ONE PLANET
SWF NETWORK

REAL ESTATE DECARBONISATION PLAYBOOK

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START

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Congratulations to the OPSWF Greening Real Estate Working Group for producing such a thoughtful and practical guide to greening real estate.

The built environment is responsible for almost 40 percent of global energy-related greenhouse gas emissions, making it one of the largest opportunities for decarbonising the economy.
Emissions from buildings are rising faster than in any other sector because of inefficient existing stock and growing demand for new and better homes.

Beyond its impact on the climate, the sector profoundly shapes how people live. We are facing a global housing crisis, with an estimated 1.6 billion people lacking adequate shelter, a number expected to almost double by 2030. The construction industry, which employs more than 220 million people, has a vital opportunity to lead a transition towards safer, greener employment and inclusive development. By 2050, the total floor area of buildings worldwide is expected to increase by 75 percent, with the majority of this growth occurring in the emerging and developing economies. Transforming the way we design, build and operate our spaces is one of the most pressing challenges of this century.

Progress will depend in part on effective regulation and policy. When policy succeeds, impact follows at scale. Yet to achieve this, we must proceed with a market mindset that matches the growing appetite among investors, financiers, developers and tenants for buildings that use low-emission energy and materials, offer higher quality homes, and create more resilient communities. The case studies in this Playbook illustrate the essential role that asset owners and managers can play in decarbonising buildings and demonstrate how many measures can pay for themselves while cutting emissions.

At CIFF, we help provide the scaffolding and technical assistance for city, state and national governments to design ambitious climate policy which meets the needs of society and sets clear and fair rules for market participants.

Looking ahead, there is a clear opportunity to deepen the dialogue between policymakers and investors around the future of the built environment. Policy can set the direction of travel, but long-term capital determines the pace and scale of progress. When clear, consistent frameworks meet the steady horizons of sovereign and institutional investors, momentum builds naturally. Initiatives such as this playbook can help anchor that convergence, fostering collaboration that turns ambition into implementation. By advancing this conversation together, governments and markets can chart a path that delivers economic renewal, social benefit, and measurable reductions in risk for generations to come.

Terri Willis
Director, Climate
CIFF | Children's Investment Fund Foundation

Unique among institutional investors, sovereign wealth funds have a cultural as well as a financial mandate: to preserve value for their societies' future generations. The real estate sector thus has powerful significance both symbolically and practically. While directing a large share of total assets into real estate (more than 25 percent in 2023), sovereign wealth funds play a major role in influencing people's experiences in the built environment: how they live, work, play, shop, and gather together. The famous observation about our buildings—*first we shape them, then they shape us*—is true, and sovereign wealth funds take that role seriously.

The One Planet Sovereign Wealth Funds Network, or OPSWF, includes 50 member institutions from among sovereign wealth funds as well as asset managers and private equity investors. We pursue our shared mandate of long-term value creation and preservation by identifying specific areas of interest where we feel we can exercise meaningful influence. Then we organise ourselves into working groups and commit to specific, practical tasks.

The Greening Real Estate Working Group came together in late 2024 and quickly decided to fill what we saw from our own professional experiences was a persistent gap: the lack of a practical tool to guide real estate stakeholders through decarbonisation. As detailed in the pages that follow, the Working Group was aware of the many frameworks, guidelines and mandates already in existence; it was not our goal to duplicate any of those. Rather, the task we set ourselves was to guide the user through the entire how of decarbonisation, not just the what and why, important as those are. Bearing in mind our goal of filling gaps, the Working Group put special emphasis on the initial work of a Decarbonisation journey—deciding where to start and creating team cohesion—that we believed does not usually get enough attention.

Although the Greening Real Estate Working Group took the lead on authoring the Playbook, the entire OPSWF Network contributed, most notably during intensive roundtable sessions at the OPSWF Mid-Term Meeting in June 2025. Their input, offered from a wealth of relevant experience and in the pragmatic spirit that characterises OPSWF, definitively shaped this project.

Going forward, the Working Group intends to gather user feedback to the Playbook systematically, through surveys and regular online "office hours" during which we will answer questions and take suggestions. We hope to publish updates of the Playbook that will integrate this feedback, ideally in other languages in addition to English. For now, it is our honor to share this first edition of the Decarbonising Real Estate Playbook, a hands-on, pragmatic tool in the service of an inspiring vision: a built environment that preserves value in every sense, so that people and the environment can thrive.

On behalf of the Greening Real Estate Working Group and the rest of the OPSWF network, we hope you find it useful.

Greening Real Estate Working Group Members
OPSWF Network

Lawrence Yanovitch
CEO & Founder
OPSWF Network

The Real Estate Decarbonisation Playbook aims to provide a structured and pragmatic approach towards the object of decarbonising real estate portfolios: from the upfront work to understand and align stakeholder interests, to effective planning and clear communications, and finally to an implementation approach that emphasises continuous improvement. The Playbook is designed to support the convergence of good practices around real estate decarbonisation by synthesizing and building upon—without duplicating—the existing body of work and tools. Our goal was not to develop a mandatory framework or general standards, but rather to deliver a step-by-step roadmap to facilitate and progress.

Because real estate is an unusually complex multi-stakeholder sector, the Playbook details the intersections between asset owners, operators, managers, and tenants. Specifically, it focuses on the transition risk in real estate portfolios and investments—that is, the costs arising from the transition to a low-carbon economy, including the repricing of carbon-intensive assets, reduced demand, and rental yield sensitivity. Although the Playbook is intended primarily for OPSWF members and those with whom we engage in real estate transactions (e.g., co-investors, asset managers, tenants), the authors hope that it will also be useful to other real estate practitioners and to the general public.

Recognising that different users will be at different points on their decarbonisation journeys, we designed the Playbook as an interactive PDF. If you choose, you can read the Playbook from start to finish in a linear fashion (bearing in mind that some material will be repeated from one section to another, since they were also designed to work as stand-alones). But thanks to the interactive technology, you can also navigate easily between sections and chapters by clicking on items in the menu bar. Each chapter contains a “Summary” table, a snapshot of the steps each stakeholder needs to take. We have also included a “Summary of Summaries” to streamline the user experience even further.

The Playbook details two distinct pathways when decarbonising real estate*.

New Investment and Relationships.

At the beginning of any new relationship, transaction, or lease, there is a unique opportunity to set the terms for decarbonisation from day one. Setting these foundations at the outset can create a smoother path for all parties and provides the greatest chance of long-term success. The Playbook provides guidance on these ideal foundations—be they alignment, roles, rights and governance, a climate-aligned due diligence process, information, and communication channels.

Existing Investments and Relationships.

In many existing relationships and portfolios, the ideal conditions were not established at the outset—but this does not mean that progress is impossible. There are clear, practical, and actionable steps that stakeholders in real estate investment can take to bring these relationships closer to alignment. The Playbook is designed to provide practical insights and tools to deploy for existing circumstances, too.

Given the diversity and breadth of the OPSWF members’ portfolios, the Playbook adopts a broad approach and stresses the value of getting started. No journey is perfect and small steps—even one building at a time—can deliver important investment and environmental benefits.

* Nothing contained in this Playbook shall be construed as investment advice. Neither OPSWF nor its members shall be held liable for any actions taken based on the content of the Playbook

GLOSSARY

BBP	Better Buildings Partnership
BREEAM	Building Research Establishment Environmental Assessment Method
Capex	Capital expenditure
CCREM	Carbon Risk Real Estate Monitor
DDQ	Due diligence questionnaire
EMDEs	Emerging markets and developing economies
EPC	Energy Performance Certificate
FRI	Full repairing and insuring
GHG	Greenhouse gas
GP	General partner
GRESB	Global Real Estate Sustainbility Benchmark
HVAC	Heating, ventilation, and air conditioning
KPI	Key performance indicator
LEED	Leadership in Energy and Environmental Design
LP	Limited partner
LPAC	Limited partnership advisory committee

LTV	Loan to value
MACC	Marginal abatement cost curve
NAV	Net asset value
NOI	Net operating income
Opex	Operating expenditure
SFDR	Sustainable Finance Disclosure Regulation
TOD	Transit-oriented design
TCFD	Task Force on Climate-related Financial Disclosures
UHI	Urban heat island

REAL ESTATE DECARBONISATION OPPORTUNITIES.

A value protection/creation driver for investors

Sovereign wealth funds (SWFs) have significant exposure to real estate, with more than 25 percent of total SWF investments in 2023 aimed at the sector, up from 18 percent in 2019[1] . Managing real estate portfolio misalignment risk is thus becoming a strategic issue for long-term value protection. Buildings may have their value impacted if they fail to meet emissions targets, becoming economically unviable to the point of obsolescence. Indeed, a 2024 survey by Deepki of more than 250 senior European commercial real estate asset managers from institutions in the UK, Germany, France, Spain, and Italy—representing a combined AUM of €226.3 billion—found that 94 percent viewed the financial risk from "brown discounting," or the depreciation of non-sustainable properties, as high[2].

More than half of the respondents indicated that 50 percent of their assets are either already misaligned or at risk of becoming misaligned within the next three years, with more than half of these assets considered high priority[3].

Along with accounting for a significant share of global emissions and energy consumption, the real estate sector also faces significant climate-related risks.

According to the latest Global Status Report, the building sector accounts for 37% of energy-related GHG emissions.[4] The impacts of climate change make the sector especially vulnerable to both regulatory and market pressures, including dramatic increases in the cost of insurance. The convergence of these many issues—high energy costs, decreasing costs for energy efficiency solutions, regulatory pressures, and market forces (e.g. investor/tenant demand)— will only increase the motivation for commercial and tertiary real estate to decarbonise.

As outlined in PREQIN's 2025 Global Report on Real Estate, benchmarks of real estate funds that integrate a climate lens throughout the investment process show that such funds have historically outperformed competitors in certain benchmarks[5]. This outperformance seems to reflect a broader structural shift in real estate markets, where climate-conscious strategies are increasingly aligned with both regulatory trends and tenant demand, as detailed below.

Growing demand for efficient, sustainable assets, driven by both tenants and tightening regulations.

We are seeing strong policy signals across geographies to accelerate the decarbonisation of real estate. In Europe, the Renovation Wave strategy provides a comprehensive approach to double the annual energy renovation rate by 2030; the EU Commission is also progressively implementing minimum requirements in terms of energy efficiency and supporting new technologies[6]. Similar strategies are being implemented across the world, with Gulf State countries leading the way (e.g., Saudi Arabia's net zero 2060 strategy, Qatar National Vision 2030, or UAE Net Zero 2050 strategy) and EMDEs such as India also contributing to global efforts.

[1] Invesco Global Sovereign Asset Management Study, 2024, SWF Annual Report
[2] Deepki (2024), European Commercial Real Estate Faces Stranded Asset Time Bomb, According to New Research by Deepki, June 19, 2024.
[3] DEEPKI, 2024, European Retrofitting Report
[4] Global Status Report for Buildings and Construction 2024/25
[5] PREQIN, 2025 Global Report: Real Estate
[6] Net-Zero Industry Act and possible integration in the EU Emission Trading Scheme (EU-ETS) by 2026

New opportunities are emerging for value-add approaches and conversions, as misaligned assets come onto the market at significant discounts.

This is due to liquidity constraints that make it difficult to refurbish income-generating assets. In addition, technologies to achieve a 40 percent reduction in emissions by 2030 are already available to be fully leveraged across geographies[7]. Digital technology will be a key enabler of this transition. The Internet of Things when coupled with building management systems can help optimise consumption by around 20 percent[8]. Demand-side management, LED lighting technologies, and smart metering are competitive and have a short payback period of less than three quarters of a year, consistent with most investors' time horizons. HVAC and system optimisation are competitive but have a payback period between six and seven years, requiring financial innovation.

Value protection strategies in an environment characterised by higher uncertainty and longer holding period.

Decarbonisation enables owners to retain their assets for longer and provides more flexibility for exit strategies, with green buildings commanding high rents and demonstrating lower tenant risk (8 percent rent premium and 13 percent points lower vacancy rate compared to standard assets[9]). In addition, physical climate risks could also significantly impact real estate portfolios, with property damage costs potentially increasing by up to 30 percent under a business-as-usual scenario[10].

[7] Environmental Defense Fund, 2021. Revamped-cost-curve-reaching-net-zero-emissions
[8] World Economic Forum, 2021. Digital solutions can reduce global emissions by up to 20 percent /
[9] OID, 2023, How can we define the green value of a building ?
[10] CCR, 2023. consequences of climate change in France and IPCC 2022. Key Risks across Sectors and Regions

A practical example of relevant dynamics can be seen in the Thessaloniki International Fair (TIF) premises redevelopment project, which illustrates how activating sustainability levers can both enhance long-term asset value and align with evolving regulatory and market expectations.

CASE STUDY

Redevelopment of the Thessaloniki International Fair (TIF) premises in Greece

Growthfund is spearheading the redevelopment of the Thessaloniki International Fair grounds, the most significant urban redevelopment project in Northern Greece. Growthfund is working on this project in collaboration with its wholly-owned subsidiary TIF-HELEXPO, which organises and hosts international and local exhibitions and events.
Located in the heart of Thessaloniki, TIF's existing features include the city's Museum of Modern Arts, a telecommunications tower, and a basketball arena. The expansion project will transform this vital area into a modern, sustainable, and multifunctional hub of green space, cultural identity, and economic activity.

TIF HELEXPO already performs annual carbon footprint measurements and publishes sustainability reports, is a UN Global Compact signatory, and successfully certifies the exhibitions and events it hosts with ISO 20121, an international standard for sustainable event management systems. For the TIF project, the design process involved extensive consultation with stakeholders, including the city's citizens and businesses, whose views were thoroughly assessed and incorporated into the project's vision and planning.

The project incorporates the following elements:

- The largest part of the site, covering more than 100,000 square meters, will become an accessible recreational and event space available to citizens and visitors 365 days a year and featuring extensive green plantings.
- The project also fosters improvements in urban mobility, with 660 modern underground parking spaces and connections to public transport bus routes and metro lines.
- The new facilities will include cutting-edge exhibition and conference facilities covering approximately 47,000 square meters, facilitating the hosting of large-scale international events. Due to sustainable infrastructure, environmentally friendly systems and smart technologies, the environmental footprint is expected to be reduced.
- The urban regeneration model was envisaged to balance environment, economy, and society, and to this end, pursued a win-win approach of having all stakeholders onboard. With continuous consultation, collaboration with local bodies, the Thessaloniki Municipality, the State, and with open voting from citizens, all stakeholders were given the opportunity to contribute to shaping the asset's best utilisation.
- The Project is currently planned for completion by 2029, and implementation will be phased to ensure continued operation of the current exhibition facilities.
- The project upgrades the city of Thessaloniki and positions it as a modern, green, and competitive urban hub in Southeast Europe.

REAL ESTATE DECARBONISATION CHALLENGES.

A comprehensive approach remains necessary and both calls for and entails public engagement.

Greening the built environment through decarbonisation and smart and sustainable urban planning are interconnected challenges. Urban planning decisions and strategies can significantly impact emissions as well as the potential for the transformation of buildings. Land-use efficiency, transit-oriented design, access to green spaces, resilience, and district clean energy planning enable a systemic approach that delivers more efficient and low-carbon solutions.

Addressing urban heat island (UHI) mitigation through land planning and vegetation initiatives can help reduce temperatures by up to 3°C, significantly reducing the need for cooling during summer. Location efficiency and transit-oriented design (TOD) can help reduce greenhouse gas (GHG) emissions and building life-cycle energy consumption by 9-25 percent[11]. City-level actors should collaborate across sectors and government levels to support this integrated vision.

New expertise needed to fully leverage these new opportunities

Key challenges for investors pursuing a build-to-green strategy include the need for improved data to track portfolio transitions, new expertise they may not already possess in-house, and improved collaboration between stakeholders. The Playbook provides key insights to guide investors in the transitioning of their portfolio, including:

- Data solutions to support asset managers in monitoring and managing misalignment risk, assessing the green premium, and determining the ability to recover investments.

- Effective engagement tools for stakeholders, including tenants, contractors, and public authorities to align on the definition of green building to accelerate capital allocation toward the most efficient approaches. (Indeed, debt providers, LPs, and tenants are increasingly demanding evidence of risk reduction and positive impact.)

Specialised expertise is increasingly necessary to manage the complex process of fully integrating climate aspects into the investment process. While the challenges are significant, they can also be turned into investment opportunities. Investors who adapt quickly by leveraging new tools, building the right expertise, and collaborating across the ecosystem are well positioned to capture emerging value in the transition to green real estate.

[11] Ibid

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SECTION 1 -

LAYING THE GROUNDWORK

- Building Internal Alignment and Engagement
- Understanding Different Stakeholders
- Managing Investment Dynamics

The decisions you make, and the relationships you foster, during the planning phase will to a large extent determine the success of your decarbonisation efforts. You will need approval and support from a wide range of stakeholders—and active, on-going participation from some of them, most of whom will be juggling multiple and competing demands of their own. The work you do in this section will help you understand what motivates (and demotivates) your stakeholders, meet them where they are, respond to their concerns, build effective alliances, and manage complex investment dynamics.

BUILDING INTERNAL ALIGNMENT AND ENGAGEMENT

Decarbonising an existing real estate portfolio is a complex, multi-year journey. Embarking on this journey first requires buy-in, alignment, and engagement within your own organisation before you can hope to align, engage, and influence others.

Decarbonisation is not just a technical or engineering challenge. It is an organisational strategic commitment and change management exercise which will impact many different teams and parts of the organisation. They must see the value creation and protection benefits and understand how decarbonisation may impact the organisation and their individual roles—how they interact, assess, evaluate performance and make capital allocation and asset management decisions.

Be flexible

It is likely that your portfolio is diverse, held in numerous structures, geographies, asset classes, and legal entities. Responsibility for different parts of the portfolio and decarbonisation process will likely rest with different individuals or teams in the organisation depending on the asset type, location, and stage of the investment life cycle. A one-size-fits-all approach is thus unlikely to be successful.

Crucially decarbonisation is an evolving space: awareness, expectations, regulation, and technology are constantly evolving. So your decarbonisation strategy should be flexible enough to meet the demands of a diverse and evolving portfolio as well as those of an evolving market and regulatory landscape.

Additionally, it should be noted that a decarbonisation strategy or commitment does not typically restrict the investable universe. To the contrary, it allows investment teams to make better informed decisions, to identify potential costs associated with transitioning assets post-acquisition, and to future-proof design/build specifications during the development phase.

Start at the top

A champion at the Board and CEO level and a clear mandate from leadership is a powerful tool. Senior management and ideally Board-level commitment can provide visibility, signaling, direction, authority and resources to support the goal. Critically if decarbonisation can be embraced at this level it sets the tone that decarbonisation is a strategic long -term priority.

This most senior level champion doesn't need constant engagement or daily management. They can provide strategic direction and should be kept up to date and re-engaged when their gravitas and resource allocation is needed.

If you are not in a position to enlist senior-level buy-in, however, progress is still possible. Try finding other influential champions within the organisation who can help provide visibility, authority and momentum. That said, while a bottom-up approach can allow an organisation to tactically pursue decarbonisation, that alternative will depend upon the investment team possessing an advanced level of sustainability fluency and/or sustainability/ responsible investing resourcing (e.g., a real estate sustainability professional on the asset owner side).

But don't forget to engage the whole organisation

Decarbonisation is a team sport. Beyond leadership, don't forget to engage the whole organisation. Especially given that the responsibilities for decarbonisation are often decentralised, the real day-to-day work and progress happens at the individual and team levels. Additionally, a dedicated sustainability function at the asset owner/manager-level can be an important tool and accelerant for progress, helping with tracking and managing progress and acting as a center of excellence.

The key to a successful decarbonisation strategy is to make it relevant to each of these groups, and for them to find and drive their own momentum because they can see the benefits that decarbonisation brings. This may include formal inclusion of decarbonisation related KPIs, objectives and incentives.

Educate – Build understanding of climate risk and opportunity

You may need to educate your broader organisation - and crucially - your leadership on climate risk and how decarbonisation can benefit the organisation. Don't assume that everyone already knows or understands this. Take the time to raise awareness, reinforce and to gain insights on unique opportunities or challenges. Ask them to lead sessions themselves or lean on the expertise of a sustainability function and/or subject-matter expert consultants.

Cross-functional working group

For your decarbonisation strategy to succeed, it is essential to form a working group composed of a broad range of people within the organisation including investment team, sustainability team, finance, capital projects, and property management. It is imperative to include individuals who own the capital planning or budget approvals for assets.

A working group may also involve external stakeholders (e.g. local portfolio, property managers, sustainability advisors and key team members) with a proven track record of implementing and delivering decarbonisation strategies.

Appoint a leader for the working group. This is a critical role to coordinate, track progress, assign responsibilities, and escalate if needed. The leader can also be responsible for sustaining the group's momentum: to succeed, the group must maintain a regular cadence, a drum beat of action.

Summing up

Building internal alignment and engagment

Checklist of actions

- ✓ Seek senior level buy-in and leadership
- ✓ Find other champions (e.g. non-executive) across the organisation
- ✓ Educate and raise awareness – consider a dedicated CEO and Board session
- ✓ Establish a cross functional working group
  - > Appoint a lead
  - > Meet regularly
- ✓ Establish systems and processes to measure and monitor GHG emissions across your real estate portfolio
- ✓ Explore KPIs, objectives and incentives to drive alignment and progress
- ✓ Communicate ambition and progress to the whole organisation

UNDERSTANDING DIFFERENT STAKEHOLDERS

As discussed in the previous chapter, decarbonising real estate is not exclusively, or even primarily, a technical and financial challenge. Before those challenges even come into play, decarbonisation requires understanding and responding to the competing goals of different stakeholders. That process begins within one's own organisation (explored in the previous chapter), but within the real estate investment ecosystem, there are diverse stakeholders with distinct—and sometimes competing—interests, whether about return expectations, investment horizons, or accountability to their own stakeholders. These different priorities can cause friction when it comes to decarbonisation (or anything else).

Understanding this complexity is key to decarbonisation. Real estate investment is not a single linear system but rather an interconnected network where each stakeholder holds different levers to initiate action and influence outcomes. The Playbook is grounded in that reality, and aims to bring clarity, common ground, and practical solutions to a complex landscape. By surfacing shared challenges and laying out stakeholder realities, we hope to foster alignment and support better, more coordinated action on decarbonisation in the built environment.

For example, sovereign wealth funds may prioritise regulatory compliance, long term value creation, their mandate, and accountability to their beneficiaries.
Asset managers, meanwhile, have greater pressure to deliver more immediate financial returns whilst balancing the different sustainability priorities of sometimes hundreds of different limited partners (LPs). For their part, tenants may want greener decarbonised buildings but may resist higher service charges for climate-aligned upgrades from which they feel disconnected or when the benefits are indirect or long-term. Developers are under pressure to keep upfront costs low and to finish build and refurbishment times on schedule whilst also incorporating decarbonisation demands and features.

The key is not to typecast one stakeholder with a specific and static set of incentives and barriers but rather to recognise that there are generalised pressures and priorities on each group, and that decarbonisation is a collective effort. Remaining open to understanding different perspectives, whilst also being clear with your own, is crucial. Bringing these diverse voices and sometimes conflicting incentives together requires deliberate communication, negotiation, and sometimes compromise.

Even within each of these general characters, there are nuances and differing ambitions, enablers and blockers.

Summing up

Understanding Different Stakeholders

Stakeholder	Incentives	Blockers
Sovereign Wealth Fund	• Protect long-term asset value • Regulatory compliance • Reduce standard asset risk • Strengthening Reputation • Beneficiary accountability • National decarbonisation targets	• Initial capex can be high • Challenge to pass costs through to tenants depending on the lease • Payback misalignment • Internal capability and prioritisation of climate • Internal buy in and direction • Limited control over operational decisions at the asset level or influence on tenants
Tenant	• Reduce operating costs • Meet employee expectations on sustainability and comfort	• Tenants are limited in adopting sustainability measures due to lack of control and restrictive lease terms • Retrofit disruption • Increases in service charges • Restrictive lease terms • Unable to gather or fulfil data requests

Stakeholder	Incentives	Blockers
Property Manager	• Optimise performance of asset • Meet owner/investor expectations • Meet regulations • Reputation improvemen	• Not financially incentivised • Needs owner investment to execute • Additional tasks and ad hoc requests generate work they are not paid for
GPs / Fund Managers	• Respond to increasing expectations/requirements from investors that sustainability be integrated into overall strategy (not just specific climate-focused funds) • Aligns with fund targets • Reduced stranded asset risk • Reputation enhancement • Attract climate-aligned LPs	• LPS may not communicate clear expectations • Quantum and divergence of LP decarbonisation targets and dates • Reporting burdens, greenwashing risk • Difficulty in accessing and collating information at the underlying asset level
Lenders	• Reduce transition risk • Product – sustainability linked loans • Reputation	• Reporting burdens, greenwashing risk • Data availability and quality

MANAGING INVESTMENT DYNAMICS

Decarbonisation has become an increasingly important focus for asset owners and asset managers alike. Institutional asset owners are not only affirming (or committing to) ambitious targets but are also strategically directing capital toward platforms and managers with demonstrated capability to execute decarbonisation at scale. At the same time, existing funds are experiencing evolving demands and expectations about decarbonisation – even when it was not initially a mandate or core focus. As a result, there is a growing interest in the role of investment dynamics at the intersection of asset owner and manager relationships.

Asset owners and managers must navigate this dynamic alongside broader market pressures including interest rate volatility, evolving tenant sustainability preferences, and rising operating costs. Identifying decarbonisation pathways that are both financially viable and technically executable is essential to aligning owner and manager priorities and unlocking long-term value.

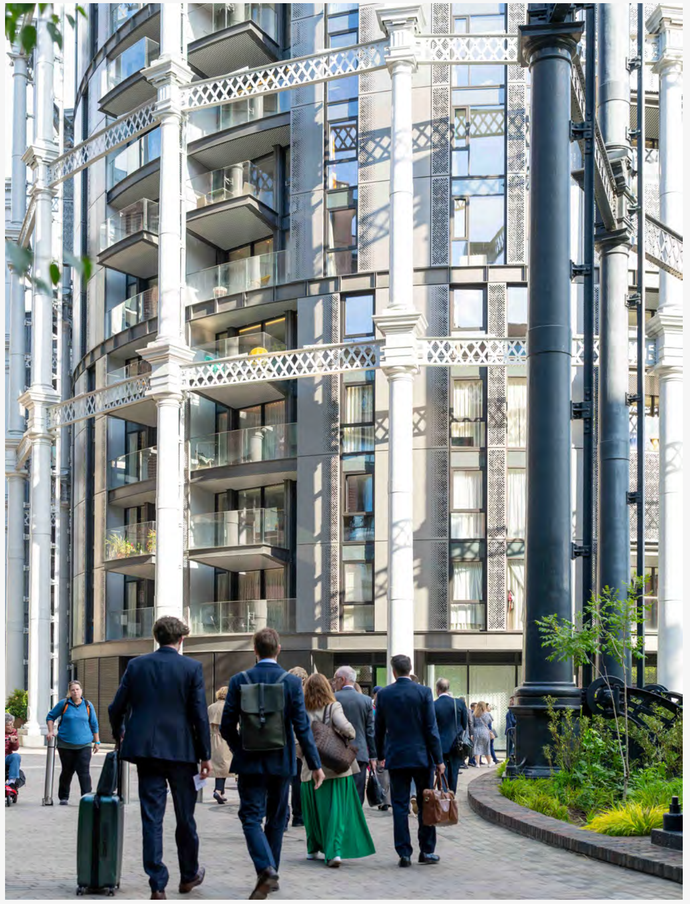
For assets with high decarbonisation potential, owners should expect and explicitly request managers to conduct rigorous assessments, select the most effective interventions, and establish a clear implementation Roadmap. From an investment dynamics perspective, this requires owners to provide clear expectation and directions with a focus on building archetypes and capital planning, particularly aligning decarbonisation strategies with regularly scheduled equipment replacement cycles to avoid missed opportunities for efficient capital deployment.

As elaborated elsewhere in the Playbook, governance shapes the level of influence and thus the pace at which decarbonisation can be achieved. Your approach to managing investment dynamics must reflect the degree of financial and operational control embedded in the different investment structures, ensuring that decarbonisation efforts are tailored to the governance realities of each asset or fund. Owners should also understand if their expectations can reasonably be achieved.

Plan and integrate early.

To maximise impact, improve pace, and reduce cost and complexity, decarbonisation must be integrated as early possible in the investment process. Decarbonisation should be prioritised at the asset or fund level based on a set of investment-relevant criteria, including current energy performance, property type, local market dynamics (e.g., regulatory trajectory, tenant expectations), access to green financing, divestment strategy, and lease structures. By integrating these factors into capital allocation and asset

management decisions, owners and managers can jointly advance climate-aligned performance while preserving and enhancing long-term asset value.



Collaboration and engagement as a decarbonisation lever.

Because collaboration between asset owners and asset managers is such a critical enabler of decarbonisation, asset owners and general partners (GPs) collaborate through a mix of governance, contractual, and operational coordination. While control over the decarbonisation strategy and overall sustainability reporting approach may be higher in direct investment structures, incentive structures to advance decarbonisation practices can also be embedded in fund documentation and reporting requirements for indirect (fund/limited partnership) commitments.

CASE STUDY

Mubadala & Project DeCarb: Unlocking Sustainable Value

In 2024, Mubadala drove forward at pace with Project DeCarb, its partnership with Solutions+. Project DeCarb focuses on long-term value creation through the integration of decarbonisation planning across a selection of UAE-based portfolio companies.

Mubadala selected 16 of its assets from sectors including real estate, education, and industrial, and carried out detailed energy audits and GHG assessments for each. The data revealed that purchased electricity and water were the dominant sources of Scope 3 emissions, followed by employee commuting and business travel.

The Project DeCarb team then identified 160 carbon reduction opportunities. Of these, 110 were analyzed in detail; 56 were deemed feasible, and 43 exceeded Mubadala's hurdle rate.

Six initiatives were selected for phase one implementation based on strong business cases and payback periods of under four years. These included heating, ventilation and air conditioning (HVAC) upgrades, fan replacements, and pre-cooling systems, achieving 1.67 million kilowatt-hours in electricity savings and emissions reductions equivalent to removing around 1,750 cars from the road each year.

Although concessional capital had been earmarked from the Mubadala Foundation to support energy efficiency efforts, many of the proposed projects turned out to be self-financing. As a result, Foundation funding was not required in phase one, and the phase one projects are expected to deliver AED 18 million in long-term value, calculated using net present value and lifetime carbon dioxide reductions of 7,523 metric tons.

For phase two, Project DeCarb is scoping an additional 52 energy efficiency measures, collectively expected to require AED 39.4 million in investment and to deliver annual savings of AED 6.44 million and lifetime emissions reductions of 101,000 metric tons of carbon dioxide. Thirteen lower-yield projects are also under consideration for future Foundation-backed support.
Beyond emissions reductions, the project significantly improved data maturity, embedded climate KPIs into business planning, and fostered cross-functional ownership of climate risk, marking a step change in companies' approaches to sustainability.

Project DeCarb has become a platform for climate-smart value creation, reinforcing Mubadala's role in responsible investment.

Key mechanisms to align and coordinate decarbonisation initiatives include:

Budget/Capital Planning Discussions.

Annual budgeting and capital planning present an opportune time to discuss the decarbonisation roadmap for a property or portfolio. Approval processes for major capital expenditures can be used to prioritise decarbonisation measures such as more efficient equipment, and the timing of upgrades to align with decarbonisation measures. This alignment can be strengthened by negotiating formal approval rights over budgets and capital plans—or, where full control is not feasible, by securing engagement or notification rights to ensure visibility into key investment decisions.

Joint Sustainability Committees or Working Groups.

These are cross-party forums bringing together asset managers, owners, and operating partners to refine decarbonisation roadmaps, share data, align on timelines and discuss best practices. Crucially, such forums can also foster a shared sense of ownership of decarbonisation.

Shared Reporting Platforms.

You can simplify your journey, and promote transparency consistency, by embracing monitoring and reporting technology, platforms and tools. Near real-time dashboards (e.g., GRESB, BREEAM LEED Online) can help align owners and operators on energy, water, waste, and GHG emissions KPIs.

Sustainability-Linked Fees.

Fees and performance incentives tied to measured decarbonisation outcomes can be a powerful incentive, including GP compensation tied to carbon reduction milestones or building performance metrics.

The approach to decarbonisation varies significantly between direct or co-investment structures and fund investments, driven by differences in the level of control and influence owners can exert over asset-level decisions.

Direct Investments.

In co-investment structures where asset owners invest alongside a general partner (GP) or developer, there is often greater opportunity to influence design and operational decisions, particularly for new developments and major capital upgrades. This level of control may provide owners with strategic input on key decarbonisation levers such as low-carbon material selection (e.g., recycled steel, low-carbon concrete), renewable energy procurement or on-site integration, building certifications, tenant engagement mechanisms (e.g., green lease clauses), adoption of smart building technologies, and specification of high-efficiency systems (e.g., air source heat pumps). Green leases and other tenant engagement tools can also be recommended and adopted more easily in high control/influence investments.

With active owner engagement, direct structures can materially enhance a property's ability to achieve net-zero emissions by design or can help ensure that existing assets are positioned to meet future regulatory and market expectations. Direct structures also simplify alignment on carbon reduction targets at the asset or portfolio level, enabling more precise capital planning and performance tracking.

Indirect (fund) commitments.

In limited partner structures, asset owners deploy capital through pooled vehicles managed by GPs, often alongside other institutional investors with varying levels of ambition and understanding of the decarbonisation business case. Balancing the expectations and requests of multiple or dozens of LPs further increases the complexity of the challenge for GPs. GPs and their operating partners may also differ in technical capability to implement climate-aligned strategies.

Despite these challenges, indirect commitments offer scale advantages and access to specialised expertise. Asset owners can embed decarbonisation expectations contractually at the fund level, ensuring climate considerations are integrated into investment and asset management processes. Post-investment, active engagement, whether directly or via Limited Partnership Advisory Committees, is essential to guide fund-level decarbonisation strategy, surface value-accretive opportunities, and ensure alignment with long-term resilience and return objectives.

Investment dynamics and decarbonisation barriers.

As noted earlier, accelerating decarbonisation across real estate portfolios requires coordinated action between asset owners and managers, particularly to overcome timing and capability barriers. The lifecycle of capital equipment (e.g., HVAC systems) often misaligns with decarbonisation goals, while technical expertise may be unevenly distributed across operating partners. To unlock investment at scale, owners should work with managers to embed implementation-ready policies and practices to reduce execution friction and enhance the financial case for low-carbon upgrades.

- **Integrating decarbonisation considerations into valuation.** Despite the long-term value preservation benefits (including reduced carbon pricing and regulatory risk) of low- and net-zero carbon buildings, these attributes are not yet reflected in mainstream valuation models or underwriting practices. Asset owners can play a catalytic role by encouraging managers and the broader industry (e.g., valuation advisors and standards-setters) to integrate climate risk-adjusted metrics into investment analysis and performance reporting, thereby aligning capital decisions with long-term asset resilience and value creation.

- **Alignment on standards and reporting.** The proliferation of disparate standards, spanning net-zero definitions, disclosure frameworks, and municipal emissions regulations, also creates operational complexity and can delay decarbonisation progress. Owners and managers should collaborate to identify and align around credible, interoperable standards that support consistent measurement, reporting, and benchmarking across jurisdictions and asset types.

- **Advocacy.** Access to clean energy remains a critical enabler of building decarbonisation, yet structural barriers persist. In many markets, managers have limited control over electricity procurement and face constraints to on-site generation due to permitting or grid limitations. Owners can support progress by advocating for policy reform, investing in shared infrastructure, and enabling portfolio-wide energy strategies that address these systemic challenges.

- **Tenant engagement.** Tenant engagement is another key lever, particularly in industrial and open-air retail assets where owners and managers often lack control over HVAC systems or visibility into utility data. This limits whole-building emissions tracking and impairs efforts to influence tenant behavior. Owners should work with managers to deploy green lease structures, data-sharing protocols, and collaborative engagement models that drive shared accountability and unlock emissions reductions across the value chain.

Summing up

Managing investment dynamics

Recommendations to accelerate action.

Building owners and managers should ensure that investment dynamics support collaboration and alignment around decarbonization. Each should undertake specific steps to advance that collaboration.

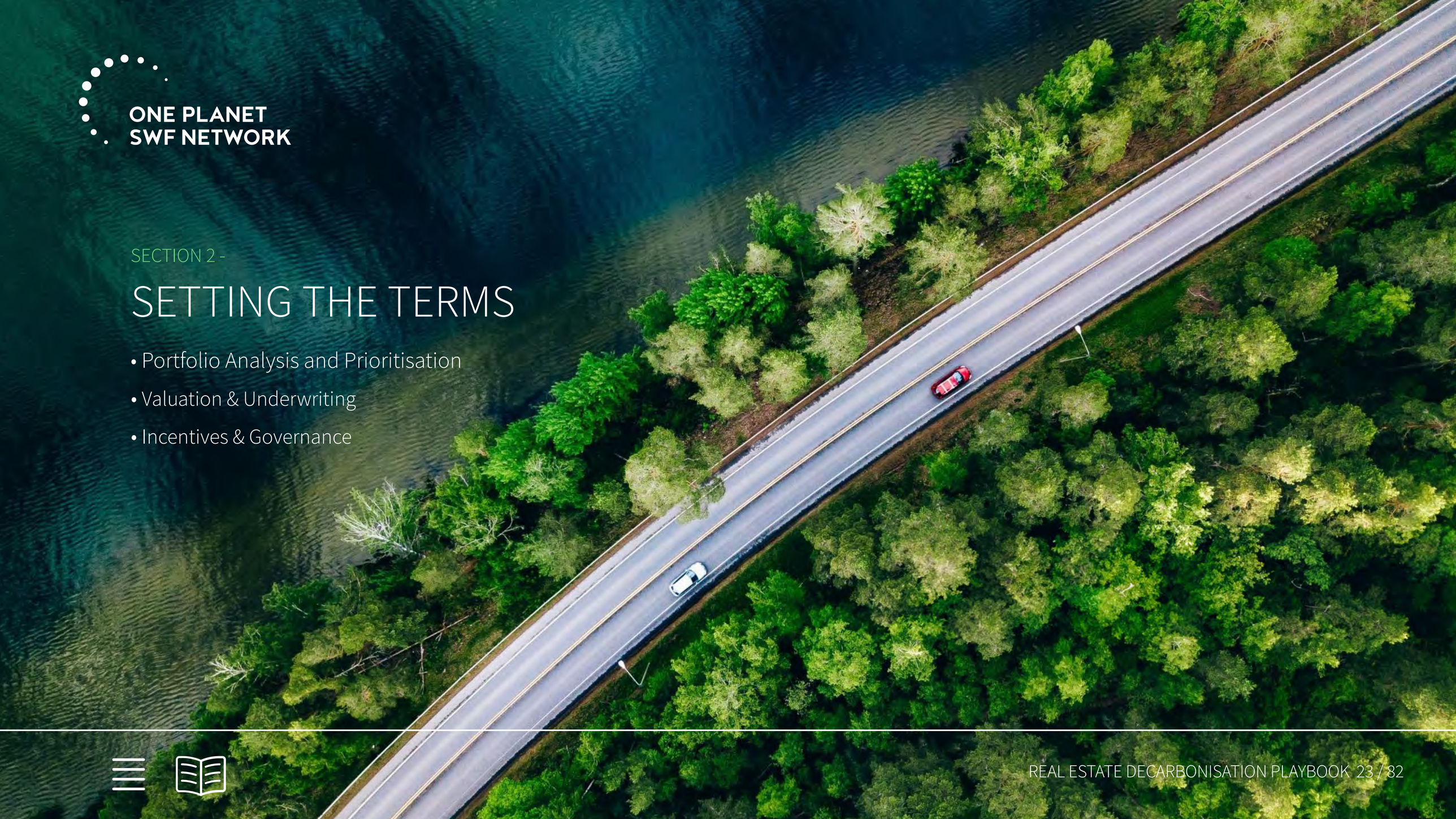
Stakeholder	Recommended Actions
Real estate investors and service providers (all stakeholders)	• Increase decarbonisation leadership, knowledge and skills across the industry. • Encourage further consideration / recognition of decarbonisation investments in property valuations.
Asset managers and real estate operators	• Coordinate low-carbon upgrades with scheduled infrastructure and equipment renewal cycles, giving special attention to high-impact opportunities like building envelope replacements. • Adopt a holistic approach to retrofit planning, moving beyond isolated system upgrades to comprehensive building-wide strategies. • Collaborate to identify and align around credible, interoperable standards that support consistent measurement, reporting, and benchmarking across jurisdictions and asset types. • Leverage innovative project delivery models, such as: • Access to green financing through sustainability-linked loans or green loans/bonds.
Asset managers and real estate operators	• Seeking long-term low fixed-rate debt financing options for low carbon construction and retrofits. • No up-front capital Investment. • Off-balance-sheet financing. • Shared cost-benefit arrangements between owners and tenants. • Performance guarantees to reduce project risk.
Asset Owners / Sovereign Wealth Funds	• Embed decarbonisation expectations contractually at the fund level. • Negotiate formal approval rights over budgets and capital plans • If not feasible, negotiate to have engagement or notification rights. • Negotiate a seat on the Fund LPAC (Limited Partnership Advisory Committee). • Secure a place on or establish a joint sustainability committee or working group. • Collaborate to identify and align around credible, interoperable standards that support consistent measurement, reporting, and benchmarking across jurisdictions and asset types. • Ensure access to whole building data through direct engagement, advocating for green lease clauses, and side letters. • Create stronger incentives for decarbonisation (e.g., adopt employee remuneration practices that include achieving low carbon targets alongside financial targets). • Increase internal decarbonisation leadership, knowledge and skills

ONE PLANET
SWF NETWORK

SECTION 2 -

SETTING THE TERMS

- Portfolio Analysis and Prioritisation
- Valuation & Underwriting
- Incentives & Governance



Once you have completed the upfront work to identify, understand, and build engagement among your stakeholders (including those within your own organization), the task shifts from people to projects. In this section, you will explore how to analyse your real estate portfolio to identify the best prospects for decarbonisation, how to structure the financial terms and incentives for the projects, and how to ensure effective governance.

PORTFOLIO ANALYSIS AND PRIORITISATION

Portfolio Composition

The potential pathways to decarbonisation will be shaped based on ownership type, operational/ financial control parameters, and the portfolio's characteristics. The most common ownership types for institutional real estate investors are outlined below.

Ownership type	Implications
Wholly owned	Typically highest level of control overdecision-making, budgeting, upgrades and improvements; generally bears the cost of upgrades (depending on lease and operating structure). Fewest financial control barriers to decarbonise.
Majority owned	Significant influence and control. Requires collaboration and negotiation with partners or stakeholders.
Minority stakes	Limited control depending on size of stake and rights agreed. Minority stakes typically have limited oversight or influence for capital allocation decisions and may require more intensive engagement and stewardship.
JVs	Efforts need to be agreed in conjunction with partners – collaboratively. Alignment is critical for success.
Funds	Delegated and generally limited control, but may be able to influence the selected manager through its due diligence process and through the ongoing engagement with the Fund Manager and/or the asset management team.

It is also important to understand the breakdown of your portfolio by key property types and characteristics which can impact how materially exposed they are likely to be to transition risk and therefore how much work and capital might be required.

Attribute	Why it's important
Property type	The type of the asset will be crucial in your decarbonisation journey as it will affect costs (i.e., recoverability or pass-through), potential regulatory requirements, technical feasibility, and timelines. For example, commercial properties will face different regulatory GHG emissions reporting, standards and/or energy requirements compared to residential properties.
Age	Older buildings tend to be more carbon-intensive, use older systems (e.g., fossil fuel heating), and may require higher capex costs to meet transition demands. Older buildings tend to be more carbon-intensive, use older systems (e.g., fossil fuel heating), and may require higher capex costs to meet transition demands. However, age does not always equate to inefficiency, as many heritage structures possess durable materials and passive design features that can support sustainable adaptation.
Condition	Poor property condition and deficiencies in ongoing maintenance could lead to occupancy risk and result in higher capex requirements.
Operational and financial control (i.e., lease terms, single- or multi-tenant etc.)	Is the asset managed by you or it is under an FRI (Full Repairing and Insuring) lease, where the tenant is responsible for all repairs and maintenance of the property, including the cost of insurance? Operational and financial control, and hence the opportunity to implement decarbonisation initiatives, can be heavily reliant on the lease terms and conditions.

An analysis of the portfolio should be conducted to prioritise assets. It may be useful to implement a phased approach where the most carbon material assets in a portfolio are prioritised based on business strategy, influence, control, and asset characterist

Portfolio's transition risk

Transition risks can significantly affect asset value, attractiveness for tenants, operational viability, and regulatory compliance. Therefore, asset owners and managers should conduct regular portfolio alignment assessments, integrate transition risk into investment decisions and ongoing asset management, and prioritise engagement with high-risk asset tenants and operating partners to preserve value.

Transition risk type	Description	Impact
Regulatory	Stricter standards or codes	Unplanned unbudgeted capex costs for upgrades
	Carbon pricing	Introduction or extension of carbon pricing schemes could increase operating costs
	Energy performance certifications	Regulatory non-compliance could result in monetary fines or the inability to transact an asset
Market risk	Tenant demand	Green premium or brown discount, sustainability-focused tenants, flight to quality etc.
	Energy pricing risk	The cost of energy is increasing which makes the asset less attractive to new tenants

Transition risk type	Description	Impact
Valuation risk	Reduced investor demand, drop in valuation	Reduced demand or pricing for inefficient assets, could impact exit economics, require unplanned or unbudgeted capex.
Reputational risk	Poor perception from lack of action or poor performance	Hard to quantify but could have far reaching impact in regards to fundraising at the GP level or could lead to lack of partnership opportunities if not a partner of choice at the LP level.
Obsolescence risk	Property becomes outdated and no longer competitive	Higher risk if an asset is perceived as undesirable compared to competition. Poor-performing assets in terms of energy use/GHG intensity may become stranded as regulations tighten and tenant expectations evolve.
Financing risk	Risk of not accessing the lowest cost of capital	Unable to access lower cost of debt or climate-related financing opportunities.

Summing up

Portfolio Analysis and Prioritisation

Checklist of actions

- ✓ Consider the assets' ownership structure and the implications of that ownership.
- ✓ Understand the assets' characteristics and attributes (property type, age, condition, etc.) and how those will impact risk exposure and capital requirements.
- ✓ Conduct regular portfolio alignment assessments.
- ✓ Integrate transition risk into investment decisions and ongoing asset management
- ✓ Prioritise engagement with tenants in high-risk assets and operating partners to preserve value.

VALUATION & UNDERWRITING

Accurately incorporating climate factors into asset valuations can reduce risk profiles by enhancing that asset's resilience, lowering vacancy rates, and shortening time to let or sell, ultimately decreasing the cost of capital and insurance premiums. This improved valuation not only strengthens the loan-to-value (LTV) ratio, enabling greater leverage, but also broadens investor appeal, facilitating syndication across a wider investment universe.

In the annual RICS survey, nearly two-thirds of 2023 respondents globally indicated that a building's sustainability features have a fairly strong impact on rents and capital value[12]. In addition, investors, occupants, and lenders may have minimum requirements for sustainability to transact, and failure to meet these can result in value erosion or increased risk premiums. Yet 77 percent of respondents consider that valuation "do(es) not accurately reflect all the challenges and opportunities impacting real estate, such as climate change"[13].

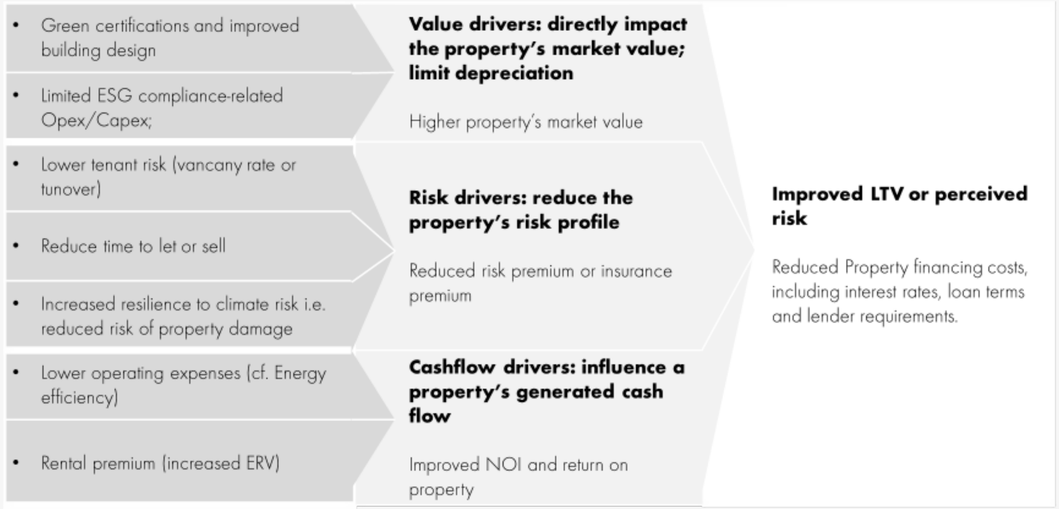


Figure A. Climate "value impact chain": What to consider and what is likely to impact the asset value (Based on *The future of real estate valuations: The impact of ESG*: RICS, 2024]

[12] RICS. 2023. Sustainability report. P.7
[13] PWC & ULI. 2024. Emerging Trends in Real Estate Europe

Although guidelines for the consideration of ESG factors in valuation exist (e.g., RICS “Red Book” Global Standards VPS 2 paragraph 1.5), the availability of reliable transaction-level climate data remains a limiting factor. This section aims to offer practical guidance on integrating climate considerations into asset valuations, both internally and externally. It explores organisational requirements (such as having a clear strategy and embedding ESG data in investment decisions), and then discusses how to leverage the asset management process and existing data to ensure that climate-aligned investment strategies are accurately reflected in valuations.

Factoring ESG in valuation at pre-acquisition.

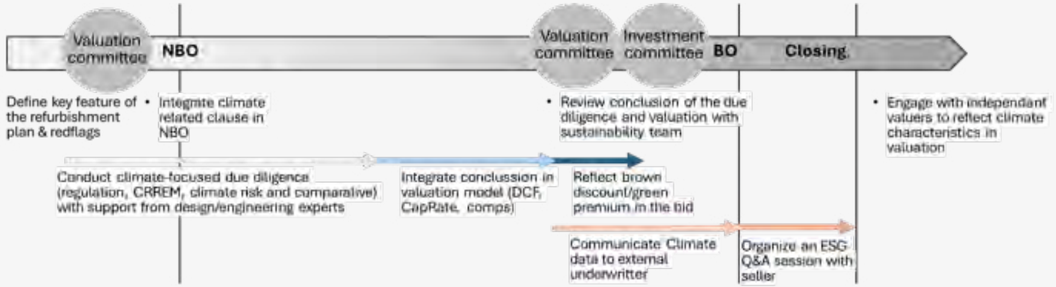
To facilitate the integration of climate-related factors into competitive and time-constrained transaction processes, you should capitalise on existing due diligence processes (e.g., net zero pathway analysis or climate risk analysis). In addition, explicitly articulating the evidence basis for your assumptions around ESG integration in valuations can also help you think through the ESG due diligence processes to ensure that they directly help inform negotiations.

Formalise and communicate on your strategy.

Formalising and communicating your strategy with key stakeholders, including the seller side and technical partners, is key to accelerating integration of climate factors into the valuation bidding process. A formalized and well-communicated valuation strategy will make it easier for stakeholders to access this information in an efficient and transparent manner, and it should include relevant analyses of the process that led up to the bidding offer.

These analyses (see Figure B) should help you assess the financial impact of stranding risk, notably the impact of environmental factors on projected net operating income and the risks and opportunities associated with renovating the building. Information to perform this assessment (see Figure C) is often not available before the non-binding offer (NBO) stage.

Integrating sustainability clauses into the NBO which specify information needed to assess climate risks and require a renovation feasibility study prior to submission of a binding offer can support the valuation/ negotiation process by making sustainability a key negotiating factor and providing additional room to push for a potential brown discount.
Additionally, communicating your strategy and expectation with the technical partners, including design, engineering and contracting authority representatives, can help steer the design proposal toward greener alternatives and can provide the basis for discussions on maximizing both sustainability and return.



[Figure B. indicative workflow for integration of climate in the valuation process]

Build capacity in the investment teams on key ESG tools.

Skills shortages, gaps in knowledge, and inadequate training are key barriers to sustainability integration. Appropriate capacity building for the deal team to navigate sustainability-focused concepts and tools (e.g., decarbonisation pathway, marginal abatement cost curves [MACC], climate scenario analysis) is key to put the actual climate and financial benefits of the refurbishment program into proper perspective. In addition, you should involve the sustainability team in valuation discussions preceding the investment committee meeting to ensure that climate risks are appropriately considered in those IC discussions and reflected in the valuation (e.g., to assess the alignment of capex plan with a 1.5°c increase scenario).

The climate valuation process should be based on at least three main components.

- **Net-zero pathway analysis (CRREM analysis or equivalent) and analysis of compliance with key climate-related regulations.**
  Analyse alignment of GHG emissions with global climate targets and regulatory requirements in “as-is” vs. refurbished scenario using energy modeling to estimate energy reductions associated with the renovation program. This will help you: (i) understand the appropriateness of the capex program from a climate/energy perspective, in particular the marginal emission reduction associated with different initiatives to inform reduction strategy; and (ii) estimate associated reduction in operating expense (efficiency improvements’ cost-saving measures, cost of capital, and repair and maintenance). When energy data is not available, technical consultants can create proxies via digital twinning.

- **Physical climate risk analysis.**
  Whilst the Playbook focuses on transition risk, analysing the potential impact of extreme weather events (e.g.,heavy precipitation, water stress, heat waves, clay soil movement) is crucial to asset valuation since such events could result in damage to the asset, productivity loss, or impact on occupant well-being. (e.g., heavy precipitation, water stress, heat waves, clay soil movement) is crucial to asset valuation since such events could result in damage to the asset, productivity loss, or impact on occupant well-being. This analysis provides a basis to assess the relevance of the mitigation measures already in place, and the need for additional adaptation measures as well as reliance on insurance for risk management.

- **Comparable evidence on buildings with similar green characteristics.**
  The impact of sustainability on value should be supported by evidence from current market analysis and comparables. Adjusting the parameters in the comparative analysis to capture properties with similar characteristics and attributes, including energy ratings and certifications, can be useful for capturing the extra benefits associated with climate-related initiatives, in particular expected rental value.

  When data is not available, it is recommended to take a conservative approach to the analysis because it is difficult to isolate climate factors in a comparative analysis. (For example, a certification acknowledges a comprehensive renovation program rather than specific attributes.) Sensitivity analysis to test key hypotheses can help you better understand to what extent the realisation of expected return depends on the realisation of the green premium.

Proactively communicate an "ESG data pack" to external underwriters' lenders and insurers.

This will accelerate the consideration of climate factors in their assessment – or the assessment of the eligibility of the project to their green finance solution. Along with the data pack, scheduling a dedicated ESG session with the external underwriters can support the process. RICS has developed a comprehensive list of climate data points to support the integration of climate in real estate valuations (see Figure C) and can serve as a basis for those sessions.

ESG aspects	Data to be captured and analysed	Approach/Driver
Energy rating	• Energy Performance Certificate (EPC) or other energy ratings in the market • Property energy details and physical characteristics e.g. efficient lighting systems or building management system are in place	• Preferred approach: comparative. • Main drivers: risk, cash flow.
Energy consumption	• Primary and final energy consumption current and forecasted • Energy intensity	• Preferred approach: DCF, cap rates/ multiples • Main drivers: risk, cash flow.
Renewable energy production (onsite)	• Method of energy generation including heating source • Quantity and specification of renewable energy systems (e.g.solar panels, heat pumps, biomass, wind turbines)	• Preferred approach: comparative, DCF • Main driver: cash flow.
Labels and certificates	• Green building certification schemes and national-level certificates (e.g. BREEAM, LEED, WELL, Fitwel, BOMA360, SHORE)	• Preferred approach: comparative. • Main drivers: value, risk.
Greenhouse gas emissions	• CO2 emissions, based on real energy consumption • Has the property been constructed using low-carbon construction principles?	• Preferred approach: DCF • Main driver: risk.
Emissions pathway analysis	• CRREM pathway and stranding analysis or other pathway analysis • Transition-focused Capex/Opex plan	• Preferred approach: DCF, cap rates/ multiples • Main driver: risk.
Physical climate risk	• Climate risk analysis issued by a recognised source (e.g. MSCI, Moodys, R4R, AXA) • Mitigation measures already in place and planned	• Preferred approach: comparative, DCF • Main driver: risk.
Landlord-tenant relationship	• Tenant activity and rental contract types • Green leases in place	• Preferred approach: DCF, cap rates/ multiples • Main drivers: value, risk, cash flow
Material use	• Materials used for construction or renovation	• Preferred approach: Comparative, DCF • Main drivers: value, risk

Figure C. Relevant information to consider depending on the valuation approach. (Adapted from page 10 of ESG data list for real estate valuations. Royal Institution of Chartered Surveyors (RICS), 2024.)

Post acquisition.

Post-investment, the strategy should focus on ensuring that the valuation used for the net asset value calculation reflects the anticipated premium associated with green initiatives at exit, and structures information for the buyer side at exit (e.g., ESG data room). It is important to engage on sustainability with the external valuer early in the process, for instance by integrating an ESG review in the terms of engagement and specifying key expectations from the report to ensure that ESG factors are implemented in the entire valuation process.

It is expected that the independent valuer should demonstrate how sustainability and ESG have been considered in the approach, calculations, and commentary. The report should include: (i) Assessment of the extent to which the property meets sustainability and ESG criteria, (ii) Description of sustainability-related property characteristics; (iii) Statement of the relationship between sustainability factors and valuation, and (iv) Opinion on the potential impact of these factors on value over time.

Summing up

Valuation & Underwriting

Checklist of actions

- ✓ Factor ESG in valuation at pre-acquisition, capitalising on existing due diligence processes (e.g., climate risk analysis) to assess financial impacts of climate risk and opportunities. Explicitly articulate the evidentiary basis for your assumptions.
- ✓ Prepare and disseminate a formalised and well-communicated valuation strategy. Leverage it to communicate to investors/fiduciaries on your strategy
- ✓ Identify gaps in skills, knowledge and training and ensure appropriate capacity building for the deal team to navigate sustainability-focused concepts and tools.
- ✓ Engage with your lenders and valuer on climate-related topics, including proactively communicate an “ESG data pack” to external underwriters’ lenders and insurers.
- ✓ Post-investment, ensure that the valuation used for the net asset value calculation reflects the anticipated premium associated with green incentives at exit.

INCENTIVES & GOVERNANCE

1. INCENTIVES

Redefining success with climate linked long-term incentives

Viewed through the practical lens of the real estate investment life cycle, sustainability objectives frequently seem to conflict with traditional investment priorities or may even seem irrelevant to value creation. Investment strategies, especially those with short- to medium-term horizons, typically prioritise short-term return on investment, asset valuation optimisation, exit strategies, and maintaining minimal capex, whereas decarbonisation targets require long-term vision, upfront spend, and enduring performance. Financial incentives for the stakeholders across the investment lifecycle are typically aligned with the former, sidelining sustainability goals.

Conflicting priorities

As noted throughout this Playbook, real estate is a complex multi-stakeholder sector. Real estate management, development, and transactions all involve multiple parties—in acquisitions, asset/property management, sustainability, investment/ portfolio management—each shaping a property's business plan. However, in most cases, sustainability factors have not been integrated into the investment models, and most roles lack direct financial incentives to decarbonise, creating misalignment and acting as a drag on execution. To compound the issue, sustainability professionals are often responsible for addressing climate goals but are not included in decision-making processes. They typically track progress and measure impact but report to internal stakeholders without direct control or major influence over capital, strategy, execution or sourcing filters. This fragmentation creates complexity and makes sustainability objectives difficult to integrate and implement—even when top-level strategy exists.

Role / Function	Current Incentive Focus	Sustainability Misalignment
Acquisitions / Investment	Underwriting returns, exit valuation	Sustainability factored too late—if at all Lack of standardisation on how sustainability risks factored in valuations
Asset / Property management	Operational performance, occupancy, cost	No direct rewards to implement upgrades
Sustainability professionals	Reporting & target-setting	No power to allocate capital, define sourcing filters or earn performance-based rewards
Portfolio / Executive management	Payout tied to investor IRR & overall financial performance	Climate value is neither integrated nor mandated

Long-term economic incentive allocation linked to sustainability outcomes

Tying climate performance metrics—such as reductions in carbon emissions, energy use intensity, and climate adaptation costs – to long-term incentives can ensure that sustainability becomes a strategic priority beyond compliance. Integrating sustainability is about creating and preserving value and future proofing real estate assets. In addition, incentivising execution and clear implementation plans accelerates the adoption of sustainability measures, thereby increasing the potential for rapid positive climate impact.

Support for aligned incentives can:

- Support development of achievable decarbonization plans by aligning sustainability objectives with investment strategy.
- Integrate decarbonisation metrics into decision-making at every stage—from deal sourcing to operations to portfolio oversight.
- Empower teams with real influence, not just advisory roles, to consider sustainability as an opportunity to create value.
- Bridge short-term investment expectations and long-term climate value, reducing trade-offs and internal tension.
- Support compliance and reduce risk: as laws tighten and investors require sustainability performance, aligned incentives reduce exposure.

Role / Function	Suggested Climate Linked Incentives
Acquisitions / investment	Include decarbonisation assumptions in sourcing filters and underwriting models
Asset / Property management	Long term incentives and/or bonus tied to efficiency gains, renewable energy execution, emissions reduction targets
Sustainability professionals	Budget control, project mandate, long term incentives tied to verified results
Portfolio / Executive management	Include aggregate emissions metrics and asset value created in portfolio reporting

The Result: A Unified Performance Culture

- **Shared accountability**. All roles—from acquisitions to portfolio management—are rewarded when real climate targets are met.
- **Behaviour change**. Linking incentives to clear emissions or sustainability goals can push investment into innovation and sustained action, catalyzing industry transformation.
- **Investor confidence.** Transparent, measurable targets tied to compensation builds credibility and elevates sustainability metrics to the same level of importance as financial metrics.
- **Scalable and systemic**. From leadership to property-level teams, the economic incentives are designed to motivate performance and pragmatic execution.

2. GOVERNANCE

Foundational practices

For real estate investment managers, strong climate governance starts with clear roles and consistent processes. At the board level, it's important to assign responsibility for climate-related oversight to an existing committee. This committee should be reviewing how climate risks and opportunities affect acquisitions, disposals, and major capital projects. The discussions don't need to be overly technical but should happen regularly, ideally as part of quarterly or annual strategy reviews. Any decisions or discussions around climate should be documented in board minutes or governance reports to demonstrate accountability.

On the management side, a senior leader should take ownership of climate-related risks and opportunities. This doesn't mean creating a new sustainability function but rather ensuring that climate risks are considered alongside other operational and financial risks. For example, asset-level risk registers should include exposure to flooding, overheating, or EPC non-compliance. These risks should be escalated through existing reporting lines so that senior management can track and respond to them.

Climate considerations should also be embedded into day-to-day investment processes. Due diligence checklists should flag climate and regulatory risks, and investment papers should reflect how these risks might affect asset value or income. Annual business plans for each asset should include any planned energy upgrades, tenant engagement on sustainability, or resilience measures. Staff training is also key. Asset managers and analysts should be equipped to spot climate risks and understand how they affect asset performance.

Optional enhancements

For firms looking to go farther, scenario planning is a valuable tool. This involves testing how the portfolio might perform under different climate futures, for example in a 2°C or a 4°C world. The focus should be on practical impacts, such as rising insurance costs, increased vacancy risk, or capex requirements for compliance. Start with high-risk assets and build from there.
Board education is another area worth considering. Periodic briefings on climate regulation, investor expectations, and market trends can help board members make better-informed decisions. Some firms also choose to link climate-related performance—for example, reductions in energy intensity or achieving green building certifications—to management incentives. This linkage can help align day-to-day decisions to long-term climate goals.

Finally, engaging with tenants, joint venture partners, and local authorities on climate-related initiatives can strengthen governance and reduce risk. Whether it's collaborating on energy efficiency upgrades or sharing data on building performance, these partnerships can support more resilient and future-proof assets.

CASE STUDY

Galvanize Real Estate's Incentive Model for Climate Driven Value

Launched in 2022, Galvanize Real Estate (GRE)'s mission is to profitably decarbonise real estate assets. The model aims to drive cash flow improvements and achieve outperformance through decarbonisation and other sustainability measures.
To do this, GRE aligns five sustainability outcomes—emissions reduction, potable water use reduction, physical climate risk and mitigation plans, social and community impact programs, and diverse representation—with a one-third portion of long-term economic incentive allocations specifically tied to key performance indicators.

Strategy

GRE believes that its approach exemplifies how integrating sustainability into the core of real estate investment strategies can yield compelling financial returns while addressing urgent climate challenges. By demonstrating that sustainability can enhance asset performance and value, GRE's incentive-driven model illustrates that decarbonisation is not just complementary to financial performance—it can be a driver of it. GRE seeks to align climate urgency with investor demand and operational excellence by embedding sustainability into deal evaluation, execution, and compensation structures.
The result is a scalable, systemic, and reproducible approach that positions GRE at the intersection of climate action and real estate value creation.

Approach and framework

1. Built-in sustainability from day one

- GRE considers decarbonisation early in the acquisitions process and includes specific features as part of sourcing filters and during underwriting. This aims to ensure sustainability actions are evaluated from the start—not retroactively.

2. Long-term economic incentive allocation

- Long-term economic incentive allocation is structured such that acquisitions, asset management, sustainability heads, and portfolio teams share incentives for successful climate outcomes—targeting alignment across roles.

3. Operating improvement focus

- GRE leverages deferred maintenance as an opportunity to execute green retrofits by upgrading systems to deliver immediate potential reductions in opex, additional revenue streams, tenant attraction, retention and resiliency.

Component	Description
Compensation structure	1/3 of long-term economic incentive allocation is tied to predefined impact targets; 80% weight on operational CO2e equivalent emissions reduction
Investment framework	Sustainability concepts are integrated into underwriting and business planning via proprietary tools
Value creation strategy	Boosts to NOI may be achieved through reduced OPEX and/or revenue generated from onsite solar, without relying on speculative green premiums
Execution incentive	Align stakeholders—acquisitions, asset managers, sustainability teams—from day one

Concept alignment: Science based, practical, actionable framework

- **Science-based.** Proprietary decarbonisation tools calibrate emissions savings, retrofit feasibility, and impact forecasts across asset types.
- **Practical.** Focuses on deferred maintenance, operating expense reduction, and tenant demand rather than speculative premiums or subsidies.
- **Actionable.** Each building receives a tailored climate retrofit plan, which may include leveraging on-site renewables to create potential income streams and long-term value.
- **Authentic.** Rapid execution is needed to address the climate crisis and incentivise implementation within three years of ownership, reviewed annually for purposes of incentive calculations, which can accelerate positive climate impact.

Why this can work

- Bridges investment and climate objectives.
- Encourages climate risks be approached as an opportunity – not a trade-off or a ‘nice to have.’
- Enables the opportunity for scalable capital deployment with the potential for compelling returns because of the comprehensive execution of sustainability initiatives.

Summing up

Incentives & Governance

Checklist of actions

- ✓ Consider each of the key roles in real estate investments (e.g., deal team, property managers) to understand their respective incentives and the alignment of those incentives with sustainability outcomes.
- ✓ Go beyond compliance and tie climate performance metrics (e.g., reduction in emissions, energy use intensity, climate adaptation costs) to long-term economic incentives for each of the key functions, ensuring that sustainability becomes a shared responsibility and strategic priority.
- ✓ Pay particular attention to incentivising execution and clear implementation plans.
- ✓ Assign responsibility for climate-related oversight to an existing board committee, ideally Investment or Risk, and document their proceedings and decisions in meeting minutes.
- ✓ Ensure that a senior leader on the management side takes ownership of climate-related risks and opportunities. This does not mean creating a new sustainability function but rather ensures that climate issues are embedded within, and considered alongside, other operational and financial issues.
- ✓ Ensure that climate is embedded into day-to-day investment processes:
  - Due diligence checklists flag climate and regulatory risks
  - Investment papers reflect how such risks might affect asset value or income
  - Include sustainability measures in underwriting
  - Annual business plans include planned energy upgrades, tenant engagement on sustainability, or resilience measures.
- ✓ Ensure asset managers and analysts are equipped to identify and understand climate risks and profitable decarbonization opportunities to asset performance.
- ✓ Consider obtaining expertise in scenario planning for different climate futures, with an emphasis on identifying practical mitigants and quantifying impacts.
- ✓ Consider board education and regular briefings.
- ✓ Commit to ongoing engagement and data-/knowledge-sharing with tenants, joint venture partners, and local authorities.

ONE PLANET
SWF NETWORK

SECTION 3 -

INTO ACTION

- Emissions Baseline Setting
- Ambition Level
- Decarbonisation Due Diligence
- Decarbonisation Levers

Up to now, your efforts have focused on people, policies, and portfolio. You have done the work to understand all your project stakeholders and build effective relationships. You have analysed your portfolio to identify the best opportunities for decarbonisation, and you have structured and documented the terms of engagement. Now in this section, you will tackle the technical work. You will define both the current state and the desired future state (in the chapters on Emissions Baseline Setting and Ambition Level, respectively) of your project's carbon profile. Then you will explore the many decarbonisation levers available, and make specific decisions about which to implement.

EMISSIONS BASELINE SETTING

A key step on the decarbonisation journey is the development of an emissions baseline or footprint. This baseline can provide a point from which to measure progress against targets—and can also help you decide the level of ambition at which to set those targets in the first place (as described in the Ambition Level chapter). The baseline can give an indication of starting performance as well as helping to highlight priorities for action. It should be an inventory of the greenhouse gas emissions associated with the real estate investments. It is measured in carbon dioxide equivalents (CO2e), generally over a one-year period, and the baseline should be associated with an emissions boundary as described below. This chapter focuses upon operational carbon, the baseline emissions associated with operational energy use.

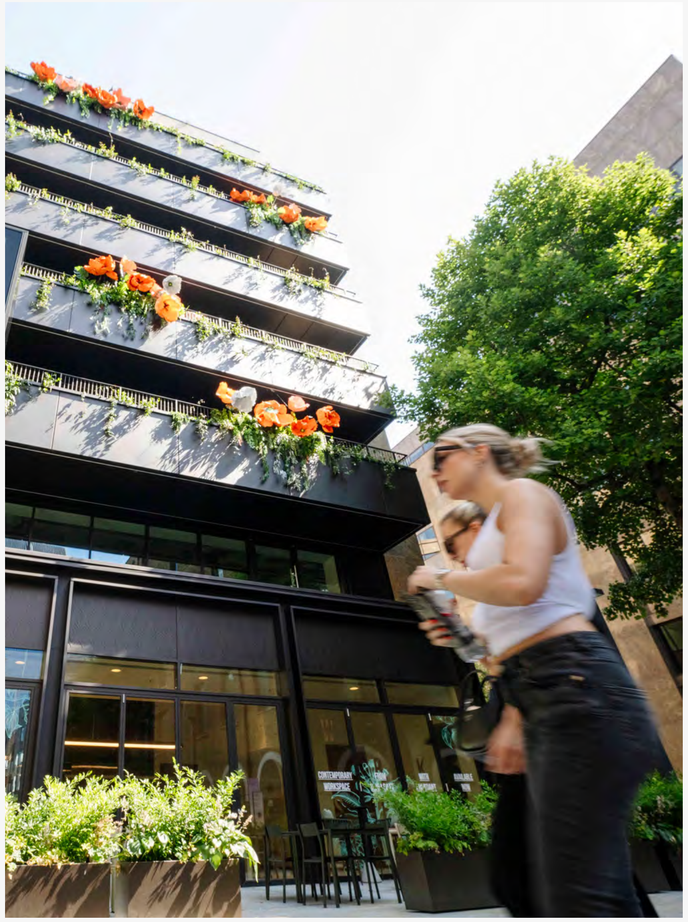
Emissions Boundary

As per the GHG Protocol Corporate Standard[12], the first step in developing a baseline is to define the emissions boundary that the baseline will encompass. This should ideally include all real estate holdings in which your organisation has capital invested, but it could cover a subset of investments, such as those over which the property owner has direct operational or financial control. For indirect real estate investments, it is recommended that carbon emissions be attributed on a proportional-share basis relative to ownership. For real estate debt, a methodology for calculating carbon emissions associated with investments has been developed by PCAF, the Partnership for Carbon Accounting Financials. That methodology involves using the size of the debt as a proportion of property value to apportion the emissions.

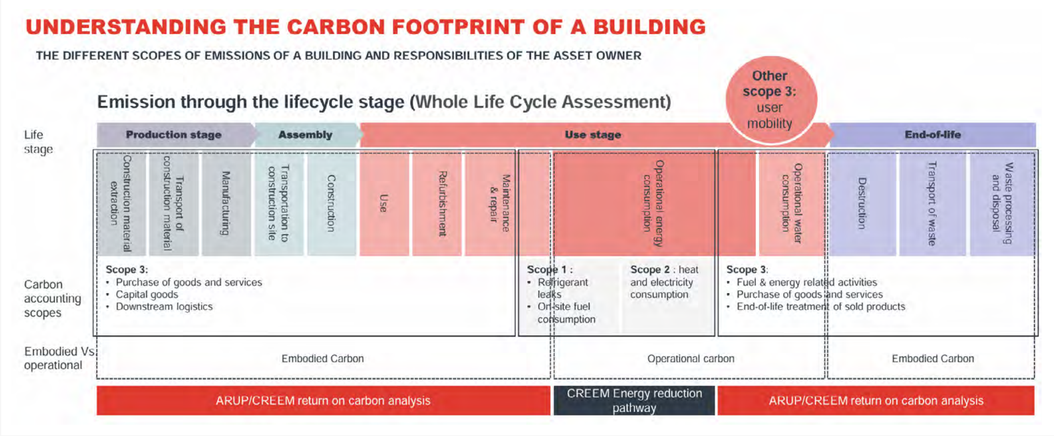
What to measure

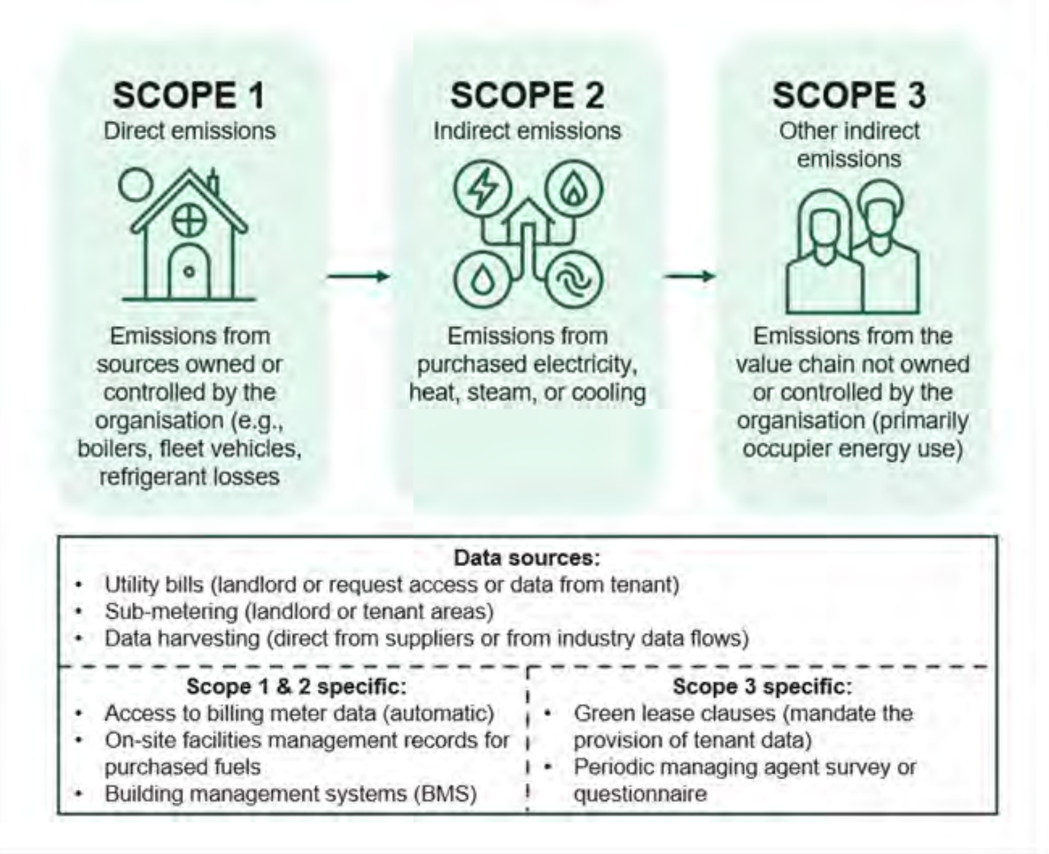
Having defined the emissions boundary, the next stage is to identify what needs to be measured, in order to calculate the baseline. There are three scopes of emissions data which need to be collected and measured.

[14] https://ghgprotocol.org/



Emissions Scope	Description	Data sources
Scope 1: Direct emissions	From sources owned or controlled by the organisation (e.g., emissions as a result of combustion in boilers owned or controlled by the organisation, emissions from organisation-owned fleet vehicles, refrigerant losses).	• Utility bills (landlord) • Access to billing meter data (automatic) • Sub-metering • On-site facilities management records for purchased fuels • Building management system (BMS) • Data harvesting (direct from suppliers or from industry data flows)
Scope 2: Energy indirect emissions	As a result of electricity consumed which is supplied by another party (e.g., electricity supply in buildings). This should also include other purchased indirect emission sources such as heat, steam and cooling.	
Scope 3: Other indirect emissions	All other emissions which occur as a consequence of activity in an organisation's value chain, but which are not owned or controlled by the organisation. This is primarily occupier energy use.	• Tenant utility bills (request access or data) • Use green lease clauses (mandate the provision of tenant data) • Periodic managing agent survey or questionnaire • Sub-metering of tenant areas • Data harvesting (direct from suppliers or from industry data flows)





The energy data obtained for the relevant scopes can then be converted into carbon emissions using the appropriate carbon emission factors according to region or location. Figures can then be expressed as absolute (kWh or kgCO2e) or converted to intensity metrics (kWh/m2) by dividing by building floor area (typically gross internal area or net lettable area).

Here are the calculations for a hypothetical example.

Building: Office
Location: London, UK
Fuel: Electricity
Annual Energy Consumption: 1,000,000 kWh
Area: 5,000 m^2

Carbon calculation

Energy Use		Carbon Factor*		Carbon Emissions
1,000,000 kWh	×	0.177 $kgCO_2e$/kWh	=	177,000 $kgCO_2e$

*UK Grid Carbon factor for electricity 2025

Intensity calculation

Energy Use: 1,000,000 kWh Carbon Emissions: 177,000 $kgCO_2e$	÷	Floor Area 5,000 m^2	=	Energy use intensity: 200 kWh/m^2 Carbon intensity: 35.2 $kgCO_2e/m^2$.

For investors involved in new development and major refurbishment projects, the measurement and mitigation of embodied carbon is an emerging area of consideration. Currently this source of scope 3 emissions is generally measured and targeted at a project level, rather than forming part of an organisational baseline.

Data Availability and Estimation

In areas where the owner has operational control and is often responsible for the procurement of energy, the task of obtaining (landlord) data should be relatively straightforward, for example through supplier invoices, automated (or manual) meter reading, on-site property team records, and building management systems.

Buildings and areas of buildings controlled by tenants often represent the largest sources of emissions across a portfolio but can also be the most difficult to measure due to a lack of available tenant energy data. Tenants need to be engaged to obtain this information. Routes include: green lease clauses requiring tenant data-sharing; requesting tenant invoice data; the installation of sub-meters to collect data directly; the use of property managers to collect data; or the use of new data harvesting technology-led solutions whereby landlords, having obtained tenant consent, can go directly to suppliers or industry data sources. Consideration of the likely materiality of the carbon emissions of different asset classes can help with the prioritisation of efforts to obtain actual data.

Estimation methods

If actual energy data is not yet available, you will need to make estimations. The method adopted will depend upon the information from which you can work.

I) Gap filling – where some actual data is available

If some actual energy data is available but is incomplete, then it is possible to use the available data to estimate what is missing and to fill the gaps. The actual data can be used to calculate an estimated average monthly use figure which can then be extrapolated across the missing months to arrive at an annual estimate. Alternatively previous years' data for missing periods can be used to fill gaps.

II) Benchmarks - where no actual data is available

In situations where no energy data is available, such as for tenant areas or for financed assets, estimated energy consumption and emissions can be calculated by using suitable energy benchmarks. (See table below.) These benchmarks are generally available for different building types. The benchmarks generally provide the typical energy performance of buildings in the form of an Energy Use Intensity (EUI)(kWh/m2/year). These can be used to estimate the annual energy use of a building if its floor area is known.

Sources of benchmarks

Benchmark	Access	Jurisdiction
Benchmarks linked to commercial data platforms e.g. Deepki	Subscription	Global
Better Buildings Partnership - Real Estate Environmental Benchmarks (REEB)	Free	U.K
CIBSE Guide F (Energy Efficiency)	Subscription	U.K
CIBSE TM46 Energy Benchmarks (2008)	Subscription	U.K
CRREM	Free	Global
LETI	Free	U.K
National Australian Built Environment Rating System (NABERS)	Free	Australia, New Zealand & U.K
UK Net Zero Carbon Buildings Standard	Free	U.K
U.S Energy Star	Free	U.S & Canada, Japan & Switzerland

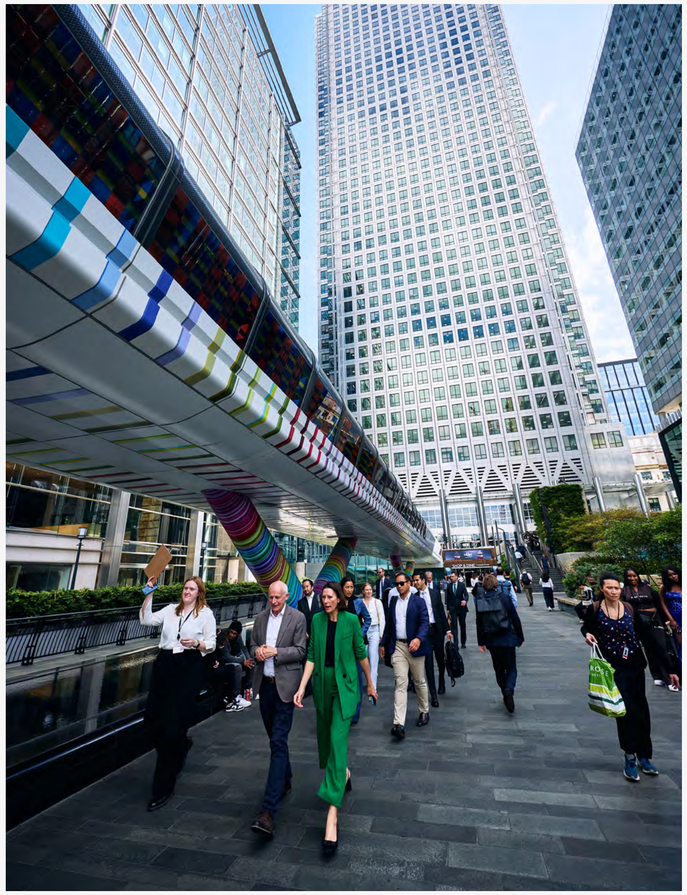
Carbon Emission Factors

To calculate greenhouse gas emissions, companies must apply appropriate carbon emission factors. The GHG Protocol Scope 2 Guidance specifies two complementary approaches: the **location-based** method, and the **market-based** method.

Location-based carbon factors reflect the average emissions intensity of the electricity grid in a specific geographic area. This method uses regional or national grid emission factors, such as those published by government agencies or international bodies (e.g., Government Conversion Factors in the UK[13] or the IEA globally[14]. The IEA produce emission factors for different geographies; please see the link at the end of this section and in Helpful Resources.) The location-based method provides a standardised view of emissions based on where the energy is consumed.

Market-based carbon emission factors are used to calculate the emissions associated with the purchase of electricity from external suppliers. These factors reflect the specific purchase contract that an organisation puts in place, rather than using a local grid average emission value, as the location-based approach does. Provided these factors have been verified, organisations can use the factors provided by their electricity suppliers for emissions reporting.

[15] https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2025
[16] https://www.iea.org/data-and-statistics/data-product/emissions-factors-2024



Case Study

One data journey: L&G

In 2019, L&G signed a commitment to achieve net zero carbon by 2050 or sooner for all its real estate properties. This was followed soon after by the setting of science-based targets to 2030.

An early requirement was to establish a carbon baseline against which targets could be set and progress measured. This presented a major challenge, primarily due to a lack of scope 3 tenant energy and emissions data. Typically, data was obtained for around 25-30 percent of tenants, which often involved property managers collecting meter readings or invoice data from a relatively small number of tenants. Consequently, benchmarks had to be used extensively to estimate scope 3 emissions.
Since 2022 a programme of data collection has been rolled out across the L&G real estate platform. This has included the installation of automatic sub metering in more than 200 assets, the strengthening of green lease clauses requiring tenants to share data, the launch of a new tenant engagement platform on which tenants who share data can see their energy profiles, and most recently the successful piloting of a new data harvesting technology-led solution. This involves directly accessing the U.K. energy industry settlement system, which holds energy consumption data for all electricity and gas meters in mainland U.K. Having gained tenant consent, L&G can access data on an ongoing basis without the need to engage suppliers or tenants.

This programme resulted in tenant data coverage rising to 63 percent by the end of 2024 and the aim to increase this further going forward. The ultimate objective is to achieve full and automated data collection across all L&G properties.

Measurement and baselining of carbon emissions, useful links.
BBP Net zero Carbon Pathway Framework
Homepage | GHG Protocol
Guide to Scope 3 Reporting in Commercial Real Estate | UKGBC
The Global GHG Accounting and Reporting Standard for the Financial Industry
Government conversion factors for company reporting of greenhouse gas emissions - GOV.UK
Emissions Factors 2024 - Data product - IEA

Summing up

Emissions Baseline Setting

STEP		
1	Define emissions boundary	Decide what will be included in your baseline. Ideally this will cover all real estate investments, however it may be a subset, based upon level of control, availability of information, and organisational ambition.
2	Identify required data	Having defined a boundary, identify the data required, to cover all emissions within the boundary. This will include property and investment schedules, property types, building floor areas, sources of energy use and any other emissions associated with that portfolio.
3	Collect data	Establish the process of data collection, to draw together all the controlled data and engage with tenants to request data. Ideally data should be consolidated in a suitable platform to support calculation, analysis, and reporting.
4	Calculate baseline	Use the available data gathered and any required estimation techniques (gap filling or benchmarks) along with appropriate carbon emission factors to calculate the baseline.

AMBITION LEVEL

Now that the current state has been baselined, it's time to determine the ambition and coverage of the decarbonisation strategy. This demands a strategic approach. Given the diversity of stakeholders involved—from institutional investors and asset managers to tenants and regulators—it is critical to begin with a clear goal. This clarity will support the internal alignment that has been carefully built, and will also facilitate external accountability and engagement.

As the first step, the work in the previous chapter produced a detailed understanding of the real estate holdings, calculated the baseline, and defined the status quo from an energy and carbon perspective.

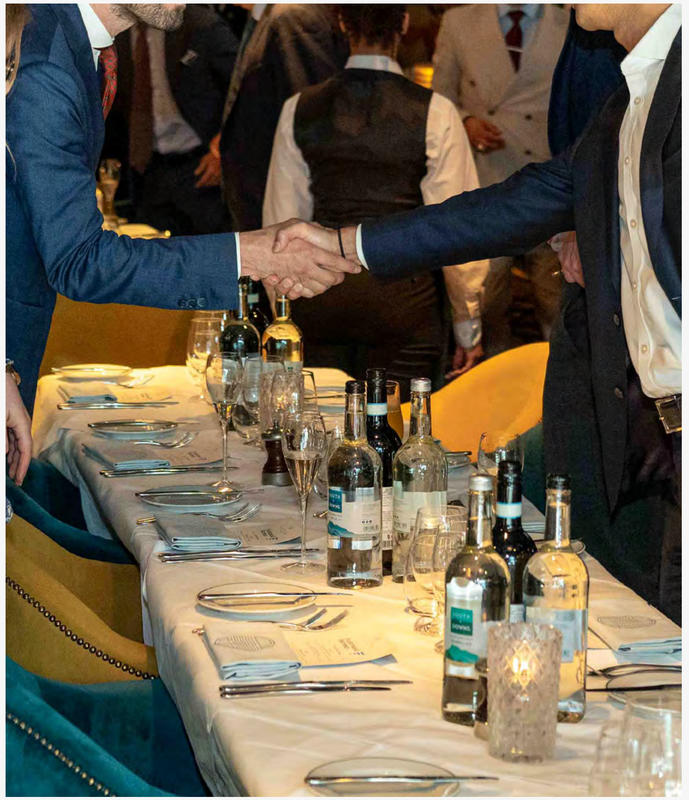
Choosing the framework to follow is the next step. The Playbook encourages asset owners and managers to consider setting a Paris-aligned target, and there are several frameworks built around those targets. At the international level, these include SBTi (Science-Based Targets Initiative) and CRREM (Carbon Risk Real Estate Monitor) and there are others (such as UK NZCBS, or U.K. Net Zero Building Standard) that focus on domestic markets. But the Playbook also recognises that not every organisation is able to commit or execute on that today, and thus provides practical and pragmatic guidance to start organisations on that journey. As a first step, it may be easiest to build consensus for a roadmap along some clear lines.

Stage 1: Commitment for monitoring, reporting and verifying energy and carbon data.
Stage 2: Formally integrating sustainability and net-zero carbon criteria into acquisition and investment decisions (e.g., systematise climate due diligence at acquisition)
Stage 3: Develop minimum performance standards for operational assets and engage with suppliers and partners.

Once a roadmap has been adopted along these or similar lines,the work can start to set specific targets.

Target setting and strategic alignment

Decisions about the ambition and coverage of the decarbonisation strategy will first be based on what the real estate portfolio looks like in terms of ownership level because decarbonisation objectives (like all objectives) must be aligned with the broader business strategy. This includes aligning targets with investment planning, asset management, and capital allocation processes. A top-down approach on setting a target will signal the ambition and the direction. A bottom-up approach— starting with asset-level analysis to inform what is feasible in terms of decarbonisation—will enable the identification of high-impact interventions and supports the development of credible decarbonisation pathways.



1. Ambition level

What is the most ambitious target the organisation can em brace? Set specific targets for both energy and carbon around:

a. Absolute reduction
b. Intensity
c. Asset alignment target

Interim targets are a critical component of effective delivery of the decarbonisation journey. Whatever ambition the organisation lands on, setting interim targets is as important as the end target date. They provide measurable milestones that enable performance tracking and promote accountability as well as opportunities for regular on-going engagement. These interim targets should be set at three- to five-year intervals, aligned with investment cycles, asset planning and maintenance, and they could be a time to pivot and adapt as necessary.

2. Coverage by scope

a. **Scope 1:** Direct emissions from owned assets (e.g., building heating, cooling, on-site energy use).
b. **Scope 2:** Indirect emissions from purchased energy (e.g., electricity consumption).
c. **Scope 3:** Indirect emissions across the value chain, including tenant activities, the embodied carbon in building materials, and emissions from the supply chain (progressively incorporate and influence as data becomes available).

3. Set boundaries

a. Asset-level vs. portfolio-level: Determine to which of the portfolio assets the target applies. Ideally the target applies to the whole portfolio. But if this is not feasible, then the Playbook can help determine realistic yet ambitious coverage.
b. Influence and control:
   I. Direct wholly or majority-owned investments where the organisation has more influence
   II. Fund investments where the organisation has an aligned party and influence

4. Commit to monitoring and verifying energy and GHG data from assets and where possible report.

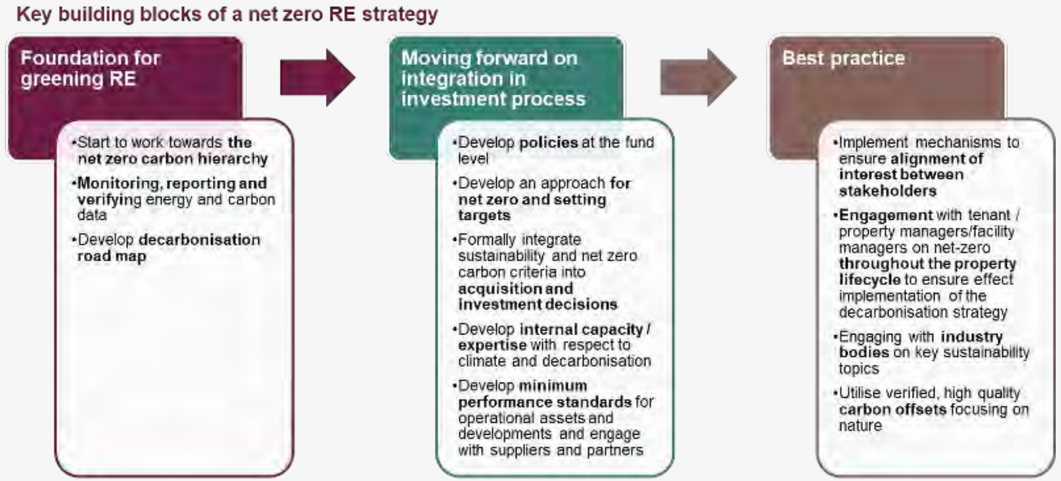
This ensures an accurate baseline to develop decarbonisation pathways, provides insights into reduction opportunities, and allows for measurement and communication of progress.

5. Develop decarbonisation pathways.

Decarbonisation pathways should include baseline assessments and energy use, annual reduction trajectories, key interventions (e.g., electrification, fabric upgrades, renewable energy procurement), and associated capital requirements.

a. Approach should align with the investment strategy and be embedded in that strategy.
b. Align with the asset management plans, business plans and capex planning.
c. Align with existing decarbonisation standards and targets, such as Carbon Risk Real Estate Monitor (CRREM) pathways, the UK Net Zero Carbon Building Standard, etc.
d. To be credible they need to be developed at the individual building level

Creating a pragmatic set of principles and guidance to support decarbonization and value create and protection in real estate.
Supporting collaboration and alignment between asset managers and asset owners on minimum.
Developing a guideline framework that supports the convergence of practices around green real estate.



OPSWF GRE Working Group Graphic presented at 7th Annual OPSWF CEO Summit December 2nd, 2024

Communication and Engagement

Once the targets have been decided and the pathways developed, it is imperative that these targets are clearly communicated across all levels of the organisation and externally with the supply chain. (The importance of clear and consistent communications throughout the decarbonisation journey is elaborated elsewhere in the Playbook.) Effective engagement, both internal and external, is essential to ensure that teams responsible for acquisition, development, asset management, and reporting are equipped to deliver on the pathways. Communication on the end target and interim targets must be consistent, transparent, and tailored to various stakeholders. Equally, developing a reporting framework is critical to maintaining credibility. Conduct portfolio- and asset-level assessments and disclose progress on an annual basis.

Summing up

Ambition Level

Checklist of actions

- ✓ Before tackling the work of setting specific targets, build consensus with the stakeholders for a clear roadmap around reporting and monitoring data, integrating sustainability into investment decisions, and developing performance standards for operational assets.
- ✓ Determine the most ambitious goal the organisation can embrace and then set specific targets, for both energy and carbon, around absolute reduction, intensity, and asset alignment.
- ✓ Based on the ultimate targets, set measurable interim targets to enable performance tracking, promote accountability, and provide opportunities for regular on-going engagement.
- ✓ Consider setting the interim targets on three- to five-year intervals, aligned with investment cycles, asset planning and maintenance.
- ✓ Set targets by scope (1,2, and 3).
- ✓ Aim for a target that applies to the whole portfolio to ensure that all the decarbonisation risks have been captured. If the target cannot be applied to the whole portfolio, determine and document to which of the portfolio assets the targets apply.
- ✓ Monitor and verify energy and GHG data from assets and where possible, report.
- ✓ Develop decarbonisation pathways, aligned with and embedded into the investment strategy and other business plans, at building level.

DECARBONISATION DUE DILIGENCE

Institutional real estate investors seem to increasingly view decarbonisation as both a fiduciary responsibility and a lever for value creation and better risk management. This section focuses on the due diligence phase, where climate transition risks can be identified and opportunities captured.

Neglecting to assess decarbonisation potential during due diligence can expose portfolios to financial downsides. Assets with poor energy performance and/or high GHG emissions may suffer ‘brown discounts’, reduced valuations, leasing challenges, and limited financing. With carbon-related regulations tightening globally, failure to assess compliance risks can result in stranded assets or unexpected costs.

Conversely, net-zero or net-zero-ready buildings offer upside. Strong tenant demand for low-carbon space is driving rent and valuation premiums in key markets. Decarbonisation appears to be no longer optional, but a strategic imperative for value preservation and growth.

The Playbook’s decarbonisation due diligence guidance covers both direct investments (individual assets, co-investments, JVs) and indirect investments (LP commitments to commingled funds), offering actionable steps to future-proof portfolios.

Direct Investment Due Diligence: Best Practices

For direct investments, asset owners and their partners should conduct detailed asset-level diligence to assess Climate Transition Risk and decarbonisation potential.

1. Evaluate regulatory compliance and retrofit (capex) needs.

- Ensure engineering assessments (e.g., energy/decarbonisation audits) yield a costed decarbonisation roadmap. This is reflected as part of a net zero audit, which can be commissioned as part of the pre-acquisition process.
- Map current and upcoming regulations across jurisdictions. For example, in the U.K. it is anticipated that new EPC (Energy Performance Certificate) guidelines will come into place by 2030. As a result, the due diligence process should assess whether this future regulatory requirement has been taken into consideration.
- Due diligence should include a regulatory gap analysis that determines whether the asset complies with current and/or anticipated requirements. This can help identify required improvements and estimate the cost.

2. Integrate decarbonisation and climate resilient considerations into underwriting.

- Model retrofit costs and opex savings to reflect NOI impacts.
- Consider scenario analyses that factor in financially material impacts such as a higher exit cap rate or lower rent growth if the building remains inefficient. Conversely, an asset with a credible decarbonisation roadmap may have better leasing velocity or exit assumptions, given tenant and investor appetite for sustainable assets. Review of lease structures for barriers or enablers to implementation can also add value.
- Treat climate resilience strategy as integral to underwriting, on par with tenant improvement allowances or capex. Assets should be evaluated against climate-related financial risks as part of driving the need for proactive resilience strategies, which can safeguard assets and ensure long-term viability.

3. Assess energy and GHG emissions performance.

- Review 1–2 years of energy data and benchmark asset-level energy use intensity (kWh/m2) and carbon intensity (kg CO_2/m^2), relative to comparable regional property types and use cases.
- Use tools such as the Carbon Risk Real Estate Monitor (CRREM) to evaluate alignment with 1.5°C pathways and identify potential «misalignment» keeping the quotations. years; this analysis can inform upgrade/retrofit capex requirements and regulatory risk exposure.

4. Consider green building certifications and/or net-zero requirements for new developments.

- If the investment involves new construction/development, consider incorporating green building certifications or net-zero-ready conditions into your project requirements.
- In joint ventures (JVs), embed sustainability targets into agreements to align with portfolio goals, which can also correlate with higher rents and values by appealing to quality-conscious tenants.

5. Assess partner sustainability credentials and establish appropriate governance.

- Evaluate asset manager/operator sustainability maturity via Global Real Estate Sustainability Benchmark (GRESB) scores, sustainability reports, and/or proprietary assessment/due diligence questionnaire tools; share results with the manager and use them as a foundation for engagement discussions. Sustainability targets could be incorporated into the asset manager's performance objectives to ensure alignment.
- Establish governance structures (e.g., JV committees) to retain influence over major sustainability-related decisions such as major capex.

In short, decisions made during direct investment due diligence (e.g., what price to pay, which improvements to budget, which standards to uphold) can set the course for the asset's entire hold period. Embedding decarbonisation into due diligence is increasingly standard informed real estate investors.

Indirect Investment Due Diligence: Best Practices

For indirect investments, diligence shifts to evaluating the GP's ability to steward capital in line with decarbonisation goals.

1. Assess the GP's sustainability policies and management practices.

- Request the GP's sustainability policy, responsible investment report, climate-related documentation (including targets and approach to decarbonisation and climate-related financial risks and opportunities) and GRESB scores, if available
- Consider issuing a bespoke sustainability assessment questionnaire (if required) and leverage existing tools such as the Institutional Limited Partners Association (ILPA) ESG DDQ or INREV's DDQ to assess governance, staffing, and prior actions.
- Require the GP to undertake energy assessments when they make acquisitions in the fund (e.g., per the above step regarding assessment).

2. Evaluate the GP/fund's process for incorporating sustainability into the investment process.

- Assess how the GP is integrating sustainability considerations into their investment process for this fund (screening, due diligence/ decision-making, contracting, management/monitoring, and exit).
- Assess fund-level emissions targets and decarbonisation plans and/or the partner's overall approach to assessing and managing climate transition risks and opportunities.

3. Assess sustainability data management, completeness, and reporting systems.

- Confirm GHG data availability/completeness (e.g., whole-building energy use) and any use of sustainability data management platforms. Agree on the relevant sustainability metrics as part of the standard reporting process to monitor performance and measure success.
- Verify reporting cadence and readiness for regulatory disclosures (e.g., SFDR in the E.U.).

4. Consider green leases or negotiating sustainability provisions in side letters.

- Request alignment with your sustainability policy and regular reporting.
- Codify commitments (e.g., annual Scope 1 and 2 emissions reporting, completion of an annual sustainability DDQ) in legal agreements.

5. Plan for ongoing engagement.

- Ensure that expectations around ongoing (e.g., quarterly or annual engagement on sustainability) are set. For example, if your organisation has annual sustainability assessments or tools that require GP input, ensure alignment on completion.

For indirect investments, decarbonisation due diligence means assessing the manager as much as the real estate assets. Setting clear expectations and systematically evaluating a GP's sustainability capabilities, data, action plans, and commitments is crucial to the success of the GP-LP partnership model.

Closing Thoughts

Integrating decarbonisation into due diligence is essential for institutional investors seeking resilient, high-performing portfolios. By systematically evaluating climate transition risks, energy performance, and sponsor capabilities, investors can align interests and reduce friction.

Following these practices enables asset owners and managers to jointly navigate the decarbonisation journey, balancing value creation (via efficiency, innovation, and green premiums) with value preservation (via risk mitigation and compliance). The result? More resilient portfolios positioned for superior, risk-adjusted returns in a low-carbon future.

Summing up

Decarbonisation Due Diligence

Checklist of actions

For direct investments (individual assets, co-investment, joint ventures)

- ✓ Evaluate regulatory compliance and retrofit (capex) needs.
- ✓ Integrate decarbonisation and climate adaptation considerations into underwriting.
- ✓ Assess energy and GHG emissions performance.
- ✓ Consider green building certifications and/or net-zero requirements for new developments.
- ✓ Assess partner sustainability credentials and establish appropriate governance structures.

For indirect investments (limited partner commitments to commingled funds)

- ✓ Assess the GP's sustainability policies and management practices.
- ✓ Evaluate the GP/fund's process for incorporating sustainability into the investment lifecycle.
- ✓ Assess sustainability data management, completeness, and reporting systems.
- ✓ Consider green leases or negotiating sustainability provisions in side letters.
- ✓ Plan for ongoing engagement.

DECARBONISATION LEVERS

The following section provides an overview of real estate decarbonisation levers. This guidance can be used as a starting point by real estate operators to:

- Identify targeted areas for decarbonisation (i.e., enable strategic decisions on emissions hotspots and which decarbonisation levers are most relevant).
- Start conducting cost-benefit analysis (i.e., assess each decarbonisation lever/initiative to prioritise impactful actions at optimal cost).
- Integrate decarbonisation into business plans (i.e., assess the decarbonisation timeline to plan phased implementation of strategies and identify efficient capital expenditure).

In general, building owners and operators should focus on specific key levers. These are summed up in the table, and then elaborated in the paragraphs following.

Summing up

Decarbonisation levers (part 1)

STEP	ACTION
1	Transition away from fossil fuels, primarily through electrification.
2	Implement energy demand-reduction strategies, through prioritised interventions.
3	Integrate on-site renewable energy systems, wherever feasible.
4	Embed decarbonisation into capital planning, align capital expenditure and major refurbishments with long-term decarbonisation goals.
5	Engage occupants, implement green leases to support collaboration and aligned incentives. Promote occupant behavioural change.
6	Reduce embodied carbon, adopt circular economy principles to refurbish and reuse rather than demolish, reduce consumption and consider end-of-life scenarios.

1. Transition away from fossil fuels.

- Electrifying buildings offers a powerful pathway to reduce emissions, particularly in regions with favourable low carbon grid-mixes. It can enhance financial performance through higher capital values and rents, fewer void periods, and lower maintenance costs whilst also enhancing appeal to high-quality tenants. A recent study conducted by JLL, across 46,600 buildings in 14 global cities, discovered that electrification of a building has the potential to increase its value significantly as a result of demand from corporate tenants[15].
- All-electric buildings can also cut energy demand and carbon emissions due to the higher efficiency of electric solutions compared to fossil fuel-based systems.
- Replace fossil fuel-based systems with electric alternatives such as heat pumps. These units provide efficiencies three to five times higher than fossil fuel systems; they can offer substantial energy and cost savings. In some cases the use of geothermal and ground source heat pumps can provide fossil fuel alternatives. Solutions must be examined on a case-by-case basis to ensure that they achieve the desired carbon intensity of energy supplied.

2. Implement energy demand-reduction strategies.

- Building Envelope Retrofits. Improve insulation, window glazing, air-tightness, and facades to reduce heating/cooling demand. Major refurbishments, which typically only occur every 20-40 years, represent a rare, high-impact intervention opportunity to improve the building fabric and deliver decarbonisation. It is key that decarbonisation be embedded in these projects, which can deliver additional benefits including: enhanced thermal comfort; lower peak demand; improved indoor air quality; increased building durability; reduced maintenance costs; improved climate resilience; and an opportunity to optimise lettable floor area.
- Mechanical, Electrical, and Plumbing (MEP) Upgrades. Replace outdated HVAC, lighting and control systems with high-efficiency alternatives.

Where possible, HVAC system upgrades should be preceded by energy load reduction measures which can significantly lower the demand on HVAC systems, helping to ensure that new systems are appropriately sized.

- Smart Building Platforms. Implement automated systems for lighting, heating, cooling, occupancy sensing, and energy management to optimise usage, enhance occupant comfort and safety, and lower operational costs.
- Space Utilisation Optimisation. Match building services operation to occupancy, to reduce energy waste by minimising energy use in unoccupied or underutilised spaces.

3. Integrate on-site renewable energy systems.

- On-site Renewable Generation. Conduct feasibility studies into on-site renewable energy. Where feasible, install solar PV panels, geothermal systems, or wind turbines to produce clean energy directly.
- Optimised Renewable Procurement. Engage in long-term contracts for renewable electricity, aligning procurement with decarbonisation timelines.
- Prioritise on-site renewables to reduce exposure to energy price volatility, provide clean energy, and improve energy security.

4. Embed decarbonisation into capital planning.

- Align short-term capital expenditures with long-term decarbonisation goals to help avoid stranded assets.
- Coordinate major refurbishments (e.g., roof, insulation, HVAC) to maximise decarbonisation opportunities, leverage economies of scale, and reduce overall costs.
- Use portfolio-wide optimisation for bulk procurement and project management efficiencies.

[17] IS-2025-015.pdf

5. Engage occupants.

- Engaging occupants is key to delivering real estate decarbonisation goals. In many cases occupants retain practical control of all building emissions (scope 3 emissions).
- Implement green leases that share costs and benefits of energy improvements between landlords and tenants.
- Promote collaboration and align incentives for energy efficiency and lower emissions.
- Promote occupant behavioural change through education and engagement to reduce consumption.
- Support the occupant achieving lower operational energy costs and carbon emissions through engagement.

6. Reduce embodied carbon through circular economy principles.

- Focus on refurbishment and reuse rather than demolishing existing buildings.
- Reduce consumption of materials by adopting lean design principles.
- Design for flexibility and adaptability to increase life span of the building.
- Specify low-carbon materials and construction methods in new builds and major refurbishments.
- Apply lifecycle carbon assessments to major refurbishments to ensure that embodied emissions are mitigated by operational carbon savings.

7. Hour Matching

Another important driver of decarbonisation for real estate is known as “hour matching.” Hour matching is a building energy optimisation practice that aligns a property’s electricity use to times when the local grid is producing the cleanest power (highest share of renewables, lowest carbon intensity).
Instead of just looking at annual averages of the local grid’s emissions, hour matching recognises that the grid’s carbon footprint changes throughout the day.

For example:
- Midday: Solar is abundant, grid is cleaner.
- Evening: Fossil fuel “peaker plants” often come online, due to intermittency of renewables (e.g., grid is dirtier). Peaker plants are power plants that generally only operate during periods of high electricity demand, or «peak demand,» to supplement the grid.

By shifting flexible building loads like cooling, heating, or EV charging into the cleaner hours, owners can cut emissions without reducing total energy consumption. In short, hour matching is about using energy at the right times, not just using less energy overall.

- **Load shifting:** Move flexible uses (e.g. HVAC pre-cooling, EV charging, water heating) into cleaner, lower cost hours.
- **Low capex solution:** Requires smart building controls and optimisation, not deep retrofits (which means little-to-no disruption for tenant spaces or income generation).
- **Cost synergy:** Cleaner hours often overlap with off-peak electricity pricing, reducing both emissions and building operating costs.
- **System impact:** Scales across portfolios and supports overall grid decarbonisation by lowering reliance on fossil peaker plants.

Optimising *when* energy is consumed is as critical as reducing *how* much is consumed.

Commercial Buildings: Decarbonisation Levers

The following table provides a sample of decarbonisation levers with indicators of the ease of implementation, carbon impact, and prospective ROI in developed markets.

Initiative	Ease of Implementation	Energy Efficiency Impact*	Embodied Carbon Impact**	ROI	Description
LED lighting retrofit	Very easy	Medium	Low	High	Replacing incandescent or fluorescent lighting with energy-efficient LED fixtures. Quick payback and minimal disruption.
Smart thermostats & controls	Easy	Medium	Low	High	Installing programmable or AI-driven thermostats to optimise HVAC usage based on occupancy and weather.
HVAC optimisation & maintenance	Easy	Medium	Low	High	Regular maintenance, filter changes, and system tuning to improve efficiency and reduce energy use.
Occupancy sensors & timers	Easy	Medium	Low	Médium-high	Installing motion sensors and timers to control lighting and HVAC in unoccupied spaces.
Building Energy Management Systems (BEMS)	Moderate	Medium to high	Low	Medium-high	Centralised systems that monitor and control energy use across building systems for
Window film or glazing upgrades	Moderate to difficult	Medium	Medium	Medium	Applying reflective films or upgrading to double/triple glazing to reduce heat gain/loss.
On-site solar PV installation	Moderate	High	Medium -high	Medium	Installing rooftop or carport solar panels to generate renewable electricity on-site.
Green lease clauses	Moderate	High	None	Medium	Embedding sustainability requirements into leases to align landlord-tenant incentives.
Electrification of heating systems	Moderate to difficult	High	High	Medium	Replacing gas or oil heating systems with electric heat pumps or other low-carbon alternatives.
Deep energy retrofits	Difficult	High	High	Medium-Low	Comprehensive upgrades to insulation, windows, HVAC, and lighting for major energy savings.
Green roofs or cool roofs	Difficult	Medium	Medium to High	Low-Medium	Installing vegetation or reflective materials on roofs to reduce heat island effect and improve insulation.
Embodied carbon Reduction in materials	Difficult	Low	This measure will save embodied carbon.	Low	Choosing low-carbon materials in renovations or new construction to reduce lifecycle emissions.

*Energy Efficiency Impact: High is more desirable as it will save more energy during operation.

**Embodied Carbon Impact: Low is more desirable as it will release fewer embodied carbon emissions as a result of implementing the initiative.

There are tools available to help prioritise emission reduction actions. These include approaches such as the use of Marginal Abatement Cost Curves (MACC) for operational carbon reduction projects. Of growing importance is the use of whole life carbon analysis, which can enable both operational and embodied carbon to be considered across the lifecycle of a building.

Regional Decarbonisation Lever Considerations

- The applicability of decarbonisation levers varies widely depending upon local climate conditions and other regional characteristics including: the composition of the energy mix and availability of renewables; construction materials and building practices; energy efficiency standards; regulatory frameworks; and local lifestyle preferences.

- It is essential to tailor and apply decarbonisation strategies to the specific local context. An engineering consultant with local market knowledge can advise on the decarbonisation levers typically considered 'ROI positive' for a particular asset and region.

Turning this into Action

These levers must be brought to bear in a coherent and prioritised portfolio strategy which includes overarching elements such as capital planning and procurement of decarbonisation goods and services. Decarbonisation should be generally embedded across all refurbishment projects and plant
replacement cycles.

Individual buildings should have specific and prioritised decarbonisation roadmaps tailored to the building's characteristics, opportunities and challenges. These roadmaps should be developed through technical building audits and feasibility studies.

Case Study

Decarbonisation through Major Refurbishment (L&G Asset Management – Tempo, Maidenhead)

L&G recently undertook a major refurbishment at Tempo, a 150,000 square foot office development located in the southeast of England. Throughout the refurbishment process, L&G's decision-making prioritised sustainability achievements including low-embodied and operational carbon impacts, and a whole-life carbon assessment was integral to the design process. Refurbishments can offer significant carbon savings compared to redevelopment and in Tempo's case, the foundations, superstructure, and approximately 40 percent of the original façade were able to be retained. L&G tracked the impact of carbon initiatives closely through procurement and construction, and has found that post-refurbishment, Tempo now outperforms several industry benchmarks for both operational and embodied carbon. Design considerations, including removal of natural gas, addition of 280 photovoltaics panels, and efficient glazing, have resulted in a projected 23 percent reduction in energy use when compared to U.K. Green Buildings Council net zero operational energy trajectory. L&G also prioritised health and wellbeing considerations through inclusion of additional communal and green spaces and extensive tenant amenities. These achievements have resulted in rental uplift of around 20 percent above local market rates.

Summing up

Decarbonisation levers (part 2)

STEP		
1	Identify targeted areas for decarbonisation	Identify emissions hotspots and which decarbonisation levers are most relevant. The work done on the emissions baseline, covered earlier in this guide, should help to identify the material sources of emissions and priority areas e.g., largest energy users / carbon emitters, largest fossil fuel users.
2	Conduct cost-benefit analysis	Assess each decarbonisation lever/initiative to prioritise impactful actions at optimal cost. • At a building level commission energy/carbon management audits and feasibility studies, starting with priority assets. These should identify a range of mitigation steps from no cost / low-cost measures, to those requiring investment over the medium to long term. • Identify and assess fund-wide opportunities, through reviewing policies, specifications, and processes against best practices.
3	Integrate decarbonisation into business plans and building-level road maps	Leverage the decarbonisation timeline to plan phased implementation of strategies and identify efficient intervention and capital injection points. For example: • New developments and major refurbishments – electrification, demand reduction, on-site renewables, minimised embodied carbon. • Operational Property Management – demand reduction (building optimisation), occupant engagement.

ONE PLANET
SWF NETWORK

SECTION 4 -

COMMUNICATION

CHALLENGES AND OPPORTUNITIES

Sustainability is central to long-term value creation, risk management, and fiduciary responsibility. For asset owners, it is essential that sustainability goals be understood and implemented across the investment chain. However, one of the most persistent challenges is misalignment between asset owners and real estate asset managers*. Misunderstandings about sustainability priorities, unclear governance structures, and inconsistent reporting can all undermine performance. These issues are rarely due to a lack of intent. More often, they stem from a lack of structured communication.

By embedding clear communication protocols into the investment process, asset owners can ensure that sustainability goals are not only set but delivered. Where possible, if sustainability measures such as decarbonisation initiatives can demonstrate positive financial impact in the form of higher rental yields, it will reinforce the communication process.

*Asset Managers as referenced represent those institutions that manage assets on others behalf of Asset Owners / Wovereign Wealth Funds.

GUIDANCE FOR NEW INVESTMENTS

Guidance for new investments vs.existing Portfolios

It is critical to establish a shared understanding of sustainability priorities right at the beginning of an investment because the early stages of a transaction set the tone for the entire investment lifecycle. Clear, structured communication between asset owners and asset managers at this point is not just helpful—it is essential to ensure alignment, avoid misinterpretation, and enable effective execution.

Set expectations early.

Sustainability goals must be clearly articulated at the outset of any transaction. This includes expectations around energy performance, environmental certifications (e.g., BREEAM, LEED), climate resilience measures, and social impact considerations. These expectations should not be left to assumption or informal discussion. Instead, they should be explicitly communicated in early-stage meetings, investment memos, and pre-approval documentation. Doing so ensures that both parties are aligned on what success looks like and reduces the risk of future disputes or delays. Some asset managers are incentivised to set sustainability objectives as part of their individual annual performance targets.

Document rights and responsibilities.

Verbal agreements are insufficient when it comes to sustainability commitments. Asset owners should ensure that their rights—such as access to environmental, social, and governance (ESG) data, approval of capital expenditure plans related to sustainability, and participation in ESG governance structures—are formally documented. This can be achieved through side letters, term sheets, or within the investment management agreement. Clear documentation provides a reference point for both parties and ensures that sustainability is treated with the same rigour as financial and legal terms. Green leases could be a useful tool of future-proofing buildings by agreeing to energy efficiency improvements and any work needed to meet regulations. In return, occupants benefit from lower energy costs whilst reducing their carbon impact. This could be an important part of strengthening the collaboration between owner and occupant.

Integrate ESG into due diligence.

ESG factors should be fully integrated into the due diligence process. This means assessing not only the current sustainability performance of the asset but also its future potential and associated risks. ESG findings should be shared transparently between the asset owner and manager and used to shape the investment thesis. Open dialogue during this phase helps identify potential gaps in expectations and provides an opportunity to align on remediation strategies or enhancement plans before capital is committed. For example, a net zero carbon audit can be commissioned as part of the due diligence process to identify the building's net zero pathway and the key interventions required to transition the asset.

Establish governance structures.

Effective governance is the backbone of sustainability delivery. Asset owners and managers should agree in advance how sustainability performance will be monitored, reported, and reviewed. This may include the formation of ESG steering committees, the establishment of quarterly reporting cycles, or the inclusion of sustainability metrics in performance dashboards. Agreeing from the outset to a clear and consistent set of metrics supports effective monitoring of sustainability performance and better governance. Governance structures should be proportionate to the scale of the investment but robust enough to ensure accountability. Importantly, they should also provide a forum for ongoing dialogue, enabling both parties to respond to emerging risks, regulatory changes, or shifts in market expectations. Informal working groups at an operational level between the sustainability team and asset managers have also proven to be an effective way to share best practices and strengthen collaboration.

GUIDANCE FOR EXISTING PORTFOLIOS

Guidance for new investments vs.existing Portfolios

Once an investment is made, delivering on sustainability goals over the life of a portfolio requires structured, consistent, and transparent communication between asset owners and asset managers. Without that communication, even the best-designed strategies can falter.

Maintain Regular Dialogue.

Sustainability performance should be a recurring agenda item in portfolio review meetings. It should include updates on key performance indicators (KPIs), progress against asset-level business plans, and any material changes in risk profile or regulatory exposure. Communication should be two-way: asset managers must be proactive in sharing updates, and asset owners must be clear in providing feedback and reinforcing expectations. Additionally, the scope of regular communication can be widened to the asset team, including property managers and facility managers, to ensure productive review meetings. This inclusion also helps facilitate alignment of strategies and objectives. Regular dialogue builds trust, enables early identification of issues, and ensures that sustainability remains a live and evolving priority.

Adapt to change.

Sustainability is a dynamic field where regulatory frameworks, market expectations, and technological capabilities are all evolving rapidly. Asset owners and managers must be prepared to adapt. This requires open channels of communication to discuss how new developments—such as changes in energy performance standards, disclosure requirements, or tenant expectations—may affect the portfolio. Flexibility is important, but so is clarity. Any changes to strategy or targets should be discussed, agreed upon, and documented to avoid ambiguity.

Address underperformance proactively.

Not all assets will perform as expected. When sustainability targets are missed or delayed, the response must be timely and transparent. Asset managers should present a clear explanation of the issue, supported by data, and propose a corrective action plan with defined timelines and responsibilities. Asset owners, in turn, should assess the plan, provide guidance where needed, and monitor implementation. This process should be collaborative, not punitive. The goal is to restore alignment and maintain momentum, not to assign blame.

Reinforce accountability through governance.

Governance structures such as ESG steering committees, sustainability working groups, or formal reporting frameworks play a critical role in maintaining alignment. These structures provide a forum for structured communication, escalation of issues, and strategic decision-making. They also ensure that sustainability performance is not siloed within asset management teams but is integrated into broader portfolio oversight.

Summing up

Communication

Stakeholder	Actions
Asset owners	• Define clear sustainability objectives and minimum standards for all investments. • Ensure these are reflected in manager selection, appointment, and monitoring processes. • Require transparent reporting and engage regularly to ensure alignment. Where possible, sustainability targets could be incorporated into the asset manager's performance objectives to ensure alignment.
Real estate asset managers	• Translate owner-level goals into actionable asset-level strategies. • Provide timely, accurate, and transparent updates on sustainability performance. • Flag risks early and propose mitigation strategies with clear rationale; including relevant stakeholders to ensure alignment of objectives.
Investment committees and governance bodies	• Review sustainability alignment as part of investment approvals. • Monitor portfolio-level performance and escalate issues where necessary. • Ensure sustainability is considered in the capital allocation decisions.

Effective communications: some examples

#1 Aligning at Acquisition

A pension fund investing in a real estate vehicle required all new acquisitions to meet minimum energy performance standards and to hold a recognised sustainability certification. Because the owner communicated this requirement upfront, the asset manager integrated it into the investment screening process, avoiding misalignment and wasted time, and ensuring that capital was deployed in line with the fund's values.

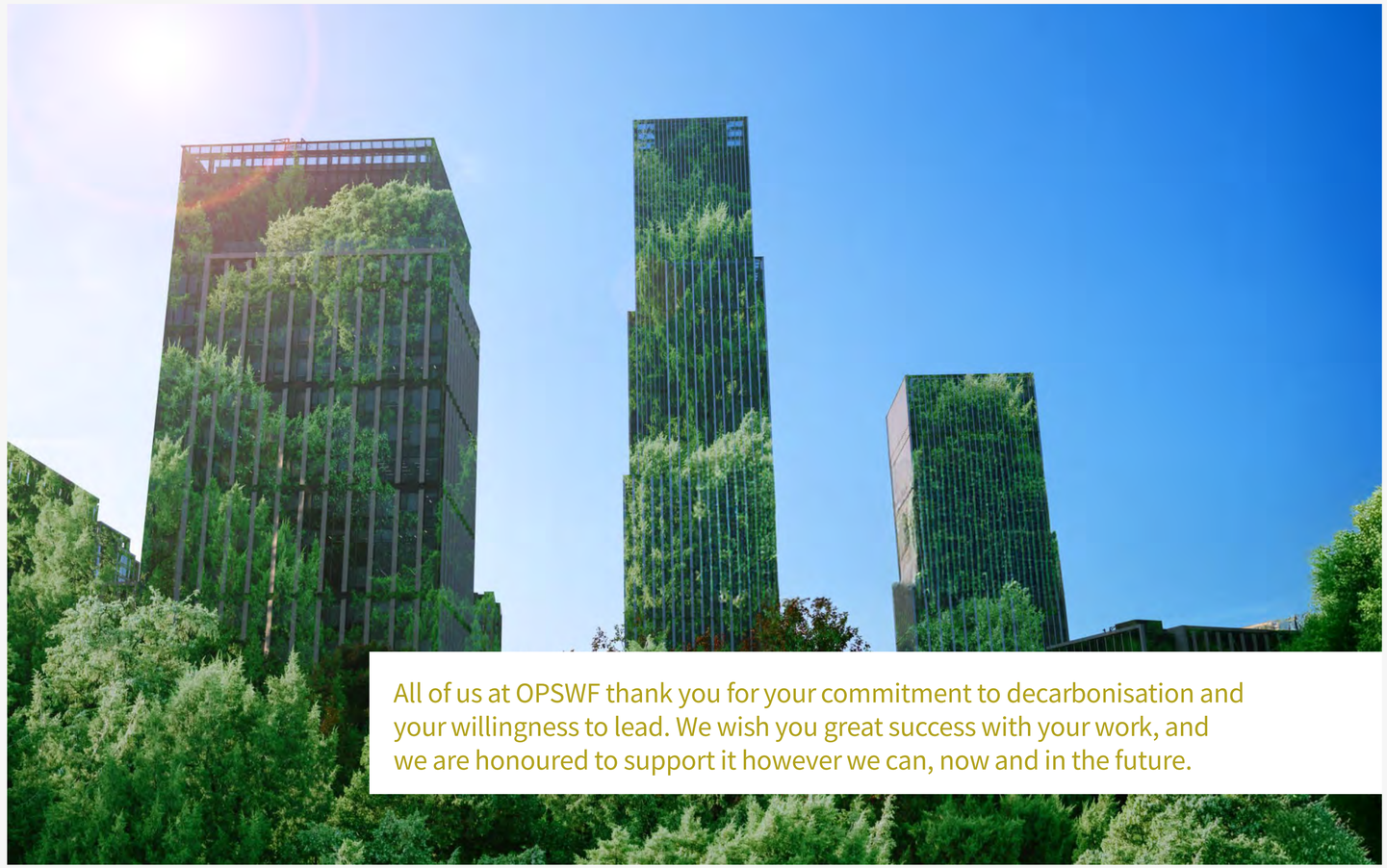
#2 Mid-Hold Course Correction

An investor was informed of delays in a building upgrade due to tenant negotiations. The asset manager provided the investor with a revised plan including updated timelines and mitigation measures. Transparent, proactive communication preserved trust and allowed the investor to maintain confidence in the strategy.

As you pursue your decarbonisation journey, we would like to leave you with two thoughts. First, we are aware that the task can seem daunting. There are multiple stakeholders involved in even relatively straightforward real estate transactions. The subject matter of decarbonisation is technically complex, and the financial stakes are high. But important work usually does come with challenges, and the important thing is to start. We have tried to structure this Playbook to be as comprehensive as possible—hence its length and density—but also user-friendly. We hope that we have struck a good balance, and we would very much welcome and appreciate your feedback: what you liked and what could be improved for the next edition.

Second, we are in this together. Since its founding in 2017, the animating spirit of OPSWF has been peer learning and mutual support. The Playbook stands alongside other key OPSWF products such as the Climate Disclosure Guidelines as a repository of our collective experience to date and as a roadmap for the future. The Playbook will be helpful to the extent that it is used, in the real world, and those experiences are reported back to us so that we can integrate, aggregate, and share them.

We plan to hold regular online sessions for users to share their experiences with decarbonisation and their questions and comments about the Playbook. You can also send your feedback to us via email to Secretariat@OPSWF.net, with 'Decarbonisation Playbook' in the subject line.



All of us at OPSWF thank you for your commitment to decarbonisation and your willingness to lead. We wish you great success with your work, and we are honoured to support it however we can, now and in the future.

CRREM (Carbon Risk Real Estate Monitor)
CRREM enables a wide range of real estate stakeholders to better understand the carbon and en- ergy performance of buildings relative to science-based reference benchmarks. With open-access CRREM Pathways for 40+ countries and all major property types, CRREM supports the real estate industry with taking action to meet global climate goals and safeguard value.

GRESB (Global Real Estate Sustainability Benchmark)
GRESB supports sustainable investments across real assets in climate-critical industries. They aim to facilitate productive engagements between investors and managers, helping organisations comply with regulations, define best practices, and demonstrate leadership so they can build more resilient, efficient, and financially attractive portfolios for long-term success.

PCAF (Partnership for Carbon Accounting Financials)
Enables financial institutions to assess and disclose greenhouse gas emissions associated with financial activities

SBTi (Science-Based Targets Initiative)
A corporate climate action organisation that enables companies and financial institutions worldwide to play their part in combating the climate crisis. SBTi develops standards, tools and guidance which allow companies to set greenhouse gas emissions reductions targets in line with what is needed to keep global heating below catastrophic levels and reach net-zero by 2050 at latest.

Renovation Wave
The Renovation Wave aims to renovate 35 million buildings by 2030, at least doubling the annual rate of energy renovations in the E.U. By reducing energy consumption and greenhouse gas emissions, as well as creating green jobs in the construction sector which is dominated by local businesses, the Renovation Wave aims to improve overall living standards for Europeans.

RICS (Royal Institution of Chartered Surveyors)
RICS develops and enforces leading international standards to effect positive change in the built and natural environment.

BBP Green Lease Essentials
The BBP's Green Lease Essentials, provides guidance on a minimum level of expectation for a green lease, with the guide outlining 10 areas which the BBP would expect to see covered in a lease to help define it as "green". The 10 areas are highlighted in the link with 8 of these based on focus topic areas and two other 'enabling' clauses. In all cases, whether owners/occupiers choose to pursue the light/medium or dark green options will depend on their ambition and the specific asset and type of lease being negotiated. The BBP hopes by setting out these Green Lease Essentials that this will contribute to a shared industry understanding and greater transparency concerning the scope of green leases.

INREV Due Diligence Questionnaires (DDQ)
The INREV Due Diligence Questionnaire (DDQ) assists investors and consultants in the due diligence process to understand a fund manager's structure, strategy and non-listed real estate business. It also gives insight in a specific vehicle's strategy, risk processes, management, terms and projected performance. With it, investors can determine, in principle, whether a proposal fits their investment objectives.

Summing up

Section 1 -Laying the groundwork

- Building internal alignment and engagment
- Understanding Different Stakeholders
- Managing investment dynamics

Section 2 -Setting the terms

- Portfolio Analysis and Prioritisation
- Valuation & Underwriting
- Incentives & Governance

Section 3 - Into actions

- Emissions Baseline Setting
- Ambition Level
- Decarbonisation Due Diligence
- Decarbonisation levers (part 1)
- Decarbonisation levers (part 2)

Section 4 -Communcation

- Communication

Summing up

Building internal alignment and engagment

Checklist of actions

- ✓ Seek senior level buy-in and leadership
- ✓ Find other champions (e.g. non-executive) across the organisation
- ✓ Educate and raise awareness – consider a dedicated CEO and Board session
- ✓ Establish a cross functional working group
  - > Appoint a lead
  - > Meet regularly
- ✓ Establish systems and processes to measure and monitor GHG emissions across your real estate portfolio
- ✓ Explore KPIs, objectives and incentives to drive alignment and progress
- ✓ Communicate ambition and progress to the whole organisation

Summing up

Understanding Different Stakeholders

Stakeholder	Incentives	Blockers
Sovereign Wealth Fund	• Protect long-term asset value • Regulatory compliance • Reduce standard asset risk • Strengthening Reputation • Beneficiary accountability • National decarbonisation targets	• Initial capex can be high • Challenge to pass costs through to tenants depending on the lease • Payback misalignment • Internal capability and prioritisation of climate • Internal buy in and direction • Limited control over operational decisions at the asset level or influence on tenants
Tenant	• Reduce operating costs • Meet employee expectations on sustainability and comfort	• Tenants are limited in adopting sustainability measures due to lack of control and restrictive lease terms • Retrofit disruption • Increases in service charges • Restrictive lease terms • Unable to gather or fulfil data requests

Stakeholder	Incentives	Blockers
Property Manager	• Optimise performance of asset • Meet owner/investor expectations • Meet regulations • Reputation improvemen	• Not financially incentivised • Needs owner investment to execute • Additional tasks and ad hoc requests generate work they are not paid for
GPs / Fund Managers	• Respond to increasing expectations/requirements from investors that sustainability be integrated into overall strategy (not just specific climate-focused funds) • Aligns with fund targets • Reduced stranded asset risk • Reputation enhancement • Attract climate-aligned LPs	• LPS may not communicate clear expectations • Quantum and divergence of LP decarbonisation targets and dates • Reporting burdens, greenwashing risk • Difficulty in accessing and collating information at the underlying asset level
Lenders	• Reduce transition risk • Product – sustainability linked loans • Reputation	• Reporting burdens, greenwashing risk • Data availability and quality

Summing up

Managing investment dynamics

Recommendations to accelerate action.

Building owners and managers should ensure that investment dynamics support collaboration and alignment around decarbonization. Each should undertake specific steps to advance that collaboration.

Stakeholder	Recommended Actions
Real estate investors and service providers (all stakeholders)	• Increase decarbonisation leadership, knowledge and skills across the industry. • Encourage further consideration / recognition of decarbonisation investments in property valuations.
Asset managers and real estate operators	• Coordinate low-carbon upgrades with scheduled infrastructure and equipment renewal cycles, giving special attention to high-impact opportunities like building envelope replacements. • Adopt a holistic approach to retrofit planning, moving beyond isolated system upgrades to comprehensive building-wide strategies. • Collaborate to identify and align around credible, interoperable standards that support consistent measurement, reporting, and benchmarking across jurisdictions and asset types. • Leverage innovative project delivery models, such as: • Access to green financing through sustainability-linked loans or green loans/bonds.
Asset managers and real estate operators	• Seeking long-term low fixed-rate debt financing options for low carbon construction and retrofits. • No up-front capital Investment. • Off-balance-sheet financing. • Shared cost-benefit arrangements between owners and tenants. • Performance guarantees to reduce project risk.
Asset Owners / Sovereign Wealth Funds	• Embed decarbonisation expectations contractually at the fund level. • Negotiate formal approval rights over budgets and capital plans • If not feasible, negotiate to have engagement or notification rights. • Negotiate a seat on the Fund LPAC (Limited Partnership Advisory Committee). • Secure a place on or establish a joint sustainability committee or working group. • Collaborate to identify and align around credible, interoperable standards that support consistent measurement, reporting, and benchmarking across jurisdictions and asset types. • Ensure access to whole building data through direct engagement, advocating for green lease clauses, and side letters. • Create stronger incentives for decarbonisation (e.g., adopt employee remuneration practices that include achieving low carbon targets alongside financial targets). • Increase internal decarbonisation leadership, knowledge and skills

Summing up

Portfolio Analysis and Prioritisation

Checklist of actions

- ✓ Consider the assets' ownership structure and the implications of that ownership.
- ✓ Understand the assets' characteristics and attributes (property type, age, condition, etc.) and how those will impact risk exposure and capital requirements.
- ✓ Conduct regular portfolio alignment assessments.
- ✓ Integrate transition risk into investment decisions and ongoing asset management
- ✓ Prioritise engagement with tenants in high-risk assets and operating partners to preserve value.

Summing up

Valuation & Underwriting

Checklist of actions

- ✓ Factor ESG in valuation at pre-acquisition, capitalising on existing due diligence processes (e.g., climate risk analysis) to assess financial impacts of climate risk and opportunities. Explicitly articulate the evidentiary basis for your assumptions.
- ✓ Prepare and disseminate a formalised and well-communicated valuation strategy. Leverage it to communicate to investors/fiduciaries on your strategy
- ✓ Identify gaps in skills, knowledge and training and ensure appropriate capacity building for the deal team to navigate sustainability-focused concepts and tools.
- ✓ Engage with your lenders and valuer on climate-related topics, including proactively communicate an "ESG data pack" to external underwriters' lenders and insurers.
- ✓ Post-investment, ensure that the valuation used for the net asset value calculation reflects the anticipated premium associated with green incentives at exit.

Summing up

Incentives & Governance

Checklist of actions

- ✓ Consider each of the key roles in real estate investments (e.g., deal team, property managers) to understand their respective incentives and the mlignment of those incentives with sustainability outcomes.
- ✓ Go beyond compliance and tie climate performance metrics (e.g., reduction in emissions, energy use intensity, climate adaptation costs) to long-term incentives for each of the key functions, ensuring that sustainability becomes a shared responsibility and strategic priority.
- ✓ Pay particular attention to incentivising execution and clear implementation plans.
- ✓ Assign responsibility for climate-related oversight to an existing board committee, ideally Investment or Risk, and document their proceedings and decisions in meeting minutes.
- ✓ Ensure that a senior leader on the management side takes ownership of climate-related risks and opportunities. This does not mean creating a new sustainability function but rather ensures that climate issues are embedded within, and considered alongside, other operational and financial issues.
- ✓ Ensure that climate is embedded into day-to-day investment processes:
  - Due diligence checklists flag climate and regulatory risks
  - Investment papers reflect how such risks might affect asset value or income
  - Include sustainability measures in underwriting
  - Annual business plans include planned energy upgrades, tenant engagement on sustainability, or resilience measures.
- ✓ Ensure asset managers and analysts are equipped to identify and understand climate risks and profitable decarbonization opportunities to asset performance.
- ✓ Consider obtaining expertise in scenario planning for different climate futures, with an emphasis on identifying practical mitigants and quantifying impacts.
- ✓ Consider board education and regular briefings.
- ✓ Commit to ongoing engagement and data-/knowledge-sharing with tenants, joint venture partners, and local authorities.

Summing up

Emissions Baseline Setting

STEP		
1	Define emissions boundary	Decide what will be included in your baseline. Ideally this will cover all real estate investments, however it may be a subset, based upon level of control, availability of information, and organisational ambition.
2	Identify required data	Having defined a boundary, identify the data required, to cover all emissions within the boundary. This will include property and investment schedules, property types, building floor areas, sources of energy use and any other emissions associated with that portfolio.
3	Collect data	Establish the process of data collection, to draw together all the controlled data and engage with tenants to request data. Ideally data should be consolidated in a suitable platform to support calculation, analysis, and reporting.
4	Calculate baseline	Use the available data gathered and any required estimation techniques (gap filling or benchmarks) along with appropriate carbon emission factors to calculate the baseline.

Summing up

Ambition Level

Checklist of actions

- ✓ Before tackling the work of setting specific targets, build consensus with the stakeholders for a clear roadmap around reporting and monitoring data, integrating sustainability into investment decisions, and developing performance standards for operational assets.
- ✓ Determine the most ambitious goal the organisation can embrace and then set specific targets, for both energy and carbon, around absolute reduction, intensity, and asset alignment.
- ✓ Based on the ultimate targets, set measurable interim targets to enable performance tracking, promote accountability, and provide opportunities for regular on-going engagement.
- ✓ Consider setting the interim targets on three- to five-year intervals, aligned with investment cycles, asset planning and maintenance.
- ✓ Set targets by scope (1,2, and 3).
- ✓ Aim for a target that applies to the whole portfolio to ensure that all the decarbonisation risks have been captured. If the target cannot be applied to the whole portfolio, determine and document to which of the portfolio assets the targets apply.
- ✓ Monitor and verify energy and GHG data from assets and where possible, report.
- ✓ Develop decarbonisation pathways, aligned with and embedded into the investment strategy and other business plans, at building level.

Summing up

Decarbonisation Due Diligence

Checklist of actions

For direct investments (individual assets, co-investment, joint ventures)

- ✓ Evaluate regulatory compliance and retrofit (capex) needs.
- ✓ Integrate decarbonisation and climate adaptation considerations into underwriting.
- ✓ Assess energy and GHG emissions performance.
- ✓ Consider green building certifications and/or net-zero requirements for new developments.
- ✓ Assess partner sustainability credentials and establish appropriate governance structures.

For indirect investments (limited partner commitments to commingled funds)

- ✓ Assess the GP's sustainability policies and management practices.
- ✓ Evaluate the GP/fund's process for incorporating sustainability into the investment lifecycle.
- ✓ Assess sustainability data management, completeness, and reporting systems.
- ✓ Consider green leases or negotiating sustainability provisions in side letters.
- ✓ Plan for ongoing engagement.

Summing up

Decarbonisation levers (part 1)

STEP	ACTION
1	Transition away from fossil fuels, primarily through electrification.
2	Implement energy demand-reduction strategies, through prioritised interventions.
3	Integrate on-site renewable energy systems, wherever feasible.
4	Embed decarbonisation into capital planning, align capital expenditure and major refurbishments with long-term decarbonisation goals.
5	Engage occupants, implement green leases to support collaboration and aligned incentives. Promote occupant behavioural change.
6	Reduce embodied carbon, adopt circular economy principles to refurbish and reuse rather than demolish, reduce consumption and consider end-of-life scenarios.

Summing up

Decarbonisation levers (part 2)

STEP		
1	Identify targeted areas for decarbonisation	Identify emissions hotspots and which decarbonisation levers are most relevant. The work done on the emissions baseline, covered earlier in this guide, should help to identify the material sources of emissions and priority areas e.g., largest energy users / carbon emitters, largest fossil fuel users.
2	Conduct cost-benefit analysis	Assess each decarbonisation lever/initiative to prioritise impactful actions at optimal cost. • At a building level commission energy/carbon management audits and feasibility studies, starting with priority assets. These should identify a range of mitigation steps from no cost / low-cost measures, to those requiring investment over the medium to long term. • Identify and assess fund-wide opportunities, through reviewing policies, specifications, and processes against best practices.
3	Integrate decarbonisation into business plans and building-level road maps	Leverage the decarbonisation timeline to plan phased implementation of strategies and identify efficient intervention and capital injection points. For example: • New developments and major refurbishments – electrification, demand reduction, on-site renewables, minimised embodied carbon. • Operational Property Management – demand reduction (building optimisation), occupant engagement.

Summing up

Communication

Stakeholder	Actions
Asset owners	• Define clear sustainability objectives and minimum standards for all investments. • Ensure these are reflected in manager selection, appointment, and monitoring processes. • Require transparent reporting and engage regularly to ensure alignment. Where possible, sustainability targets could be incorporated into the asset manager's performance objectives to ensure alignment.
Real estate asset managers	• Translate owner-level goals into actionable asset-level strategies. • Provide timely, accurate, and transparent updates on sustainability performance. • Flag risks early and propose mitigation strategies with clear rationale; including relevant stakeholders to ensure alignment of objectives.
Investment committees and governance bodies	• Review sustainability alignment as part of investment approvals. • Monitor portfolio-level performance and escalate issues where necessary. • Ensure sustainability is considered in the capital allocation decisions.

The Real Estate Decarbonisation Playbook was written by the members of the OPSWF Network's Greening Real Estate Working Group. These include:

Qatar Investment Authority

Ardian

Galvanize

L&G Asset Management

Mubadala Investment Company

Federated Hermes Limited

GrowthFund, The National Fund of Greece

Nuveen

The larger OPSWF network provided helpful early input during roundtable discussions held in June 2025 at the OPSWF Mid-Term Meetings in London. The Greening Real Estate Working Group members sincerely thank our colleagues for their thoughtful guidance which did much to shape the Playbook's ultimate direction.

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We wish to thank the following organisations for their support and participation in the Decarbonisation Playbook's development:

ONE PLANET
SWF NETWORK

ABOUT OPSWF NETWORK

Established following the Paris Agreement and the 2017 One Planet Summit, the OPSWF Network is a trusted forum for strategic knowledge exchange and community building among global sovereign wealth funds, asset managers, and private equity funds. The Network has grown selectively to include 50 members as of June 2025, reflecting its alignment with core investor priorities: value creation and preservation. The OPSWF Network remains committed to voluntary and non-binding principles, while fostering a community to enable members to share best practices which help to improve long-term investment decision-making.

Website: oneplanetswfs.org
LinkedIn: One Planet Sovereign Wealth Funds

The OPSWF Network Mid-term Meeting during London Climate Action Week 2025

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