

APPROACH TO CLIMATE RESILIENCE

Glossary, bibliography and acknowledgements

The creation of Savills IM's Approach to Climate Resilience required significant internal and external collaboration. Here we provide the research sources used to shape the document's content, definitions of all terms used within Approach to Climate Resilience, and a thank you to all our contributors.

> Click here for our full Approach to Climate Resilience



Glossary

Term	Definition / Explanation
Acute physical climate risk	Exposure to physical hazard events increasing with climate change such as storms (including hurricanes), wildfires, droughts, heatwaves, precipitation extremes and floods.
AUM	Assets under management
Albedo	Albedo is a measure of how much solar radiation is reflected by a surface. It is expressed as a decimal fraction or a percentage, with 1 (or 100%) representing total reflectivity and representing total absorption.
Better Buildings Partnership (BBP)	A collaboration of the UK's leading commercial property owners who are working together to improve the sustainability of existing commercial building stock.
Blue infrastructure	Within an urban context, blue infrastructure encompasses the integrated network and systems of water bodies and water management solutions designed to enhance environmental, social, and economic aspects of urban life. It involves the strategic use of both natural and engineered water-based elements to create sustainable and resilient urban environments.
Built environment	The environment encompassing all forms of building (housing, industrial, commercial, hospitals, schools, etc.), and civil engineering infrastructure, both above and below ground and includes the managed landscapes between and around buildings.
Built form	Describes the attributes of the urban landscape, i.e., its geometry (the structure of the surface such as levels of vertical or horizontal density); the characteristics of its surface (i.e., vegetated, and impervious cover), and the characteristics of its materials (i.e., manufactured, and natural). At building level, it describes the height, volume, and overall shape of a building as well as its surface characteristics including the spaces in-between buildings. It is the form of the surfaces and their proximity to each other that results in modifications to the background climate. ¹
Carbon intensity	The amount of emissions of carbon dioxide (CO2) released per unit of another variable such as floor space of a building.
Chronic physical climate risk	Exposure to physical hazards which are a result of gradual, long-term climate change trends such as rising sea levels, rising average temperatures and changing precipitation patterns.
CMIP5 and CMIP6	CMIP5 (Coupled Model Intercomparison Project Phase 5) and CMIP6 (Coupled Model Intercomparison Project Phase 6) are two phases of a coordinated international effort to understand global climate change and its impacts. CMIP5 was conducted between 2008 and 2014, and CMIP6 began in 2016 and is still underway. Both involve climate modelling groups from around the world running their models under a common set of experiments. These experiments are designed to explore different aspects of the climate system, such as its response to different greenhouse gas concentrations, changes in land use, and natural variability. The datasets are used by scientists around the world to study climate change and have been used to produce the respective IPCC reports which are the most authoritative assessments of climate change science.

	Term	Definition / Explanation			
	Carbon Risk Real Estate Monitor (CRREM)	Provides the real estate industry with with the Paris Climate Goals of limiting			
	Commercial Real Estate Finance Council (CREFC)	The trade association for the commerce transparent, liquid, and sustainable rea industry and ultimately the economy a			
	ECB	European Central Bank			
	Ecological footprint	A measure that quantifies the demand communities, or nations. It represents required to produce the resources a p given prevailing technology and resou helps in understanding and managing emphasising the importance of sustain			
-	Energy islands	Typically refers to a self-contained and stores, and manages its own energy n advanced energy-efficient technologie and resilience, with the goal of reducir minimizing its environmental impact.			
	ESG	Environmental, Social, and Governance			
	Evapotranspiration ²	Evapotranspiration is the sum of all pro- atmosphere via evaporation and trans- the soil surface, evaporation from the water bodies on land. Evapotranspiration from the soil to the atmosphere via plat the soil and release water vapor into the			
	Exposure	The fact of experiencing something or place. In the built environment, exposu situation or place and therefore subject			
	EU Taxonomy	A five-step approach which determine or socially sustainable for the purpose Sustainable Investment. Only when all be considered as substantially contrib Taxonomy. The Taxonomy for social o			

transparent, science-based decarbonisation pathways aligned g global temperature rise to 2°C, with ambition towards 1.5°C.

rcial real estate finance industry. Their mission is to promote eal estate debt markets for the benefit of its members, the wider and society as a whole.

d placed on Earth's natural resources by individuals, the amount of biologically productive land and water area population consumes and to assimilate the wastes it generates, arce management practices. It is a comprehensive metric that the impact of human activities on the natural environment, nability in resource consumption and waste management.

nd energy-efficient building or development that generates, needs independently, often using renewable energy sources and ies. The concept of an energy island is rooted in sustainability ing a property's reliance on external energy sources and

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rocesses by which water moves from the land surface to the spiration. Where water evaporates into the atmosphere from capillary fringe of the groundwater table, and evaporation from tion also includes transpiration, which is the water movement ants. Transpiration occurs when plants take up liquid water from the air from their leaves.

r being affected by it because of being in a particular situation or ure is defined as the fact of the built asset being in a particular ct to a potential loss.

es whether an economic activity qualifies as environmentally es of establishing the degree to which an investment is a I the defined requirements are successfully met can the asset buting to one of the environmental objectives as set by the EU objectives has not yet been released.

Glossary cont.

Term	Definition / Explanation		Term	Definition / Explanation
Function	Describes building and urban land use i.e., activities (and their timings), such as residential, commercial, or service delivery (i.e., healthcare, education and leisure).		KPIs	Key Performance Indicate organisation or individual
Greenhouse gas (GHG)	A gas that absorbs and emits radiant energy within the thermal infrared range, causing the greenhouse effect.		Microclimate	A smaller area that differ vegetation can modify m temperature variations ar
Global Scientific & Investor Committee (GSIC)	The Global Scientific & Investor Committee (GSIC), formerly called European Investor Committee (EIC) operates as an advisory board to the CRREM project partners, comprising senior executives and key decision makers from across the European real estate industry.		Nature Based Solutions	Nature-based solutions (modified ecosystems tha providing human well-be
Green infrastructure	A strategically planned and managed network of natural and semi-natural areas, including features like parks, green roofs, rain gardens, and permeable surfaces, designed to deliver a wide range of environmental, social, and economic benefits in both urban and rural settings. It encompasses an array of elements that work together to maintain natural ecosystem processes and provide ecological		Natural hazards	Natural phenomenon cau causing damage to stand
	The Global Real Estate Sustainability Benchmark provides a means of measuring a fund's environmental performance and benchmarks this against the environmental and social performance of over 1,000 real estate entities, responsible for managing a GAV of \$4.5 trillion. Savills IM is a member and participant of GRESB for 22 funds and mandates.		Net energy relationship	'Net energy' considers th
				 Energy in its natural ex Building opergy peeds
GRESB				3) Anthropogenic output
Hazards	Collectively refers to acute, chronic, and natural hazards.		Net Zero Carbon (NZC)	Achieving a balance betw it. This balance, or net ze more than the amount re
Heatwave	A prolonged period of excessively hot weather, which may also be accompanied by high humidity, especially in maritime climates. These extreme weather events are characterized by temperatures that are substantially hotter and typically last longer than the average temperature for a specific place and time of year. The specific definition of a heatwave can vary by region due to different climatic conditions.		Net Zero Asset Managers Initiative (NZAMI)	The Net Zero Asset Mana supporting the goal of ne to limit warming to 1.5 de
IC	Savills IM's Investment Committee.			2050 or sooner.
Impact	The consequences of realised risks on natural and human systems, where risks result from the interactions of climate-related hazards (including extreme weather/climate events), exposure, and vulnerability. Impacts generally refer to effects on lives, livelihoods, health and well-being, ecosystems and species, economic, social and cultural assets, services (including ecosystem services), and infrastructure.		Occupier engagement	The act of the owner (lan relationship with the occ Occupier engagement wi property newsletters, gre
INREV	INREV is the European Association for Investors in Non-Listed Real Estate Vehicles. The platform for sharing knowledge on the non-listed real estate industry to improve transparency, professionalism and best practices across the sector, making the asset class more accessible and attractive to investors.		Permeable surface	Refers to ground cover o than running off into stor contribute towards storn quality and enhancing ur
Intergovernmental Panel on Climate Change (IPCC)	An intergovernmental body of the United Nations responsible for advancing knowledge on human- induced climate change.		Physical climate risk	Includes physical climate natural hazards, which m

ndicators. A type of performance measurement that evaluate the success of an ividual or a particular activity in which they engage.

differs from the surrounding area. Factors such as building materials and dify microscale urban climate effects further. These microclimates can result in ions and wind patterns from one side of the street to the next.

tions (NBS) are actions to protect, sustainably manage, and restore natural or ns that address societal challenges effectively and adaptively, simultaneously ell-being, ecosystem services and resilience and biodiversity benefits.

on caused by nature such as earthquakes, tornadoes, tsunami, hail, lightning standing assets owned within the portfolio.

ers the interdependent energy relationships between;

ural expression (temperature, wind and sunshine);

needs (heating, cooling and ventilation); and

utputs (manmade heat and pollution).

e between the carbon emitted into the atmosphere, and the carbon removed from net zero, will happen when the amount of carbon we add to the atmosphere is no unt removed. For real estate it is especially important that buildings are built and *rery* low carbon emissions before any offsetting takes place.

t Managers initiative is an international group of asset managers committed to I of net zero greenhouse gas emissions by 2050 or sooner, in line with global efforts 1.5 degrees Celsius; and to supporting investing aligned with net zero emissions by

er (landlord) or their third-party representatives forming an active and collaborative the occupiers (tenants) in respect of both direct and indirectly managed properties. ent will include, but is not limited to property manager led occupier forums, rs, green lease negotiations, educational or charitable on-site events, etc.

over or pavement that allows water to pass through to the ground below, rather to storm drains. These surfaces are integral to sustainable urban design and stormwater management, reducing urban heat island effect, improved water ing urban greenery.

limate risks, both acute and chronic which are linked to climate change; as well as nich may not be directly linked to climate change due to lack of available data.

Glossary cont.

Term	Definition / Explanation		Term	Definition / Explanation
Probability	The level of possibility of something happening. In the built environment, probability is defined as the likelihood over a given time period that adverse effects to the built asset will arise.		Task Force on Climate- Related Financial Disclosures (TCFD)	An organisation that was established i climate-related financial risk disclosur
Radiative forcing	Radiative forcing is what happens when the amount of energy that enters the Earth's atmosphere is different from the amount of energy that leaves it. For example, energy travels in the form of radiation: solar radiation entering the atmosphere from the sun, and infrared radiation exiting as heat. If more radiation is entering Earth than leaving—as is happening today—then the atmosphere will warm up. This is called radiative forcing because the difference in energy can force changes in the Earth's climate.	-	Transition risk	The risks associated with the transitio risks include regulatory and legal risk investment exists and operates, such corporate reputation risk.
Representative	Four greenhouse gas concentration (not emissions) trajectories.		ULI C Change Initiative	C Change is a ULI-led programme to r
Concentration Pathways (RCPs)			UN PRI	United Nation Principles for Responsit network of investors working togethe
Risk	The potential for adverse consequences, determined probabilistically as a function of hazard, exposure, vulnerability and capacity. In the built environment, risk is defined as the potential loss including destroyed or damaged assets within a defined zone of influence which could occur in a specific period of time, which can be determined as a function of consequence and probability.	-	UN Sustainable	A UN framework to help countries adv support the SDGs, but they must adap There is no standardisation and wide fund SDG reporting.
EU Sustainable Finance Disclosure Regulation (SFDR)	Imposes mandatory ESG disclosure obligations for asset managers and other financial market participants with substantive provisions of the regulation.	-	Urban biodiversity	Refers to the variety and abundance of microorganisms, found in urban enviro diversity within those species, and the
Shared Socioeconomic Pathway (SSP) scenario	Shared Socioeconomic Pathways (SSPs) are scenarios used in climate research to explore plausible future socioeconomic developments and their potential impacts on climate change. They represent different narratives about how societies, economies, and policies might evolve, helping researchers assess the effects	-		biodiversity is a crucial component of such as ecosystem services, habitat for educational and cultural value, and ae
	of various pathways on greenhouse gas emissions, adaptation, and mitigation strategies. Sky view factor (SVF) is a dimensionless number that represents the fraction of the sky hemisphere that is visible from a given point on the ground. It is calculated by dividing the area of the visible sky hemisphere by the total area of the sky hemisphere. SVF is typically expressed as a percentage, with an SVF of 0% indicating that the sky is completely obscured and an SVF of 100% indicating that the sky is completely unobstructed. Architects can use SVF to design buildings that are more energy efficient. For example, they can design buildings with large windows that face south to maximise solar gain in the winter and minimise solar gain in the summer.		Urban Heat Island (UHI) effect	A UHI is localised area within a city or temperatures compared to its surroun activities, the concentration of building environments.
Sky View Factor (SVF)			Urban street canyon	An urban canyon is a narrow street wi wind, creating a unique microclimate. have a significant impact on air quality
Street canyon	A street canyon is a narrow street with tall buildings on both sides.		Vulnerability	The conditions determined by physica which increase the susceptibility of an hazards. In the built environment, vuln adverse impacts of the climatic event
Sustainable Urban Drainage	Encompass a range of techniques and practices designed to manage surface water runoff in urban			
Systems (SUDS)	areas in a sustainable way. Some of these techniques don't inherently involve green or vegetated elements. Examples include: permeable pavements, underground storage tanks, rainwater harvesting systems, soakaways and infiltration trenches, etc.	-	WTW	Willis Towers Watson, a British-Americ
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in December 2015 with the goal of developing a set of voluntary res which is now widely adopted.

on to a low carbon economy. The components of transition and broader commercial environment within which the asset/ as technology risk, market risk (under transactional risk) and

mobilise the European real estate industry to decarbonise.

ble Investment. A United Nations-supported international r to implement six aspirational principles.

vance sustainability across 17 E, S and G factors. Companies may pt the nation-state level Goals to be relevant to their businesses. divergence in the methodologies and the quality of corporate/

of living organisms, including plants, animals, and conments. It encompasses the diversity of species, the genetic diversity of ecosystems that occur in urban areas. Urban f sustainable city development and offers several key benefits for wildlife, human well-being, resilience and adaptation, esthetic value.

r metropolitan area that experiences significantly higher nding rural areas. The UHI effect is primarily driven by human ngs, infrastructure, and the modification of land surfaces in urban

with tall buildings on both sides. The buildings block sunlight and . Street canyons can be found in all major cities, and they can try, temperature, and noise levels.

al, social, economic, and environmental factors or processes n individual, a community, assets or systems to the impacts of nerability is defined as the susceptibility of the built asset to the t (hazard).

can multinational company providing insurance services.

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