CLIMATEVALUATION

» Comprehensive Report

A comprehensive analysis of the modelled impacts of climate change on the future value and insurability of residential property.

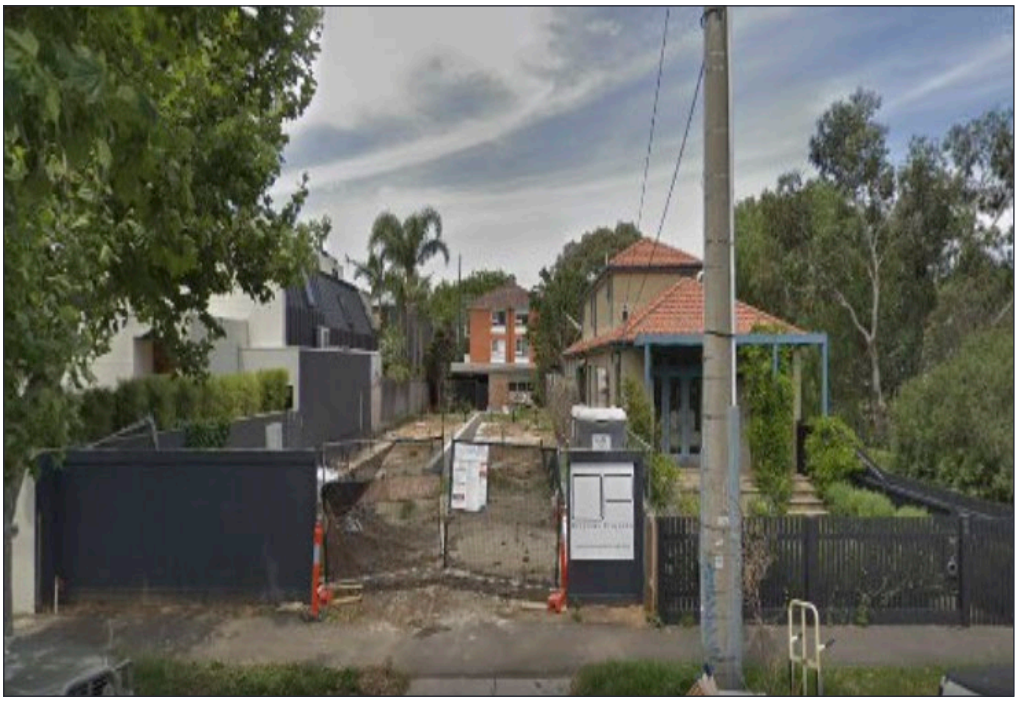
Powered by Climate Risk Engines

» Report overview

Prepared for: test@gmail.com

Street address: 42 Wallaby Way, Sydney, NSW 1234

Report date: 26/02/2020



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» Important information

Scope of This Report

The results set out in this report relate to the address: 42 Wallaby Way, Sydney, NSW 1234 and have been provided to test@gmail.com strictly for their general information and personal use, subject to the agreed Terms & Conditions.

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To the extent permitted by law we and our data and analytic suppliers will not be liable for any loss or damage, whether in contract, tort (including negligence), breach of statutory duty or otherwise, even if foreseeable, arising under or in connection with use of or reliance on any information, data or content obtained via our services, including (without limitation) the modelling outputs presented in this report.

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- **Not to be taken as financial advice**
  The information presented in this report does not comprise, constitute or provide, nor should it be relied upon as investment or financial advice, credit ratings, an advertisement, an invitation, a confirmation, an offer or a solicitation, or recommendation to buy or sell any security or other financial, insurance, credit or lending product or to engage in any investment activity, or an offer of any financial service. This information does not purport to quantify risk to the subject land, infrastructure, buildings or other physical assets or any part thereof, nor make any representation in regards to the saleability, mortagability, insurability, or defects, of any subject property, nor its suitability for purchase, holding or sale. The modelling outputs presented in this report are provided with the understanding and expectation that each user will, with due care, conduct their own investigation and evaluation of any real or planned asset at a specific location under the advice of relevant accredited authorities.

» Important information continued...

Limitations

The information presented in this report has been generated using an expert selection of the scientific methods and computational modelling techniques available at the time of creation.

However, at any time, these calculations are subject to physical, political, regulatory, technological, stakeholder related variables and uncertainties that could cause results to differ materially. There are a number of limitations effecting this analysis of which users should make themselves aware. These are constantly refined and updated and more information on such variables is available on the Climate Valuation website.

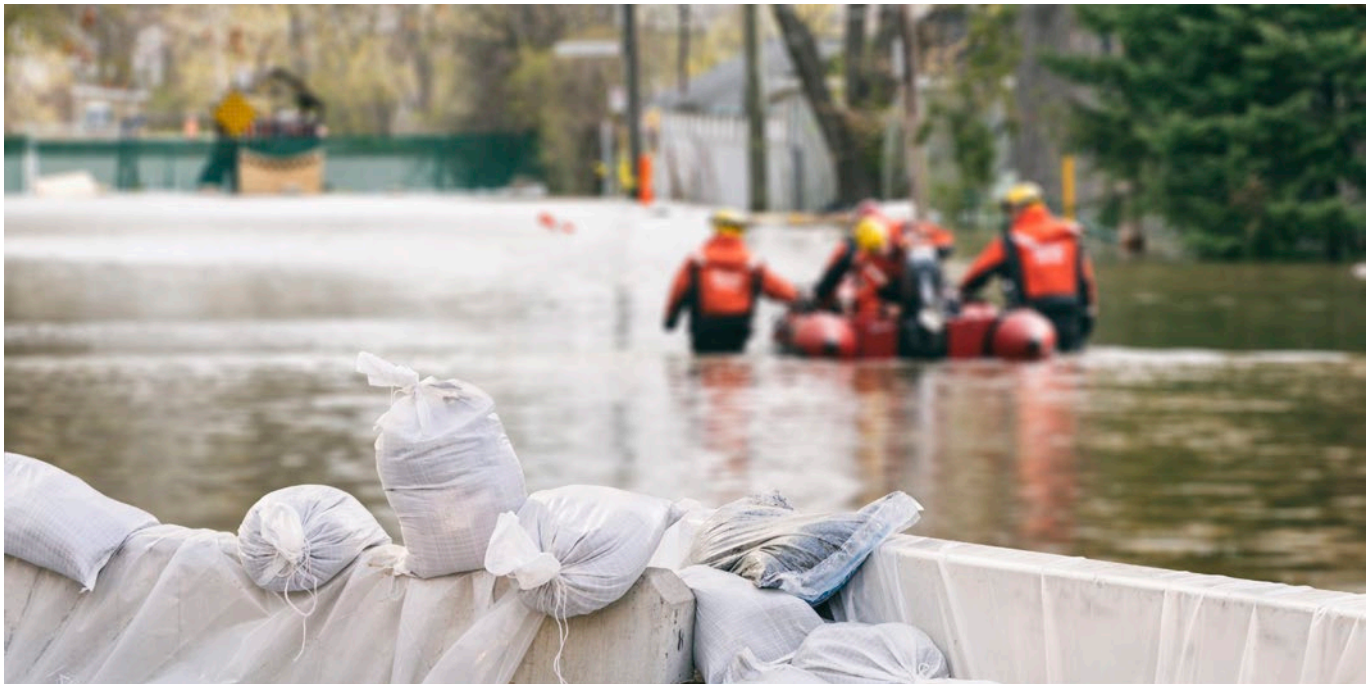
- **Representative Assets (Property)**
  The asset analysed in this report is a synthetic representation of a real or hypothetical asset placed at the nominated address which may include real estate properties, infrastructure or other physical objects. The analysis does not necessarily take into account the impact of any actual buildings, built infrastructure, modifications, adaptations or resilience building measures (public or private) that have been, or may be, applied that reduce (or exacerbate) the relevant risks.

- **Climate Hazards Covered**
  The analysis covers riverine flooding, coastal inundation, forest fires, extreme wind, soil subsidence, and extreme heat. The included hazards may increase or decrease over time, and/or for different locations at the sole discretion of Climate Valuation. The analysis does not cover any other hazards, such as surfacewater flooding (pluvial), coastal erosion, grass fires, land slip, cyclones/hurricanes/typhoons, hail or heat impacts.

- **Climate Change Scenarios**
  The impacts of climate change analysed are based on greenhouse gas emission and global warming scenarios presented in the Intergovernmental Panel on Climate Change Assessment Reports (IPCC 2007; 2014). These models are only one possible view of the future and representation of climate change.

  No explicit or implicit assumption is made in relation to the current or future alignment of any climate change-related scenarios with climate related policies of any government at international, national or sub-national level.

» Introduction



We believe that when people can quantify the dangers and costs of climate change, they are empowered to make informed decisions, to adapt and to plan for a more resilient future.

About Climate Valuation

Climate change has shifted the risk landscape for communities around the world. The past few years have borne witness to a sharp increase in catastrophic climate events - from raging wildfires to extreme flooding (IPCC 2014)

For the general public, the first step to responding to the challenges of climate change is understanding the specific risks that their physical assets face and investing in adaption measures to reduce or mitigate this risk

Climate Valuation was established in 2016 to help homeowners and homebuyers quantify and manage the physical and financial risks of climate change to residential property. Our analysis harnesses the world's most powerful Climate Risk Engine software, leveraging the most advanced extreme weather and climate projections available to deliver location and asset specific insights to users around the world.

» Introduction continued...

About This Report

Climate Valuation's suite of risk analysis reports provide in-depth insights into the potential impacts of several climate change related events on the future value and insurability of residential property. The analysis contained in this report utilises a combination of public and commercial data to provide insights into the risks to, and resilience of, the Representative Property selected, at the specified location, for the following extreme weather and climate change hazards:

Riverine Flooding

Coastal Inundation

Forest Fire

Soil Subsidence

Extreme Wind

Using an expert selection of scientific methods and computational modelling techniques (see methodology section of this report for more details), the Representative Property's climate risk profile is calculated based on:

Hazard Exposure

The extent and severity of each extreme weather and climate change related hazard at the specific location.

Asset Vulnerability

The vulnerability of the Representative Property's overall design and individual component elements to each climate hazard.

» Introduction continued...

Key Risk Indicators

The results of the climate risk analysis are represented in terms of three key metrics:

1 **Technical Insurance Premium (TIP)**

Equivalent to the Annual Average Cost of Damage to the Representative Property caused by extreme weather and climate change events.

2 **Climate Adjusted Value**

The percentage reduction in value for the Representative Property, relative an equivalent property unaffected by climate change.

3 **Percentage of Value at Risk (VAR%)**

The Technical Insurance Premium as a percentage of the Representative Property's replacement cost.

Climate Valuation Rating

Results are also summarised in an overall Climate Valuation Rating for the Representative Property. This rating may be used as an indication of the future insurability and value degradation of the Representative Property over three key points in time; the current year, at the end of a standard mortgage term (30 years) and by the end of the nominal property lifetime (year 2100).

Low Risk Rating
May be insurable at reasonable cost

Moderate Risk Rating
May lead to higher Insurance costs

High Risk Rating
Insurance may be high cost or unavailable unless adaptation actions are undertaken

The Climate Valuation Ratings follow the Federal Emergency Management Agency (FEMA) designations that are used for pricing many insurance premiums in the USA. Climate Valuation has used FEMA's probability method and extended it to include a wider set of hazards and adjusted to account for differences in vulnerability. Actual risk of damage will depend on building design and construction. Cost of insurance for any real property should be obtained from a licensed commercial insurance provider.

Glossary of Terms

Term	Definition
Archetype	A standardised type of building based on nominal industry design specifications and construction materials used in major elements such as electrical, civil, mechanical and engineering components. Archetypes assume things such as wind speed thresholds, floor height above ground and build year.
Climate Adjusted Value (CAV%)	The percentage reduction in value for the Representative Property, relative an equivalent property unaffected by climate change.
Coastal Inundation	A high sea event that floods land, infrastructure and buildings.
Damage Threshold	The point at which an element is affected by a hazard such that it is broken or excessively weakened.
Exposure	The extent to which a Representative Property is in a location that could be adversely affected by a climate hazard.
Extreme Wind	High-wind conditions that may exceed a building's design specifications.
Failure Threshold	The point at which an element of the Representative Property prevents it from performing is function.
Forest Fire	A destructive fire that spreads via trees and forest. This definition does not include grass fires.
Hazard	An extreme weather or climate change related event or process that has the potential to cause damage, disrupt or threaten the safety of people, livelihoods, infrastructure or ecosystems.
Maximum Value at Risk to Date (MVAR%)	The maximum VAR% seen in the results up to and including the year in question. This parameter avoids temporary dips or downward trends in climate data causing underestimated risk.
Percentage of Value at Risk (VAR%)	Technical Insurance Premium as a percentage of the Representative Property's replacement cost
Representative Property	A synthetic representation of a real or hypothetical property based on nominal industry design specifications for different archetypes and specific customisation by the user.
Riverine Flooding	Precipitation in a catchment that causes a river to exceed its capacity, inundating nearby areas.
Soil Subsidence	Soil movement as a result of drought, causing contraction of clay soils, that can lead to the foundations of a property shifting.
Technical Insurance Premium (TIP)	Equivalent to the estimated Annual Average Cost of Damage to the Representative Property caused by the included climate hazards.

» Methodology

Climate Valuation's risk analysis is powered by purpose-built software developed by Climate Risk Pty Ltd. These "Climate Risk Engines" integrate the user's inputs with information from national and international climate data sets to provide quantitative analysis of how climate change related hazards may affect the current and future risk to the Representative Property selected. A detailed explanation of the methodology for such analysis is outlined below:

Process Overview

» Methodology continued...

1 Define Representative Property

Initially the Climate Valuation system creates a synthetic representation of a property that is based on nominal industry design specifications and customisation by the user. The Representative Property could be configured to represent a real property at the same location, or an entirely hypothetical property being placed in that location.

The Representative Property may contain assumptions about things such building type, value, construction materials, wind speed thresholds, floor height above ground and build year. The user may also have chosen to customise some of the Representative Property's design and material features using the settings tab on climatevaluation.com. These are displayed in the 'Analysis Settings' section of this report. These settings are important as they affect how the model calculates the associated risk to the Representative Property analysed.

2 Calculate Property Vulnerability

Using the design specifications and construction materials stipulated in the analysis settings, the Climate Risk Engine computes the threshold at which each of the Representative Property's various elements would be damaged or disrupted if exposed to each climate hazard. The system tests both failure thresholds and damage thresholds to calculate the damage cost and failure probabilities of the Representative Property across each extreme weather scenario:

- **A Damage Threshold** is breached when an element is affected by a hazard such that it is broken or excessively weakened. Examples might be flood waters damaging an electrical control system, or a wind-storm blowing the roof tiles off a house.
- **A Failure Threshold** is breached when an element of the Representative Property prevents it from performing is function. For example, when the roof is blown off in a storm it is both damaged and it fails to protect its occupants from the weather. It is possible to have failure without damage, for example an electrical control system that exceeds its operating temperature in a heat wave may stop working, but there will be no lasting damage (when the temperature drops it will start working again).

The mechanisms by which Representative Property's component elements are caused to fail by a hazard are further explored in Vulnerability Diagnostics section of the Climate Valuation Comprehensive Report.

» Methodology continued...

3 Gather Location Information

Contextual information about each location is gathered from internal geospatial databases by the Climate Risk Engines to underpin Climate Valuation's analysis. This may include information about the soils, tree cover, ground vegetation, topology, elevation above sea level, flood plains, local tides or waves, as well as current and historical weather patterns for the local area.

The Climate Risk Engines have access to data from 100,000 weather stations around the world. Internal algorithms are used to select which station's data is applicable to the analysis, based on proximity, data quality, duration and completeness. In some cases, the Climate Risk Engines may use a combination of data from more than one station or gridded data sets made by national meteorological centres. A comprehensive list of national and international data sources used for this analysis are set out in the Data & Methodology section of the website.

4 Compute Hazard Probabiliites

The future probably of failure and damage to a Representative Property will also depend on the future severity and frequency of each hazard adjusted for climate change. Exposure is adjusted to account for changes in parameters such as heat, precipitation, wind and humidity based on the range of greenhouse gas emission and global warming scenarios presented in the Intergovernmental Panel on Climate Change Assessment Reports (IPCC 2007; 2014)

Using available climate modelling for each relevant climate event, a range of scenarios representing different probabilities and impacts are computed. Specific emissions scenarios and climate models used for such calculations are listed in the "Climate Settings" section of each report.

5 Calculate Risk Profile and Generate Report

Once the relevant exposure and vulnerability of the Representative Property is established under current and future climate scenarios, the respective damage costs associated with this risk are computed for each future year. The results of this quantitative analysis may indicate the possible impact of climate risk on the value and insurability of the Representative Property over three relevant time periods - The current year, at the end of a standard mortgage term (30 years) and by the end of the nominal property lifetime (2100).

A) Technical Insurance Premium (TIP)

The Technical Insurance Premium (TIP) is calculated by applying the annual probability of damage to each element of the Representative Property from each hazard, and summing the value of replacing the damaged components. It is effectively the forward looking annualised average cost of damage that would be caused by climate change and extreme weather.

There are many other variables that may impact on actual insurance premiums, which are excluded from this analysis (including, for example, relocation or transaction costs, and the impact of measures that may reduce or exacerbate the impacts of a climate hazard on the Representative Property).

B) Percentage of Value at Risk (VAR%) and Maximum Value at Risk (MVAR%)

VAR% = TIP / replacement cost of the Representative Property

Because the replacement value of a Representative Property can vary, the results of the Technical Insurance Premium calculations can be expressed as a percentage rather than a dollar figure. This is effectively the Technical Insurance Premium, expressed as a percentage of the Representative Property's replacement cost. This allows the scale of risk to be compared across properties of different value. The higher the VAR%, the greater the fraction of value at risk.

The VAR% line shows the change in climate risk based on current climate projections for the relevant location over time. In some instances, climate model outputs are aggregated into 20-year blocks, in which case curve-fitting is used to interpolate and extrapolate the annual behaviour. In some cases, this can cause downward fluctuations to appear in annual VAR% calculations (for example in an area where changes in climate lead to less precipitation and a reduced risk of flood).

Maximum VAR% (MVAR%) shows the highest VAR% result that may be reached up to the given year. Maximum VAR% is an important reference for stress testing a Representative Property, because it represents the highest computed risk the Representative Property may be exposed to, regardless of whether climate indicators decrease after the Max VAR% point. For this reason, the Max VAR% is the most appropriate to use for adaptation planning & risk assessment.

» Methodology continued...

C) Climate Adjusted Value (CAV)

Climate Adjusted Value assumes that funding is finite and fixed, and that money spent on insurance or self-insurance against climate related hazards must redirect financial resources away from servicing the mortgage. Using the interest rate provided by the user (or a default interest rate), this diversion of funds is calculated as an equivalent reduction in the principal value of the loan that may be borrowed.

As the value of a property may fluctuate with the market, the reduction in the lending capacity is expressed as a percentage reduction in equivalent value, rather than a monetary figure. The Climate Adjusted Value is therefore the percentage reduction in value for the Representative Property, relative an equivalent property unaffected by extreme weather & climate change. It is expressed as a percentage reduction in equivalent value as this overcomes the effects of inflation and fluctuations in the property market.

D) Climate Valuation Rating

Climate Valuation also provides an overall rating associated with the Representative Property over three relevant time periods - the current year, at the end of a standard mortgage term (30 years) and by the end of the nominal property lifetime (2100).

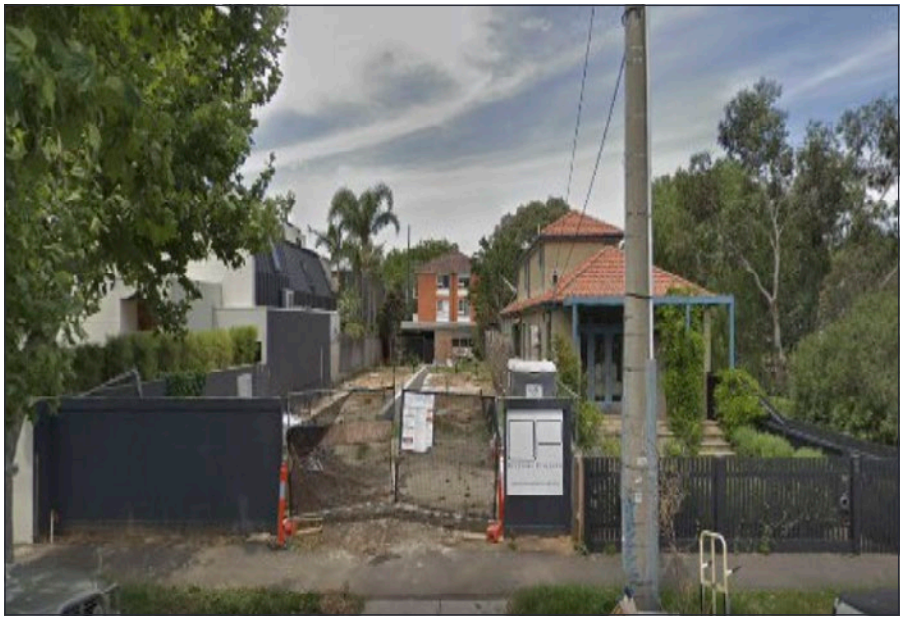
The Climate Valuation Ratings follow the Federal Emergency Management Agency (FEMA) designations that are used for pricing many insurance premiums in the USA (FEMA.gov 2019). Climate Valuation has used FEMA's probability method, adjusted to include a wider set of hazards and account for differences in vulnerability. Based on the FEMA framework, the Climate Valuation Rating provides an insight into the possible longer-term availability and cost of insurance, however actual availability and costs of insurance for any real property should be obtained from a licensed commercial insurance provider.

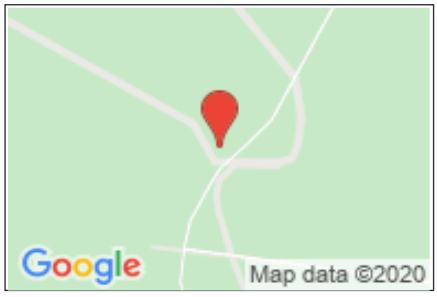
- **Climate Valuation Ratings Legend:**

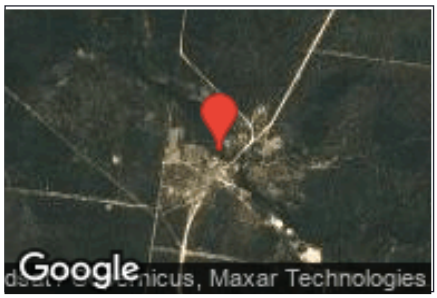
C	**High Risk = %VAR > 1.0%**	Insurance may be high cost or unavailable unless adaptation actions are undertaken.
B	**Moderate Risk = 0.2% < %VAR < 1.0%**	Risk may lead to higher insurance costs.
A	**Low Risk = %VAR< 0.2%**	Risk may be insurable at reasonable cost.

» Analysis Settings

42 Wallaby Way, Sydney, NSW 1234







Representative Property Settings

The following property settings are assigned by the user or left as default attributes:

Asset Category	Property Type	Lat Lon	Build Year
Building	Town House on Ground	-37.87861, 144.98058	1990
User selected	*User selected*	*User selected*	*User selected*

Financial Settings

The following financial settings are assigned by the user or left as default attributes. They are inputs to the model for a synthetic Representative Property and do not represent real or implied values or attributes of any actual building at this address:

Total Est. Property Value	Est. Replacement Cost of Home	Default Mortgage Term	Interest Rate (interest only)
$1,000,000	$300,000	30 years	5.00%
User selected	*User selected*	*User selected*	*User selected*

» Analysis Settings Continued...

Design and Material Settings

Climate Valuation uses nominal industry design specifications and construction materials to define the Representative Property. It assumes things such as construction materials, wind speed thresholds, floor height above ground and build year. These are listed below under “Default Settings” and cannot be taken as the specifications of an actual property whether real or planned. It is possible to alter many of the attributes of the Representative Property using the ‘customise’ tab on climatevaluation.com website. This will be differentiated from the “Default Settings” under the “Current Setting” column below.

Design Settings

Design	Default Setting	Current Setting
Floor height above ground (metres)	0.5	0.5
Elevation above sea level (metres):	2.5	2.5
Heat Threshold (°C):	42	42
Heat Threshold (°F):	108	108
Wind Speed Design Threshold:	1 in 500	1 in 500
Forest Fire Protection:	None / Normal	None / Normal

Construction Material Settings

Construction Material	Default Setting	Current Setting
External rafters and beams or soffits openings:	Timber	Timber
Roof cladding:	Steel - Galvanised	Steel - Galvanised
Roof fastening:	Steel - Galvanised	Steel - Galvanised
Roof insulation:	Glass Wool	Poly
Roof structure material:	Timber	Steel
Ceiling material:	Plaster	Plaster
External wall cladding:	Weatherboard	Brick
Internal wall lining:	Plaster	Plaster
Wall insulation:	Glass Wool	Glass Wool
Wall structure:	Timber	Timber
Piers and foundation:	Concrete MPA>20	Concrete MPA>20
Flooring covering:	Concrete MPA>20	Concrete MPA>20
Floor structure:	Reinforced Concrete	Reinforced Concrete
External door material:	Timber	Timber

» Analysis Settings Continued...

Construction Material Settings

Construction Material	Default Setting	Current Setting
Window frame:	Aluminium	Aluminium
Window glazing	Glass	Glass
Deck and patio material:	Timber	Timber
Kitchen:	Kitchen Composite	Kitchen Composite
Bathrooms:	Bathroom Composite	Bathroom Composite
Plumbing:	PVC	PVC
Hot water:	Steel - Galvanised	Steel - Galvanised
Downpipe and guttering:	Steel - Galvanised	Steel - Galvanised
Storm water plumbing and drainage	PVC	PVC
Electrical:	Electrical Components	Electrical Components
Telecommunication:	Electrical Components	Electrical Components
Airconditioning:	Electrical Components	Electrical Components
Battery storage:	Waterproof Electrical	Waterproof Electrical
Solar panel:	Electrical Components	Electrical Components

» Analysis Settings Continued...

Climate Change Model Settings

The following emissions scenarios and climate models have been used for the analysis of the Representative Property at the specific location:

Hazard	Dataset	Details	
Riverine flooding	Projection	Description:	Annual maximum 24-hour precipitation
		Source:	NARCliM
		Dataset:	NARCliM
		Domain:	NARCliM-d02
	Bias correction	Description:	Annual maximum 24-hour precipitation
		Source:	GHCN-Daily
	Context data	Riverine Flood Depth:	30m_Australia
		Flood defended areas:	AU_DefendedAreas_02-DefendedAreas_Australia_2016_WGS84
Coastal inundation	Projection	Description:	Global Sea Level
		Source:	Haigh-et-al-2014 (1.5 metres by 2100)
	Bias correction	Description:	Global Sea Level
		Source:	CSIRO_Recons_gmsl_yr_2015
	Context data	Land rise (Glacial Isostatic Adjustment):	drad250.1grid.ICE5Gv1.3_VM2_L90_2012-global
		Maximum annual tide height:	CANUTE-global
Forest fire	Not calculated	Reason:	No forest nearby
Wind damage	Projection	Description:	Annual maximum wind gust speed
		Source:	CORDEX
		Dataset:	CORDEX
		Domain:	AUS-44
Soil movement due to drought	Projection	Description:	Annual total precipitation
		Source:	NARCliM
		Dataset:	NARCliM
		Domain:	NARCliM-d02
	Context data	Soil Clay Content:	CLYPPT_M_sl5_250m_ll_06_16-06_16

» Analysis results: key risk indicators

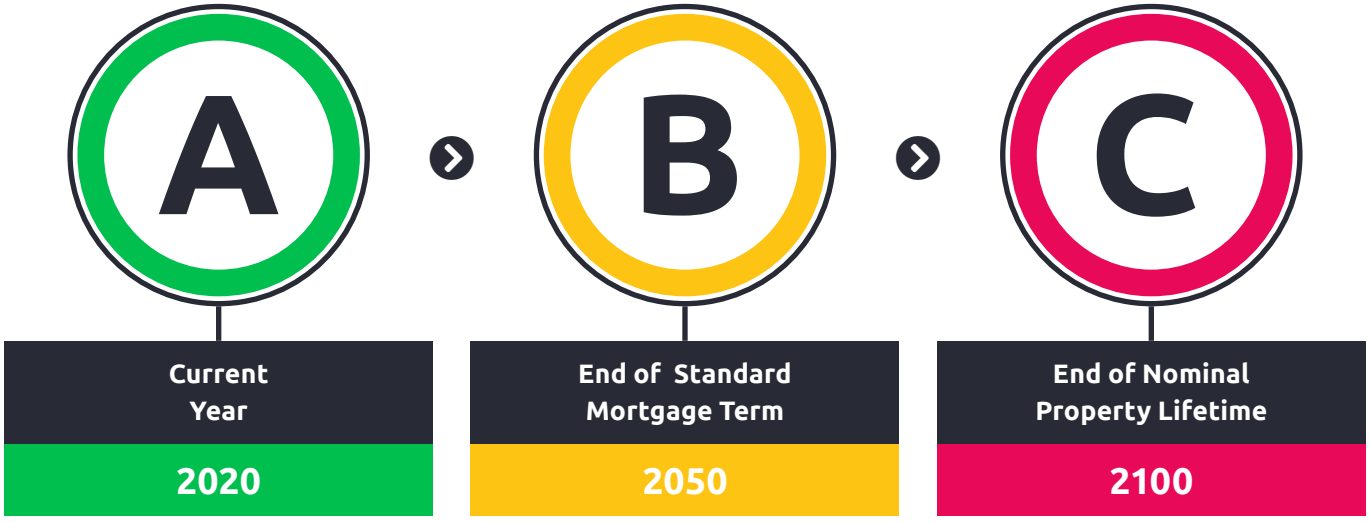
Key Metrics Summary

The table below summarises the results for the analysis of the Representative Property. Based on the computations detailed in the methodology section of this report, the key risk metrics for the Representative Property across three key time periods are as follows:

	Current year 2020	End of Standard Mortgage Term 2050	End of Nominal Property Lifetime 2100
Technical Insurance Premium (TIP)	$300	$2,700	$6,000
Maximum Value-At-Risk (MVAR%)	0.1%	0.90%	2.0%
Climate Adjusted Value (CAV)	99.4%	94.6%	88%

Climate Valuation Rating

Based on the results above, the overall Climate Valuation Rating for the Representative Property across three time periods has been computed - current year, at the end of a standard mortgage term (30 years) and by the end of the nominal property lifetime (2100).



Climate Valuation Ratings Legend:

C	**High Risk = %VAR > 1.0%**	Insurance may be high cost or unavailable unless adaptation actions are undertaken.
B	**Moderate Risk = 0.2% < %VAR < 1.0%**	Risk may lead to higher insurance costs.
A	**Low Risk = %VAR< 0.2%**	Risk may be insurable at reasonable cost.

» Analysis results: key risk indicators continued...

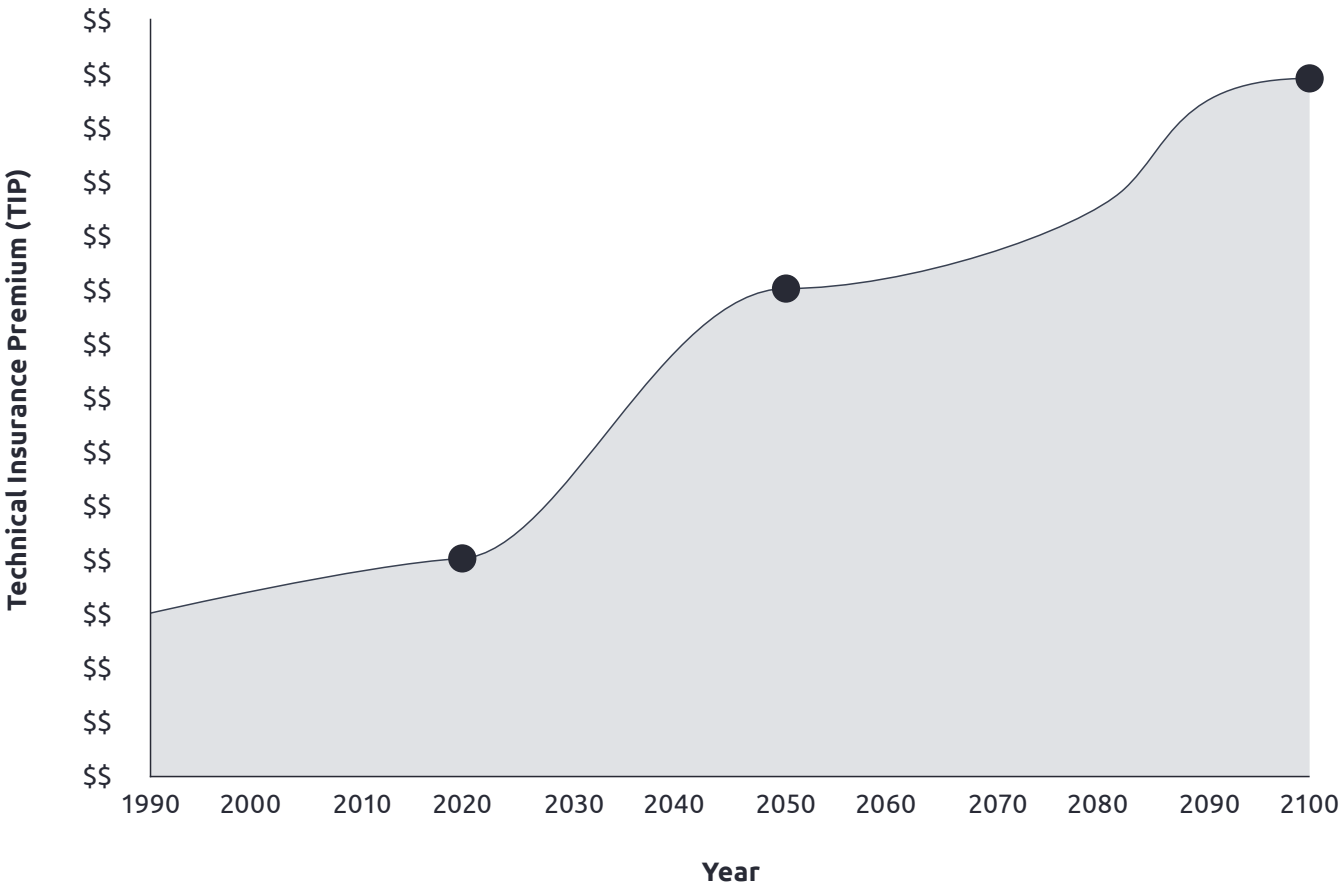
Technical Insurance Premium (TIP)

The Technical Insurance Premium (TIP) is equivalent to the Annual Average Cost of Damage to the Representative Property caused by extreme weather and climate change.

For detailed explanation of Technical Insurance Premium calculations see Methodology section of this report.

The table and graph below show how the Technical Insurance Premium for the Representative Property is modelled to change over time.

	Current year	End of Standard Mortgage Term	End of Nominal Property Lifetime
	2020	2050	2100
Technical Insurance Premium (TIP)	$300	$2,700	$6,000



Selected currency: $AUD

» Analysis results: key risk indicators continued...

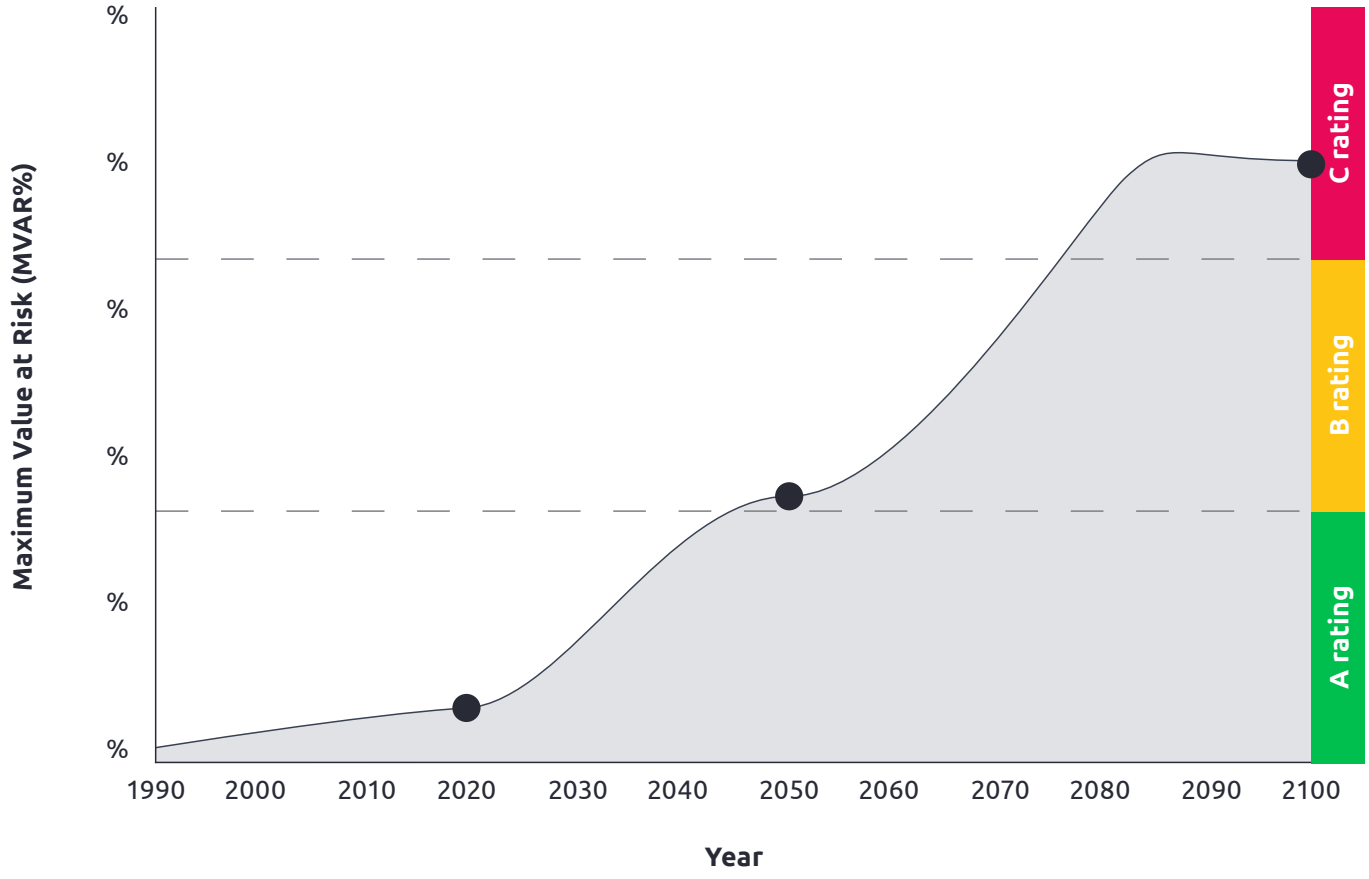
Percentage Value at Risk (VAR% & MVAR%)

The Percentage Value at Risk (VAR%) is the Technical Insurance Premium, expressed as a percentage of the Representative Property's replacement cost.

For detailed explanation of VAR% and MVAR% see Methodology section of this report.

The table and graph below show the change in Annual VAR% for all climate hazards over time. Maximum VAR% reached is indicated by the red line. The "Hazard Breakdown" section of this report provides further insights into the annual and maximum VAR% for each climate hazard individually.

	Current year	End of Standard Mortgage Term	End of Nominal Property Lifetime
	2020	2050	2100
Annual VAR%	0.1%	0.90%	2.0%
Maximum VAR%	0.1%	0.90%	2.0%



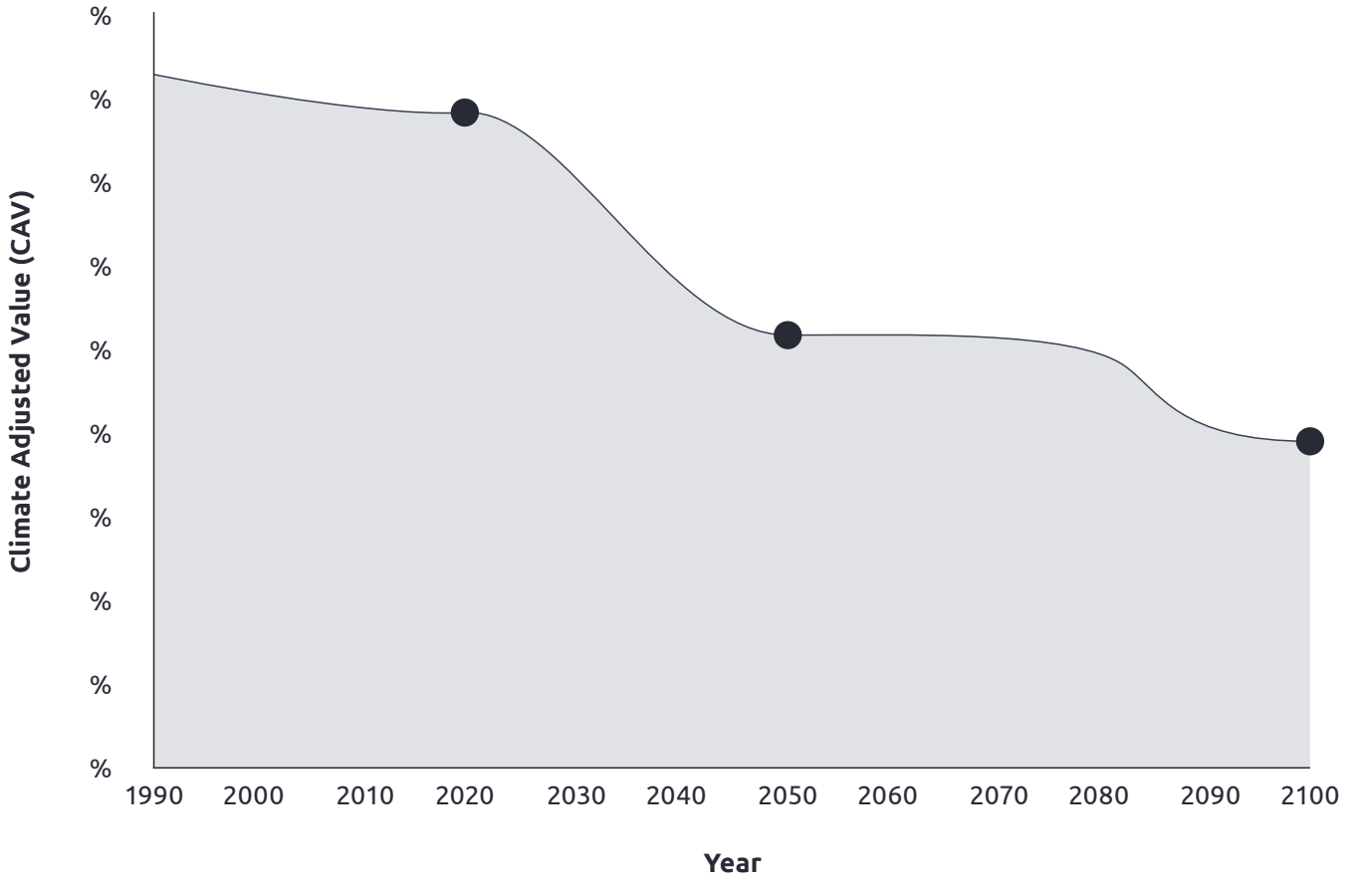
Climate Adjusted Value (CAV)

The Climate Adjusted Value is the percentage reduction in value for the Representative Property, relative an equivalent property unaffected by climate change. It is expressed as a percentage reduction in equivalent value as this overcomes the effects of inflation and fluctuations in the property market.

For detailed explanation of Climate Adjusted Value calculations see Methodology section of this report.

The table and graph below show the estimated change in the Climate Adjusted Value of the Representative Property over time.

	Current year	End of Standard Mortgage Term	End of Nominal Property Lifetime
	2020	2050	2100
Climate Adjusted Value (CAV)	99.4%	94.6%	88%
% reduction in market value	-0.6%	-5.4%	-12%

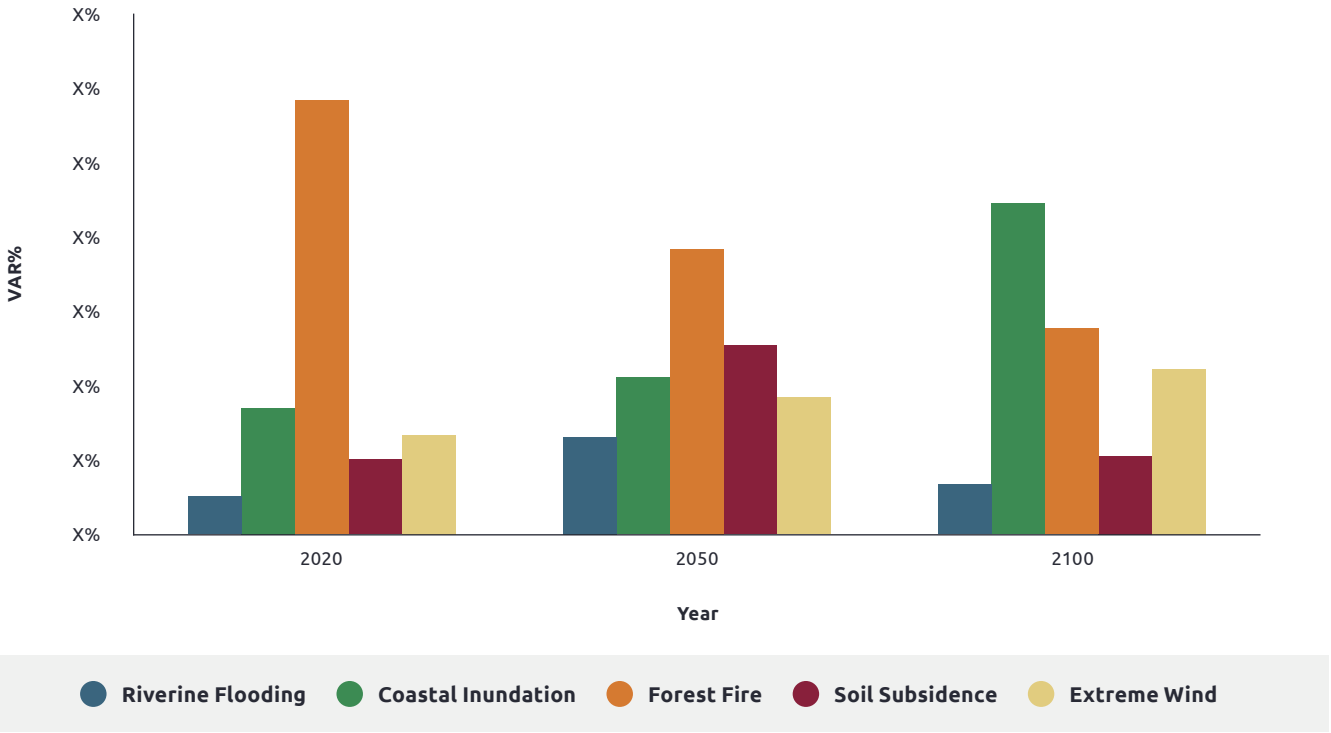


» Analysis results: hazard breakdown

This section of the report includes an analysis of the individual contribution of each hazard to the risk profile of the Representative Property.

Hazard Contribution to VAR%

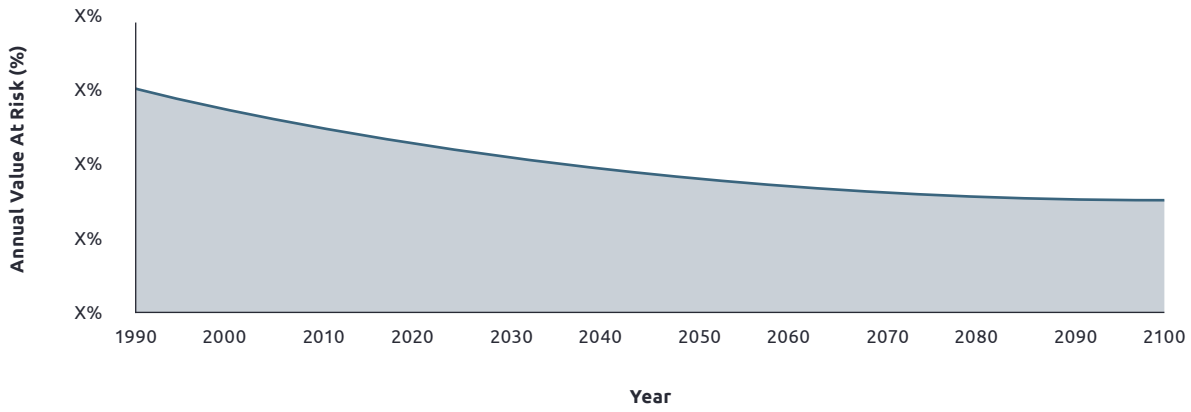
The graphs below summarise the contribution of each climate hazard to the Representative Property's Annual VAR% calculations and how that changes across three time periods - current year, at the end of a standard mortgage term (30 years) and by the end of the nominal property lifetime (2100). Actual risk from each hazard will depend on building design and construction and can be explored further in the Vulnerability Diagnostics section of the report.



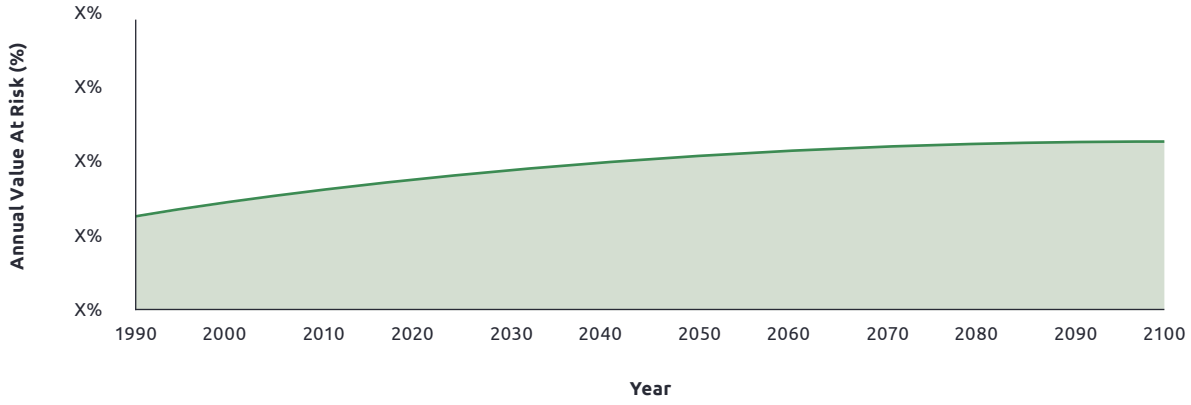
» Analysis results: hazard breakdown continued...

The contribution of each hazard to Annual Value At Risk (%).

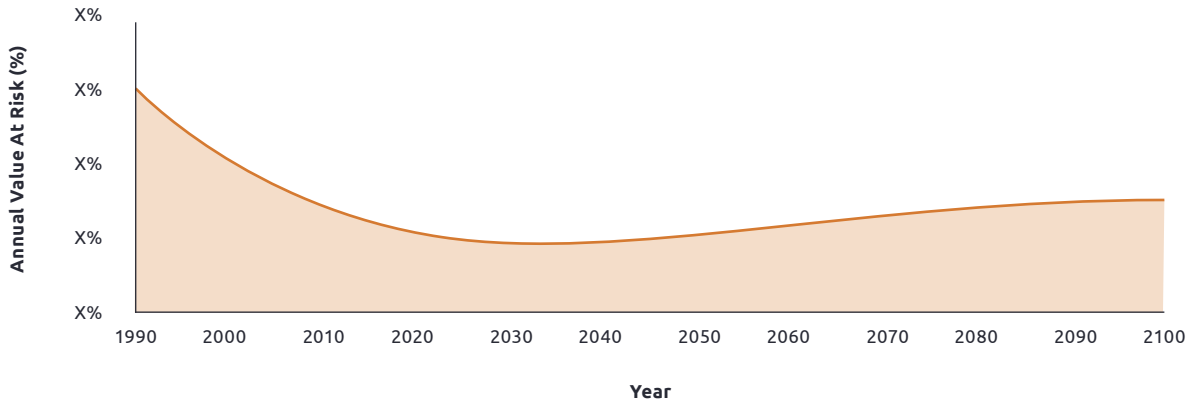
Riverine Flooding



Coastal Inundation

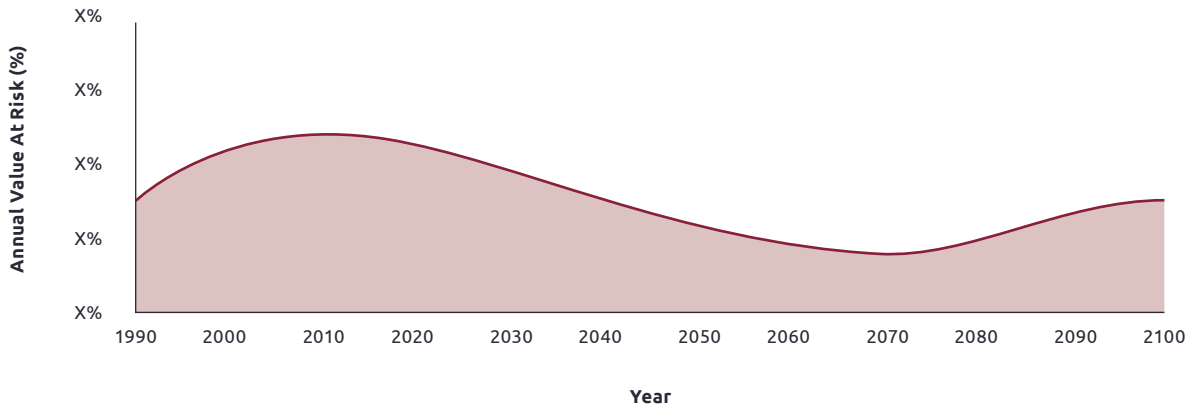


Forest Fire

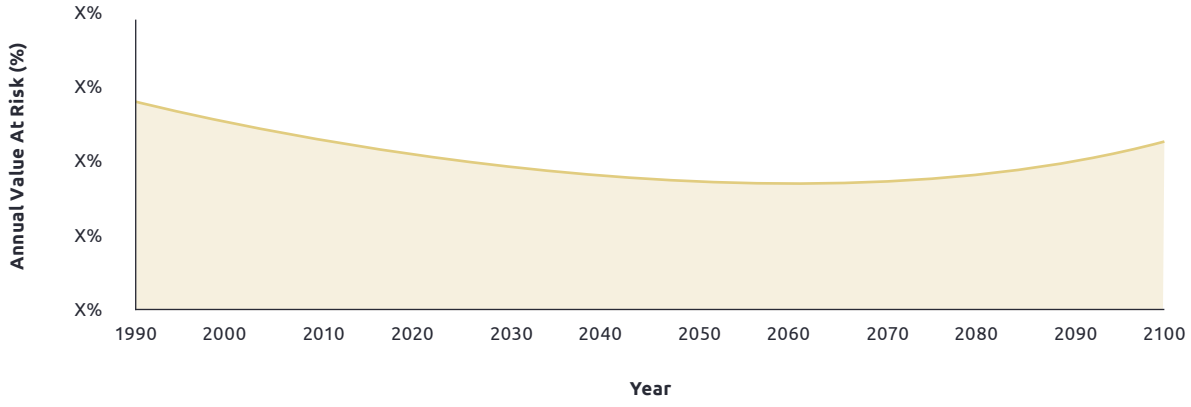


» Analysis results: hazard breakdown continued...

Soil Subsidence



Extreme Wind

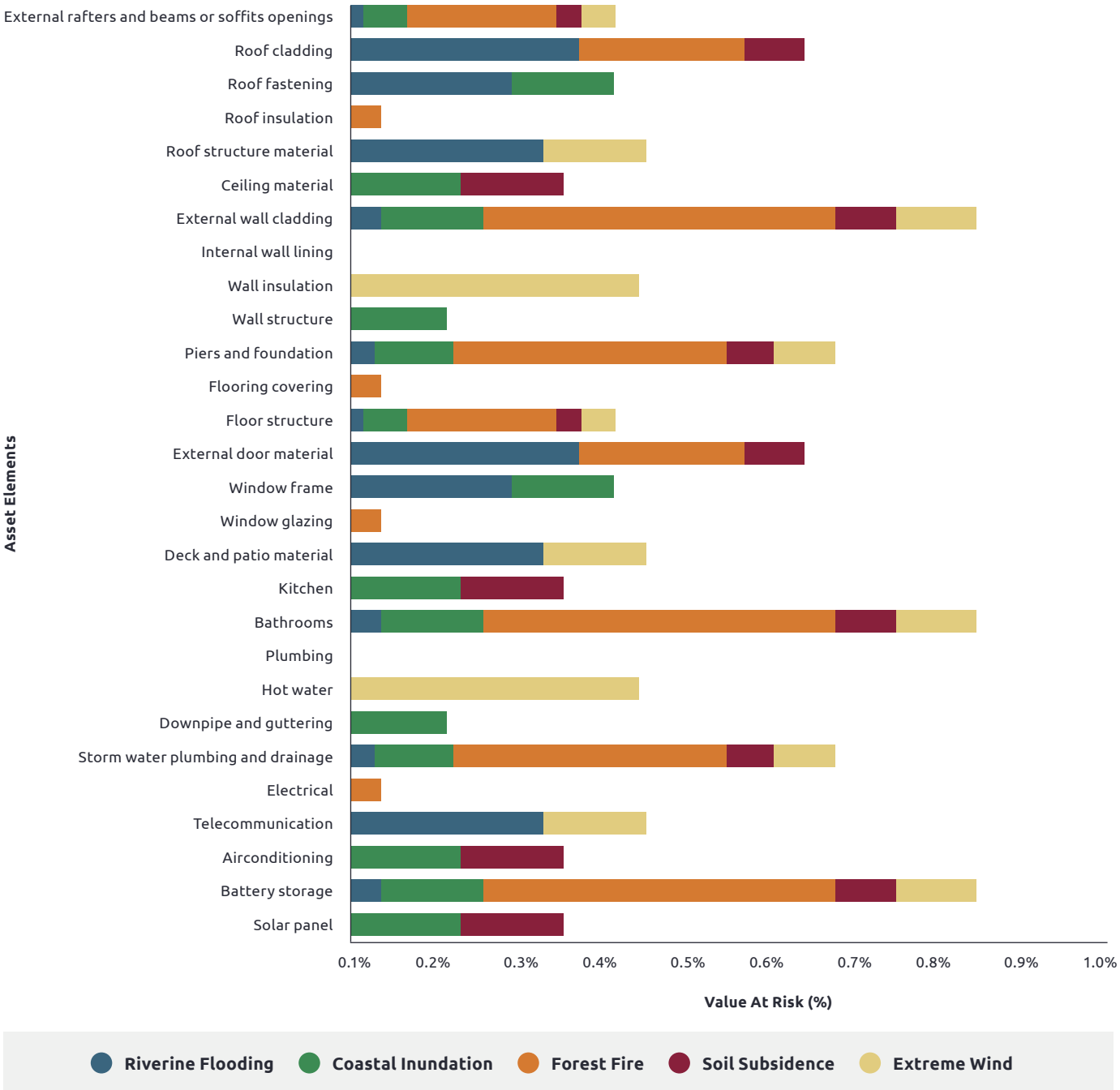


» Vulnerability diagnostics

This section of the report examines which elements of the Representative Property are modelled to fail and why. The graphs below show climate impacts (colour coded for each hazard) on each of the construction elements of the Representative Property for three time periods - current year, at the end of a standard mortgage term (30 years) and by the end of the nominal property lifetime (2100).

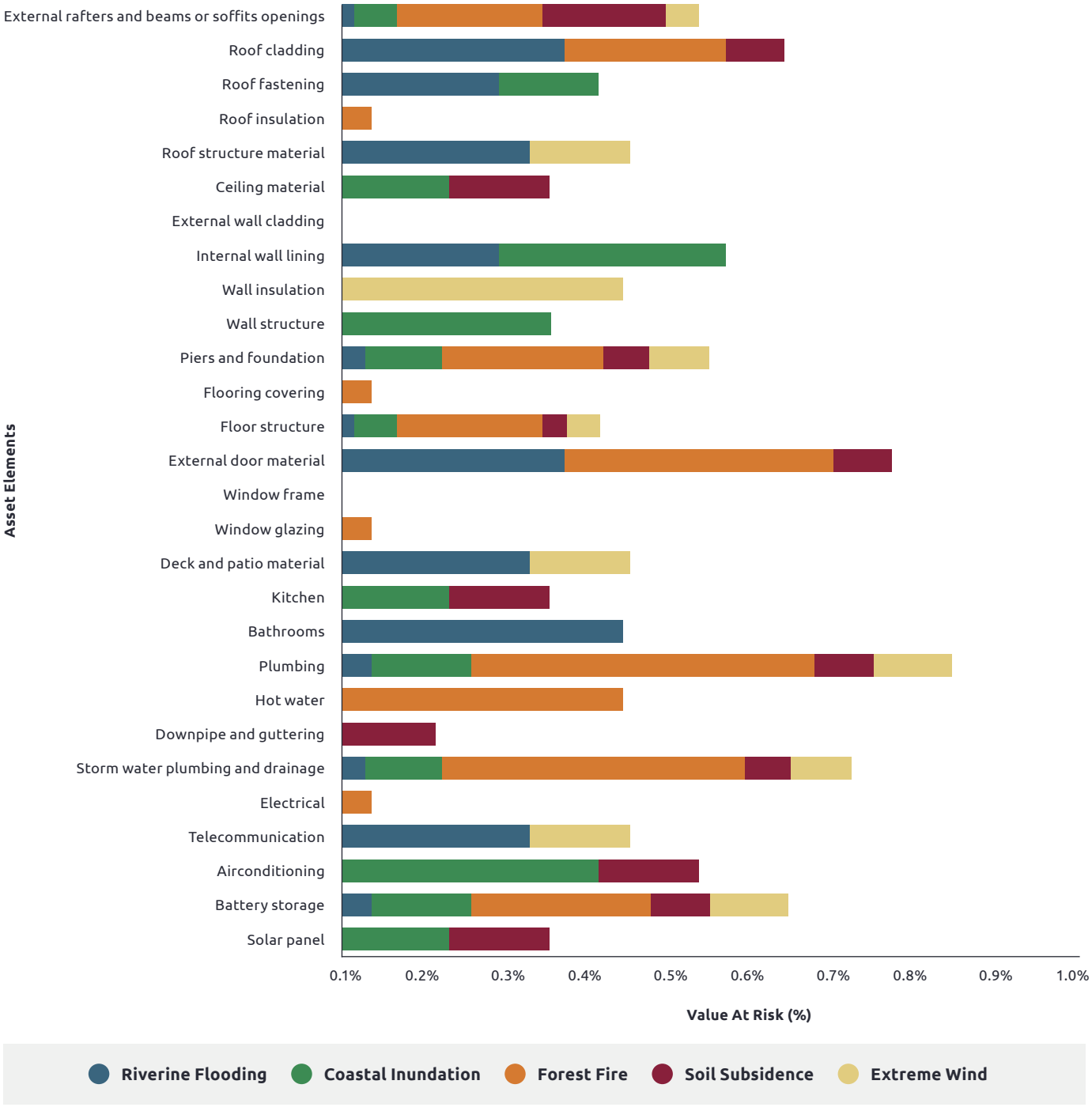
Diagnosing vulnerability helps to identify risk reduction and adaptation opportunities – such as maintenance, design upgrades, or renovations.

Current Year (2020)



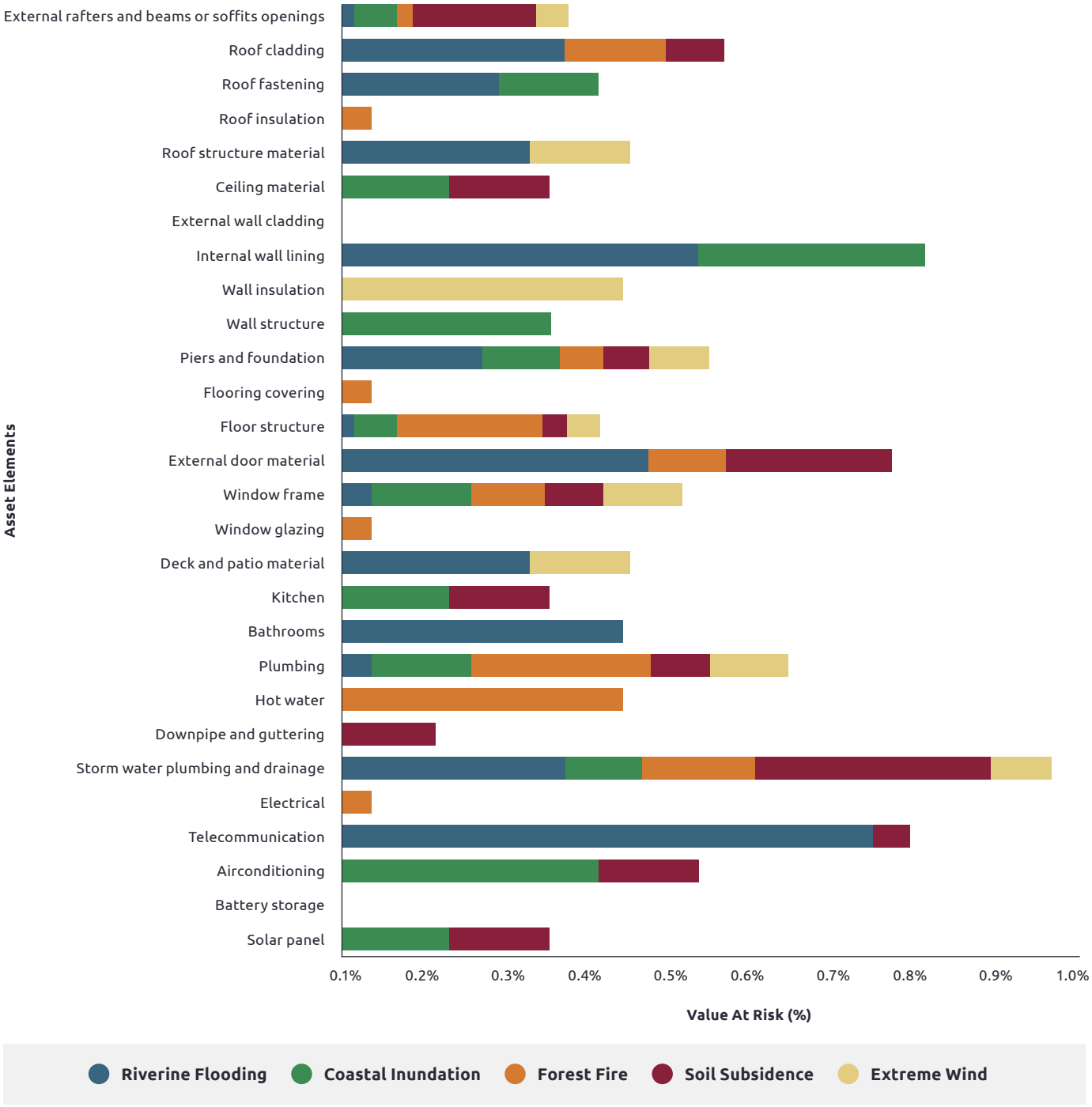
» Vulnerability diagnostics continued...

End of Standard Mortgage Term (2050)



» Vulnerability diagnostics continued...

End of Nominal Property Lifetime (2100)



» Next Steps

Once a clear understanding is achieved regarding the degree of risk to the Representative Property, the process of planning, investing, insuring, and protecting can begin.

Stay Aware

If this report indicates no significant risk, it doesn't mean there is no risk at all, but it does mean that the models didn't find anything material over the analysed period. Make sure you know of any additional hazards are not covered in this analysis and how they might effect the Representative Property.

Contact Your Local Council

If this report shows the Representative Property is at risk from climate change, contact the municipal government or local council for their climate change risk maps and adaptation plan. They may be aware of emergent risks and have plans for risk mitigation measures (such as building sea levy walls). Alternatively they may be applying a planned retreat which means the property may not be eligible for redevelopment.

Look Into Insurance Options

If this report shows significant risk to the Representative Property, you may wish to check the availability of insurance for specific climate hazards. Each insurance provider covers hazards differently, so make sure you consider the Terms and Inclusions carefully.

Investigate Adaptation Measures

If this report shows a significant projected reduction in the relative value of the Representative Property, consider mitigation options to either reduce or avoid risks. Remember the projected effects are over the term of the mortgage so there may be time to make a sensible plan. This could include raising the floor height of the property or changing the construction materials to those less prone to expensive damage. You may wish to undertake a new Climate Valuation analysis with changed settings that consider improved resilience - for example by changing design specifications or the choice of materials used in the Representative Property to see how this effects the Climate Risk profile.

Financing Risk Mitigation

We are currently working on a project for our clients to access mortgage extensions to cover the costs of adaptation works designed to address extreme weather and climate hazards. If you would like to get access to such a programme please contact us.

Adaptation Cost-Benefit-Analysis

If you wish to undertake detailed diagnostic analysis, plan adaptation actions, explore the impacts of hazards in more detail or assess large numbers of assets, please contact our team at ***info@climatevaluation.com***

» Appendix

Specific Emissions Scenarios

The impacts of climate change analysed are for a range of greenhouse gas emission and global warming scenarios presented in the Intergovernmental Panel on Climate Change Assessment Report (IPCC, 2014, IPCC 2007). Specific climate models are selected to 'stress test' each hazard - thus a model that tends to predict a drier future is used to consider drought, and a model which predicts a wetter future is used to test flood risk. This selection process avoids masking risks or diluting impacts through averaging an ensemble of models.

- **Representative Concentration Pathways**
  The Climate Risk Engines stress test assets using emissions scenarios modelled by international climate research groups based on the Representative Concentration Pathways published (RCP) by the Intergovernmental Panel for Climate Change (IPCC). The scenario used in this analysis, RCP 8.5, provides a high greenhouse gas emissions trajectory which is most consistent with current global emissions behaviour, trends and the business-as-usual outlook.

- **Climate Parameters**
  The projections for climate parameters covering temperatures, precipitation, wind are sourced from the results of a range of General Circulation Models (GCM) and Regional Concentration Models (RCM) developed by international research agencies and published as part of the Coordinated Regional Climate Downscaling Experiment (CORDEX).

- **Bias Correction**
  Historical weather data may be used to adjust climate model data to align with known local weather behaviour and statistics.

Sources and References

This report is based on over 100 data sources from expert institutions around the world. This list is constantly updated and can be found on the climate valuation website. Specific references referred to in this report are outlined below:

FEMA.gov. 2019. "Flood Zones." March 18, 2019. https://www.fema.gov/flood-zones.

IPCC. 2007. Climate Change 2007-the Physical Science Basis: Working Group I Contribution to the Fourth Assessment Report of the IPCC. Edited by Susan Solomon, Martin Manning, and Melinda Marquis. Vol. 4. Cambridge university press.

——. 2014. Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. Edited by Rajendra K. Pachauri and Leo A. Meyer. Geneva, Switzerland: IPCC.

CLIMATEVALUATION

» Contact

Since 2006, organisations have turned to our team to help them analyse the physical impacts of climate change to their business operations. Climate Valuation's analysis is underpinned by the Climate Risk Engines, developed through extensive commercial engagement with industry and government. If this report identifies significant risk, we may be able to provide more detailed analysis through other products and services.

Please contact us for more information at
info@climatevaluation.com

Or visit the website at
climatevaluation.com

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