

Revise the Formula

# THE TRANSITION.

approach to Climate Change  
Mitigation and Adaptation



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**Sajjeed Aslam, Partner, SpectrEco**

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**C**limate change is an urgent and vastly underestimated risk that demands the immediate attention and coordinated efforts of governments, businesses, and investors. We've lived in complacency for too long, hoping that someone else will address this looming crisis. Over the past three decades, there have been commendable initiatives, such as voluntary actions, financial commitments, the transition to renewable energy, and advancements in sustainable construction materials and design. To truly comprehend the gravity of the situation, it's imperative to delve into the historical context, understanding the successes and failures on a global scale.



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# Historical Context

## Montreal Protocol, 1987

While the Montreal Protocol wasn't initially aimed at addressing climate change, it set a historic precedent for global environmental diplomacy. This accord required every nation to cease the production of ozone-depleting substances, such as chlorofluorocarbons (CFCs). Remarkably, it succeeded in eliminating nearly 99% of these harmful substances. In 2016, the Kigali Amendment extended its scope to include the reduction of hydrofluorocarbons (HFCs), potent greenhouse gases.

## COP (Conference of the Parties) by UNFCCC

COP meetings provide an annual platform for countries to discuss and negotiate strategies to combat climate change and assess progress under international agreements, including the Paris Agreement since 2016. In the lead-up to COP28 in Dubai, the United Nations has issued a stark warning: governments are falling short of their Paris Agreement commitments. They must adopt significantly more ambitious decarbonization plans.

## UN Framework Convention on Climate Change (UNFCCC), 1992

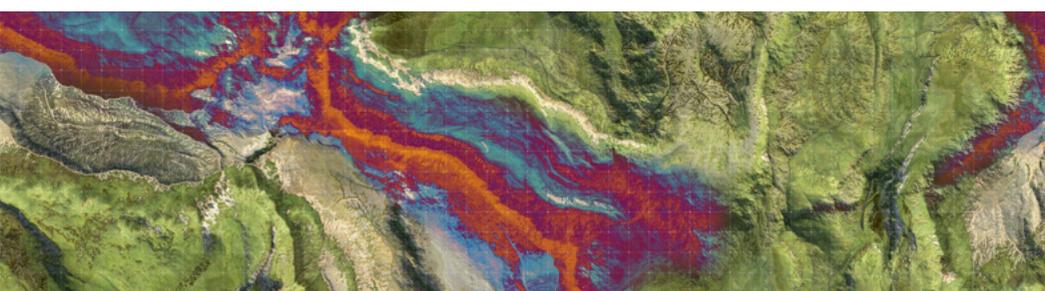
Ratified by 197 countries, including the United States, this pioneering accord was the world's first global treaty explicitly addressing climate change. It gave rise to the annual Conference of the Parties (COP), a forum for international discussions on stabilizing greenhouse gas concentrations. Subsequent meetings produced the Kyoto Protocol and the Paris Agreement.

## Paris Agreement, 2015

The Paris Agreement is the most significant global climate accord to date, obliging all countries to set emissions-reduction targets known as nationally determined contributions (NDCs). Its aim is to limit global warming to well below two °C above preindustrial levels, with an aspiration to keep it under 1.5°C. The agreement also seeks global net-zero emissions by the latter half of this century.

## Kyoto Protocol, 1997

The Kyoto Protocol, in force from 2005, marked the first legally binding climate treaty. It required developed nations to reduce emissions below 1990 levels, though it lacked mandatory emissions cuts for developing countries. Regrettably, the United States signed but never ratified the agreement and later withdrew its support.



# The Current Landscape (2023) and its Implications

Understanding the intricate relationship between economic growth and CO<sub>2</sub>e emissions is crucial. In Figure 1.1, we observe the cumulative CO<sub>2</sub>e emissions from 1850 to 2021 alongside the GDP size in 2021 for the top ten countries with the highest cumulative emissions. This analysis unveils a historical correlation between the volume of CO<sub>2</sub>e emissions and the size of the economy over the past two centuries.

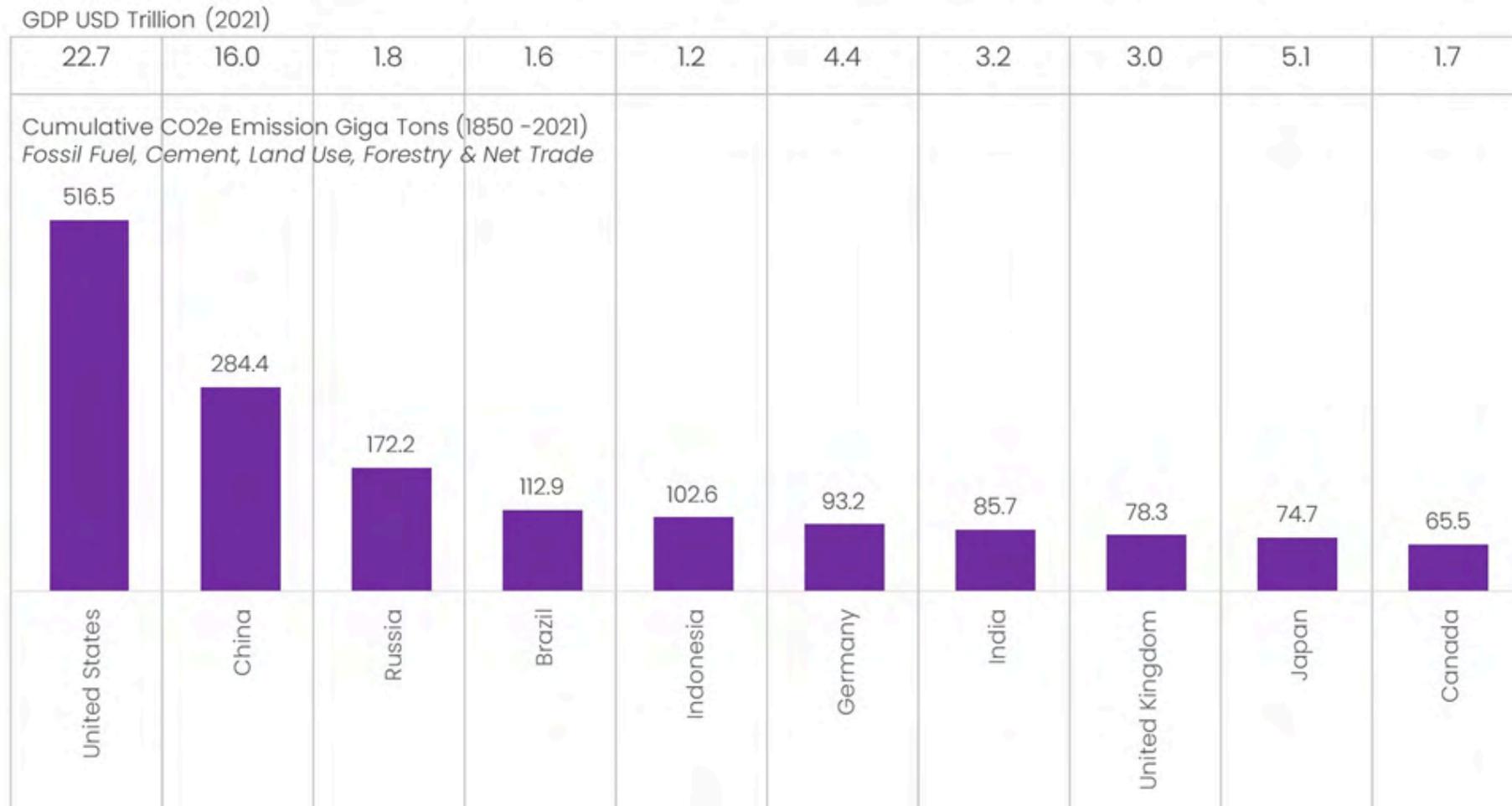


Figure 1.1 (Top ten countries with the largest cumulative CO<sub>2</sub>e emissions in giga tons (1850–2021) and GDP USD trillion (2021))

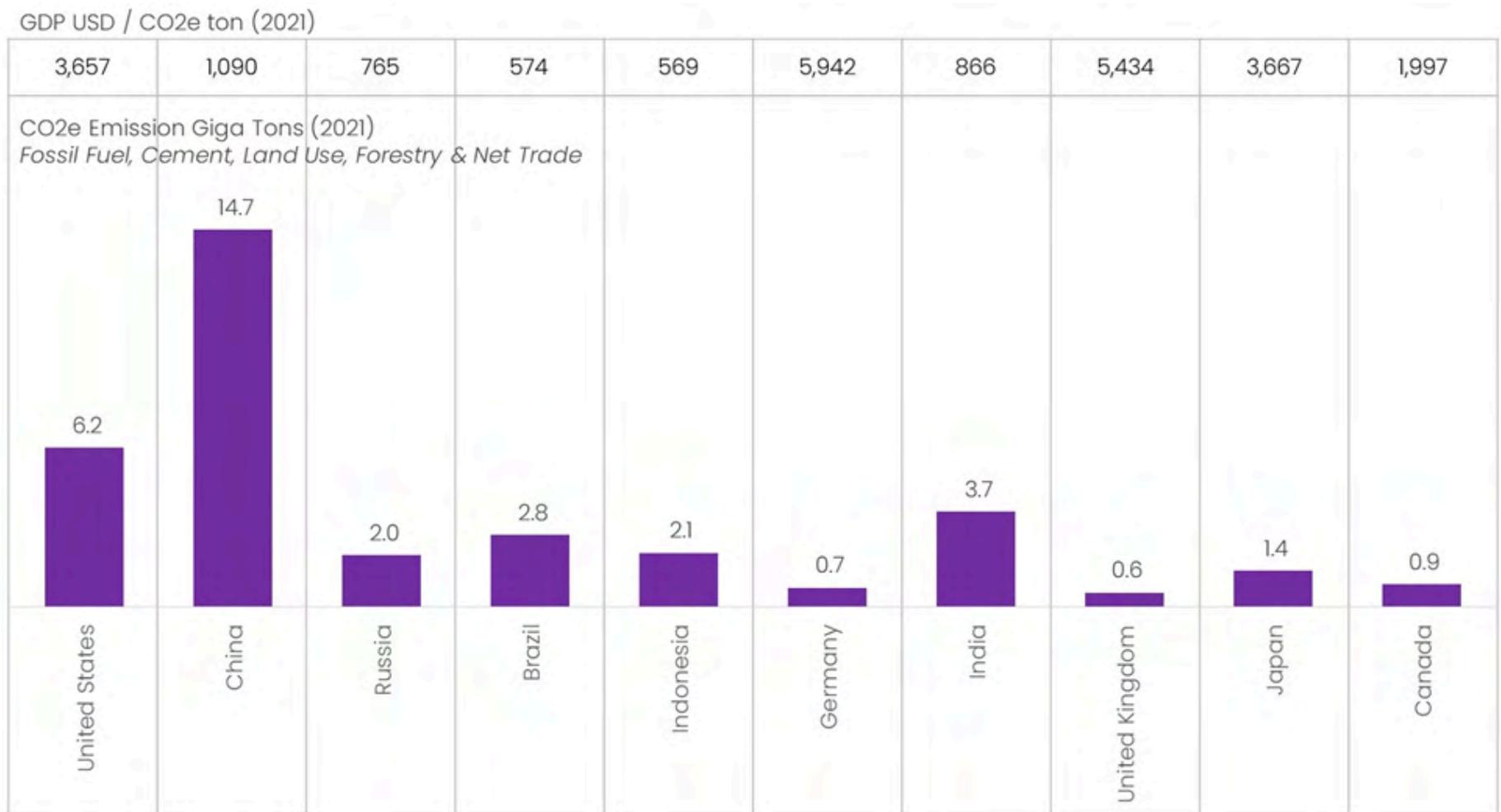


Figure 1.2 (GDP USD / CO2e Ton)

Notably, this correlation isn't uniform across all countries, as illustrated in Figure 1.2, which depicts the GDP (USD) for 2021 per CO2e (ton) emissions. The productivity, or output per ton of CO2e, varies significantly among countries. This discrepancy emphasizes the need for a nuanced understanding of the economic impact of emissions.

Delving into the sources of emissions, five key segments emerge: Energy Systems, Industry, Agriculture, Transport, and Building. Among the top ten highest emitter countries, each nation exhibits a distinct profile in these segments, contributing differently to the GDP mix and overall output. The evolution of systems, practices, and economic segments over centuries

necessitates a transformative shift to address current climate challenges in adaptation and mitigation.

These systems are integral to our daily lives and represent trillions in investments. The livelihoods of the global population hinge on these segments. Addressing climate change requires a significant shift, demanding another round of substantial investments estimated at 45 trillion USD in a much shorter period, specifically within the next 8 to 10 years. This investment is critical to facilitate the transition toward a more sustainable and resilient future. CEOs play a pivotal role in driving these transformative changes, ensuring the well-being of both economies and the planet.

As of 2023, substantial parts of Europe and Russia have already experienced temperature increases exceeding two °C, while the Arctic has warmed by over 4°C. Achieving the crucial 1.5°C target necessitates an annual 7% reduction in global emissions—a rate more significant than the decline resulting from the COVID-19 pandemic—every year until 2030.

attainable or not, every tenth of a degree holds immense significance. Consequently, there is no alternative but to intensify mitigation efforts considerably.

In practical terms, rising temperatures and sea levels over the next 10 to 25 years will reshape the world we know.

CO2e Giga Tons (2022)



Figure 1.3 (Global Emission CO2e by Industry in Giga Tons)

Nevertheless, emissions are projected to rise this year, and progress remains inadequate across the board. This encompasses national commitments, policies, corporate climate initiatives, the scaling of green technologies, and funding.

Maintaining the current decarbonization trajectory will render adaptation efforts insufficient to navigate the impending challenges. Given the exponential nature of climate impacts, whether 1.5°C remains

The economy depends on the varied services that nature's ecosystems offer. For instance, these services encompass the provision of timber for harvest, the supply of groundwater or freshwater essential for drinking, cooling power plants, or irrigation, and the contribution of animal or plant fibres for fabric or fertilizer production. Additionally, nature plays a crucial role in providing ecosystem services by regulating climate, hydrological cycles, ecological



processes, and soil functions. Examples of these services encompass pollination, carbon sequestration, erosion control, flood and storm protection, disease regulation, and soil quality enhancement.

Visualize a scenario where flooding and extreme heat deteriorate or destroy a significant portion of built infrastructure, leading to accessibility and housing challenges. Agriculture, forestry, fishing, livestock, and mining sectors will grapple with altered weather patterns and working conditions, impacting food and feed

availability. This, in turn, will trigger displacement and involuntary migrations, straining urban centres and giving rise to housing, healthcare, food supply, and citizen services challenges.

Further, given that over 55% of global GDP is directly or indirectly linked to the natural resources mentioned above, the impending disruption could lead to loss of revenue, credit defaults, and insurance claims and potentially precipitate another financial crisis.

# Let's reevaluate the challenge and strive to formulate a new equation



## Current Equation

Velocity of CO2 Emission > Velocity of CO2 Sequestration

## Required Equation

Velocity of CO2 Emission <= Velocity of CO2 Sequestration

Facilitating the transition to net zero demands a holistic approach to address both sides of the equation. Key drivers encompass Regulations (driving systemic change across business and society), financing (introducing new financial instruments for patient private and public capital), technology (reducing emissions, e.g., through renewable energy, and enhancing sequestration velocity, e.g., with CCS), talent (comprehending and implementing crucial initiatives), and data (platforms generating near real-time insights for tracking, benchmarking, and reporting progress for businesses, investors, and governments).

Globally, there exists a substantial misalignment between the required pace of change and the progress achieved. The capacity of businesses and governments to implement effective mitigation or adaptation plans is constrained, as evident in our collective progress over recent years.

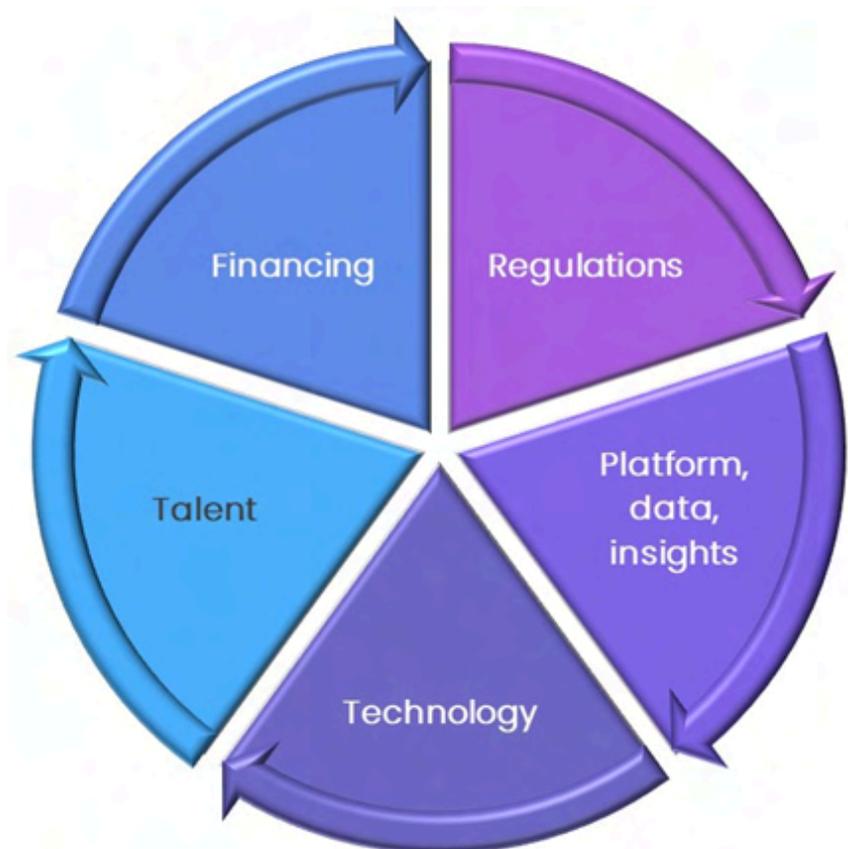


Figure 1.4

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A 7% annual reduction in CO<sub>2</sub>e emissions implies curtailing economic activities across sectors and geographical locations, impacting the cost-of-living crisis and potentially prompting involuntary migration. The primary challenge lies in mobilizing private capital without a robust business case and reasonable Return on Investment (ROI). Public sector funds are depleting, and successful implementation at one geographical region doesn't suffice due to the integration of the global supply chain and interdependencies.

Historically, monumental challenges like these have found solutions in technological advancements witnessed by the human race. Thus far, the optimism surrounding clean energy system replacements, cap-

and-trade regulations, sustainable infrastructure renovations, and behavioural changes in agriculture and livestock practices seems to lack merit, considering the investment, time, available materials, and systemic behavioural shifts.

The world's most significant bet lies in Carbon Capture and Storage (CCS) technology, retrofitting to existing energy systems and industries while monitoring emissions across other economic segments. Emphasis should also be placed on reforestation and underlying economic activities, ensuring local communities are not solely dependent on timber trade—harvesting high-value herbs, flowers, or crops that thrive in forest environments.

Shifting the emphasis toward the speed of CO<sub>2</sub>e sequestration appears to have the potential to expedite the transition rather than solely emphasizing reduction. Consequently, directing financing, talent, and technological development efforts in that direction would be advantageous.

