GUILD OF INVESTMENT MANAGERS

# Net Zero & Climate Investment – Challenges & Opportunities

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**Foreword**

There is certainly momentum behind the push to net zero but ahead of our panel discussion, we want to look at what are the barrier and which type of investments could be showcased as the opportunities arising form such a push.

- **INVESTMENTS:** Uneven Corst of Capital Playing field between Investments in Sustainable solutions and fossil-intensive Investments
- **SCIENCE**: limited understanding of the complexities of the regional differences and feedback loops on Physical and Social dimensions.
- **ECONOMICS**: Current infrastructural design, with a lack of real externalities pricing creates economic barriers to large-scale deployment of sustainable solutions.
- **POLICY**: Regionalization of policies and taxonomies makes it difficult to collaborate on large-scale solutions.

The are however opportunities that call for a certain degree of optimism: we look at three of those.

1. **Investments in hybrid renewable energy: a build-to-core and impact-driven approach**
2. **Investments in energy storage**
3. **Investments in EMs via public-private partnerships**

**Introduction**

Against the secular backdrop of increasing urbanisation, more energy, less carbon, there has been a record-breaking investment aligned with Paris Agreement and the 2050 net zero goals. More national sustainable targets have been enacted across the globe – Inflation Reduction Act (IRA) in the US; Fit for 55 and RePowerEU Plan in Europe; 14$^{th}$ Five Year Plan in China – to strengthen the policy momentum in net zero alignment. Yet there remains a $1+ trillion investment gap across the entire energy transition value chain in order to meet the Paris Agreement target. Major challenges remain – we summarise them in this note along with some opportunities for investors committed to net zero goals.

**1. Investment:**

As most low-carbon energy options are capital expenditure heavy, a higher cost of capital impacts low-carbon energy options more than high-carbon equivalents. Yet there is a significant variation in the cost of capital trend across regions. While low-carbon electric utilities have a lower cost of capital than their high-carbon peers in Europe, the cost of capital of low-carbon electric utilities is higher than high-carbon peers in North America and key emerging markets (EM) including China, ASEAN, and LATAM (Caldecott, Limburg, Shrimali, Wilson, Zhou, 2023). This is due to Europe having a stronger climate change policy ecosystem including the EU Taxonomy, which benefits renewables-friendly companies. To accelerate the net zero shift, the cost of capital for low-carbon as opposed to high-carbon energy needs to fall.

Secondly, a key component of climate solutions analysis is cost-benefit analysis, which traditionally utilized the time value of money, a comparinge the present values of benefits and costs via a (the?) Capital Asset Pricing Model (CAPM). While CAPM is known for its ease of use and consideration of systematic risks, challenges remain in the discrepancy between long-term exposure and vulnerability to climate hazards and the time value of money in assessing climate adaptation investment options. A large nominal cost in 25+ years' time has little present value, yet it is likely to have a substantial impact on the value of the asset as time goes by. It may be uneconomic to wait to address the issue as delays in implementing adaptation options may significantly alter the physical integrity of the asset and the methodology for adjusting discount rates in relation to climate risks lowers the transparency of cost of capital assessment. Additionally, frequently utilised investment metrics like LCOE for renewables neglect the energy system integration and learning benefits, making the net zero benefits harder to justify for asset owners who prefer lower upfront capital investment in a higher for longer interest rate environment

Lastly, while there is an increase in blended finance in energy transition investing in the EMs – the key region that would decide the outcome of net zero alignment – with the introduction of first-loss instruments that lower interest rates, much of the first-loss risks remain in the governments of low-income countries, which often have poorer fiscal and monetary capacity to bear projects of higher risks (Crabb, 2022). This makes it more challenging to unlock the entire energy transition value chain and scale large projects for private finance and less appealing to global asset owners and managers which are more risk-averse.

**2. Science:**

Firstly, while the use of Climate Value-at-Risk (CVaR) gained popularity in the investment industry given its forward-looking nature, it mostly focuses on carbon VaR and fails to include the remaining 6 greenhouse gases defined under the Kyoto Protocol. It does not account for the social aspect of climate risk such as public health and migration – adaptation of the last resort. This presents a potentially higher cost of capital and risk-return profile to institutional investors over the next few years as we are in the "risk build-up" phase following the Paris Agreement in 2015 (Fulton, Poulter, 2020).

Secondly, in terms of climate scenarios, although the current IEA net zero emission transition pathway serves as a global alignment benchmark for individual corporations, it fails to consider national differences and how firms should adjust in response to variations in national policies and resource limitations. As decarbonisation should be pursued with a relative equity principle and utilize more disaggregated scenarios, the global scenarios underestimate the climate risks for EMs which often require more urgent, forceful, and country-specific analysis with financing that is aligned with their national climate scenarios (Shrimali, Zhou, 2023). The extremely rapid deployment of renewables and electric vehicles; widespread behavioral changes for individuals and governments; and maturation of early-stage technologies such CCUS – key assumptions under the NZE scenario – have not materialised yet (Layke et al. 2021). This widens the deviation of outcomes for institutional investors on climate investments which utilised the widely known industry scenarios.

Thirdly, as climate feedbacks (physical, biological, human) can interact with each other, exhibit temperature dependence, and are non-linear, currently weak feedbacks such as changing insect patterns have the potential to become stronger, following warming driven by other feedback loops (Duffy et al., 2023). In a base-case scenario, interacting feedback loops could result in a sequence of climate tipping points being exceeded, producing 'climate cascades', whereby the net effect of reinforcing feedbacks is greater than the sum of their individual effects under current conditions.

**3. Economics:**

For net zero investments, electricity market redesign will be a critical factor for valuation and future financial prospects. Electricity markets have been historically designed around dispatchable, often fossil

fuel driven, energy supplies, resulting in the existing infrastructure and market design being out of step with what a renewable energy driven electricity supply would need (Henderson, Sen, 2021). The current designs can create economic barriers to renewable energy deployment. Manufacturing capacity and supply chain bottlenecks for minerals and materials may also delay the net zero transition.

Secondly, although there has been an increasing adoption of carbon pricing on a national and company level, three significant challenges remain. First, measurement of emissions is difficult and controversial as seen from the leakage of methane from natural gas pipelines. More importantly, there is not yet an agreed global carbon price with carbon leakage – emissions and industries move to less stringent jurisdictions to avoid carbon pricing (Remeur, 2020). Although policies such as border tariff adjustments on carbon content have been enacted, momentum has been slow. Finally, many carbon pricing systems apply only to a subset of economic sectors.

Lastly, while the voluntary carbon market is expected to act as a key instrument for corporates to implement their net zero targets, it remains far from perfect. Nature-based offsets – including carbon sequestration – have a constant risk of reversal, which would result in the emissions just being delayed or not fully removed from the atmosphere. As well, to be genuine, quantifiable, and permanent, the underlying emissions reduction of an offset must be additional to what would have happened if offset credits had not existed.

**4. Policy:**

Policy remains one on the major challenges on the road to decarbonisation. 2023 saw a number of governments backsliding on their commitments to climate goals. In Europe, Green and progressive parties have suffered election losses, driven at least in part by concerns by voters affected by green policies (Germany and the Netherlands are just two examples). The UK government, too, has recently announced a weakening of its net-zero targets (The Economist, 2023). Effective change is at risk of being undermined by populism – especially as voters begin to see the extent of disruption involved in the green transition (Bloomberg, 2023).

The policy backsliding is coupled with a political and societal pushback against ESG investing in the US – combined with concerns about greenwashing in Europe. This poses a challenge to investors operating across jurisdictions who now need to balance conflicting policy requirements. A number of large ESG champions in the financial services industry have taken a pragmatic stance, toning down their sustainability rhetoric and commitments. Several investors have also withdrawn from flagship collaborations, including the Net Zero Asset Managers (NZAM) initiative, raising concerns about their long-term survival and the broader net zero project (Hussain, Kerber, 2022).

Separately, whilst there has been a global uptick in sustainable investment, there is a lack of interoperability between taxonomies across regions. For example, there are only 6 sectors and 72 climate mitigation activities covered in the Common Ground Taxonomy, which serves as a bedrock for integrating EU and Chinese taxonomies. This poses challenges to investing in new climate technologies that often fall out of the taxonomies due to their unproven efficacy.

Further, there is a policy leakage that encourages investment in existing renewable plants instead of greenfield renewable projects, which have higher carbon and cost efficiency. In particular, for renewable energy – the key asset to decarbonize the portfolio and broader economy, the existing permitting mechanisms often create more problems than solutions from operational perspectives. Firstly, permitting barriers in aligning technologies with local planning schemes and central collection of environmental data for environmental impact assessments increase the risks of projects being revoked. More importantly, as renewable energy infrastructure requires intensive multi-stakeholder engagement, the lack of centralized permitting institutions with conflicts between different government levels in many countries would stretch out development timelines longer than required (5-10+ years). This creates challenges across all stages of

project development and for asset owners like pension schemes which invest in renewable infrastructure for predictable cash flow and long-term liability-matching.

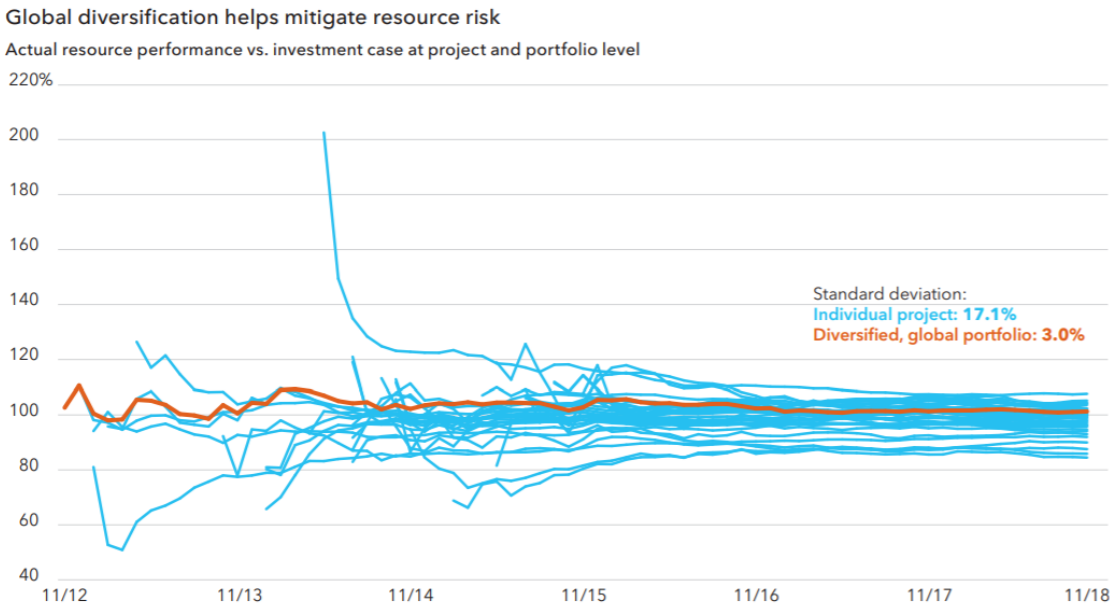
**From challenges to opportunities**

Despite the multiple cross-sector and material challenges from science, policy, economics, and financial perspectives, the case for net zero investing remains large in the long-term given it yields multiple structural benefits. We present 3 investment opportunities which we believe would foster a stronger net zero alignment in the long-term.

**4. Investments in hybrid renewable energy: a build-to-core and impact-driven approach**

Given that the intermittency of wind and solar is complementary, investments in renewable-plus-storage and power-to-x technologies portfolio would provide a higher and more stable cash flow yield (high single to low double digits) to asset owners (Hale, Horne, 2023).

Secondly, since most of the cash flow is pegged against price movement under national law, it also provides a powerful hedge against long-term inflation for better liability management. While listed equities and corporate bonds are normally negatively impacted by power price rises, renewable portfolios benefit from price hike through the energy it generates. Thirdly, given the nature of renewables, it provides an even lower correlation against general market movement via various energy, market, weather, and regulatory regimes – thereby better diversification (Giordano, O'Connor, Spoorenberg, 2019).



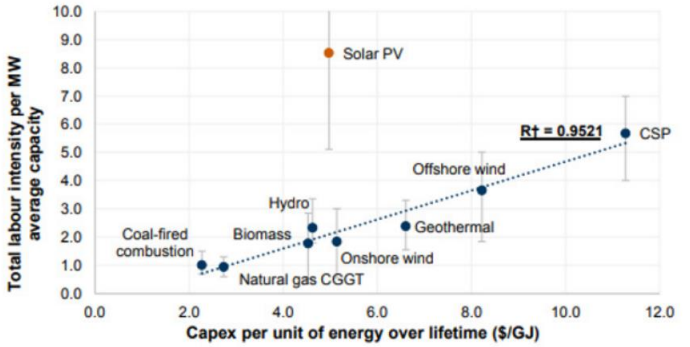

Source: BlackRock, as at October 31, 2018. The information presented above represents a global portfolio of renewable power investments. Variation is based on 20 year implied uncertainty at the project level.

From a sustainability perspective, given it is the greenest asset class, it enables institutional investors to adhere to any principle and standard-based regulations, including TCFD, SFDR, EU Taxonomy. It also empowers them to show their strongest commitment to decarbonize the portfolio and the broader economy in line with the Paris Agreement and PAII Net Zero Framework.

Lastly, with the build-to-core and place-based approach, given renewables have a higher labor intensity – it creates more jobs per dollar invested (Gandolfi et al., 2020), the hybrid renewable strategy is especially appealing to asset owners for the alignment with the UK's Levelling Up Agenda and UNSDG (Forster et al. 2021). More importantly, the build-to-core approach enables asset managers and owners to maximise the technology learning and cost reduction on a system level.

**. Clean energy technologies are more capital- and job-intensive and benefit the most from low cost of capital and attractive regulation...**

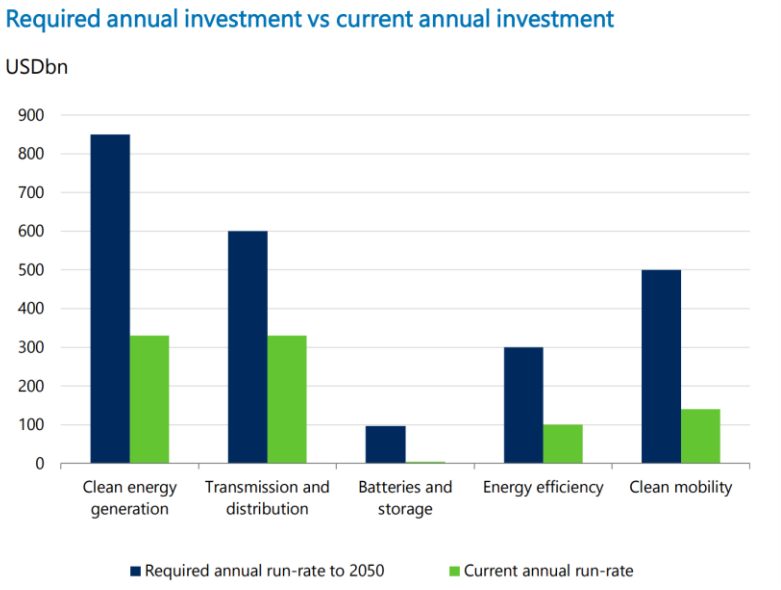
Capex per unit of energy over asset life vs. labour intensity per MW average capacity




Source: Wet et al. - IRENA, UNEP-ILO-IOE-ITUC, Goldman Sachs Global Investment Research

## 5. Investments in energy storage

Much of the recent investment in renewables has gone towards solar and wind energy and electric vehicles (Lacey, Monk, Odey, 2020). There remains a strong need to fund energy storage: long duration, utility-scale, and behind-the-meter energy storage would not only provide the energy flexibility for power-to-x electricity generation, but also foster innovation in demand side management for residential, industrial, and commercial customers (European Commission, 2023; Copenhagen Infrastructure Partners, 2023).




Source: Lacey, Monk, Odey, 2020

Further, the relatively short investment period (5 years) compared to traditional infrastructure (10 years) means that it offers investors a longer time for cash flow generation and better liability management (Leung, 2022).

## 6. Investments in EMs via public-private partnerships

Given EM's pivotal role in reaching net zero globally, it is critical to direct capital to those countries and address net zero with better risk-adjusted return (Bhattacharya et al., 2022). By having multilateral development banks ramp up the use of first-loss instruments, interest rates will be lower and there will be more appetite for private finance to take on riskier projects, making the risk transfer mechanism more effective. Country or sector mobilization platforms could provide a focal point for consultation and coordination and help to tackle upstream (weak policies and regulations), midstream (unbankable projects), and downstream (lack of financial channels) constraints.

| | Main focus | Climate and nature opportunity | Challenges for blended finance | Key needs | Principal objective | Examples |
|---|---|---|---|---|---|---|
| **'Frontier strategies': Enabling risky or pioneering projects** | Frontier countries, sectors and business models | Sustainable infrastructure in low-income countries; many adaptation, resilience and biodiversity projects | Project development and related financing risks; mobilising DFIs, impact investors and specialist funds | Early-stage risk capital and project technical assistance | Impact | IDA PSW<br>SREF<br>ElectriFi<br>AgriFi<br>Mirova<br>& Green |
| **'Mobilisation strategies': Enabling large amounts of finance** | 'Centre ground': moderate country risk, proven technologies and business models | Sustainable infrastructure in middle-income countries; some adaptation and resilience projects (water, agriculture) | De-risking local and global asset owners and managers; unlocking whole sectors and large projects for private finance | Blended finance cushions for risk-averse investors | Scale | Green bond funds<br>BlackRock CFP<br>FAST-Infra |

Source: Lankes, P et al. (2021)

**Conclusions**

1. Cost of capital remains a challenge for the net zero transition. This is especially evident in the Emerging Markets where oil and gas and coal firms receive large subsidies.
2. It is very important to consider social factors such as just transition in the net zero transition. as there are tipping points for social adoption of technologies. Unfortunately, "S" remains a missing spot in the energy transition.
3. Renewable energy remains underinvested despite its increasing popularity - 1% of investment on renewables came from the oil and gas sector. This raises greenwashing risks.

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