ABSTRACT

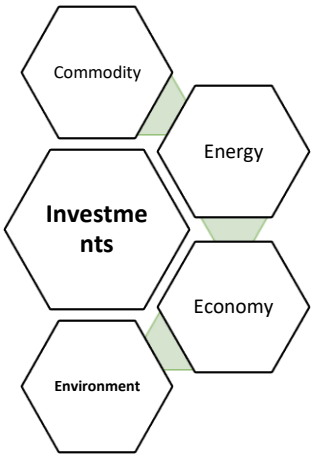
Within the heartbeat of commodities lies an untapped reservoir of energy, a symphony of resources waiting to be harnessed. From the sun-kissed fields yielding agricultural bounty to the subterranean richness of fossil fuels, commodities are not merely raw materials; they are reservoirs of power, each holding the potential to illuminate our homes, fuel our industries, and propel us toward a sustainable energy future. In the alchemy of innovation, commodities are transformed into the lifeblood of progress, shaping the energy landscape that powers our collective aspirations.

Image source: Picsart: an AI-generated image.

Introduction:

Energy plays a pivotal role in fostering economic growth and development in several ways for example Industrial Production, Transportation, Infrastructure Development, Innovation and Technology, and Commercial and Residential uses. Ensuring access to affordable, reliable, and sustainable energy is essential for fostering economic prosperity and improving the quality of life for people around the world. Nations with abundant and diverse energy resources often experience more robust and sustainable economic growth. Gross Domestic Product (GDP) is a widely used indicator to measure a country's economic performance and growth for several reasons: Comprehensive Measurement, Comparison across countries, and an indication of the standard of living among others.

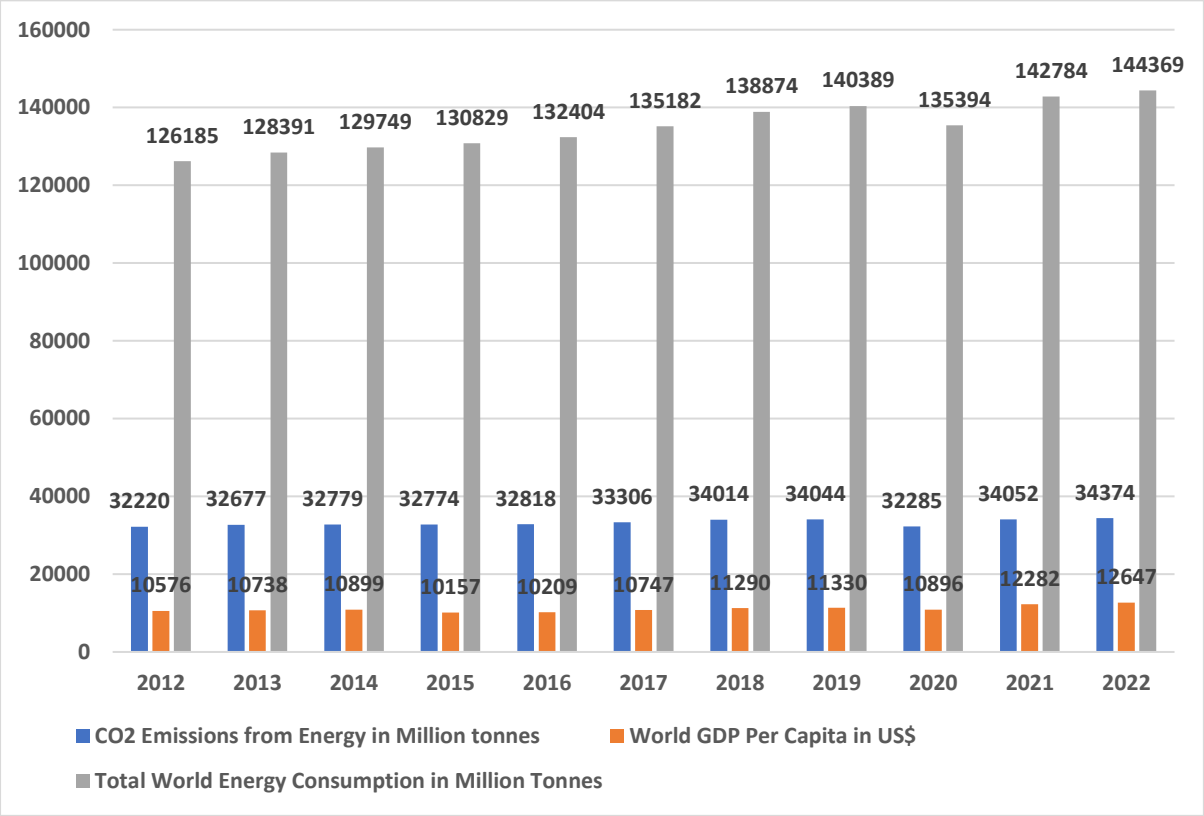
Through this article, the **Asset Management Working Party** tried to analyze the dependency of GDP growth on Energy and the environmental costs of this, both in terms of CO2 emissions and wider ecological destruction. The Energy Institute Statistical Review of World Energy™ analyses data on world energy markets from the prior year and the same is used throughout this article to articulate the nexus between the Energy, Environment, and Economy.



Nexus between Economic Growth, Energy and Environment:

The relationship between energy consumption and Gross Domestic Product (GDP) is complex and multifaceted. In modern, globalized economies, growth is often attributed to how much a country can produce and export. With such production and manufacturing comes higher energy consumption. Generally, therefore, there is a high **correlation between Energy Consumption and GDP (as shown below in Fig 1).**

Fig1: Correlation between energy consumption and GDP



Source: World GDP per capita: https://www.macrotrends.net/countries/WLD/world/gdp-gross-domestic-product

Energy Consumption and CO2 Emissions: Home | Statistical Review of World Energy (energyinst.org)

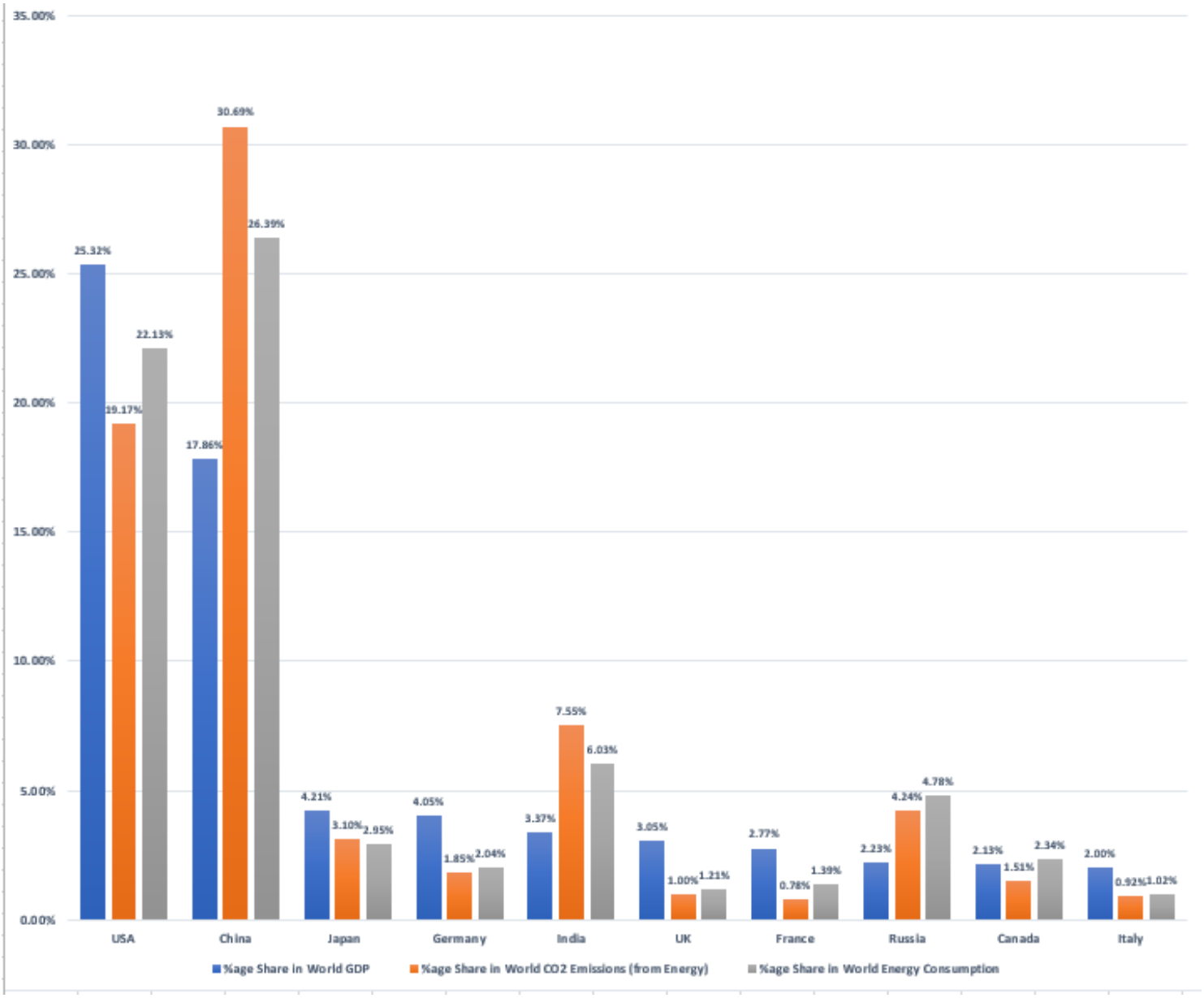
In the above Fig1, we noted that from 2012 to 2022, the Worldwide GDP per capita increased from USD 10,576 to USD 12,647 (approximately 20% growth over 10 years). We also noted that the total Energy Consumed to achieve this GDP increased from 126 billion Tonnes to 144 billion Tonnes (1 Exajoules to 239 Million Tonnes, approximately 14% growth). The GDP per capita grew by 20%, which was achieved by an increase in Energy Consumption by 14%.

However, over the same period, the CO2 Emissions from energy generation have risen by only 7%. The fact that the increase is not proportional to the rise in energy usage could be viewed as a positive sign that renewable or low-carbon fuels have started to fill some of the global demand. Alternatively, generation may have become more efficient over time. Either way, it is clear that if this trend continues then economic growth will become less dependent on high-emitting fossil fuels.

Next, we tried to analyze the top 10 contributing nations to this growth and their respective energy consumption in the year 2022 vis a vis their contribution to the World CO2 emissions, (as shown below in Fig 2). Countries like China, India, and Russia seem to be consuming more energy and contributing less to world GDP. On the contrary, these countries have the highest share of World CO2 emissions.

When countries transition to post-industrial economies the ratio of energy consumption to GDP typically drops, as services industries, such as those in the UK, have much lower energy requirements. The likes of the USA and China remain far more active in global export markets than other countries in the G20.

Fig 2. Top 10 Countries %age Share in World GDP V/s %age share in World Energy Consumption V/s %age share in World CO2 Emissions



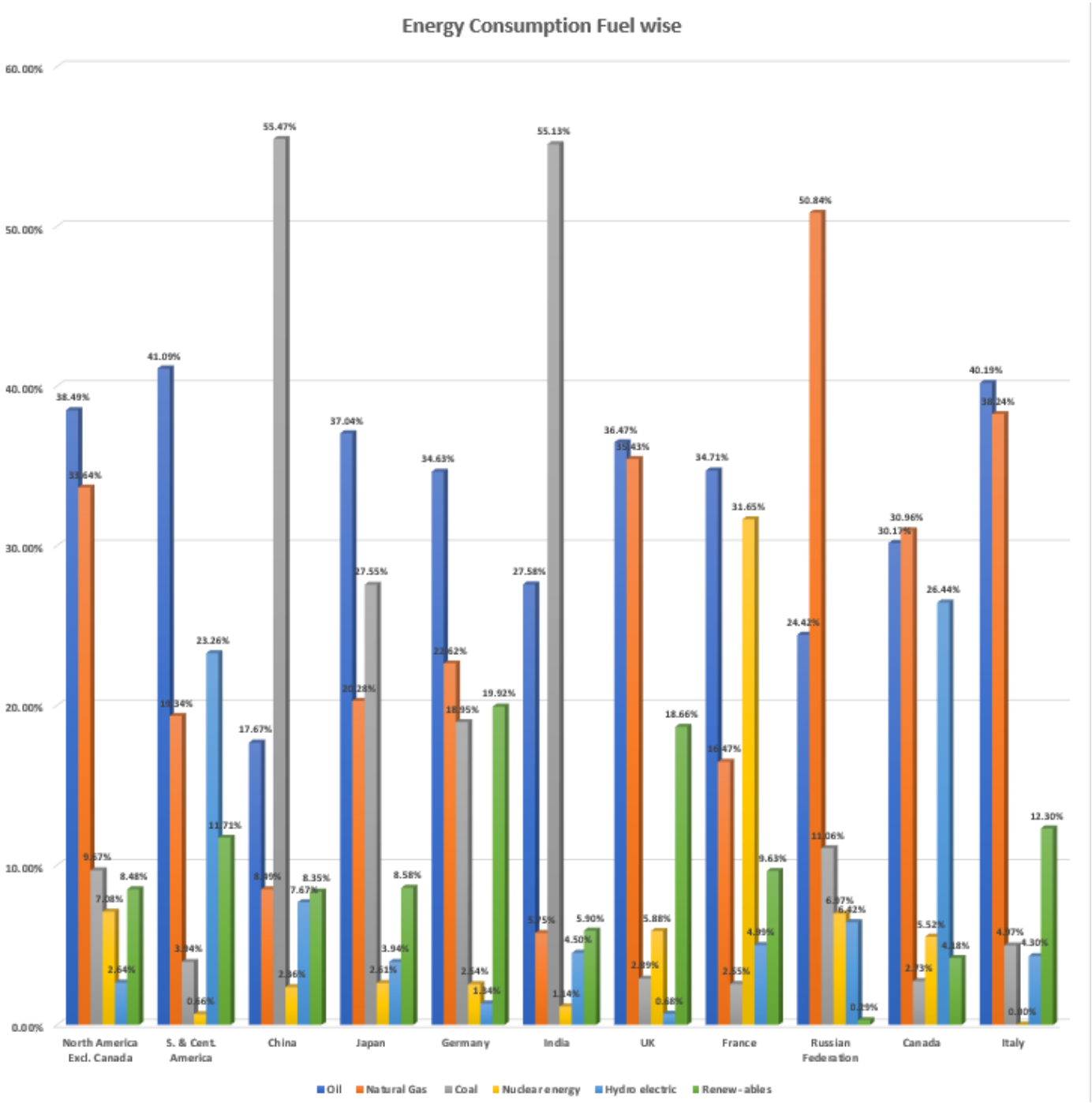
Further analysis shows that these countries rely on high-carbon-emitting fossil fuels as a source of energy. As shown in Fig. 3 more than 50% of the energy source was coal (for China and India) during the year 2022.

However, one could take the cynical view that GDP growth in many Western countries relies on outsourced manufacturing from overseas businesses, such that these economies reap the rewards of sweeping their emissions under the supply chain rug, leaving other countries to be scrutinized more critically. China is the so-called “World’s Factory” after all.

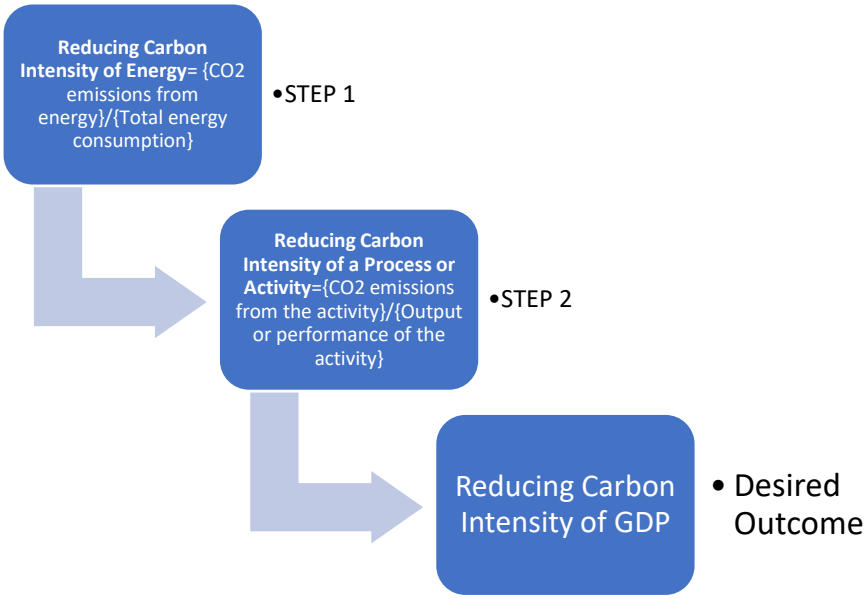
However, a ray of optimism is seen in an analysis by Carbon Brief (available here) showing the so-called “new three” industries of solar power, electric vehicles, and batteries were the main focus of China’s clean energy investment in 2023. China is scaling up its clean energy industry, 40% of the country’s GDP increase in 2023 was attributable to growth and investment in these sectors.

With the largest emitters having the biggest challenge to meet net-zero goals, these CO2 emissions to GDP ratios may be set to fall shortly, as finance is pumped into alternative energy sources. In only a few years, a new version of Fig.3 may show a drastically different landscape, with the likes of China potentially demonstrating the most drastic shift in energy sources.

Fig.3- Top 10 countries (Contribution in World GDP) Source of Energy in year 2022



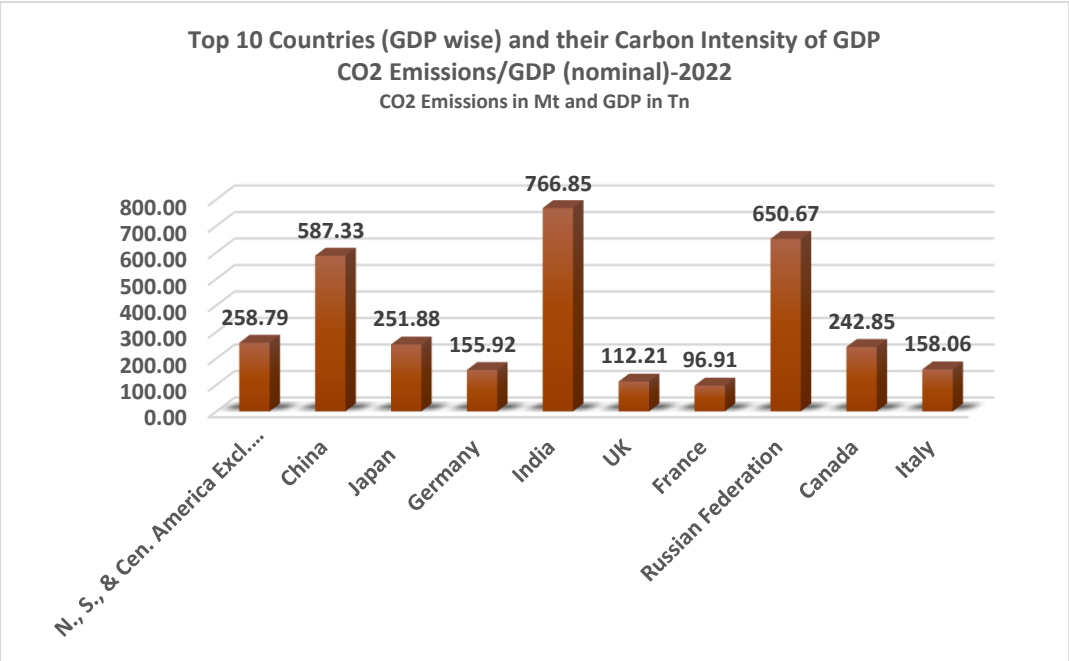
Asset Management Working Party found that reducing the carbon intensity of GDP is a two-step process.



The carbon intensity of GDP inevitably needs to be reduced and the same can be achieved by reducing the reliance on carbon for energy first and then reducing the reliance on carbon for other processes/activities.

To reduce the carbon intensity for energy, an economy needs new and dynamic Commodity investment strategies. We need to acknowledge the fact that the only way the global community will avert climate catastrophe is with a transition away from fossil fuels. Further to reduce the carbon intensity of the entire process or activity a huge investment is required in R&D and companies are already embracing such new technologies be it Direct Lithium Extraction (DLE) or Carbon Capture and Storage (CCS). Once these 2 steps are achieved, the carbon intensity of GDP is set to fall from the year 2022 levels, as shown in Fig. 4.

Fig. 4 - Top 10 Countries (GDP wise) and their Carbon Intensity of GDP.



Conclusion:

As we stand at the crossroads of Economies, Energy and Environment, an asset manager needs to derive new investment strategies while keeping in mind their ESG goals. These strategies must be capable of dealing with some of the unprecedented challenges during their execution.

Over time, asset managers could deploy Switching Strategies, which means shying away from investments in CO2-emitting commodities and investing in green energy. However, one must acknowledge the question of dealing with stranded assets.

There will be winners and losers through the transition to green economies, but asset managers can be sure there are gains to be made. Since one energy source is left behind, global uptake of renewables will come to the fore, and rising demand for precious earth minerals will boost their prices and asset managers can expect the returns. As these disruptions could cause more volatile commodity prices and an uptick in hedging costs, asset managers must be switched on to these dangers ahead of time to avoid potential hits to returns in the future.

Though there is evidence that tightening the regulation can help in reducing the carbon intensity of the processes and GDP too, however, this again comes at the cost of greenwashing which needs to be factored in corporate governance metrics while evaluating the investment options by asset managers. Further, asset managers can choose to invest in companies with better climate score/ESG ratings, however, there needs to be a common rating methodology across the globe which further needs sacrosanct data points.

Asset managers can also use their proxy voting rights to achieve the ESG goals of investments or whistleblowers can play a vital role in this, however, this might need a more robust statute.

Disclaimer: The observations noted here are the personal views of the members of the Working Party, and do not represent the opinion of their employers.