Climate Risk Management

Unpacking Green Finance, IALS
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Paul Gilbert (p.gilbert@sussex.ac.uk)

Jodi-Ann Jue Xuan Wang (juexuan.wang@qeh.ox.ac.uk)

Session Overview

- **The first of two sessions:**
  - This morning: climate risk & derisking finance
  - This afternoon: disaster risk financing in Caribbean
- **This morning: 2 ways climate risk <-> finance**
  - 'De-risking' climate finance
  - Financing mitigation of 'climate risks'
- **Examine actors involved in defining risks**
  - And ask who gets left holding the risk?
  - If only certain climate risks can be financed (and 'de-risked' for investors), what is left behind?

Climate Risk enters into Climate Finance

By DFIs / Impact Investors / Institutional Investors

Physical Climate Risks – Require Adaptation / Mitigation

'Climate Finance' Investment in adaptation / mitigation / transition

+ measure climate risk *to* capital

Requires measurement of climate risk + mitigation by investment

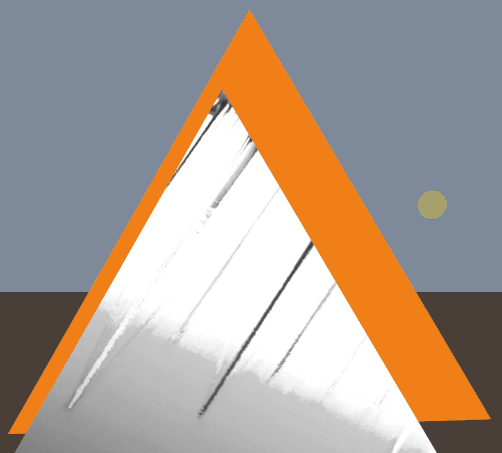
By intermediaries

Requires 'derisking' to encourage private investment

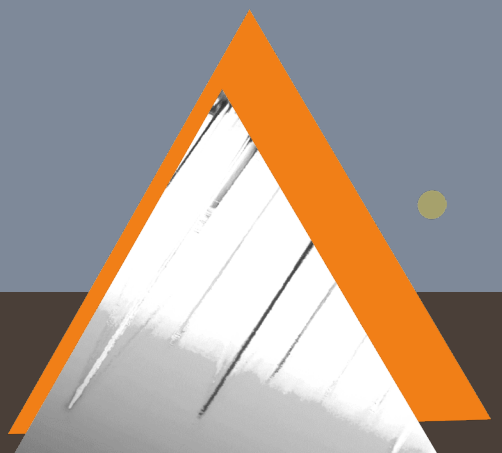
By public sector

De-Risking Climate Finance

- **Now fairly commonplace set of propositions:**
  - Huge need for adaptation, mitigation financing
  - This funding must come from the private sector
  - "that private finance will not be forthcoming on the scale and cost-of-capital necessary without international action to manage and reduce risk" (Stern 2025: xii)
- **Cost-of-capital is higher in Global South**
  - …but we see questionable explanations for this. e.g.:
  - "Access to capital is arguably more difficult in developing countries, as systemic risks in the market (e.g. the likelihood of political distractions) are higher" (Steckel and Jacob 2018: 21) - !



The Cost of Capital



- **No dispute that it is higher for Global South**
  - This is often presented as necessitated by 'country risk' or 'political risk' treated as inherent in Global South
- **But: growing work on unjust/biased ratings**
  - Alami (2022), Styve & Gilbert (2023), Vijaya (2024)
  - "The significance of these qualitative and interpretive components lies…in the possibility that they transmit broader structural and geographic biases into sovereign ratings […] the incorporation of climate vulnerability…may reproduce them in a new form, particularly where structural exposure to climate shocks is treated as a credit weakness without adequate consideration of historical responsibility, unequal adaptive capacity, or the development constraints faced by vulnerable economies" (Latindadd/TWN 2026)

Ratings & 'Required Returns'

Table 12.1: Return expectations from solar projects in emerging economies.

Country	S&P rating	Required return from solar project (%)
Germany	AAA	7%
United States	AA+	9%
United Arab Emirates	AA	10%
Saudi Arabia	A–	12%
Chile	A	12%
Morocco	BBB–	15%
India	BBB–	17%
Algeria	B	18%
Oman	BB–	20%
Peru	BBB	21%
Costa Rica	B	21%
Namibia	BB–	22%
Ghana	B–	22%
Brazil	BB–	22%
Nigeria	B+	22%
Bolivia	B+	24%
Tanzania	B	24%
Egypt	B	28%
Zambia	CCC–	38%
Argentina	CCC+	52%

Source: CPI (2023).

Persaud (2025)

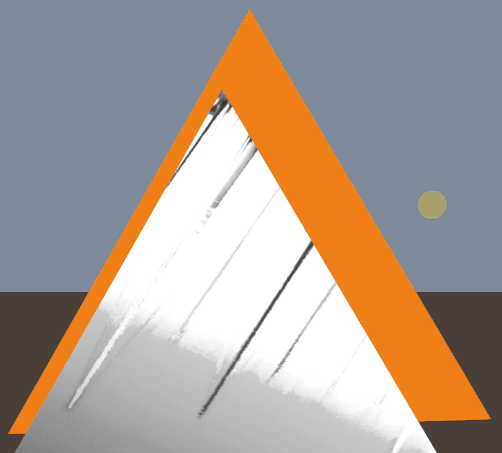
Biased and overly harsh credit ratings

Mean cost of capital to invest in Global South countries becomes higher

This means higher expected returns for private investors to be willing to invest in adaptation / mitigation / transition projects

This requires more concessional / public finance to 'de-risk' investments, guarantee those higher returns, and mobilise / leverage / catalyse private finance if such returns are not possible

De-Risking by Blending

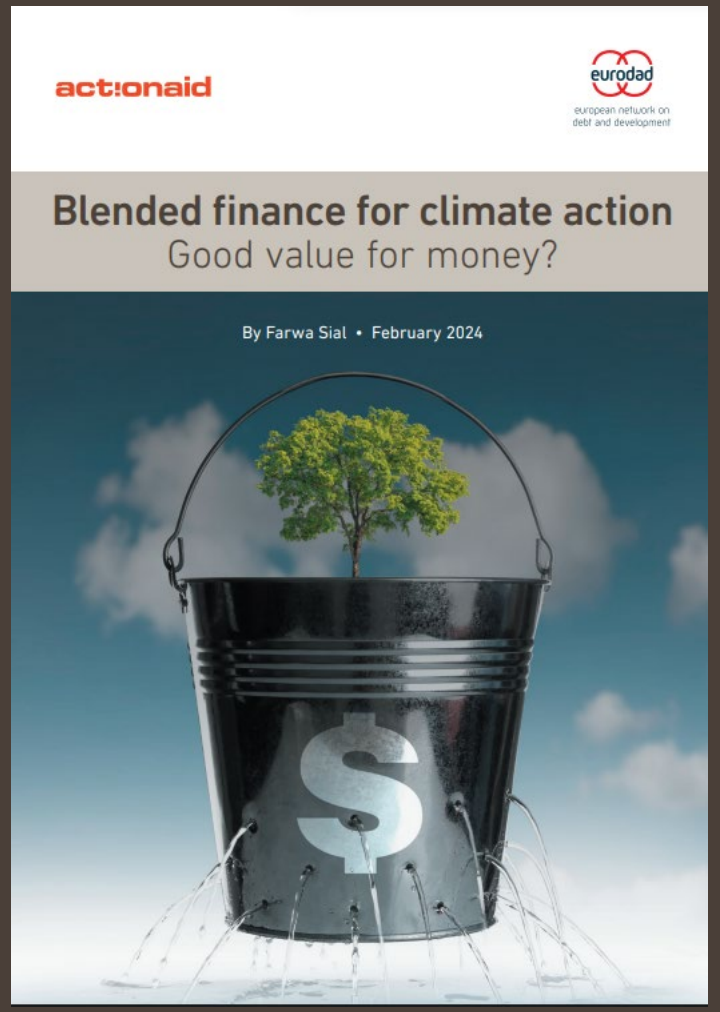


- **If the cost of capital is higher in the South…**
  - …and only de-risked private finance can fund adaptation / mitigation / transition…
  - …then there is a need for ‘blended finance’ tools
- **No clear definition of ‘blended finance’**
  - Sial (2024): no consistency in reporting
  - Broadly, is using public funds to ‘mobilise’ private
  - Typically involve concessional loan tranches, insurance / guarantees against non-payment (by sovereign or user)
  - Underwrite profits for (often Global North) investors

Blended Finance

Table 3: Instruments of blended finance

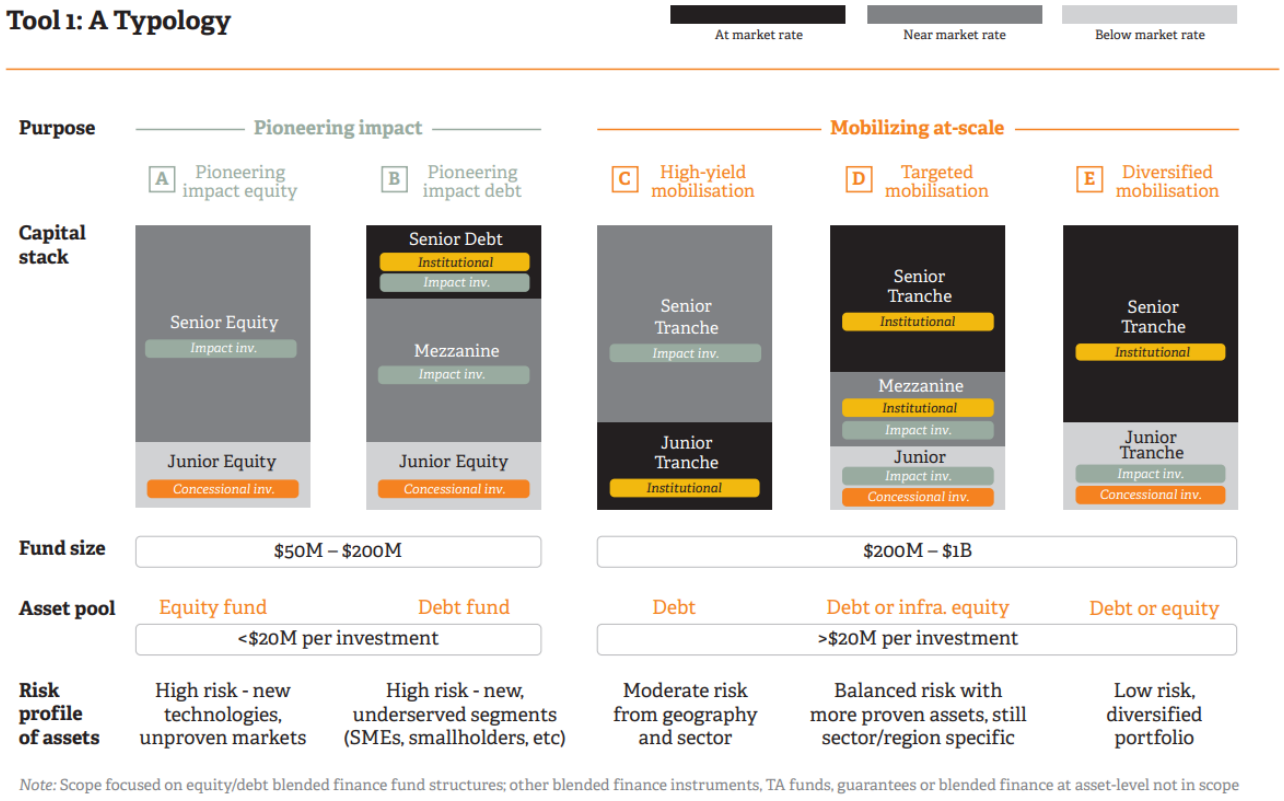
Instruments	Details
Senior debt	This refers to debt that takes priority over other unsecured or otherwise more 'junior' debt owed by the issuer.
Subordinated (sub) debt	A debt that, in the event of default, will only be repaid after all senior obligations have been satisfied.
Equity	When equity mechanisms are used, investors take a share in the ownership of a corporation or a certain project and derive a claim on the residual value of cash flow streams after creditors' claims are met. As in debt structures, there are typically senior and junior (subordinated) tranches.
Risk-sharing guarantees	These can be defined as a type of insurance policy meant to protect financial institutions and investors from the risks of non-payment. They can be tailored to cover specific types of risk, which might be linked to the instruments for which they are used. Guarantees offer the benefit of not requiring immediate monetary outflows by donors.
Grants	These represent the provision of financial resources that do not need to be repaid. Grants help decrease the total funding costs of a given investment project and as such are sometimes used to make projects 'investment ready'.
Performance grants	These represent an award that may be earned or exercised, in whole or in part, based on the attainment during a performance period of one or more performance goals.



Blended Finance – Industry Perspective

Figure 2: Overview of the five identified blended finance fund archetypes

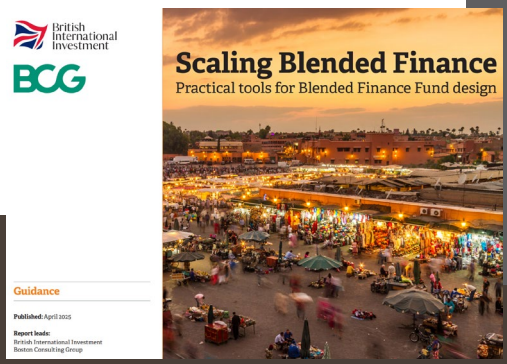
Tool 1: A Typology



Note: Scope focused on equity/debt blended finance fund structures; other blended finance instruments, TA funds, guarantees or blended finance at asset-level not in scope

Investor definitions

Blended finance attracts investors with distinct motivations, risk-return preferences, and roles. This paper organises investors into three broad categories: 'institutional investors', 'impact-driven investors', and 'concessional investors' which we will use consistently throughout. It does not aim to establish a comprehensive taxonomy for the blended finance sector. Instead, these investor categories serve as 'defined terms' for clarify throughout.



'Risking' Green Finance

- **Climate finance doesn't just rely on 'de-risking'**
  - It also requires the establishment of legible climate risks
- **'climate finance' also has to address 'climate risks'**
  - Being able to define these comes before you can 'de-risk' returns on investment itself
- **Defining climate risks = knowledge infrastructures**
  - For example, with carbon pricing, and climate disclosures
  - Folkers (2024): TCFD, IFRS – allow internal risk pricing
- **Climate finance knowledge infrastructures:**
  - Development Finance Institutions create criteria
  - Common Principles for Climate Mitigation Finance Tracking
  - Which in turn rely on codifications of physical climate risk

DFI Methodologies for Climate Finance

Adapted investments vs. investments enabling adaptation and resilience

The following two categories are considered activities for adaptation finance:

	Adapted activities	Enabling activities
Description	Activities that integrate measures to manage physical climate risks and ensure the project's intended objectives are realised despite the risks.	– Activities that directly reduce physical climate risk and/or build the adaptive capacity of the system within which the activity takes place. – Activities that contribute to reducing the underlying causes of vulnerability to climate change at the systemic level and/or removing knowledge, capacity, technological and other barriers to adaptation.
Objective	– Activities that directly reduce physical climate risk and/or build the adaptive capacity of the system within which the activity takes place.	– Adaptation is one of the objectives or the primary objective of the activity.
Scope	– Activities that directly reduce physical climate risk and/or build the adaptive capacity of the system within which the activity takes place.	– System level/other people, nature, assets and/or other economic activities.
Examples	– A water utility vulnerable to increased risk of floods invests in early warning systems to reduce this risk. – Using conductors with operating limits at higher temperature thresholds in a transmission line vulnerable to increased extreme temperature.	– Investment in a start-up offering flood early warning and response systems. – Diversification of water sources needed in a city's water supply system to meet increased demand from a growing population and reducing risks to the water supply system resulting from droughts.
MDBs A&R activity type	Type 1	Type 2 and 3[19]
Adaptation finance quantum	X per cent determined taking a proportional approach as outlined in Annex B.	X per cent to 100 per cent determined taking a proportional approach as outlined in Annex B and based on investment-specific circumstances.

Physical into Investment Risk:

A STEPWISE APPROACH TO INTEGRATE PHYSICAL CLIMATE RISK ASSESSMENT AND MANAGEMENT IN THE INVESTMENT PROCESS

1. Screening for physical climate risks

Determining if the counterparty's assets, operations and workforce are exposed and sensitive to physical climate risk drivers that may affect its performance.

2. Determining physical climate risk materiality

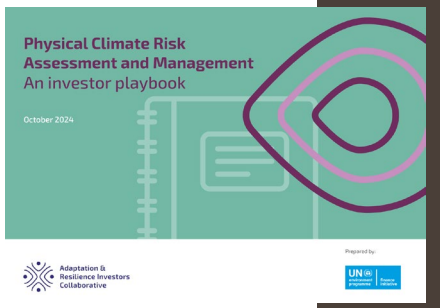
Determining the materiality* of physical climate risk to the counterparty's performance through a climate risk and vulnerability assessment.

3. Identifying adaptation and resilience (A&R) solutions

Identifying A&R solutions to mitigate or avoid the identified material physical climate risks, and engaging with the counterparty to develop an Adaptation Action Plan.

4. Managing physical climate risks

Monitoring performance in the implementation of A&R solutions agreed in the Adaptation Action Plan.



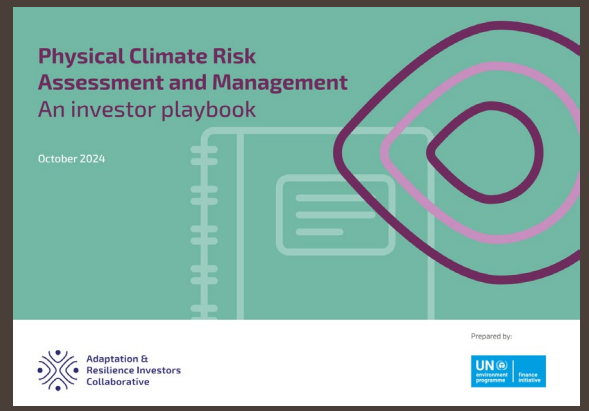
*Materiality is defined as any climate hazard that may impact counterparty operations and financial performance.

Physical into Investment Risk (2):

INTEGRATING PHYSICAL CLIMATE RISK ASSESSMENT AND MANAGEMENT IN THE INVESTMENT CYCLE

The representative investment cycle below demonstrates how to integrate physical climate risk and A&R at each stage of the investment process in a proportional and risk-based manner.

Investment cycle	Key objective	Key output
Screening due diligence	Identify which physical climate risk driver(s) may affect the counterparty's assets and operations over their expected lifetime	Inherent physical climate risk rating[1]
In-depth due diligence	Gain an enhanced understanding of the counterparty's vulnerability to physical climate risk, the related implications, and identify required adaptation and resilience solutions	Residual physical climate risk rating[2] and Adaptation Action Plan
Investment decision	Make an investment decision informed by physical climate risk and identified adaptation and resilience opportunities	Physical climate risk informed investment decision
Investment legal agreement	Secure and formalise the commitment and resources required to increase a counterparty's resilience to climate change shocks and stressors	Adaptation Action Plan in place
Monitoring & reporting	Oversee and support the counterparty to implement adaptation and resilience solutions and build physical climate risk management capabilities	Monitoring performance in the implementation of the Adaptation Action Plan and updated residual risk rating
Exit with value-add	Enhance the counterparty's capability to withstand climate-related shocks and stressors, and longer-term delivery of climate-resilient development objectives	Successful exit and value realisation



But where do managed risks 'go'?

- **What happens when investors aim to manage or reduce physical climate risk…**
  - …but only some risks legible in terms of investment decisions
  - …and only certain projects can be financially 'de-risked' through guarantees, blended finance etc.?
- **Why is derisked external finance prioritised?**
  - What about domestic investment?
  - The risk of exacerbating debt burdens?
  - How do climate finance projects interact with wider funding landscapes (e.g., IPP project feed-in tariffs)
  - What about public ownership of utilities?
  - Whose experience of climate risk does not get to be de-risked?
  - Whose adaptation / mitigation / transition just isn't 'bankable'?

Cases to Discuss: SEACEF

Case study:
Southeast Asia Clean Energy Fund II

The Southeast Asia Clean Energy Fund II is the second fund from Clime Capital, headquartered in Singapore. The fund exemplifies the key drivers of Archetype A:

- It aligns with the '**pioneering impact**' purpose by deploying early-stage capital to accelerate the low-carbon transition in Southeast Asia. The fund focuses on energy technologies, energy storage, energy efficiency, and electric vehicles in frontier markets across the ASEAN region (excluding Myanmar), with a primary emphasis on Indonesia, Vietnam, and the Philippines.
- Its underlying assets are equity instruments.

The capital stack follows the reference design for Archetype A, utilising a two-tranche structure with senior and junior equity tranches. The waterfall mechanism is also consistent, with junior tranche returns subordinated to senior tranche recovery.

Investors in the senior tranche include impact-driven investors such as BII, FMO, Norfund, and the CISCO Foundation. The first-loss junior tranche is anchored by Allied Climate Partners (ACP), a philanthropic investment organisation.

The fund and investment ticket sizes align with typical Archetype A characteristics. The fund achieved a final close of $175 million and seeks to invest approximately $1 million–$2 million into early-stage businesses, with follow-on tickets ranging from $5–$10 million.

A notable addition—not always present in Archetype A funds—is the inclusion of a technical assistance facility, which provides additional support to investees.

$175m

raised by Clime Capital at final close for Southeast Asia Clean Energy Fund II

Cases to Discuss: SEACEF

Investments made by this fund into companies:

For further information about these companies, visit https://www.seacef.org/

INVESTMENT NAME	COUNTRY	REGION	SECTOR	FOSSIL FUEL OR RENEWABLE EXPOSURE	START DATE
Ampotech Pte. Ltd.	Indonesia, Philippine...	Rest of the World	Infrastructure		March 2025
Mober Technology Pte Inc	Philippines	Rest of the World	Business and cons...		June 2024
Nami Solar Energy Joint Stock Company	Vietnam	Rest of the World	Infrastructure		June 2024
Nymble Holdings Pte. Ltd	Singapore	Rest of the World	Infrastructure		March 2025
PT Investasi Hijau Selaras (Hijau)	Indonesia	Rest of the World	Infrastructure		June 2024
Upgrade Energy Philippines, Inc	Philippines	Rest of the World	Infrastructure	Renewable	May 2024
Xurya Pte. Ltd	Indonesia	Rest of the World	Infrastructure		May 2024

Cases to Discuss: SEACEF

NAMI SOLAR

Nami Solar is a subsidiary of Nami Energy and was founded in 2019 by Vietnamese experts and investors, renowned for their experience in the renewable energy sector. We are motivated by the need to address the long-term challenges of climate change. We are inspired by opportunities to collaborate with our partners in order to maximize the huge social and business benefits rooftop solar has to offer.

Our Vision

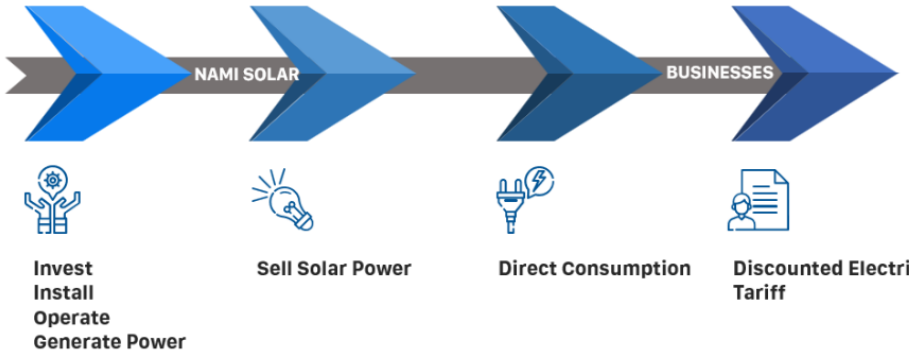
We aim to be a premier rooftop solar developer and a trusted independent power producer in Vietnam.

Our Mission

We advocate green and sustainable growth by providing well-designed rooftop solar solutions delivering both social and commercial benefits for our partners.

Our Solutions

We invest in, install and operate rooftop solar to help businesses switch to solar energy at no cost.



Cases to Discuss: SEACEF

Coatings Manufacturer

22/04/2025

1. Project Overview

This project involved a **coatings manufacturer** in Singapore adopting an advanced energy insight system to optimize operations across its facilities. The primary goals were to reduce energy consumption, lower operational costs, and improve sustainability practices.

2. Challenges Addressed

The manufacturer faced rising energy costs and inefficiencies in energy management, impacting their operational and environmental performance. Without detailed monitoring, it was difficult to identify high-energy-use areas or opportunities for improvement.

3. Solutions Implemented

The company deployed an **energy insight system** featuring machine-level metering, real-time reporting, and alerts. These tools provided detailed visibility into energy usage, enabling targeted efficiency measures and proactive management of energy-intensive processes.

4. Results and Impact

- **Energy Savings:** Achieved a remarkable **48% reduction** in energy consumption, equivalent to **58,510 kWh** saved annually.
- **Cost Savings:** Realized **S$16,506 in savings** within the first year alone.
- **Sustainability Gains:** Enhanced operational efficiency while significantly contributing to the company's sustainability goals.

kWh Change (Year on Year)	Percent Change (Year on Year)	Energy Cost Saving (Year on Year)
-58,510	-48%	S$16,506

Cases to Discuss: Mirova

Case study:
Mirova Gigaton Fund

The Mirova Gigaton Fund is focused on investing in the distributed energy and off-grid landscape, targeting both middle- and low-income countries as well as least developed markets. The fund achieved its first close in 2023.

The fund aligns closely with the principles of Archetype D:

- With a target fund size of $500 million and an average ticket size of $10 million, it focuses on mobilising capital at scale to support the clean energy transition and improve energy access in Africa, Asia, and Latin America.
- It exhibits balanced risk with limited portfolio diversification, concentrating on specific off-grid sectors such as off-grid solar, mini-grids, commercial and industrial solar, telco solarisation, and agri-solar.

The fund's three-layer capital stack is consistent with the reference design for Archetype D:

- The **senior debt tranche** is funded by institutional investors (e.g., Natixis IM).
- The **mezzanine debt tranche** is supported by impact-driven investors (e.g., EIB, DFC).
- The **junior tranche** is funded by a combination of impact-driven investors and concessional funders (e.g., VISA Foundation, NDF, Global Affairs Canada).

The waterfall mechanics align closely with the reference structure. Dividends for the junior tranche are distributed only after repayment of interest and principal to senior and mezzanine debt holders. The junior equity tranche also benefits from upside returns as the exclusive recipient of residuals in the case of overperformance.

A notable variation from the reference structure is the inclusion of a portfolio-level, unfunded guarantee of $50 million.

EU Securitisation Regulation

The EU Securitisation Regulation*, introduced following the Global Financial Crisis, imposes strict requirements on EU-based institutional investors participating in securitisations, investment structures with more than two tranches. If triggered, the regulation requires investors meet enhanced due diligence, risk retention, and reporting obligations in addition to higher capital charges. These requirements are often difficult or too expensive to satisfy in blended finance funds. As a result, European institutional investors avoid three-tier structures altogether, opting instead for simplified two-tranche capital stacks to remain outside the regulation's scope and reduce barriers to investment.

*Regulation (EU) 2017/2402 of the European Parliament and of the Council

Cases to Discuss: Mirova

mirova

ABOUT US INVEST FUNDS RESEARCH IDEAS NEWS

Fund size	Inception date	Minimum investment period	Carbon trajectory
Target $500M	2022	15 years	N/A

Caractéristiques du fonds

Management Company	MIROVA
Geographical area	Emerging markets (Africa, Asia, Latin America)
Legal structure	Société d'Investissement à Capitale Variable, Reserved Alternative Investment Fund
Strategy	Debt investments in energy transition infrastructure in emerging markets, with a focus on high impact distributed clean energy and climate sectors.
Currency	USD
Gérant principal	Christiane Wurdemann

A fund dedicated to energy transition infrastructure in the emerging markets

The Mirova Gigaton Fund aims to mobilize institutional investor support for high-impact investments in climate change mitigation and adaptation, social development, economic infrastructure and gender equality in emerging economies, and particularly in Africa, Asia, the Middle East and Latin America, capitalising on its experience with 3 previous vintages and on projects already invested.
The fund is managed by Mirova and supported by Mirova SunFunder East Africa Ltd as an investment advisor.

Cases to Discuss: Mirova

Policy marker

- Environmental sustainability (cross-cutting) (principal objective)
- Gender equality (significant objective)
- Climate change mitigation (principal objective)
- Climate Change Adaptation (significant objective)

Description

The Gigaton Fund is a US$500 million blended finance debt fund that scales up clean energy transition and climate investments in underserved markets to increase affordable and clean energy use. The Fund aims to improve the environment and well-being of vulnerable populations, especially women in emerging markets. Project activities include mobilizing private sector capital to finance impactful clean energy companies, commercial and industrial solar projects, agri-businesses, and smallholder farmers. The Fund finances over 100 projects to benefit 10 million people, including 50% women, while also demonstrating the potential to mobilize capital at scale to help drive the sector toward long-term sustainable financing.

Expected results

The expected outcomes of this project include: (1) improved access to affordable clean energy and climate-smart solutions by households, individuals (particularly women), and businesses; (2) improved climate adaptation in emerging markets and reduced green house gas emissions ; and (3) increased equitable inclusion of women and other vulnerable groups in global value chains.

Results achieved

N/A

Cases to Discuss: Mirova

Shell Foundation, with co-funding from UK aid from the UK Government via the Transforming Energy Access (TEA) platform, committed $3m to the Fund that will be used as a catalyst in the Junior tranche and facilitate a $30m investment for the e-mobility value chain.

The Fund has a target size of $500m and expects to deploy U$1.2bn of private debt throughout its 15-year life primarily to small and medium-sized enterprises (SMEs).

“Shell Foundation and the UK government’s investment was catalytic in decreasing risks and unlocking support from DFC, SwedFund and Sida. Natixis Private Equity also invested in the fund to further mobilise private investors,” said Ryan Levinson, Director of the Mirova Gigaton Fund, Head of Emerging Market Energy Transition.

The Fund has already constituted a pipeline of investments in over 30 countries and continues to actively seek new investable opportunities that further the efforts to build a sustainable and low carbon future. The Mirova Gigaton Fund complements one of the key aims of the TEA platform, creating and scaling business solutions to enhance access to clean energy for underserved communities in Africa and Asia, to transform health, education, and income generation.

“We are proud to play a catalytic role with the UK government that enabled Mirova SunFunder to mobilise substantial capital for the Distributed Renewable Energy sector, which we believe represents the most cost-effective route to meeting the energy needs of millions of underserved consumers across Africa and Asia.” said Richard Gomes, Chief Programme Officer at Shell Foundation.

“More specifically, we see huge impact potential in supporting urban transporters transition from petrol or diesel to electric vehicles in Africa and Asia, and believe the Mirova Gigaton Fund, alongside the collective experience and networks of the partners, will bring substantial impact in these regions.”

See the Mirova SunFunder press release

News 22nd March 2023

SF & FCDO provide catalytic funding to new Mirova SunFunder Fund

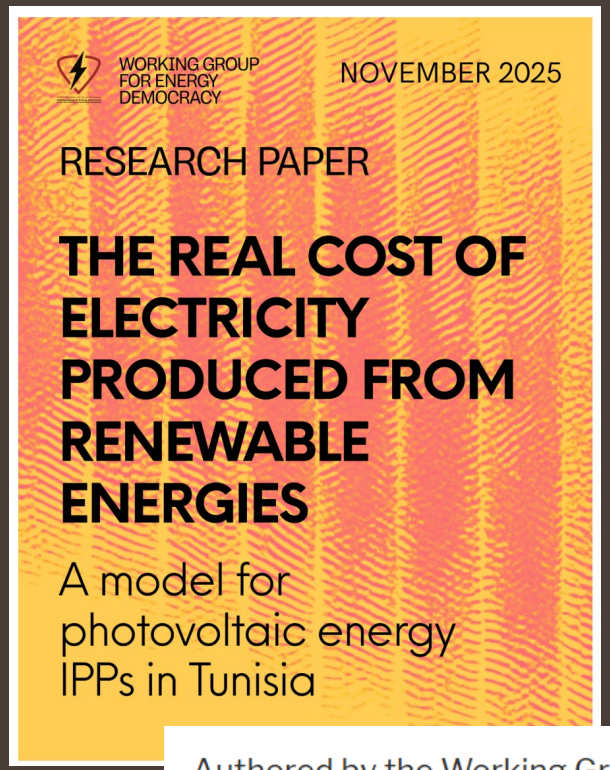
Financial Solutions | Micro-Entrepreneurs | East Africa | Electric Vehicles

Mirova, the affiliate of Natixis Investment Managers dedicated to sustainable investment – supported by Mirova SunFunder East Africa Ltd as Investment Advisor (a wholly-owned subsidiary based in Nairobi) – last week announced a $171m first close of its Mirova Gigaton Fund which aims to accelerate the clean energy transition in emerging countries in Africa and Asia.

UKaid from the British people

Transforming Energy Access

Alternatives?



Authored by the Working Group for Energy Democracy of Tunisia, the paper shows that public solar would be far less expensive than the current approach, which privileges IPPs while imposing excessive costs on the Tunisian people. Under current legislation, private solar PV projects obligate the public power company to buy all the electricity produced at a fixed price according to the proposed capacity. Efforts to reduce energy prices were in vain because the public structure was required to purchase electricity at a higher fixed price (for example, 48 USD/MWh instead of 40 USD/MWh for 10 megawatt projects under the average price of electricity sold to the public structure). In other words the private approach has been burdening public budgets in order to create investor profits that could otherwise have been avoided if the public utility had completed these projects.