis*, ERIA Research Project Report (Jakarta: ERIA, 2018), 67–80.

can be deployed more rapidly, typically within 12 to 18 months, and at a lower cost, around $300 to $500 million, depending on capacity and ship availability.[68] Despite this, global gas supply is still quite inelastic. Combining this with an inelastic energy demand in most markets means that any sudden cut in supply results in an outsized price jump for consumers as they compete for the relatively little gas available on the LNG spot market.

Thus, the sudden decrease in supply to Europe due to Gazprom's actions heavily impacted energy security in the region, dropping global supply, and driving up prices in the LNG spot market. This global natural gas supply shock had knock-on effects for more than just the European LNG market. Gas prices in Europe naturally rose astronomically, and so did prices in Asia, traditionally the largest consumer of LNG, as European buyers scrambled to purchase whatever LNG they could, with European LNG imports growing by 60% in 2022.[69] Estimates calculate that Europe spent €643 billion in excess market costs due to higher commodity prices in the period October 1, 2021, to December 31, 2022, and an additional €908 billion in fiscal spending on energy-related infrastructure and policies by various European governments.[70]

In reaction to this conflict, unprecedented sanctions were imposed on Russia and numerous Western companies exited the Russian market. The Russian energy sector and Gazprom were largely excluded from the massive sanctions package imposed on Russia by the

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[68] Brian Songhurst, "The Outlook for Floating Storage and Regasification Units (FSRUs)" (Oxford Institute for Energy Studies, July 2017), https://doi.org/10.26889/9781784670894.
[69] "IEEFA: Turmoil in Global LNG Markets Is Curbing Long-Term Demand Growth," Institute for Energy Economics and Financial Analysis (IEEFA), accessed April 22, 2025, https://ieefa.org/articles/ieefa-turmoil-global-lng-markets-curbing-long-term-demand-growth.
[70] Jeff D. Colgan, Alexander S. Gard-Murray, and Miriam Hinthorn, "Quantifying the Value of Energy Security: How Russia's Invasion of Ukraine Exploded Europe's Fossil Fuel Costs," *Energy Research & Social Science* 103 (September 1, 2023): 103201, https://doi.org/10.1016/j.erss.2023.103201.

West, with the exception of individual sanctions enacted by Poland,[71] but a $60/barrel price cap was imposed on Russian oil exports in December of 2022.[72] Natural gas was largely excluded from sanctions, but Russian LNG has been sanctioned by numerous countries and the EU banned the transshipment of LNG cargoes through EU ports to non-EU countries.[73] Many oil and gas majors, like Shell, pulled out of joint-ventures with Russian energy firms and sold their Russia-based assets.[74]

This massive spike in fossil fuel commodity prices led to clear winners and losers. Consumers globally lost; however, many O&G firms attained record profits during the price spike, more than making up for the write-downs resulting from their exit from the Russian market. In 2022, Western supermajors more than doubled their profits to a record-breaking $219 billion.[75] These profits enabled BP, Chevron, Equinor, ExxonMobil, Shell, and TotalEnergies to distribute an unprecedented $110 billion to shareholders.[76]

Recognizing the threat to energy security that reliance on Russian energy presents, Europe attempted to shift its energy mix away from Russia. Energy policy has always been framed as a trilemma, with a need to balance security, affordability, and sustainability. European policymakers have gone through a stark shift in mentality since the start of the war in Ukraine away from sustainability towards security. This shift in mentality has changed the parameters of

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[71] "Poland Sanctions Gazprom among 50 Russian Firms and Oligarchs," *Reuters*, April 26, 2022, sec. Europe, https://www.reuters.com/world/europe/poland-sanctions-gazprom-among-50-russian-firms-oligarchs-2022-04-26/.
[72] "The Price Cap on Russian Oil: A Progress Report," U.S. Department of the Treasury, accessed April 22, 2025, https://home.treasury.gov/news/featured-stories/the-price-cap-on-russian-oil-a-progress-report.
[73] Anouk Honoré, "EU Sanctions on Russian LNG: A Test of European Unity," OIES Energy Insight (Oxford Institute for Energy Studies, July 2024), https://www.oxfordenergy.org/wpcms/wp-content/uploads/2024/07/Insight-156-EU-sanctions-on-Russian-LNG.pdf.
[74] Peter Granitz, "Major Oil Companies Pull out of Once-Promising Russia," *NPR*, March 1, 2022, sec. Business, https://www.npr.org/2022/03/01/1083659975/oil-majors-pull-out-of-once-promising-russia.
[75] Ron Buosso, "Big Oil Doubles Profits in Blockbuster 2022," *Reuters*, n.d., https://www.reuters.com/business/energy/big-oil-doubles-profits-blockbuster-2022-2023-02-08/.
[76] Ron Buosso.

what is allowable in the European consciousness with regards to energy production and supply. This can be most clearly seen in the reopening of coal plants in Germany in 2022 and renewed support for new gas infrastructure and gas purchasing to ensure energy security irrespective of emissions immediately following the start of the war.[77]

Similarly, in the legislative sphere, faced with the 2022 energy crisis, the EU developed new legislation geared towards energy security and independence. Much of this legislation fell under the broad RePowerEU plan, which was launched in 2022 as a response to the energy crisis.[78] Broadly, the plan sought to reduce the EU's dependency on Russian fossil fuels and accelerate the transition to renewable energy, although these two goals sometimes conflicted. The plan included investment in renewables, energy efficiency, and diversification of energy sources.

From the supply side, much effort went in to shoring up gas supply, with the development of a joint purchasing platform for smaller firms and buyers.[79] Furthermore, to ensure flexibility and security of supply, the EU mandated that European gas storage had to be 90% full by the start of winter going forward.[80] There was a broad effort to diversify European supply by buying LNG and finding new suppliers to fill the gap that Russia left like Norway, Azerbaijan, North Africa, and the U.S.[81] By the end of 2024, EU LNG import capacity reached 334.5 bcm.[82] EU member states enabled this by fast tracking permitting for FSRUs and LNG import terminals and

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[77] "Energy Crisis Fuels Coal Comeback in Germany | Reuters," accessed April 26, 2025, https://www.reuters.com/markets/commodities/energy-crisis-fuels-coal-comeback-germany-2022-12-16/.
[78] "EU Action to Address the Energy Crisis - European Commission."
[79] Henderson, "The Impact of the Russia-Ukraine War on Global Gas Markets."
[80] Henderson.
[81] Henderson.
[82] "LNG Regasification Capacity in Europe 2024," Statista, accessed April 22, 2025, https://www.statista.com/statistics/1101409/lng-terminals-regasification-capacity-outlook-europe/.

in some cases outright buying FSRUs, like in Italy's case where its state-controlled natural gas operator Snam bought an FSRU with a capacity 5 bcm in 2022.[83]

While many discussions of management of this crisis focus on what the EU and member states did to overcome it, it is important to note that unless a particular member state has a national energy or utility company, that supply-side actions were completed by private companies like Shell, Eni, TotalEnergies, and private utility companies. From a demand side, the EU required that gas consumption be constrained by 15%,[84] with many member states incentivizing heat pumps and curtailing industrial production.[85]

Outside of the RePowerEU plan, to protect consumers, various EU member states and the UK developed price caps for its domestic consumers. The EU also enacted a wholesale price cap of €180 per megawatt-hour (MWh) and an LNG price cap limiting the difference between the price of LNG to Europe and the spot price on the continent to a max of €35/MWh.[86]

As Europe rapidly reduced its reliance on Russian energy, Russia, seeking alternative consumers and revenue to sustain its war effort, pivoted toward Asia, with a particular focus on China. In 2019, the Power of Siberia 1 pipeline, delivering 38 bcm of gas from Russia's Siberian fields to China came online.[87] Since the end of its energy relations with Europe, Russia has built upon this agreement, developing a 10 bcm contract in 2022 to bring Russian gas from Sakhalin

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[83] Valentina Za and Maria Pia Quaglia, "Snam Buys Regasification Vessel as Italy Diversifies Energy Supplies," *Reuters*, accessed April 22, 2025, https://www.reuters.com/article/business/snam-buys-regasification-vessel-as-italy-diversifies-energy-supplies-idUSKBN2NI2OQ/.
[84] Henderson, "The Impact of the Russia-Ukraine War on Global Gas Markets."
[85] "Council Formally Adopts 15% Gas Demand Reduction Target," Consilium, accessed April 26, 2025, https://www.consilium.europa.eu/en/press/press-releases/2023/03/30/council-formally-adopts-15-gas-demand-reduction-target/.
[86] Henderson, "The Impact of the Russia-Ukraine War on Global Gas Markets."
[87] Henderson.

Island to China via a pipeline running through Vladivostok.[88] Russia also hoped to increase the volumes sent through the Power of Siberia 1 and develop a new Power of Siberia 2 pipeline. The proposed Power of Siberia 2 pipeline would bring 50 bcm of gas from the Yamal peninsula, a field that traditionally supplies European gas markets, to China, which would allow Gazprom to divert 33% of the gas meant for the European market to China.[89]

In the meantime, Russia has also ramped up its sanctions evasion tactics, illicitly selling oil and LNG with the use of its shadow fleet, a clandestine network of ships used to transport sanctioned commodities discreetly. The shadow fleet operates primarily by transferring Russian oil and petroleum products onto older vessels with unclear or concealed ownership structures, frequently changing their registration and sailing under flags of convenience to avoid scrutiny and sanctions enforcement.[90] This fleet has enabled Russia to circumvent Western sanctions, maintaining crucial export revenue streams to finance its economy and military activities, further complicating the geopolitical tensions surrounding global energy markets and undermining international efforts to limit Russian influence through economic measures, although there are high additional costs to Russia imposed by using this practice.

Europe's energy landscape, already disrupted by changes in key gas suppliers, policy shifts, and supply shocks, has been further destabilized by a rise in critical infrastructure attacks. Critical infrastructure attacks are a form of grey zone warfare, which is a wide category of hybrid threats under which states use any number of disruptive measures from sabotage to cyber-attacks to undermine the security of adversaries. These attacks fall below the level of direct military

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[88] Henderson.
[89] Henderson.
[90] "Where Did Russia's Shadow Fleet Come from?," Brookings, accessed April 27, 2025, https://www.brookings.edu/articles/where-did-russias-shadow-fleet-come-from/.

action, and often go unattributed, but have the potential to cause chaos and disorder. Some of the most prominent examples of grey zone warfare on the European energy system are the severing of the Balticconector pipeline in October of 2023,[91] and the destruction of the Nord Stream 2 pipeline in 2022.[92]

In the background of all of these macro-changes to the energy sector there are still strong geopolitical, military, and security undercurrents that companies may be able to ignore to a degree, but that strongly influence policymakers and the broader macroenvironment on top of the existential climate threat that countries and companies are attempting to adapt to. As a result, there is a greater pressure than ever before to develop sustainable and resilient energy systems, enabled or hindered by the largest market players – the oil and gas majors.

## 5.0 Case Studies:

The following two chapters investigate how Shell and Gazprom, despite both being major players in the global energy market, have responded in divergent ways to geopolitical and market shocks according to their own unique contexts. By tracing the evolution of each firm's strategy from 2020 to 2024, this analysis reveals how institutional environments, ownership structures, and regulatory regimes shape corporate pathways toward, or away from, the green transition.

### 5.1 Shell:

Against this turbulent geopolitical and regulatory backdrop, the strategic responses of fossil fuel companies offer crucial insight into the evolving global energy order. Shell (NYSE:

[91] "Finland Investigates Suspected Sabotage of Baltic-Connector Gas Pipeline," October 10, 2023, https://www.bbc.com/news/world-europe-67070389.
[92] Majkut et al., "Security Implications of Nord Stream Sabotage."

SHEL), as one of the largest integrated oil and gas companies in the world and a key player in the European energy market, sits at the intersection of climate ambition and energy security. Its response to the war in Ukraine, the European energy crisis, and shifting regulatory pressures serves as a clear indicator for how industry leaders navigate this new era.

Shell initially positioned itself as a climate leader among oil majors, setting ambitious net-zero targets and investing in renewables. However, following the 2022 energy crisis, Shell recalibrated its strategy, loosening short- and mid-term climate goals, pivoting heavily toward natural gas and LNG, and prioritizing shareholder returns and energy security, bolstered by the securitization of European energy policy and high fossil fuel prices. Despite this, Shell has kept its long-term climate goals intact, but they are increasingly undermined by the softening of Shell's shorter-term goals. This shift highlights how even transition "leaders" dilute climate ambition under geopolitical and market pressures, exposing the fragility of corporate sustainability commitments in times of crisis.

The following section provides an in-depth analysis of Shell's strategy between 2020 and 2024, examining how it has responded to these external shocks and adapted its business model in an increasingly carbon-constrained world. From its historical positioning and organizational structure to the turning point of 2022 and beyond, Shell's evolving strategy reveals both the possibilities and limitations of transition in an era of insecurity, as it balances higher fossil fuel prices, investor demands for profitability, and short-term energy security goals driving both higher fossil fuel demand and a loosening of European energy attitudes towards sustainability. See Appendix 10.1 for a discussion of Shell's organizational structure and reporting.

### 5.1.2 Shell Company History and Strategy:

Shell traces its origins to the early 20th-century merger of a British oil export business, Shell Transport and Trading Company, and a Dutch oil trading firm, Royal Dutch Petroleum into Royal Dutch Shell. Over its more than 100-year history, Shell has grown into one of the world's largest oil and gas companies. Among its many milestones, it helped pioneer the first sea transportation of LNG in 1964. Traditionally focused on fossil fuels, with assets concentrated in the Middle East and Asia, Shell expanded its portfolio in response to the 1970s oil crisis, increasing its presence in the North Sea and the United States while diversifying into coal, nuclear power, and metals. From the 1980s through the 2010s, the company pursued growth through acquisitions and advanced its deepwater drilling capabilities.

In 2016, Shell established its New Energies division, marking its formal entry into the renewable energy sector.[93] That year, Shell announced that it would have a $200 million new energy investment budget, which would increase to $1 billion in 2017.[94] Then, in 2017 it announced that its new energy investment budget would be increased to $1-2 billion, 80% of which was planned to invest into the power sector.[95] Accordingly, it moved into the consumer power sector, acquiring UK-based electricity and gas supplier First Utility and Europe's largest EV charging company New Motion in the same year. In 2018 these renewable energy acquisitions continued, with Shell buying the U.S. solar developer Silicon Ranch, investing $20 million into Husk Power Systems, and investing in energy storage companies like GI Energy, Axiom Exergy, and sonnen, amongst others.[96]

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[93] "Our Company History."
[94] Pickl, "The Renewable Energy Strategies of Oil Majors – From Oil to Energy?"
[95] Pickl.
[96] Pickl.

Despite these moves, taken in the broader context of Shell's massive investment budget, Shell's real commitment to renewable energy and the energy transition in this period was quite minimal. In 2016, Shell had a total capital expenditure (capex) of $80 billion, the vast majority of which went to its core oil and gas business, dwarfing its 2016 $200 million and 2017 $1 billion pledges for renewable energy investment. [97] Moreover, where data is available, analyses show that Shell invested less than 50% of its pledged clean energy amounts, spending only $900 million in 2020 despite promising $1–2 billion annually.[98]

However, despite doubts about the substance of Shell's strategic pivot, it remains a leader within the oil and gas industry's energy transition efforts, classified as a "transition leader" in Hartmann's typology.[99] Shell's multipronged approach to the energy transition, via in-house R&D, direct asset ownership, and venture capital investments, aligns with Shojaeddini's most engaged firms,[100] and it is classified as a "renewables leader" in Pickl's capital allocation analysis.[101] Although Shell spent only about 1.33% of its capital expenditures on clean energy between 2010 and 2018, this still far outpaced the industry average of 0.5–0.8% reported between 2015 and 2019, and the American oil majors, often classified as "renewable laggards" or "hydrocarbon stalwarts," which invested just 0.22–0.23%.[102] Furthermore, its climate pledges have been the most far reaching and amongst the earliest.

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[97] Pickl..
[98] Mei Li, Gregory Trencher, and Jusen Asuka, "The Clean Energy Claims of BP, Chevron, ExxonMobil and Shell: A Mismatch between Discourse, Actions and Investments," *PLOS ONE* 17, no. 2 (February 16, 2022): e0263596, https://doi.org/10.1371/journal.pone.0263596.
[99] Hartmann, Inkpen, and Ramaswamy, "The Oil and Gas Industry."
[100] Shojaeddini et al., "Oil and Gas Company Strategies Regarding the Energy Transition."
[101] Pickl, "The Renewable Energy Strategies of Oil Majors – From Oil to Energy?"
[102] Li, Trencher, and Asuka, "The Clean Energy Claims of BP, Chevron, ExxonMobil and Shell."

In 2017, Shell became the first O&G company to announce that it was pledging to reduce its greenhouse gas (GHG) emissions from its energy products after sales, i.e. its Scope 3 emissions, which many O&G firms have been reluctant to do even today.[103] Shell announced that it aimed to reduce the carbon emissions of its energy products by 20% by 2035, and by 50% by 2050, in accordance with the 2015 Paris Climate Agreement.[104] In May of 2018, the CEO of Shell, Ben van Beurden, told investors that Shell is no longer an oil and gas company, but an "energy transition company."[105] Following through with this, Shell announced that it would begin to develop short term intermediary emissions targets annually and link company performance on them to executive salaries.[106] For example, in 2019, Shell set the goal of reducing its carbon footprint by 2-3% compared to 2016 levels by 2021, and in 2020 Shell set a goal of reducing its carbon footprint by 3-4% compared to 2016 levels by 2022, for which performance was linked to the salary of 16,500 employees.[107]

### 5.1.3 Shell Climate Rhetoric and Strategic Shifts (2020-2024):

Shell's strategic focus and attitude towards the energy transition is most clearly defined in four key areas of the annual report: the "Chair's message, " "CEO's review," "Strategy and outlook" segment, and "Climate change and energy transition" segment (later referred to as "Our journey to net zero"). Shell's strategy is informed by the strategic planning and understanding of

[103] Li, Trencher, and Asuka.
[104] "Responsible Investment Annual Briefing Updates," Shell Global, April 16, 2020, https://www.shell.com/news-and-insights/newsroom/news-and-media-releases/2020/responsible-investment-annual-briefing-updates.html.
[105] Anjli Raval, "Oil Producers Face Their 'Life or Death' Question," *Financial Times*, accessed April 22, 2025, https://www.ft.com/content/a41df112-7080-11e8-92d3-6c13e5c92914.
[106] "Responsible Investment Annual Briefing Updates."
[107] "Responsible Investment Annual Briefing Updates."

the energy system which Shell develops in its scenario analyses and is further detailed in its 2021 and 2024 Energy Transition Strategy.

In 2020 and 2021, Shell seemed poised to continue the trend of climate leadership amongst its peers, setting ambitious new climate targets, casting itself as a market leader playing an active role in the energy transition. In February of 2021, Shell announced its first ever Energy Transition Strategy, laying out its path forward through the energy transition, called "Powering Progress." In it, Shell announced that it would aim to become net-zero by 2050 across Scopes 1, 2, and 3 emissions as well as key targets along the way, such as achieving a 20% reduction in net carbon intensity by 2030 as compared to 2016 levels, and a 45% reduction by 2035.[108] Rhetorically Shell echoed these ambitious targets, writing in 2020 that "Shell will change as the world adopts the low-carbon energy system needed to tackle climate change,"[109] and asserting in 2021 that "Shell must also play its part in helping to tackle the world's biggest challenge: climate change."[110]

At the same time, Shell's public commitment to climate action was reinforced by an unprecedented legal ruling. In May 2021, the District Court of The Hague ruled in *Milieudefensie et al. v. Royal Dutch Shell plc.* that Shell was legally obligated to reduce its net global carbon emissions by 45% by 2030 compared to 2019 levels, across Scopes 1, 2, and 3.[111] The court emphasized that Shell's existing climate policies were insufficient and that the company bore a duty of care under Dutch law and human rights principles.[112] This landmark

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[108] Shell plc, "Energy Transition Strategy 2021" (The Hague: Shell plc, 2021).
[109] Shell plc, "Shell Annual Report 2020" (The Hague: Shell plc, 2021).
[110] Shell plc, "Shell Annual Report 2021" (The Hague: Shell plc, 2022).
[111] "Milieudefensie et al. v. Royal Dutch Shell Plc.," *Climate Change Litigation* (blog), accessed November 12, 2024, https://climatecasechart.com/non-us-case/milieudefensie-et-al-v-royal-dutch-shell-plc/.
[112] "Milieudefensie et al. v. Royal Dutch Shell Plc."

decision compelled Shell to formalize and publicly defend its energy transition plans as part of its corporate strategy, lending legal weight to what had previously been framed as voluntary ambition.

By the publication of the 2021 Annual Report in the spring of 2022, however, Russia had already begun its full-scale invasion of Ukraine. Throughout 2022, faced with the energy crisis, Shell's strategic priorities and tone clearly shifted. In September of 2022, it was announced that Ben van Beurden, who led Shell in its energy transition efforts, would be stepping down from the position of CEO and Wael Sawan would succeed him in 2023. In his "CEO's Review" in the 2022 Annual Report, Sawan asserted that "the stark realities we are seeing globally reinforce the need for a balanced energy transition" in reference to the start of the war in Ukraine, reflecting the already changing attitudes towards energy security globally.[113] He also clearly indicated a renewed emphasis on profitability, writing "Shell is a great company, and we are changing to ensure we become a great investment too" and noted that "Profit without sustainability erodes our license to operate. Sustainability without profit erodes our shareholder support and financial capacity to play a meaningful part in the energy transition."[114] This coincided with a refocus on O&G and in particular LNG, with Shell delivering 194 LNG cargoes to Europe that same year, over 5 times greater than its yearly average.[115]

In 2023, this strategic re-centering of O&G continued, with Shell announcing a plan to increase LNG capacity by 11 million tons per year in the second half of the decade,[116] and with

[113] Shell plc, "Shell Annual Report 2022" (The Hague: Shell plc, 2023).
[114] Shell plc.
[115] Shell plc.
[116] Shell plc, "Shell Annual Report 2023" (The Hague: Shell plc, 2024).

the introduction of internal rate of return (IRR) thresholds for RES projects.[117] Shell's future investments in its Renewables and Energy Solutions segment would require an IRR of 12–14%, compared to 6–8% for Integrated Gas and 10–12% for Upstream projects, signaling a clear financial prioritization of fossil fuel assets. Concurrently, Shell exited its retail energy businesses in the UK, Germany, and The Netherlands, citing low margins and misalignment with its new "value over volume" strategy. These moves reflect a strategic pivot toward high-return, core operations and away from lower-margin consumer-facing power markets.

The 2024 Energy Transition Strategy was the culmination of these changes in Shell's attitude towards the energy transition, emphasizing a refocus on profitability, as it exited low-margin ventures like retail electricity, "stepping back from activities that do not fit our strategy or that do not generate enough returns."[118]

In Shell's 2021 Energy Transition Strategy, it framed itself as a proactive climate leader able to take initiative to 'win' in a changing market. Contrastingly, in 2024, Shell cast itself as a rational actor in a constrained environment, navigating a volatile and uncertain energy future, taking a much more defensive and cautious approach. Rhetorically Shell emphasized both the need for a "balanced energy transition…that maintains secure and affordable energy supplies,"[119] and that its "ability to raise and invest capital depends on delivering strong returns to shareholders, shaping the role that Shell can play on the journey to net zero,"[120] and for the first time detailed the expected IRR on its energy projects in an Energy Transition Strategy.

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[117] Shell plc.
[118] Shell plc, "Energy Transition Strategy 2024" (The Hague: Shell plc, 2024).
[119] Shell plc.
[120] Shell plc.

Broadly, Shell's kept its long-term goal of reaching net zero emissions by 2050 and its approach towards achieving those goals stayed the same, referencing the same methods: increasing operational efficiency and reducing operational emissions, shifting its product mix towards natural gas, growing its low-carbon power business, deploying EV charging stations, developing biofuels and hydrogen, investing in carbon capture and storage, and the use of natural carbon sinks and carbon credits. However, on a more granular level, Shell walked back many of its short and medium-term energy transition and emissions goals and shifted its strategy away from renewable energy generation towards low carbon solutions like biofuels and especially LNG. For example, the 2021 target of a 45% reduction in net carbon intensity by 2035 was dropped in the 2024 Energy Transition Strategy,[121, 122] and the goal of a 20% reduction in net carbon intensity by 2030 was relaxed to a range of 15–20%.[123] Simultaneously, the ambitious 2021 target of deploying 2.5 million EV charging points by 2030 was downgraded in 2024 to a new target of deploying only 200,000 public chargers by 2030.[124]

In keeping with its strategy to return to its core business model and emphasis on projects with higher margins, Shell abandoned its 2021 commitment to reduce oil production 1–2% annually.[125] While acknowledging that oil had hit peak production in 2019, Shell announced that it would instead invest enough to maintain a consistent level of oil output through 2030, while still asserting it would end frontier oil exploration after 2025. [126] Furthermore, Shell's shift towards LNG was made exceedingly clear, driven by energy security and profitability concerns.

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[121] Shell plc, "Energy Transition Strategy 2021."
[122] Shell plc, "Energy Transition Strategy 2024."
[123] Shell plc.
[124] Shell plc.
[125] Shell plc, "Energy Transition Strategy 2021."
[126] Shell plc, "Energy Transition Strategy 2024."

In the 2021 Energy Transition Strategy, LNG was only referenced 8 times, whereas in the 2024 document, it was referenced 89 times. In it, LNG was touted as a solution to decarbonization, energy security, and profitability, serving as a strategic 'sweet spot' for Shell in the changed industry post-2022 energy crisis. In 2019, Shell launched a program linking employee salaries to key energy transition performance indices. In 2024, one of those KPIs was LNG volumes, again emphasizing the importance that Shell placed on LNG as a core part of its business strategy. In the 2024 Annual Report, LNG was enshrined as a core tenant of Shell's strategy, with the CEO writing that "we expect that supplying LNG will be the biggest contribution we will make to the energy transition over the next decade." [127]

In 2024, the case *Milieudefensie et al. v. Royal Dutch Shell plc.* was dismissed by The Hague's Court of Appeal. While the case is going to be taken to The Netherland's Supreme Court, this reversal marked a significant turning point.[128] The Court of Appeal's dismissal in 2024 lifted the immediate legal pressure on Shell to comply with the original emissions reduction mandate, allowing the company to continue revising and relaxing its short- and medium-term climate targets without regulatory pressure otherwise. While Shell maintained its long-term net-zero ambition, the weakening of binding legal obligations coincided with, and arguably enabled, its strategic pivot back toward LNG and high-return fossil fuel assets. The ongoing appeal to The Netherlands' Supreme Court leaves the legal uncertainty unresolved, but for now, Shell appears to be leveraging this window of flexibility to prioritize profitability and investor returns.

This shift towards profitability and tightening of business activities inwards towards Shell's core business was driven by pressure to improve investor returns, economic uncertainty,

[127] Shell plc, "Shell Annual Report 2024" (The Hague: Shell plc, 2025).
[128] Shell plc.

and shifts in both the thinking around and realities of security in global energy supply and policy due to the war in Ukraine. This is most clearly seen in Shell's scenario analyses.

In Shell's 2023 Energy Security Scenario, Shell developed two scenarios for the world: Sky 2050, working backwards to achieve net-zero emissions by 2050 and limit global warming to 1.5℃ by 2100,[129] and Archipelagos, following a world trajectory based on the state of the world in 2022,[130] both assuming a global shift to a security mindset towards both energy and in the global world order.[131] In both scenarios, natural gas is of critical importance well into the century, with natural gas demand only peaking in the 2040s, and use falling only 50% by 2090 in the Archipelagos scenario, and peaking in the 2020s and falling by 50% after 2050 in its ambitious Sky 2050 scenario.[132] LNG too remains relevant for a long period of time. In both optimistic and pessimistic scenarios, LNG emerges as a solution to energy security needs and continues to grow even as global gas demand falls (Sky 2050) or plateaus in the long term (Archipelagos).[133]

This strategic recalibration by Shell in the aftermath of the 2022 energy crisis mirrors broader geopolitical dynamics and underscores the evolving tensions within the European energy trilemma. As the EU reframed its energy priorities in response to acute supply shocks and security concerns, Shell's pivot toward LNG and retreat from some of its more ambitious short- and mid-term climate goals reflects the growing weight of energy security and affordability over sustainability. This rhetorical and strategic shift exemplifies how even firms positioned as

[129] Shell plc, "2023 Shell Energy Security Scenario" (The Hague: Shell plc, 2023).
[130] Shell plc.
[131] Shell plc.
[132] Shell plc.
[133] Shell plc.

industry leaders in the energy transition recalibrate under duress, calling into question the credibility and feasibility of achieving long-term climate targets when short-term geopolitical realities dominate. In many ways, Shell's strategic pivot is not just a reflection of internal investor logic or market shifts, but also a corporate embodiment of Europe's crisis-induced reorientation, where the imperative to keep the lights on today has complicated the vision for a decarbonized tomorrow.

### 5.1.4 Shell Performance (2020-2024):

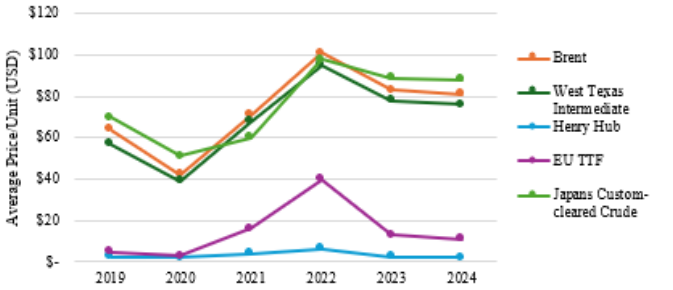
Shell's financial performance from 2020 to 2024 encapsulates a period of volatility, strategic pivoting, and renewed emphasis on fossil fuel profitability. This five-year period saw dramatic highs and lows in production, demand, prices, and ultimately profits. Shell's financial and production outcomes for this time period both incentivized and resulted from its strategic transition during the same time.

Due to the COVID-19 pandemic, energy prices were quite low in 2020, with Brent crude averaging $42 per barrel and the European Title Transfer Facility (EU TTF) at just $3 per Million British Thermal Units (MMBtu), falling 52% and 68% from 2019 levels respectively (see Figure 5.1). During this period, capital expenditures into both Integrated Gas and Upstream extraction fell. Thus from 2020 to 2022, Shell's production volumes in both these segments declined. Integrated Gas, for instance, fell from 1,011 thousand barrels of oil equivalent per day (kboe/d) in 2020 to 921kboe/d in 2022 (see Figure 5.2).[134,135] These investment choices and this gradual

[134] Shell plc, "Shell Annual Report 2020."
[135] Shell plc, "Shell Annual Report 2022."

shift in Shell's product mix away from O&G were in line with Shell's public climate commitments and expectations of a slow but steady decline in fossil fuel demand at the time.

This trajectory reversed dramatically in 2022. The full-scale invasion of Ukraine and its accompanying global energy shock pushed energy prices to unprecedented highs, with Brent prices rising to $101 per barrel and EU TTF prices to $40/MMBtu, over triple their 2021 levels (see Figure 5.1). Shell's average realized crude oil and natural gas liquids price in Europe reached $94.52/MMBtu, up from $68.30/MMBtu in 2021, and its average realized natural gas prices in Europe reached $27.24 per trillion standard cubic feet (tscf), a 154% increase from the year before, reflecting the extraordinary price environment and reinforcing the logic of its pivot toward gas (see Figure 5.1). These price surges fueled Shell's most profitable year on record, with total earnings hitting $40 billion.[136]



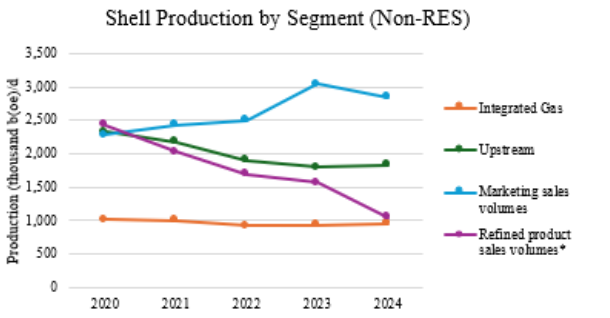

**Oil and Gas Average Industry Prices**

| Segment | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Unit |
|---|---|---|---|---|---|---|---|
| Brent | $64.00 | $42.00 | $71.00 | $101.00 | $83.00 | $81.00 | $/b |
| West Texas Intermediate | $57.00 | $39.00 | $68.00 | $ 95.00 | $78.00 | $76.00 | $/b |
| Henry Hub | $ 2.50 | $ 2.00 | $ 4.00 | $ 6.40 | $ 2.50 | $ 2.20 | $/MMBtu |
| EU TTF | $ 5.00 | $ 3.00 | $16.00 | $ 40.00 | $13.00 | $11.00 | $/MMBtu |
| Japans Custom-cleared Crude | $70.00 | $51.00 | $60.00 | $ 98.00 | $89.00 | $88.00 | $/b |

**O&G Average Industry Prices Growth (YoY)**

| Segment | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Notes: |
|---|---|---|---|---|---|---|---|
| Brent | n/a | -52.4% | 69.0% | 42.3% | -17.8% | -2.4% | Global oil benchmark |
| West Texas Intermediate | n/a | -46.2% | 74.4% | 39.7% | -17.9% | -2.6% | US oil benchmark |
| Henry Hub | n/a | -25.0% | 100.0% | 60.0% | -60.9% | -12.0% | North Am gas market |
| EU TTF | n/a | -66.7% | 433.3% | 150.0% | -67.5% | -15.4% | Euro gas spot price |
| Japans Custom-cleared Crude | n/a | -37.3% | 17.6% | 63.3% | -9.2% | -1.1% | Asia LNG contract price |

**Figure 5.1:** Oil and Gas Benchmark Prices, 2019–2024.
**Source:** Shell plc, *Annual Report 2020*; Shell plc, *Annual Report 2021*; Shell plc, *Annual Report 2022*; Shell plc, *Annual Report 2023*; Shell plc, *Annual Report 2024*.




**Reported Production by Segment (thousand b(oe)/d unless specified)**

| Segment | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Integrated Gas | 1,011.0 | 1,004.0 | 921.0 | 939.0 | 954.0 |
| Upstream | 2,324.0 | 2,178.0 | 1,897.0 | 1,800.0 | 1,831.0 |
| Marketing sales volumes | 2,276.0 | 2,433.0 | 2,503.0 | 3,045.0 | 2,843.0 |
| Refined product sales volumes* | 2,434.0 | 2,026.0 | 1,700.0 | 1,570.0 | 1,052.0 |
| Chemicals sales volumes (thousand tons) | 15,036.0 | 14,216.0 | 12,281.0 | 11,245.0 | 11,875.0 |

**Production Change by Segement (YoY)**

| Segment | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Integrated Gas | n/a | -0.7% | -8.3% | 2.0% | 1.6% |
| Upstream | n/a | -6.3% | -12.9% | -5.1% | 1.7% |
| Marketing sales volumes | n/a | 6.9% | 2.9% | 21.7% | -6.6% |
| Refined product sales volumes* | n/a | -16.8% | -16.1% | -7.6% | -33.0% |
| Chemicals sales volumes | n/a | -5.5% | -13.6% | -8.4% | 5.6% |

**"Product sales volumes" references refined oil products and is referred to as "Refining & Trading sales volumes" in earlier Annual Reports and underwent reporting changes from 2023*

**Figure 5.2:** Shell Non-Renewable Production 2020-2024.
**Source:** Shell plc, *Annual Report 2020*; Shell plc, *Annual Report 2021*; Shell plc, *Annual Report 2022*; Shell plc, *Annual Report 2023*; Shell plc, *Annual Report 2024*.

[136] Shell plc.

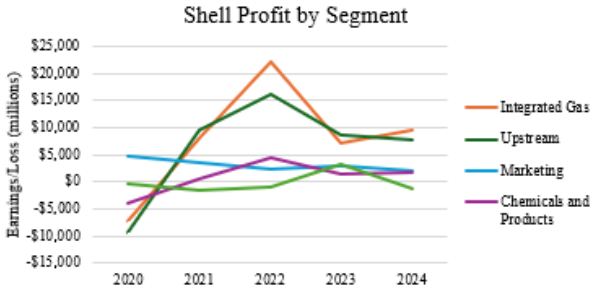
In response to Russia's unilateral invasion, Shell, like many other companies, completely divested from its Russian assets, and ended all joint ventures and cooperation with Russian firms like Gazprom, losing a sizeable portion of its natural gas portfolio. Despite this loss, Shell's Integrated Gas segment alone generated $22 billion in earnings, up 176% from the previous year, and overtook Upstream, which posted $16 billion in earnings, largely due to price shocks, as production was still at a low level due to earlier investment reluctance (see Figure 5.3).

This windfall not only offset Russian write-downs but also validated Shell's strategic pivot back toward oil and gas. The following year, in 2023, Shell reallocated capital expenditures to high-margin fossil fuel projects, particularly in LNG and Upstream, while moderating growth in renewables. Capex into Integrated Gas increased by over 20% in 2023, reflecting Shell's growing focus on LNG as both a transition fuel and a strategic hedge against energy insecurity (see Figure 5.4). Upstream capex also rose as the company sought to stabilize and eventually grow production capacity. In contrast, investment in Renewables & Energy Solutions (R&ES) slowed markedly, growing only modestly in 2023 and declining by 5% in 2024 (see Figure 5.4). These changes most clearly illustrate Shell's new post-2022 prioritization of "value over volume," with capital increasingly funneled into high-margin fossil fuel assets and away from lower-return renewables, aligning with the firm's updated transition logic under its 2024 Energy Transition Strategy and relaxation of short- and medium-term climate targets.

Oil and gas assets have long lead times, meaning that despite these investments made in 2023, O&G production only began to rise again late in 2023 and in 2024, reversing the prior downward trend. Take for instance, LNG liquefaction volumes, which had dipped from 33.2 million tons in 2020 to 28.3 million tons in 2023, and only began recovering after capital injections that same year, reaching 29.1 million tons by 2024 (see Figure 5.5).

Interestingly, throughout this period, despite a slow in investment into RES, Shell's renewable power capacity continued to grow, and reported a temporary profit surge in 2023. However, RES has always been a loss for Shell, posting a $1.5 billion and $1 billion loss in 2021 and 2022 respectively and this spike was driven more by volatile, lucrative energy trading markets in Europe than underlying renewable asset performance, and reverted back to a loss in 2024, posting a loss of $1.2 billion that year (see Figure 5.3).

Despite this fossil fuel resurgence, this time period did not coincide with a spike in reported emissions. However, aside from a drop in emissions tied to Shell's 2022 divestments from the Russian market, emissions did not meaningfully move during this 5-year period. In fact, Shell's carbon intensity fell from 91 grams of $CO_2$ equivalent per megajoule ($gCO_2e/MJ$) in 2021 to 87 $gCO_2e/MJ$ in 2022 and remained flat through 2024 for oil and gas-to liquid products, and



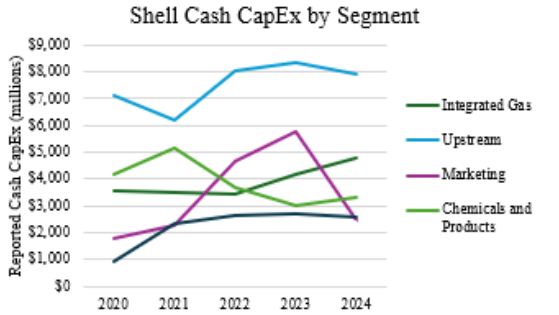

**Reported Earnings/Loss by Segment (in millions)**

| Segment | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Integrated Gas | $ (7,230) | $ 8,060 | $ 22,212 | $ 7,057 | $ 9,590 |
| Upstream | $ (9,300) | $ 9,603 | $ 16,258 | $ 8,540 | $ 7,772 |
| Marketing | $ 4,801 | $ 3,535 | $ 2,292 | $ 3,057 | $ 1,894 |
| Chemicals and Products | $ (3,831) | $ 404 | $ 4,380 | $ 1,482 | $ 1,757 |
| RES | $ (479) | $ (1,514) | $ (1,027) | $ 3,089 | $ (1,229) |
| Corporate | $ (2,952) | $ (2,606) | $ (2,562) | $ (2,944) | $ (2,992) |
| Total | $ (18,991) | $ 17,482 | $ 41,553 | $ 20,281 | $ 16,792 |

**Earnings Growth**

| Segment | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Integrated Gas | n/a | 211% | 176% | -68% | 36% |
| Upstream | n/a | 203% | 69% | -47% | -9% |
| Marketing | n/a | -26% | -35% | 33% | -38% |
| Chemicals and Products | n/a | 111% | 984% | -66% | 19% |
| RES | n/a | -216% | 32% | 401% | -140% |
| Corporate | n/a | 12% | 2% | -15% | -2% |
| Total | n/a | 192% | 138% | -51% | -17% |

**Figure 5.3** Shell Profit/Loss by Segment 2020-2024.
**Source:** Shell plc, *Annual Report 2020*; Shell plc, *Annual Report 2021*; Shell plc, *Annual Report 2022*; Shell plc, *Annual Report 2023*; Shell plc, *Annual Report 2024*.




**Reported Cash CapEx by Segment (in millions)**

| Segment | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Integrated Gas | $ 3,566 | $ 3,502 | $ 3,433 | $ 4,196 | $ 4,767 |
| Upstream | $ 7,099 | $ 6,168 | $ 8,020 | $ 8,343 | $ 7,890 |
| Marketing | $ 1,774 | $ 2,273 | $ 4,674 | $ 5,790 | $ 2,445 |
| Chemicals and Products | $ 4,198 | $ 5,175 | $ 3,688 | $ 3,014 | $ 3,290 |
| RES | $ 928 | $ 2,359 | $ 2,610 | $ 2,681 | $ 2,549 |
| Corporate | $ 262 | $ 221 | $ 175 | $ 368 | $ 144 |
| Total | $ 17,827 | $ 19,698 | $ 22,600 | $ 24,392 | $ 21,085 |

**Cash CapEx Change**

| Segment | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Integrated Gas | n/a | -2% | -2% | 22% | 14% |
| Upstream | n/a | -13% | 30% | 4% | -5% |
| Marketing | n/a | 28% | 106% | 24% | -58% |
| Chemicals and Products | n/a | 23% | -29% | -18% | 9% |
| RES | n/a | 154% | 11% | 3% | -5% |
| Corporate | n/a | -16% | -21% | 110% | -61% |
| Total | n/a | 10% | 15% | 8% | -14% |

**Figure 5.4** Shell Capital Expenditures by Segment 2020-2024.
**Source:** Shell plc, *Annual Report 2020*; Shell plc, *Annual Report 2021*; Shell plc, *Annual Report 2022*; Shell plc, *Annual Report 2023*; Shell plc, *Annual Report 2024*.

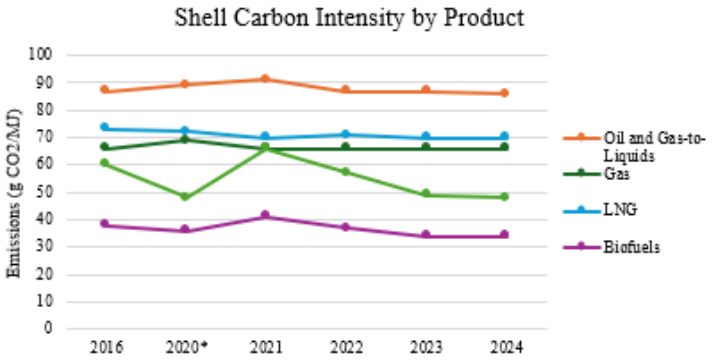
similarly gas emissions largely remained at a stable 66 $gCO_2e/MJ$ during this entire period (see Figure 5.6).

Overall, Shell's post-crisis returns signaled renewed confidence in hydrocarbons as both a financial and geopolitical cornerstone. Even as sustainability rhetoric continued on a surface level, meaningful investment into the energy transition and emissions targets was laid to rest in favor of the outsized financial outperformance of fossil fuels, which coupled with persistent high prices, recast oil and LNG not as legacy burdens, but as vital and still-lucrative transition fuels. Shell's strategic pivot was both incentivized by and continually rewarded by the market environment in the post-2022 energy landscape. Balancing market forces, geopolitical pressures, and conflicting domestic policy signals from the EU, Shell made the strategic choice that prioritized financial resilience. This evolution illustrates the pressures faced by shareholder-driven IOCs to balance sustainability commitments with evolving market and geopolitical realities, and highlights the relative structural flexibility afforded to IOCs as compared to the much more rigid, politically entrenched NOCs.

**LNG-Specific Metrics (million tons)**

| Metric | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| LNG Liquefaction Volume | 33.20 | 31.00 | 29.70 | 28.30 | 29.10 |
| LNG Sales Volume | 69.67 | 64.20 | 66.00 | 67.00 | 65.80 |
| | | | | | |
| LNG Liquefaction Volume Growth (YoY) | n/a | -6.6% | -4.2% | -4.7% | 2.8% |
| LNG Sales Volume Growth (YoY) | n/a | -7.9% | 2.8% | 1.5% | -1.8% |

**Figure 5.5** Shell LNG production 2020-2024.
**Source:** Shell plc, *Annual Report 2020*; Shell plc, *Annual Report 2021*; Shell plc, *Annual Report 2022*; Shell plc, *Annual Report 2023*; Shell plc, *Annual Report 2024*.




**Carbon Intensity by Product (g CO2e/MJ)**

| Product | 2016 | 2020* | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|
| Oil and Gas-to-Liquids | 87.0 | 89.0 | 91.0 | 87.0 | 87.0 | 86.0 |
| Gas | 66.0 | 69.0 | 66.0 | 66.0 | 66.0 | 66.0 |
| LNG | 73.0 | 72.0 | 70.0 | 71.0 | 70.0 | 70.0 |
| Biofuels | 38.0 | 36.0 | 41.0 | 37.0 | 34.0 | 34.0 |
| Power | 60.0 | 48.0 | 66.0 | 57.0 | 49.0 | 48.0 |

**note: 2020 values estimated from 2020 Annual Report as no detailed values provided*

**Carbon Intensity by Product Change (YoY)**

| Product | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Oil and Gas-to-Liquids | n/a | 2.2% | -4.4% | 0.0% | -1.1% |
| Gas | n/a | -4.3% | 0.0% | 0.0% | 0.0% |
| LNG | n/a | -2.8% | 1.4% | -1.4% | 0.0% |
| Biofuels | n/a | 13.9% | -9.8% | -8.1% | 0.0% |
| Power | n/a | 37.5% | -13.6% | -14.0% | -2.0% |

**Figure 5.6:** Shell Carbon Intensity by Product 2020-2024.
**Source:** Shell plc, *Annual Report 2020*; Shell plc, *Annual Report 2021*; Shell plc, *Annual Report 2022*; Shell plc, *Annual Report 2023*; Shell plc, *Annual Report 2024*.

### 5.2 Gazprom:

Contrasting with Shell, Gazprom (MOEX: GAZP) is Russia's largest company by revenue and the world's largest producer and exporter of natural gas. Prior to the start of the war in Ukraine in 2022, it was one of Europe's largest natural gas suppliers. As an NOC, it sits at the intersection of business and policy, operating according to both market principles and in pursuit of Russia's geopolitical goals, which thus affects its attitudes towards climate and energy security. It’s a key example of the stagnation that can occur when a firm, tied tightly to geopolitical goals, misses a key chance to pivot and change, effectively cutting itself out from future markets due to a misalignment of market and national and geopolitical pressures.

Like most NOCs, Gazprom has lagged far behind in its sustainability and climate commitments. The 2022 energy crisis has not meaningfully changed this. Rather, due to its strategic choices, driven by state geopolitical objectives, it has lost its key positioning in the European market, and pivoted to developing markets further reducing any external pressures on the firm to decarbonize or make meaningful investments into the green transition. These actions have thrown the firm into turmoil, calling into question the longevity of the firm and massively harming its balance sheet.

The following case study provides an in-depth analysis of Gazprom's strategy from 2020 to 2024. As Gazprom's strategy and broader customer market has shifted over this time period, the strategic paralysis forced on it due to the unique institutional and governance pressures facing NOCs have emerged, displaying the difficulties of balancing short- and long-term market, geopolitical, and climate risk factors. These pressures have increasingly isolated Gazprom and appear to have doomed it to fall behind not only in its core oil and gas business, but also in developing any meaningful long-term strategy for a low-carbon or renewable future. Gazprom, as a politically instrumentalized NOC, has been unable to adapt to the post-2022 energy landscape due to its alignment with Russian geopolitical objectives. This institutional rigidity has led to a loss of market share, strategic isolation, and an unsustainable approach to the energy transition. See Appendix 10.2 for Gazprom's organizational structure and reporting.

### 5.2.2 Gazprom Company History and Strategy:

Established as a state enterprise in the Soviet era and privatized in 1994, during the final years of the Soviet Union,[137] Gazprom emerged as one of the largest public natural gas-focused

[137] ПАО «Газпром», "Годовой отчет за 2020 год."

IOCs. In 2005 it was effectively re-nationalized under Vladimir Putin's administration, as a law was passed ensuring that the Russian state would always have a majority ownership stake in the firm.[138] As of 2024, the Russian government still owns a controlling stake of over 50% in the company, making Gazprom an NOC and a central instrument of the Kremlin's domestic and foreign policy especially over the last two decades.

Since Vladimir Putin's re-consolidation of the Russian energy sector in the 2000s and Gazprom's re-nationalization, Gazprom has served not only as a commercial enterprise but also as a tool of Russian statecraft, with its pricing decisions, export volumes, and infrastructure projects often aligning with Russia's foreign policy goals. By law, Gazprom is the singular exclusive exporting entity of Russian natural gas to foreign countries. With rights to ~70% of Russia's substantial gas reserves, and 16% of global natural gas reserves amongst its assets, Gazprom has the world's largest reserves of natural gas and is an extremely significant actor in the global energy industry.[139] Thus, Gazprom has been situated in a unique geopolitical situation since the start.

Gazprom traditionally sells the bulk of its product as pipeline gas in long-term take-or-pay contracts, which is a long-term agreement in which the buyer commits to paying for the delivery of a fixed volume of natural gas, regardless of actual consumption, ensuring revenue stability for the supplier. A smaller portion of Gazprom's product is sold as LNG, and another is sold on spot markets, historically in Europe, using these long-term contracts as a price benchmark for further short-term flexible supply arrangement of excess gas flows as needed.

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[138] ПАО «Газпром».
[139] ПАО «Газпром».

This long-term contract structure was largely upheld by both Gazprom (and its Soviet predecessor) and its European customers for decades, forming the basis of a strong sense of trust in the reliability of Russian gas amongst Europeans, despite simultaneous subtle and covert efforts to undermine European energy security.[140] Furthermore, Gazprom played a crucial role in building Europe's post-war energy system and as a result was historically viewed as a reliable partner to Europe, even during Cold War tensions, which was even cited in the 2020 Annual Report as a particular strength of the firm.[141] As a result Gazprom achieved 32% market share in the European gas market in 2020, becoming one of the largest actors in the European energy sector.[142] However, trust in Gazprom and its track record as a reliable energy supplier began to rapidly deteriorate in the 2000s and 2010s due to politically motivated supply disruptions, most notably the 2006 and 2009 gas crises involving Ukraine. These incidents, along with Russia's annexation of Crimea in 2014, and the full-scale invasion of Ukraine in 2022, precipitated a redefinition of Gazprom's role in both the European and global energy systems. The company's close integration with the Kremlin's political agenda and its weaponization of energy exports have accelerated its isolation from Western markets, deepening its dependence on emerging economies.

On the climate and sustainability front, Russia and its major corporations have never been known as leaders. Gazprom, in particular, has taken a reactive, risk-management approach to the energy transition rather than one of proactive adaptation. Gazprom represents a classic case of Guo's "hydrocarbon stalwarts" or "transition resistors," viewing the global push toward

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[140] Margarita M. Balmaceda, *Russian Energy Chains The Remaking of Technopolitics from Siberia to Ukraine to the European Union*.
[141] ПАО «Газпром», "Годовой отчет за 2020 год."
[142] ПАО «Газпром».

decarbonization as an external threat to its business model rather than an opportunity for renewal. Within Hartmann's framework, Gazprom aligns with the "spectator" or "cautious defender" categories, showing little strategic ambition or transformation. Pickl's comparative framework further categorizes Gazprom as a "renewables laggard," with limited capital reallocation and virtually no organizational adaptation to the energy transition. Its ESG disclosures, such as those in its Social Impact Reports, are largely compliance-driven and lack any forward-looking climate commitments of the scale seen among Western IOCs, reinforcing its position as an institutionally rigid and geopolitically instrumentalized fossil fuel incumbent.

Like other Russian corporations, Gazprom has never been overly concerned with its environmental footprint, and much less with its sustainability profile. In the period leading up to 2020, between 2014 and 2019, Russian political and corporate discourse reflected a deep skepticism toward the EU's climate agenda, often framing the energy transition as either an economically irrational or geopolitically motivated effort to marginalize Russian fossil fuels.[143] That being said, as a major player in the European gas market, it faced some investor pressure pushing them to become green. Importantly, the EU has stringent climate disclosure regulations like the CSRD, which Gazprom would have been subject to due both to its presence in the European energy market and its dual listing on the London Stock Exchange. Despite its substantial market presence in the EU's climate-conscious environment and owning a power business with high potential for renewables, Gazprom remained focused on maintaining and expanding its core oil and gas operations in the years leading up to 2022.

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[143] Tatiana Romanova, "Russia's Political Discourse on the EU's Energy Transition (2014–2019) and Its Effect on EU-Russia Energy Relations," *Energy Policy* 154 (July 1, 2021): 112309, https://doi.org/10.1016/j.enpol.2021.112309.

### 5.2.3 Gazprom Strategic Shift (2020-2024)

From 2020 until the 2022 invasion of Ukraine, Gazprom's strategy continued along this trend, and the firm's overarching product strategy and core business changed little even after the invasion. The key indicators of this were the stated strategic goal and mission of the firm which did not change in this entire five-year period. Gazprom's stated mission was to provide a "надежное, эффективное и сбалансированное обеспечение потребителей природным газом, другими видами энергоресурсов и продуктами их переработки" ["reliable, efficient, and balanced supply of natural gas, other energy resources, and their derivatives to consumers"] with the strategic goal of "укрепление статуса лидера среди глобальных энергетических компаний посредство"м диверсификации рынков сбыта, обеспечения энергетической безопасности и устойчивого развития, роста эффективности деятельности, использования научно-технического потенциала" ["strengthening Gazprom's leadership among global energy companies by diversifying sales markets, maintaining energy security and sustainability, driving operational efficiencies and leveraging R&D capabilities"].[144] Rather than a strategic shift or shift in Gazprom's core business model during this time, we see a strong shift in customer base and geography, as well as a recognition of a more securitized energy environment.

Gazprom holds a vast network of production fields concentrated primarily in Western Siberia, the Yamal Peninsula, and Eastern Siberia. Key transit pipelines included the Yamal-Europe pipeline, running through Belarus and Poland to Germany; the Soyuz pipeline, which historically carried gas through Ukraine, Slovakia, and the Czech Republic; and the Brotherhood (Druzhba) corridor, part of a wider network feeding Eastern and Central Europe. The Nord

[144] ПАО «Газпром», "Годовой отчет за 2023 год." (Москва: ПАО «Газпром», 2024)..

Streams 1 and 2, a direct undersea link to Germany, was long considered a flagship route, bypassing transit states and offering stable supply to Western Europe.

In 2020 and 2021, the year of the pandemic and the year following, operation continued broadly as usual through each of these key transit routes to Europe. Notably, in 2020, the new TurkStream pipeline supplying Russian gas to Europe via Turkey opened.[145] Despite the ongoing economic and social turmoil at the time, Gazprom continued to maintain its strong presence in the European market, and a minor stake in the Chinese market, ramping up production in both after a relative low in 2020.

In 2022, Gazprom's customer mix changed dramatically due to a much-altered geopolitical environment following the invasion of Ukraine in February of that year, yet Gazprom's core business strategy did not meaningfully change. In 2022, Gazprom benefited from the spike in oil and gas prices during the global energy crisis, one it had a meaningful role in precipitating by curtailing supplies to Europe. However, the company also faced growing restrictions on energy-related technologies due to Western sanctions, the voluntary exit of nearly all Western IOCs from joint ventures, and a massive push by European consumers to sever reliance on Russian gas due to its role as a tool of Russian foreign policy. In official releases however, Gazprom avoids addressing these issues head on. Rather, its massive shift in customer base and dramatic loss in market share in the European market is only addressed throughout the 2022 Annual Reported with the explanation that "сокращение поставок газа в Европу в 2022 году было обусловлено в первую очередь политически мотивированными решениями ряда стран ЕС об отказе от импорта российского газа" [“the reduction in gas supplies to Europe in

[145] ПАО «Газпром», “Годовой отчет за 2020 год.”

2022 was primarily driven by politically motivated decisions by a number of EU countries to refuse to import Russian gas"].[146]

Gazprom's extensive set of pipelines bringing gas from fields in Western Russia to European countries were gradually shut down as the war progressed. Gas flows through the Yamal-Europe pipeline were halted after Poland declined to renew its long-term contract and imposed sanctions on Gazprom subsidiaries.[147] The Soyuz pipeline and other Ukraine transit routes saw significant reductions due to the war. Nord Stream 1, once the cornerstone of Russian gas exports to Germany, was abruptly shut down in mid-2022, officially for maintenance, and later rendered inoperable following the suspected sabotage of both Nord Stream 1 and 2 in September 2022.[148] By the end of 2022, the only remaining Russian pipeline gas making its way to Europe was via the TurkStream pipeline, some of which was officially sold as 'Turkish' gas, to Hungary and Serbia.[149]

These loses were largely precipitated by consumer and market responses to the unilateral invasion of Ukraine by Russia, but they were also precipitated by actions that Gazprom in particular took to put pressure on the European energy system as a mechanism of Russian foreign coercive soft power following the start of the full-scale war in 2022 and in 2023 which went largely unmentioned in official press and investor releases. For example, after the start of the conflict, Gazprom began to require its remaining consumers to pay for contracted volumes in Russian rubles in accordance with Presidential Decree issued on March 31, 2022 (Decree No.

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[146] ПАО «Газпром».
[147] Samantha Gross and Constanze Stelzenmüller, "Europe's Messy Russian Gas Divorce" (Brookings), accessed April 27, 2025, https://www.brookings.edu/articles/europes-messy-russian-gas-divorce/.
[148] Samantha Gross and Constanze Stelzenmüller.
[149] Samantha Gross and Constanze Stelzenmüller.

172), which mandated that ‘unfriendly’ countries pay for Russian natural gas in rubles.[150] However, this demand contravened existing contracts denominated in euros or dollars and was perceived by European nations as a violation of contractual obligations and a potential breach of EU sanctions.[151] Consequently, many European countries refused to comply with the ruble payment requirement, leading Gazprom to suspend gas supplies to nations like Bulgaria in April 2022.[152]

Additionally, Gazprom's actions prior to the invasion further strained Europe's energy security and were perceived as taken in bad faith in order to weaken European energy supply.[153] In the latter half of 2021, Gazprom significantly reduced its participation in the European spot gas market and declined to replenish its gas storage facilities in Europe. This left European countries with diminished gas reserves, rendering them more vulnerable to supply disruptions. The situation deteriorated further when Gazprom halted gas flows through the Nord Stream 1 pipeline in September 2022, citing maintenance issues.[154] Many European officials viewed this as a politically motivated move to pressure Europe amidst the ongoing conflict. The indefinite suspension of Nord Stream 1, combined with the cessation of spot market sales and reduced storage levels, intensified Europe's energy crisis during the winter months in 2022, weakening European trust in Gazprom’s role as a reliable energy supplier.

Altogether, Gazprom’s actions in 2021 and 2022 harmed what was previously perceived as a strong cooperative relationship with Europe and caused a market shock which halved its

[150] ПАО «Газпром», “Годовой отчет за 2022 год.” (Москва: ПАО «Газпром», 2023).
[151] Samantha Gross and Constanze Stelzenmüller, “Europe’s Messy Russian Gas Divorce.”
[152] Samantha Gross and Constanze Stelzenmüller.
[153] Samantha Gross and Constanze Stelzenmüller.
[154] Samantha Gross and Constanze Stelzenmüller.

revenue in 2022 as compared to 2021 levels, and caused it to post a loss of 629 billion rubles in 2023.[155] This leaves us with a question – why, if putting pressure on the European energy market and ending decades of reliable supply would seem to put the long term health of the company at jeopardy, would Gazprom engage in such behavior?

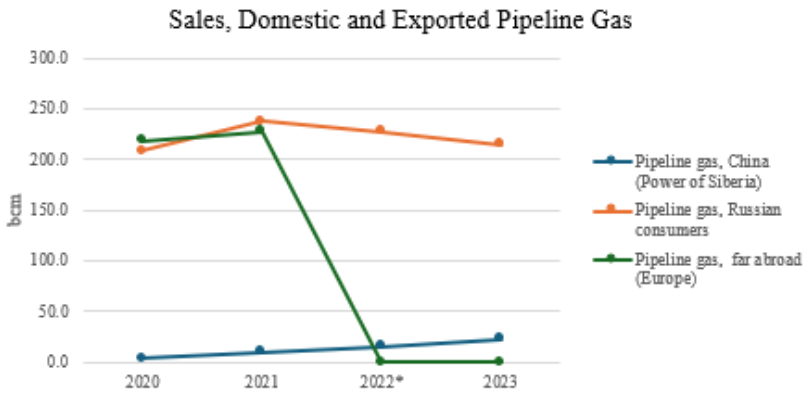
The answer lies in the pressure that Gazprom faced from its position as a Russian NOC. As Russia's energy 'weapon,' Gazprom is compelled to act in ways that were detrimental to its commercial interests but serves the country's broader geopolitical strategy. The strategic pivot towards China and Russia's near abroad like the Commonwealth of Independent States (CIS) can be explained partially with this framework as well. Without European gas revenues, these developing markets presented a clear substitute market. Importantly, these markets have a little allegiance to Europe and political alignment with Russia, with many of them historically falling into Russia's sphere of influence.

In 2014, the same year of Russia's annexation of Crimea, Gazprom began expanding its supplier contracts with China, agreeing to the first Russia-to-China natural gas pipeline, the Power of Siberia 1.[156] This was foreshadowing to Russia and Gazprom's current pivot. After the full-scale invasion of Ukraine in 2022, gas volumes sold to China increased 285% from just 4 bcm in 2020 to 15.4 bcm in 2022 (see Figure 5.7). That same year, a new gas supply agreement was reached between CNPC and Gazprom to supply 10 bcm of Russian gas annually to China.[157] Gazprom has also been in talks with China to build a second Power of Siberia 2 pipeline with a

[155] ПАО «Газпром», "Консолидированная финансовая отчетность с аудиторским заключением за год, закончившийся 31 декабря 2023 года (подготовленная в соответствии с МСФО)" (Москва: ПАО «Газпром», 2024).
[156] ПАО «Газпром», "Годовой отчет за 2023 год."
[157] ПАО «Газпром», "Годовой отчет за 2022 год."

capacity of 50 bcm to carry gas from the Yamal fields in Northwestern Siberia to China via Mongolia, which would essentially replace the now defunct Nord Stream 1 in Gazprom's ortfolio.[158] Gazprom also turned towards its near abroad, the former Soviet nations, beginning its supply of natural gas to Uzbekistan via Kazakhstan in 2023.[159] Neither China nor the CIS have retaliated against Russia or Gazprom for the invasion of Ukraine, and are areas of growth for Gazprom. Despite this market pivot that has allowed Gazprom to make up some of its lost revenues, the loss of the European market was a huge financial blow to the firm.

[158] "Russia and China to Sign Power of Siberia-2 Gas Pipeline Contract 'in near Future', Says Novak," *Reuters*, accessed April 22, 2025, https://www.reuters.com/business/energy/russia-china-sign-power-siberia-2-gas-pipeline-contract-in-near-future-says-2024-05-17/.
[159] ПАО «Газпром», "Годовой отчет за 2023 год."




**Sales, Domestic and Exported (bcm of pipeline gas, million tons of LNG)**

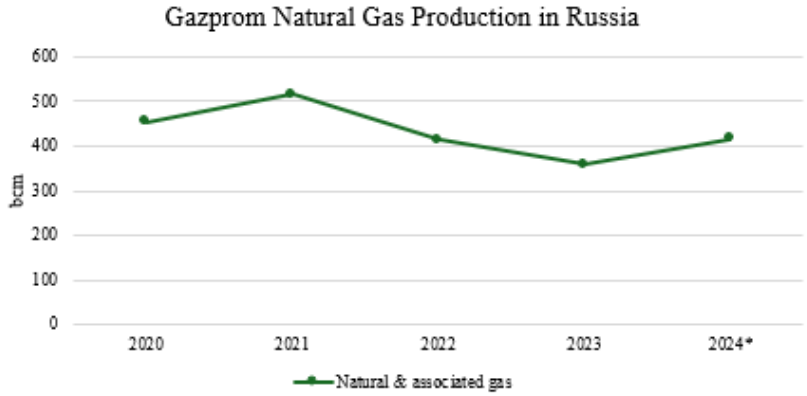
| Segment | 2020 | 2021 | 2022* | 2023 | 2024 |
|---|---|---|---|---|---|
| Pipeline gas, China (Power of Siberia) | 4.0 | 10.4 | 15.4 | 22.7 | - |
| Pipeline gas, Russian consumers | 208.4 | 238.1 | 227.5 | 215.2 | - |
| Pipeline gas, far abroad (Europe) | 219.0 | 227.9 | - | - | - |
| Russian-produced LNG | - | 22.3 | 24.2 | 23.2 | - |

**after 2022, Gazprom no longer released sales data for the far abroad*

**Sales Change (YoY)**

| Segment | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Pipeline gas, China (Power of Siberia) | n/a | 159.75% | 48.22% | 47.60% | n/a |
| Pipeline gas, Russian consumers | n/a | 14.25% | -4.45% | -5.41% | n/a |
| Pipeline gas, far abroad (Europe) | n/a | 4.06% | n/a | n/a | n/a |
| Russian-produced LNG | n/a | n/a | 8.52% | -4.13% | n/a |

**Figure 5.7** Gazprom Pipeline Gas Sales 2020-2024.
**Source:** ПАО «Газпром», *Годовой отчет за 2020 год*; ПАО «Газпром», *Годовой отчет за 2021 год*; ПАО «Газпром», *Годовой отчет за 2022 год*; ПАО «Газпром», *Годовой отчет за 2023 год*.




**Production in Russia by Segment (bcm unless otherwise specified)**

| Segment | 2020 | 2021 | 2022 | 2023 | 2024* |
|---|---|---|---|---|---|
| Natural & associated gas | 454.5 | 515.6 | 412.9 | 359.0 | 416.0 |
| Active gas production wells | 7494.0 | 7534.0 | 7447.0 | 7717.0 | - |
| Total hydrocarbon production (mm boe) | 3428.0 | 3832.9 | 3193.7 | 2877.6 | - |

**2024 values taken from various press reports, thus data gaps remain*

**Production Change (YoY)**

| Segment | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Natural & associated gas | n/a | 13.4% | -19.9% | -13.1% | 15.9% |
| Active gas production wells | n/a | 0.5% | -1.2% | 3.6% | n/a |
| Total hydrocarbon production | n/a | 11.8% | -16.7% | -9.9% | n/a |

**Figure 5.8** Gazprom Natural Gas Production 2020-2024.
**Source:** ПАО «Газпром», *Годовой отчет за 2020 год*; ПАО «Газпром», *Годовой отчет за 2021 год*; ПАО «Газпром», *Годовой отчет за 2022 год*; ПАО «Газпром», *Годовой отчет за 2023 год*.

Furthermore, much of this eastward capacity is still in development, requiring capital investments and time before it can be fully operational. As of 2024, Gazprom's CEO Aleksei Miller reported a production rebound to 416 bcm of natural gas, marking a 16% increase over 2023 and the first year of growth following two years of decline (see Figure 5.8). New long-term supply agreements with Uzbekistan (11 bcm/year from 2026) and Kyrgyzstan (1 bcm/year) reinforced Gazprom's strategy of deepening its presence in Central Asia. However, despite this expansion, the Central and East Asian markets have not fully compensated for the loss of the European market, either in volume or profitability. China remains Gazprom's most important customer, with the Power of Siberia pipeline expected to reach full capacity by 2025, but key negotiations on the Power of Siberia 2 and Far Eastern routes remain unresolved, particularly on pricing. Due to the loss of the European market, Gazprom's bargaining power has been massively reduced, and it has been reported that price negotiations have been the key factor delaying the final contract negotiations for the Power of Siberia 2.[160]

The final market to which Gazprom has turned is the domestic Russian market. While Gazprom has been Russia's sole natural gas exporter, within the domestic market, there are several competing firms. Following the collapse of its gas exports to Europe in 2022, Gazprom has significantly increased investment in the Russian domestic gas market. This strategic pivot is rooted in state policy: in 2021, under direct instruction from President Vladimir Putin, Gazprom launched an accelerated gasification program aimed at providing free gas connections to households in regions with existing infrastructure.[161] The initiative was codified in the updated

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[160] Vladimir Soldatkin, "Russia's Weaker Hand Undermines Case for Power of Siberia 2 Gas Link to China," *Reuters*, accessed April 22, 2025, https://www.reuters.com/business/energy/russias-weaker-hand-undermines-case-power-siberia-2-gas-link-china-2023-10-30/.
[161] ПАО «Газпром», "Годовой отчет за 2021 год." (Москва: ПАО «Газпром», 2022).

federal *Программа развития газоснабжения и газификации регионов Российской Федерации на 2021–2025 годы [Gas Supply and Gas Infrastructure Expansion Program for 2021–2025]*, covering 72 regions. In the aftermath of Western sanctions and the loss of European revenue, this state-mandated domestic buildout, focused on inter-settlement pipelines, rural access, and gas-for-boilers programs, has become central to sustaining Gazprom's revenues and political relevance. As of 2023, over 874,000 households and 412 localities have been connected, allowing Gazprom to monetize previously untapped demand while reinforcing its role as a national development engine.[162]

Overall, this period of time has massively shaken up the financial performance of the firm and changed its core customer segments. At this point it is unclear if Gazprom will be unable to regain its past position in the global energy market. With Ukraine refusing to renew its gas transit agreement on December 31, 2024,[163] the door to the European market is firmly shut, and it seems Gazprom has strategically turned to the east for good.

In sum, despite facing extraordinary geopolitical shocks and a fundamental shift in its external environment, Gazprom's core business strategy remained largely static between 2020 and 2024. While the company pivoted geographically from Europe toward China, Central Asia, and the domestic market, its structural dependence on fossil fuel exports, its inflexible ownership model, and its role as an instrument of Russian state policy prevented meaningful strategic renewal. Rather than adapting to changing market dynamics or advancing toward decarbonization, Gazprom doubled down on its traditional model, prioritizing geopolitical

[162] ПАО «Газпром», "Годовой отчет за 2023 год."
[163] "Russian Gas Era in Europe Ends as Ukraine Stops Transit," *Reuters*, accessed April 27, 2025, https://www.reuters.com/business/energy/russia-halts-gas-exports-europe-via-ukraine-2025-01-01/.

objectives over commercial resilience. This stagnation sharply contrasts with more market-responsive firms and reflects the rigid strategic path dependencies faced by NOCs operating within authoritarian political structures. Gazprom's trajectory during this period illustrates how state ownership and political instrumentalization can constrain a firm's ability to adapt to both geopolitical disruption and long-term global energy transition pressures.

### 5.2.4 Gazprom Climate Rhetoric (2020-2024):

Applying Guo and Pickl's typologies, Gazprom would be considered a "transition resistor" or "renewable laggard," as Gazprom's climate goals and promises have been minimal over the years if at all present. Furthermore, its rhetoric on the topic has also been largely consistently minimal through this time period as well. Gazprom has always claimed that "природный газ — самый экологически чистый, экономичный и удобный в использовании вид топлива" ["natural gas is the cleanest burning and the most cost-efficient fuel"], [164] and projects its lifetime lasting long into the future. This mindset was further entrenched in 2022, when the securitization of the energy industry precipitated. In the 2022 Annual Report, Gazprom wrote that "события 2022 года подтвердили, что ископаемые виды топлива критически важны для мировой экономики. Многие страны переориентируют свои энергетические политики на обеспечение доступа к необходимым энергоресурсам, в то время как экологические факторы отходят на второй план" ["the events of 2022 have confirmed that fossil fuels are critical for the global economy. Many countries are refocusing their energy policies on securing access to the necessary energy resources while environmental factors remain

[164] ПАО «Газпром», "Годовой отчет за 2020 год."

in the background"].[165] Gazprom's pivot eastward has further reduced pressures to decarbonize and reduce emissions. While the European market has strong emissions controls and stringent standards for companies operating in it, China, Turkey, and other Central Asian countries do not.

In its reporting, climate change and emissions information are embedded in with other general company and sustainability information and lacks its own independent section in Gazprom's Annual Reports. In Gazprom's Sustainability and Social Impact Reports, they are simply one of many factors like water usage and waste treatment and are not noted as a significant driver of strategy or investment. Gazprom's stated strategy towards emissions reductions derives improvements neither from a pivot of its core business model, nor an increase in RES investment in its electric power business, but from operational energy efficiency gains and a product mix change towards natural gas which likely would have happened at the same rate regardless of its supposedly climate-conscious rhetoric. Some of its cited core emissions reduction strategies are methane capture, gradual technological modernization, and promoting natural gas use.[166] Rhetorically, Gazprom has promised some emissions reductions, but is extremely opaque about its goals, largely only reporting whether goals have been achieved or not post-attainment. The only exception is the 2021 goal of a 12.1% reduction in GHG intensity by 2032 based on 2018 levels.[167] In 2021, there was also the creation of a Sustainable Development Committee within Gazprom's management,[168] and the following year, in 2022, Gazprom approved a 2050 Climate Roadmap.[169] Interestingly, these 2021 developments align with Shell's

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[165] ПАО «Газпром», "Годовой отчет за 2022 год."
[166] ПАО «Газпром», "Отчет об устойчивом развитии Группы Газпром за 2021 год" (Москва: ПАО «Газпром», 2022).
[167] ПАО «Газпром».
[168] ПАО «Газпром», "Годовой отчет за 2021 год."
[169] ПАО «Газпром», "Отчет о социальной деятельности Группы Газпром за 2022 год" (Москва: ПАО «Газпром», 2023).

most ambitious promises, indicating an industry-wide sustainability movement amongst both industry leaders and laggards. However, in the case of Gazprom, the true impact of these developments is unclear, especially in the changed post-2022 environment.

While Gazprom acknowledges climate change as a material risk and has formally adopted its 2050 Climate Roadmap, its approach to the energy transition remains fundamentally gas-centric. Rather than diversifying meaningfully into renewables, Gazprom positions natural gas as a low-carbon fuel that supports decarbonization goals. The company's strategy emphasizes enhancing energy efficiency, expanding gas-for-transport initiatives, and reducing methane emissions within its existing operations. Although Gazprom has strengthened its ESG governance, creating a dedicated board committee and improving emissions disclosures over time, aligning with global climate ambitions is clearly not a top priority. Investments in renewable energy remain marginal and largely symbolic: in 2020, the company operated just over 2,500 renewable electricity generating units, primarily for auxiliary power, contributing less than 1% of total power output.[170] Even post-2022, Gazprom continues to prioritize geopolitical goals and fossil fuel infrastructure expansion, notably LNG and pipeline projects toward Asia, over structural shifts in its core business model. Its few publicly released emissions targets reflect incremental compliance rather than transformational change, with no promises of reaching net-zero and a lack of emphasis on Scope 3 emissions.

Gazprom's limited climate rhetoric and minimal action during this period further illustrate its structural inability and lack of strategic will to pivot toward a more sustainable business model. Long-term adaptation to energy transition pressures was neither prioritized nor

[170] ПАО «Газпром», "Отчет об устойчивом развитии Группы Газпром за 2020 год" (Москва: ПАО «Газпром», 2021).

meaningfully pursued. Instead, Gazprom's trajectory remained tightly bound to the strategic interests of the Russian state, with little regard for commercial viability or long-term resilience. Absent external regulatory compulsion or direct political mandate, Gazprom shows no indication of departing from its fossil fuel-centric model. This stagnation underscores the central constraint faced by NOCs embedded in authoritarian political systems: their strategic paths are dictated not by evolving market or environmental realities, but by the geopolitical priorities of their governments.

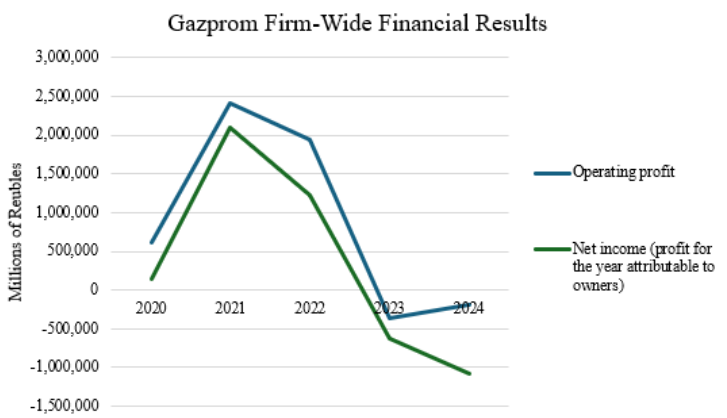
### 5.2.5 Gazprom Performance (2020-2024):

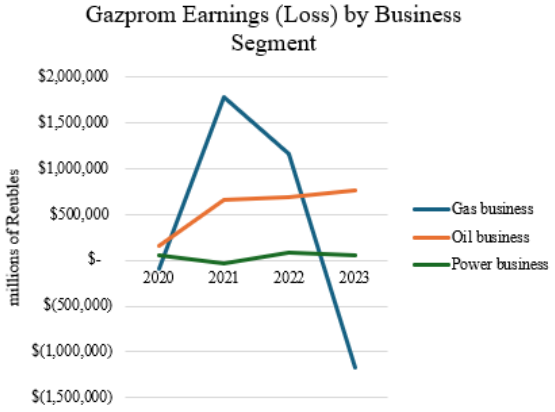
Gazprom's financial, operational, and environmental performance between 2020 and 2024 illustrates the consequences of geopolitical entanglement, strategic inertia, and the structural rigidity of a state-owned fossil fuel incumbent. While the company temporarily benefited from the global energy crisis in 2022, these gains were short-lived. Following the rupture of its relationship with Europe, Gazprom experienced a significant deterioration in both revenue and profitability, with only modest adjustments in operational emissions and no discernible shift in long-term climate strategy.

Gazprom's revenues rose from 6.3 trillion rubles in 2020 to a peak of 11.7 trillion rubels in 2022, driven by record gas prices in the wake of Russia's invasion of Ukraine and ensuing supply disruptions. That year, net profit surged to 2.1 trillion rubles, up from just 135 billion rubles in 2021 as the global economy rebounded from the Covid-19 pandemic. Production also surged from 2020 to 2021, with Gazprom's hydrocarbon production increasing by 11.8% in just one year.

However, this brief windfall quickly gave way to decline. Gazprom's natural and associated gas production fell from 516 bcm in 2021 to 413 bcm in 2022 and further to 359 bcm in 2023, representing a 30% decline over two years (see Figure 5.8), and in 2023, revenues fell to 8.5 trillion rubles and net profit dropped nearly 40% to 1.2 trillion rubles (see Figure 5.9). This collapse corresponded with the full-scale retreat from Gazprom's most lucrative market, Europe. In 2022 Gazprom's gas business, of which earnings had grown a stunning 1892% from 2020 to 2021, shrank 166% from 2021 to 2023, posting a 1.27 trillion ruble loss that year, contributing to a total 629 trillion ruble loss for the entire company, a first since 1999 (see Figure 5.9).

Gas, as Gazprom's core business, in which the European market made up one of the largest customer segments, heavily dictates the financial health of the firm. Despite efforts to make up for lost sales with its eastward pivot to Asia, with gas exports via the Power of Siberia pipeline increasing 468% from 2020 to 2023 (see Figure 5.7), Gazprom's revenues still were hit




| KPI (in millions of reubles) | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| Revenue (sales) | $ 6,321,559 | $ 10,241,353 | $ 11,673,950 | $ 8,541,818 | $ 6,200,000 |
| Operating profit | $ 614,851 | $ 2,411,261 | $ 1,935,159 | $ (363,689) | $ (192,000) |
| Net income (profit for the year attributable to owners) | $ 135,341 | $ 2,093,071 | $ 1,225,807 | $ (629,085) | $ (1,076,000) |

| Earnings/Loss (Financial Result, in millions of reubles) | | | | | |
|---|---|---|---|---|---|
| Segment | 2020 | 2021 | 2022 | 2023 | 2024 |
| Gas business | $ (99,473) | $ 1,782,483 | $ 1,165,325 | $ (1,179,402) | - |
| Oil business | $ 152,958 | $ 654,628 | $ 691,787 | $ 764,952 | - |
| Power business | $ 54,831 | $ (39,397) | $ 78,047 | $ 50,761 | - |

**Figure 5.9** Gazprom Financial Results 2020-2024.
**Source:** ПАО «Газпром», *Консолидированная финансовая отчетность с аудиторским заключением за год, закончившийся 31 декабря 2020 года (подготовленная в соответствии с МСФО)*; ПАО «Газпром», *Консолидированная финансовая отчетность с аудиторским заключением за год, закончившийся 31 декабря 2021 года (подготовленная в соответствии с МСФО)*; ПАО «Газпром», *Консолидированная финансовая отчетность с аудиторским заключением за год, закончившийся 31 декабря 2022 года (подготовленная в соответствии с МСФО)*; ПАО «Газпром», *Консолидированная финансовая отчетность с аудиторским заключением за год, закончившийся 31 декабря 2023 года (подготовленная в соответствии с МСФО)*.

extremely hard by its exit from the European market. This was compounded by constrained prices in the Asian market by unfavorable contract terms dictated by China's dominant bargaining position for the Power of Siberia 1 pipeline.

These financial woes have continued into 2024. Gazprom has reportedly had to abandon projects in Bolivia, India, Tajikistan, Uzbekistan and Venezuela due to a of lack of cash,[171] and is project to report a loss of 1.076 trillion rubles in 2024,[172] which may grow to $179 billion over the next decade.[173] Furthermore, Russia's relations with its new export markets such as China seem to have soured. The planned Power of Siberia 2 pipeline, which was projected to begin construction in 2024 with gas deliveries to start by 2030 has once more been delayed.[174] This delay stems largely from prolonged negotiations over pricing, as Gazprom finds itself in an extremely weak bargaining position, desperately needing revenue to offset its European losses, while China, aware of its leverage, pushes for deep discounts.[175]

In environmental terms, Gazprom's emissions were quite stagnant over the period. While Gazprom formally introduced a 2032 GHG emissions reduction target based on a 2018 baseline, 12.1% for its gas business and ~10% for its power business, there is no evidence that these targets are tied to a broader operational transformation or that they have been translated into tangible investment decisions.[176] From 2021 to 2024, Gazprom demonstrated marginal

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[171] Роман Попов, "«Газпром» вышел из проектов в Узбекистане и Таджикистане," *Arbat media*, April 8, 2025, sec. Эхо Москвы, https://arbatmedia.kz/exo-moskvy/gazprom-vysel-iz-proektov-v-uzbekistane-i-tadzikistane-57177.
[172] "Убыток «Газпрома» превысил триллион рублей за год," *The Moscow Times*, March 17, 2025, sec. news, https://www.moscowtimes.ru/2025/03/17/ubitok-gazproma-previsil-trillion-rublei-zagod-a158262.
[173] "Конец газовой сверхдержавы. Потеря европейского рынка обойдется «Газпрому» в 15 триллионов рублей в ближайшие 10 лет," *The Moscow Times*, March 26, 2025, sec. news, https://www.moscowtimes.ru/2025/03/26/konets-gazovoi-sverhderzhavi-poterya-evropeiskogo-rinka-oboidetsya-gazpromu-v-15-trillionov-rublei-v-blizhaishie-10-let-a159182.
[174] Vladimir Soldatkin, "Russia's Weaker Hand Undermines Case for Power of Siberia 2 Gas Link to China."
[175] Vladimir Soldatkin.
[176] ПАО «Газпром», "Годовой отчет за 2021 год."

improvements in Scope 1 emissions, but without clear correlation to deliberate decarbonization strategies. The firm reported emissions of 210.3 million tons of $CO_2$ equivalent ($MtCO_2e$) in 2020, rising to 243.3 $MtCO_2e$ in 2021 before dropping to 213.5 in 2022 and 209.6 in 2023 (see Figure 5.10). These reductions mostly stemmed from fluctuations in production volumes, following closely the 2022 and 2023 dips in production, rather than meaningful and purposeful investment in emissions reduction.

Scope 3 emissions increased from 1,078.5 $MtCO_2e$ in 2020 to 1,150.8 $MtCO_2e$ in 2021 but were not disclosed for subsequent years (see Figure 5.10). Meanwhile, Gazprom's reported GHG emissions intensity for its products was 64.3 $gCO_2/MJ$ in 2021, with no further updates in later years (see Figure 5.10). Specific emissions from Gazprom's gas operations also remained high, at 239 kg $CO_2$ per ton of oil equivalent in 2020 and rising to 253 kg in 2021, but no further data was available for 2022 to 2024 (see Figure 5.10), which is interestingly, when Gazprom exited the climate-conscious European market. This lack of data and general opacity with regards to climate and sustainability practices is indicative of Gazprom's general attitude towards the energy transition. Gazprom's attitude toward the energy transition is one of strategic resistance, viewing decarbonization primarily as a geopolitical and economic threat rather than an opportunity for renewal, and responding with minimal levels of adaptation, focusing its energies on Russia's geopolitical goals rather than fiscal performance or long-term strategic adaptation.

Gazprom's performance between 2020 and 2024 reveals a company in structural decline, shaped by its entanglement with the Russian state, a rigid export model, and a failure to adapt to an emerging low-carbon economy. Financially weakened by the loss of the European market, operationally constrained by slow-moving infrastructure projects, and environmentally stagnant despite superficial emissions pledges, Gazprom appears increasingly isolated from global energy

transition trends. Its lack of diversification, minimal transparency, and absence of climate-driven strategic renewal contrast sharply with firms embedded in more competitive, investor-responsive environments. While Gazprom's pivot to Asia offers some limited future potential, its trajectory during this period underscores the fragility of state-centric fossil fuel strategies in a rapidly evolving global landscape. Ultimately, Gazprom illustrates the risks faced by NOCs that prioritize geopolitical objectives over market adaptation, sacrificing company performance, long-term resilience, and strategic flexibility to align with state-driven mandates.

**Carbon Intensity by Product**

| Product | 2020 | 2021 | 2022 | 2023 | 2024 | Unit |
|---|---|---|---|---|---|---|
| GHG Emissions from Gas | 239.0 | 253.0 | - | - | - | kg of CO2 eq/toe product |

**after 2021, Gazprom no longer released carbon intensity by product statistics*

**Firm-Wide Emissions Metrics**

| Metric | 2020 | 2021 | 2022 | 2023 | 2024 | Unit |
|---|---|---|---|---|---|---|
| Scope 1 Emissions | 210.3 | 243.3 | 213.5 | 209.6 | - | mm tons of CO2 eq |
| Environmental & Sustainability Capex | 14.0 | 60.5 | 48.0 | 52.1 | - | rubles, billions |
| Environmental Protection Costs | 34.4 | 36.3 | 40.4 | 43.5 | - | rubles, billions |

**Firm-Wide Emissions Metrics Change (YoY)**

| Metric | 2020 | 2021 | 2022 | 2023 | 2024 | Unit |
|---|---|---|---|---|---|---|
| Scope 1 Emissions | n/a | 15.7% | -12.2% | -1.8% | n/a | n/a |
| Environmental & Sustainability Capex | n/a | 332.1% | -20.7% | 8.5% | n/a | n/a |
| Environmental Protection Costs | n/a | 5.5% | 11.3% | 7.7% | n/a | n/a |

**Figure 5.10** Gazprom Emissions Results 2020-2024.
**Source:** ПАО «Газпром», *Экологический отчет за 2020 год*; ПАО «Газпром», *Экологический отчет за 2021 год*; ПАО «Газпром», *Экологический отчет за 2022 год*; ПАО «Газпром», *Экологический отчет за 2023 год*.

## 6.0 Discussion:

Faced with the same market conditions but divergent positioning within it and under contrasting geopolitical pressures, Shell and Gazprom's strategic responses from 2020–2024 demonstrate how firm-level reactions to shared shocks are fundamentally filtered through

institutional logics, ownership structures, and stakeholder obligations. Both firms acknowledged the new, security-focused reality of the energy industry in their strategic reports; however, while this shift validated Gazprom's existing fossil-focused trajectory, for Shell it triggered a recalibration of its transition strategy, walking back short- and medium-term climate goals.

One somewhat surprising finding is the speed and magnitude of Shell's strategic retreat. Despite historically positioning itself as an industry leader in sustainability, Shell's partial reversal suggests that, in times of acute crisis, market pressures and security concerns can outweigh even strong internal commitments to climate leadership. This observation challenges overly optimistic assumptions in existing literature that first-mover advantages in decarbonization create durable strategic momentum.

Throughout this five-year period, Shell and Gazprom's basic assumptions about energy markets were informed by the same economic and geopolitical disruptions. However, when formulating strategy, their distinct institutional contexts, private-sector, market-facing Shell versus state-owned, geopolitically-driven Gazprom, became far more influential. Shell's relaxation of climate goals moved in step with Europe's pivot toward natural gas for energy security. Meanwhile, Gazprom's turn eastward and investment in domestic gas infrastructure mirrored Russia's geopolitical realignment following the full-scale invasion of Ukraine. Yet critically, while Shell's strategy continues to offer a concrete path toward long-term transition, Gazprom remains entrenched in a traditional fossil fuel model with no clear strategic renewal or decarbonization trajectory.

A societal dimension also underpins these divergent paths. Shell must contend with broader societal scrutiny and the need to maintain a social license to operate, especially potent in Western democracies where litigation, activism, and reputational risk directly impact corporate

governance. The *Milieudefensie et al. v. Royal Dutch Shell plc*. case, despite its eventual overturning in 2024, underscored Shell's exposure to environmental accountability mechanisms. Gazprom, by contrast, operates within a closed media and political environment where civil society influence is minimal and state interests dominate, reinforcing a model where environmental and public accountability are secondary to geopolitical imperatives.

Regulatory environments have shaped both companies, but through fundamentally different processes. For Shell, regulation influences company-led strategy development, reflected in its internal scenario analyses and public sustainability reporting. For Gazprom, regulatory influence is direct and top-down, with state mandates guiding key investment decisions, such as its pivot to domestic gas development. This contrast exemplifies the broader structural divergence between IOCs and NOCs: while IOCs must balance regulation against shareholder demands and competitive pressures, NOCs are primarily instruments of state policy, with national governments acting as their most influential stakeholder.

Investor expectations represent another critical differentiator. Shell, sensitive to the demands of institutional and ESG-focused investors, initially accelerated its climate commitments in the early 2020s. However, the post-crisis fossil fuel boom led to a recalibration, aligning Shell's strategy with market preferences for short-term returns over long-term sustainability. Conversely, Gazprom, largely shielded from global investor pressures due to state ownership and sanctions, remains insulated from ESG expectations. This divergence underscores the differential influences of market pressures on IOCs and NOCs. Shell, as an IOC, remains highly sensitive to market expectations around future profitability and risk, while Gazprom, shielded by state objectives, is largely unresponsive to financial market discipline.

The looming risk of stranded assets has also influenced Shell's strategy but is virtually absent from Gazprom's planning horizon. For Shell, stranded asset risk is embedded within shareholder reporting and scenario planning exercises. For Gazprom, these considerations are largely subsumed within broader state energy strategies that prioritize short-term political and economic goals over long-term climate volatility. While the risk of stranded assets appears lower in the current high-profit environment, a future global recommitment to stringent climate action could once again alter investor calculations and strategic imperatives.

Several limitations to this research should be acknowledged. First, while Shell and Gazprom serve as illustrative case studies, they cannot represent the full spectrum of responses across the oil and gas sector globally. Second, the analysis is based on publicly available documents and reports, which may not capture informal internal deliberations or hidden strategies. Third, limited access to Gazprom's post-2023 emissions data constrains the depth of analysis on its environmental performance. Finally, this research relies primarily on qualitative, temporally correlated analysis rather than formal quantitative or statistical modeling of financial or emissions impacts.

As of today, the vision of a sustainable oil and gas sector remains distant, and arguably, is moving farther away. Yet the future remains fluid. Company strategies are built on evolving assumptions about regulatory environments, technological innovation, investor expectations, and consumer demand, all of which could shift rapidly.

Several emerging policy mechanisms could reshape the economic calculus of the energy transition. Europe's Carbon Border Adjustment Mechanism, which may eventually include oil and gas products, and proposed Carbon Contracts for Difference, which could create a functional

carbon market, could tighten regulatory pressures. A potential re-tightening of European environmental targets as energy security concerns ease would further drive this shift.

However, geopolitical realities continue to temper this outlook. Energy security remains paramount for regulators, ensuring ongoing political support for natural gas and LNG as transitional fuels. Hybrid warfare tactics, including infrastructure attacks since the start of the 2022 full-scale war in Ukraine, have heightened concerns about the resilience of energy systems, potentially increasing the cost and risk profile of renewable energy projects and slowing investment. Furthermore, it is clear that these market and policy shifts are much less influential on NOCs, which own a majority of O&G assets globally.

A critical unresolved geopolitical question is the future of Russia's role in the global energy system once the war in Ukraine ends. Will Russia be reintegrated into the international community? Will European firms and governments once again engage with Gazprom? While a full restoration of pre-2022 relations seem highly unlikely given Russia's eastern pivot and Europe's investments in diversification, any softening of political barriers could affect energy markets and corporate strategies. Conversely, if Russia seeks to re-enter global markets, it may face new environmental demands as a condition of reintegration, though this appears improbable under current circumstances.

Looking ahead, the future of a clean oil and gas sector will depend on firms' willingness and ability to pursue two distinct strategic pathways. The first involves a complete pivot away from traditional hydrocarbons, leveraging core competencies in offshore engineering and project management to dominate renewable infrastructure development, such as offshore wind and large-scale solar. The second pathway involves strategic transformation, building new capabilities and markets that align more closely with their traditional strengths, such as hydrogen

production, carbon capture and storage (CCS), sustainable aviation and maritime fuels, geothermal energy, and critical mineral extraction.

Collectively, these emerging sectors represent incremental shifts by oil and gas majors into lower-carbon markets that leverage existing capabilities. For now, these initiatives complement rather than replace the core fossil fuel business, but they may form the foundation for long-term strategic renewal, at least for companies like Shell that are institutionally capable of evolving. For IOCs like Shell, engagement with these types of strategic renewal depends on the technological and market viability of these strategies. For NOCs, the political will of their domestic institutions is paramount.

Ultimately, the divergence between Shell and Gazprom in response to the same geopolitical and market shocks reinforces the central finding of this research: while market conditions and policy frameworks exert powerful influence on large oil and gas companies, it is the institutional character and governance structure of energy firms that fundamentally shape their energy transition trajectories. As global conditions continue to evolve, these underlying governance models will remain critical determinants of both the speed and direction of the global energy transition.

## 7.0 Conclusion:

This thesis has explored how Shell and Gazprom, two dominant fossil fuel firms operating under distinct institutional models, responded divergently to the shared shocks of the post-2022 global energy crisis. Shell, operating within a regulatory-heavy, investor-driven environment, retreated from its short- and medium-term climate ambitions while doubling down on LNG as a bridge fuel, illustrating how security concerns and profitability pressures can

override decarbonization goals even for supposed transition leaders. Gazprom, by contrast, remained strategically static, prioritizing state-directed geopolitical objectives over commercial adaptation, and deepening its fossil fuel dependence despite mounting long-term risks.

Together, these cases illustrate a key insight: the energy transition is not solely determined by market signals or climate policy but is deeply embedded in geopolitical realities, institutional legacies, and governance models. These findings confirm that ownership structure, political entanglement, and institutional environments fundamentally mediate corporate adaptation during periods of geopolitical upheaval. As long as energy security remains the dominant policy concern and fossil fuels remain profitable, large incumbent firms, especially NOCs, will likely continue to delay or dilute climate action. This reinforces the growing body of literature emphasizing the limits of market forces alone in driving the energy transition. Ultimately, achieving meaningful progress toward global decarbonization will require addressing the structural and political barriers that continue to shape the strategies of major energy companies.

Looking ahead, the prospects for the global energy transition will hinge not only on technological innovation or market signals, but on how regulatory frameworks, geopolitical alignments, and investor priorities evolve. The pace and direction of the energy transition will be determined as much by politics as by price. Understanding how companies like Shell and Gazprom navigate this complex terrain is essential for crafting effective climate policy and managing the global transition toward a more sustainable energy future. As the energy transition increasingly intersects with questions of security, sovereignty, and resilience, understanding the institutional foundations of corporate strategy will remain critical for shaping an equitable and sustainable global energy future.

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## 10.0 Appendix:

### 10.1 Shell Organizational Structure and Reporting:

Shell plc.’s shareholders are largely composed of investment managers and banks like Fidelity, Morgan Stanley, Bank of America, and Blackrock.[177] Shell has operations in over 70 countries across the globe but has been headquartered in London since its 2022 move from The Hague. Shell’s renewable energies, technical and chemical hubs remain in Rotterdam and Moerdijk in The Netherlands.

Shell’s business is divided into four primary reporting segments: (1) Integrated Gas, (2) Upstream, (3) Downstream, Renewables and Energy Solutions (R&ES), which includes Marketing, Chemicals and Products, and R&ES, and (4) Corporate, which covers Shell’s non-operating activities. Integrated Gas focuses on the production and trading of LNG, natural gas, and gas-to-liquids (GTL) products, serving power utilities, industrial buyers, and LNG offtakers across long-term and spot markets, with major demand centers in Japan, South Korea, China, and Europe. Upstream concentrates on oil and gas exploration and extraction, supplying internal refining operations and external customers through direct sales and offtake agreements in regions such as the United States, Brazil, Nigeria, and the Gulf states. The Chemicals and Products segment handles the refining of crude oil into fuels, lubricants, and base chemicals. Marketing manages Shell’s global retail fuel network of over 47,000 service stations and business-to-

[177] “Shell Plc (SHEL) Stock Major Holders,” Yahoo Finance, accessed April 1, 2025, https://finance.yahoo.com/quote/SHEL/holders/.

business offerings for lubricants and aviation and marine fuels, with key markets in the United States, United Kingdom, Germany, China, and India. Renewables and Energy Solutions (R&ES), Shell's newest division, includes renewable electricity, hydrogen, biofuels, carbon credits, and energy trading, serving corporate clients, industrial decarbonization partners, and grid operators across Europe, North America, and selected Asian economies.

Shell is subject to a comprehensive set of UK, EU, and U.S. reporting requirements due to its listings on the London Stock Exchange, Euronext Amsterdam, and the New York Stock Exchange. In addition to its required Annual Report and Accounts, Shell publishes a suite of annual disclosures including its Climate and Energy Transition Lobbying Report, Industry Associations Climate Review, Payments to Governments Report, and Sustainability and Energy Transition Progress Reports. Shell also uses scenario planning tools to develop its future-oriented 'Shell Scenarios' which map its predictions of the future energy system according to various moving assumptions included in its World Energy Model, a model of future energy demand,[178] and its Global Supply Model, a model of oil and gas production potential.[179] Importantly these models inform company strategy such as Shell's Energy Transition Strategy which was released in April of 2021, then updated in March of 2024.

**10.2 Gazprom Organizational Structure and Reporting:**

Gazprom operates a vertically integrated model encompassing the full natural gas value chain from exploration, production, and processing to pipeline transportation, underground

[178] "World Energy Model," Shell Global, accessed April 22, 2025, https://www.shell.com/news-and-insights/scenarios/what-scenario-planning-models-does-shell-use/world-energy-model.html.
[179] "Global Supply Model," Shell Global, accessed April 22, 2025, https://www.shell.com/news-and-insights/scenarios/what-scenario-planning-models-does-shell-use/global-supply-model.html.

storage, and marketing. While its primary focus is natural gas, Gazprom also owns oil assets (through Gazprom Neft), electricity generation companies, and banking and media holdings via an extensive web of subsidiary companies. Thus, its three primary business lines follow its reporting structure, divided between natural gas, oil, and power. The company's operations are concentrated in Russia but extend to Europe, Central Asia, and increasingly to Asia Pacific markets, especially China and India, operating in more than 20 countries, and supplying more than 100 markets in 2020, although these numbers fell after the 2022 Russian invasion of Ukraine.[180]

Gazprom's reporting practices are far less transparent than those of Western IOCs. Its key disclosures include annual and quarterly financial reports filed under Russian accounting standards and International Financial Reporting Standards (IFRS). Gazprom also publishes annual sustainability reports, though it is sparse on forward-looking climate-related disclosures. Unfortunately, to date the 2024 Annual Report has yet to be published and thus there is some missing data for this case study. However, the strategic narrative for 2024 has been supplemented with other press and news releases. Additionally, unlike Shell, Gazprom does not publish climate scenario analyses or detailed transition strategies publicly. Furthermore, due to its complicated parent-and multi-subsidiary company structure, under which select information is presented in each individual entity's IFRS reports and Annual Reports, this research limited analysis to the most broad, overarching parent company, Gazprom PJSC.

[180] ПАО «Газпром», "Годовой отчет за 2020 год."