

METRICS AND INDICATORS FOR CLIMATE-RELATED RISK ASSOCIATED TO OVERHEATING

OVERHEATING METRICS & INDICATORS

Proposed metric or indicator	Apparent temperature or heat index	Outdoor thermal comfort index	Universal thermal climate index (UTCI)	Cooling degree days	CIBSE's TM52 & TM59 thermal comfort limits (i.e., % of hours over temp. limit)	Cooling capability	No. of assets complying with Building Regulations Part O	No. of assets complying with the performance overheating assessment approach	Albedo and/or reflectance of roof (coefficient 0 to 1)	Proportion of green vs. grey roof	Tree canopy cover	Urban Greening Factor (UGF)
Unit of measurement	Air temperature & relative humidity	UTCI categories	UTCI categories	Number of days	Number of assets complying with limits	N/A	Number of assets	Number of assets	Number of assets with high albedo	% of roof	% of tree cover	Ratio between 0 to 1
Is this a metric or an indicator?	Metric	Metric	Metric	Metric	Metric	Indicator	Metric & Indicator	Metric	Metric	Metric	Metric	Metric
Is this monitoring the hazard, or measuring exposure, resilience or vulnerability to it?	Monitoring hazard	Monitoring hazard	Monitoring hazard	Monitoring hazard	Vulnerability to risk	Vulnerability to risk	Resilience to risk	Resilience to risk	Resilience to risk	Resilience to risk	Resilience to risk	Resilience to risk

Planning and Design (P&D)

Construction (Con)

Operation (Op)

Retrofit (Retr)

Building Life Cycle stage applicability*



* Coloured boxes mean that the metric/indicator can be used to monitor the hazard, or measure the exposure, vulnerability or resilience at that building life stage.

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METRICS AND INDICATORS FOR CLIMATE-RELATED RISK ASSOCIATED TO FLOODING

FLOODING METRICS AND INDICATORS

Proposed metric or indicator	Increase in average sea level	Water accumulated over time (rainfall)	No. and location of assets with a historical flood event	Number of assets with Property Flood Resilience measures in place	Proximity to water sources	Elevation of asset	Flood Zone asset is located within	Flood depth	Number of flood Performance Certificates	Long term monitoring of flood risk	Housing damage	Value of insurance claims due to flood events	No. of sustainable urban drainage systems (SuDS) in urban areas	No. of flood defences	The average insurance claim for floods	Number and location of properties at flood risk	% of sponginess (for an area or city)
Unit of measurement	cm	mm	Number of assets	Number of assets	m or km	m	Flood Zone	m	emerging - no. of certificates	N/A	No. of houses, or value of damage in £	£ value	No. SUD installations	No. of defences	£ value	Number of assets	%
Is this a metric or an indicator?	Metric & Indicator	Metric	Metric & Indicator	Metric & Indicator	Metric	Metric	Indicator	Metric	Metric	Metric & Indicator	Metric & Indicator	Metric & Indicator	Metric & Indicator	Metric & Indicator	Metric & Indicator	Metric & Indicator	Metric
Is this monitoring the hazard, or measuring exposure, resilience or vulnerability to it?	Monitoring	Monitoring	Exposure	Resilience	Exposure	Exposure	Exposure	Monitoring	Resilience	Monitoring	Vulnerability	Vulnerability	Resilience	Resilience	Vulnerability	Exposure	Resilience

Building Life Cycle stage applicability*	Planning and Design (P&D)	Construction (Con)	Operation (Op)	Retrofit (Retr)
Planning and Design (P&D)	Coloured	Coloured	Coloured	Coloured
Construction (Con)	Coloured	Coloured	Coloured	Coloured
Operation (Op)	Coloured	Coloured	Coloured	Coloured
Retrofit (Retr)	Coloured	Coloured	Coloured	Coloured

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METRICS AND INDICATORS FOR CLIMATE-RELATED RISK ASSOCIATED TO DROUGHT

DROUGHT METRICS AND INDICATORS												
Proposed metric or indicator	Uptake of water efficiency measures in new and existing buildings	Water storage capacity (soil moisture content)	Water leakage rates from public water supply system	Water usage limits for new build and retrofit properties	Household and non-household water demand	Change in reservoir capacity	% of sponginess (for an area or city)	No. of sites reporting subsidence (for an area or city)	Change in soil moisture content	Frequency of asset repairs (to indicate ground movement)	No. of insurance claims due to subsidence	Value of insurance claims due to subsidence
Unit of measurement	Number of assets	Soil moisture %	M/day	Litres per person per day (Lpppd)	Litres per person per day (Lpppd)	MI	%	No. of sites with detailed studies	Soil moisture %	N/A	Number of claims	£
Is this a metric or an indicator?	Metric	Metric	Metric	Metric	Metric	Metric	Indicator	Metric	Metric	Metric & Indicator	Metric	Metric
Is this monitoring the hazard, or measuring exposure, resilience or vulnerability to it?	Resilience	Monitoring	Resilience	Resilience	Resilience	Monitoring	Resilience	Exposure	Exposure	Exposure	Vulnerability	Vulnerability
Building Life Cycle stage applicability*	Planning and Design (P&D)											
	Construction (Con)											
	Operation (Op)											
	Retrofit (Retr)											



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METRICS AND INDICATORS FOR CLIMATE-RELATED RISK ASSOCIATED TO WILDFIRE

WILDFIRE METRICS & INDICATORS												
Proposed metric or indicator	Quantification of damage (m2 covered by fire; m2 of burned property)	Amount of surrounding vegetation	Wildfire / Fire weather stress index (zones)	No. of external cladding exposure risk assessments for assets	Long term tracking of fire event locations, duration and impact	Frequency and location of necessary natural wildfires	Water availability	UK Fire Danger Rating System	Fuel moisture survey	Number of assets with access to security	Number of assets with access to emergency routes	Quantity of housing damage
Unit of measurement	m2	m3	Number of assets in the zone	Number of assessments	N/A	N/A	N/A	N/A	Number of surveys	Number of assets	Number of assets	Number of houses, or value of damage in £
Is this a metric or an indicator?	Metric	Metric	Indicator	Metric	Indicator	Indicator	Indicator	Indicator	Metric	Metric & Indicator	Metric	Metric
Is this monitoring the hazard, or measuring exposure, resilience or vulnerability to it?	Vulnerability	Exposure	Exposure	Exposure	Monitoring	Monitoring	Monitoring	Monitoring	Exposure	Vulnerability	Vulnerability	Vulnerability
Building Life Cycle stage applicability*	Planning and Design (P&D)											
	Construction (Con)											
	Operation (Op)											
	Retrofit (Retr)											



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METRICS AND INDICATORS FOR CLIMATE-RELATED RISK ASSOCIATED TO STORMS

STORM METRICS & INDICATORS														
Proposed metric or indicator	Pedestrian Wind Comfort limits	Met Office limits	Maximum wind gust speed	Wind load capacity assessment of an asset	No. of assets undertaken roof and façade survey for loose elements	Location of asset in historic wind maps (Eurocodes EN1991-1-4)	Location(s) of nearby hazards (such as trees)	A financial quantification of wind-related impacts	No. of days of disruption, closure or 'unsafe access' (for a building, space, piece of infrastructure)	No. of workdays lost (for an organisation)	% increase / decrease of insurance claim rates related to wind damage	Severity of wind-related damage	Reduction in electricity generation due to high winds or storm events	Reduction in public services (transport, healthcare, schools open etc.)
Unit of measurement	Gust equivalent mean (GEM) in m/s	Knots	Knots	N/A	Number of assets	N/A	N/A	£ value of damage	Number of days	Number of days	Number of claims	N/A	% (of MWh)	N/A
Is this a metric or an indicator?	Metric & Indicator	Metric & Indicator	Metric & Indicator	Metric & Indicator	Metric	Indicator	Indicator	Metric	Metric	Metric	Metric	Indicator	Indicator	Indicator
Is this monitoring the hazard, or measuring exposure, resilience or vulnerability to it?	Resilience & Vulnerability	Monitoring	Monitoring	Resilience & Vulnerability	Vulnerability	Exposure	Exposure	Vulnerability	Vulnerability	Vulnerability	Vulnerability	Vulnerability	Vulnerability	Vulnerability
Planning and Design (P&D)					For planning. From surrounding buildings				For planning. From surrounding buildings		For planning. From surrounding buildings	For planning. From surrounding buildings		Would inform planning
Construction (Con)														
Operation (Op)														
Retrofit (Retr)														

Life Building Cycle Stages applicability*

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