

ENERGY INVESTMENT IN A TIME OF INFLATION

BY CHARLES LICHFIELD AND JOSEPH WEBSTER





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The Atlantic Council wishes to thank RBC Capital Markets for its generous support for this project.

Atlantic Council
1030 15th Street NW, 12th Floor
Washington, DC 20005

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January 2023

Design: Donald Partyka and Anais Gonzalez

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Energy Investment in a Time of Inflation

CHARLES LICHFIELD
JOSEPH WEBSTER

High rates of inflation across the world are forcing central banks to reluctantly tighten monetary policy despite accompanying recession risks. Moreover, restricted credit access could jeopardize energy investments, particularly for capital-intensive clean energy projects, potentially rendering the world more vulnerable to energy price shocks, which are a significant contributor to the current crisis.

This paper will briefly examine the macroeconomic drivers of inflation in late 2022, including Russia's war in Ukraine and uncertainties around energy supply, supply-chain resets, and lingering COVID-19 disruptions, before examining the persistent energy underinvestment of the past decade and how this has left markets exposed to varying degrees. As such, this paper will also consider how private capital can accelerate cleaner energy adoption, suited to different markets' unique conditions and needs. Borrowing costs will rise, but this doesn't have to bring the transition to a standstill. With the Great Moderation of low volatility, interest rates, and inflation perhaps a relic of the past, assets offering inflation protection, such as infrastructure, may become increasingly attractive to investors.

DRIVERS OF GLOBAL INFLATION AND THE ROLE OF ENERGY

Multiple factors, including energy prices, contribute significantly to faster global inflation. This was particularly true following the COVID-19 pandemic, which brought about a surge in demand for key inputs, while depressing supply. Accelerating price increases were first noticed in semiconductors and key raw materials. Generous stimulus programs in Europe, and especially in the United States, put a floor under demand, even as many workers lost their jobs. Some of these workers have not returned to the labor force, creating a tight labor market where pressure to increase wages is high.

Against this backdrop of macroeconomic drivers, energy prices have fluctuated wildly. COVID-19 led to whipsaws in energy supply and demand. In the initial stages of the pandemic, demand for transportation fuels cratered amid lockdowns, leading oil and gas producers to decrease output. There was a response lag to upstream production—especially amid the Saudi-Russia crude-production war—while the collapse in demand was nearly instantaneous. Consequently, the early days of the crisis saw West Texas Intermediate (WTI) crude reach negative prices; the US economy also saw deflation in the first period of the pandemic.

Global demand for energy, however, recovered faster than expected, exceeding pre-pandemic levels in 2021.¹ After vaccines were introduced and virus-related restrictions in many places were lifted, energy demand surged. Annual world oil demand

1 "Evolution of Global GDP, Total Primary Energy Demand and Energy Related CO2 Emissions, Relative to 2019," International Energy Agency, last updated October 26, 2022, <https://www.iea.org/data-and-statistics/charts/evolution-of-global-gdp-total-primary-energy-demand-and-energy-related-co2-emissions-relative-to-2019>.



Pandemic control workers in protective suits sit in a Beijing neighbourhood that used to be under lockdown. December 10, 2022. REUTERS/Thomas Peter.

rose from about 90.7 million barrels per day (MMBPD) in 2020 to about 97.5 MMBPD in 2021, while global annual trade volumes for liquefied natural gas (LNG) increased 4.5 percent over the same period.² Still reeling from historically low prices, upstream producers were hesitant to increase investment in new supply, leading to market imbalance with supply unable to keep pace with surging demand. In total, as world oil production rose 1.6 percent in 2021, while demand increased by 6 percent over the same period.³ In natural gas markets, LNG prices rose substantially, reflecting supply shortages exacerbated by Russia's invasion of Ukraine.

The volatility of global energy prices has had dramatically different impacts on national economies. In the United States, despite headlines about gasoline and diesel prices,

overall US energy outlays as a percentage of personal consumption expenditures are about half of the levels seen during the 1980s energy crisis.⁴ Still, relative expenditures have risen significantly since COVID-19's early days, when energy consumption plummeted, even as consumers received stimulus checks. While energy prices could remain highly volatile due to geopolitical risks, some evidence suggests that US energy-related inflation has peaked, as relative energy expenditures are trending downward due to softer prices for crude products and natural gas.

Europe's energy inflation has been reinforced by the continent's dependence on Russian natural gas, and by equivocation over investment strategies. Germany accounted for about 20 percent of total European electricity generation in 2021, but the country has become increasingly depen-

2 "Oil 2021," International Energy Agency, March 2021, <https://www.iea.org/reports/oil-2021>; "Oil Market Report," International Energy Agency, April 13, 2022, https://iea.blob.core.windows.net/assets/eb61211f-1248-4a94-b146-e87e13aa067a/-13APR2022_OilMarketReport_.pdf; "World LNG Report 2022," International Gas Union, July 6, 2022, <https://www.igu.org/resources/world-lng-report-2022/>.

3 "bp Statistical Review of World Energy," bp, last visited December 27, 2022, <https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2022-full-report.pdf>.

4 "Personal Consumption Expenditures: Energy Goods and Prices/Personal Consumption Expenditures," Federal Reserve Bank of St. Louis, last visited December 27, 2022, <https://fred.stlouisfed.org/graph/?g=WGlz>.

dent on foreign hydrocarbon imports.⁵ Nuclear power's share of German electricity generation has fallen from about a quarter in 2011 to just 6 percent in October 2022, as Germany shut down nuclear power plants in the wake of the Fukushima incident.⁶ While France has maintained its pro-nuclear stance officially, prevarication over investments and repairs has led to the current situation where, as of mid-November, only half of utility company EDF's fifty-six atomic reactors were operating, and domestic nuclear generation reached a thirty-year low.⁷ The situation is unlikely to improve much in early 2023.

The immediate challenge for Europe is twofold. First, elevated energy prices, sparked by higher natural gas prices due to Russia's invasion of Ukraine, are harming the competitiveness of its industry. Second, households must now devote a much higher share of their income to energy-related spending. This fraction varies depending on the level of direct subsidy by governments and exposure to Russian natural gas imports.

Meanwhile, emerging markets have been battered by commodity inflation, with the most vulnerable hit hardest. Soaring energy costs have punished energy importers, such as Pakistan, as rising fuel prices have led to major, persistent electricity outages.⁸ To maintain maximum electricity coverage, many developing countries are turning to coal instead of less polluting natural gas, as LNG prices have surged in the wake of Russia's invasion of Ukraine. Even worse, agricultural prices are near record highs, causing households to choose between buying food and paying for heat or cooking.⁹ The World Bank estimates that more than seventy million individuals have been pushed into poverty since 2020 due to the pandemic and Russia's invasion of Ukraine.¹⁰

Injecting significant additional uncertainty into energy markets is China's relaxing of zero-COVID restrictions. Low population immunity, coupled with surging infections, will likely overwhelm China's hospital capacity in the short term,

and constrain mobility demand as consumers self-quarantine. Barring the emergence of a new variant, however, China's mobility and energy demand will likely rise significantly after COVID-19 waves recede. Thus, the global energy crunch may not improve substantially in the latter half of 2023, especially for LNG, as Asian and European economies may continue to compete for scarce volumes of the fuel in 2023, further amplifying the pain of Europe's high energy prices.

FACTORS IN DECLINING OIL AND GAS INVESTMENT AND ITS FALLOUT

Scarce LNG volumes and, more generally, the global energy crunch are due to declining energy production and a sharp downturn in energy investment. While world oil and gas supply received more than \$1.1 trillion of investment in 2014, the sector received only about \$500 billion of funding in 2020, after normalizing for inflation.¹¹ Moreover, oil and gas projects have variable lag times between investment and production. Although "short-cycle" tight oil projects can typically be brought online within a few months, the development phase for offshore oil projects can last 5–10 years before the first barrel of production.¹² Yesterday's underinvestment is being felt today.

Investors shied away from investing in the energy sector for several reasons. A primary, if often underexamined, reason is that efficiency gains in shale extraction led to a flatter cost curve and improved productivity for crude oil output.¹³ Still, the US shale oil industry has hemorrhaged free cash flows since its inception: one study suggests that between 2005 and 2020, the industry registered net negative free cash flows of \$300 billion and impaired \$450 billion, deterring some investors from entering the market.¹⁴ Additionally, investors are increasingly wary of environmental, social, and governance (ESG) concerns and the risk of potential stranded assets. Declining energy investment has led to a shortage of world energy supplies and elevated prices.

5 "bp Statistical Review."

6 "Nuclear Power in Germany," World Nuclear Association, last updated October, 2022, <https://world-nuclear.org/information-library/country-profiles/countries-g-n/germany.aspx>.

7 Ronan Planchon, "Crise de l'Energie: 'Nous Payons Aujourd'hui la Strategie a Court Terme de l'Executif,'" *Figaro*, August 30, 2022, <https://www.lefigaro.fr/vox/economie/crise-de-l-energie-nous-payons-aujourd-hui-la-strategie-a-court-terme-de-l-executif-20220830>; Liz Alderman, "As Europe Quits Russian Gas, Half of France's Nuclear Plants are Off-Line," *New York Times*, November 16, 2022, <https://www.nytimes.com/2022/11/15/business/nuclear-power-france.html>.

8 Adnan Aamir, "Pakistan Blackouts Choke Economy as China Power Plants Go Unpaid," *Nikkei Asia*, June 15, 2022, <https://asia.nikkei.com/Economy/Pakistan-blackouts-choke-economy-as-China-power-plants-go-unpaid>.

9 "The Ukraine Conflict and Other Factors Contributing to High Commodity Prices and Food Insecurity," US Department of Agriculture, April 6, 2022, <https://www.fas.usda.gov/data/ukraine-conflict-and-other-factors-contributing-high-commodity-prices-and-food-insecurity>.

10 "Global Progress in Reducing Extreme Poverty Grinds to a Halt," World Bank, press release, October 5, 2022, <https://www.worldbank.org/en/news/press-release/2022/10/05/global-progress-in-reducing-extreme-poverty-grinds-to-a-halt>.

11 "Global Investment in Energy Supply, 2010-2020," International Energy Agency, last updated October 26, 2022, <https://www.iea.org/data-and-statistics/charts/global-investment-in-energy-supply-2010-2020>.

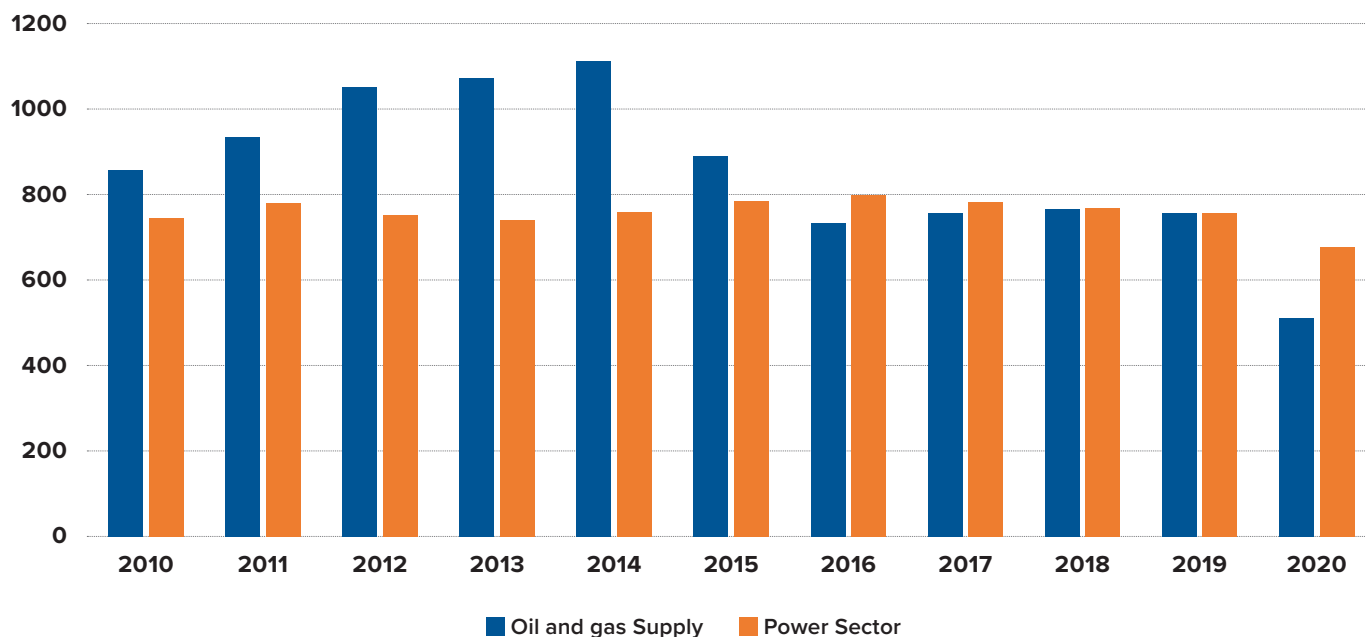
12 "Offshore Oil and Natural Gas Life Cycle," Canadian Association of Petroleum Producers, last visited December 27, 2022, <https://atlanticcanadaoffshore.ca/offshore-oil-gas-lifecycle/>.

13 Michael D. Plante and Kunal Patel, "Breakeven Oil Prices Underscore Shale's Impact on the Market," Federal Reserve Bank of Dallas, May 21, 2019, <https://www.dallasfed.org/research/economics/2019/0521>.

14 Duane Dickson, Kate Hardin, and Anshu Mittal, "The Great Compression: Implications of COVID-19 for the US Shale Industry," Deloitte, June 22, 2020, <https://www2.deloitte.com/content/dam/Deloitte/us/Documents/energy-resources/us-the-great-compression.pdf>.

Global investment in energy supply, 2010-2020 (USD 2019 billion)

(USD 2019 billion)



Source: "Global Investment in Energy Supply, 2010-2020."

Price pressures were already on economists' radar in late February when Russia launched its brutal, unprovoked invasion of Ukraine. Up until that point, there was still a lively debate between those who believed high inflation was a transitory phenomenon and those who were concerned about its longer-term duration. The latter group started calling for interest-rate hikes to bring down inflation expectations. "Team transitory" disputed this approach, arguing that inflation was mainly driven by supply-chain issues and anomalies in year-on-year data because of lockdowns—a so-called "base effect." In their view, excessive interest-rate rises would only jeopardize growth, without solving any of the supply issues behind inflation.

The theoretical debate between these two camps was cut off by the supply shocks caused by Russian President Vladimir Putin's invasion of Ukraine, which forced central banks to intervene. The European Central Bank (ECB) has been more cautious than the US Federal Reserve, arguing (rightly) that energy prices are a bigger factor in Eurozone inflation than in the US economy. Still, the ECB's latest mid-December hike clearly indicated that further hikes are coming.

GOVERNMENT AND PRIVATE INVESTMENT IN A HIGH INTEREST RATE ENVIRONMENT

Fiscal leeway to address the energy underinvestment that helped spark the inflation outburst and rate hikes varies across the developed world. An underappreciated factor behind the EU's objection to the United States' Inflation Reduction Act is that Brussels cannot borrow as easily as Washington. In less than a year, the United States has signed off on \$73 billion in power infrastructure and clean energy transmission through the Infrastructure Investment and Jobs Act, and \$369 billion in climate change investment through the Inflation Reduction Act.

Meanwhile, the European Union (EU) has managed to re-allocate 225 billion euros from its post-pandemic Recovery and Resilience Fund (RRF) to REPowerEU, the European Commission's plan to diversify away from Russian fossil fuels. The RRF, however, was designed as a one-off initiative. It cannot simply be expanded or duplicated without triggering acrimonious debates among member states—especially because the terms of borrowing will now be much less attractive.

In emerging markets, the pandemic led to heavier public-debt burdens, reaching the historic high of 67 percent of gross domestic product (GDP) in late 2021.¹⁵ Additionally, developing countries will need to invest \$2.2 trillion a year in energy infrastructure just to keep pace with projected GDP growth over the next fifteen years.¹⁶ To an even greater extent than developed markets, they depend on private capital to ensure appropriate investments are made.

There is a fear that global inflation will sharply curtail energy investment into emerging markets. The fear is justified. Higher interest rates in developed markets mean higher rates of return, which will lure emerging-market investors back to the United States and Europe. Troublingly, some

corporates in emerging markets succumbed to the temptation of “original sin” when Western interest rates were low. By borrowing abroad in foreign currencies, corporates in emerging markets enjoyed access to cheap credit in the post-Global Financial Crisis monetary-expansionist period. With Western interest rates rebounding and currencies strengthening, however, debt-repayment costs for emerging-market corporates are surging in local currency terms. The risks to greenfield energy investment in the developing world are self-evident. Still, it’s not all bad news for emerging markets. Quasi-state actors like pension and sovereign welfare funds are interested in very long-term, high-yield projects—two criteria to which emerging-market energy infrastructure corresponds.



A view shows the dome of an Orthodox church behind a building destroyed in the course of Russia-Ukraine conflict in Mariupol, Ukraine, December 24, 2022. REUTERS/Alexander Ermochenko

15 Jeff Goldstein, *Trouble for Emerging Markets: Could Spell Trouble for All*, *Atlantic Council*, June 29, 2022, <https://www.atlanticcouncil.org/blogs/econographics/trouble-for-emerging-markets-could-spell-trouble-for-all/>.

16 “Infrastructure Investment to Be a Key Driver of Growth in Emerging Markets Post COVID-19 Crisis, Sigma Says,” Swiss Re, press release, June 17, 2020, <https://www.swissre.com/media/press-release/nr-20200617-sigma-3-2020.html>.

In hindsight, infrastructure projects could have benefited if launched when borrowing was cheap. However, current higher borrowing costs do not have to mean investment should continue to lag behind needs. The infrastructure sector tends to outperform other equities under high-inflation conditions like what we have today. This makes well-thought-through contracts crucial.

Energy technologies that were once seen as risky are now a core part of the mix. At the same time, the restructuring of global energy markets caused by Russia's invasion calls for new hydrocarbon infrastructure, but ideally only for a short period of time. Essentially, investors will be asked to expect long-term, stable returns from projects that, until recently, would have been considered risky, while also seeking short-term, high returns on projects that, also until recently, would have been at the core of energy infrastructure.

In practice, however, it isn't as easy to divide new projects between "quick fixes" and long-term core infrastructure. Governments are devising remedies for this uncertainty while encouraging investment. Germany, for example, has designed Regulated Asset Base (RAB) contracts for new gas infrastructure with a safe payback raised through revenue. Because the infrastructure will be in use for an unknown amount of time, the contracts pass some risk on to the investor, but the guaranteed rates are meant to be attractive enough. The United Kingdom is also using a RAB model to fund its new nuclear power plants.

Contracts for difference (CfD) are also likely to remain attractive funding models for long-term contracts, despite tighter money markets. Inflation plays an unlikely, but positive, role here. Because inputs will be more expensive, downward auctions on the rates promised to investors will settle higher. This will lock in more attractive rates for years to come. Although this means higher bills for energy consumers, higher settlement prices at least provide a guarantee against investment drying up.

Political will and climate pragmatism are necessary to ensure a stable energy-investment environment for developing countries. Multilateral institutions should cooperate to make ESG standards less rigid. Notably, preferential rate funding shouldn't be banned just because a country has invested in natural gas infrastructure to address the current crisis.

Ensuring investment continues to flow into developing countries will also require more innovative approaches. It is true that soaring energy prices offer a much-needed impetus to nudge all governments to invest toward moving away from dirty energy. But 2022 was an especially challenging year for developing countries dependent on hydrocarbon imports, as they were outbid by Europe as it sought to reduce its dependence on Russian gas. Moreover, the most prominent clean energy infrastructure funds eschew opportunities in emerging markets. Convincing international financial institutions and overseas development aid agencies to introduce a portion of emerging market exposure should be a priority. More certain contracts, along the lines described above, and consistent, transparent data on the relative cost of capital will help unlock these deep sources of funding, even in a high interest rate environment.¹⁷

LEVERAGING PRIVATE INVESTMENT FOR NEW ENERGY INFRASTRUCTURE

Inflation is not, perhaps, everywhere and always a monetary phenomenon. Energy investment faltered from 2014 to 2020, despite low interest rates. Meanwhile, aggregate supply shocks—first due to COVID, then from Putin's invasion of Ukraine—have pressured energy production and prices, raising inflation and necessitating interest-rate hikes. The consequences of persistent energy underinvestment are now becoming apparent.

The need for new energy infrastructure cannot be met without private investment. This was the case when inflation was lower; it is even more important now. Although energy bills for consumers and industry will rise, the good news is that contracts in this sector are more attractive in high-inflation environments. With greater data transparency and incentives for funds to invest in emerging markets, private investment can continue to assist the transition to cleaner energy worldwide.

17 "Report: COVID-19 Slows Progress Toward Universal Energy Access," World Bank, press release, June 1, 2022, <https://www.worldbank.org/en/news/press-release/2022/06/01/report-covid-19-slows-progress-towards-universal-energy-access>.

ABOUT THE AUTHORS

Charles Lichfield is the deputy director of the Atlantic Council's GeoEconomics Center. He previously worked as an analyst in Eurasia Group's Europe team, leading coverage on France and Germany, deputizing on Brexit, and monitoring an extensive variety of European security, trade, neighborhood, and energy policies.

His analysis and commentary have been featured on *Bloomberg News*, the BBC, the *Financial Times*, *Le Figaro*, and *Bild-Zeitung*, among others.

Lichfield holds an MSc in economics from the University of London and an MA in German and Russian from the University of Cambridge.

Joseph Webster is a senior fellow at the Atlantic Council's Global Energy Center, where he serves as hydrogen and offshore wind lead. Webster previously worked as a fundamentals energy consultant at a boutique energy firm in Houston, TX, where his project work included topics across hydrogen, ammonia, electricity, liquefied natural gas (LNG), and oil & gas markets.

Parallel to his energy work, Webster edits the *China-Russia Report*, an independent, non-partisan newsletter covering developments within and between the two authoritarian superpowers. He is proficient in Mandarin Chinese and has been published by *The China Project*, *Politico Europe*, *Eurasianet*, the *Bulwark*, and more.

Webster completed a master's degree in international relations from the Johns Hopkins University's Paul H. Nitze School of Advanced International Studies, where he was a Mount Vernon fellow, and a bachelor's degree in economics from the University of Maryland.



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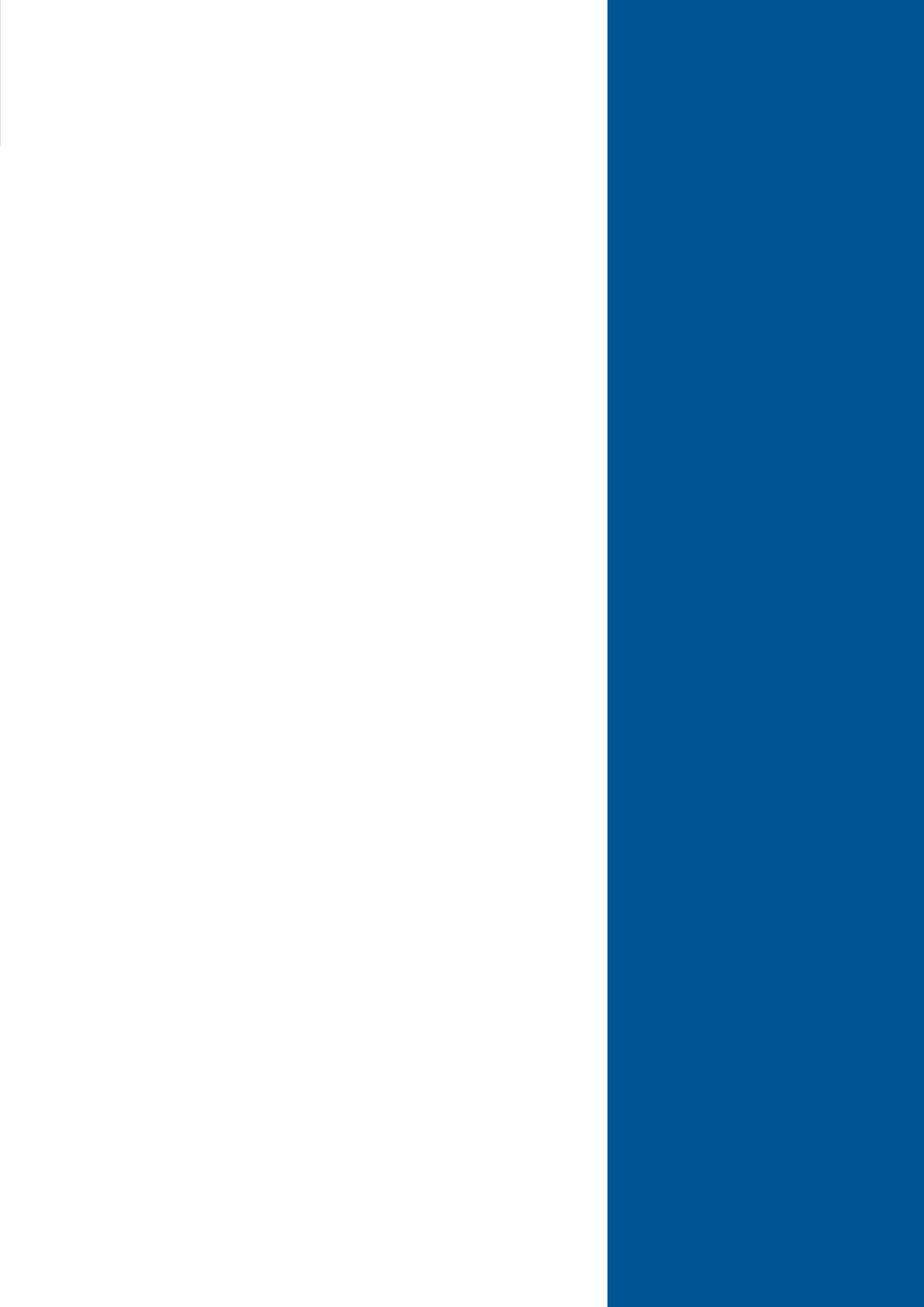
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