Appendix 1: Typical ESG-related risks and Value at Risk

A risk management framework generally includes a process that identifies relevant risks, establishes risk limits based on the investors' risk appetite, assesses relevant information, and responds on a timely basis. Risk management, including managing ESG-related risks, is a continuous process that should be monitored by the investment manager and the governing body of the vehicle. The results of this process should be reported to investors, taking account of applicable regulatory and financial reporting requirements – see G22 of the Governance module for more details.

Particular areas of focus that the investment manager should consider when performing an ESG risk analysis related to the vehicle include but are not limited to:

- Market-related risks; such as changing tenant expectations and behaviour with respect to sustainability matters reflected in rentability of the property. Also, volatility in the cost of services and raw materials as a result of environmental factors;

- Reputational risks; such as shifts in public perception which adversely stigmatise a particular sector or asset type, issues related to adverse social impacts when operating particular assets and the occurrence of specific incidents such as contamination and pollution events;

- Operational risks; as well as ESG-related factors impacting day-to-day operations, events, such as damage to physical assets and system failures due to extreme weather events, risks associated with workplace safety and supply chain risks may also be relevant;

- Liquidity-related risks; the degree to which the availability and cost of capital and financing are impacted by the ESG track record and ambitions of the vehicle may be material. In addition, the liquidity (ie buying and selling) of certain assets may be impacted by evolving ESG factors;

- Legal and regulatory-related risks; such as increased pricing of GHG emissions, changes in reporting obligations, changes in environmental and social regulations related to existing investment strategies and assets, as well as corruption and bribery risks;

- Technology-related risks; such as substitution of existing products and services with better emission outcomes, unsuccessful investment in new technologies and adverse costs related to the transition to lower emissions.

Specific climate-related risks

When developing an overall risk management framework from the perspective of assessing ESG factors, current or anticipated physical and transition risks or impacts of climate change at an asset level are critical considerations. This includes the assessment of the potential financial, commercial and legal impacts on investments, which are potentially significant. A summary of typical climate-related factors and risks that an investment manager may consider as part of this process is illustrated below:

	Transition Risk		Physical Risk	
	Direct	Indirect	Direct	Indirect
Revenue	Decline of demand of tenants in unsustainable buildings for occupiers that have made a climate commitment Introduction of Carbon tax or subsidies by governments Introduction of Carbon price or earnings due to carbon certificates Introduction of stringent minimum regulatory standards by governments	Decline in a sector or local economy resulting in lower local real-estate demand/occupancy	Disruptions to an asset's operations from severe or repeated physical-hazard events (eg, major floods) Risk of inability to sell the asset due to physical climate risk	Reduced real-estate demand in a local market given disruptions to surrounding transportation or other infrastructure Market perception with reduced interest in certain areas with the highest physical risks
Operating Cost	Increased utility costs given carbon- intensive building systems Introduction of carbon tax or subsidies by governments on the utility bills	Changes in the tenant behaviour due to ESG demands	Increased maintenance costs as physical risks increase Integration of innovative mitigation solutions that are not (cost) efficient	Increased insurance costs as insurers recognise physical risks and adjust underwriting models Operational costs involved with staff, knowledge to mitigate the risks
Capital Cost	Significant capital investment required to meet local energy efficiency/ emissions standard or tenant demands (eg, early retrofit of heating/ cooling systems), increased need to purchase lower-emissions building materials (eg, steel, timber)	Increased financing costs as investors and lenders price in market- level transition risks (eg, in economies dependent upon carbon-intensive industries)	Investment required to improve the resilience of building to increasing physical risks (eg, elevating lobby, green roofs, protecting electric and mechanical systems)	Increased capital investments (eg, development fees), required to protect broader communities from climate risks (eg, floodwalls, green infrastructure for heat mitigation)
Capitalisation rate / Liquidity	Changes in capitalisation due to perceptions of both physical and transition risks by market participants		High cap rate due to the physical risks that an asset is facing	

Assessing Value at Risk (VaR) from the perspective of climate change considerations

Assessing VaR is a common approach used in a general risk management context. Historically, it has been focused on financial inputs and variables. Given the potential impact of climate-related risks on the overall performance of the vehicle, consideration of a specific climate-related VaR as a component of the overall VaR is an important emerging risk management technique.

When determining the VaR to be included in underwriting and for disclosure to investors, the most accurate assessment of this figure will be determined by undertaking a quantitative assessment of the risks and opportunities set out in the table above for each individual asset. Expert advice may be required in order to assess the financial impact of the climate change risks and opportunities (eg the capital expenditure required to achieve Net Zero Carbon or the costs associated with the necessary resilience measures).

The return on investment of undertaking this work should also be taken into account, recognising that this will vary significantly from sector to sector and geography to geography.

The complexity of assessing the VaR using this granular approach means that it is likely to only be deemed appropriate for those portfolios where a materiality assessment has indicated that the risk or opportunity has the potential to be significant in the coming 5 to 10 years.

It must also be recognised that this 'bottom up' approach, while likely to deliver the most accurate assessment of VaR, may vary from manager to manager in its application.

Managers may therefore choose to use a third party 'Climate Related Value at Risk' model. The advantages of using these models are that they deliver comparability for investors and that they enable a manager to determine a Climate Related VaR figure for every asset in a portfolio affordably and without having to rely on time-intensive programme of site assessments. Investment managers and investors using a Climate Related VaR model should acknowledge the fact that these models look at a small number of the factors set out in the table above. The models assess the potential cost of physical damage using climate change models. Additionally, to quantify the transition risk, they model the potential cost of carbon taxation but do not include the capital expenditure required to adapt buildings to be Net Zero Carbon. Climate-Related VaR figures from these models will therefore be very different from the VaR that is arrived at when analysing the range of risks described above.

Investment managers may use a combination of both methods, initially restricting the granular approach to those portfolios most at risk but applying the methodology more widely over time. As the cost to undertake climate resilience and Net Zero Carbon improvement works becomes more widely understood, the ability to apply this methodology more widely will increase.