SEDCO CAPITAL سدكو كابيتال

Rethinking Net Zero Resilience

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Rethinking net zero:
Is it time to focus on resilience and adaptation?[1]

Summary

- The article aims to analyze the opportunities for responsible investments related to climate change mitigation. An economic policy perspective is applied concluding that the objectives of the Paris Climate Agreement may not be reached. While climate transition risk is declining, the increasing physical climate risk can create investment opportunities related to resilience and adaptation.

Green energy must be competitive to succeed

- The green transition has faced challenges recently due to changes in policies, both in the US and across Europe. The implementation of costly emission abatement is politically difficult. Europe's commitment to climate transition is being challenged by energy security risks, reflected in high electricity prices, hurting industrial competitiveness. Canadian Prime Minister Mark Carney, despite his prior engagements for climate initiatives, has eliminated the Consumer Carbon Tax. The European Union Member States agreed in May 2025 to exempt approximately 90% of importers from the upcoming Carbon Border Adjustment Mechanism (CBAM).

- The Paris Climate Agreement (PCA) has the overarching goal to hold the increase in the global average temperature to less than 2°C above pre-industrial levels and pursue efforts "to limit the temperature increase to 1.5°C above pre-industrial levels" by reaching net-zero greenhouse gas emissions around 2050. The PCA operates on a system of voluntary commitments, and there are no legally binding enforcement mechanisms to ensure countries meet their national commitments. Most countries have voluntary commitments that are above the PCA's 1.5°C target. This lack of enforceability means that even the few countries with ambitious targets are not legally compelled to achieve them and there are no penalties for non-compliance. While over 100 countries have announced net-zero targets in line with the Paris Agreement, only six countries (not all EU member states currently have legally binding net-zero targets for 2050) have enshrined these commitments into law currently-less than 3% of global emissions.

1 The author is Chief Risk Officer at SEDCO Capital. SEDCO Capital has become the first Shariah-compliant and Saudi Arabia-based asset manager to be a signatory of the UN Principles for Responsible Investment in 2014. SEDCO Capital integrates socially responsible investment (SRI) and Shariah-compliant investment into a concept called Prudent Ethical Investment (PEI), with has additional benefits to SRI only. SEDCO Capital has been a pioneer for responsible investment in the Saudi real estate market.

- For the green transition to succeed, green energy must become cost-competitive with fossil fuels. This could be achieved through innovation, regulation, and the proper pricing of carbon emissions. Regulation could lower the relative costs for green energy through carbon taxes, emissions rights, or CBAM, but not on a global scale. Innovation will require significant investments to enhance the cost efficiency of green energy and emission reduction technologies.

- Commitment to the PCA is an example of a Collective Action Problem, which occurs when individually rational behavior leads to a collectively suboptimal outcome. Each individual country has little incentive to contribute to the maintenance of the global public good-limiting global temperature increase and thus mitigating climate change- even though all would reach superior outcomes if everyone contributed. The superior outcome could be reached through collectively binding agreements.

- To stay within the 1.5°C warming limit, the UN Intergovernmental Panel on Climate Change (IPCC) and the UNEP Emissions Gap Report recommend that Global emissions in 2030 must fall to around 33 $GtCO_2e$. This is a required reduction from 2022 levels by ~24.4 $GtCO_2e$ (~42.5%) from the estimated ~57.4 Emissions ($GtCO_2e$) in 2022.

- The International Renewable Energy Agency (IRENA) and International Energy Agency (IEA) presented similar estimates of $4.5 to 5 trillion investments required per year to 2030 (starting 2023) for a successful energy transition, with transition technologies representing 80% of the total investment. IEA estimates the annual gap to target investment levels as $2.7 trillion. Climate Policy Initiative even estimated an annual investment target of $7.5 trillion per year to 2030, which is a 4-5x increase from 2023 estimated investments.

- At this point, it can be concluded that the likelihood of reaching the PCA goals is very low.

Free Riders will both save on climate transition costs and reap cheap fossil fuels

- Free-rider behavior is a key challenge to the collective action problem of facilitating the global public good "climate change mitigation." Since no country can be excluded from the benefits of climate change mitigation, a Free-rider country gains the benefits of the public good while maintaining high emissions.

- In the following, oil is taken as a representative fossil fuel. Oil production has been steadily rising since the 1960s (see Table 1) with only one notable decline due to the global pandemic. Even with stronger mitigation policies, energy systems have long lifespans (e.g., vehicles, pipelines, refineries). Transitioning from oil takes decades, so even with increasing clean energy investments, crude oil will continue to be produced and consumed steadily in the medium term.

Year	Production (mb/d)
1965	31
1970	46
1980	59
1990	66
2000	74
2010	82
2015	91
2019	95
2020	88 (pandemic drop)
2023	94
2025P	96
2030P	97

Table 1: Global crude oil production from 1965 to 2023, with projections (P) to 2030. Values are in million barrels per day (mb/d), based on data from the Energy Institute and IEA.

Scenario	2030 Estimate (mb/d)	2050 Estimate (mb/d)	Key Assumptions
IEA Net Zero Emissions (NZE)	~75	~24	Aggressive climate action, no new oil fields beyond current approvals.
IEA Announced Pledges (APS)	~88	~55	Full implementation of nationally determined contributions and net-zero pledges.
IEA Stated Policies (STEPS)	~96	~85	Continuation of current policies; moderate decline post-2030.
EIA reference case (2023)	~100	~102	No new climate policies; continued growth in demand.
BP current trajectory	~101.7	~76.8	Current policies
BP Net Zero Scenario (2023)	~70	~30	Rapid electrification, fuel efficiency, and green investment.
OPEC World Oil Outlook (WOO)	~104	~110	Assumes robust global oil demand growth and economic expansion.
S&P Reference	~109.3	~100.8	High demand, limited transition

Table 2: Overview of crude oil production under different climate scenarios. The 2022 baseline was about 97 (mb/d). Green shading indicates Net-Zero Scenarios and orange indicates Transition Scenarios.

- Table 2 shows that while in the Net Zero and Transition scenarios oil output decreases, oil production is projected to increase in the scenarios that project the current regulatory backdrop. For 2050, the International Energy Agency (IEA) projects oil prices per barrel at around $24 for the NZE, $55 for the APS, and $85 for the STEPS scenario.

- This means that the efforts of some countries to lower their fossil fuel demand will give additional incentives for Free-Rider behavior of other countries since expected prices of fossil fuels may decrease.

- The Free-Rider issue corroborates the prior conclusion on the low likelihood for the PCA's success: there will still be economic incentives to use fossil fuels, as mitigation actions will lower demand and thus lower prices for fossil fuels.

Are there still climate-related investment opportunities?

- Despite low chances for the PCA's success, there can still be opportunities in climate-related investments. Due to weakening policy support, investor appetite for earlier stage, less competitive green technologies has decreased. The medium-term climate transition risks are waning due to lower regulation, resulting in decreasing emissions costs, and moderating stranded assets risks.

- Figure 1 shows a rising supply for all energy sources, fossil fuels alongside renewables, over the last decades. The current energy system is still 80% fossil-fuel-based, predominantly coal, oil and natural gas. Wind and solar can be cost-competitive to conventional sources (see Table 3), while newer carbon reduction alternatives (e.g., green hydrogen, carbon capture) would still require significant investments to reach competitiveness.

- Artificial intelligence and data centers will become a new critical energy demand driver. By 2030, global electricity demand from data centers is projected to more than double, reaching approximately 945 terawatt-hours (TWh), equivalent to Japan's current total power consumption.

Total energy supply (in TJ) by source, World, 1990-2022

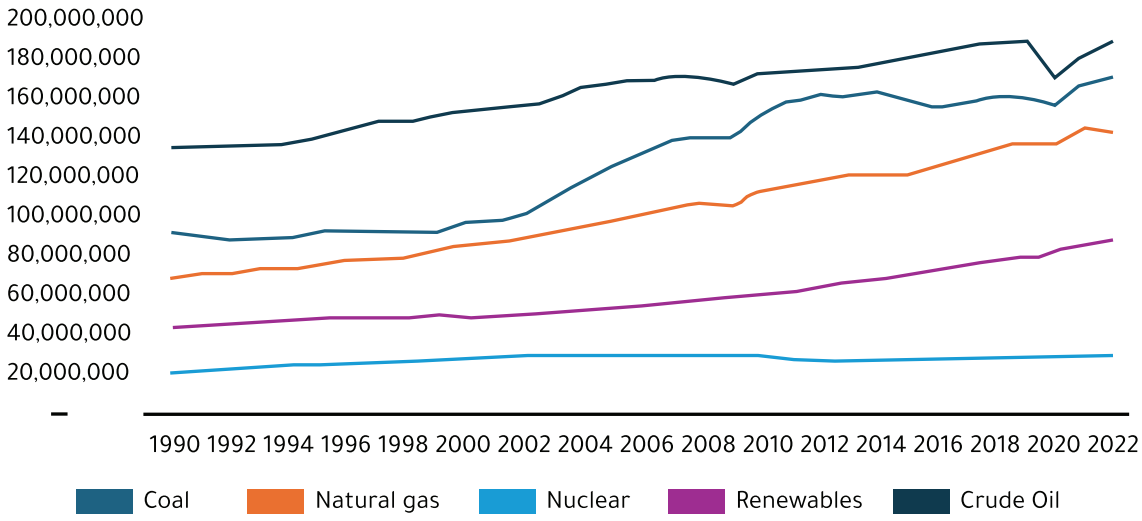

Figure 1: Total energy supply (in TJ) by source, World, 1990-2022, Source: International Energy Agency.

Type	Description	LCOE in $/MWh
Renewable	Solar PV-Utility scale	29-92
	Solar PV + Storage–Utility scale	60-210
	Wind–Onshore	27-73
	Wind + Storage–Onshore	45-133
	Wind–Offshore (unsubsidized)	74-139
	Green Hydrogen (25% blending with natural gas, unsubsidized)	171-300
Conventional	Gas combined cycle (operating) (marginal cost)	23-37
	Gas combined cycle (new build)	45-108

Table 3: Levelized Cost of Energy (LCOE) Comparison for renewable and conventional energy ($/MWh)). LCOE is a financial metric that estimates the average cost of producing electricity over the lifetime of a power plant to compare the cost of different electricity generation technologies on a consistent basis. Source: Lazard.

- Due to the rising future energy demand, growth of both conventional and renewable energy (e.g., solar, wind) seems more likely than a substitution of fossil fuels by renewables.

Climate resilience investment with return potential

- As emissions reduction investments stall, the physical risks from climate change rise significantly. Physical climate risks represent the negative impacts of climate change on physical assets, ecosystems, and human populations manifesting as acute events like extreme weather or chronic changes like rising sea levels, increased temperatures, and changes in precipitation patterns. Unlike mitigation, adaptation frequently has private good characteristics. Resilience investments have immediate, localized benefits, reducing the free-rider problem. Building resilient systems is a risk-management strategy akin to buying insurance against worsening climate events. Early adaptation actions often cost far less than post-disaster recovery and may offer first-mover advantages.

- Examples are prevalent in capital-intensive sectors such as infrastructure, energy, real estate, and agriculture. Investments are increasingly not only risk mitigation but strategic in nature. Real estate resilience review and certification is an example of risk mitigation investments that may contribute to property values.

Conclusion

- As climate transition risks have abated, achieving the objectives of the PCA becomes unlikely. Physical climate risks will grow in importance. Resilience and adaptation offer essential risk mitigation and attractive long-term investment opportunities.

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