British International Investment

FMO
Entrepreneurial Development Bank

Adaptation & Resilience Investors Collaborative

Climate Investment Playbook

Guidance

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Foreword

If someone asks you to picture what a climate investment looks like, what's the first image that springs to mind? A typical answer is likely to be a wind farm, or perhaps a solar power plant.

While investment in these types of large renewable energy infrastructure projects is vital, they are by no means the only climate finance opportunity available to investors. They form one part of a wide spectrum of opportunities spanning all sectors, from manufacturing to real estate through to natural assets.

The climate investment market has grown rapidly in recent years. As heat waves, floods and droughts increasingly make headlines worldwide, climate adaptation and resilience solutions are becoming a more prominent focus for investors. The World Economic Forum estimates that climate adaptation could be worth $2 trillion per year by 2026. In 2023, venture capital and private equity invested $56.5 billion into companies offering climate solutions. It includes businesses such as Fasal, which uses AI and the Internet of Things to provide farmers with insights to optimise water and fertiliser use in the face of climate change, and Battery Smart, which is building India's largest network of battery swapping stations for two- and three-wheel electric vehicles. The company's helping drivers to earn more as well as improving air quality.

For venture capital and private equity investors who are new to climate investing, it can be challenging to navigate the world of climate investment and climate impact management. Today there are several frameworks and methodologies seeking to help investors on their journey, but few are tailored to venture capital or private equity investing, particularly in emerging markets.

From working with venture capital investors within our own portfolios, we know that often investors have the appetite to step up their climate finance commitments but need clarity on how to get started. We're publishing this guidance to address this challenge.

This playbook provides a holistic picture of climate finance: what it is, why it matters, and how to invest in climate solutions. It focuses on all kinds of climate impact – from avoiding greenhouse gas emissions, to supporting communities to prepare and respond to the adverse effects of climate change. It explains the steps an investor can take to integrate climate finance into the investment process, as well as identifying and assessing impact. We've made sure it aligns with key international climate investment frameworks too.

At BII and FMO, driving clean, inclusive and climate-resilient growth in the countries where we invest is a key priority. We are committed to engaging and empowering investors and businesses to contribute to our climate ambitions and meeting the goals of the Paris Agreement. There is huge opportunity ahead and we hope this guidance helps investors to maximise it.

Nicola Mustetea
Director, Climate Change
British International Investment

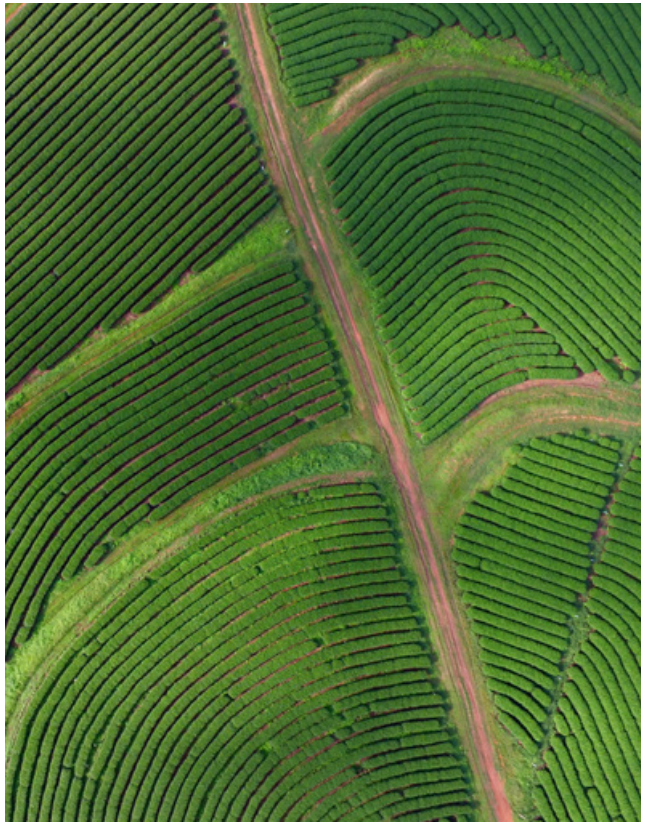
Jorim Schraven
Director, Impact
FMO

$2 trillion

estimated value of climate adaptation per year by 2026

$56.5 billion

invested in climate solutions by venture capital and private equity in 2023



Introduction

Private equity (PE) and venture capital (VC) investors are seizing the climate opportunity. In 2023, climate-focused companies attracted 10 per cent of total PE and VC investment, up from just 1.5 per cent in 2013.[1] PE and VC's model of active stewardship of businesses and long-term investment means it is well placed to identify opportunities to drive the transition to a low-carbon and climate-resilient economies.

This playbook supports PE and VC investors to originate and assess climate deals.

Understanding what qualifies as a climate investment can be challenging, with multiple frameworks, taxonomies, and greenwashing risks to navigate. This playbook gives investors practical information and tools for overcoming these challenges. While primarily designed with an emerging market lens, its principles and criteria apply across markets.

This playbook addresses three key questions:

1. What
is climate investing?

Key principles and examples

2. Why
invest in climate?

The climate opportunity and key market trends

3. How
to invest in climate solutions?

Climate investment strategy; approach to identifying and assessing climate investment opportunities through the investment process; examples of climate investments in mitigation and adaptation solutions.

1 PwC (2023) https://www.pwc.com/gx/en/issues/esg/state-of-climate-tech-2023-investment.html (data refers to first three quarters of 2023).

10%

of PE and VC investment went towards climate-focused companies in 2023

About this playbook

It focuses on investments in companies offering climate mitigation and adaptation-enabling solutions

These are technologies, products, and services that enable people, economies, and the planet to decarbonise and become resilient to climate shocks and stressors.

It is designed for PE and VC investors relatively new to climate investing

Although the focus is on equity investments in climate solutions, it is equally applicable to providers of debt capital.

It offers guidance on integrating climate investment criteria and impact assessment in the investment process

It focuses on how to originate and assess climate investments, underscoring that climate impact management and monitoring during the holding period and exit are core parts of the climate investment cycle.

It provides examples of climate mitigation and adaptation solutions across multiple sectors

along with specific assessment criteria, where applicable, to enable the qualification and quantification of climate finance.

It builds on elements of key climate investment framworks, and it was peer-reviewed

such as the EU Taxonomy; the Common Principles for Climate Mitigation and Climate Adaptation Finance of a group of Multilateral Development Banks (MDBs) and members of the International Development Finance Club (IDFC); the Climate Resilience Investments in Solutions Principles (CRISP); the Adaptation Solutions Taxonomy, the Taxonomy for Adaptation and Resilience Investments, and Climate Bonds Initiative's (CBI) forthcoming Resilience Taxonomy (*see Annex for details*). Given increasing climate-related regulations, investors should consider the specific requirements of the jurisdiction that applies to them.

01

What is climate investing?

For PE and VC investors, climate investing means investing in companies offering climate solutions.

Climate finance is...

An umbrella term for capital allocation in climate change mitigation and adaptation and resilience (A&R) solutions.

A climate investment is...

An investment in a company offering a technology, product and/or service	▶	**addressing the causes** (mitigation) and / or the **consequences** of climate change (adaptation and resilience)

There are two key types of climate solutions: i) mitigation solutions, and ii) A&R solutions.

A climate mitigation investment is...

An investment in a company offering a technology, product and/or service	▶	**Avoiding** **Reducing** **Removing**	▶	**Greenhouse gas emissions**

Mitigation solutions include:

Renewable power generation		**Avoids** GHG emissions
Energy efficiency products		**Reduces** GHG emissions
Reforestation		**Removes** GHGs from the atmosphere

A climate A&R investment is...

An investment in a company offering a technology, product and/or service enabling others to:	▶	**Prepare & prevent** **Respond** to **Recover** from	▶	The risk and impacts of climate change

A&R solutions include:

Climate risk analytics		Enable others to **prepare for & prevent** the impacts of climate change
Cooling technologies		Enable others to **respond** to the impact of climate change
Climate insurance		Enables others to **recover** from the impacts of climate change

Climate solutions that can simultaneously deliver on both mitigation and A&R impacts

Examples of 'cross-cutting' climate solutions include:

Solar-powered water efficient irrigation system	**Mitigation impact** **A&R impact**	**Reduces** GHG emissions by replacing diesel-powered irrigation Enables farmers to **prepare** for & **respond** to drought
Mangrove restoration	**Mitigation impact** **A&R impact**	**Removes** GHGs from the atmosphere **Prevents** storms from impacting coastal infrastructures and people

Investment opportunities in climate solutions exist across sectors and geographies

Here is an overview of examples. The 'climate opportunities by sector' section provides further details, including on climate solution-specific assessment criteria.

Agriculture, Forestry & Fisheries

Mitigation: Biochar production; Anaerobic waste digesters; Electric boats for fishing

A&R: Water-efficient irrigation; Drought tolerant crops; Efficient cold storage.

Cross-climate: Solar irrigation; Agroforestry

Energy

Mitigation: Wind generation; Solar generation; Hydropower

A&R: Weather forecasting for grid resilience; Weatherisation of renewable energy assets

Cross-climate: Off-grid solar

Manufacturing

Mitigation: Low-carbon cement; Green steel; Electrification of industrial processes

A&R: Water-efficient equipment; Energy-efficient cooling equipment

Cross-climate: Supply chain optimisation

Real Estate/Buildings

Mitigation: Rooftop solar; Insulation; Sustainable building materials

A&R: Green roofs; Rooftop rainwater harvesting

Cross-climate: Energy-efficient cooling

Transport

Mitigation: Electric vehicles (EVs); low emission fuels; EV charging infrastructure

A&R: Remote sensing systems to identify damaged infrastructure

Cross-climate: Renewable charging infrastructure

Water

Mitigation: Solar-powered water treatment; Demand monitoring systems

A&R: Water storage & harvesting

Cross-climate: Solar-powered desalination; Waste-water recovery and reuse; Non-revenue water reduction

Waste

Mitigation: Recycled materials; Waste to energy; Methane capture

A&R: Fire-safety landfill structures

Cross-climate: Decentralised waste stations

Digital & Communication Technology

Mitigation: Efficient data centres

A&R: Climate risk modelling services; Crop data analytics

Cross-climate: Digital climate advisory services to farmers

Nature-based Solutions

Mitigation: Satellite systems to measure and monitoring carbon stocked in forests

A&R: Bioswales; Green roofs; AI-tools modelling climate impacts on forests to support forest management

Cross-climate: Mangrove restoration

Health

Mitigation: On-site renewables for hospitals

A&R: Disease surveillance systems; Early warning systems

Cross-climate: Energy-efficient cooling to manage heat stress.

Financial Services

Mitigation: EV finance

A&R: Climate insurance; microfinance for climate-resilient agriculture

Cross-climate: Green mortgages for buildings certified for energy performance and climate resilience

02

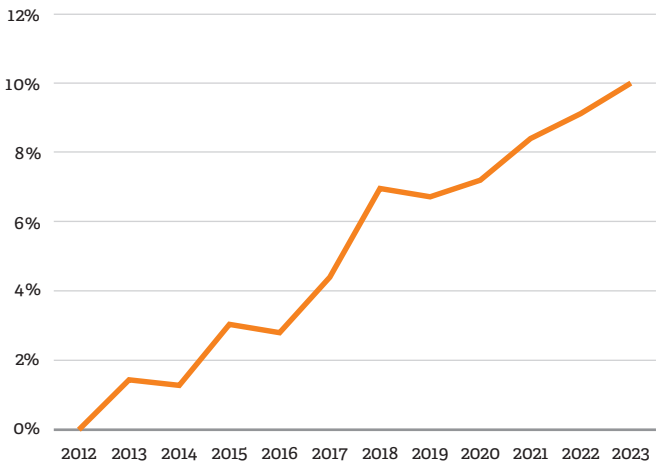
Why invest in climate solutions?

Over the past decade, climate investing has grown from a niche market to a widely recognised space that attracts billions of PE and VC capital. In 2023, VC and PE invested $56.5 billion into companies offering climate solutions.[2]

The scale of the opportunity has attracted more than 25,000 climate investors, with over 2,000 making their first climate investment in the last year.[3]

Investing in climate has become an increasingly tangible and appealing opportunity given the multiple drivers at play.

Figure 1. Share of climate tech investing as a proportion of global private equity market and grant investment



Drivers of climate investing

1. Policy & regulation
2. Technology developments
3. Climate risks and impacts
4. Consumer demand
5. Business demand
6. Investor demand

2 Pitchbook data; PwC analysis.
3 PwC (2023) https://www.pwc.com/gx/en/issues/esg/state-of-climate-tech-2023-investment.html

1. Policy & regulation

Governments are increasingly required to meet decarbonisation commitments and address the impacts of climate change.

This has driven policies and regulations supporting climate investments and the uptake of climate solutions, such as financial incentives and carbon taxes.

Figure 2. Climate pressures on governments drives policies that foster the demand for climate solutions

$143 billion
Estimated annual cost of climate change-attributed extreme weather events (2000-2019)

40%
of the global economy covered by climate risk disclosure requirements (once pending disclosure rules come into force)

145 countries
Have set or are considering net zero targets

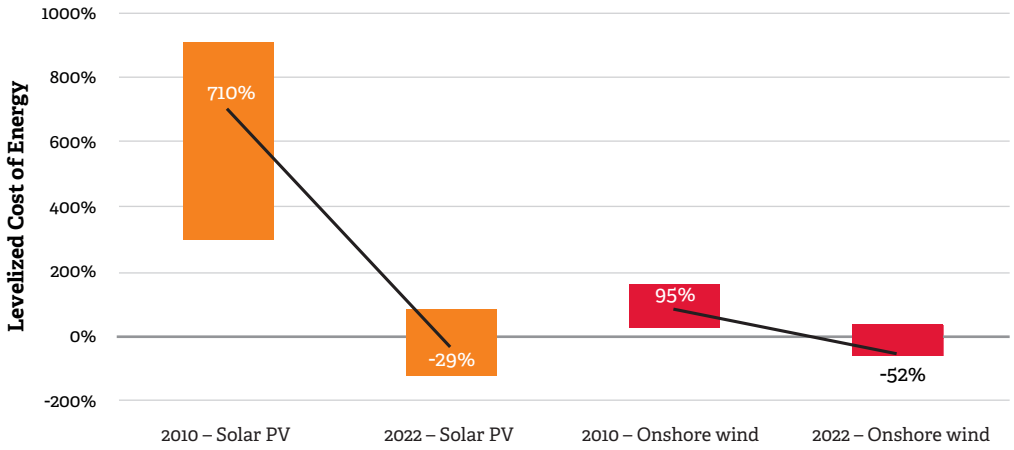
183
Pieces of legislation passed globally to support the deployment of electric vehicles

2. Technology developments

Technology developments are reducing the costs of climate solutions, making them increasingly cost-competitive compared to conventional alternatives.

For example, as Figure 3 shows, between 2010 and 2022, solar and wind power became cost-competitive with fossil fuels, even without financial support. Technological innovation and increasing deployment should continue to unlock new solutions and reduce the costs of existing ones.

Figure 3. Change in competitiveness of solar and wind generation since 2010 (cost below zero per cent indicates a levelized cost of energy lower than fossil fuel generation)



Source: *IRENA (2023) Renewable Power Generation: Costs in 2022*

3. Climate risks and impacts

The climate adaptation opportunity is significant and growing.

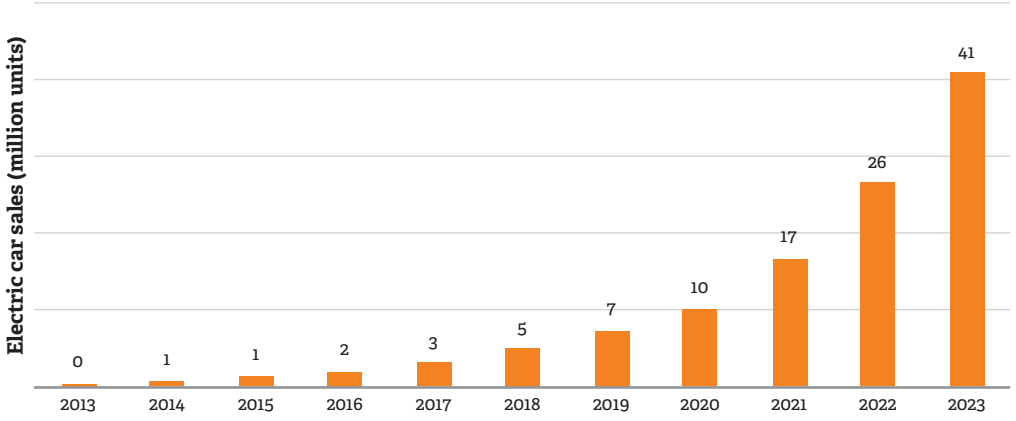
Over the past 50 years, weather, climate and water-related disasters have had a total economic cost of US$4.3 trillion, with costs rising every decade.[4] The need to prevent and reduce climate-related risks on economies and societies is expected to grow inexorably in the coming decade, regardless of the pace of decarbonisation. A&R solutions are, therefore, essential and a *$2 trillion market opportunity the private sector cannot ignore.*[5]

4. Consumer demand

Consumers are increasingly experiencing the adverse effects from climate change and becoming more aware of their climate impact.

This drives demand for climate technologies, products and services that can address issues like drought, extreme heat, flooding, and food insecurity, as well as for climate mitigation solutions like EVs.

Figure 4. Global electric car sales since 2013



Source: *IEA (2024) Global EV Outlook 2024: Moving towards increased affordability*

4 WMO (2023) https://wmo.int/publication-series/atlas-of-mortality-and-economic-losses-from-weather-climate-and-water-related-hazards-1970-2021

5 World Economic Forum (2022) https://www.weforum.org/agenda/2022/11/climate-change-climate-adaptation-private-sector/

5. Business demand

Companies increasingly require technologies, products and services to prepare, prevent, respond to, and recover from climate-related impacts.

This is particularly relevant in emerging markets, where impacts on agriculture, infrastructure and supply chains are often most severe.

Companies are also under pressure to decarbonise their activities. This creates a particular opportunity for investment in climate solutions to energy intensive activities such as agriculture, manufacturing and logistics with high GHG emissions.

86%

of corporates in emerging markets surveyed by BII reported that climate change is impacting their organisation today

Source: *BII (2023) Emerging Economies Climate Report 2023*

8000

companies have submitted Net Zero targets

Source: *SBTi; Companies taking action*

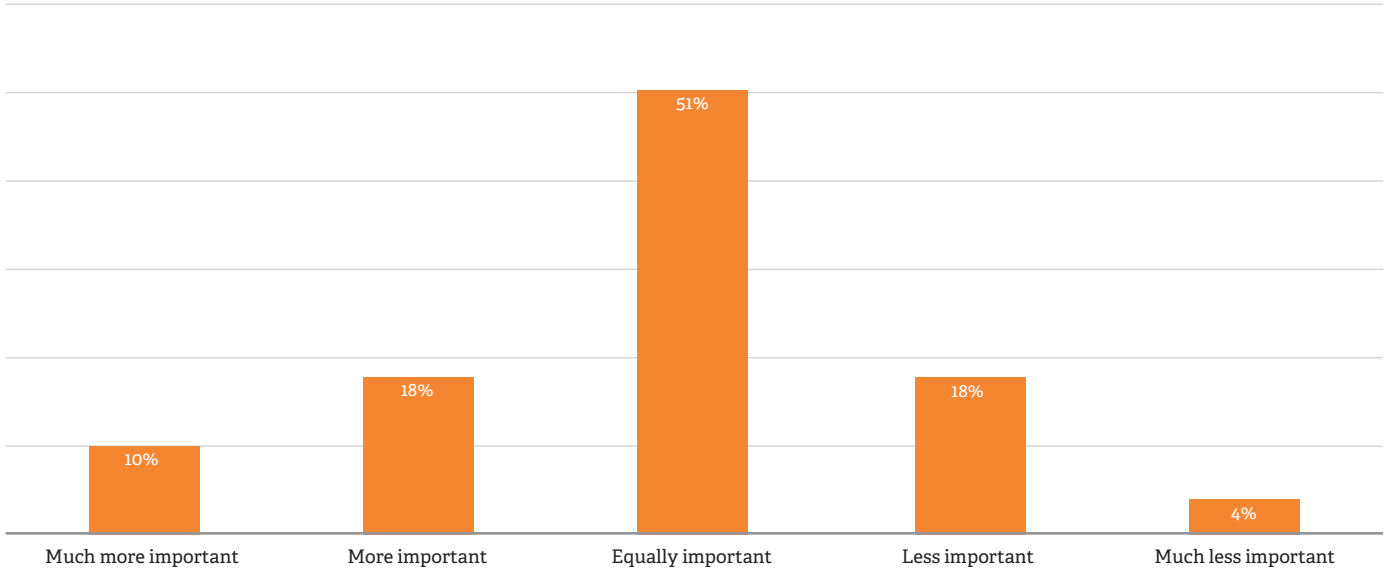
6. Investor demand

Limited Partner investors are recognising the importance of ensuring climate change risks do not erode the value of their assets as well as of realising the opportunity offered by investments in climate solutions.

Asset values can be reduced directly by damage caused by climate-related events such as flooding or wildfires, or by assets becoming 'stranded' as the global economy transitions to low-carbon alternatives. The need to manage and disclose climate-related risks, as well as the growing understanding about the climate opportunity, is leading asset owners to increasingly place a focus on climate investing. On a global basis, 86 per cent of asset owners are implementing sustainable investment into their investment strategies.[6]

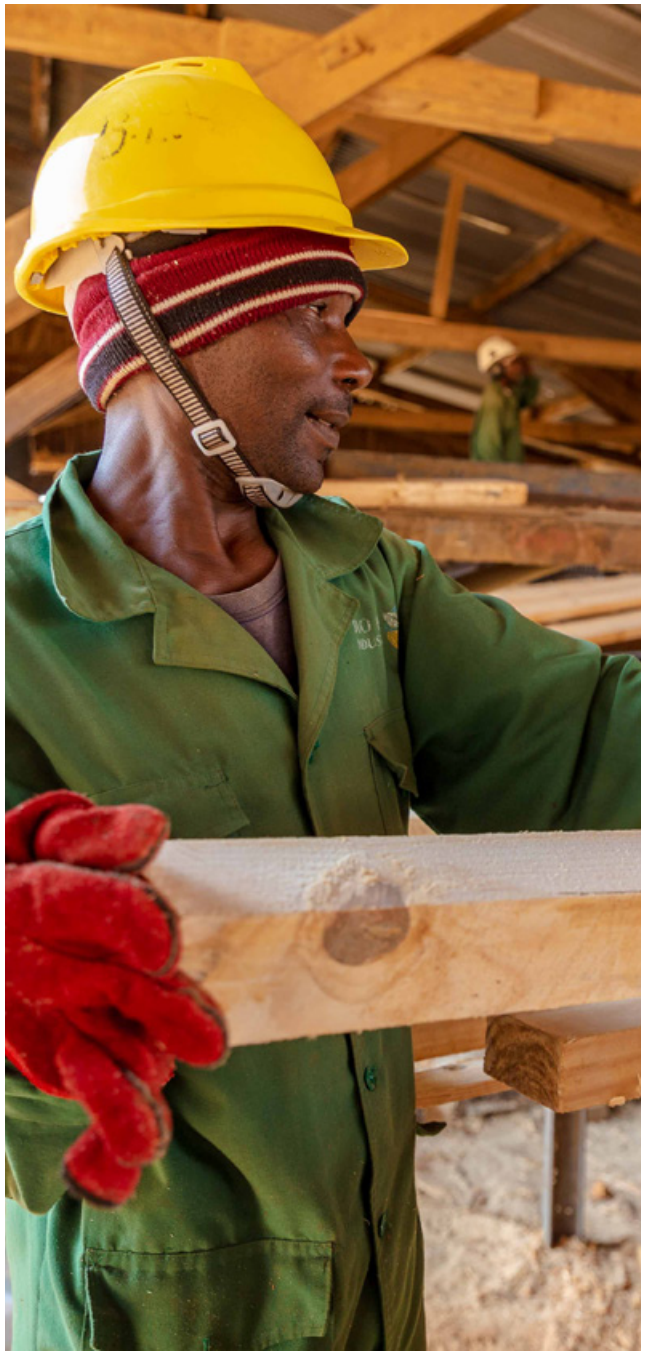
Recent surveys show that A&R is now a strategic focus for the majority of the world's top finance firms, and that firms are actively working on A&R investment and financing strategies.[7] VC and PE investors recently indicated that investments in companies with technologies addressing climate-change-induced water-related risks are a top priority.[8]

Figure 5. Importance to institutional investors of climate risk disclosure relative to financial risk disclosure



Source: *WRI (2024) Corporate Climate Disclosure Has Passed a Tipping Point. Companies Need to Catch Up*

6 FTSE Russell (2022) https://www.lseg.com/content/dam/ftse-russell/en_us/documents/reports/global-asset-owner/sustainable-investment-2022-global-survey-findings-from-asset-owners.pdf
7 Standard Chartered Bank (2023) https://www.sc.com/en/campaigns/adaptation-economy/
8 Mazarine Ventures (2024) https://www.mazarineventures.com/post/climate-adaptation-survey-2-of-3



Market trends in climate investing

Investment in renewables and EVs has been a significant trend in the past decade.

Falling tech costs, supportive policies, demonstrated returns on investment and growing demand suggest these areas are well-placed to keep attracting investment. This is reflected in emerging markets, where electricity demand often outstrips supply, and fast-growing cities require affordable solutions to congestion and air pollution.

Beyond renewable power generation and EVs, several opportunities may interest emerging market investors. These include battery storage, renewable-powered mini grids, and grid management solutions that help users to maximise the available power. Within e-mobility, two- and three-wheeler vehicles, charging stations and battery swapping solutions can provide affordable alternatives to traditional modes of transport. Two or three-wheelers are the most electrified market segment today; in emerging markets and developing economies, they outnumber cars. India is one of the world's fastest-growing EV markets with more than 90% of its 2.3 million electric vehicles are the cheaper and more popular motorbikes, scooters and rickshaws; over half of India's three-wheeler registrations in 2022 were electric.[9]

Climate tech can provide a vast array of opportunities for investors.

Many PE and VC investors have extensive track records of investing in the tech space. Investing in tech-enabled climate solutions can, therefore, provide them with a natural entry point for climate investing. With climate investing and artificial intelligence (AI) both prominent trends in PE/VC investing, the intersection of these two spaces appears likely to attract significant investor interest.

74%

Proportion of climate tech equity funding to energy or mobility businesses (2022–2023)

Source: *PwC (2023) State of Climate Tech 2023*

Water technology

As the threat of water scarcity ramps up, water is becoming the next big climate tech bet and a trickle of VCs are cottoning on.

Innovative water solutions are increasingly coming to the fore from start-ups and more mature corporates – from techs pulling water out of air, AI sensors detecting leakages in pipes, to wastewater reuse technologies taking water 'from the tap to the toilet'.

Ag-tech

Climate-smart agricultural approaches and technologies can deliver a *triple win* for food security. They can help increase farmers and agri value chain's climate resilience, boost productivity, and reduce GHG emissions in an inclusive way.

Carbon markets are triggering new opportunities at the intersection of agtech and fintech.

Climate data and services

Climate services are critical for water, food, energy and health security. All sectors need climate data and services including early warning systems, and geospatial weather and climate risk analytics to prevent and prepare for changing climate conditions.

Climate services for early A&R action pays off: $1 spent on early warning can avoid up to $20 worth of losses.

Climate Fintech

Climate Fintech refers to those solutions at the intersection of climate, finance, and digital technology.

Fintech provide an opportunity to connect climate vulnerable users to services such as climate insurance to cushion the effects of climate shocks.

Nature-based solutions

NbS refer to solutions that protect, sustainably manage or restore ecosystems.

They provide benefits to humans, biodiversity, assets, and economies. Nature-tech is a key emerging investment opportunity. VC investments in nature tech startups amounted to $7.5 billion over the past five years.

9 IEA (2023), https://www.iea.org/reports/global-ev-outlook-2023

Watertech (water technology)

Water-tech innovation address challenges across a wide spectrum of market segments - from agriculture, process industry, power generation, manufacturing, semiconductors, and food and beverages.

In 2023, the water startups ecosystem is valued at over $25B.

Water treatment companies have attracted the largest share of VC funding, mostly directed to the wastewater treatment segment.

Water management solutions: SunCulture uses off-grid solar technology to give customers reliable access to solar-powered water efficient irrigation systems.

Agtech (agricultural technology)

Agtech solutions give investors the opportunity to overcome typical barriers to servicing of large numbers of disperse farmers by investing in companies providing tech solutions. Prominent areas include:

Data and AI: Fasal is an Indian firm using AI and the Internet of Things (IoT) solutions to provide farmers with insights for optimising water and fertiliser.

Climate data and services

Companies across sectors increasingly rely on climate data to make informed decisions and meet reporting obligations. Examples include:

Carbon management, accounting, and reporting: enabling companies to measure, report and act on their GHG emissions, or measure, report and verify the carbon credits generated by their projects.

Understanding the physical climate risk to assets: for example, the likelihood and severity of flooding, wildfire, or drought. Skymet provides forecasting insight to the insurance, power, and agriculture sectors in India.

Fintech (financial technology)

Fintech solutions give investors several opportunities to deliver climate impact. Examples include:

Financing climate products and services: Hohm's marketplace lets customers in South Africa access finance for rooftop solar energy and battery storage solutions.

Innovative insurance: BlueOrchard's InsuResilience funds invest in companies offering climate insurance to vulnerable populations, helping them recover from climate impacts such as flooding and drought.

$640 million

Agri-foodtech funding raised in Africa in 2022 – a 22% increase year-on-year, and the biggest regional increase globally

Source: *AgFunder (2003) Global AgriFoodTech Investment Report 2023*

$2.2 billion

Global Climate Fintech funding in 2022. Up from $1.8 billion in 2021

Source: *Dealroom (2022) Going green with climate fintech*

Nature-tech are an emerging opportunity that can simultaneously deliver positive climate mitigation and A&R impacts.

Nature-based Solutions (NbS) can contribute to climate mitigation, and ecosystem-based adaptation because they can sequester carbon while helping to reduce the incidence and impacts of flooding, landslides, and other climate-related disasters.

Nature tech refers to a broad set of technologies that can accelerate and scale the implementation of high-quality NbS.

Market demand for NbS is being reinforced by regulatory and industry developments such as the Taskforce on Nature-related Financial Disclosures (TNFD) as well as the opportunity offered by voluntary carbon markets. Carbon credits are a potential growth area for NbS. The voluntary carbon market is worth $2 billion (2023), with expectations of significant future growth.[10]

Examples of nature-tech include the deployment of drone technology for reforestation or satellite-based digital monitoring, reporting and verification (MRV) systems to generate carbon credits from the enhancement of natural ecosystem and demonstrate their benefits. MRV-related solutions have experienced strong momentum growing from $120 million in 2018 to $306 million in 2022 (+155% in five years).[11] Such solutions are seen as critical to provide confidence in the delivery of positive GHG mitigation impacts.

Café Selva Norte is the example of a company that farms coffee in a way that generates carbon credit through forest conservation and restoration.

$200 billion

Global finance flows to Nature-based Solutions in 2023 – an 11% increase from 2022

Source: *UNEP (2023) State of Finance for Nature*

$7.5 billion

VC investment into nature-tech startups between 2018–2022

Source: *Nature4Climate (2024) The State of Nature Tech*

37%

of mitigation needs to achieve the Paris Agreement targets by 2030 could be met by nature-based solutions

10 Reuters (2023) https://www.reuters.com/markets/carbon/voluntary-carbon-markets-set-become-least-five-times-bigger-by-2030-shell-2023-01-19/

11 Nature4Climate, MRV and Serena (2023), The State of Nature Tech - https://nature4climate.wpenginepowered.com/wp-content/uploads/2023/10/N4C-The-state-of-nature-tech-final.pdf

03

How to approach climate investing

Key steps for approaching climate investing

The starting point for climate investing is defining climate impact objectives and developing an investment strategy geared towards achieving them.

It implies determining positive and measurable climate impacts targeted to solving key climate change challenges and defining how to realise them to achieve the intended climate impact objectives.

Investors seeking to design and implement a climate investment strategy can consider the following key steps informed by the Operating Principles for Impact Management.[12]

1. Define strategic climate impact objectives

The goals of the Paris Climate Accord provide the 'north star' for defining climate impact objectives:

	A&R	Mitigation
Paris climate goals	To reduce vulnerability to climate change by enhancing adaptive capacity and strengthen resilience	To limit global warming to 1.5C
Climate solutions required	Solutions enabling to prepare and prevent, respond to and/or recover from climate impacts	Solutions enabling to avoid, reduce and/or sequester GHG emissions

The Sustainable Development Goals (SDs) also point investors to climate impact investment outcomes. Beyond SDG 13 on *climate action*, other SDGs also integrate climate outcomes - SDG 1.5 on *no poverty*,[13] SDG 2.4 on *zero hunger*[14] and SDG11 on *sustainable cities and communities*.[15]

Gender, diversity, and inclusion are critical factors to consider in a climate investment strategy.[16]

This is because disadvantaged and marginalised groups are often the most vulnerable to the impacts of climate change. These groups also play a unique role in driving the adoption of climate A&R and mitigation solutions, as well as developing climate solutions. There is some evidence that green start-ups are more often established by women.[17]

12 The Operating Principles for Impact Management provide investors with framework for the design and implementation of their impact management systems, ensuring that impact considerations are integrated throughout the investment lifecycle.

13 SDG 1.5., *"By 2030, build the resilience of the poor and those in vulnerable situations and reduce their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters".*

14 SDG 2.4., *"By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality".*

15 SDG 11b. *"By 2020, substantially increase the number of cities and human settlements adopting and implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and develop and implement, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management at all levels".*

16 The concept of a 'just transition' refers to ensuring the benefits of transitioning to a net zero and climate-resilient world are maximised in a way that is fair and socially inclusive. This includes an emphasis on creating high-quality jobs for those whose employment may be vulnerable as the global economy shifts. 'Just adaptation' recognises the importance of ensuring A&R measures meet the needs of people who are most vulnerable to the impacts of climate change. The Private Equity and Value Creation: A Fund Manager's Guide to Gender-smart Investing provides a step-by-step guide for incorporating a gender focus into the investment approach. See also the "Gender & climate finance toolkit."

17 EIB (2023), Business case for women's leadership, https://www.eib.org/en/stories/climate-women-profits

2. Set measurable performance metrics and targets

To manage impact achievement at the porftolio level an investor can set measurable climate impact targets and establish a process to measure and monitor climate impact performance for the whole portfolio, while recognizing that impact may vary across individual investments in the portfolio.[18] Establishing climate impact targets can enable an investor to:

- Inform portfolio allocation.
- Demonstrate the impact achieved to investors and regulators.

Mitigation impact targets typically focus on GHG emissions avoided, reduced, or sequestered. Proxies such as renewable energy deployment are also common.

A&R impact targets are more varied as one singular metric cannot be used to assess climate impact across people, the planet, and economy.

80%

of people displaced by climate change are women

Source: *UNICEF (2023) Climate Change's greatest victims are women and girls*

Examples of A&R and mitigation impact metrics for target setting structured around which stakeholder stand to benefits from a climate investment

Impact dimension	PEOPLE	PLANET	ECONOMY
Examples of A&R metrics	Number of people (#) supported to be more climate-resilient through access to A&R solutions	Number of hectares (#) of natural assets under climate-resilient management	Value of assets (USD) made more climate-resilient due to the investment Increase in investee's turnover (USD/ year) derived from the sale of A&R solutions
Examples of mitigation metrics	Number of people (#) with improved energy access.	Farmland under regenerative agricultural practices (ha and % of acreage farmed)	Number (#) of green jobs generated

Examples from fund managers

Investors	PEOPLE	PLANET	ECONOMY
Wavemaker Impact		Reduce 10 per cent of global GHG emissions	Investees' potential to reach US$100 million in high-margin recurring revenue
Climate Fund Manager's Climate Investor Two	14 million people supplied with safe drinking water	Avoid 3.5 million tons of GHG emissions annually	USD 2.5 billion private sector funds catalysed
Mirova's Land Neutrality Fund	70,000 employees and smallholders benefiting from the projects	350,000 ha under Sustainable Land Management 25 million of CO_2 sequestered	

18 Source: OPIM https://www.impactprinciples.org/index.php/9-principles

Useful resources for establishing A&R impact targets include the targets established within the Global Goal on Adaptation or the framework developed by the Adaptation & Resilience Investors Collaborative.

Theme	Global Goal on Adaptation Framework (COP28: CMA5, art. 9)	Alignment with SDGs
Ecosystems	Reducing climate impacts on ecosystems and biodiversity, and accelerating the use of ecosystem-based adaptation and nature-based solutions, including through their management, enhancement, restoration and conservation and the protection of terrestrial, inland water, mountain, marine and coastal ecosystems;	
Food, Agriculture & Forestry	Attaining climate-resilient food and agricultural production and supply and distribution of food, as well as increasing sustainable and regenerative production and equitable access to adequate food and nutrition for all;	
Water & Sanitation	Significantly reducing climate-induced water scarcity and enhancing climate resilience to water-related hazards towards a climate-resilient water supply, climate-resilient sanitation and towards access to safe and affordable potable water for all;	
Health	Attaining resilience against climate change related health impacts, promoting climate-resilient health services, and significantly reducing climate-related morbidity and mortality, particularly in the most vulnerable communities;	
Social Systems	Substantially reducing the adverse effects of climate change on poverty eradication and livelihoods, in particular by promoting the use of adaptive social protection measures for all; Protecting cultural heritage from the impacts of climate-related risks by developing adaptive strategies for preserving cultural practices and heritage sites and by designing climate-resilient infrastructure, guided by traditional knowledge, Indigenous Peoples' knowledge and local knowledge systems;	
Cities & Settlements	Increasing the resilience of infrastructure and human settlements to climate change impacts to ensure basic and continuous essential services for all, and minimizing climate-related impacts on infrastructure and human settlements;	
Infrastructure		
Industry & Commerce	Ensuring that industrial and commercial operations are resilient to the projected and future impacts of climate change so that their economic output, operational safety, affordability of products and services and the provision of employment are not adversely affected by such impacts	

Adapted from: *Tailwind (2024).*

3. Integrating climate impact objectives through the investment process

Integrating climate impact assessment into the investment process is crucial for evaluating new opportunities consistently and focus engagement with investees to realise, enhance and sustain impact through and beyond the holding period.

Investment Strategy

Define climate impact objectives & targets at the portfolio level

Investment Process

Integrate climate impact assessment and management through the investment process

Origination	Screening	Due Diligence	Investment decision	Monitoring	Exit
Identify climate investment opportunities aligned with the goals of the investment strategy	Screen the investment opportunity against climate impact criteria	Assess the actual or potential climate impact of an opportunity Determine proportion of the investment qualifying as climate finance	Integrate the climate impact case in the document submitted to the IC Integrate investment-specific impact reporting metrics and targets in the legals	Measure, monitor and evaluate impact performance Report progress against impact objectives Support the investee to deliver sustained positive climate impacts	Enhanced investee's climate offering and ability to deliver climate impact over the long term Communicate climate impact of the investment

A results framework structured along the Five Dimensions of Impact can support the systematic and consistent evaluation of the contribution of each investment to the identified climate impact target(s) for submission to the Investment Committee (IC). It enables investors to assess, monitor and evaluate the impact of their investments at the investment stage and beyond, as well as defining key performance indicators (KPIs) to track during the holding period.

The A&R impact measurement framework for investors developed by a group of Development Finance Institutions in collaboration with investors under the aegis of the Adaptation & Resilience Investors Collaborative provides an example of application of the Five Dimensions of Impacts to for assessing the impact of adaptation and resilience investments.

Gathering relevant data to monitor the climate impact of an investment should be conducted throughout the lifecycle of the investment. Monitoring helps investors to confirm their investment thesis and demonstrate (and report) on the climate impact of their investment to investors and regulators (as applicable).

Metrics for climate impact monitoring should align with those used at the screening and due diligence stages. This enables direct and ongoing assessment of the impact targeted at the point of investment. Where applicable, monitoring can include gender and inclusion-specific metrics.

The Five Dimensions of Impact:

What?

What outcome is an investment contributing to?

How important is it to stakeholders?

Who?

Which stakeholders are experiencing the outcome ?

How underserved are they in relation to the outcome?

How much?

How many stakeholders experience the outcome?

What degree of change do they experience?

How long do they experience the outcome for?

Contribution?

Did the investor / company's actions result in outcomes that were likely better than would have occurred otherwise?

Risk?

The likelihood that the impact will be different than expected

Performing a climate impact evaluation mid and/or pre-exit, can provide a full view of impact over an investment's lifecycle. It can prove valuable in understanding, demonstrating, and reporting impact to follow-on investors, helping to improve an investment's attractiveness for takeout. It can also help informing future investment decision-making processes.

4. Quantifying the proportion of investment going towards climate action (climate finance)

To build market trust and evidence to meet regulatory-related requirements, an investor can determine the proportion of capital invested in climate solutions. In the context of VC and PE climate investing, this can be 100% or lower, depending on the investment targeted and associated use of capital.

The climate investment strategy of a VC or PE investor may target:

- A climate solution company i.e., a company whose entire focus is on delivering climate solutions. In this case, climate finance is 100 per cent of the capital invested.
- A company offering climate solutions i.e., a company offering climate solution as one of its business lines. This requires assessing the proportion of investment that is climate finance.

Assessing the proportion of an investment that is climate finance can be done with reference to two metrics:

1. **Turnover:** linked to the specific economic activity that delivers a climate solution.
2. **Expenditure:** (CAPEX and OPEX) linked to the specific economic activity that delivers a climate solution.

Investors should refer to the relevant framework for the jurisdiction in which they operate (for example, EU Taxonomy, South Africa Green Finance Taxonomy, MDBs-IDFC Common Principles for Climate Finance Tracking, etc.)

Figure 10. Two types of climate company:

Type of company	**Climate Solutions Company** A company that offers climate solutions as a significant part of their business E.g. Renewable energy generator	OR	**Company Offering Climate Solutions** A company that offers climate solutions as part of their business / as one of their business lines E.g. General insurer offering climate-agri insurance
Investor's objective	Enable a climate solutions company to grow and scale its offering		Support the growth of a company's climate solutions business
Climate finance proportion	**100%**		**≤100%**

VC investors are more likely to invest in climate solution companies because companies offering climate solutions (i.e., with multiple business lines) tend to be more established and sizeable than typical VC targets.

PE investors can invest in both climate solution companies and companies offering climate solutions.

Climate solutions companies typically have limited historical data to provide an investor at the fundraising round due to often being early-stage and thereby with limited track record. The climate impact assessment of a VC investor, therefore, may need to be thesis driven. Companies offering climate solutions, instead, can have track record and, therefore, can typically be expected to provide historical data to enable quantitative assessment of climate impact *ex-ante*, at the time of the investment.

Figure 11. Key considerations for PE vs. VC climate investors

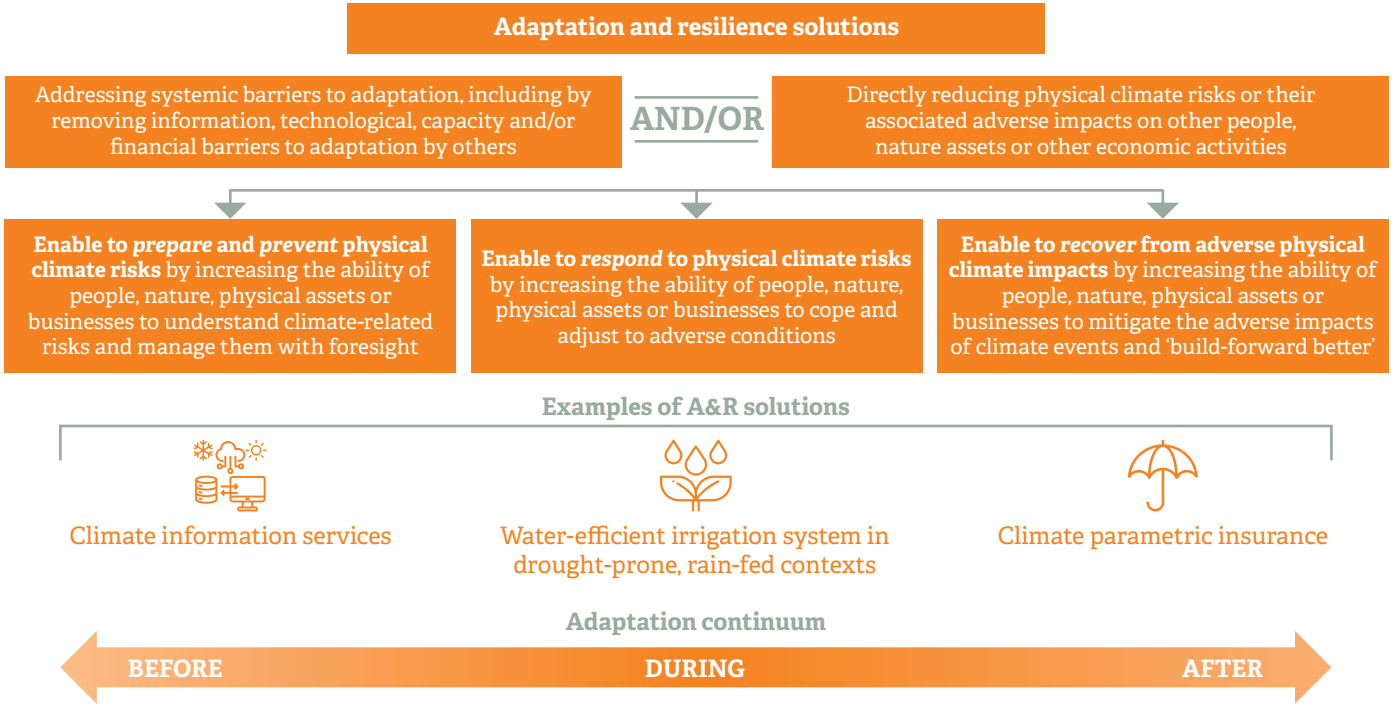
	Venture Capital	Private Equity
Company offering climate solutions	Unlikely target	Likely target
Climate solutions company	Highly likely target	Potential target
Climate finance proportion	100%	≤100% (use proportional approach)
Climate impact data at the time of the investment	Thesis driven	Historical data based

How to identify and assess A&R investment opportunities

A&R solution:

A technology, product, service and/or practice that enables others to prepare for, prevent, respond to, and/or recover from climate shocks and stresses.[19]

The visual below outlines the pathway through which A&R solutions enable people, businesses, infrastructures and nature to adapt to to a changing climate.



Source: *GARI (2024), Climate Resilience Investments in Solutions Principles.*

An A&R solution can address climate impacts in more than one way. For example, efficient irrigation technologies can help replenish water tables, helping to prepare for periods of drought, and then enable farmers to respond to drought conditions by using available water efficiently.

19 Source: GARI (2024) https://img1.wsimg.com/blobby/go/66c2ce28-dc91-4dc1-a0e1-a47d9ecdc17d/downloads/CRISP 2024 - Climate Resilience Investments in.pdf?ver=1711984837089

04

Climate Adaptation and Resilience (A&R) investing

How to identify an A&R Solution

A&R solutions address specific climate impacts that, in turn, are caused by a climate risk driver.

The Climate A&R opportunities by sector section that follows provides example of A&R solutions, each linked to the adverse climate risks and impacts they seek to address.

How to assess an A&R investment opportunity

The following steps aim to guide investors in the identification, assessment and selection of companies offering A&R solutions through the investment cycle. They also can help identifying 'entry points' for engagement activities.

The checklist for identifying and assessing A&R opportunities provides further details for each steps through the investment cycle; The Annex lists other relevant guidance documents.

The A&R impact assessment approach developed by ARIC rovide investors with a consistent and comparable method to understand, assess and manage the positive A&R impacts of an investment.

	Steps	Guidance
Screening / Due diligence / Monitoring	**1** Assess the company's offering for A&R solution(s)	– Determine whether a company's technology, product, service and/or practice enables to: • Directly reducing the risks driven by climate-related events, or their associated adverse impacts on people, nature, assets, or other economic activities and/or • Address systemic barriers to adaptation by removing information, technological, capacity and/or financial barriers to adaptation by others
	2 Check 'do no harm' of the A&R solution(s) and company	– Evaluate both the A&R solution(s) offered by the company and the company itself to evaluate that they do not • Undermine the achievement of the 1.5°C goal of the Paris Agreement. Preference should be for A&R solution(s) minimally GHG-emissions intensive within a specific context and for those solutions simultaneously delivering on adaptation and mitigation goals. (Through active engagement, investors can support the decarbonisation of A&R solutions). • Cause adverse effects on social, environmental, and economic systems. – Determine the expected positive A&R impacts over the life of the investment, based on actual data where available given the stage of a company's business maturity)
	3 Measure A&R impact results	– Measure, monitor and manage positive adaptation impacts using qualitative and/or quantitative metrics over the holding period.

Source: *Adapted from GARI (2024), Climate Resilience Investments in Solutions Principles.*

Checklist for assessing A&R investment opportunities

This checklist guides VC and PE investors in

1. Identifying and assessing companies offering A&R solutions and
2. Quantifying the proportion of the investment qualifying as climate adaptation finance.

In meeting the checklist's requirements, investors can ensure investments deliver a positive climate impact and align with climate finance qualifying criteria.

Screening	
Evaluate the A&R solution(s) provided by the target company	– Does the solution(s) offered by the company enable to prepare, prevent, respond, recover from climate-related shocks and stressors (e.g., floods, drought, or extreme heat)?
Ensure the A&R solution(s) aligns with the investment strategy	– Does the solution(s) align with the A&R objectives set out in the investment strategy?
Due diligence	
Evaluate the A&R solution(s)	– Is there any evidence that the A&R solution(s) enables its target customers to prepare, prevent, respond or recover from climate-related shocks and stressors
Define and assess the expected A&R impact of the investment[20]	– Have you assessed expected A&R impact against the Five Dimensions of Impact? • **What:** impact a company's A&R solution(s) is contributing to and how? • **Who:** which stakeholders are experiencing the impact (people, planet, economy)? • **How much:** how many stakeholders experienced the impact and degree of change? • **Contribution:** how could the investor support the achievement of the intended impact? • **Risk:** what is the likelihood the impact will be different than expected and how risks are mitigated?
Ensure the target company and the A&R solution offered 'Do No Harm'	– Does the target company have capacity and track record for identifying and managing relevant climate and ESG risks and complying with relevant regulations and minimum standards according to industry best practice, the IFC's Performance Standards on Environmental and Social Sustainability? If not, define a plan of action for the company to address identified gaps. – Can the company's solution undermine the achievement of the Paris Agreement 1.5°C goal lock-in GHG emissions? Could it lead to any other unintended consequence such as increasing social vulnerability or worsening the present or future condition of marginalised groups? If yes, define a plan of action for the company to address these issues (so-called maladaptation).
Define the proportion of the investment that could be tagged and reported as climate finance	– How much of your investment qualifies as climate finance using a 'use of proceeds' or turnover-based approach?
Investment decision	
Factor the A&R impact case in investment decision-making	– Is the A&R impact case and climate finance qualification and quantification integrated in the memo put forward to the Investment Committee?
Integrating A&R impact metrics in the shareholder agreement	– Have you included requirements to report on A&R impact metrics in the legal agreement?
Develop ESG action plan	– Have you included requirements to report on progress against relevant climate, ESG and GHG mitigation actions in the legal agreement?

20 Have you assessed the expected impact on Gender and Social Inclusion as applicable (e.g., using Private Equity and Value Creation: A Fund Manager's Guide to Gender-smart Investing?)

Worked example

Background

Fund Manager: Capital Agri is a specialist agricultural investment firm that has been investing in Southern African agribusinesses for ten years. It has recognised that climate change is raising temperatures, causing more extreme weather events that are impacting yields for smallholder farmers in the region. It successfully raised a new fund to invest in scaling companies with solutions to prevent and reduce the risks of climate impacts. Capital Agri new fud's investment strategy set the following key A&R objectives:

- To increase the availability of and access to A&R enabling solutions
- To help 50,000 smallholder farmers become more resilient to climate change.

The Fund Manager has identified Water Smart as a suitable investment opportunity to screen.

Target Company: Water Smart is an early-stage company providing solar-powered water efficient irrigation systems to smallholder farmers on a Pay-as-you-Go (PAYG) basis. It is fundraising to expand its operations and reach more climate vulnerable farmers.

Screening

✓ **A&R solution:** Solar-powered water efficient irrigation systems offered to farmers relying on rain-fed agricultural systems in contexts affected by droughts and increasingly irregular rainfalls.

✓ **Fit with the climate investment strategy:** water efficient irrigation can help farmers to prevent and cope with the adverse effects of droughts.

✓ **Climate adaptation finance:** 100%

Due diligence

✓ **A&R solution:** water efficient irrigation enables farmers to prepare for and respond to periods of droughts and increasingly erratic rainfall patterns. This is grounded on empirical evidence and analysis carried out by Water Smart.

✓ **A&R impact:** To assess the expected A&R impact of its investment, the Fund Manager uses the Impact Management Project's Five Dimensions of Impact:

- **What:** reduce the vulnerability of smallholder farmers to droughts, which are made more likely and intense by climate change.
- **Who:** People (smallholder farmers)
- **How much:**
  - 10,000 farmers equipped with Water Smart's solar-powered water irrigation systems to become more climate-resilient.
  - 20,000 ha of agricultural land switched from rain-fed to water efficient irrigation system.
- **Contribution:** provide capital that would not be available otherwise to fund the manufacturing of all 10,000 water irrigation systems, and so is integral to achieving the A&R impact. The Fund Manager will also provide Water Smart with (i) Technical Assistance to support the company in developing a Gender Action Plan to better target its offering to women (ii) connections with portfolio companies to explore partnership opportunities.
- **Risk:** Potential risks of maladaptation exist if the solution leads to greater abstraction of groundwater. Water Smart is mitigating this risk through irrigation advisory to farmers, and sensors monitoring groundwater table levels to ensure they were not being unsustainably drained.

✓ '**Do No Harm':** Water Smart's solution is solar powered, so no harm is caused to the 1.5C goals of the Paris Agreement. Solar-powered water irrigation systems could have maladaptive impacts if they cause unsustainable withdrawal of groundwater depletion. Risk mitigants are in place. On ESG risks, Capital Agri positively evaluated Water Smart's capacity, commitment and track record to manage ESG related risks.

✓ **Climate adaptation finance:** 100% confirmed

Investment decision

The Investment Committee paper features:

- **The A&R impact rationale** for the investments, including how it contributes meeting the goals of the investment strategy and impact target – equipping 10,000 new farmers with solar-powered water efficient irrigation systems to help them adapt to the effects of climate change
- **The climate finance quantification:** 100%

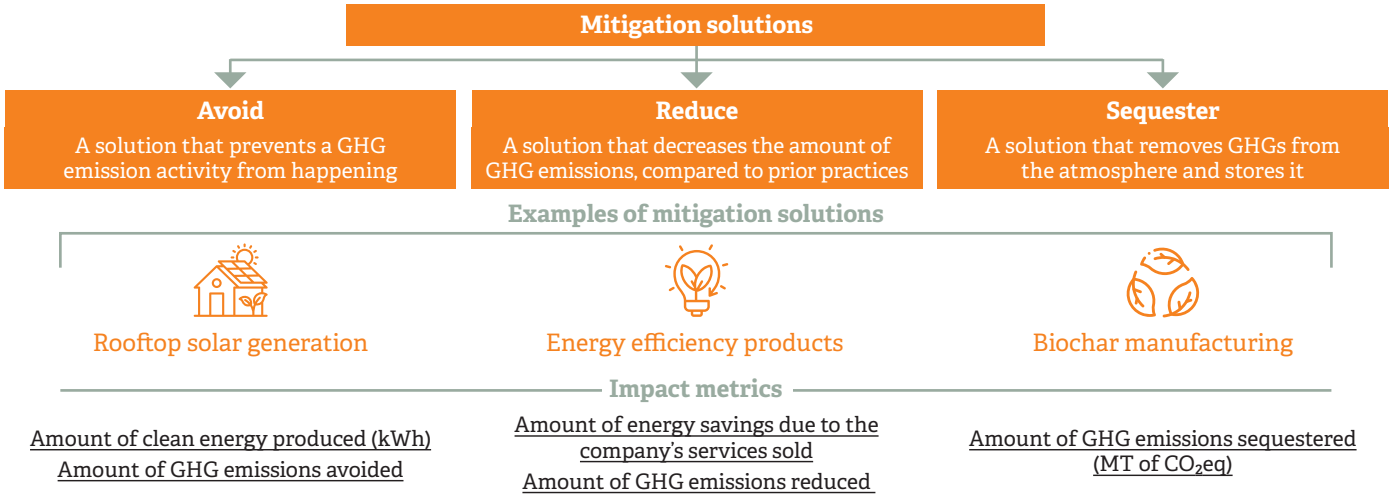
The Shareholder Agreement includes a requirement to the company to report on agreed impact performance metrics along with performance on the Gender Action Plan.

How to identify and assess climate mitigation investment opportunities

Mitigation solution:

A technology, product, service and/or practice that substantially avoids, reduces, or removes (sequesters) GHG emissions from the atmosphere.[21]

The visual below outlines the pathway through which mitigation solutions enable people, businesses, infrastructures to decarbonise their activities, or leverage the power of nature and other technologies to sequester emissions.



How to identify a mitigation solution

The mitigation solutions section provides sector-specific list of climate mitigation solutions and criteria that need to be checked to determine the climate mitigation finance qualification. Some mitigation solutions, such as using waste gas to generate electricity, will only qualify as a mitigation investment if they meet additional criteria. Meeting these criteria often requires evidence that the solution has substantial effects on avoiding, reducing, or sequestering emissions and does not have adverse climate effects (e.g., maladaptation). The sector-specific MDBs-IDFC criteria for climate mitigation finance can be consulted to clarify if any additional criteria are required.

The checklist for identifying and assessing mitigation opportunities provided as follows explains how to assess mitigation solutions through the investment process, and the Annex includes examples of tools for calculating the GHG emissions avoidance, reduction or removal potential of mitigation solutions.

The IRIS+ Catalogue of Metrics provides investors with access to generally accepted metrics and guidance to ensure consistency in climate mitigation impact measurement and reporting.

21 MDBs-IDFC (2023) https://www.eib.org/attachments/documents/mdb_idfc_mitigation_common_principles_en.pdf

05

Climate Mitigation investing

Checklist for assessing mitigation investments

This checklist guides VC and PE investors in

1. Identifying and assessing companies offering mitigation solutions and
2. Quantifying the proportion of the investment qualifying as climate finance.

In meeting the checklist's requirements, investors can ensure investments deliver a positive climate impact and align with climate finance qualifying criteria.

Screening	
Evaluate the mitigation solution(s) provided by the target company	– Is there evidence the solution(s) avoids or reduces GHG emissions, or increases GHG sequestration?
Ensure the mitigation solution(s) aligns with the investment strategy	– Does the solution(s) align with the mitigation objectives set out in the investment strategy?
Due diligence	
Evaluate the mitigation solution(s) against the climate finance eligibility criteria	– Have you identified the relevant category and eligibility criteria for the solution(s) within the MDBs-IDFC Common Principles for Climate Mitigation Finance (see mitigation examples section), or other relevant climate Taxonomy frameworks? – Is there sufficient evidence that the solution(s) meets the identified eligibility criteria?
Define and assess the expected mitigation impact of the investment[22]	– Have you assessed the expected mitigation impact of the investment? – **What:** impact a company's mitigation solution(s) is contributing to and how? – **Who:** which stakeholders are experiencing the impact (people, planet, economy)? – **How much:** how many stakeholders experienced the impact and degree of change? – **Contribution:** how could the investor support the achievement of the intended impact? – **Risk:** what is the likelihood the impact will be different than expected and how risks are mitigated?
Evaluate that the target company and its solution 'Do No Harm'	– Have you assessed the target company's commitment, capacity and track record for ESG risk assessment and management and compliance with minimum social standards e.g., using IFC's Performance Standards on Environmental and Social Sustainability and relevant local regulation. – Have you checked if the mitigation solution(s) may generate unintended climate consequences (e.g., increased water usage in a water scarce context)? If so, identify possible mitigants.
Define the proportion of the investment that could be counted and reported as climate finance	– Is the investment targeted at growing and scaling a climate solutions company i.e,. a company offering mitigation solutions as a core business? *If so, count 100% at climate finance.* – Is the investment supporting the growth of the climate mitigation offering of a company that has multiple business lines? If so, estimate the proportion of climate finance based on the turnover of the company linked to the mitigation solution(s) or taking a use of proceeds approach i.e., based on Capex/Opex outlined in the company business plan.
Investment decision	
Factor the mitigation impact case in investment decision making	– Have you integrated the mitigation impact case and the proportion of the investment qualifying as climate finance in the memo put forward to the investment committee?
Integrate mitigation impact metrics in the shareholder agreement	– Have you included requirements to report on mitigation impact metrics over the life of the investment?
Develop ESG action plan	– Have you developed an ESG action plan with requirements to undertake, and report on progress against needed ESG actions?

22 The Five Dimensions of Impact, what, who, how, contribution and risk to impact, provide a useful framework to evaluate the expected mitigation impact. The IRIS+ Catalogue of Metrics provides relevant mitigation impact metrics. Tools for climate impact assessments include: Project Frame, CRANE, Simples Emissions Reduction Calculator, Climate Impact Assessment for Early-Stage Ventures. Have you assessed the expected impact on Gender and Social Inclusion e.g., using Private Equity and Value Creation: A Fund Manager's Guide to Gender-smart Investing?

Worked example

Background

Fund Manager: 123 Energy Finance is an investment firm that has raised a fund to invest in off-grid renewable power solutions. Its investment strategy aims to achieve the following objectives, centred on avoiding and reducing carbon emissions:

- To provide access to renewable energy to 80,000 households in India
- To fund 40 megawatts (MW) capacity of off-grid renewable energy generation

The Fund manager has identified XYZ Energy as a suitable opportunity to screen.

Target Company: XYZ Energy An innovative company providing off-grid solar energy to communities in India on a PAYG basis. Its solar panels and energy storage systems enable households and businesses to access reliable and sustainable electricity, even in areas without access to the grid. XYZ Energy is seeking funding to expand its operations and reach more underserved communities in 25 new sites.

Screening

✓ **Mitigation solution:** off-grid solar energy and renewable energy storage which helps to avoid and reduce GHG emissions by providing rural communities with renewable energy, and that it would be categorised as a 'Negative or very-low emission' mitigation solution. This solar energy would replace the use of diesel generated electricity in a number of cases.

✓ **Fit with the climate investment strategy.**

Due diligence

✓ **Mitigation solution:** off-grid solar energy and renewable energy storage: "2.1 Generation of renewable energy with low lifecycle GHG emissions to supply electricity, heating, mechanical energy or cooling" and "2.8. Energy storage or measures to improve network stability or flexibility that increase consumption of very-low carbon energy". From desktop research and documents provided by XYZ Energy, 123 Energy Finance was confident it met the necessary criteria for these activities.

✓ **Climate mitigation impact:**

- **What:** reduce GHG emissions and increase access to electricity
- **Who:** Planet and People
- **How much:** about 8 tonnes/CO_2e per annum for each 10MW of solar energy. 15,000 households with increased access to renewable electricity across the 25 sites.
- **Contribution:** The key area of engagement was highlighted to be the financing of the sites, as well as providing advice on how to take XYZ Energy into new geographies, and expand its impact, as 123 Energy Finance operates across Central and Southern Asia. This is a clear market opportunity for XYZ Energy, and something 123 Energy Finance is well positioned to support.

✓ **'Do No Harm':** No identified likely risks of maladaptation, and conversely, research noted that providing off-grid generation increases the resilience of energy supply in the area, while also enabling customers to use products that support A&R (e.g., electricity-powered cooling solutions). The Fund Manager positively evaluated XYZ Energy' capacity, commitment and track record to manage ESG related risks. The ESG review also noted that the specific engagement of women during stakeholder conversations to increase the take-up of the renewable energy provision, as well as the special PAYG rates offered to women-led households.

✓ **Climate mitigation finance:** 100% confirmed.

Investment decision

The Investment Committee paper features:

- **The climate mitigation impact rationale** for the investments, including how it contributes meeting the 1.5C goals of the Paris agreement and of the investment strategy and impact target.
- **The climate finance quantification:** 100%

The Shareholder Agreement includes a requirement to the company to report on agreed impact performance metrics - megawatts-per-hour (MWh) generated by the solar sites, and the number of households provided with energy.

A&R solutions: examples by sector

This section provides examples of A&R solutions structured around sectors and sub-sectors. Within each sub-sector, guidance is given on the physical risk drivers and climate-driven impacts that A&R solutions can address.

While not an exhaustive list, these example of A&R solutions can help determine the types of investment opportunities that exist within a sector and provide a potential point of reference when considering an investment opportunity. Any investment opportunity should be assessed as per the approach on page.

Agriculture, Forestry & Fisheries

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Crop production	• **Drought-resistant crop variants** to increase the ability of crops to survive drought periods. • Water-efficient irrigation technologies e.g., drip irrigation to optimize water use in drought-prone contexts.	Decline in yields quality and/or quantity	Flooding Droughts
	• **Weather forecasting analytics** to enable farmers and agribusinesses to prepare for extreme weather conditions. • **Climate insurance** to help farmers recover from the impacts of adverse climate events.	Crop loss	Flooding Wildfires Extreme storms Hailstorms Extreme heat
	• **AI-powered pest monitoring and forecasting** to help prepare for pest outbreaks	Increased pest and disease occurrence	Rising temperatures Changes in precipitations patterns
	• **Energy efficient cold storage facilities** to safeguard perishable food from extreme temperatures avoid supply chain disruptions	Post-harvest losses	Extreme heat
Animal production	• **Temperature regulation technologies for livestock** to increase livestock's ability to cope with extreme heat • **Digital advisory services - providing information on best agricultural practices** to help farmers prepare for, and cope with, climatic-driven impacts	Decreased livestock productivity	Extreme heat
	• **Weather forecasting analytics** to help prepare for extreme weather • **Climate insurance** to help farmers recover from the impacts of climate events	Livestock loss	Flooding Wildfires Storms
Forestry	• **Wildfire early warning systems** • **Satellite imaging of forest ecosystems** to monitor and adaptively manage forests	Forest loss	Wildfires

06

Climate opportunities by sector

Case study: Fasal

Precision farming intelligence platform - India

A&R solution: Fasal offers weather forecasts and related real-time advice to enable farmers to *prepare* for and *prevent* the adverse consequences of extreme weather events (e.g., extreme rain or extreme heat), which would otherwise damage crops. By leveraging crop science and IoT devices, Fasal helps farmers to optimize water consumption and improve crop farming, improving their ability to cope with drought conditions and enhance productivity in the face of climate-related challenges.

Business model: Farmers pay some upfront costs for Fasal's hardware, and then pay a subscription fee for Fasal's tailored intelligence. Fasal has also launched a digital marketplace (Fasal Fresh) where farmers can sell their products.

Funding details: In 2023, Fasal raised $12 million in Series A equity funding to improve it digital platform, and to support expansion into South-East Asia.

Energy

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Energy generation	• **Climate risk analytics** to identify sites for hydropower generation at lower risk from droughts, and to forecast droughts which may affect power generation	Reduced hydropower generation due to changes in hydrological flows	Droughts
	• **Floating solar photovoltaics (PV)** to manage variability in hydropower-based energy generation	Increased hydropower generation variability	Droughts
	• **Water efficient technologies** to reduce water consumption for cooling or cleaning needs e.g., dry or hybrid cooling systems for CSP plants	Reduced energy generation performances	Extreme heat Rising temperatures
Transmission and distribution	• **Climate-proofing technologies for transmission and distribution assets** e.g., underground cabling and cooling systems to improve infrastructure ability to cope with extreme weather events	Storms can damage power lines, causing power outages and black-out	Storms Extreme heat
	• **Wildfires early warning systems** • **Sensors for Rapid Emergency Deactivation** • **Distributed storage systems** to improve grid resilience	Power outages caused by flooding, wildfires and extreme weather	Flooding Wildfires Heat waves

Case study: VFlowTech

Energy storage solution – Singapore and India

A&R solution: VFlowTech manufactures low-cost and efficient modular vanadium redox flow batteries that can operate in tropical conditions. Batteries improve grid resilience by enabling the operation of decentralised energy systems and bridging demand-supply gaps during extreme weather conditions.

Business model: VFlowTech offering Energy Storage as a Service (ESaaS) for commercial and industrial applications.

Funding details: In 2021, VFlowTech raised $3 million in pre-Series A equity funding. It will use the capital to expand business operations and has plans to scale manufacturing of redox flow battery energy storage systems.

Manufacturing

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Building products / construction material	• **Wastewater reuse and recycling technologies** to reduce water demand during droughts. • **Water storage and harvesting products and technologies** e.g., rainwater harvesting to increase water availability in periods of drought	Inadequate water availability	Droughts Water scarcity
	• **Water Gates** i.e, rapidly deployable temporary barrier to protect houses from flooding events	Flood-induced damages	Floods
	• **Heat reflective materials** to reduce need for cooling in areas exposed to extreme heat	Increase in energy costs for cooling	Extreme heat Rising temperatures
	• **Energy efficient sustainable cooling technologies** to reduce risk of food waste	Food loss and waste	Extreme heat Rising temperatures
	• **3D printed homes and emergency shelters** designed to withstand extreme weather conditions	Damages to houses and buildings	Storms
	• **Cool-tech clothing for workers** e.g., cooling vests to enable workers to cope with higher temperatures	High temperatures reduce worker productivity and health	Extreme heat
Consumer Distribution & Retail	• **AI-powered supply chain risk assessment** e.g., remote weather monitoring, coupled with real-time location sensing, to improve supply chain ability to cope with extreme weather events	Supply chain disruption due to extreme weather	Storms
Chemicals	• **Drones and in-field sensors** to assess soil health and enabling precision applications of fertilizers and improved management of nutrients	Reduced agricultural yields	Flooding Droughts
Food and beverages	• **Water-use efficiency measures** e.g., smart water metres and pressure control equipment to increase operational ability during droughts.	Disruption due to reduced water availability for processing activiites	Droughts Water scarcity

Real Estate/Buildings

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Residential	• **Climate insurance** to help homeowners recover from adverse climate events • **Natural water retention solutions** e.g., green roofs, rainwater harvesting and permeable paving to reduce risk of flooding or water scarcity • **Weather forecasting software** to enable preparation for extreme weather and flooding events	Extreme weather and flooding cause increased property damage/ loss	Droughts Water scarcity
Commercial	• **Climate risk modelling services** to identify low risk areas • **Retrofitting technologies** e.g., impact-resistant glass to protect buildings against the extreme winds of tropical storms. • **Storm-resilient building technologies** e.g., rainwater storage and ground floor raising to protect buildings against extreme storms	Devaluation of real estate assets	Sea-level rise Cyclones and storms
Industrial	• **Energy efficiency technologies** to reduce energy demand • **Green building designs and technologies** e.g., passive ventilation and solar control windows to reduce energy demand	Increased operating costs due to higher energy demand for cooling	Extreme heat Rising temperatures
	• **Energy and water efficient cooling technologies** to enable machines to cope with higher temperatures • **Ventilation and air conditioning technologies** to enable workers to cope with higher temperatures • **Urban greenery** e.g., green roofs, to reduce building temperatures	High temperatures reduce worker and machine productivity	Extreme heat Rising temperatures

Transport

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Transport Infrastructure	• **Remote sensing systems** to identify damaged infrastructure • **Climate risk modelling services** to identify low-risk areas for infrastructure. • **Climate-adapted materials** e.g., extreme heat-resistant road material to reduce damage from climate-driven events.	Increased damage and maintenance costs for infrastructure due to extreme weather events	Flooding Storms Extreme heat Extreme precipitation
Ground transportation	• **Predictive geospatial tools** to reroute traffic congestion driven by weather-related events • **Remote weather monitoring coupled with real-time location sensing**, to avoid weather-driven supply chain disruptions • **Weather forecasting software** to enable preparation for extreme weather • **Flood defense technologies for tunnels**	Extreme weather disruptions to ground transportation and reduces ability to move goods	Flooding Storms Extreme heat

Water

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Water collection, treatment, and supply	• **Solar-powered hydro-panels** to provide clean drinking water • **Water storage and harvesting** products e.g., rainwater harvesting to increase water availability in water scarce contexts	Lack of safe access to adequate amount of water due to droughts	Droughts Water scarcity
	• **Hydrological modelling and forecasting systems**	Hydrological variability	Rising temperatures Changes in rainfall patterns
	• **Wastewater recycling and reuse technologies** to reduce demand of freshwater resources in drought-prone and water scarce contexts	Increased water demand Reduced availability of water	Rising temperatures Droughts Water scarcity
	• **Smart water leak detectors** to identify damaged distribution infrastructures and reduce non-revenue water in drought-prone contexts	Increased occurrence of pipe bursts and leaks	Extreme weather variation

Case study: Source Global

Off-grid renewable drinking water system - Global

A&R solution: Source Global provides off-grid hydropanels that use solar energy to extract clean drinking water from the air to helps commercial and residential clients to respond to reduced water availability (due to drought) and higher temperatures caused by climate change.

Business model: B2C and B2B.

Funding details: In 2022, Source Global raised $130 million in Series D equity funding. Already operating in 50 countries, it will use the funding to further scale its commercial, community and consumer offerings globally, and invest in researching advanced renewable water generation technologies.

Health

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Health Care Equipment & Services	• **Early-warning systems** to help communities to prepare for adverse climate-related events. • **Water treatment technologies** to reduce post-event disease spread. • **Wildfire smoke air purification systems** to reduce impact of wildfire smoke	Increased deaths and diseases from floods and extreme weather events	Flooding Extreme storms Wildfires
	• **Disease surveillance technologies** to prevent and prepare for climate-related driven disease patterns • Rapid diagnostic tests to treat climate-driven diseases	Increased food-, water-, and vector-borne diseases	Flooding Extreme storms Rising temperatures
	• **Sustainable cooling technologies** including energy and water efficient air conditioning units to reduce the risk of heat stress • **Cool-tech clothing for workers** e.g., cooling vests to reduce heat stress occurrence.	Increased illness due to heat stress	Extreme heat
Pharmaceuticals	• **Cooling solutions for the transport and storage of vaccines** • Vector-Borne Disease Vaccines and Treatments	Changes in the spread of vector-borne diseases e.g. dengue and malaria	Rising temperatures Changes in precipitations patterns

Financial Services

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Insurance	• **Climate insurance** to reduce the financial impacts associated with climate-related adverse events including e.g., business interruption Insurance for weather-related events	Losses and damages driven by extreme events	Droughts Floods Heil Cyclones
Fintech	• **Climate-related financial risk modelling analytics and services** to estimate value at risk from physical risk drivers and identify 'hot spots' within portfolios of financial institutions	Investment portfolio vulnerability to climate risk drivers Decrease in assets' values due to extreme events	Flood Droughts Extreme heat
Banks	• **Financing for A&R solutions** e.g., heat resistant crop variants to help farmers cope with climate events; water efficient irrigation to help farmers cope with high temperatures	Reduced crop quality	Extreme heat
	• **Green mortgages** (preferential terms if buyer can demonstrate they are meeting certain A&R criteria) to incentivise property owners to improve energy efficiency of their properties	Increased energy demand	Extreme heat

Case study: Apollo Agriculture

Farm financing and agri-services for smallholder farmers - Kenya

A&R solution: Apollo Agriculture provides small-scale farmers with improved inputs, financing, climate insurance and training to helps farmers prepare for, cope with and recover from climate-induced impacts. Farmers served by Apollo demonstrated to improve their yields by an average of 2.6x higher than other Kenyan farmers. Apollo Agriculture also uses the satellite imagery data of farms and AI to rate the creditworthiness of farmers.

Business model: Apollo Agriculture provides farmers with a complete package of crops, farming inputs such as pesticides, training, market access, and climate insurance to protect their harvest. The package is delivered as a loan, so farmers can buy what they need at the start of the farming season and repay post-harvest.

Funding details: In 2022, Apollo Agriculture raised $40 million in Series B equity funding to expand geographically, improve its products and technology, and grow its team. It also received $10 million in debt funding in January 2024 to support its expansion across Africa.

Information & Communication Technologies

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Telecommunication services	• **Geospatial climate analytics** to provide early warning and response systems pre- and post-extreme weather event	Increased demand for water to cool data centres	Extreme heat Rising temperatures
	• **Weather observation stations and weather radars** to install on telecom towers to bridge climate data gaps	Increase climate-related socio-economic losses and damages	Droughts Cyclones Sea-level rise
	• **Climate risk modelling services** to identify infrastructures at risk of climate events	Flooding and extreme weather events damage data centres	Droughts Cyclones Sea-level rise
	• **Digital climate advisory platforms for farmers**	Reduced crop and livestock productivity	Hailstorm Water scarcity Flood
	• **Energy and water efficient cooling systems for data centres** • **Emergency backup power systems for data centres**	Business interruptions due to extreme weather events	Heat Waves Droughts Cyclones

Case study: ignitia

Tropical climate intelligence and forecasting solutions – West Africa and Brazil

A&R solution: ignitia helps farmers to prepare and reduce weather-related risks by providing them with improved weather forecasts and actionable agricultural advice – such as when to sow, apply crop nutrition and protection.

Business model: ignitia provides clear local weather forecasting, with 84 per cent accuracy, to farmers and enterprises in West Africa and Brazil. It has developed 'Iska', a subscription-based daily, 48-hour rainfall forecast delivered via text message directly to farmers, and also provides monthly and seasonal weather outlooks.

Funding details: In 2021, ignitia raised $4.2 million in Series A2 equity funding to increase its supercomputer capacity, expand into new reason, and grow its team.

Nature-based Solutions

Example sub-sectors	Example A&R solutions	Example of climate-driven impacts	Examples of physical risk drivers
Terrestrial ecosystems	• **Hybrid coral reefs (including using artificial substrate)** to offer protection from storm surges	Damages to coastal assets	Cyclones Storms
	• **Drone reforestation** for large-scale tree planting of forests damaged by wildfires	Forest losses	Wildfires
	• **Precision forestry techniques like LiDAR** (Light Detection and Ranging) and satellite imagery create high-resolution maps of forest areas to identify optimal planting locations, and choose the tree species best suited for specific climatic conditions	Forest losses Changes in habitat suitability Erosion of forest soils	Wildfires Droughts Pests and pathogens
Buildings	• **Sustainable urban drainage technologies** e.g., soakways, permeable paving and swales, to reduce flooding risk	Increased property destruction and damage from flooding	Storms Flooding
	• **Green urban cooling technologies** e.g., green roofs and green walls to reduce energy consumption while providing shade and regulate building temperatures	Increased operating costs due to higher energy demand for cooling	Extreme heat

Mitigation solutions: examples by sector

This section gives examples of mitigation solutions and associated investment opportunities. The examples are structured around sectors and sub-sectors. Within each sub-sector, guidance shows how emissions are mitigated, as well as criteria to consider when assessing an investment opportunity.

These examples outline the types of opportunities that exist within a sector, and provide a potential point of reference when considering assessing an investment opportunity for mitigation finance. Please note that these tables are not comprehensive. The Annex provide details about documents providing further guidance on mitigation solutions.

Agriculture, Forestry & Fisheries

Example sub-sectors	Category	Example solutions	How emissions are mitigated
Crop production	Equipment efficiency	Solar powered irrigation, Low flow irrigation	**Mitigation type:** Reduce **Criteria:** GHG emissions, carbon intensity (e.g., tCO_2e/unit of output), or energy intensity should be substantially reduced by the solution. **Guidance:** Potentially eligible activities include increasing energy efficiency of crop production and increasing use of energy-efficient equipment for agricultural processing and storage. To ensure significant impact investors should select a benchmark for the reduction.
	Carbon sinks	Biochar production, Regenerative agriculture practices	**Mitigation type:** Sequester **Criteria:** Carbon sinks should substantially increase in the above-or below ground carbon stock. **Guidance:** A solution should consider potential trade-offs between different GHGs (such as methane and CO_2) to ensure the overall climate impact is positive.
Animal production	Improved feed	Low carbon cattle feed	**Mitigation type:** Reduce **Criteria:** GHG emissions, carbon intensity (e.g., tCO_2e/unit of output), or energy intensity should be substantially reduced by the solution.
	Reducing emissions from waste	Anaerobic waste digesters, Manure drying	
Forestry	Carbon sequestration	Reforestation, Afforestation, Agroforestry	**Mitigation type:** Reduce and/or sequester **Criteria:** Opportunities should substantially increase sequestered carbon or reduce GHG emissions intensities. Opportunities that harm ecosystems and degrade hydrological systems will not be counted as mitigation activities, even if they reduce GHG emissions. **Guidance:** Direct assistance forestry improvements must be demonstrated, over and above a forest naturally recovering, or self-planting.
	Reducing deforestation	Selective logging	
Fishing and aquaculture	Low emission fisheries	Electric boats, Biofuel boats	**Mitigation type:** Avoid and/or reduce **Criteria:** GHG emissions, carbon intensity (e.g., tCO_2e/unit of output), or energy intensity should be substantially reduced by the solution. Technologies should not contribute to the degeneration or destruction of native ecosystems. **Guidance:** Mitigation can occur either through reducing feed emissions or lowering the GHG emissions of the overall fishery operation. International sustainability certifications should be in place for business operations.
Marine and other water habitats	Blue carbon planting	Mangrove restoration, Saltmarshes planting, Seagrasses planting	**Mitigation type:** Reduce and/or sequester **Criteria:** Opportunities should substantially increase sequestered carbon or reduce GHG emissions intensities. Opportunities that harm ecosystems will not be counted as mitigation activities even if they reduce GHG emissions. **Guidance:** Opportunities must directly assist in regeneration or habitat creation.
	Blue carbon conservation	Coastal Wetland Protection	
Cross-sectoral	Biomass production	Construction grade timber, Bioplastics from cereals, Asphalt from lignin, Bio-material clothing, Wooden products	**Mitigation type:** Reduce **Criteria:** GHG emissions, carbon intensity (e.g., tCO2e/unit of output), or energy intensity should be substantially reduced by the solution. Opportunities should harvest biomass responsibly and any production increase should not limit areas to deliver food security: - Biomass only includes crop waste and/or processing by-products OR biomass is from sustainable and socially acceptable sources as can be demonstrated by internationally recognised certifications (i.e., RSB certification) - Biomass is not in competition with food crops - Biomass is not causing indirect land use change (i.e., deforestation) **Guidance:** Lifecycle emissions should be considered and GHG emissions should be compared to the materials the opportunity directly replaces.

Energy

Example sub-sectors	Category	Example solutions	How emissions are mitigated
Energy generation	Wind generation	Off-shore wind, Onshore wind, Micro wind generation	**Mitigation type:** Avoid **Criteria:** GHG emissions of renewable energy to be substantially lower than corresponding GHG emissions from fossil fuel generation (without carbon capture and storage or utilisation). **Guidance:** Examination of GHG emissions is not necessary for forms of energy (e.g., solar and wind) that are widely recognised to have very low lifecycle emissions. Other forms of generation will require an analysis of lifecycle GHG emissions.
	Solar	Rooftop solar (domestic or commercial buildings), Solar as a service, Solar water heating, Utility-scale solar	
	Hydropower	Run-of-river hydropower, Storage hydropower, Pumped storage hydropower	
	Low-carbon Hydrogen	Hydrogen production, Hydrogen transportation, Hydrogen storage	**Mitigation type:**Reduce **Criteria:**New fuels should have lower life cycle GHG emissions than fossil fuel alternatives, meaning low GHG energy should be used to create fuels.
	Bio- gas	Methane bio-digesters, Methane capture and sale	**Mitigation type:**Reduce **Criteria:**First-generation liquid biofuels are not climate finance unless they are sourced from waste. **Guidance:** Examination of material lifecycle sources is needed for bioenergy.
Energy efficiency	Efficient Energy infrastructure	Low loss transmission equipment, Operating district heating networks	**Mitigation type:** Reduce **Criteria:** If fossil fuels are used in generation there should be no viable alternative and carbon capture and storage must be used. The solution should demonstrate a substantial improvement in energy efficiency or a substantial reduction in net GHG emissions. **Guidance:** Carbon capture and storage may also be used to mitigate GHG emissions from non-fossil fuel energy generation.
Transmission and distribution	Storage	Small-scale home energy storage, Large battery storage devices, Pumped air storage, Pumped hydro power storage	**Mitigation type:** Reduce **Criteria:** The storage and transportation of any fossil fuel does not count as a mitigation activity. If energy has been generated via fossil fuels, but the storage is aimed at increasing storage capacity for renewables, and will not significantly increases GHG emissions over the short or medium term, this can be counted as a mitigation activity. **Guidance:** Opportunities should increase the storage capacity or viability of renewable energy generation regardless of scale or time horizon.
	Transmission	Operation of local area energy systems, Heat networks	**Mitigation type:** Reduce **Criteria:** Opportunities should improve connections or connect renewable and low GHG energy to a grid. **Guidance:** Where whole grids are being financed, the labelling of mitigation should be proportional to the projected share of low GHG sources on the grid. In this instance labeling can be apportioned using the projected share of renewables in the electricity system at the end of ten years in the country's decarbonisation plan.

Case study: Nuru

Renewable energy generation and storage - Democratic Republic of the Congo (DRC)

Mitigation solution: Avoids GHG emissions. Nuru's mini-grids use solar energy and batteries, thereby contributing to the avoidance of fossil-fuelled electricity through renewable energy generation. This aligns with eligible activity for climate mitigation finance 2.1 of the MDBs-IDFC Common Principles for Climate Mitigation Finance.

Business model: Nuru acts as a traditional power company, selling electricity to local residents and businesses connected to the grid. As less than 20 per cent of the DRC population has access to energy, and with a rising energy demand projected for the future, Nuru's innovative approach to renewable energy access could unlock immense market potential across the country.

Funding details: In 2023, Nuru raised $40 million in Series B equity funding, and $28 million in project finance. The funding will be used to construct three mini-grids in the eastern region of the DRC. These mini-grids will use solar energy and batteries, generating a total generation capacity of 13.7MW.

Manufacturing

Example sub-sectors	Category	Example solutions	How emissions are mitigated
Energy efficiency	Energy	Use of recycled material, Higher efficiency furnaces, Material use optimisation	**Mitigation type:** Reduce **Criteria:** Existing manufacturing should be used as the benchmark to compare opportunities against. Any opportunity that can reduce energy demand or GHG emissions is eligible. GHG emissions, carbon intensity (e.g., tCO_2e/unit of output), or energy intensity should be substantially reduced by the solution. **Guidance:** GHG emission reductions can come from any energy savings, decreased carbon intensity, decreased use of virgin materials, or decreased waste generation.
Electrification	Electrification of industrial processes	Electric arc-furnaces Electric cracking, Electric cement production, Green ammonia production	**Mitigation type:** Reduce **Criteria:** The electrification of the process should be a recognised pathway to decarbonisation and should not lock in any additional GHG emissions. **Guidance:** Industrial processes need to switch from using fossil fuels to electricity as their energy source.
Alternative materials: cross-sectoral	Manufacture techniques Substitution	Alternative cement; Green steel; Bamboo, Timber, Natural insulation	**Mitigation type:** Reduce **Criteria:** Existing manufacturing techniques for individual materials should be used as the benchmark to compare opportunities. GHG emissions, carbon intensity (e.g., tCO_2e/unit of output), or energy intensity should be substantially reduced by the solution. **Guidance:** GHG emission reductions can come from any energy savings, decreased carbon intensity, decreased use of virgin materials, or decreased waste generation.

Real Estate/Buildings

Example sub-sectors	Category	Example solutions	How emissions are mitigated
Building design	Renewables	Rooftop solar PV, On-site wind turbines	**Mitigation type:** Avoid and/or Reduce **Criteria:** Opportunities can include substantially reducing net energy consumption, resource consumption, or GHG emissions. **Guidance:** Local benchmarks for efficiency and emissions can be used to compare opportunities.
	Energy efficiency	Insulation; Passive shading, Natural lighting	
Building use and upgrades	Energy efficiency	Building retrofitting, Low energy appliances	**Mitigation type:** Avoid and/or Reduce **Criteria:** New technology should reduce emissions emanating from buildings as well as not locking-in fossil fuels even if they are more efficient. **Guidance:** Electrification of equipment previously using fossil fuels shall be eligible without the need for a demonstration of a substantial reduction in net energy consumption.
	Electrification	Induction hobs, Electric ovens, Heat pumps, Electric heating, Passive cooling	
Alternative materials: cross-sectoral	Low carbon materials	Alternative cement, Sustainable timber, Low carbon steel, Bamboo, Wood	**Mitigation type:** Reduce **Criteria:** Materials should demonstrate a substantial reduction in net GHG emissions, taking account of material lifecycle sources including scope 3 emissions. **Guidance:** Where possible, materials should also be chosen to lower the emissions from the use of the building, such as installing better insulation in cold climates and breathable materials in humid climates.

Case study: Ampd Energy

Energy battery and storage for the construction industry

Mitigation solution: Reduces: Ampd's compact and grid-connected battery energy storage system electrifies previously diesel-powered generators used during construction, thereby reducing GHG emissions. Its electrified generators emit up to 85 per cent less CO_2 than traditional diesel generators, making it align with eligible activity 2.8 of the MDBs-IDFC Common Principles for Climate Mitigation Finance. Ampd has reduced 55,000 tons of CO_2 emissions from over 180 construction projects.

Business model: Ampd produces and sells an all-electric replacement for diesel generators to construction companies. This approach is attractive compared to diesel generators due to its lower carbon footprint, being as much as 32x as quiet, having zero refuelling downtime, and being far cheaper to operate.

Funding details: In 2023, Ampd raised $8 million in an extension of Series A funding. It is using the funds to expand its geographical presence.

Transport

Example sub-sectors	Category	Example solutions	How emissions are mitigated
Vehicles and personal transport	Electric Vehicles	Electric cars, Electric trains, Electric buses, Electric vans, Electric HGVs	**Mitigation type:** Avoid and/or Reduce **Criteria:** Vehicles or associated infrastructure with zero or low direct emissions. Vehicles that transport fossil fuels or that use blended fossil fuels (where fossil fuels are still the predominant energy source) are not counted as mitigation finance. **Guidance:** The vehicles, research and development (R&D) and associated infrastructure are all counted as climate mitigation finance.
	Public transport	Buses, Trains, Ferries, Trams	**Mitigation type:** Avoid and/or Reduce **Criteria:** The solution must demonstrate a modal shift from a higher carbon mode. **Guidance:** Modal shift includes prevention of future shifts to higher-carbon modes.
	Low emission fuels	Synthetic aviation fuel, Bio-fuels, Hydrogen	**Mitigation type:** Reduce **Criteria:** Total lifecycle GHG emissions have to be lower than emissions from the current fuel mixes. For, First-generation liquid biofuels they are not climate finance unless they are sourced from waste and when blended, only the portion of non-first-generation biofuel is eligible as climate finance. **Guidance:** Synthetic fuels with low lifecycle GHG emissions (or e-fuels) are those that use low-carbon feedstocks of hydrogen and CO_2. These can count as low emission fuels
Infrastructure	EV infrastructure	EV charging points, Battery swapping	**Mitigation type:** Avoid and/or Reduce **Criteria:** Infrastructure that transports fossil fuels or that use blended fossil fuels (where fossil fuels are still the predominant energy source) are not counted as mitigation finance. **Guidance:** Infrastructure supporting any transport method or sector can count (such as vehicles, trains, aviation or waterborne vessels).

Case study: Battery Smart

Battery swapping stations for EVs - India

Mitigation solution: Reduces. Battery Smart provides infrastructure enabling the acceleration of EV adoption, resulting in reduced GHG emissions from transport. This aligns with eligible activity 9.1 and 8.6 of the MDBs-IDFC Common Principles for Climate Mitigation Finance.

Business model: Battery Smart is India's largest battery-swapping network for electric two- and three-wheelers, by providing batteries as a service. Drivers have only a two-minute battery swap time, reducing range-anxiety, the risks of unreliable battery life, and thereby helping to increase EV adoption.

Funding details: In 2023, Battery Smart raised $33 million in a pre-Series B funding round. It is using the funds to expand to another ten cities within 12 months, with plans to increase its user-base to 100,000.

Waste

Example sub-sectors	Category	Example solutions	How emissions are mitigated
Circular economy	Product reuse	Reusable packaging, Product refilling, Return schemes	**Mitigation type:** Reduce **Criteria:** A product counts if: – If it would otherwise be discarded. – It is being put back to its original use. – It is not being reused in any activity harmful to the climate – Any repair should not compromise the ability to recover and recycle the product at the end of its useful life. **Guidance:** 'Repair' and 'reconditioning' are activities that aim to restore a product to a usable state by fixing or replacing faulty parts.
	Product repair	Product repair and resale	
	Recycling	Recycled paper, Recycled metals, Recycled plastics	**Mitigation type:** Reduce **Criteria:** The activity should aim to recover material from waste in preparation for reuse or recycling. The material recovered should be suitable for reuse or recycling. **Guidance:** Examples of materials recovered through this activity include metals, glass, plastics, paper and cardboard, wood, textiles and textile fibres, bricks and other inert construction materials.
Landfill	Recovery of bio-waste	Methane digesters, Waste-to-energy plants, Landfill methane capture	**Mitigation type:** Avoid and/or Reduce **Criteria:** The bio-waste is segregated at source and collected separately. The produced biogas shall be used productively and aim to replace fossil fuels. Any leftover material should be used as natural fertiliser or soil conditioner. **Guidance:** Bio-waste means biodegradable garden and park waste; and food and kitchen waste from any setting. When combined with other waste from agriculture this should not affect the overall methane production.

Case study: WasteX

End-to-end biochar solution to reduce agri-waste – Southeast Asia

Mitigation solution: Sequesters. WasteX has a technology that converts agri-waste biomass into biochar. Biochar sequesters GHG in both its production and its application to soil, with WasteX planning to remove more than 10Mt of CO_2 annually by 2035. This aligns with eligible activity 5.10 of the MDBs-IDFC Common Principles for Climate Mitigation Finance.

Business model: WasteX was launched in 2022 to tackle the problem of 3.5 billion tons of agricultural processing waste globally that is dumped, burnt, or sold cheaply. It sells small-scale modular carbonisers to agribusinesses. These carbonisers produce biochar from assorted biomass waste (e.g., rice husks) that can be applied to farmland to increase yields, reduce the use of fertilisers, reduce waste management costs, and generate carbon credits.

Funding details: In 2024, WasteX raised $450,000 to accelerate its expansion of biochar production facilities in Indonesia.

Water

Example sub-sectors	Category	Example solutions	How emissions are mitigated
Water	Resource efficiency	Water loss tracking, Demand monitoring systems	**Mitigation type:** Avoid and/or Reduce **Criteria:** Water produced should either be more efficiently generated or transferred, or reduce the GHG emissions with generation. **Guidance:** The best local technology should be used to not lock-in systems to high GHG emitting technology for long periods.
	Water treatment	Solar water treatment, Solar water desalination	
Wastewater	Wastewater treatment	Decentralised wastewater treatment	**Mitigation type:** Reduce **Criteria:** Opportunities should be able to either substantially reduce emissions, reduce water consumption or improve efficiency when treating wastewater. **Guidance:** Opportunities can be dedicated at any or all stages of water treatment.

Information & Communication Technologies

Example sub-sectors	Category	Example solutions	How emissions are mitigated
ICT	Energy efficiency	Efficient data centres, Renewable energy	**Mitigation type:** Reduce **Criteria:** Any solution should improve on industry standards and use common technology to benchmark its performance . A data centre would have to meet an internationally recognised green building certification. **Guidance:** If possible, lifecycle emissions should be calculated for both the product life cycle and the lifecycle of the comparable technology.
Transport	Transport efficiency	Traffic network optimisation, Intelligent route optimisation	**Mitigation type:** Reduce **Criteria:** All transportation types are eligible for improved routing, from maritime shipping and aviation to cars and personal vehicles. Solutions should substantially decrease the overall travel demand, traffic operational efficiency or encourage modal shifts to more efficient modes **Guidance:** Both the technology and physical infrastructure to deliver the technology is counted as mitigation finance.
	Fuel transparency	Sustainable fuel traceability, Supply chain traceability	**Mitigation type:** Reduce **Criteria:** The opportunity should aim to minimise GHG emissions with the final goal being full decarbonisation. **Guidance:** Tracking can occur at either the unit or entity level, to support the traceability of any product that could reduce GHG emissions.
Energy	Energy transparency	Hydrogen traceability	**Mitigation type:** Avoid and/or Reduce **Criteria:** The opportunity should aim to minimise GHG emissions with the final goal being full decarbonisation. **Guidance:** Tracking can occur at either the unit or entity level to support the traceability of any product that could reduce GHG emissions.
	Energy efficiency	Grid management optimisation, Intelligent power management, Utility-scale dispatch prediction and management	**Mitigation type:** Reduce **Criteria:** Opportunities should directly improve the ability for a system to reduce GHG emissions. Lifecycle emissions should be taken into account by the opportunity if it is suggesting changes. **Guidance:** This can be done either at the unit or entity level, as and how systems are introduced.

Nature-based Solutions

Example sub-sectors	Category	Example solutions	How emissions are mitigated
Carbon capture	Land sinks	Abandoned farmland restoration, Tree plantations (on degraded land), Forest restoration, Biomass production, Bamboo production	**Mitigation type:** Sequester **Criteria:** Long-term storage of emissions must be demonstrated, e.g., planting bio-crops to then burn them as fuel is not a viable carbon capturing technique. **Guidance:** Where the stored carbon is to be used (e.g., timber) the transportation and life cycle of emissions should be taken into account.
	Coastal and ocean sinks	Seaweed farming	
Carbon release prevention	Land sinks	Forest protection, Grassland protection, Peatland protection and rewetting	**Mitigation type:** Avoid and/or sequester **Criteria:** Investments should have no impact on local food security or negative impacts on wider biodiversity. **Guidance:** Investments should actively improve the natural environment they operate in beyond what would be possible if nature was left to its own devices.
	Coastal and ocean sinks	Coastal wetland protection, Macroalgae protection and restoration	
Cross-cutting	Monitoring	Systems or transparency tools for monitoring GHG emissions	**Mitigation type:** Avoid and/or sequester **Criteria:** GHG measurement and monitoring solutions should lead to an improvement in gathering data and information on GHG emissions.

Appendix

Guidance documents

Reference	Summary and when to use
Methodologies and frameworks for investing in *climate mitigation solutions*	
MDBs and IDFC (2023), Common Principles for Climate Mitigation Finance Tracking	Sets out common principles and boundaries agreed on by MDBs and IDFC members for financing climate mitigation projects. These principles aim to guide investors in aligning their financial activities with the goals of the Paris Agreement.
Climate Bonds Initiative (2021): Climate Bonds Taxonomy	Taxonomy that screens assets across key sectors of the economy against their compliance with the goals of the Paris Agreement. The taxonomy provides screening indicators and a rating of compliance with the Paris agreement. Work is ongoing to develop an A&R taxonomy.
Project Drawdown	A non-exhaustive library of climate solutions with their associated impact on reducing GHG emissions.
Methodologies and frameworks for investing in *climate A&R solutions*	
GARI (2024): Climate Resilience Investments in Solutions Principles (CRISP) (2024)	**Provides investors with a framework and set of principles** for investing in climate A&R solutions. **Provides a non-exhaustive list of practical examples of A&R solutions** per sector as well as details on key concepts and resources.
Adaptation SME Accelerator Project (ASAP), Lightsmith Group (2020): Adaptation Solutions Taxonomy	**Provide investors with a framework** and set of principles for investing in climate A&R solutions. **Provides a non-exhaustive list of practical examples** of A&R solutions per sector as well as details on key concepts and resources.
Tailwind (2024), Taxonomy for Adaptation and Resilience Investments	**Provides a classification and exploration framework** designed to empower philanthropic and early-stage public and private investors to identify and support A&R projects and companies. Highlights climate adaptation needs and opportunities across society and the economy. **Provides over 400 examples of investable solutions**, financial instruments, and philanthropic interventions.
Standard Chartered and UNDRR(2024), Guide for A&R Finance	**Sets out an indicative list of A&R activities alongside guidance on the process for assessment of this.** Aims to accelerate the development and structuring of financial products focused on A&R, such as loans, bonds, private placements, structured notes, letters of credit, and deposits.
MDBs and IDFC (2023), Common Principles for Climate Change Adaptation Finance Tracking	**Sets out common principles for financing climate A&R activities** agreed by a group of multilateral, bilateral and national development banks.
CBI and UNDRR (2023). Designing a climate resilience classification framework. To facilitate investment in climate resilience through capital markets.	**A&R** Provides a blueprint for the development of a climate A&R classification framework with the objective of promoting and facilitating the much-needed investment in climate resilience through capital markets. It offers an evidence-based approach that enables issuers, investors and other stakeholders to identify climate resilience investments, assets and entities and to facilitate the flow of capital towards them. CBI is currently working on an A&R Taxonomy.

Sector-specific approaches for and evidence on A&R solutions

GSMA (2021), Digital Innovation for Climate-Resilient Agriculture GCMA (2022), Data-driven advisory services for climate-smart smallholder agriculture	**Agriculture**	Highlights the potential of digital services to strengthen the climate resilience of smallholder farmers.
Climate X (2024), Building resilience: A Comprehensive Guide to Adaptation Retrofitting	**Real estate**	Outlines the what, why and how of climate A&R. Includes multiple examples and case studies of adaptation measures.

Regional and/or national climate finance taxonomies and frameworks

EU Taxonomy for Sustainable Activities - (2021) Delegated Act Climate Annex II 2021/2139 and its June 2023 Amendment	**Defines criteria for determining** whether an economic activity within or funded from within the EU **qualifies as climate mitigation and/or climate A&R.**
South Africa Green Finance Taxonomy (2022)	Catalogue of a minimum set of assets, projects, activities, and sectors contributing to mitigation and/or A&R, in line with international best practice and national priorities. Can be used by investors to track, monitor, and demonstrate the credentials of their activities.
ASEAN Taxonomy Board (2024) Taxonomy for Sustainable Finance – version 3	Taxonomy intended to provide a common language for sustainable financing in the Southeast Asian region. It supports the identification of activities contributing to mitigation, climate A&R, protection of ecosystems and biodiversity, as well as resource resilience and the transition to a circular economy. It draws on and intends to be interoperable with the EU Taxonomy and others, tailoring it for the ASEAN context.
Kenya Green Finance Taxonomy (Draft) (2024)	Kenyan Green Finance Taxonomy. (NB: in draft form at time of writing)
Bangladesh Sustainable Finance Taxonomy (2020)	Bangladesh Sustainable Finance Taxonomy. Classifies economic activities that align to sustainable finance (incorporating climate and wider sustainability considerations).

Guidance on impact measurement and metrics

OPIM: Operating Principles for Impact Management	**A framework of nine impact principles for investors to consider in the design and implementation of impact management systems**, ensuring that impact considerations are integrated throughout the investment lifecycle from strategy to exit.
Impact Frontiers: Five Dimensions of Impact	**Sets out a shared logic for assessing and managing impacts on people, economy, and the planet**. It does so by setting out five key areas to consider for defining and assess impact: *what, who, how much, contribution and risk*. Each area is presented in a table with key data points to consider when making an investment.
ARIC (2024): Adaptation & Resilience Impact: A measurement framework for investors	**Provides a practical framework for assessing the positive A&R impacts of investments**, as well as a proposed set of metrics for assessment.
Third Derivative (2022): How (And Why) We Measure Climate Impact	**A step-by-step guide, and calculations, of how to measure GHG emissions** for an investment. Along with additional common benchmarks for the scale of solutions that will impact climate mitigation.
GIIN IRIS+	**IRIS+ is generally accepted impact accounting system** that leading impact investors use to measure, manage, and optimize their impact. **Provides a catalogue of metrics with guidance** to ensure consistency and comparability. IRIS metrics should be used and analysed in combination according to the Five Dimensions of Impact.

Impact assessment tools and methodologies on GHG emissions

Project Frame	**Provides methodology guidance for investors assessing forward-looking GHG emissions impact**. This may be of particular use in assessing early-stage businesses offering mitigation solutions with limited track record / past data on mitigation impact.
CRANE tool	**A free tool for calculating the GHG emissions reduction potential of climate technologies**. CRANE is designed with a focus on early-stage companies.
Simple Emissions Reduction Calculator	**A calculator for assessing the GHG reduction potential of climate tech startups**. The calculator is designed to provide a quick and simple assessment of GHG reduction potential, ahead of more detailed modelling.
IFI's Methodologies for GHG Accounting	**Sets out a harmonised approach for assessing mitigation benefits or Renewable Energy, Energy Efficiency and Transport sectors**.
WRI's Estimating and Reporting Avoided Emissions	**GHG Protocol for estimating and reporting avoided GHG emissions**.

Other resources

Market trends on A&R investing

GARI (2024): The Unavoidable Opportunity: Investing in the Growing Market for Climate Resilience Solutions	Examines the **growing market for climate A&R solutions**. It includes a new analysis mapping companies that provide A&R solutions listed in 47 markets worldwide, including 24 emerging markets. It demonstrates that a sizeable share of the potential investment opportunity for climate A&R solutions is based in the Global South.
AgFunder and ISF (2024), Climate Capital, Financing Adaptation Pathways for smallholder farmers	**Sheds light on the pressing need and opportunities for private investment in climate A&R** within the agriculture sectors of emerging markets. Provides insights on key trends on who is financing/investing and what.
Standard Chartered and UNDRR (2024), The Adaptation Economy	**Examines the need for adaptation investment** in ten developing markets. It provides key insights on the business case for A&R investing.
GSMA (2023): Emerging Trends in Climate Tech Innovations	**Provides a summary of key emerging trends in climate tech innovations**, with a focus on digital and mobile-enabled solutions in emerging markets.
GCA (2023): Financing Nature-Based Solutions for Adaptation at Scale: Learning from Specialised Investment Managers and Nature Funds	**Reviews the status of nature finance globally**. It provides key takeaways on what works and opportunities for scaling funding for Nature-based Solutions.
Climate-KIC (2022), Adapt, Mitigate and Grow. Climate Tech Innovation in Africa	**Provides an analysis of climate tech innovation in Africa**, offers insights on the state of the market, and the growth of the climate tech industry in Africa.

Gender-lens investing

Gender & climate finance toolkit	**Guides investors to identify and prioritise gender-smart climate finance investment risks and opportunities** throughout the investment cycle, as well as in existing portfolios.
Private Equity and Value Creation: A Fund Manager's Guide to Gender-smart Investing	**Provide fund managers with a roadmap on how to strengthen gender diversity at the firm level, and incorporate a gender lens into investment decision-making at the portfolio level**

ESG Venture Capital

BII'S ESG Toolkit for Fund Managers	**Guide the integration of ESG factors into the investment cycle of VC fund managers**
A startup governance journey	**Provide actionable guidance, tools and case studies for establishing governance frameworks**

Glossary

Term	Definition	Source
Climate adaptation	In human systems, the process of adjustment to actual or expected climate and its effects, to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate and its effects.	IPCC (2022)
Climate mitigation	A human intervention to reduce emissions or enhance the sinks of GHGs.	IPCC (2022)
Climate resilience	The capacity of social, economic, and environmental systems to cope with climate-related hazardous events, trends or disturbances, responding or reorganising in ways that maintain their essential function, identity, and structure, while also maintaining the capacity for adaptation, learning, and transformation.	IPCC (2022)
Climate sequestration	The process of storing carbon in a *carbon sink* i.e., a reservoir (natural or human, in soil, ocean, and plants) where GHG is stored.	IPCC (2022)
Impacts	The consequences of realised risks on natural and human systems, where risks result from the interactions of climate-related hazards (including extreme weather and climate events), exposure and vulnerability. Impacts generally refer to effects on lives; livelihoods; health and well-being; ecosystems and species; economic, social and cultural assets; services (including ecosystem services); and infrastructure. Impacts may be referred to as consequences or outcomes and can be adverse or beneficial.	IPCC (2022)
Maladaptation	Actions that may lead to increased risk of adverse climate-related outcomes, including via increased GHG emissions, increased or shifted vulnerability to climate change, more inequitable outcomes, or diminished welfare, now or in the future. Most often, maladaptation is an unintended consequence.	IPCC (2022)
Nature-based Solutions	Nature-based Solutions are actions to protect, sustainably manage, and restore natural or modified ecosystems, that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.	IUCN, 2016
Physical climate risk	Financial risks (and losses) that can arise from the adverse effects of current or future climate. Drivers of these risks can be – Extreme climate-related weather events (or extreme weather events) such as heatwaves, landslides, floods, wildfires and storms (i.e., acute physical risk drivers) – Longer-term gradual shifts of the climate such as changes in precipitation, rising sea levels and average temperatures (i.e., chronic physical risk drivers). – Indirect effects of climate change on natural systems such as loss of ecosystem services (e.g., desertification, water shortage, degradation of soil quality or marine ecology).	TCFD, (2017); BIS (2021)

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Core Partner Group

Chiara Trabacchi	British International Investment
Tatwin Owen Edmunds	British International Investment
Charissa Bosma	FMO
Vika Bhagat	FMO
Ian Milborrow	PwC
Alex Clarke	PwC
Ludo Findlay	PwC
Ben Shergold	PwC

Fund Managers

Mokgadi Maunatlala	Adenia Capital
Mackenzie Schow	Adenia Capital
Emma Jordi	Allied Climate Partners
Burzin Dubash	Ankur Capital
Shiva Shanker	Ankur Capital
Arpit Agarwal	Blume Ventures
Maelis Carraro	Catalyst Fund
Ellen Martin	Circulate Capital
Rob Kaplan	Circulate Capital
Elizabeth Dunne	Circulate Capital
Mason Wallick	Clime Capital
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Kosal Heang	Emerging Markets Investment Advisers
Virek Chey	Emerging Markets Investment Advisers
Savin Mao	Emerging Markets Investment Advisers
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Quentin Vaquette	Wavemaker Impact
Steve Melhuish	Wavemaker Impact
Krezia Medina	Wavemaker Impact
Mel Mayol	Wavemaker Impact
Okke Loman	XSML Capital
Karijn de Bok	XSML Capital
Jarl Heijstee	XSML Capital

Practitioners

Paul Smith	Adaptation and Resilience Investors Collaborative
Chirantan Patnaik	British International Investment
Ryan Wagner	British International Investment
Craig Gifford	British International Investment
Megha Okhai	British International Investment
Randa Sherif	British International Investment
Nishtha Chopra	British International Investment
Reem Daoud	British International Investment
Tom Bruton-Chambers	British International Investment
Nicola Mustetea	British International Investment
William Buchan	British International Investment
Amal-Lee Amin	British International Investment
Craig Davies	Cadlas
Francesca Cataldo	CDP
Ujala Qadir	Climate Bonds Initiative
Jessica Brown	Climate Works
Lori Collins	Collins Climate Consulting
Micheal Knaus	DEG Invest
Daniel Buckley	DFC
Aidan Pongrace	DFC
Kayenat Kabir	Findev Canada
Gilles Vercammen	FMO
Sonja Loggenberg	IDC
Stuart B	IDC
Vladimir Stenek	IFC
Yusuf Jameel	Project Drawdown
Fabio Menten	Proparco
Denis Maina	Swedfund
Anton Ståhl	Swedfund
Amanda Koppang Willfors	Swedfund
Emilie Mazzacurati	Tailwind
Katie MacDonald	Tailwind
Chetan Krishna	Third Derivative

For further information:

British International Investment plc:

123 Victoria Street
London SW1E 6DE
United Kingdom

T: +44 (0)20 7963 4700

E: enquiries@bii.co.uk

bii.co.uk

FMO:

Anna van Saksenlaan 71
2593 HW, The Hague
The Netherlands

T: +31 70 314 96 96

E: info@fmo.nl

www.fmo.nl