

Global Economy, Energy, and Geopolitics

TRENDS AND UNCERTAINTIES



Angel Saz-Carranza
Mateu Tomi
Juan Moscoso
Jordi Sevilla

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Foreword

by Javier Solana

The current world is one with deep and rapid shifts occurring simultaneously. Demographic changes, climate change and the re-emergence of industrial policies are all deeply interrelated. If left unmanaged, their effects could be dire, resulting in higher insecurity, food shortages and people displacements. However, averting a global catastrophe will largely depend on the extent to which the international community cooperates to affront its shared challenges.

It is estimated that by 2050 there will be 10 billion people living in the world, that means an increase in 2 billion from today's population. According to the estimates, this increase will come mainly from eight countries: India, Nigeria, Pakistan, Ethiopia, Uganda, Tanzania, the Democratic Republic of Congo, and Indonesia. This represents an inevitable shift of the weight Global South countries will have as geopolitical actors. In the XXI century, the main challenges and opportunities in global governance will come from the South.

Recently, there has been a movement away from multilateral cooperation towards a fragmenting world. The expansion of the BRICS, including countries such as Saudi Arabia, and the absence of President Putin and President Xi from the latest G-20 summit are just the latest examples. In the face of global challenges, the world cannot afford to underestimate the need for multilateral cooperation. Division in blocks entails crucial delays in these much-needed efforts.

The energy transition is a challenge of an unprecedented complexity. At the same time, it presents a unique opportunity for multilateral cooperation. The European Union (EU) has been a leader in the energy transition, and this is a much welcome sign. However, this effort must continue. On the one hand, it must spark cooperation with and among countries outside the Union. On the other hand, it can deliver on its long overdue commitment of assisting the Global South countries in their energy transition processes. The only way to deliver is to not leave anyone behind, neither people nor countries.

Industrial policy has made a return in the last few years. The State has overtaken the market as the main driver in economic development. The EU has become overdependent on other markets for energy, critical materials, and technologies. For instance, in the 1990s Europe manufactured 44% of semiconductors worldwide, today it is only 9%. Europe must shape its industrial policy to gain autonomy. This does not mean the EU must undermine the power of interdependence – through trade relations – in promoting global stability and peace. Rather, to remain as a first-line actor in international relations there must be a concerted effort to escape the risk of overdependence. The private sector is vital in this effort. For it, understanding how the actions of companies are enshrined in the geopolitical arena is crucial for a successful approach.

Table of Abbreviations

AI: Artificial Intelligence

GHG: Greenhouse Gas

APS: Announced Policies Scenario

IEA: International Energy Agency

BRI: Belt and Road Initiative

IMF: International Monetary Fund

CCS: Carbon Capture and Storage

IRA: Inflation Reduction Act

CCUS: Carbon Capture, Usage and Storage

IT: Information Technology

CO₂: Carbon dioxide

MENA: Middle East and North Africa

EDI: Economist Democracy Index

MIC2025: Made in China 2025

EU: European Union

NOC: National Oil Company

EV: Electric Vehicle

NZE: Net Zero Emissions

FDI: Foreign Direct Investment

NZIA: Net Zero Industry Act

FH: Freedom House

PA: Paris Agreement

G7: Group of 7

PGII: Partnership for Global Investment and Infrastructure

GDIP: Green Deal Industrial Plan

STEPS: Stated Energy Policies Scenario

GDP: Gross Domestic Product

UN: United Nations

GG: Global Gateway

WTO: World Trade Organization

Introduction

In an era defined by rapid transformations, the world finds itself at a crossroads of unprecedented change. From the intricate interplay of global demographics and economies to the pivotal challenges posed by climate change and the shift towards sustainable energy sources, our planet stands on the cusp of a new paradigm. This report – the result of a partnership between VINCI Energies Spain and EsadeGeo – delves into these critical junctures, seeking to unravel the complexities of today's global landscape and trying to extract possible outcomes. It is never an exact science to ascertain what the future holds, and perhaps even less so regarding the great drivers of global change and progress, i.e. demographics and the world economy. These are always subject to large structural forces and vulnerable to shocks to the system, as the Covid-19 pandemic and the war on Ukraine proved to be. However, drawing on historical trends and available data, this report seeks to draw a few takeaways on four sections: global economic and demographic tendencies, the energy transition and climate change, the clash between democracies and autocracies, and the return of industrial policy.

The dynamic forces of demography and economy lie at the heart of the global landscape. This chapter charts their evolution, offering insights into the trends that shape societies and economies alike for decades to come. As we navigate through historical structures and emergent patterns, we encounter not only convincing predictions (a rising but plateauing Asia, a bustling Africa and decaying Europe) but also the uncertainties that populate this field, as is the case with migration.

As climate change gains urgency on the global agenda, the imperative for an energy transition has never been more acute. This chapter points out the driving forces behind this monumental shift, exploring the intricacies between greenhouse gas emissions and the evolving global energy mix. New critical materials, essential for the green transition, bring new players like China to the fore and transform the geopolitical dimension of energy. The potential for hydrogen in this context is key for energy stakeholders to know, and this chapter also delves into the pros and cons of this alternative energy source.

Within the realm of governance, democracies and autocracies vie for prominence and influence. Through the lens of freedom indices, this chapter offers a concise analysis of the state of democracy worldwide, identifying the forces that shape its ebb and flow. We explore how democracies and autocracies play out on the global stage through global infrastructure projects, and explore the Chinese and Western proposals.

Against the backdrop of a shifting economic landscape, a resurgence of industrial policy has rapidly gained salience. This chapter dissects this renaissance, recapping the policies put forward from global economic leaders – the USA, EU, and China – as well as the ensuing debates. Is it too late for the US to catch up in green tech leadership? Can the EU have a potent industrial policy while maintaining its current policy on state aid?

The analyses of these global changes are all characterised by the presence of uncertainties and different possible outcomes. Yet, within these uncertainties lie opportunities for foresight and proactive adaptation. As we look at the trends underpinning this report, we confront the implications and unresolved questions that define our global challenges, and endeavour to offer explanations to the main problems that companies, citizens and countries alike are facing.



Chapter 1:

World Demographics and Economy

KEY TAKEAWAYS

- The world population keeps growing, and we are on track to surpass 10 billion people by 2060. Population has been rising faster in Asia (think China, India, and others), but it is starting to peak. Instead, Africa will soon become the fastest-growing continent. More than 8 out of 10 people will live in Asia or Africa by 2100.
- The economy is also shifting away from traditional poles: emerging economies will continue to grow faster than developed countries, while Asia is still lagging behind in GDP per capita, so living standards are still growing slowly. For ageing economies and developing countries alike, migration will play a key role in the future, although its impact is still uncertain.
- We must anticipate various circumstances for the global economy. Will we converge towards reinvigorated growth, with the West and the emerging economies in tandem, or downwards, where obstacles to economic development persist worldwide? Will we diverge into different paths, with some economies surging upwards while less fortunate nations stagnate? Or, more conceivably, will we end up in a grey, ambiguous situation with features of both scenarios?

World Demographics and Economy

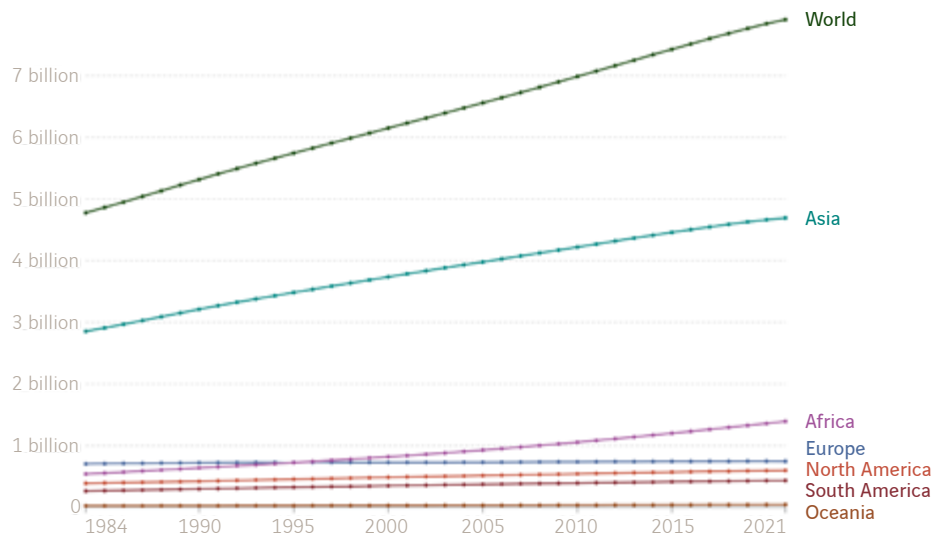
In November 2022, the world reached the impressive milestone of surpassing 8 billion inhabitants. This number is set to grow in the coming decades, and the most recent estimates by the UN set the population to reach approximately 10.4 billion people in the 2080s¹. The pace at which the world population has been growing is unprecedented; indeed, world population growth seemed exponential in the 20th century². It took humanity millennia to reach 1 billion people in 1805, but only 122 years to double it to 2 billion in 1927. Doubling it to 4 billion did not even take 50 years, until 1974, and we have since doubled our population once more in 2022³.

1 United Nations Department of Economic and Social Affairs, Population Division, "World Population Prospects."

2 Klein Goldewijk, Beusen, and Janssen, "Long-Term Dynamic Modeling of Global Population and Built-up Area in a Spatially Explicit Way."

3 United Nations Department of Economic and Social Affairs, Population Division, "World Population Prospects."

Figure 1.
World population by region,
1984-2021



Source: OurWorldInData
(based on UN estimates)

These historic growth rates, and the evolution of the world population in the future, carry transcendental consequences for the make-up and structure of the global system, the balance of power between great powers, the world economy, trade, energy dependencies... Essentially, **it has the potential to alter the current global structure as we know it**. The main reason behind the transformative potential of how the world is growing is that the population has not grown equally across regions. Growth has been led by **Asia and Africa**, whose populations will continue to grow at a far greater speed than those of other continents, some of which (such as Europe) has stagnated and maintained stable population numbers as a result of low fertility rates⁴.

The implications of the current structural growth rates will impact widespread issues. Firstly, and simply put, a larger population (much larger than what the Earth has historically withstood) results in a greater demand for food and therefore food security acquires relevance alongside other factors such as energy security⁵. Managing limited resources, improving efficiencies in agriculture, correcting market failures affecting food prices and eliminating inequalities across socioeconomic groups and regions has become a challenge in this regard. Moreover, agricultural needs and biofuel demand may clash when prioritising land use and create both economic and environmental externalities⁶. Increased urbanisation as a result of a booming population poses a challenge to policymakers to design and provide adequate infrastructure, housing, transportation and public services, where resources are again limited⁷. The provision of public services is especially crucial in the areas of education and healthcare, as those countries enjoying the greatest population growth rates are also enjoying rapid economic growth rates and strive to become middle-upper and higher income countries⁸. Also in economic terms, which we will explore at large further below, a larger population can contribute to stimulating growth, but countries with a large population boom might struggle to manage unemployment, income inequality, brain drain, and other negative ramifications⁹. As the UN asserts, "reducing poverty in the context of rapid population growth remains a formidable challenge: in many cases, even though poverty reduction efforts may lift large numbers of people out of poverty, the proportion of the population living below the poverty line may be stagnant or even increase"¹⁰. **Sub-Saharan Africa is set to double its population by 2050**, further intensifying the burden on already stretched resources and thwarting efforts to reduce poverty and inequalities¹¹. Finally, population growth has direct negative

4 Ibid.

5 Perrone and Hornberger, "Water, Food, and Energy Security."

6 Banse et al., "Impact of EU Biofuel Policies on World Agricultural Production and Land Use"; Searchinger et al., "Use of U.S. Croplands for Biofuels Increases Greenhouse Gases Through Emissions from Land-Use Change."

7 Zhao et al., "The Impact of Urbanization on the Delivery of Public Service-Related SDGs in China."

8 Garza-Rodriguez et al., "The Relationship Between Population Growth and Economic Growth in Mexico."

9 Ilegbinosa, Moses, and Praise, "Population and Its Impact on Level of Unemployment in Least Developed Countries."

10 United Nations Department of Economic and Social Affairs, Population Division, "World Population Prospects 2022: Summary of Results," 9.

11 Ibid.

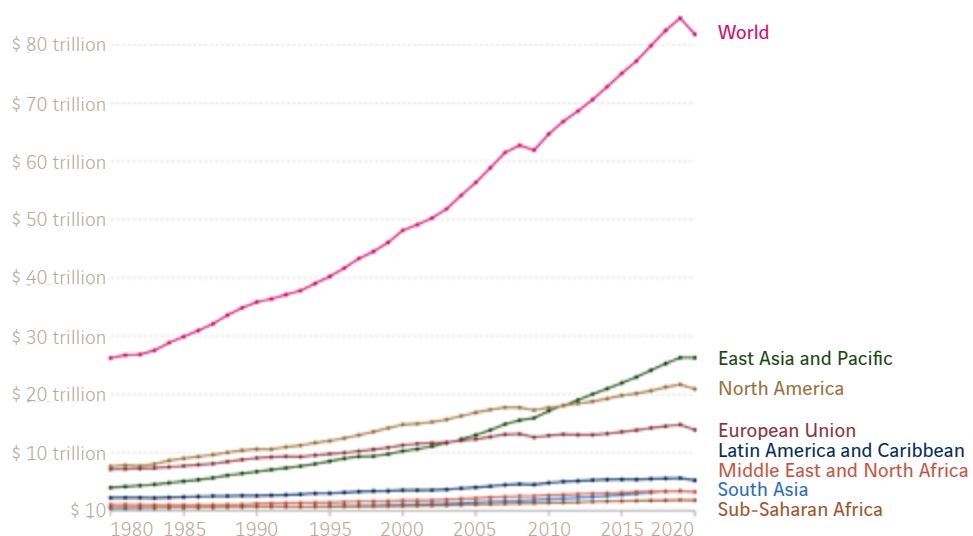
consequences for the health of the environment and the fight against climate change, as increased consumption and energy demand exert ever greater pressure on ecosystems that might already be fragile¹². Deforestation (as in the Amazon rainforest, which is primarily done in order to obtain more grazing terrain for cattle), depletion of natural resources, water pressure, increased greenhouse gas (GHG) emissions and pollution are all consequences of large population growth¹³.

The greatest population growth in history did not occur in a void, however. Inasmuch as the 19th and 20th centuries saw the greatest population booms ever, they were accompanied and largely caused by decades of unprecedented economic growth that, although less impetuous and somewhat stagnated, continues to this day.

Figure 2.

Gross domestic product, 1980-2020

Source: OurWorldInData (based on World Bank and OECD data)



Especially since the aftermath of World War II, economic growth in absolute terms has been **unequivocal and constant**. In absolute terms, **world GDP has increased greatly during the last 40 years**, driven by globalisation, technological advancement, removal of trade barriers at the global level, and market-oriented policies¹⁴. The notable economic development experienced in the Asia Pacific region, especially in China and India, has accompanied its population growth and more or less successfully **lifted millions out of poverty**, sharply increasing their share in global gross domestic product (GDP) as a result. Developed economies have also grown during this period but have likewise felt the brunt of the 2008 global financial crisis and the economic downturn as a result of the Covid-19 pandemic. These regional dynamics will be explored at greater depth in subsequent sections.

An accelerator for economic development can be found in technological advancements and innovation, both for emerging as well as developed economies¹⁵. The digitalisation of economies, advancements in logistics and transportation, and the rise of e-commerce have facilitated the movement of goods and services globally, and the growth of digital platforms has also enabled small and medium-sized enterprises to participate in international trade¹⁶.

12 Weber and Sciuabba, "The Effect of Population Growth on the Environment."
 13 DeFries et al., "Deforestation Driven by Urban Population Growth and Agricultural Trade in the Twenty-First Century"; O'Neill et al., "Global Demographic Trends and Future Carbon Emissions."
 14 Ortiz-Osipina, Beltekian, and Roser, "Trade and Globalization."
 15 Fagerberg, Srholec, and Verspagen, "Innovation and Economic Development."
 16 Myovella, Karacuka, and Haucap, "Digitalization and Economic Growth"; Goldfarb and Tucker, "Digital Economics."

Globalisation is arguably one of the main drivers behind the economic growth of the past decades¹⁷. The removal of trade barriers and global governance institutions such as the World Trade Organisation (WTO) have, with mixed results, attempted to increase economic interdependence and net global welfare through international trade. Technological advancements in the field of transport, telecommunications, the internet, or automation have acted as a catalyst for increased globalisation, allowing for more trade and investment opportunities. We have also witnessed financial integration that has further contributed to the phenomenon of globalisation; capital flows and allocation have become more efficient and the emergence of global financial institutions have facilitated cross-border investments¹⁸. However, globalisation and the international liberal framework that has been present over the past decades has not benefitted everyone equally, with much work in addressing inequalities and poverty eradication still pending¹⁹.

As we will see, **economic growth has not taken place equally across regions** either, sparking compelling debates on how the reshaping of the balance of power in economic terms affects relationships in other areas. Likewise, new relations of economic dependence are emerging, with uncertain but transcendental consequences for the future of not only the global economy, but also the fight against climate change or the global security architecture.

The evolution of world demographics and the global economy

We have mentioned how in both demographic and economic terms, growth has been unequal across regions. In this section we will explore to what extent that is the case, and what consequences that might bring. In broad strokes, we are in the midst of an eastward shift, where both the demographic and economic centres of gravity are moving towards Africa and Asia, particularly.

Demographics: growing South and East

Although it might not seem so to someone unfamiliar with the data, Europe and North America have never been contenders for the most populated continent on Earth despite being the leading regions in economic development over the past 250 years. Asia has always been the most populated continent by far, but its growth over the past century has been comfortably above any other, thereby expanding the already large gap with other regions²⁰. However, as the continent catches up to the most developed economies, we are starting to witness a structure change of gear in terms of population growth. This is already patently clear in Asia's most developed economies such as Japan and South Korea, where fertility rates have been either stagnating or, more recently, below the population replacement rate²¹. This is starting to apply to China, whose one-child policy hailed by chairman Deng Xiaoping stymied population growth to irreversible lengths²². A significant milestone in this regard is that **China has been recently overtaken by India** and is of April 2023 no longer the world's most populated country²³.

17 Dreher, "Does Globalization Affect Growth?"; Singh, "Does International Trade Cause Economic Growth?"

18 Kose et al., "Financial Globalization and Economic Policies*"

19 Ravallion, "Inequality and Globalization"; Albrecht and Korzeniewicz, "Globalization and Inequality."

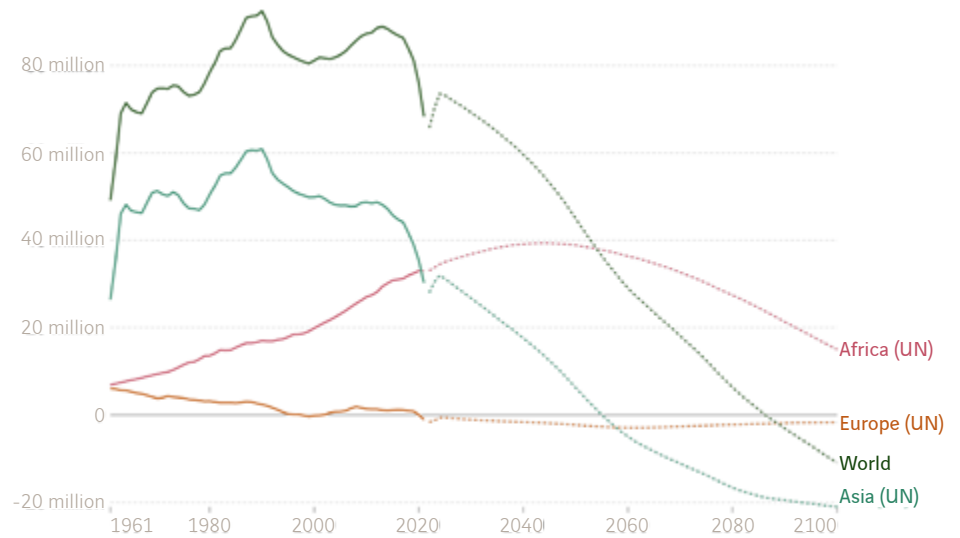
20 United Nations Department of Economic and Social Affairs, Population Division, "World Population Prospects."

21 Kitazume and Amano, "Uptrend in Birthrates among Rich Nations Skips Japan, South Korea."

22 Yu, "China's Two-Child Policy 'too Little, Too Late' Demographers Warn."

23 United Nations Department of Economic and Social Affairs, "India Overtakes China as the World's Most Populous Country."

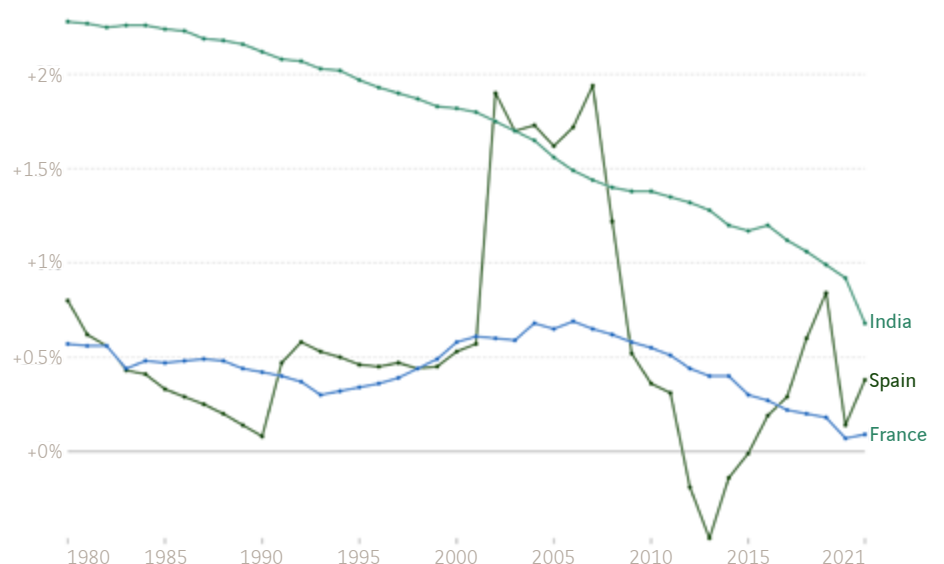
Figure 3.
Annual population growth
(selected regions), 1960-2100



Source: OurWorldInData
(based on UN estimates)

The Covid-19 pandemic seemed to have accelerated the existing transformational change in Asia’s growth rates, dipping the annual growth to below 40 million people. Another relevant paradigm shift visible in the graph above is that **Africa now leads population growth** in absolute terms, and is set to be the leading continent until well after the end of the 21st century. As China and India consolidate their economic development, their population growth will continue to decrease until reaching negative growth rates at mid-century.

Figure 4.
Population growth rate in Spain,
France and India, 1980-2021



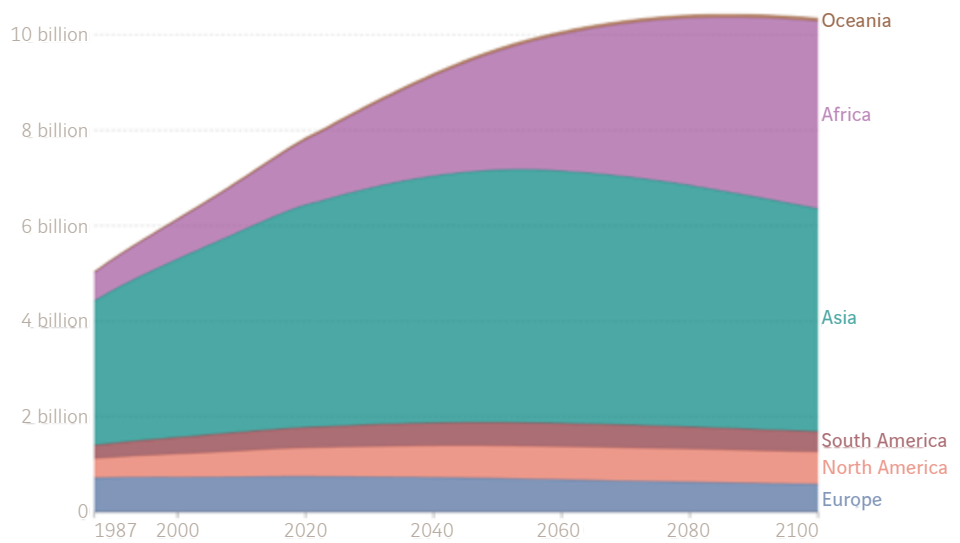
Source: OurWorldInData
(based on UN estimates)

Europe is already struggling with very poor fertility rates, currently below replacement level, although some forecasts show **migration** as a factor propping up population levels in the coming decades. As it stands, however, Europe’s ageing population will at best remain constant according to the UN’s medium fertility levels. Europe’s stagnation is easier to see when zooming into particular countries; in Figure 4 above, we can see the structural difference in growth rates between countries like France and Spain and India. Although India’s population growth rate has been steadily declining, it is still high above the European countries, even accounting for high mortality rates as a result of the Covid-19 pandemic. The fact that the latter are top destination

countries for migrants is not enough to compensate for their poor fertility levels. The exceptional years experienced by Spain in the mid-2000s are attributed to high migration levels and the baby boom that accompanied the housing market bubble.

But Europe’s demographic crisis is not falling on deaf ears. The EU has very recently put out a demography strategy, with the aim to explore how the current demographic transformation will affect living standards, health and housing, as well as ways to address the main challenges without swimming directly against the current²⁴.

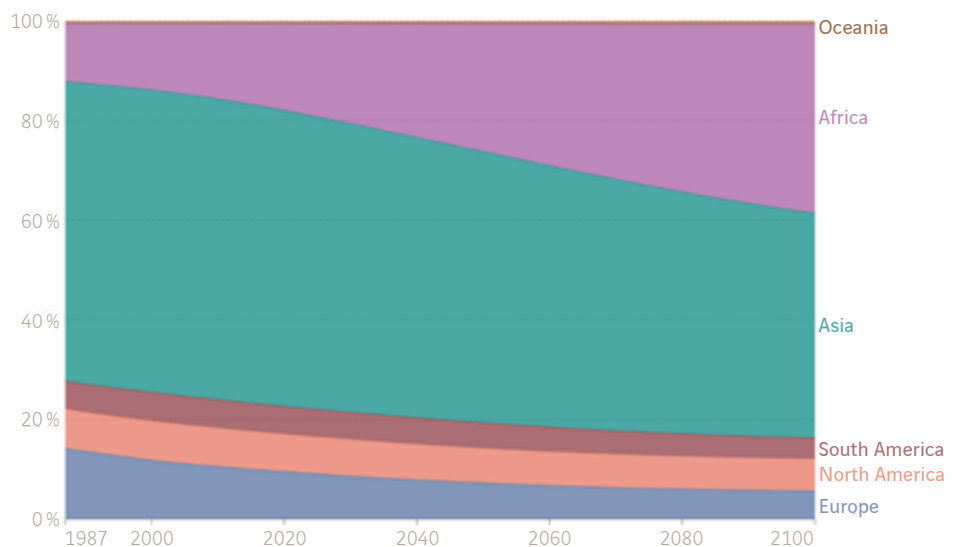
Figure 5.
Population by world region,
1980-2100



Source: OurWorldInData
(based on Klein Goldewijk et al. and UN estimates)

This graph allows us to appreciate Asia’s peak at around 2050, while Africa is not projected to peak in absolute population terms until the turn of the century, despite its growth rates to peak much earlier, at around 2060. Developed economies, especially Europe, are set to steadily decline with a more or less stable population. With the global population growing until 2100, however, this will result in a smaller share of the global population and, ostensibly, the global economy too.

Figure 6.
Share of world population by
world region, 1980-2100



Source: OurWorldInData
(based on Klein Goldewijk et al. and UN estimates)

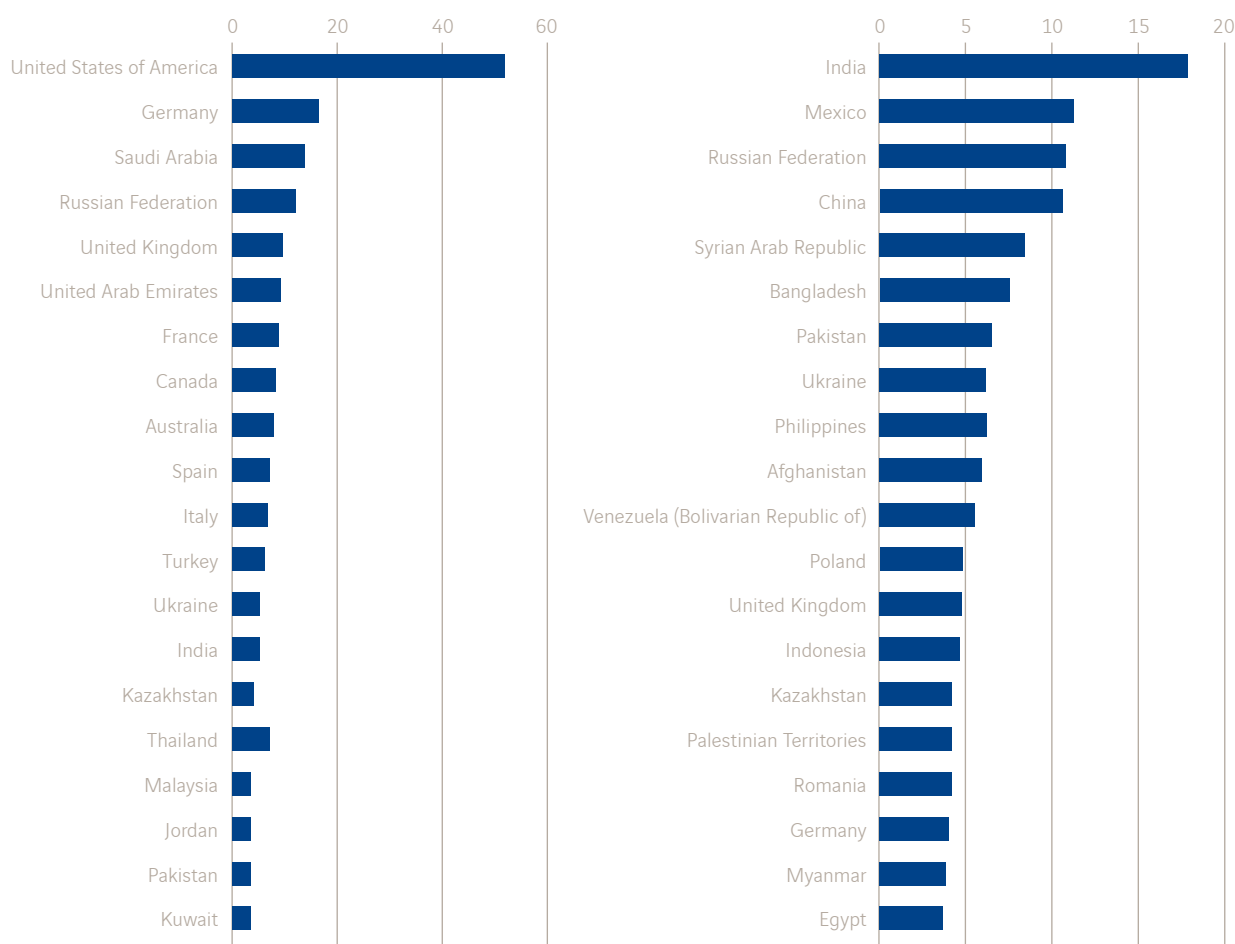
24 European Commission, “The Impact of Demographic Change in Europe.”

This asymmetrical growth will result in a great shift in the global balance, with industrialised and post-industrial economies in Europe and North America losing relative weight while the population centre of gravity shifts east and southwards. During the second half of the century Africa’s rapid growth rates will result in a rapid increase of its global share of the population, mainly eating through Asia’s share as this continent will plateau earlier.

A crucial factor that will certainly affect the demographic outlook in the future is **migration**. As population grew, so has the number of migrants in the world. They have also grown in relative terms: migrants represented 2.3% of the world population in 1970 and 3.6% in 2020²⁵. **Europe is currently the largest destination for migrants**, with 30.9% of the global stock, with Asia in a close second with 30.5% of the share²⁶. An interesting trend is observed in Latin America and the Caribbean, where its population of migrants has doubled to 15 million since 2005. The increase in migrant population in Asia has been likewise remarkable, with a 74% growth between 2000 and 2005²⁷.

Figure 7.

Top 20 destinations (left) and origins (right) of international migrants in 2020 (millions)



Source: International Organization for Migration

25 International Organization for Migration, “World Migration Report 2022.”

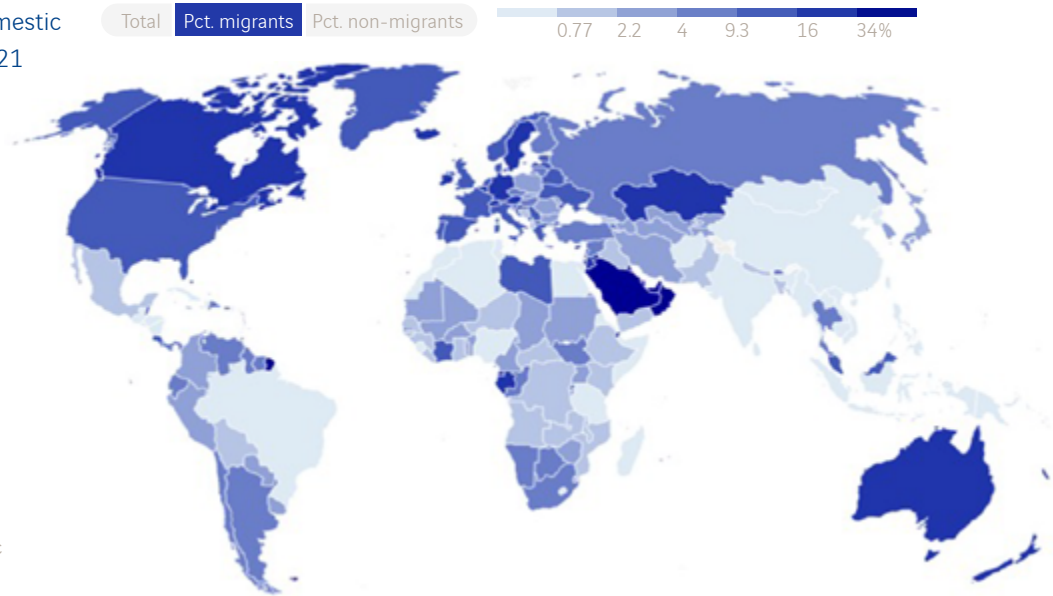
26 Ibid.

27 Ibid.

The United States of America is the top destination for migrants, and has been so for the past 50 years. India is the top sender, with over 18 million Indians living outside its borders. It is followed by Mexico, Russia and China²⁸.

Figure 8.

Share of migrants in domestic population (percent), 2021

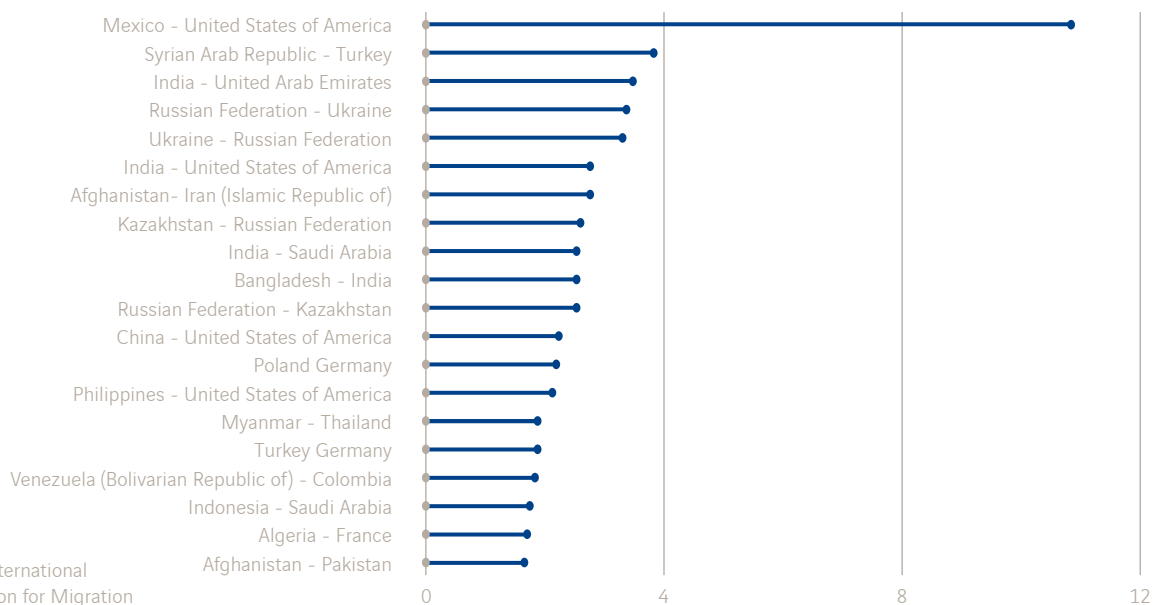


Source: UN Desk of Economic and Social Affairs

In relative terms, there are statistical outliers in the case of the Gulf countries such as Saudi Arabia, the United Arab Emirates and Qatar, as well as in Oceania owing to their small population size and their proximity to origin countries in Asia, e.g. China, India and Indonesia²⁹. Otherwise, countries with a sizeable population with a likewise substantial share of migrants include the USA, Germany, and the United Kingdom, France or other European countries to a lesser extent.

Figure 9.

Top 20 international migration country-to-country corridors (percent of global flows), 2020



Source: International Organization for Migration

²⁸ Ibid.

²⁹ United Nations Department of Economic and Social Affairs, Population Division, "World Population Prospects 2022: Summary of Results."

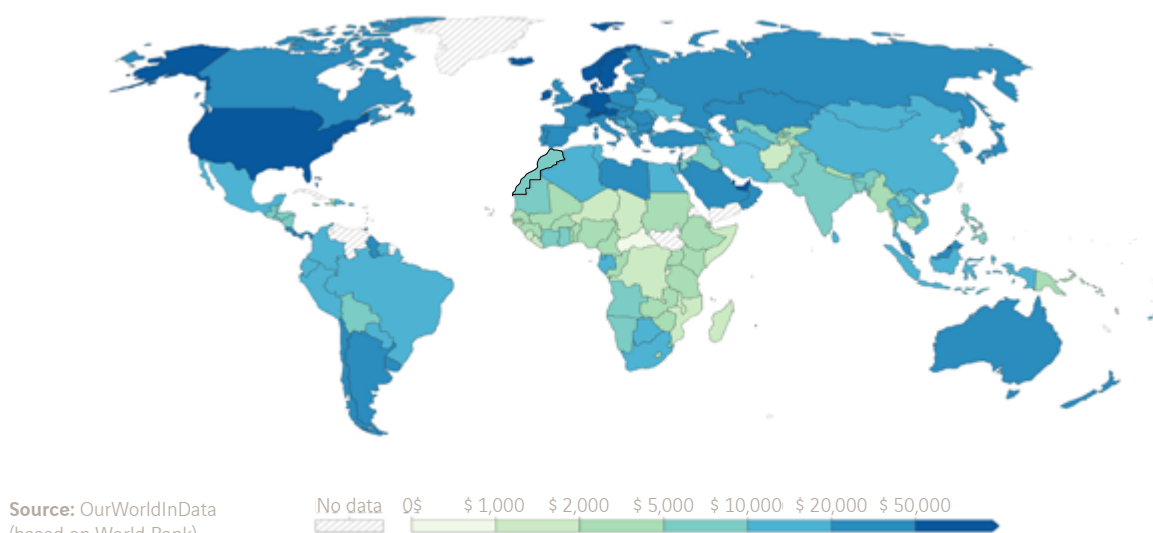
Migration corridors display the volume of bilateral migration between countries and regions. The largest bilateral corridor is between Mexico and the USA, followed by the anomalous situation in Syria where the civil war has caused displacement and large numbers of refugees and migrants fleeing the conflict. Sizeable corridors involve Russia and India, which is logical since these countries are at the top of origin countries. The considerable volume of intercontinental migration deserves to be mentioned, as there are significant corridors in the case of the USA with distant countries such as China, India, and the Philippines, as well as cases with European destination countries, e.g. the Algeria-France and Turkey-Germany corridors³⁰.

Economy: going East

A very common indicator joining demographics and economic development is GDP per capita, which measures each country's economic output and performance divided by its total population, allowing for a rough estimate of output value per person. It serves as an indirect measurement of personal income, although it cannot capture significant factors that should be accounted for, e.g. income inequality.

Figure 10.

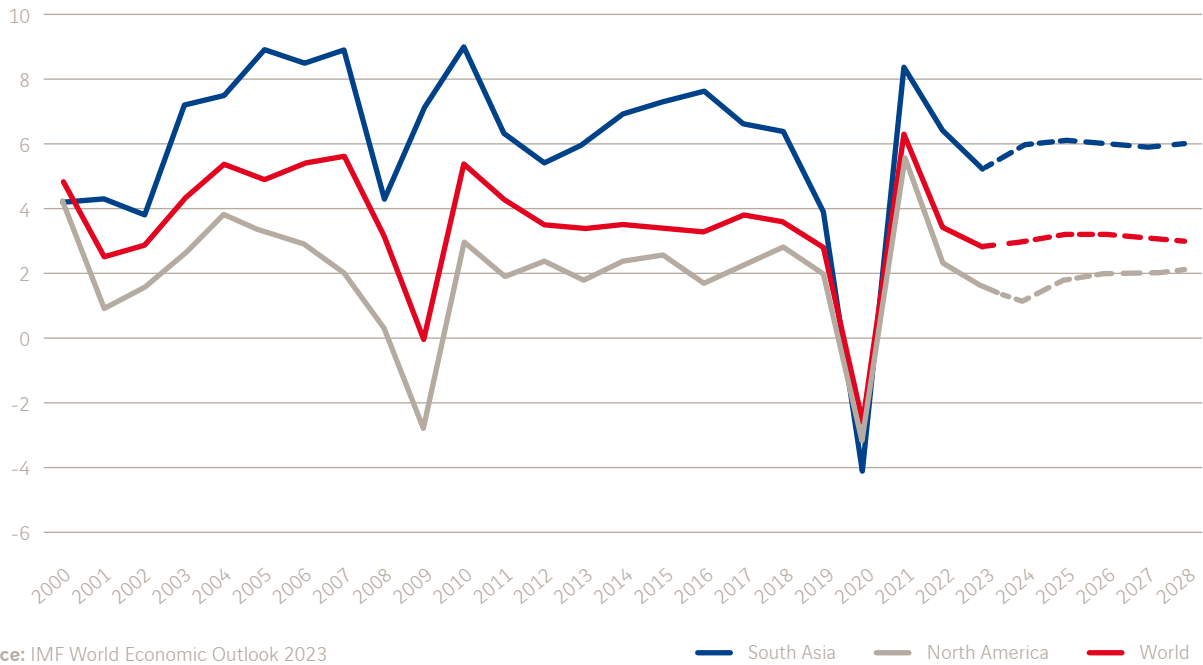
GDP per capita in International-\$, 2021



This map displaying countries' GDP per capita allows us to put the demographic weight of countries and regions into perspective. Despite being the most populated country, **India is still far behind in economic development** compared to most countries in Europe and North America, while we see **China's economy improved and now firmly in the middle-income category**, catching up to the income levels of some European countries. Figure 10 also allows us to perceive the low economic development of Sub-Saharan Africa and some states in South East Asia, while countries in Latin America have higher developed economies (although it is important to remember that this indicator does not capture inequalities within an economy). Some regional outliers appear: smaller countries such as the Gulf states or Singapore have higher GDP per capita levels thanks to their oil revenues and highly advanced and diversified economy, respectively. GDP per capita helps locate important centres of economic activity, but they also exaggerate the importance of some countries. Ireland has a very high GDP per capita, but because of its sparse population it is not an economic powerhouse within the EU compared to, say, Germany or countries with lower GDP per capita such as France and Italy.

30 International Organization for Migration, "World Migration Report 2022."

Figure 11.
Real GDP growth (selected regions), 2000-2028

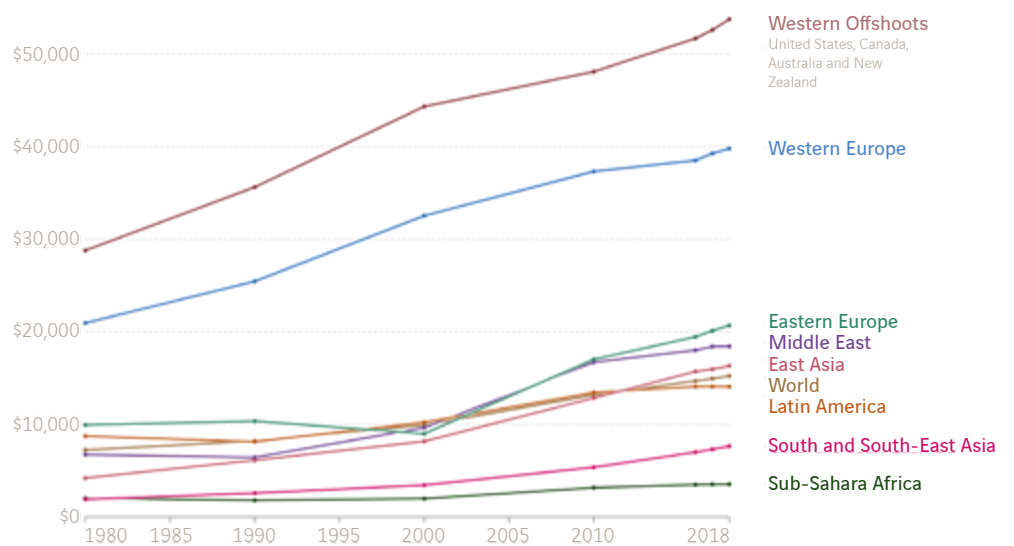


Source: IMF World Economic Outlook 2023

A historic anomaly has been corrected in the past decades, whereby Asia retook the first place in global share of GDP after 250 years of European and North American-led industrial revolution. As Figure 11 shows, Asia has led global economic growth for decades, surpassing North America’s GDP in absolute terms (as seen in Figure 2).

'Asia has led global economic growth for decades, surpassing North America’s GDP in absolute terms'

Figure 12.
GDP per capita, 1980-2018



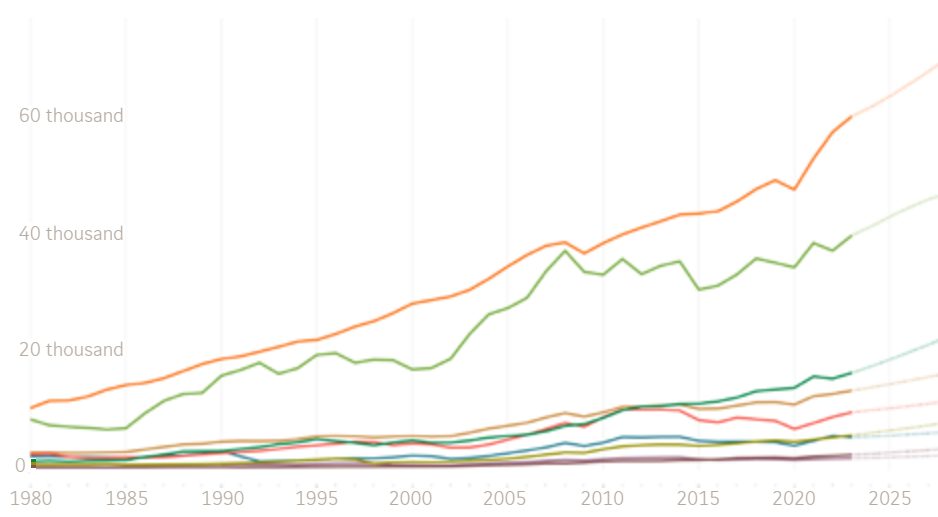
Source: OurWorldInData (based on data from Bolt and Van Zanden, 2020)

When looking at the global picture in terms of GDP per capita, the situation becomes more nuanced. As mentioned in the previous section, economic development in Asia, Africa and other developing regions is an empirical fact. Nevertheless, much is still to be done in order for these regions to enter into definite growth and to consolidate transitions to developed and industrialised economies with adequate quality of life and wage growth accompanying that of GDP (sometimes known as escaping the “middle income trap”³¹). In fairness, as Asia and Africa’s population keep growing, it is hard to keep up with the more developed nations and regions in GDP per capita terms, but the fact remains that growth in Sub-Saharan Africa and South Asia is not maintaining the pace in growth with other regions. Altogether, while growth in absolute terms shows impressive gains for the emerging economies, much catching up remains to be done. However, one can appreciate the increasing rate at which developing economies are growing: from stagnation at the turn of the century we see Eastern Europe, the Middle East and East Asia as regions that are reaching the \$20,000 per capita threshold.

Trends in World Demographics and Economy

Figure 13.

GDP per capita, current prices
(US dollars per capita),
1980-2025



Source:

IMF World Economic Outlook 2023

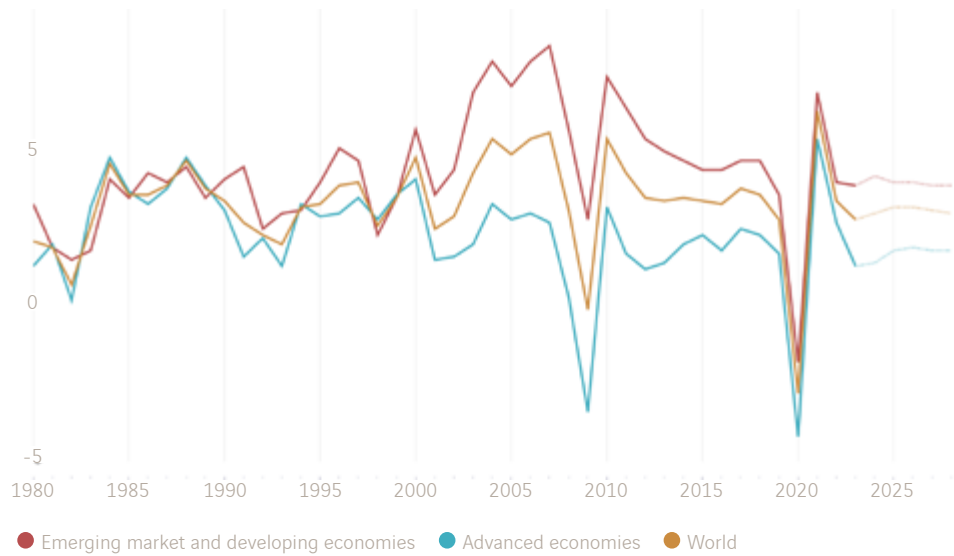
- World
- European Union
- Sub-Saharan Africa
- Middle East and Central Asia
- Latin America and Caribbean
- East Asia
- South Asia
- Southeast Asia
- North America

'We can expect emerging economies to grow at 2 or 3 percentage points higher than the developed world.'

Developing economies have gone a long way since 1980, with near-future projections showing these increasing growth rates that will most likely catch up to and surpass developed economies as these stagnate in population terms. We can also appreciate the erratic growth in the EU, which compared to the steady North American growth trends, appear to be much more vulnerable to shocks such as the 2008 financial crisis, the Covid-19 pandemic and, most recently, the Russian invasion of Ukraine. Despite large growth rates forecast for some developing regions, North America is set to keep enjoying high levels of GDP per capita, with high growth rates in the short term. This does not represent the bigger picture, however; when grouping the economies in terms of development, the situation becomes clearer and the disparity in growth rates between emerging market and developing economies and developed economies is appreciated. This difference in pace is not new; the trend appeared in the 1990s and displayed its strength during the 2000s (see below). After the Covid-19 recovery, we can expect emerging economies to grow at 2 or 3 percentage points higher than the developed world.

31 Felipe, Abdon, and Kumar, “Tracking the Middle-Income Trap.”

Figure 14.
Real GDP growth
(annual percent change)

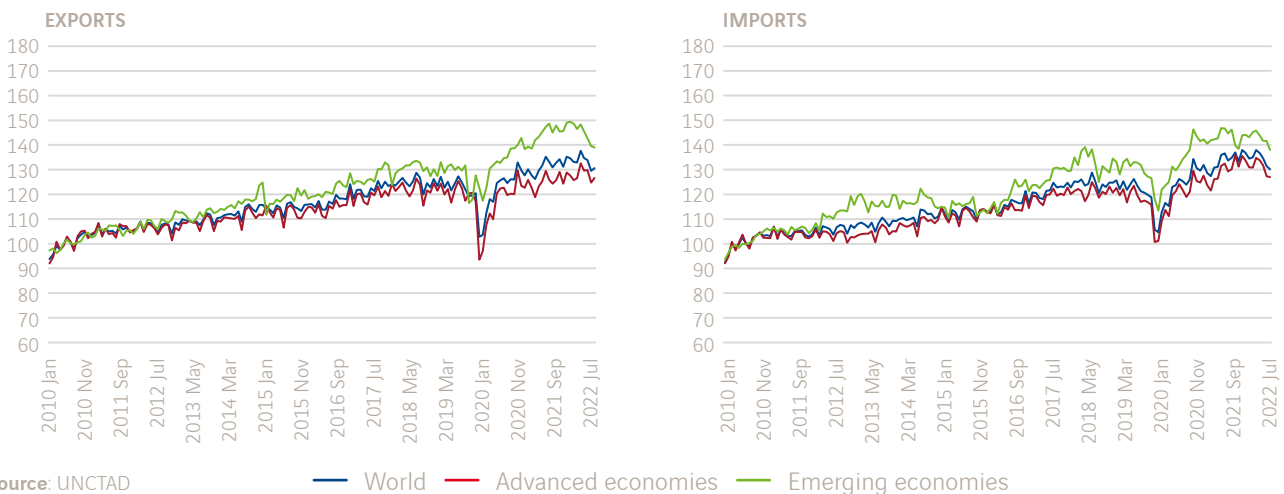


Source: IMF World Economic Outlook 2023

In essence, the current paradigm shows a world where developing regions are catching up to developed economies, albeit at different speeds according to what exact regions are being compared. With some room for nuance, one can expect these continued high rates to translate into a definite **catching up** to or even surpassing currently world-leading developed economies, although when this convergence will take place is still subject to fierce academic debate.

One of the main drivers of globalisation during the past four decades (and more) has been **trade**³². Without it, the explosion in growth of the world economy could not have taken place. The establishment of the WTO, other trade liberalisation methods and the emergence of regional trade agreements have progressively erased barriers to the movement of goods, services and capital across the world and enabled countries to specialise in their comparative advantage. In turn, this has led to the development of truly transnational and **global supply chains**, where the production of a given product occurs in different countries. While this initially allowed companies to allocate capital, labour and resources efficiently across borders, it has accrued consequences beyond pure market considerations, as we will see in later chapters.

Figure 15.
World merchandise trade by economy type, 2010-2023 (Index numbers, average 2010 = 100)



Source: UNCTAD

32 Ortiz-Ospina, Beltekian, and Roser, "Trade and Globalization."

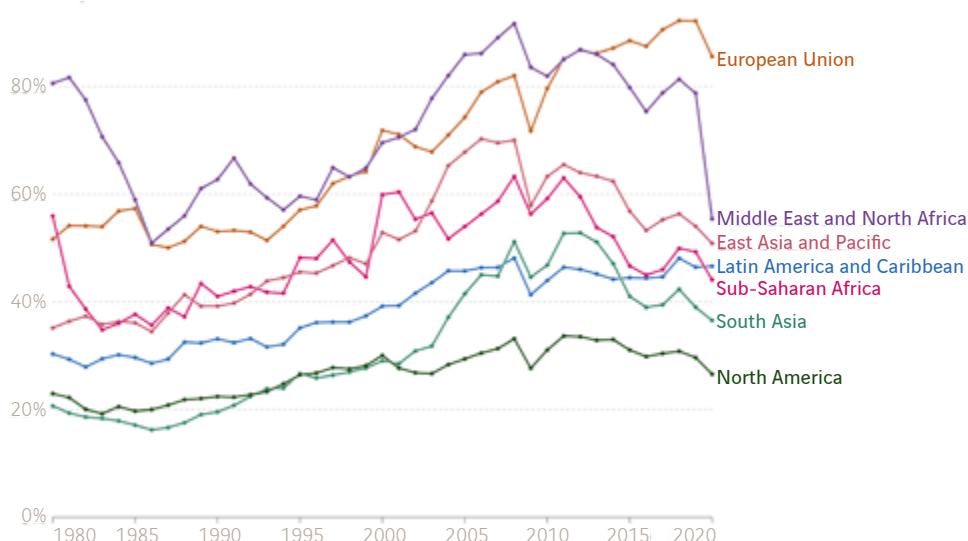
The trade figures show the general trend where emerging economies are leading trade growth at the global level, in the same catching-up dynamic in GDP terms shown previously. Among the developed economies (see Figure 12), the notable decrease and stunted growth in trade experienced by the United Kingdom stands out; the uncertainty surrounding its relationship with the EU after its departure from the bloc resulted in uneven, negative trade numbers. Overall, however, **advanced economies have enjoyed an expansion in trade**, despite that the removal of barriers to trade seems to have stagnated during the past 15 years³³.

As for the emerging economies, **China has been leading the expansion in trade**, both by measurement of exports and imports. However, in the short term, the draconian measures implemented in the Chinese mainland in order to maintain a zero-Covid policy had consequences in its trade performance, allowing other emerging Asian economies to lead the recovery. China's rapid export-oriented growth is observed below, and has allowed it to become the **world's largest exporter**. This has occurred in conjunction with the integration of these markets into global supply chains, becoming crucial hubs for a multiplicity of economic sectors, both in terms of goods and of services³⁴.

Once more, while emerging economies are undisputedly increasing their trade activity, **growth is unequal across regions**. The success enjoyed by China and other countries is offset by chronic underperformance in Latin America and Africa, attributed to high inflation rates, tight financial conditions, rising living costs and uncertainty, both in economic and security terms³⁵.

Observing trade openness provides a clear picture of an economy's dependence on trade for its domestic economic activities³⁶. The European Union is a highly trade-dependent country and is one of the regions benefitting most from trade alongside the Middle East and North Africa (MENA) region. Comparatively, high domestic demand in North America and high levels of energy sufficiency make the region comparatively inward-looking, despite the United States and Canada having promoted the liberal, free trade-friendly world order of the past decades.

Figure 16.
Trade as share of GDP,
1980-2020



Source: OurWorldInData (based on data from Bolt and Van Zanden, 2020)

Trade has been evolving as the global economic landscape changed. **Trade flows are now less markedly North-South**, where raw materials were processed in industrial centres and the value added was concentrated in developed economies. So-called **South-South trade is growing faster** than global trade at rates close to 10%, and advocates highlight its potential for developing economies to address shared challenges such as climate change and inequality³⁷.

33 OCSIS China Power, "How Influential Is China in the WTO?"

34 Li and Taube, "China's Integration into the Global Economic System."

35 United Nations Conference on Trade and Development, "Trade and Development Report Update."

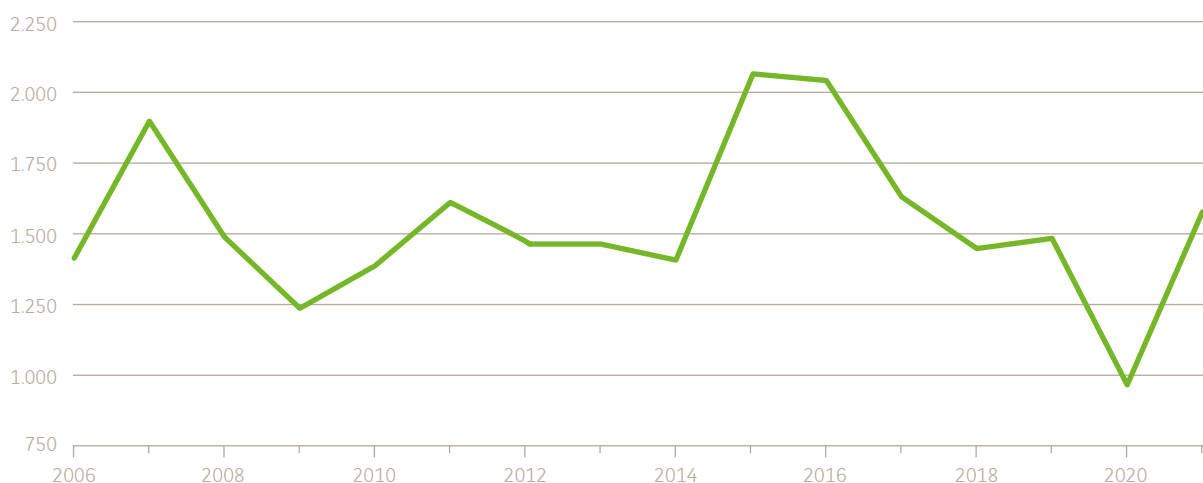
36 Harris and Nef, Capital, Power, and Inequality in Latin America and the Caribbean, 63.

37 United Nations Conference on Trade and Development, "South-South Trade Agreement Holds Key to More Sustainable and Inclusive Growth."

FDI has historically played a pivotal role in driving not only global economic development but also globalisation, by facilitating the transfer of technology, know-how and capital across borders. After the exceptional dip in 2020 (as observed in other indicators), the 2021 bounce back was equally impressive, with a 64% increase in global flows. This performance is not expected to be sustained however, as a grim economic outlook in 2022 and 2023 is expected, caused by the war in Ukraine and its snowballed food, fuel and finance crises³⁹.

Figure 17.

World foreign direct investment inflows (Billions of US dollars), 2006-2021



Source: OECD. Note: Excluding financial centres in the Caribbean

A notable driver for the recovery in FDI is the economic sectors relevant for the SDGs, and in particular a reported **boom in renewable energy sources**. The large demographic growth in most developing economies exacerbates the challenge to meet an energy demand that is increasing even faster thanks to higher incomes. As a result, developing economies are experiencing very high investment demands, especially in renewable energies and other technologies that can reconcile higher expenditures and living standards with a decarbonisation of the economy (see Chapter 2). Asia was observed once more to be leading FDI inflow data, accounting for 40% of global inflows.

39 International Monetary Fund, "World Economic Outlook, April 2023."

Future uncertainties in world demographics and economy

Demographics

Population trends are hard to modify once the structural forces exert their influence. **The decline of advanced economies is certain to take place**, not least because it has been occurring for the past few decades already. This is not limited to Europe, badly afflicted by low fertility rates, but it is also observed in quintessential ageing nations such as Japan and South Korea, both of which have implemented policies to encourage young couples not only to have children, but to promote the previous necessary steps of socialisation⁴⁰.

In the same degree of certainty, **Asia and Africa** will continue to dominate the data on population growth in the coming decades, with the former peaking earlier on. A closer look within regions show that **China's population is starting to peak** (its working age population has even started to decline already⁴¹) as a result of the now-obsolete one-child policy and a likewise plateauing economic growth rate and higher costs of living. It will instead be **India leading Asia's population growth**, having already overtaken China as the world's most populated country. On the global scale, **Sub-Saharan Africa is set to undergo a fast population boom** and will soon be the fastest-growing continent on the planet until at least the end of this century. With varying certainty, the next century might just see Africa become the Earth's most populated continent in absolute terms. That could still be considered conjecture nowadays, however, and most average estimates still see Asia as the majority of the world's population. As a result, the demographic shift eastwards will consolidate over time and will remain one of the relatively safe assumptions in this field, but Africa will lead population growth from around mid-century onwards.

While we know that the world population will increase, as well as where it will do so more than in other places, a crucial and as of yet unanswered aspect questions the *quality* of this increase in population. As such, matters of **inequality**, per capita income, access to public services, and development are far more **uncertain**. Related to this, **migration flows** may vary depending on the quality differentials between high density and population growth areas and the better-off

parts of the world. The most important uncertainty has to do with the strength of migration flows from the global south to the developed economies, and this in turn depends on the causes of migration, which can be as varied and fluctuating as **employment prospects** in more developed economies, **conflict**, or **climate change**-related droughts, heat stress, sea level rise and extreme weather events.

Economy

As opposed to the relative certainty of demographic trends, the economic outlook in the world is less set in stone. Economic yearly forecasts are known to be imperfect, and long-term estimates even more so. That being said, trade patterns are expected to evolve, with **emerging markets most likely increasing their share** in global trade. Developing countries, particularly in Africa, have untapped trade potential and may witness increased integration into the global economy. What is less certain is the degree to which the West will be able to keep up the high growth estimates set by the IMF (see Figure 11), at least in the short term. Certainly, high fuel and food prices derived from the war in Ukraine are a bad place to start. Trade in services, including sectors such as finance, telecommunications, and e-commerce, is also expected to grow in importance. Advances in technology and the digital economy will further enable the expansion of services trade, creating new opportunities for cross-border transactions, which is going to be accompanied by a growing awareness of the need for sustainable trade practices. Environmental considerations, social responsibility, and fair-trade principles are likely to influence trade policies and practices, leading to increased emphasis on sustainable supply chains and responsible investment.

In broad strokes, future scenarios will develop according to a series of **dichotomies**, with their definite outcomes remaining unknown. Firstly, **global trade** may either intensify and further integrate countries into a global economic system, or alternatively depress into less economic activity. This may depend upon the disposition of the great economic players (namely China, the US and the EU to a lesser extent)

⁴⁰ Sullivan, "South Korea to Give \$490 Allowance to Reclusive Youths to Help Them Leave the House."

⁴¹ World Bank, "Age Dependency Ratio (% of Working-Age Population) - China."

to keep their disagreements found elsewhere outside of the economic plane and refrain from engaging in tariff escalation and trade wars.

Another trade-related dichotomy refers to its degree of **regionalisation**. In this sense, we could see trade flourishing at a global scale, with multilateral trade having overcome its current challenges⁴² and facilitating multilateral removal of barriers to trade, including non-tariff barriers. Alternatively, trade will progressively become regionalised into smaller trading arrangements, with foci in Europe, South-East Asia, and North America.

Next, with the aforementioned expected increase in the relevance of the digital economy, we may see an increase in **trade in services only**. In any case, with more technological advances to be made and barriers to be removed, trade in services seems to have more to gain in the future than trade in merchandise, especially in the event of another world-stopping pandemic.

Finally, and owing to the forecasts seen in this chapter, we are before a scenario of either **convergence or divergence**. Will the West keep up with the forecasted growth projected by the IMF, and complicate other regions in their aim to catch up? There is a world where Europe follows the US in an upward divergence, gaining distance from emerging economies. However, the US might just as well shoot off at a pace the EU will struggle with due to more exposure to the war in Ukraine and other shocks, leaving it to converge with the rest of the world economy. Lastly, a final scenario where the whole world economy converges can likewise split into two different directions: one where the converge is in an upwards fashion of higher growth rates (with all the necessary conditions for that to take place), or downwards, where stagnation, stunted growth and economic fragmentation define the global landscape.

42 CSIS, "The World Trade Organization: The Appellate Body Crisis."





Chapter 2:

Climate change and the energy transition

KEY TAKEAWAYS

- Climate change is not slowing down and we are increasingly noticing its effects on nature and ourselves. The main culprit is energy and where it is sourced from, namely fossil fuels. The energy transition towards cleaner sources of energy is necessary for us to avoid the worst that the climate emergency can bring, but it faces many obstacles. Alarmingly, we are not on track to reach net zero by 2050 with current policies.
- The energy transition is already bringing noticeable change. Oil and gas producers will face declining demand, forcing some exporters to leave the market as they cannot remain competitive.
- While shifting away from fossil fuels, governments will need new resources to build clean energy infrastructure, mostly minerals and materials which are much more geographically concentrated and, crucially, most of them controlled by China.
- The energy transition brings a great geostrategic transformation: new key actors will arise due to the geographical concentration of these new resources.
- Hydrogen will play a bigger role in a clean global economy, but big questions about its scaling and profitability remain.

Rationale: the energy transition

The Earth is warming at a pace not seen in the past 10,000 years⁴³. We have “unequivocal” scientific evidence of this phenomenon⁴⁴, as well of its main driver: **human activity**⁴⁵. The consequences of climate change are and will be palpable across the globe: the global temperature is rising, but we also see oceans acidifying and warming, ice sheets shrinking, glaciers retreating, snow cover decreasing, sea level rising and extreme weather events proliferating⁴⁶. In the context of multilateral efforts to tackle climate change, the Paris Agreement (PA) was signed:

- The Paris Agreement is a legally binding international treaty on climate change, adopted by 196 parties in 2015. Its main goal is to keep “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursue efforts “to **limit the temperature increase to 1.5°C** above pre-industrial levels. To limit global warming, GHG emissions must peak before 2025 and decline by 43% by 2030⁴⁷.”

43 NASA, “Climate Change Evidence.”

44 Intergovernmental Panel on Climate Change, “Sixth Assessment Report Technical Summary.”

45 NASA, “Climate Change Evidence.”

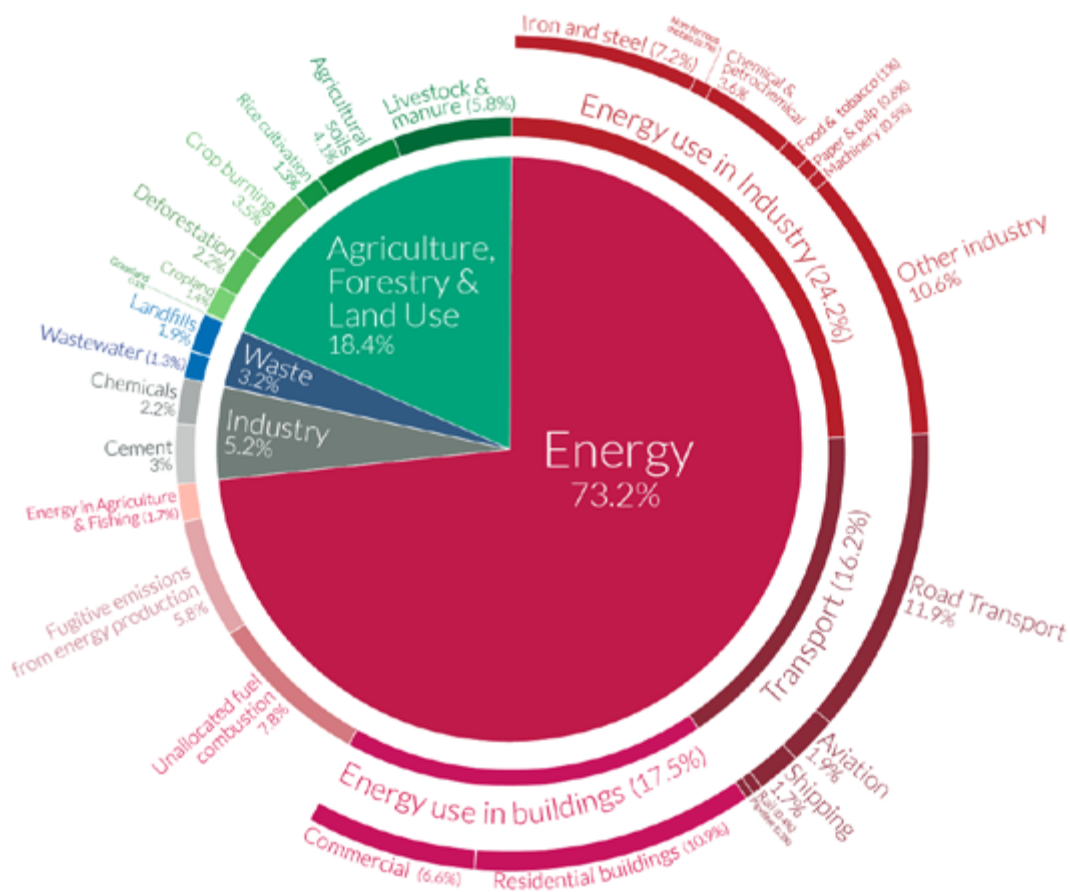
46 Ibid.

47 United Nations Framework Convention on Climate Change, Paris Agreement, art. 2 (a).

This benchmark is not arbitrary: limiting the temperature rise to 1.5°C is thought to mitigate the worst of climate change-derived effects in most areas, including the rate of sea level rise, species loss, ecosystems, ocean temperatures, human health, food security, etc⁴⁸. To be sure, there will still be negative effects on both the environment and human society alike with a 1.5°C increase, but these risks will be lower than if this goal is not achieved⁴⁹.

A staggering **73,2% of global GHG emissions is attributed to the energy sector**. In terms of CO₂, one of the main gases contributing to climate change, fossil fuel combustion is responsible for 89% of its global emissions⁵⁰. It is within this present challenge that governments – supranational, national, regional and local–, international organisations, private companies, and civil society at large have thrown themselves into realising the so-called energy transition. The rationale is clear: the energy sector is the top contributor to climate change and its effects, so we must look for alternative, cleaner sources of energy to meet our ever-increasing demand. In short, **GHG emissions need to reduce drastically and be eliminated by mid-century** to meet the goals in the Paris Agreement⁵².

Figure 19.
Global greenhouse gas emissions by sector, 2016



Source: Ritchie, 2020. Note: Total emissions for the year were 49.4bt CO₂eq.

48 Intergovernmental Panel on Climate Change, "Global Warming of 1.5 oC."

49 Ibid.

50 Olivier and Peters, "Trends in Global CO₂ and Total Greenhouse Gas Emissions."

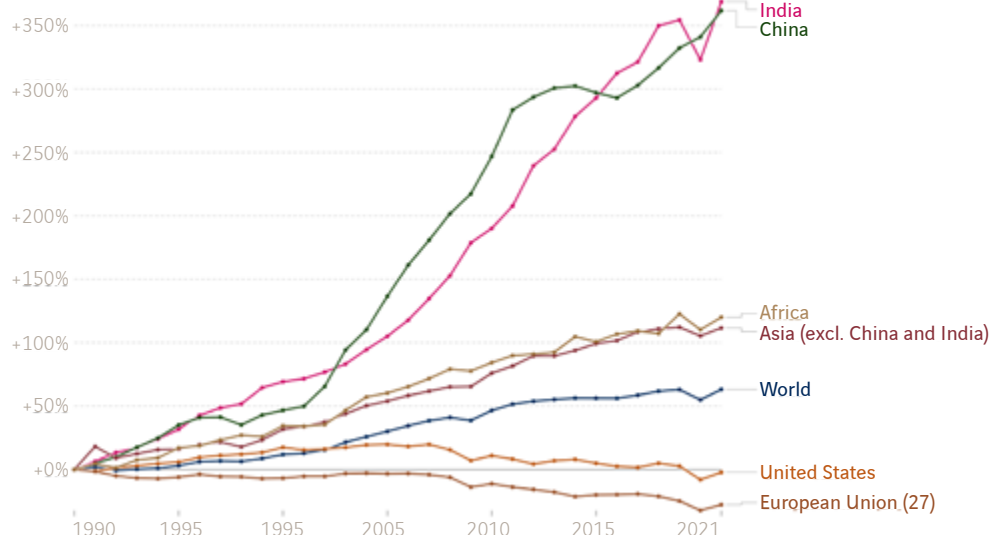
51 International Energy Agency, "Net Zero by 2050."

In order to decarbonise the energy sector, the world needs to move away – quickly and irreversibly – from fossil fuels such as coal, oil and gas and instead **embrace renewable energy sources** (e.g. solar, wind or hydro), hydrogen, bioenergy, and harness carbon-reducing methods such as carbon capture, usage and storage (CCS or CCUS). Likewise, the transport sector, which accounts for 15% of total global CO₂ emissions,⁵² faces an equally gargantuan task of shifting away from fossil fuels and the internal combustion engine in favour of lower-emitting forms of transport such as electric vehicles. This set of challenges will accrue **geopolitical consequences** the likes of which analysts and governments worldwide are still in the process of grasping. The transitional period in which countries will move from one energy model to another will usher “temporary” geopolitical dynamics, as fossil fuel-exporting countries seek to adapt to the new global reality, with some faring better than other ones as the transition moves on. And as new materials critical for the production of new energy sources rise in demand, the decades-long dependency dynamics of fossil fuels will give way to new relationships and challenges, with China rising to the fore.

The evolution of GHG emissions and the global energy mix

Figure 20.

Annual CO₂ emissions from fossil fuels and industry, selected countries and regions



Source: OurWorldInData, based on the Global Carbon Project (Friedlingstein et al.)

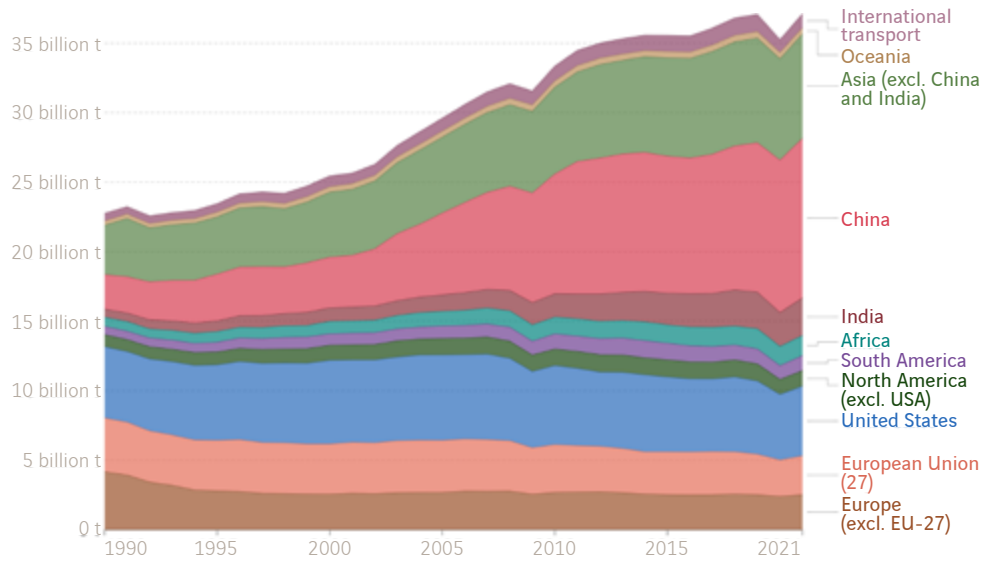
GHG emissions started to increase with the industrial revolution in the 19th century. From a historical perspective, **Europe and North America** are the heaviest polluters and emitters, as their economies surged forward in the context of the industrial revolution⁵³. However, looking at the past few decades in closer detail is useful in order to determine the world’s progress towards net-zero emissions as most analyses on emissions reduction use 1990 as the baseline comparison. As we can see, GHG emissions continue to grow. As most economies put Covid-era lockdowns behind them, the rebound in growth and economic activity resulted in emissions picking up again. A silver lining can be found in the long-term trajectories of Europe and North America, where emissions have decidedly reduced in the former, but the timid progress made by the world’s most developed economies is easily offset by the **increase in emissions in the emerging world** as their economies and population continue to grow.

52 Intergovernmental Panel on Climate Change, “Sixth Assessment Report Technical Summary.”

53 In fact, the historical aggregate of GHG emissions is the basis of a fierce debate between developing and developed nations over who should pay for climate damages, which exceeds the scope of this report.

54 The Kyoto Protocol mandated emission data to date back to 1990, thereby establishing this date as a common measuring baseline.

Figure 21.
Annual CO₂ emissions
by world region

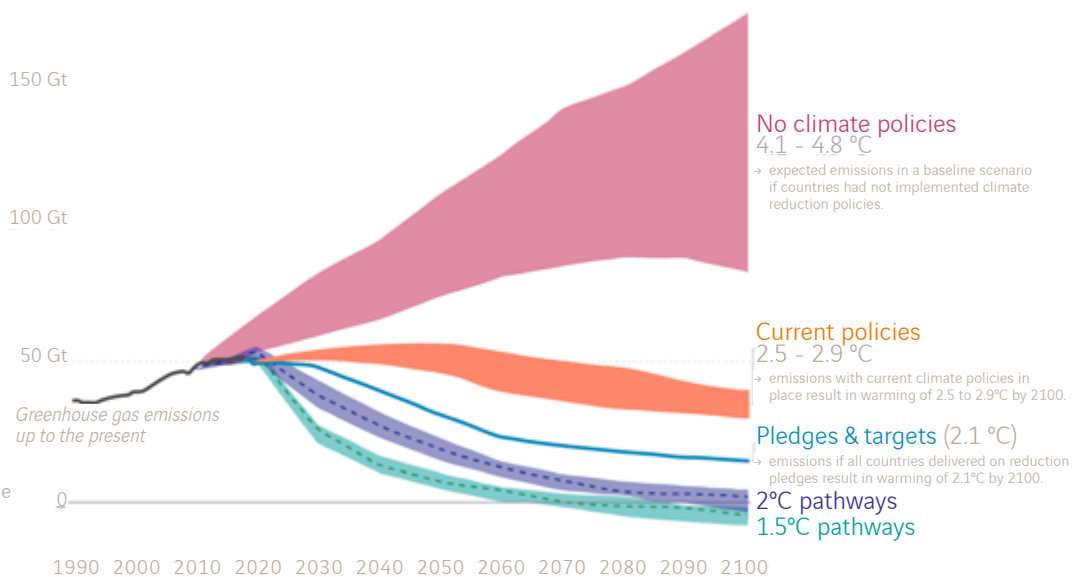


Source: OurWorldInData, based on the Global Carbon Project (Friedlingstein et al.)

China is by far the most GHG emitting country on Earth, not only because of its (until recently) largest population, but also because it houses manufacturing for most economies as well as its own. Its stellar economic growth has led it to increase from a rather small emissions share in 1990 to having the dubious honour of being the top emitter. Asia in general, owing to its large population, is also a major polluter, but so is the United States, with much larger emissions per capita. India and Africa have also increased their share of emissions as the EU and other regions and countries attempt to decarbonise, and we can expect their share to increase greatly as their economic development picks up steam.

As is evident, the energy transition faces a number of hurdles. Growing populations and rapid economic growth in Asia and Africa are **increasing demand for energy** services which, if not coupled with a decarbonisation of the energy sector, will lead to galloping increases in GHG emissions. There are various forecasts analysing future GHG emissions and their effect on the global temperature increase, according to how policymakers and the energy sector respond to these challenges (see below).

Figure 22.
Global greenhouse gas emissions in gigatons of CO₂ equivalent and warming scenarios

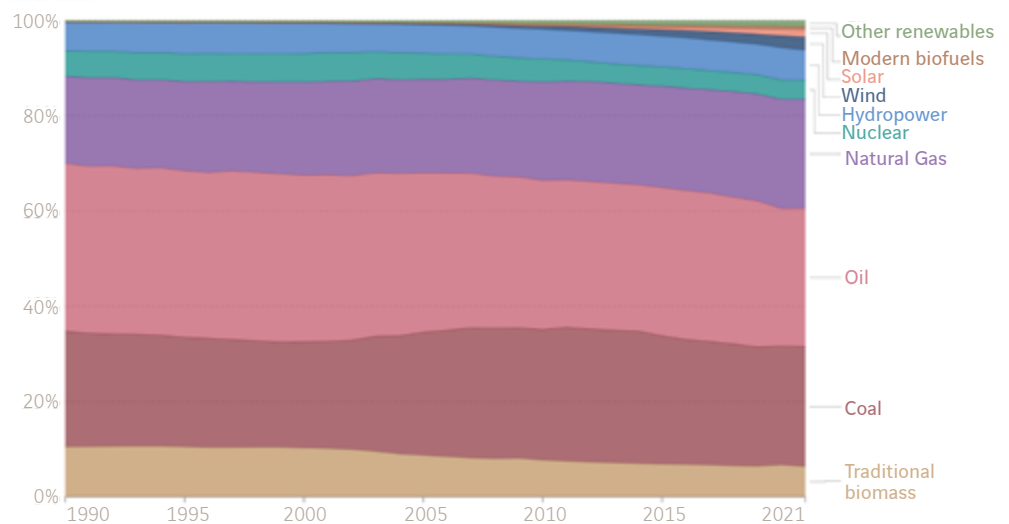


Source: OurWorldInData, based on data by Climate Action Tracker. Note: warming refers to the expected global temperature rise by 2100, relative to pre-industrial temperatures.

The PA sets a pathway towards limiting climate change to a 1.5°C increase in average temperature compared to pre-industrial levels as a preferred objective, with the main goal of staying “well below” a 2°C increase⁵⁵. The graph above shows various scenarios depending on which policies are and will be enacted. Current policies are clearly not enough to reach the PA goal, as it will surpass the average temperature increase by up to 100%. Furthermore, even if all countries and international institutions followed through on their current pledges and targets, the goal of staying well below 2°C will also not be attained. 2 and 1.5° pathways require GHG emissions to peak this decade, and as we have seen above, that is far from being a realistic objective as it stands. The disconnect between current pledges and what is needed to achieve a limit to a 1.5° increase is shown painfully clearly in this graph. Current policies will result in a **23 to 27 gigatons of CO₂ emissions gap** with what needs to be implemented by 2030⁵⁶. Clearly, more is needed and the energy transition needs to take off exponentially in the coming years if limits to climate change are to remain remotely close to the 1.5° pathways.

Figure 23.

Global primary energy consumption by source



Source: OurWorldInData, based on Smil (2017).

Currently, over 80% of energy consumption is powered by fossil fuels. As previously established, they are the leading cause of climate change. If a serious attempt at limiting the global temperature increase is to be made, the graph above needs to change drastically.

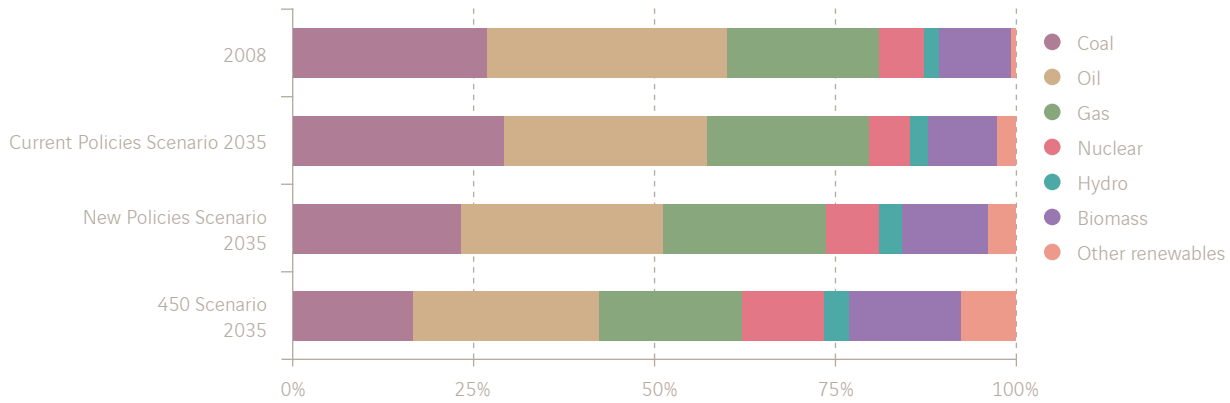
The Paris Agreement proved to be a paradigm shift by setting the hard goal of limiting climate change to 1.5°C. Just a few years prior, the benchmark was to limit it to 2°C, and the scenarios provided by international institutions clearly reflected a less ambitious plan for climate action:

55 United Nations Framework Convention on Climate Change, Paris Agreement, art. 2 (a).

56 Climate Action Tracker, “Temperatures.”

Figure 24.

IEA scenarios in 2010 for shares of energy sources in world primary demand



Source: International Energy Agency, 2010

The possibilities offered by the IEA in 2010, seen above, would now be seen as timid and clearly insufficient by most stakeholders in climate politics and energy transition. Even the most stringent one, the so-called 450 scenario which attempted to limit climate change to 2°C, pales in comparison to the ambition of the newer scenarios (see Figure 25 below). Currently, the global energy mix is similar to the New Policies Scenario for 2035, so we can appreciate a **step in the right direction** in terms the scope of necessary changes, as well as the speed at which these are implemented. As we will see in the next section, more ambition is needed to reach the PA goal of reaching 1.5°C.

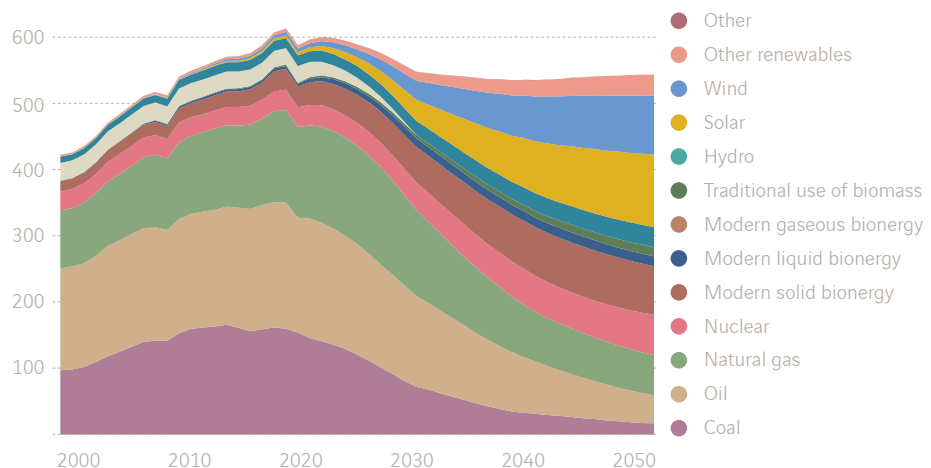
Trends towards a low-carbon world

Just how drastically the shift away is from fossil fuel depends on the different models and scenarios at hand. The only one that can reach the 1.5°C target is the Net-Zero Emissions scenario (NZE):

- **Net-zero** means cutting GHG emissions to **as close to zero as possible**, with any remaining emissions re-absorbed from the atmosphere, through ocean and forest ecosystems. whereby all anthropogenic GHG emissions are offset by removal of GHG off the atmosphere by 2050⁵⁷. In the NZE, renewables and nuclear power displace fossil fuel use almost entirely. Altogether, **oil, coal and natural gas should not exceed 20%** of the total energy supply in this scenario.

Figure 25.

Total energy supply in the NZE



Source: International Energy Agency, 2022.

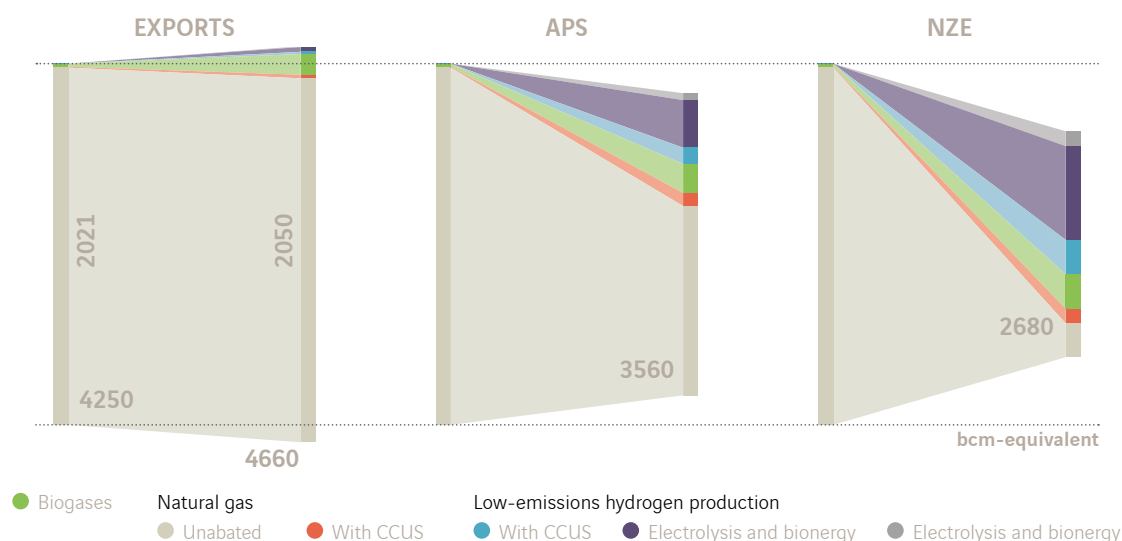
57 Levin et al., "What Does 'Net-Zero Emissions' Mean?"

Naturally, this is the most optimistic scenario and currently mostly serves as an indicator of how much is lacking in attitudes, pledges, financing and implementation. Two other scenarios, much more grounded in current developments, are often included in analyses: the **Announced Pledges Scenario (APS)** and the **Stated Policies Scenario (STEPS)**. APS gives governments “the benefit of the doubt” by assuming that all of their announced climate-related commitments will be fulfilled, including those made in international fora and whether backed by specific policy proposals or not⁵⁸. This scenario is currently associated with a temperature rise of 1.7°C in 2100. The STEPS scenario follows governments’ actual efforts to reach the targets set out by themselves, and sets the expected outcome should no new policy initiatives appear. With current efforts, the STEPS scenario is thought to lead to a 2.5°C increase in 2100⁵⁹.

'Clean energy technology is much more readily available today and also much more mature and cost-competitive'

The present decade is crucial for NZE to remain an attainable goal, as fossil fuel supply needs to be reduced by ~33%, mainly driven by a reduction of coal (see Figure 25). Likewise, **renewable energy sources require a serious take-off** in the next two decades to ensure access to energy as fossil fuels are progressively abandoned. There are a few silver linings in this sense. Clean energy technology is much more readily available today and also much more mature and cost-competitive and are further boosted by the USA’s Inflation Reduction Act and the EU’s European Green Deal⁶⁰, both of which will be discussed at length in Chapter 4.

Figure 26.
Natural gas demand by use and energy transition scenarios



Source: IEA, 2022.

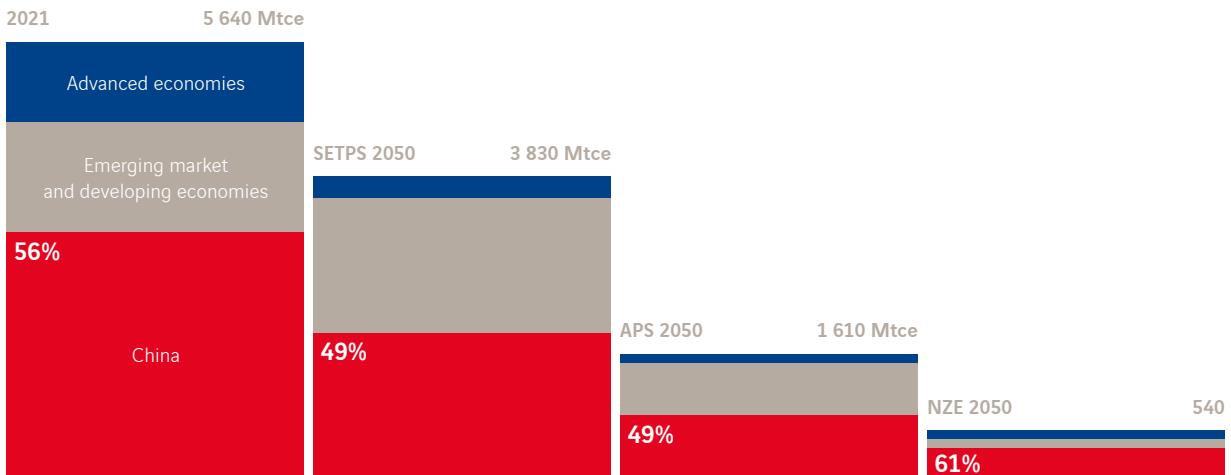
Gas is the one fossil fuel that **can be repurposed** in the context of the green transition, at least in the more ambitious scenarios. CCUS, in tandem with using natural gas to produce low-emissions hydrogen, are two activities envisaged by authorities such as the IEA that can contribute to the NZE objectives. These new opportunities are most exploited in this scenario, as they are much more limited in the APS and barely non-existent in the STEPS. In these two scenarios, unabated use of natural retains the lion’s share of its usage, and overall consumption does not reduce all that much. In general, however, it is positive to see that demand for gas is expected to grow only very slightly in STEPS, with unabated use actually decreasing.

58 International Energy Agency, “World Energy Outlook 2022,” 32.

59 International Energy Agency, “World Energy Outlook 2022.”

60 Ibid.

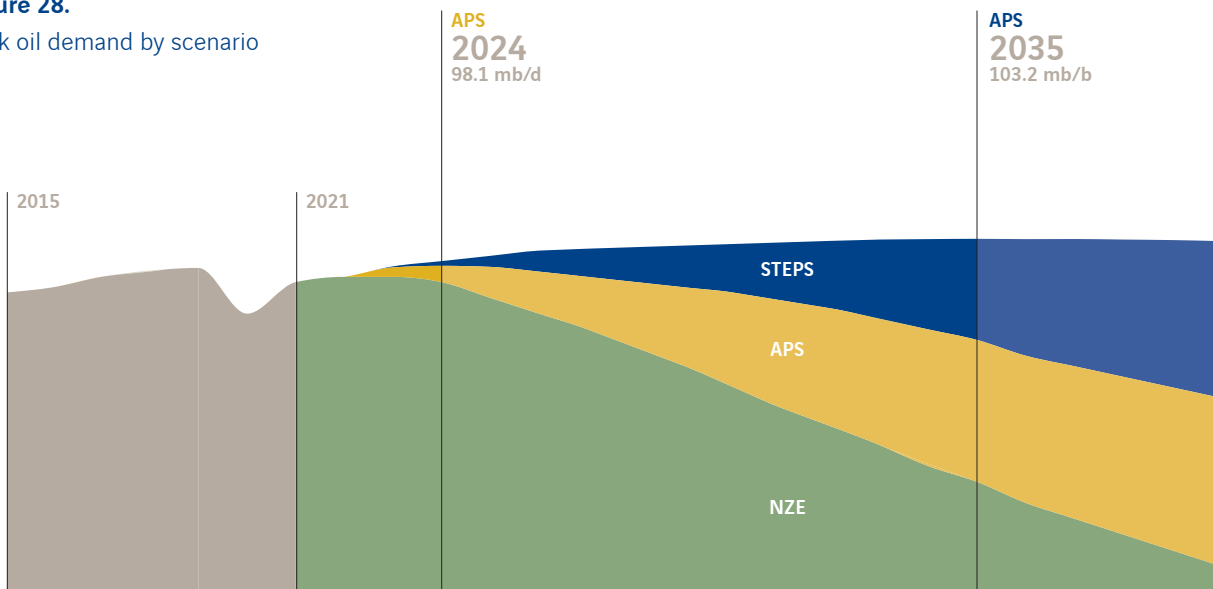
Figure 27.
Global coal consumption by scenarios



Source: IEA, 2022.

The future of coal relies on the willpower to pursue strong climate policies, but it **declines in all scenarios** at varying speeds. In STEPS, global coal demand declines by 30%, carried by a sharp decline in developed economies. According to APS, peak coal demand in critical economies such as China and India should be reached within this decade in order to reduce by 20% in 2030 and 70% in 2050. Finally, the NZE envisages coal demand to fall 90% by 2050.

Figure 28.
Peak oil demand by scenario



Source: IEA, 2022.

Finally, oil stands at a crossroads and its future is more uncertain than coal's. The STEPS scenario has oil demand rebounding after the Covid-19 pandemic, staying high so that it does not peak until 2035. But if governments keep their word then APS, on the other hand, needs oil demand to peak by 2024, which strikes an uncharacteristically large difference between this scenario and STEPS. The largest driver in the decline seen in NZE is carried by the transport sector, where most cars on the road will be electric by 2050.

It is perfectly possible that NZE or even APS will not be achieved, leading to a slower energy transition. Ostensibly, as new pledges are made and the existing pledges are acted upon, actual peak demand for oil could be reached in between the dates set by STEPS and APS. In any case, the urgency, salience and visibility of the climate emergency suggests that the dismissal of fossil fuels in favour of renewable and lower-carbon sources are going to take place sooner or later. As this process gradually takes place, fossil fuel-exporting countries will experience changes that will require **adaptation**.

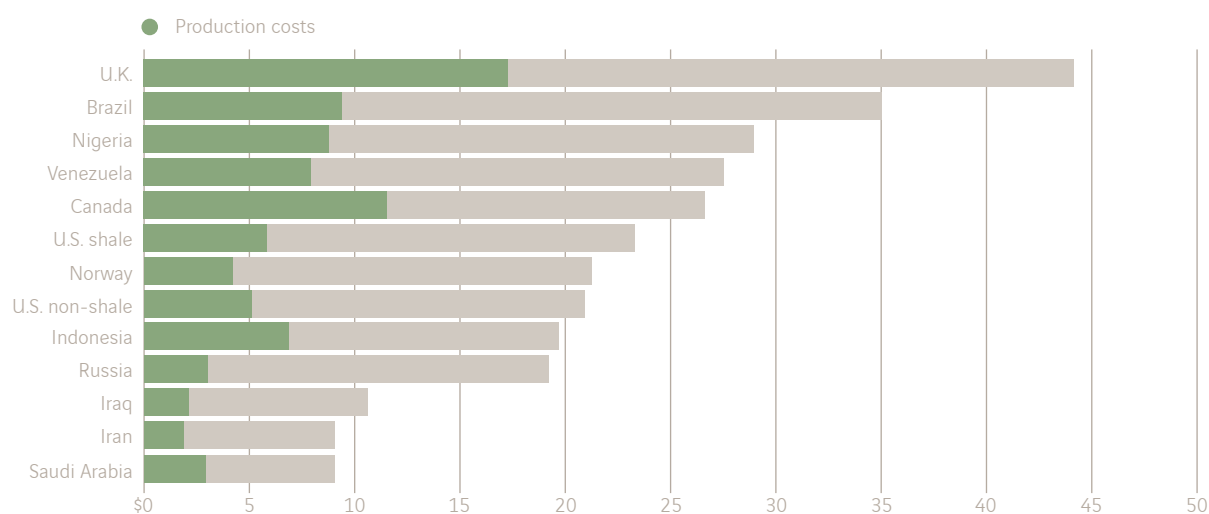
Oil and gas: winners and losers

The energy transition **will not affect everyone equally**, both in terms of population within a given country –despite entrenched pledges to make the transition a just and fair one⁶¹– and between countries. One of the first to notice the effects of the energy transition will be those oil and, to a lesser extent, gas producers whose costs of production are highest.

Even in the NZE scenario, continued investment in oil fields remains a necessity, since oil demand is falling but not fast enough to require no investment at all. In principle, this is good news for oil producers whose supply costs are lower such as those in the **Middle East**, as long as they remain resilient to lower prices by implementing strategies to **diversify their economies** and obtain revenues elsewhere.

Figure 29.

Oil production costs per barrel, selected countries (2016)



Source: Wall Street Journal

In green, we can appreciate the true share of production costs in technical terms. Other costs amounting to the total include tax burdens, transport and administration, or capital spending. As a result of the energy transition moving forward, we could see countries such as the UK changing strategies in order to remain competitive, although the effects might be limited by structural restraints. In a nutshell, we can expect oil-producing countries in the Middle East remaining the most competitive due to their low production costs and therefore winning out in the short term as less competitive countries exit the fossil fuel market. For example, British oil extraction activities in the North Sea’s rough waters are costly and its resources are hard to access, meaning that as demand for oil decreases globally, **the UK will lose out** in the most immediate development as the energy transition moves forward. The same conclusion can be drawn for countries with **oil operations in the Arctic or Venezuela**, whose heavy

61 See World Bank, “Just Transition for All”; European Commission, “The Just Transition Mechanism.”

oil is much harder to produce, despite having the largest reserves of oil on Earth. Essentially, lower-cost resources will be favoured, regardless of how demand evolves. **Large resource holders** (e.g., in the Middle East) and operators who can control extraction costs will gain a greater share of the market. While some options remain open to producers with higher production costs, such as introducing friendlier fiscal environments or restricting access to resources, the outlook is not optimistic.

Countries with a less diversified economy and with a **higher reliance on oil rents are also more exposed** to the green transition; in this sense, the UK's advanced and highly diversified economy will weather the adverse effects of losing competitiveness in oil much better than a country with lower production costs but much higher dependence on oil production such as Libya or Iraq⁶².

As for natural gas, it is expected that it will enjoy more safety than oil, having seen the outlook for each fossil fuel type above⁶³. This is mostly due to the prospects for wider uses of natural gas in the energy transition, not least net zero-contributing activities such as CCUS.

As oil and gas companies seek to invest in low-carbon activities and other initiatives such as CCUS, the challenge is particularly acute for National Oil Companies (NOC). These are oil and gas companies owned fully or in majority by a government, and account for 75% of global oil production and control of 90% of oil reserves. NOCs manage a country's fossil fuel resources and thus are a major component of their government's revenues. The energy transition has forced nations to update their strategies and look for ways to diversify their economies, and NOC are thought to have the potential of being sources of stability as these countries research and invest their way into lower-carbon sources of revenue.

The case for hydrogen

There is significant buzz around hydrogen, a source of energy that could potentially address a few of the challenges standing in the way of the energy transition. It is thought that with the proper scale and cost competitiveness, **hydrogen can contribute** to decarbonising some of the most heavily polluting sectors in the global economy such as **steel and cement production** and other heavy industry processes. These two sectors alone account for approximately 8% of global direct emissions each⁶⁴.

The Paris Agreement identified hydrogen as a potential key player in the fight against climate change. While demand for the gas has been growing in recent years, it has been currently met with hydrogen processed from fossil fuels, therefore going frontally against its envisaged use⁶⁵. Its sourcing from natural gas, dubbed "grey hydrogen", is the most common method of hydrogen. Instead, "**green hydrogen**" is synthesised from renewable energy to electrolyse water and separate the hydrogen atoms from oxygen. This is the development most governments and institutions are working towards as it is by far the cleanest method to obtain hydrogen, but it currently remains a much more **expensive process**.

Hydrogen is mostly used in industry today, but it has potential uses elsewhere as this source scales up. One of these is in the **transport sector**, especially the **air industry and heavy trucks**, which are methods of transportation that have not benefitted from the appearance and spread of electric vehicles. These more polluting sectors require more efficient and dense energy sources in order to improve weight efficiency, limiting their low-carbon alternatives. As such, hydrogen could hold the key to decarbonising these tricky sectors⁶⁶. Conventional vehicles could also benefit from the widespread use of hydrogen, but the expansion of the gas in this sector also depends on the infrastructure grid (i.e. availability of refuelling spots) and the costs of

62 International Renewable Energy Agency, "A New World: The Geopolitics of the Energy Transformation."

63 International Energy Agency, "World Energy Outlook 2022."

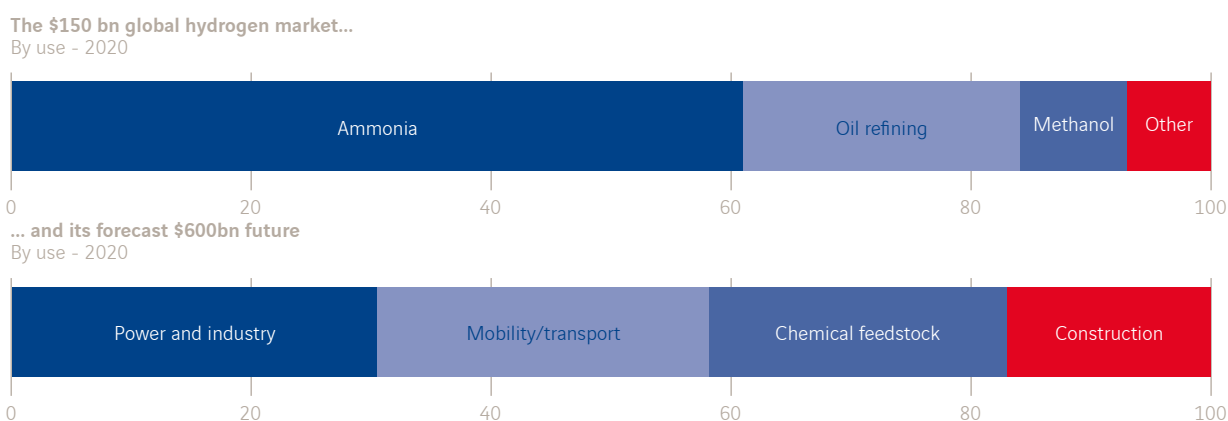
64 International Energy Agency, "The Future of Hydrogen."

65 Ibid.

manufacturing vehicle fuel cells⁶⁷. Hydrogen could also improve **energy efficiency** in buildings, making use of existing gas networks to power large buildings such as apartment blocks and commercial constructions. Lastly, hydrogen has the potential to improve renewable energy storage solutions, and the ammonia synthesised from hydrogen could have uses beyond artificial fertilisers, such as in gas turbines and in coal-based power plants to reduce emissions⁶⁸. As Figure 27 below shows, however, this is still rooted in theory, as **the present-day hydrogen market is largely industry-based**.

Figure 30.

Growth forecast for the hydrogen market



Source: Financial Times

On paper, hydrogen represents many opportunities to decarbonise and future-proof many key industries and sectors of the global economy⁶⁹. Additionally, it is currently enjoying a lot of **government, business and media attention**, which could potentially facilitate investments and ease regulation so that widespread implementation of hydrogen-based solutions can take place⁷⁰. The current trend is pointing in that direction, but some work remains pending: hydrogen demand has been steadily growing (94 million tonnes in 2021⁷¹), with most increases taking place in industry, while sectors that need to grow such as aviation and chemicals are still catching up. The IEA estimates that hydrogen demand could reach 115 million tonnes by 2030, but only 2 of these would come from new, underdeveloped uses. To keep up with announced pledges, however, 130 Mt would be necessary, 25% of which from new uses⁷².

The current outlook for hydrogen seems to be that of a quickly changing landscape. At present, most usage increases have brought no direct benefits to the fight against climate change, because hydrogen has been sourced via dirty methods and the small amounts of low-carbon hydrogen was mitigated by CCUS⁷³. That being said, there is an **impressive amount of green hydrogen projects in the pipeline** that are accelerating towards deployment. As these gather pace and face the final stages of development, the aforementioned hurdles of **regulatory frameworks and broad infrastructure** become more crucial.

Another key obstacle is the cost of **deploying hydrogen** to a sufficient extent⁷⁴. However, some timid signs show promise. There are estimates that affirm hydrogen's competitiveness against prices of fossil energy, even in today's world⁷⁵. Some regions with a potent renewable landscape could cease importing fossil fuels for hydrogen production, and switch to its green variant. As this market scales up, **costs** for crucial technologies such as electrolyzers could **fall up to 70% by 2030**⁷⁶, and as other renewable energy sources also become more affordable, green hydrogen might experience a noticeable decline in its prices

66 International Energy Agency, "Global Hydrogen Review 2022."

67 Thomas, Hume, and Sheppard, "The Race to Scale up Green Hydrogen."

68 International Energy Agency, "The Future of Hydrogen."

69 International Energy Agency, "Global Hydrogen Review 2022."

70 Ibid.

71 Ibid.

72 Ibid.

73 Ibid

moving forward. At present, however, high costs remain stubbornly high, as a result of the global energy crisis, high inflation and supply chain disruptions. This casts doubts on the overall profitability of hydrogen solutions, and as long as borrowing costs and inflation remain in the current economic landscape, the aforementioned projects in the pipeline will be tough to deploy. Transforming the hydrogen sector towards greener solutions requires many upfront investments, related to changing infrastructure and manufacturing processes, making the current adverse climate generate poor profitability expectations.

'Transforming the hydrogen sector towards greener solutions requires many upfront investments, related to changing infrastructure and manufacturing processes, making the current adverse climate generate poor profitability expectations.'

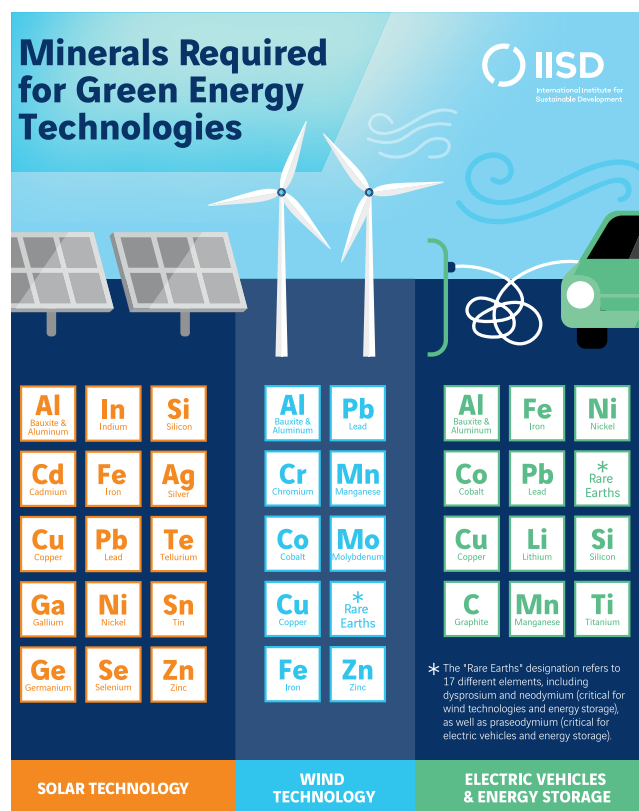
In short, hydrogen’s current challenges are all about implementing the ambitious objectives that governments and companies have set, all while keeping costs down and repurposing existing infrastructure, which has been used for fossil fuel-based solutions, towards greener sources for hydrogen.

Future uncertainties: critical materials

Renewable energies and a carbon-less energy system at large require developed supply chains for their necessary materials. “Photovoltaic plants, wind farms and electric vehicles generally require more minerals to build than their fossil fuel-based counterparts”⁷⁷. The outcome, degree of success and features of the energy transition all hinge on the materials needed for it to take place, as well as how these are harnessed, protected, traded with, and fought over.

Thus these resources bear the name *critical materials*⁷⁸. As the energy transition picks up steam, the demand for these critical materials has and will continue to grow at an unprecedented pace. **STEPS will double the demand** for mineral resources by 2040, whereas an **NZE scenario will quadruple it, and sextuple it by 2050**⁷⁹. To meet this rising demand, countries are scrambling to secure access to these emerging sectors and ensure sufficient supply of critical materials to realise their energy transitions, **establishing new dependencies** in the process.

Figure 31. Minerals required for green energy technologies



Source: International Institute for Sustainable Development

74 Temple-West, “Backing for Hydrogen Projects Lifts Investor Confidence.”

75 White, “China Edges Closer to Embracing Green Hydrogen.”

76 International Energy Agency, “Global Hydrogen Review 2022.”

77 International Energy Agency, “The Role of Critical Minerals in Clean Energy Transitions,” 5.

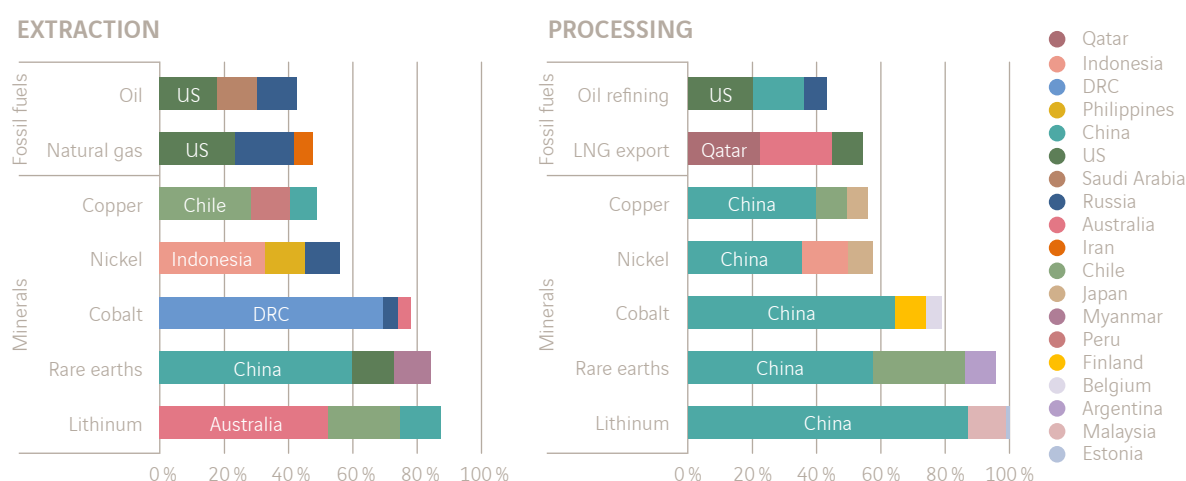
78 The USA identifies 50 minerals as critical, including aluminium, cobalt, tellurium, and others (see US Geological Survey, “U.S. Geological Survey Releases 2022 List of Critical Minerals.”). The EU identifies 34 critical minerals (see European Commission, “Critical Raw Materials.”), grouping rare earth elements while the USA lists them individually.

79 International Energy Agency, “The Role of Critical Minerals in Clean Energy Transitions.”

The crucial aspect about the energy transition and the switch towards clean energies that require critical materials is its **geopolitical makeup**. Indeed, geography takes up centre stage in the geopolitics of the energy transition. The **geographical concentration** of critical materials around the world is much more densely **located around a few areas and countries**, unlike the sparsity of fossil fuel deposits which allowed for coexisting and competing exporters. This could not only **drive global prices up**, but also **spark trade wars** and other tensions of a geopolitical nature, because the geographical location of the resources is not the only exacerbating factor. Much more than where the deposits are found, it is the **capacity to refine and process them** that is also concentrated into few countries and contributes to the tense geopolitical picture of the energy transition.

Figure 32.

Share of top three producing countries in production of selected minerals and fossil fuels, 2019



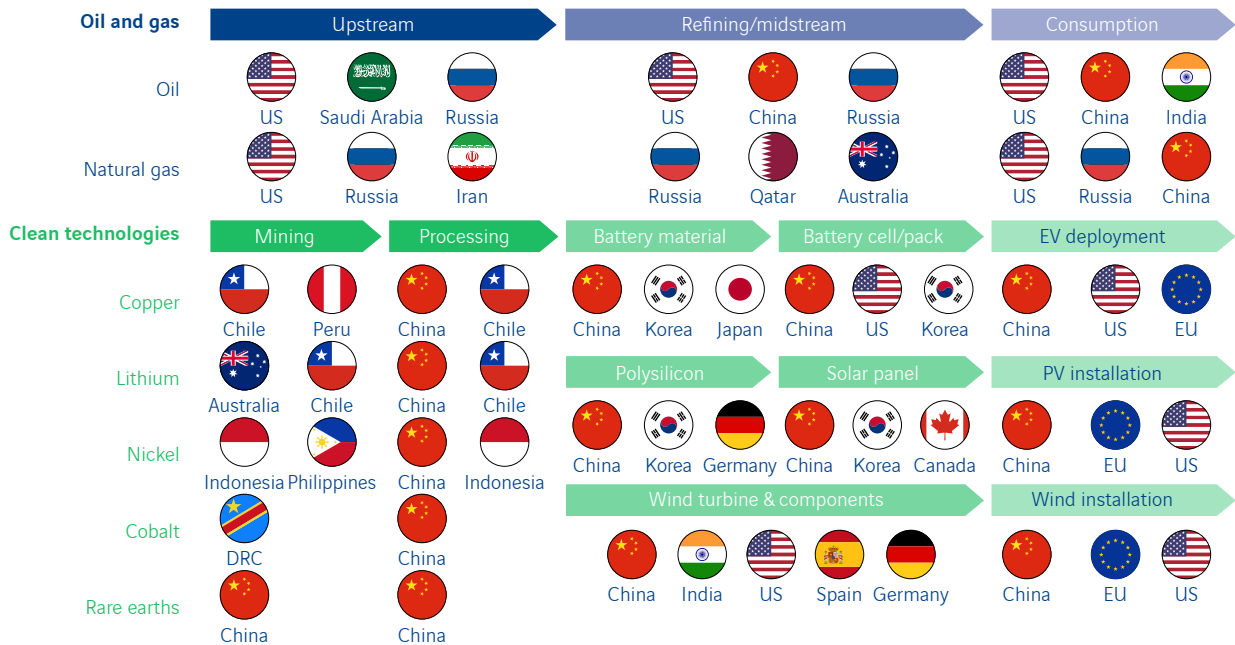
Source: International Energy Agency

'These increasingly important dependencies have led Western powers to reconsider their strategies towards China, to retain global leadership and access to critical materials.'

The figure above shows the paradigm-shifting configuration of critical materials and control over their extraction and processing. The fossil fuel sector is more or less evenly distributed among the top 3 producers in both extraction and processing. Not only that, but these countries typically do not exceed 50% of the total global output, but this is certainly not replicated in the control of critical minerals for the energy transition. The top producers of cobalt, rare earths and lithium **control over 80%** of the total global output, showcasing the high degrees of geographical concentration of these resources. Overall, the geographical distribution is varied across minerals, in the sense that one sole country does not possess reserves of many materials; however, the share of reserves in any given material tends to be highly concentrated in one country. While this may well be a boon for most countries such as **China**, Australia and Chile for their reserves of rare earths, lithium and copper respectively, some countries might struggle to find gains from their primary materials, owing to the "resources curse"⁸⁰ where extractive foreign activities might continue to take place. Regarding the processing phase of the value chain, the picture does not improve. **Control rests overwhelmingly on China**, with shares of around 50% and shooting up to over 80% in rare earths, the full control of which is only shared by 3 producers. China is in the lead in most if not all relevant critical materials, with **huge geopolitical ramifications**. It is precisely these increasingly important dependencies have led Western powers to reconsider their strategies towards China, to retain global leadership and access to critical materials for the energy transition at the same time.

80 Ross, "The Political Economy of the Resource Curse"; van der Ploeg, "Natural Resources."

Figure 33.
Indicative supply chains of oil and gas and selected clean energy technologies



Source: International Energy Agency

In geopolitical terms, the distribution and control of fossil fuels is more comfortable for the West, as oil and gas enjoy more American presence and that of business-friendly Gulf oil producers such as Saudi Arabia and Qatar. Contrary to fossil fuels, the overwhelming presence of Chinese control in critical materials, especially in the processing phase and increasingly in the development of final products, is ever more **worrisome for Western powers** and explains the frantic search for approaches that reconcile dependencies with the maintaining of global leadership. As this sector grows in both size and importance, it is likely that prospecting activities intensify, leading to discoveries of new mineral fields and deposits which may further alter the geopolitical landscape of the green transition. In fact, **new discoveries** are announced often, such as a rare earth deposit in Sweden. The discoveries themselves are a matter of dispute between countries vying for control, as is the case with a submarine deposit of cobalt and tellurium off the Canary Islands, to which both Spain and Morocco have laid claim⁸¹.

81 Badcock, "Spain Rejects Morocco's Claim on Mineral-Rich Undersea Volcano."





Chapter 3:

Democracy and autocracy in the world

KEY TAKEAWAYS

- The decades-old liberal world order is showing cracks: to what extent is there a clash between democracy and autocracies driving deglobalisation?
- Great powers are vying for influence through various mechanisms, such as huge infrastructure and investment programs such as the Belt and Road Initiative (China), the Partnership for Global Infrastructure and Investment (USA), and the Global Gateway (EU).
- A complete break between the West and China is not only undesirable for both, but also unlikely. Instead of complete defragmentation, we will see contained and selective conflicts, or ‘small gardens with tall fences’.

A clash between democracy and autocracies?

After decades of a more or less stable international liberal world order, the makeup of the current international system puts its **liberal-democratic qualities into question**, with consequences for the future. Successive milestones that marked the disintegration of the international liberal order the American invasion of Iraq, the global financial crisis of 2008 and the collapse of the Doha Round of the WTO⁸². Much more recently, democratic countries have experienced **illiberal, undemocratic reactions** by the opposition after losing an election, such as the **USA** and **Brazil**, effectively questioning the most basic rules of the democratic game. In Europe, **the far right is rising**, even supporting or entering government in countries like Sweden, Finland and Italy. The outlook for the future configuration of the international system is thus in the air, and some claim there is a real **conflict between democracies and autocracies as models of governance**⁸³. This is subject to much debate, with voices in the “Global South” distancing themselves from such a limiting dichotomy, as they see benefits in having good relations with both the US and China, the two paragons in each camp. Indeed, many developing countries remain autocratic and the US is still the major world superpower, so exacerbating a divide might not be in their best interest. At the same time, US President Biden has been one of the most outspoken leaders defending this world vision where democracies and autocracies are confronted. The current context, marked by the Russian invasion of Ukraine, certainly suggests an actual clash between two divergent world views, with the West aiding Ukraine and the democratic model against the repressive Russian regime. However, many countries far from the conflict have not manifested support for Ukraine, instead remaining on the side lines, notably Brazil, South Africa, and China even timidly giving Russia a longer leash. These countries have also pointed out the **double standards** held by the West, in terms of sanctions (compare the Iraq and Ukraine cases) and openness to refugees (e.g., Libya or Syria compared to the solidarity shown to Ukrainians).

It is important to examine the extent to which democracies and autocracies are indeed pitted against each other, and to address crucially relevant questions. Shedding light on which model might prevail and what this will mean for the global order, i.e., towards a restoration of liberal institutions or toward an unknown new model of global governance, is crucial.

82 Otero Iglesias, “The Binary Discourse of ‘Democracies vs Autocracies’ Is against Europe’s Interests.”

83 Ibid.

Democracies are less repressive than autocracies, but the differences between democracies and autocracies have clearly shrunk since the Cold War⁸⁴. The implications of the democracy or autocracy dichotomy for the rest of the chapters in this report hinge on debates around their **performance on economic growth** and technological innovation. In favour of autocracies being more conducive to growth, we find arguments that point to their greater ability to promote growth-enhancing policies free of societal pressure⁸⁵. Conversely, democracies are thought to encourage growth because of stronger protection of property rights and larger spending on basic education⁸⁶. The latter increases human capital, one of the main factors that lead to economic growth⁸⁷.

Innovation, or technological change, also leads to growth⁸⁸, which is thought to be one of the main assets in democracies' toolbox. The argument goes that autocracies focus their economic development through high savings and investment rates, but cannot compete with democracies in terms of innovation because of added difficulties in implementing new production and organisation procedures⁸⁹. While this may be true for most autocracies, there are glaring examples of the contrary actually occurring. China has been able to match the United States in terms of innovation and is now a global powerhouse, rivalling US and other frontrunners in areas such as renewable energy, electric vehicle deployment, and artificial intelligence (AI). It has accomplished this all while remaining an autocratic state with political and market control⁹⁰. China's success is attributed to its large, protected market, solid networks with foreign innovators and large reserves of capital, both human and financial⁹¹.

The debate on democracies and autocracies and what they bring to the table is posed to rage on. The next section will focus on **how democratic the world is**, and whether it is more or less democratic than before. In order to measure democracy, researchers use various indices that measure civil liberties, political rights, plurality of societies, etc., and determine an estimate for a given country. As we will see below, these indices are not without their faults, despite their usefulness in research.

Using freedom indices to measure democracy in the world

The indices used in this report are Freedom House's (FH) Freedom in the World index and the Economist Intelligence Unit's Democracy Index.

The FH index⁹² provides scores from 0 to 100, with 100 being the freest possible score. It assesses political rights (electoral process, political pluralism and participation, and functioning of government) and civil liberties (freedom of expression and belief, associational and organisational rights, rule of law, and personal autonomy and individual rights). Each category has a set of publicly available questions used to evaluate each country's status. Depending on how a given country fares, it will obtain the status of Free, Party Free, or Not Free.

The Economist Democracy Index (EDI)⁹³ bases its scoring system on five indicators: electoral process and pluralism, functioning of government, political participation, political culture, and civil liberties. Depending on the score obtained (from 0 to 10, with 10 being the most democratic score), countries can be considered to be a "full democracy", "flawed democracy", "hybrid regime" or "authoritarian regime". Contrary to FH, the sub-questions in each category remain opaque, raising concerns on the index's accuracy in the eyes of some⁹⁴. Still, the EDI is considered to disaggregate each variable in a way that they remain

84 Skaaning, "Autocracies, Democracies, and the Violation of Civil Liberties."

85 Knutsen, "Why Democracies Outgrow Autocracies in the Long Run."

86 Knack and Keefer, "Institutions and Economic Performance"; Skaaning, "Autocracies, Democracies, and the Violation of Civil Liberties."

87 Tavares and Wacziarg, "How Democracy Affects Growth."

88 Acemoglu, Introduction to Modern Economic Growth.

89 Skaaning, "Autocracies, Democracies, and the Violation of Civil Liberties."

90 "How Much Should We Fear Artificial Intelligence?"

91 Sheehan, "How China Became an Innovation Powerhouse."

92 "Freedom in the World."

93 Economist Intelligence Unit, "Democracy Index 2022."

94 Coppedge et al, "Conceptualizing and Measuring Democracy."

somewhat independent from each other, a requirement that other indices have struggled with. This provides more dimension to the conclusions that can be extracted from EDI data.

The practice of comparing democratic qualities across countries and measuring their performance over time carries intrinsic value, because it allows us to obtain knowledge on explaining what contributes to or affects democracies, mark progress, reveal consequences related to this matter, or make predictions on its future. There are a variety of indices that carry out this task, such as the ones used in this report, as well as Polity IV and the Bertelsmann Transformation Index. These indicators may have real-world consequences for countries, since “billions of dollars in foreign aid intended to promote democracy and governance in the developing world is contingent upon judgments about how democratic a polity is at the present time and the likely causal effects of giving or withholding assistance”. However, democracy indices have been subject to much criticism regarding its definitions, precision, coverage, coding, aggregation, and validation tests. Some indices present grievous flaws, such as Polity IV considering the United States a full democracy throughout the 20th and much of the 19th century, when women and black people were excluded from the electorate. Another example is the EDI’s consideration of mandatory voting as a negative factor in a democracy, an issue which has its arguments in favour as well as against. The EDI, however, is considered to be a rather sensitive index that does not group countries’ democratic rating together in an arbitrary fashion, a practice that other indices have been accused of doing (such as Freedom House and Polity IV). In terms of data, the EDI sources information from polling, albeit irregularly across the board, with many countries’ democratic rating being estimated by experts instead of primary sources. Data is then coded by experts, both in Freedom House and EDI, which are subject to human judgments and therefore prone to arbitrary decisions.

As we can see, democracy indices are far from perfect, but they allow us to roughly gauge where a country stands in relation to the wider global community. More importantly, it also allows us to oversee the evolution of countries over time and how the ebb and flow of democracy takes shape, drawing important conclusions in the process, i.e., whether democracy is consolidating and gaining ground in new countries or instead receding in favour of more autocratic forms of government. The longitudinal aspect is a welcomed strength of democracy indices, because they keep track of the same targets over time with a stable methodology.

Democracy in the world

Figure 35. Economist Democracy Index by region, 2006-2022

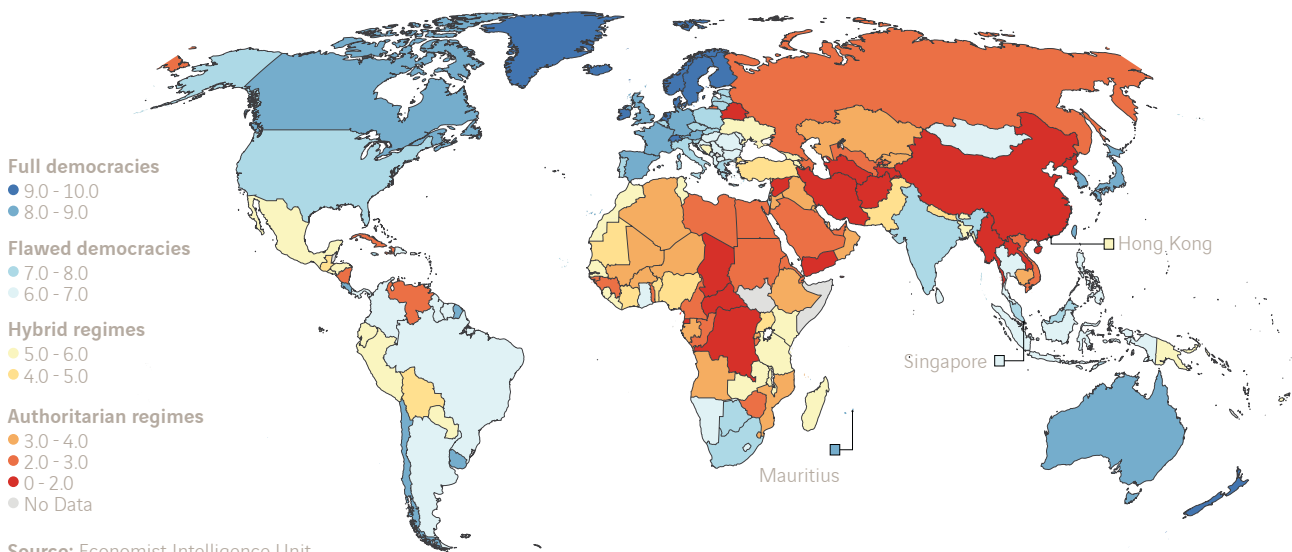
	2022	2021	2020	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2008	2006
Asia & Australasia	5.46	5.46	5.62	5.67	5.67	5.63	5.74	5.74	5.70	5.61	5.56	5.51	5.53	5.58	5.44
Eastern Europe	5.39	5.36	5.36	5.42	5.42	5.40	5.43	5.55	5.58	5.58	5.51	5.50	5.55	5.67	5.76
Latin America	5.79	5.83	6.09	6.13	6.24	6.26	6.33	6.37	6.36	6.36	6.36	6.35	6.37	6.43	6.37
Middle East & North Africa	3.34	3.41	3.44	3.53	3.54	3.54	3.56	3.58	3.65	3.65	3.73	3.62	3.43	3.54	3.53
North America	8.37	8.36	8.58	8.59	8.56	8.56	8.56	8.56	8.59	8.59	8.59	8.59	8.63	8.64	8.64
Western Europe	8.36	8.22	8.29	8.35	8.35	8.38	8.40	8.42	8.41	8.41	8.44	8.40	8.45	8.61	8.60
Sub-Saharan Africa	4.14	4.12	4.16	4.26	4.36	4.35	4.37	4.38	4.34	4.34	4.32	4.32	4.23	4.28	4.24
World average	5.29	5.28	5.37	5.44	5.48	5.48	5.52	5.55	5.55	5.53	5.52	5.49	5.46	5.55	5.52

Source: Economist Intelligence Unit, 2022

In a nutshell, **the world has become less democratic**. Even in regions where democracy has retreated even in regions where it is thought to be an irrevocable trait, however little. All regions barring Asia and Australasia are more autocratic compared to 2006. This exception barely holds water as it is only .02 points more democratic according to the Economist, a statistical anecdote that has very few real-world consequences. In the rest of the world, most regressions are not huge, but they are discouraging nonetheless.

'Democracy has retreated even in regions where it is thought to be an irrevocable trait.'

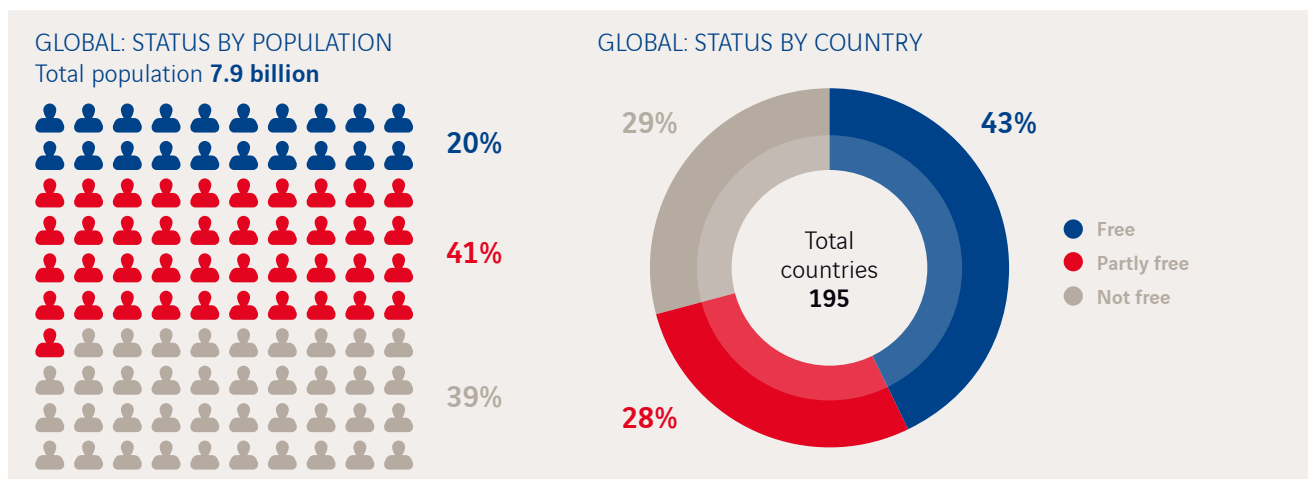
Figure 36. World regime type map, 2022



Source: Economist Intelligence Unit

The 2022 snapshot provides a somewhat expected picture. The West, including its global allies like Japan and Korea, Australia and New Zealand, is convincingly more democratic than most other regions, although Latin America and regions surrounding the Indian Ocean also house a few democracies. With democratic setbacks during the past decades, countries such as **Turkey** and **Russia** are now firmly in the hybrid and authoritarian regime categories respectively, and **China** remains one of the most autocratic states according to the EDI. Likewise, **Africa has very few democratic countries**, with the southern tip being the exception to the norm of hybrid and autocratic regimes. This is significant because, as we will see later, China has strategies in place meant to prop up autocracies elsewhere in the world, especially in Africa.

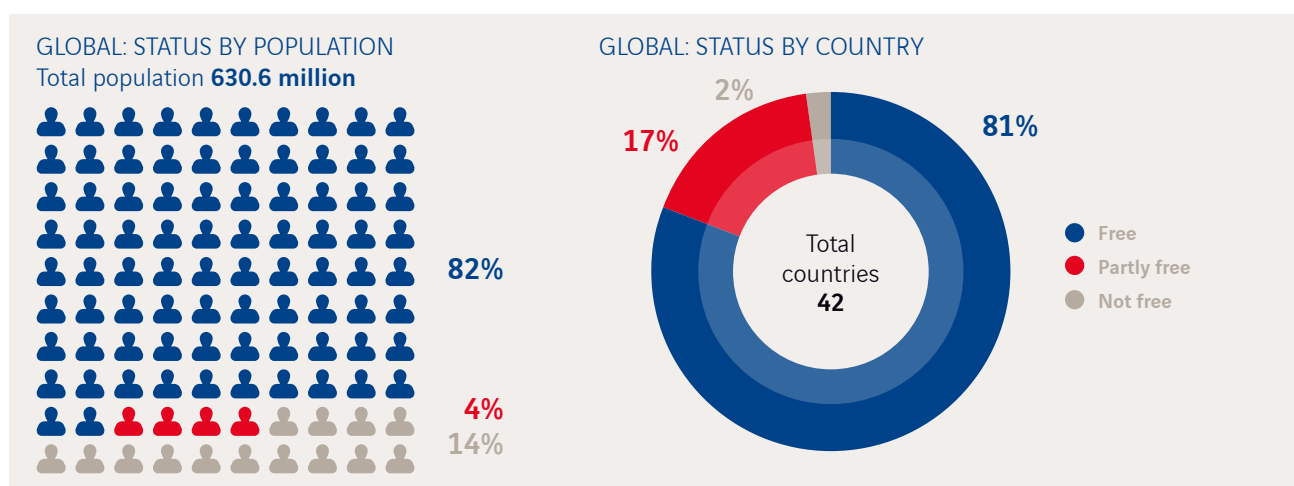
Figure 37. Freedom status by population and countries, 2022



Source: Freedom House, 2022

Going by population, **most of the world lives in undemocratic countries**, owing to China and India’s very large population in the not free and partly free categories, respectively. The population living in a free country is only 20%, despite fielding countries as populated as the USA, Japan or Brazil. The population in most democratic countries does not reach a hundred million people which, combined with the outliers of China and India, means that when analysed by country, **the share of freedom in the world increases to 43%**. There are a multitude of small, democratic countries which inflate the share. We will zoom into two regions, Europe and Africa, which serve as near polar opposites as regards democratic status.

Figure 38. Freedom status in Europe, by population and countries, 2022



Source: Freedom House, 2022

Europe is one of the most democratic regions, with very few undemocratic exceptions. The considerable minority of the population living in not free countries is due to the demographic weight of Russia, a country which has suffered a very noticeable authoritarian veer in the last 20 years under Vladimir Putin. Countries with longstanding issues in democratic rights account for the share of partly free countries, in which we can find **Western Balkan** countries such as Serbia, Bosnia and Herzegovina and Albania. All of these nations are on the path towards accession to the European Union, which has strict democratic requirements in order to eventually become a member state. Finally, **Ukraine, Moldova and Georgia**, all of which applied for EU candidate status in 2022 after the outbreak of the Russian invasion, experience difficulties in improving democratic governance, especially eradicating corruption, and are also listed as partly free countries.

The **rise of right-wing populist parties** in Europe is worrisome for democracy as they can be dangerous for a number of reasons. They typically reject the legitimacy of liberal institutions which characterise European democracies and display a toxic rhetoric against migrants, sexual minorities and globalisation (and later climate change and vaccine science)⁹⁶. They pin most grievances on an antagonistic elite against the will of the people. While not directly authoritarian, their particular vision of democracy is illiberal and anti-pluralist, which facilitates democratic backsliding⁹⁷. The high presence of populist parties has been a reality since 2015, and the movement has enjoyed moments of triumph as well as suffered setbacks, but as time goes on they seem to have become a permanent part of European politics⁹⁸. More recently, far-right anti-establishment parties have made inroads and **have become crucial** in the political systems of **Italy, Sweden, Poland, Finland**, and others. The EU’s most extreme case of populism is **Hungary**, which stands out as the only member state categorised as partly free, due to worrying regressions in the rule of law, freedom of the press and other fundamental rights under the presidency of Viktor Orbán. The EU’s opened procedures against Hungary on issues such as the rule of law, corruption and freedom of the press seem to be

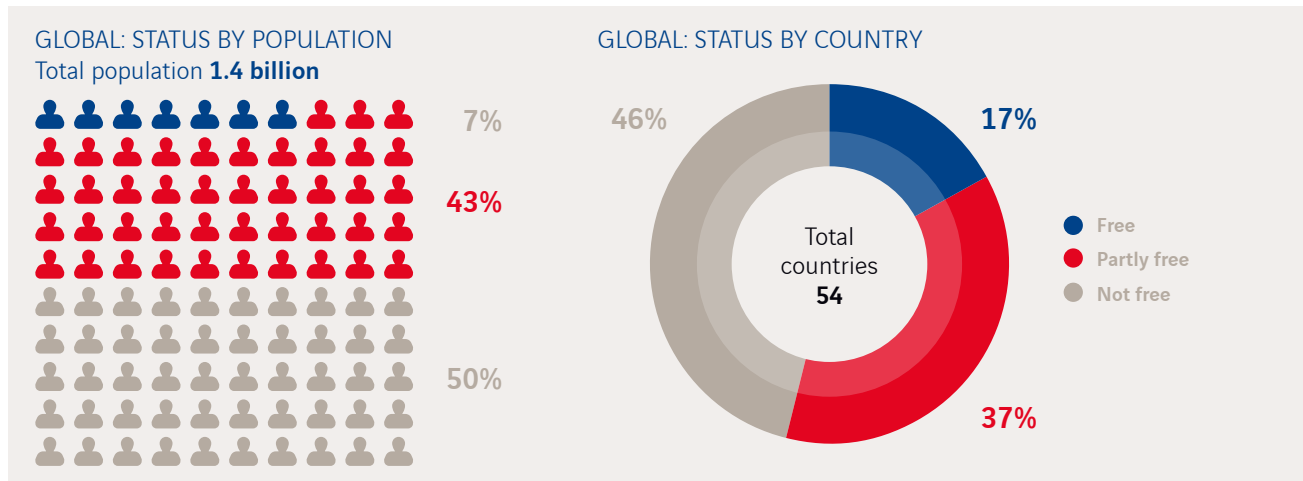
96 Lazar, “European Populism, From Left to Right”; Charlemagne, “At Last, Populism in Europe Is Losing Its Mojo.”

97 Balfour, “The (Resistable) Rise of Populism in Europe and Its Impact on European and International Cooperation.”

98 Rachman, “Democracy in Europe Adjusts to the Far Right.”

doing little to mitigate Hungary’s increasing authoritarianism. In the rest of the bloc, most countries have remained relatively stable as democratic freedoms are concerned, with light but worrying decreases after the Covid-19 pandemic that have still not been fully restored to a pre-pandemic setting.

Figure 39. Freedom status in Africa, by population and country, 2022

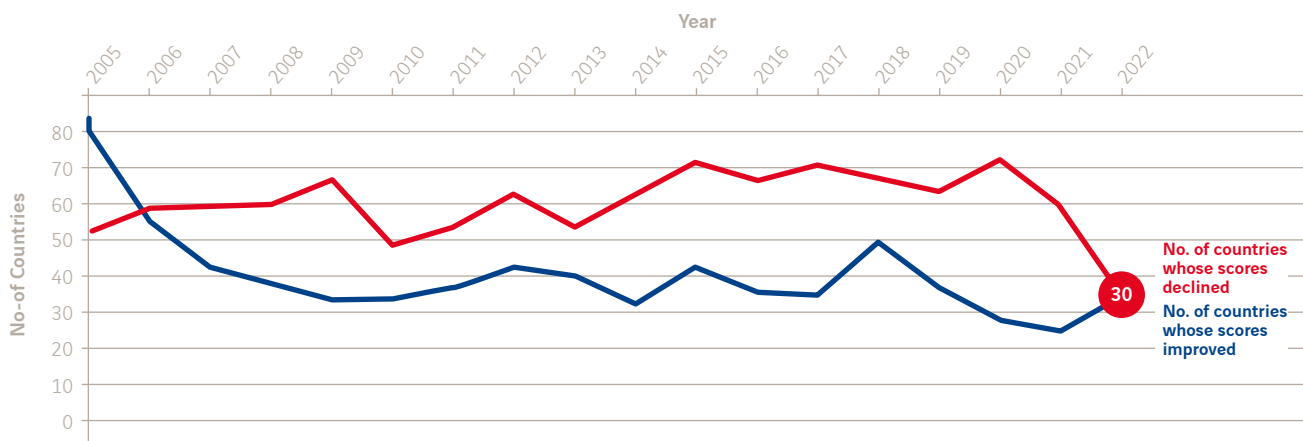


Source: Freedom House, 2022

On the other hand, **Africa is among the least democratic continents in the world.** As previously mentioned, the austral tip houses the few democracies in the region, with the rest being either partly free or not free at all. However, a few countries, mostly along the eastern seaboard, have improved in a few indicators, with Kenya and Zambia improving the most year on year. This is offset by **military coups and instability in the Sahel region**, where countries like Burkina Faso, Mali and Guinea have seen their score worsened by four points compared to 2021.

The situation in the Sahel has considerably worsened during 2023, with **coups in Niger** and further instability in Mali and Burkina Faso as well as other neighbouring countries. It is important to highlight the role of **Russian private military companies** contributing to destabilise already weak democratic structures in these countries, together with extremist and jihadist groups active in the area. Regrettably, it is more than likely that FH’s scores for most countries in the Sahel will lose several points in their next review of the state of freedom in the world.

Figure 40. Number of countries with improvements and decline in FH score, 2022



Source: Freedom House, 2022

This is an interesting graph that allows to observe the global decline manifested in Figure 1. For the better part of two decades, the number of countries whose scores in the FH declined was higher than those whose score improved. This started to change in 2021, and in 2022 countries with improving and declining score almost equalled, something which has not taken place since 2006. Little solace can be found in this fact, however, since most improvements can be attributed to an easing of restrictions after the worst of the Covid-19 pandemic subsided and the world returned to business as usual. Therefore, it is hard to ascertain whether we are witnessing the last vestiges of the pandemic or a genuine structural change where more countries are democratising after the brunt of the populist wave in various countries such as the USA or Brazil is subsiding. Certainly, the ousting of president Bolsonaro in Brazil and of Duterte in the Philippines have contributed to the number of countries improving, so more time is required to make sure the two phenomena are not being conflated.

Be that as it may, **the world has taken an undemocratic turn** in the past years and the tendency is decidedly more authoritarian. This takes place in various forms, one of which is the global infrastructure strategies that spearhead this clash between democracies and autocracies in the economic arena. Major powers around the globe, democratic and authoritarian, have such initiatives in place not only to gain an economic and investment foothold in foreign countries, but also to export and promote their mode of governance abroad.

Democracies and autocracies at play: global infrastructure strategies

If one believes there is indeed a clash between autocracies and democracies, then global infrastructure projects is one of the main fronts in which the rivalry is played out. The most famous strategy is China's Belt and Road Initiative (BRI), launched in 2013. It was initially designed to develop connectivity and infrastructure between East Asia and Europe, but it has enlarged its scope to include countries in Africa, Oceania and Latin America, with beneficial consequences for China's economic and political influence beyond its immediate neighbouring regions.¹⁹

While the project's proponents view it as a means to enhance connectivity and development, critics perceive it as a "potentially **unsettling extension of China's rising power**".²⁰ Given that costs of many of the projects have surged, some countries have started to **express opposition to the initiative**. China's motivations behind the Belt and Road Initiative are driven by both geopolitical and economic interests, in tandem with Xi Jinping's promotion of a more proactive, assertive China.

Figure 41.
BRI presence in Eurasia and Africa



Source: The Economist

Facing this ambitious bet on infrastructure and investment abroad, alarm bells rang in the West and now both the EU and the USA have their **own alternative global infrastructure strategies**. In 2018, the US launched its Build Back Better World Initiative (later **Partnership for Global Infrastructure and Investment**), while the EU developed its **Global Gateway** (GG) in 2021. The PGII is an initiative thought for the G7 and is meant to leverage around \$600bn. By comparison, about \$124bn were pledged by China between 2013 and 2017, but the current value mobilised is hard to estimate due to a lack of transparency around how the BRI is financed⁹⁹. The EU's Global Gateway, for its part, is looking to raise up to €300bn in investments. It is important to highlight a major difference between the BRI and its counterparts: both the PGII and GG expect a **big role for the private sector** in these investments¹⁰⁰. G7 and EU governments cannot compete with China's public sector investment, but at the same time cannot guarantee how money will be raised by companies or that the investments will be put towards sustainable projects, as is currently envisaged¹⁰¹.

Table 1. Overview of Belt and Road Initiative, Partnership for Global Infrastructure and Investment and Global Gateway

	BRI	PGII	GG
Year announced	2013	2021	2021
Initiating actor	China	USA	EU
Number of donor countries	1	7 + EU	27 (EU)
Amount announced (US \$bn)	Unknown (c. 127 in 2017)	600	~300
Policy priorities	Policy coordination, facility connectivity, unimpeded trade, financial integration, people-to-people bonds	Climate emergency, digital infrastructure, gender equality and equity, health and health security	Climate and energy, digital sector, transport, health, education and research
Financing institutions	Development banks, commercial banks, policy insurance institutions, equity funds, multilateral organisations	Development banks, commercial banks, policy insurance institutions, multilateral organisations, private companies	European financial and development finance institutions, private companies, European Fund for Sustainable Development
Financing tools	Loans, equity, grants	Loans, equity, grants	Budget support, guarantees and blending, trust funds
Status	Implementing	Early-stage implementation	Early-stage implementation

Source: Boston University Global Development Policy Center and European Commission

These initiatives are timely, as the BRI is **experiencing problems** and some projects have started to go south. Some recipients were affected by **bad loans** and had to be written off or renegotiated, as in the cases of Sri Lanka and Zambia¹⁰². Disillusionment in the whole initiative has grown, especially in Europe and the Middle East, and in some cases, **exiting the project altogether** has been on the table¹⁰³.

Developing countries have also accused China of politicising its investments, linking financing to security issues¹⁰⁴. Western alternatives are not exempt from linking their financing to other purposes, however, and recipient nations dislike Western

99 Yu and Jon, "What Is China's Belt and Road Initiative (BRI)?"

100 McBride, Berman, and Chatzky, "China's Massive Belt and Road Initiative."

101 Losos and Fetter, "Building Bridges? PGII versus BRI."

102 Beattie, "How the US and Europe Can Beat China's Belt and Road."

103 Yang and Kazmin, "Italy to Hold Talks with China about Exiting Belt and Road Initiative."

104 Beattie, "How the US and Europe Can Beat China's Belt and Road."

lecturing as much as China's security issue linking¹⁰⁵. Much assistance from the USA and especially the EU is linked to improvement in areas such as human rights, democratic quality and governance, which are very irritating and uncomfortable issues in many authoritarian states. Thus, the BRI still serves as a way to access financing without giving up political power in these areas; indeed, despite disenchantment elsewhere, the BRI still enjoys popularity and a positive image in Central Asian dictatorships and African countries¹⁰⁶. As such, the BRI can be interpreted as a way through which **authoritarian countries shore each other up** and protect themselves from democratic requirements from the West.

Still, China's bad loans are a worrying sign that the endeavour might not be sustainable in the long term, as many countries display a **high level of economic risk**¹⁰⁷. In light of this, Europe, America and their allies would benefit from **depoliticising their own financing channels**, especially in the context of a race for access to critical materials which is currently decidedly favouring China. This is not without cost, however: depoliticising infrastructure channels has a serious trade-off where the West would **lose soft power and its prestigious position as norm exporter**. This could possibly tilt the balance of the democracy/autocracy clash clearly in favour of the latter.

Democracies and autocracies at play: the US and China

The confrontation and opposing world views between democracies and autocracies have ramifications and impacts on livelihoods globally. Abridging this dynamic to its top two proponents, the US and China, trade is one of the arenas where this clash is most felt, with the imposition of tariffs and other barriers in specific sectors. That being said, alarmism is not warranted, as there are many signs pointing away from a complete and irreversible rupture. Due to the **high degree of interdependence** and complexity which characterises today's global economy, the complete stop of trade flows is but a very distant possibility. In fact, **trade in goods between the US and China reached an all-time high** in 2022, meaning that the **trading relationship is too important** for either of them to relinquish it, because the consequences suffered would far outweigh the benefits. In a hypothetical scenario where the West would impose sanctions on China of a similar severity to those imposed on Russia after its invasion of Ukraine, the consequences of the following economic fallout would be significantly negative and far-reaching. Prior to the war, Russia was a trading partner of relative importance to the EU and the USA to a lesser extent, but the damage done by the sanctions were felt domestically nonetheless. To impose similar restrictions on a crucial – and often top of the list – trading partner such as China would bring about inflation and supply shortages almost immediately. China is a major supplier of a wide range of goods, including consumer goods, intermediate components, electronics, clothing and industrial products. The trading relationship between the West and China has been constantly growing since relations were normalised, and since China's accession to the WTO, trade has boomed into current levels. With the exception of short dips in the context of the 2008 global financial crisis and the Trump administration barriers, trade with China has ballooned and almost quintupled since 2000. Crucially, the trade balance sheet is negative for the US, who imports Chinese goods and services with increasing dependence.

This goes to show how difficult it is to fully decouple from a top trading partner. Even with a highly stringent and broad battery of trading restrictions, the **value of EU imports from Russia rose** despite the overall decline in its share of international EU trade. It is important to highlight the idea that trade with Russia did not disappear overnight once sanctions were put in place. Trade with **intermediaries** which have allowed Russia to circumvent sanctions has grown in parallel, effectively cancelling out the decline in direct trade with Russia. Countries like Turkey, Kazakhstan, the UAE and the Caucasus states are thought to have facilitated continued trade between the EU and Russia despite the restrictive measures¹⁰⁹. For instance, trade between

105 Kyngé, "China Hit by Surge in Belt and Road Bad Loans."

106 García Herrero and Schindowski, "Global Trends in Countries' Perceptions of the Belt and Road Initiative."

107 Kyngé, "China Hit by Surge in Belt and Road Bad Loans."

108 United States Trade Representative, "The People's Republic of China."

109 Chupilkina, Javorcik, and Plekhanov, "The Eurasian Roundabout."

Germany and Kazakhstan increased by 38% in 2022 compared to the previous year¹¹⁰. However, cracking down on these alternative routes is already on the EU's agenda, in order to increase the effectiveness of sanctions.

Despite all this, some motivations to raise tariffs and investment screenings remain, mostly because some industries are particularly sensitive to countries or because there are some national security concerns, whether credible or not. As we will see in Chapter 4, the US, China, the EU, as well as other economies have **imposed tariffs, import restrictions and investment screenings** on imports that are sensitive to some crucial sectors, such as electric vehicles, solar panels, and so on. Instead of a high degree of global economic fragmentation, we can expect to see these surgical barriers to trade that affect significant, but not comprehensive sectors of the economy, in a way that resembles a 'small garden' with a 'tall fence'¹¹¹. Resorting to these protectionist practices and justifying them on security and autonomy grounds could become more likely in the future, and will further contribute to the **eroding of the neoliberal model of globalisation** that has shaped the global economy over the past decades. As for the argument that higher degree of economic interdependence will make wars disappear and the endless debate thereon, additional evidence has now been put forward against it¹¹².

'We can expect to see these surgical barriers to trade that affect significant, but not comprehensive sectors of the economy, in a way that resembles a 'small garden' with a 'tall fence'.'

Democracy moving forward

The global leadership enjoyed by Western liberal democracies in the past decades is losing its hegemony for a multitude of reasons. Whether autocracies as a bloc are going to represent an alternative mode of governance and global cooperation is still up for debate, but it is clear that **the West has been losing capacity to exert power in a global setting**. The recent escalation of the conflict in Gaza can prove as an example. The latest events have taken place during the final stages of writing this report, and as such the outcomes, consequences and lessons are not yet clear.

On October 7th, the Palestinian political and military organization Hamas (designated as a terrorist group by the USA, the EU, and other western actors) launched an assault that caused the highest number of Israeli casualties, including civilians, since 1948 and took over 200 hostages¹¹³. Israeli authorities responded quickly, while the US and EU (initially at least) also reacted swiftly and showed unequivocal support for Israel's retaliation. The response to Hamas' hideous attack, however, has raised concerns about proportionality and its indiscriminate nature¹¹⁴—including the use of white phosphorus, the targeting of civilian infrastructure such as hospitals or even UN refugee agency buildings¹¹⁵. The conflict is set to escalate even more following Israel's ground assault on the Gaza strip. Several countries have called out against Israel's disproportionate response, as well as leading politicians, NGOs and the wider civil society in countries whose governments have officially backed Israel¹¹⁶.

The haphazard response by the **West** raises questions about its **credibility and effectiveness** on the global stage. This incident further exemplifies Western diplomatic challenges, its perceived **double standards**, and **decline in global leadership**. In parallel, while this could potentially benefit other international players, **Russia and China** haven't been capable to capitalize

110 Ualikhanova, "Kazakhstan, EU Seek to Strengthen Bilateral, Regional Ties."

111 Zhihang and Walsh, "US Shifts from 'decoupling' to 'Small Yard, High Fence' on China."

112 Copeland, "Economic Interdependence and War."

113 A. B. C. News, "Israel-Hamas Conflict."

114 "Commission of Inquiry Collecting Evidence of War Crimes Committed by All Sides in Israel and Occupied Palestinian Territories since 7 October 2023."

115 "Evidence of Israel's Unlawful Use of White Phosphorus in Southern Lebanon as Cross-Border Hostilities Escalate."

116 Simpson, "Belfast Rally in Support of Palestinians Hears Calls for Gaza Ceasefire"; BBC News, "Anti-War Protesters Interrupt Antony Blinken at US Senate Hearing."

on the crisis and have been **surprisingly absent**, as they themselves have multiple allegiances, in particular to Saudi Arabia, Iran and, to a lesser degree, Israel. The recent events in Gaza and Israel have not only led to significant human suffering but have also triggered a complex geopolitical response. The actions and positions of key international actors will likely have lasting implications for the region and the global stage at large. While outbursts of regional conflict are often mismanaged by leading global democracies, it is unclear whether autocracies are capable of always capitalizing on the West's mistakes, let alone fill the governance voids created. The future is uncertain for the status of democracy in the world. Even in its 'safe havens' of Europe and elsewhere, democracy is challenged by waves of populism and extremism that challenge the foundations of the social contract characterising liberal democratic nations. We saw that the world economy has put the Covid-19 pandemic well behind itself, but the same cannot be said for the democratic health as some restrictions remain in place, as shown by the democracy indices discussed above.

'As the world turns more autocratic, democracies face dilemmas that constantly question its principles.'

As the world turns more autocratic, democracies face dilemmas that constantly question its principles. Priorities are increasing in other areas, such as access to critical materials, climate change, economic development, and security. All of these issues require **cooperation with autocratic and repressive states**; the question is to what extent democratic countries should turn a blind eye to what their partners are doing. This is already being done to an extent. Western countries have been subject to harsh criticism for double standards, where for example they strongly condemn repression in China while they strike energy deals with absolutist Gulf monarchies.





Chapter 4:

The return of industrial policy

KEY TAKEAWAYS

- Free trade as the leading doctrine that has led globalisation over the past decades is over.
- The focus is now on reviving industrial policy, based on generously subsidising companies and consumers in key technological sectors and massive subsidies. The US, China and the EU are at the forefront of this new green industrial policy. However, China is leading the green tech market in most aspects.

A new era of economic policy

In recent times, we have been witnesses of events of a global scale that have changed many facets of the world as we know it. A crucial arena where this has also taken place, with consequences for geopolitics, is industrial policy and the overarching philosophy on state aid, where its orthodoxy has been **increasingly challenged** by the Coronavirus pandemic, the war in Ukraine and assistance sent to its defence, and the energy transition. Decades of deregulation, a non-practice rooted in the belief that trade and market forces would ensure prosperity and innovation, seem to be over, and has resulted in two winners: owners of large corporations who have segmented their value chains and offshored processes to make them cheaper, and **countries like China**, who has become the world's leading manufacturer and receiver of new technologies¹¹⁷. The losers, on the other hand, are the **West**, who risks **losing its economic and technological hegemony** to nascent leaders in Asia, and blue-collar workers in the West, who have lost their jobs as industrial centres moved offshore at the same time that the welfare state was under heavy stress¹¹⁸.

'Decades of deregulation, a non-practice rooted in the belief that trade and market forces would ensure prosperity and innovation, seem to be over.'

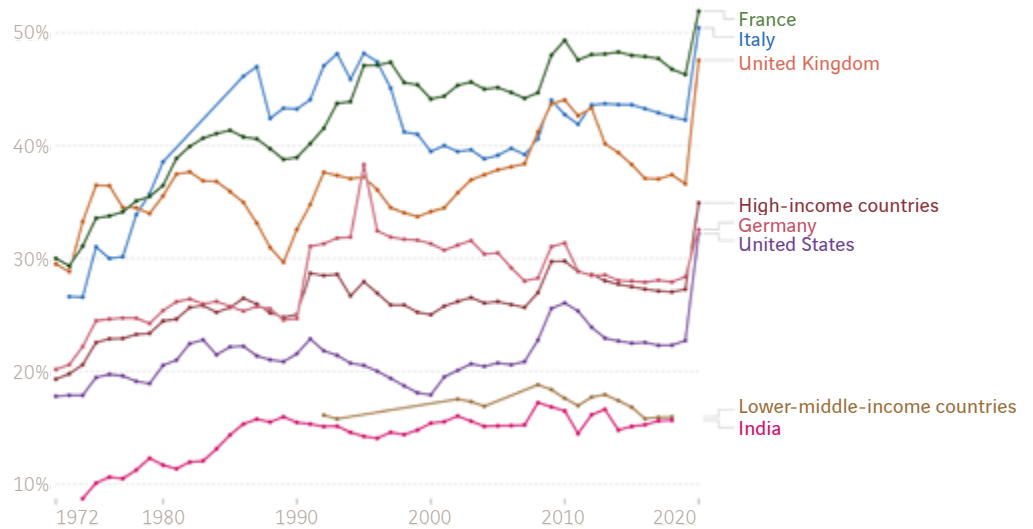
The conversation has now shifted towards considering discretionary **public support for key industrial sectors** and national champions¹¹⁹. The energy transition has been an especially significant catalyst in ushering a new, still nascent, perspective on state aid whereby states are no longer following the tenet of keeping state support to national industries to a minimum. This has taken the form of major policy initiatives and strategies meant to imbue the energy transition with the necessary momentum to **achieve climate goals** (e.g., complete decarbonisation in 2050 in the EU). At the same time, these strategies pursue a second objective, to maintain – or achieve – leadership in crucial industrial and commercial sectors. Countries are preparing to remain competitive while major structural changes to meet climate and energy goals are taking place under the hood.

¹¹⁷ Sevilla, "Occidente reacciona, aunque tarde."

¹¹⁸ Ibid.

¹¹⁹ Hafied and Ortega, "The Great Return of Vertical Industrial Policy."

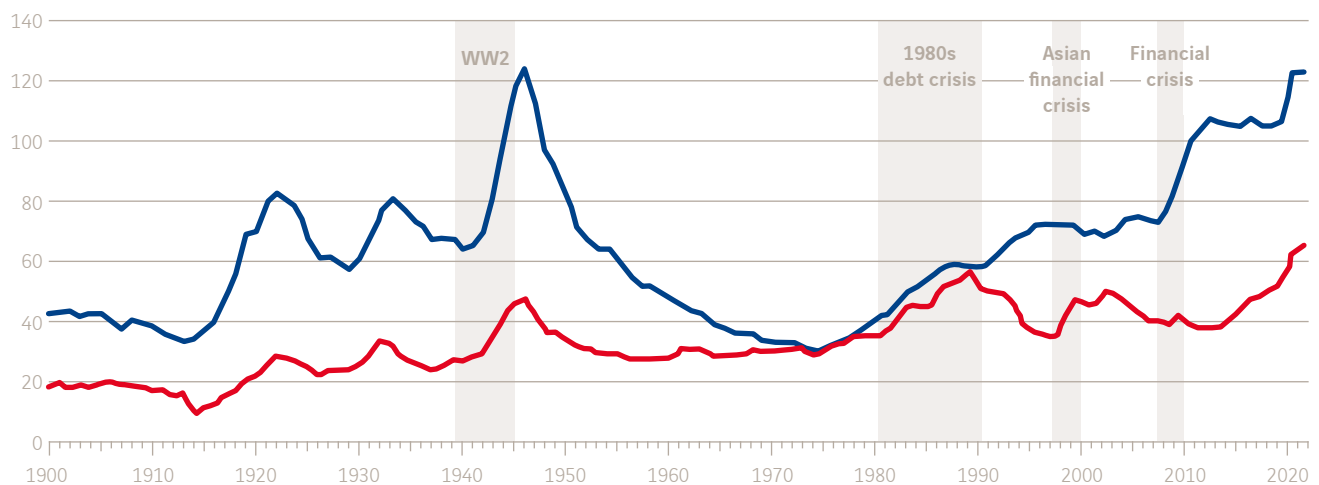
Figure 43.
Central government expenditure
as share of GDP, 1995-2020



Source: OurWorldInData based on World Bank

The change in industrial strategy will be appreciated in data by analysing indicators such as government expenditure. However, the change is not only ongoing but also tremendously recent, meaning that available data sources have not yet picked up on the expenditure hikes that were pledged for 2022 and beyond. Still, the information we do have allows us to see the unprecedented impact of the pandemic, the precursor in public expenditure. Scrambling to save businesses and livelihoods, governments suddenly increased public expenditure enormously in order to survive the necessary lockdowns. In Europe, this phenomenon was combined with the Russian invasion of Ukraine, which also broke taboos overnight: high energy prices derived from the sudden shift away from Russian gas, as well as military and humanitarian support for Ukraine, called for the **loosening of some state aid rules** in a region that historically had championed strict non-interference¹²⁰. In short, while the data above only reflects the effects of the pandemic, several shocks facilitated the turn towards a new industrial policy that is picking up steam in Europe, North America and Asia.

Figure 41. Median debt-to-GDP ratio



Source: Source: Financial Times

120 "State Aid Temporary Framework."

Of course, massive increases in government spending, on top of very expensive welfare states in some countries, may have adverse consequences. The covid pandemic required such large governmental efforts to keep the worst of its economic impact at bay that global debt is now nearing the levels observed during World War II. While this may have long-term impacts for growth¹²¹, it has not put off governments from upping its subsidies, tax breaks and other incentives in order to either stay ahead in the energy transition, or to catch up to the leaders. After all, the argument in favour of massive subsidies and other incentives becomes more convincing when remembering its ultimate objective, which is to avoid the worst of the climate emergency by shifting to a green economy as fast as possible. However, these grand strategies have their consequences, both positive and negative.

New industrial policies: USA, EU and China

The Inflation Reduction Act

The initiative that kickstarted the discussion on the **return of state-sponsored industrial policy** is the USA's Inflation Reduction Act (IRA). It takes the form of a legislative package that introduces healthcare savings, new revenue sources and, interestingly for this topic, massive green subsidies¹²². The legislation has an explicit GHG emissions reduction goal between 31 and 44% by 2030 compared to 2005 levels¹²³. In the climate branch of the package, the IRA focuses on three areas. Firstly, it provides subsidies in the form of consumer tax credits for purchases of electric vehicles (EV), up to \$7500 per purchase¹²⁴. This includes companies who use EVs in their business fleets, such as car leasing and renting companies. A very crucial asterisk in this policy is that the tax incentive is applied only to those vehicles whose final assembly took place in the US or third countries with a free trade agreement with the US. This requirement is also specifically targeted at the assembly of the EV's battery. As we will see, the domestic production requirement is a significant aspect of this policy, and has dangerous consequences for third countries, both friend and foe.

Secondly, the IRA targets **clean technology development**. It provides **subsidies for cleantech manufacturers** and critical raw material suppliers, to be used in batteries and components in the generation of **renewable energy, EV batteries, energy storage**, etc. Providers of such technologies and materials are eligible for up to 10% of the production cost. Cleantech manufacturers are eligible for further incentives if they invest in clean energy technologies that belong to a "qualifying advanced energy project" program, with 30% investment tax credits available in areas such as solar energy, optic fiber, fuel cells, microturbines and wind energy, energy storage or waste recovery¹²⁵. There are further incentives for investments in historically polluting industries or deprived communities, as well as for projects that aim to reduce emissions from heavily polluting sectors.

Finally, it has also earmarked over \$200bn for carbon-neutral electricity production alongside carbon capture, usage and storage (CCUS) technology, which includes energy generation using natural gas or hydrogen¹²⁶.

The IRA emerged from a need to shorten the distance between the US' green energy sector and its global competitors, while at the same time to reinvigorate manufacturing and industry within the country. The EU and China had developed a clear advantage in this respect, as both actors prioritised the deployment of renewable energies and cleantech innovation. China, however, stands out as the undisputed leader in this sector, as well as in renewable energy production, EV manufacturing and control over processing of critical materials, providing the IRA with as much geopolitical as economic significance. **A lost decade** of sorts explains China's head start, who now boasts a well-established domestic EV market and is starting to threaten the

121 Armstrong, "Covid Relief Drives Debt Close to Second World War Levels."

122 Villoslada Camps and Saz-Carranza, "The EU Response to the US Inflation Reduction Act."

123 Compare this to the EU's 55% emission reduction goal by 2030. However, the US' baseline comparison is 2005 when its emissions were higher than in 1990, but the difference in percentage does not suffice to make it a more ambitious climate goal than the EU's.

124 Villoslada Camps and Saz-Carranza, "The EU Response to the US Inflation Reduction Act."

125 Ibid.

126 Ibid.

market shares of European, Japanese and American makers with more affordable alternatives¹²⁷. China likewise has the largest global share in solar panels and turbines¹²⁸.

The consequences of the IRA remain largely unknown, but **many abroad are worried**. Since many of the fiscal incentives encourage businesses to produce and/or assemble products on US mainland, many fear that this will cause an exodus of companies and entire industries from Europe across the Atlantic¹²⁹. An added benefit is that energy costs and taxes would both be lower there, too. The strategy's generous subsidies has sparked a global subsidy race that could eventually become trade-distorting and counterproductive due to the sheer amount of public financing being poured into countries' new industrial policies. Massive investments have now been announced in the EU and other advanced economies such as Japan and South Korea¹³⁰.

Despite the alarmism about the IRA's entry being a game changer, not everyone is convinced about this claim. Indeed, some would have wanted to see an even grander strategy like a so-called "the big green state", which would involve larger structural changes instead of indirect incentives like subsidies and tax breaks¹³¹. For all the headlines that affirm that neoliberalism has given way to state-led vertical industrial policy¹³², critics still claim that this is the neoliberal response to de-risk the American economy from China. Still, the IRA is seen – domestically at least – as a step in the right direction by most, not least because it also displays the **US' first serious attempt at introducing measures against climate change**¹³³, even if with just indirect incentives for the time being.

A more relevant criticism for geopolitics is that the **IRA might fragment the Western nations** at a time where unity is crucially needed on the global scene¹³⁴. With the IRA luring crucial European industry players away from their home base, the legislation could instead produce an undesired effect of driving Europe closer to China and fragmenting the Western response to related challenges that may arise. Transatlantic relations are already quite touchy in some respects, such as trade, and while the war in Ukraine prompted an unexpectedly united response, the tandem might not last forever if what's left of European industry flocks to North America. The EU has already signalled that it wants a different trading relation with China, characterised by the concept of *de-risking* and diversifying instead of fully decoupling away¹³⁵. At the same time, the EU has also recognised the necessity of doling out subsidies of its own.

The EU counterpart

While the race towards renewable energy production has been on the EU's side, the European market's fragmentation, high energy prices, and of course the IRA have proved worrisome for European policymakers. Leaders agreed that a response to the Americans was warranted, but not on what it should look like. Despite high interest heterogeneity among member states, a European response was hashed out and launched under the name of Green Deal Industrial Plan (GDIP), which builds on previous EU legislation, not least the European Green Deal.

The GDIP revolves around four main pillars: a predictable and **simplified regulatory environment**, faster **access to funding, enhanced skills**, and open trade for **resilient supply chains**. Flanking legislation has been passed in order to achieve this objective, such as the Net Zero Industry Act (NZIA) for the regulatory framework pillar. The NZIA is an industrial policy that also promotes the manufacture of cleantech in the EU by listing net-zero technologies as strategic which, much like the IRA,

127 Li et al., "The Chinese Carmakers Planning to Shake up the European Market."

128 Villoslada Camps and Saz-Carranza, "The EU Response to the US Inflation Reduction Act."

129 Inagaki, Chazan, and Fleming, "A Global Subsidy War?"

130 Ibid.

131 Tooze, "The IRA (& the Fed) Debate - Bringing Hegemony Back In."

132 Hafied and Ortega, "The Great Return of Vertical Industrial Policy."

133 Villoslada Camps and Saz-Carranza, "The EU Response to the US Inflation Reduction Act."

134 Inagaki, Chazan, and Fleming, "A Global Subsidy War?"

135 O'Carroll, "EU Softens China Strategy by Adopting 'de-Risking' Approach."

includes **photovoltaic solar, offshore and onshore wind, batteries and storage, heat pumps, CCUS**, etc¹³⁶. Secondly, it sets a target of at least 40% of the EU's needs in these technologies to be manufactured in the EU itself, by 2030. The NZIA also contemplates a thin governance system where member states identify 'Net-Zero Strategic Projects', which should contribute to emissions reduction, competitiveness and supply security, with very little oversight from the Commission¹³⁷. This is the leg of the policy that attempts to support early-stage technologies that could be commercialised in the near future. Finally, the NZIA provides a series of policy instruments meant to support these projects, such as accelerated permitting processes, private funding coordination, public subsidies (limited to national initiatives only), and public procurement and auctions.

The NZIA has been under fire of heavy criticism for **falling short on its objectives**. It has an overall top-down, prescriptive approach that is noticeable in how the priority technologies were selected and that may end up in policymakers backing the wrong technology for the problem at hand, or in generating unnecessary costs. For instance, it has received criticism for not backing nuclear energy as net-zero while recognising its potential as such in the text, or for not having selected technologies that are still obscure today but that may contribute to the EU's net-zero solution by 2050. Instead, a technology neutral approach might have been more sensible in order to avoid these unintended negative consequences¹³⁸. Another major concern involves the 40% domestic production requirement because it ignores the costs of self-sufficiency vis-à-vis cheaper imports, in the case of some technologies. Therefore, the self-sufficiency benchmark could potentially clash with emissions reduction objectives and slow down decarbonisation in the continent. Additionally, the fact that the 40% mark is a blanket objective across all technologies suggests that the particularities of each (costs, deployment, stage of development, etc.) have not been accounted for¹³⁹. Other criticisms towards the NZIA include the fact that fast-track permitting is not a priority for NZIA technologies, when instead skills and access to funding tend to be the main hurdles for the manufacturing industry; or that the governance overlooking all these initiatives is very light at the European level, and most decisions are made at member state level with very little accountability.

The second pillar of the GDIP which involves faster access to funding involves **loosening state aid**, much defended by heavyweights Germany and France and taking a page out of the IRA playbook. The extra funding would come from existing pools of cash, but it also envisages repurposing other funds in order to find additional financing lines. State aid would be facilitated to all renewable technologies, including renewable hydrogen and storage solutions, and its ceiling would also be lifted in order to stimulate investment in crucial areas such as hydrogen, energy efficiency and the electrification of polluting sectors¹⁴⁰. On enhancing skills, which aims to better prepare the labour market and human capital for the needs of a net-zero economy, the Commission has proposed "net-zero academies" to up- and re-skill professionals in strategic industries. Finally, the fourth pillar focuses on maintaining the EU's philosophy and reliance on open global trade but also to make them contribute more towards its green transition. In this sense, the situation around critical raw materials outlined in Chapter 2 takes centre stage, as the EU seeks to diversify and improve existing trade relations with friendly trading partners in this particular sector. This is important in the context of de-risking its reliance on China, so **partnering up** with actors such as Chile, Mexico, Mercosur, India, and others is important for the EU to realise its net-zero transformation¹⁴¹.

The transatlantic relation after the IRA and the European reaction is complex, as both partners have manifested a resolute commitment to tackling climate change while the trading relation is not as harmonious. Indeed, luring away industry heavyweights from a partner's economy with generous fiscal incentives will usually be seen as distasteful by the affected. Still, both remain top trading partners and in the context of the war in Ukraine, transatlantic unity has seldom been more visible. Both economies want to reduce their vulnerabilities in their supply chain and to become energetically self-sufficient. The end result is a **similar policy on either side of the Atlantic**, with per-vehicle EV subsidies, incentives for cleantech manufacturing and renewable energy production.

136 Tagliapietra, Veugelers, and Zettelmeyer, "Rebooting the European Union's Net Zero Industry Act."

137 Ibid.

138 Ibid.

139 Ibid.

140 Villoslada Camps and Saz-Carranza, "The EU Response to the US Inflation Reduction Act."

141 Ibid.

Table 2. Subsidy size, IRA and GDIP

Subsidies	IRA	GDIP
Consumer tax credit	\$7500/EV	€6000/EV
Cleantech production	\$37bn	€35bn
Renewable energy production	\$250bn	€806bn

Source: Villoslada Camps & Saz-Carranza, 2023

In the process of writing these strategies into legislation, the EU and the USA have accelerated a transition from the neoliberal model of economic era towards a top-down, state-led industrial policy with protectionist tints.

China's Made in China 2025

A loose counterpart to the new American and European industrial policies can be found in China since 2015. However, it emerged from a wholly different need, philosophy, and context. While the IRA and the GDIP have as an ultimate goal to curb GHG emissions and tackle climate change, Made in China 2025 (MIC2025) is a strategy that aims to upgrade China from a "world factory" status to an innovative economy led by high-tech sectors¹⁴².

To be precise, it aims to **rapidly develop ten crucial high-tech industries** such as electric vehicles, next-generation IT, advanced robotics, artificial intelligence, aerospace engineering, or agricultural technology. By making these critical sectors grow, Beijing aims to **reduce dependence on foreign technology** (much like the West is attempting to de-risk and diversify to reduce dependence on China) and instead promote Chinese technology¹⁴³. Over the past few decades, the CCP has implemented measures to steer the economy away from resource extraction and low-value, low-wage manufacturing, primarily focused on mining, energy, clothing, and footwear, which collectively constitute nearly half of the nation's economy. Its aim is to transform it into a high-tech, high-productivity economy. China 2025 was designed to facilitate this challenging shift and overcome the "middle-income trap," a phase in which growth stagnates due to increasing wages, a challenge faced by numerous other developing countries¹⁴⁴. By 2025, China aims to have 70% independence in high-tech industries and is set on having a dominant position on global markets by mid-century.

This objective is seen as pernicious and threatening by foreign countries as it uses generous government subsidies to mobilise state-owned companies to obtain intellectual property (IP) to catch up to and surpass Western competitors. This is part of China's multifaceted approach that **combines transparent objectives with more illicit methods**, such as compulsory transfers of IP, avoidance of accountability at the WTO, etc¹⁴⁵. Much like the western strategies covered above, MIC2025 set explicit targets and uses direct subsidies for strategic industries, e.g., state funding, low interest loans, tax breaks, etc. As with the BRI, exact numbers are hard to come by, but some analyses suggest the value is around the hundreds of billions of dollars, on par with the IRA and the GDIP¹⁴⁶. At the same time, China has encouraged companies to invest in foreign companies to obtain technology and know-how through acquisitions. Similarly, Beijing requires foreign companies who want to be active in China set up joint ventures with Chinese firms so that the transfer of knowledge and technology to their counterparts is facilitated. The main concerns around MIC2025 have revolved around China's potential to control most supply chains in strategic sectors,

142 Brastetter and Li, "Does 'Made in China 2025' Work for China? Evidence from Chinese Listed Firms," 3.

143 McBride and Chatzky, "Is 'Made in China 2025' a Threat to Global Trade?"

144 Ibid.

145 Ibid.

146 Ibid.

such as critical materials which are necessary for the energy transition. At the same time, MIC2025 has been under fire for stimulating trade-distorting practices due to their bloated subsidies which lead to overproduction and dumping in cheaper markets. However, the IRA was also found to be trade-distorting, while the GDIP refrained from mirroring these measures. For all the concern drawn by the MIC2025 strategy, however, some studies have found that although China's generous subsidies have found their way to companies, there is little evidence of an improvement in productivity, increased R&D expenditure, patenting, and profitability.

Future uncertainties

On the one hand, we see that beyond the distracting considerations of one country's strategy being better than another and the ensuing debates, main global actors are starting to take climate change more seriously and are attempting to enact large-scale changes to their economies which, in the case of China and the USA, contribute to most global GHG emissions. **The EU and China have a head start in renewable energy production and cleaner infrastructure** such as high-speed rail, but it is encouraging to see a typical laggard such as the US enacting structural policies that attempt to seriously reduce emissions and kickstart clean energy production on US soil, even if the end result might have been more timid than what is necessary.

'These grand strategies are yet another front in the context of great power economic confrontation and competition.'

On the other hand, these grand strategies are yet another front in the context of great power economic confrontation and competition. Even among allies, the IRA will have negative consequences for its partners in the EU by only offering subsidies products manufactured domestically and becoming an attractive relocation option for traditional leaders. That being said, some say the IRA lacks the teeth to become a transformative grand strategy. Meanwhile, the EU has pending homework, namely in smoothing out the regulatory framework, currently fragmented, and in reducing bureaucracy costs while processing requests for subsidies and other financial assistance instruments. Essentially, it should settle how to address state aid, and decide whether it likes it as an economic tool, breaking with decades of tight state aid regulation in the process. If it decides to embrace state aid, a Pandora's box is opened that puts proponents of national state aid against those who defend the supranational approach. It also has to practice what it preaches on open trade, as it currently has tariffs set up in industry sectors identified as necessary towards the energy transition (for instance, there is a 10% tariff for imported EVs in place). The Chinese strategy also has negative consequences for world trade with its distorting practices and tight grip over crucial supply chains necessary for a net-zero world.

Conclusion

This report has covered a multiplicity of trends that are affecting the world from business to geopolitics and many fields in between. The bird's eye view of global trends started with the demographic transition and the economic transformation that may follow, where a marked shift in demographic weight towards emerging economies is already taking place. China and India, the latter now being the world's most populated country, are leading this transition. But as these two economies consolidate and their median income increases, it is thought that their demographic growth will slowly grind to a halt, and thus we could see their populations peak at mid-century (see Figure 4). Instead, Africa will lead the brunt of the growth until the end of the century. As this happens, the populations of developed economies will foreseeably stagnate at best, if not decline. However, a major question mark remains in the impact of migration; since developed economies will need migrants to replace their aging population, demographic weight might hold despite lower fertility rates. Predicting the evolution of the global economy is even less certain, but we find that it may evolve according to a few dichotomies, with extreme and opposite scenarios in each. For instance, global trade might intensify and integrate fast-growing regions such as Africa into a global system, or to become fractured with tariff disputes and trade wars becoming more frequent. The biggest question mark is whether the world will converge or follow separate economic dynamics, and within this, whether the convergence will be in an upwards trend (i.e., truly global economic growth) or downwards, with economic fragmentation and low growth.

The next major challenge, and the one with most urgency to tackle, is climate change and the necessary energy transition. With all climate indicators worsening at an unprecedented rate, the energy transition is lagging behind and not as developed as it should be. Current policies are not enough for limiting climate change to 1.5°C and major investments into renewable energy sources are needed, given that energy ultimately accounts for 73% of total GHG emissions (see Figure 17). Fossil fuel sources need to be abandoned, and while our dependency on them is diminishing, fossil fuels remain the largest source. However, as they are phased away, countries depending on revenues from their fossil fuel assets need to adapt as the global energy markets transition to renewables, and those with the highest production costs will be the first ones to exit the oil and gas markets. The largest

challenge in this chapter, however, involves geopolitics and the energy value chain. The technicalities of renewables and fossil fuels differ at a fundamental level, and thus different materials are needed to develop the necessary infrastructure for the energy transition. The challenge resides in the fact that the materials – and more importantly, the capacity to process them – are found in different countries than fossil fuel producers, and at a much higher concentration. Crucially, China controls most of the upstream value chain in many critical materials and developed economies must perform a difficult balancing act between access to these crucial resources and reducing their dependence on the Chinese market.

Chapter 3 addressed the question of a potential 'clash' between democracies and autocracies. Evidence suggests the world is less democratic than a few years ago, with democratic quality and institutions receding even in regions where liberal democracies enjoyed health and vitality, such as Europe. In terms of population, most of the world lives in either partly free or non-free countries, highlighting that democracy is still somewhat of an anomaly. The answer to whether democracies and autocracies are pitted against each other is not clear cut, but competition can be found in certain areas, such as the global infrastructure projects. The best known of these is China's Belt and Road Initiative, which focuses on infrastructure developments in Central Asia, the Middle East and Africa, and critics affirm it serves as a way for China to shore up autocracies in these regions. A Western response came late, in 2018 – the BRI was launched in 2013 –, although the focus differed substantially from the BRI's. Both the US and EU strategies have a focus on private sector involvement and prioritised areas such as climate change, health and education or gender equality, suggesting that if not an outright clash, there is certainly a difference in the philosophy guiding these massive infrastructure and investment projects.

Lastly, Chapter 4 addressed a recent change in economic policy across the world, which is the increase in massive subsidies, grants and other incentives aimed at the industrial sector and new technologies related to the energy transition, such as electric vehicles, batteries, electric grids and infrastructure, etc. Beyond the welcome recognition of climate change as a threat and the understanding of these strategies as an initial

large-scale economic response, these grand strategies reflect the great power contestation visible in other areas. For one, despite being allies and like-minded partners, the US' Inflation Reduction Act has negative consequences for European industry due to its domestic production requirements, which were not unintended. Likewise, the EU is often seen as a champion of open and fair trade, but has steep tariffs for products related to the energy transition such as EVs, and China's Made in China 2025 strategy brings similar trade-distorting effects.

The world is changing rapidly and in many aspects. Not all of these changes will be positive, but neither totally negative. Instead, the most likely outcome is a complex middle ground where the end results are multicausal and dynamic, which makes the task of predicting the impacts all the more difficult. However, through this report we have attempted to make educated assumptions on the various challenges currently at play: the demographic and economic evolution of the world,

the energy transition, democracy, and industrial policy. In doing so, a company such as Vinci Energies, with involvement in sectors that have been demonstrated to be crucial for challenges studied here (e.g., energy transition), will be better prepared for and knowledgeable of what needs to be done, what might happen in the geopolitical arena, and how that might affect its activities and interests. The task of analysing and inferring does not end here; a constant appraisal of global trends and events must take place if stakeholders such as Vinci Energies are to overcome the challenges that lay ahead.



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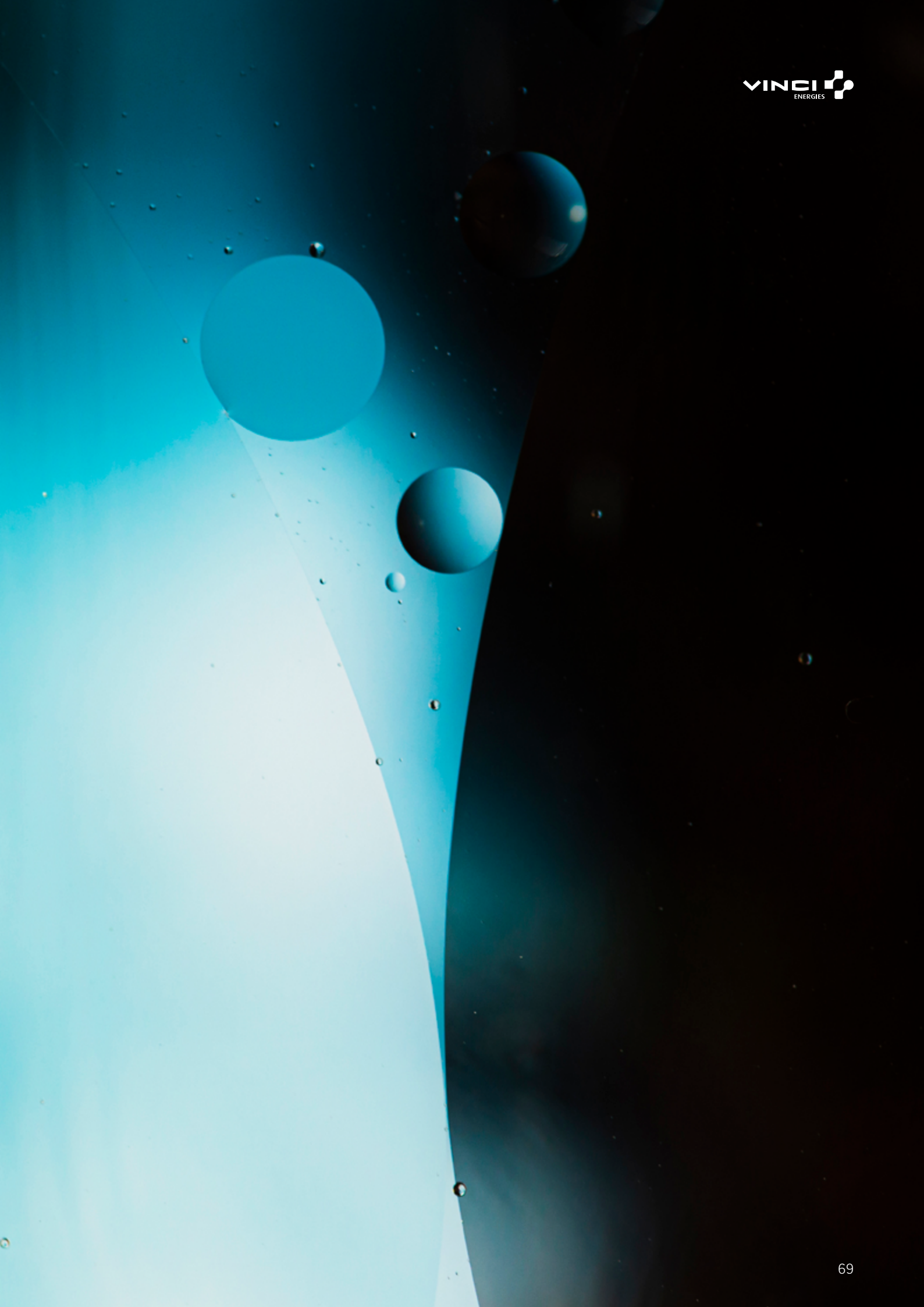
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