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Managing Climate Change Risks

The paradigm shift in the role of risk management

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Commercial Insurance
Zurich Insurance Group

Agenda

1. The two sides of the “sustainability” coin
2. Climate change science and risk assessment data
3. Climate change and the risk management challenge
4. Key takeaways
5. Q&A

Two sides of the same coin

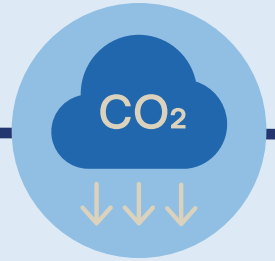
Sustainability initiatives aim to reduce the impact of…

… own operations on the environment

… the environment on own operations

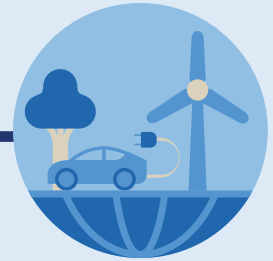
Mitigation

Navigating transition to low-carbon economy



De-carbonize
products, services, operations and investments

Engage
with investors, policy-makers, customers, etc.



Innovate
new business models and transform

Climate Resilience Strategy

Adaptation

Building resilience to physical impacts

Adapt
operations and supply chain to more frequent impacts and disruptions

Invest
in risk reduction for critical locations and communities

Transfer
residual risk to insurance markets

Opportunities and risks

Risk management is key during planning and implementation of sustainability objectives

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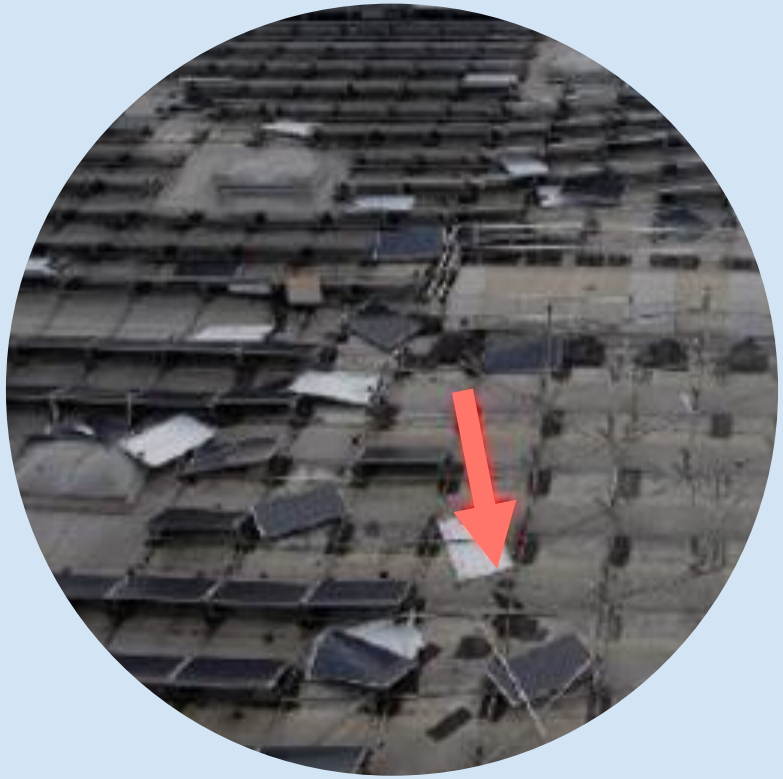

Source: Zurich Risk Engineering, 2015

Modelling climate change: From global greenhouse gas emissions…

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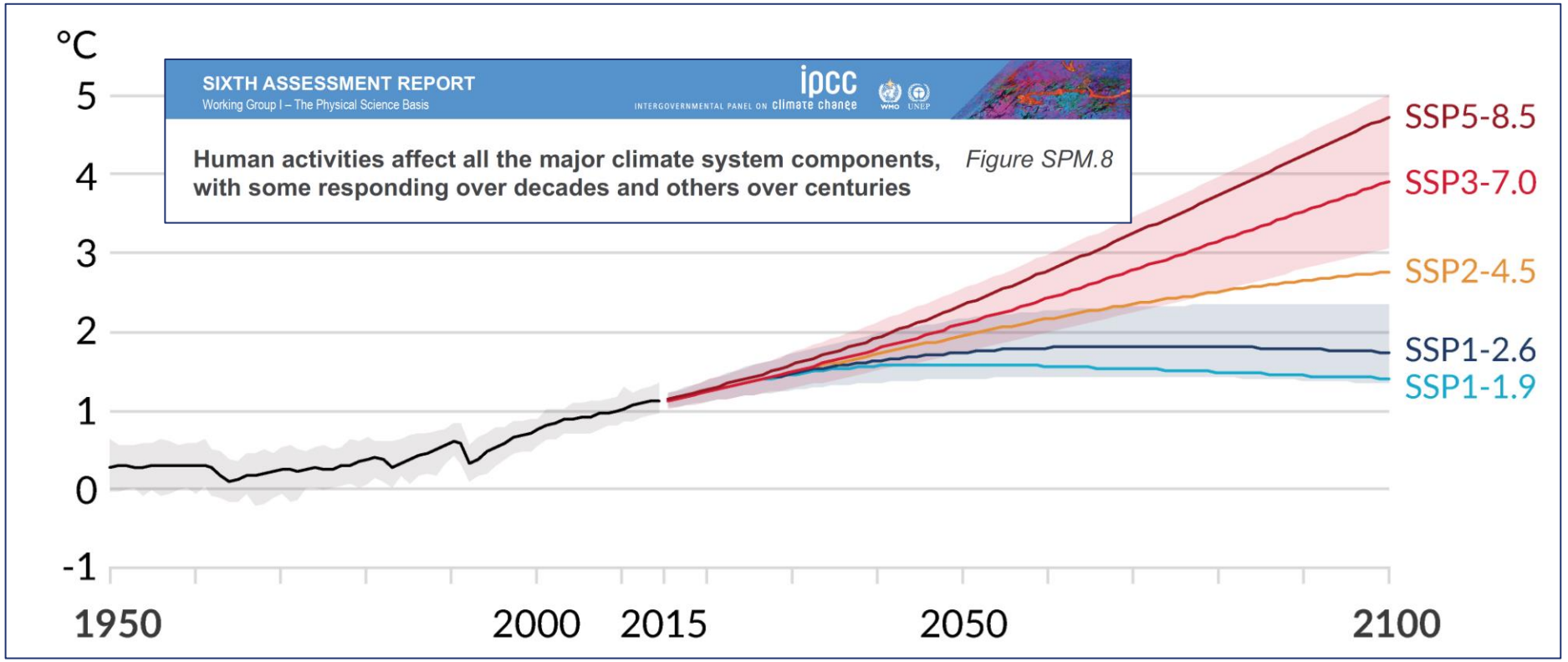
	Near term: 2021 - 2040		Mid-term: 2041 - 2060		Long-term: 2081 - 2100	
Scenario	Best estimate	Very Likely Range	Best estimate	Very Likely Range	Best estimate	Very Likely Range
SSP 1-2.6	1.5°C	1.2°C to 1.8°C	1.7°C	1.3°C to 2.2°C	1.8°C	1.3°C to 2.4°C
SSP 2-4.5	1.5°C	1.2°C to 1.8°C	2.0°C	1.6°C to 2.5°C	2.7°C	2.1°C to 3.5°C
SSP 5-8.5	1.6°C	1.3°C to 1.9°C	2.4°C	1.9°C to 3.0°C	4.4°C	3.3°C to 5.7°C

Global Surface Temperature Change Relative to 1850-1900



"business as usual"

net zero 2050

SPM: Summary for policymakers, https://www.ipcc.ch/report/ar6/wg1/

SSP: Shared Socioeconomic Pathway, linked to Representative Concentration Pathway (RCP)

Modelling climate change: Global average temperature rise to local effects

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	Metric	Benchmark Period	Changes (Confidence)			
			To the Present	1.5°C	2°C	>2°C
US Windstorm (Tropical Cyclone)	Frequency	Variable between 1973-2007	Nil global from 1975-2010 (High)	Small global decrease (Med-High)	Small global decrease (Med-High)	Small global decrease (Med-Low)
	Maximum intensity	As above	Nil global from 1975-2010 (High)	<10% (Med-High)	10-20% (Med-High)	5-10% for each 1°C (Med-High)
	Global Proportion Cat 4-5	As above	~100% between 1975-2010 (High)	Small increase from 2010-2015 (Med)	Small increase from 2010-2015 (Low)	Small increases from 2010-2015 (Low)

[1] Source: TCFD (2017), "Technical Supplement: Use of Scenario Analysis in Disclosure of Climate-Related Risks and Opportunities", Task Force on Climate-Related Financial Disclosures.

Data uncertainty, confidence levels, and “accuracy”

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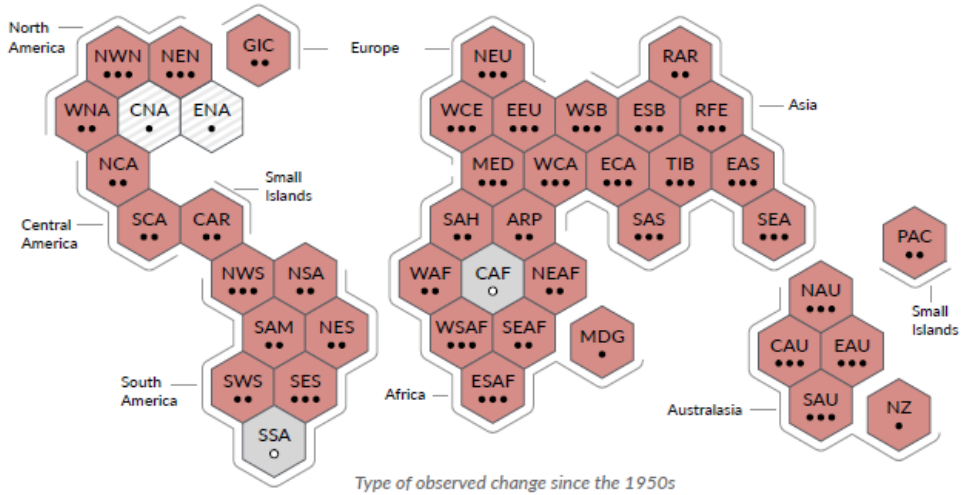
a) Synthesis of assessment of observed change in **hot extremes** and confidence in human contribution to the observed changes in the world's regions

Type of observed change in hot extremes
- Increase (41)
- Decrease (0)
- Low agreement in the type of change (2)
- Limited data and/or literature (2)

Confidence in human contribution to the observed change
- ●●● High
- ●● Medium
- ● Low due to limited agreement
- ○ Low due to limited evidence

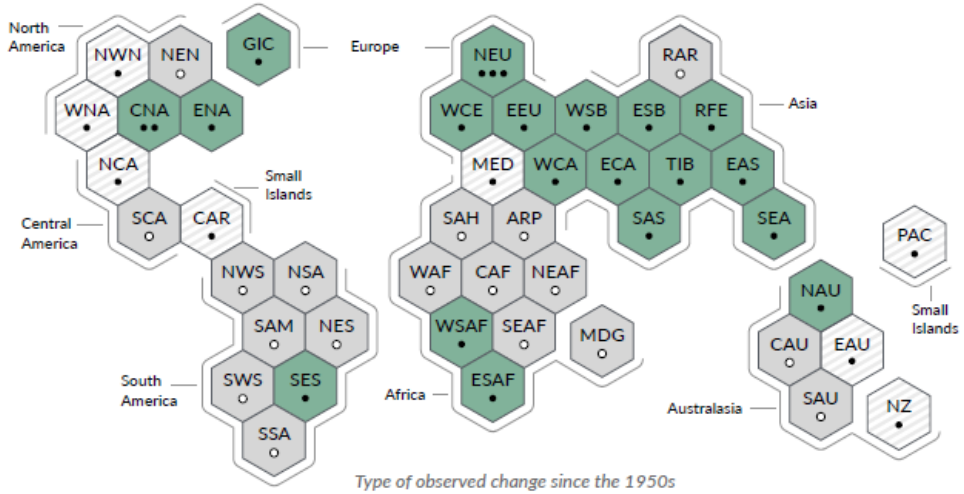


Type of observed change since the 1950s

b) Synthesis of assessment of observed change in **heavy precipitation** and confidence in human contribution to the observed changes in the world's regions

Type of observed change in heavy precipitation
- Increase (19)
- Decrease (0)
- Low agreement in the type of change (8)
- Limited data and/or literature (18)

Confidence in human contribution to the observed change
- ●●● High
- ●● Medium
- ● Low due to limited agreement
- ○ Low due to limited evidence



Type of observed change since the 1950s

Source: Intergovernmental Panel on Climate Change (2021), “Climate Change 2021: The Physical Science Basis – Summary for Policymakers. Contribution of WG I to the 6th Assessment Report of IPCC”, Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)]. Cambridge University Press. In Press.

Risk management challenges

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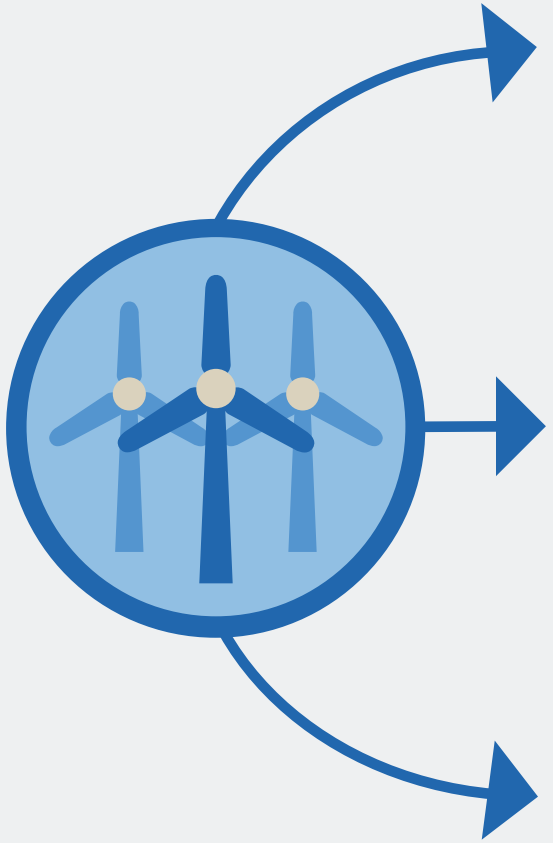

Regulatory landscape

- Increased requirements for reporting of sustainability and climate change initiatives and impacts on business (Solvency II, SST, SEC, PRA, etc.)

Sustainability reporting

- No standard methodology or framework
- Complex process, involving multiple units in the organization
- How to use existing tools and available data?

Tools (insurance, pricing, building codes, hazard maps)

- Increasing frequency and severity of “conventional” nat cat driven losses
- Increasing losses for “secondary” (non-modelled) perils
- Tools based on historical events (“backwards-” and not “forward-looking”)
- Other factors, e.g. deteriorating infrastructure, increasing urban development, population, and exposures

Risk assessments in the context of ZRE Methodology

Consider all three dimensions (and not only hazard)

ZRE Methodology is our fundamental approach of the **risk assessment process**, based on the **dimensions** of RISK.

It provides **context** for our **existing deliverables**.

Exposures

People, assets, or profits, i.e. values at risk, subject to injury or damage due to hazards.

Exposures will vary based upon the peril being assessed.

Hazards

Potential sources of damage.

Controls

Controls are measures intended to reduce risk.

The quality of controls is evaluated for its availability, reliability, and fitness for purpose.

Event

The event is any disruption to normal operations or functions leading to an unwanted adverse consequence (Effect or Loss Scenario), for example a financial loss, fatalities, business interruption, loss of reputation and many more

Solutions must consider the changing environment

Collaboration with all stakeholders to develop viable solutions

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Source: Zurich Risk Engineering, 2015

1 Vegetation reduces channel discharge capacity.

2 Loose concrete plates will dislodge during high velocity flow.

Source: Google Earth, 2020

E&E NEWS
POLICY & ETHICS

After a $14-Billion Upgrade, New Orleans' Levees Are Sinking

Sea-level rise and ground subsidence will render the flood barriers inadequate in just four years

Source: Scientific American, Apr 2019

Holistic approach to risk adaptation

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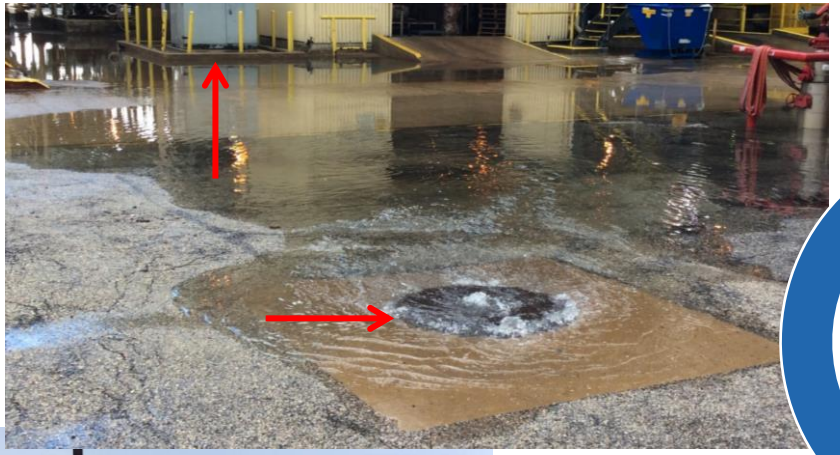

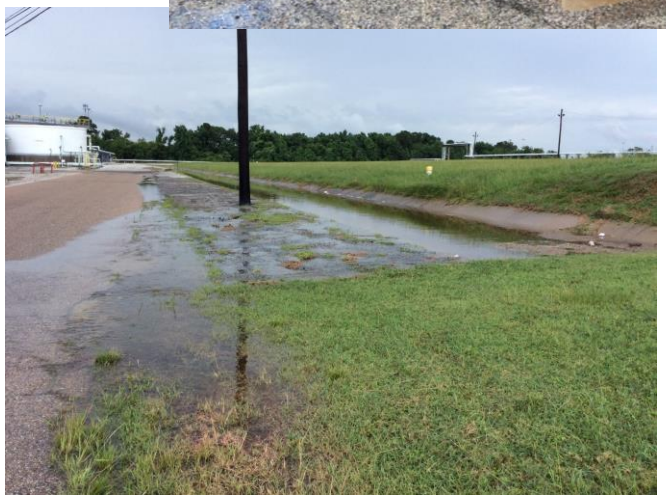

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Zurich Construction Weather Parametric Insurance

Helping protect your profits from extreme weather and climate events

UN SDG: A blueprint for a global partnership

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Source: https://sdgs.un.org/goals

Planning a new facility: Consider the entire value chain and community

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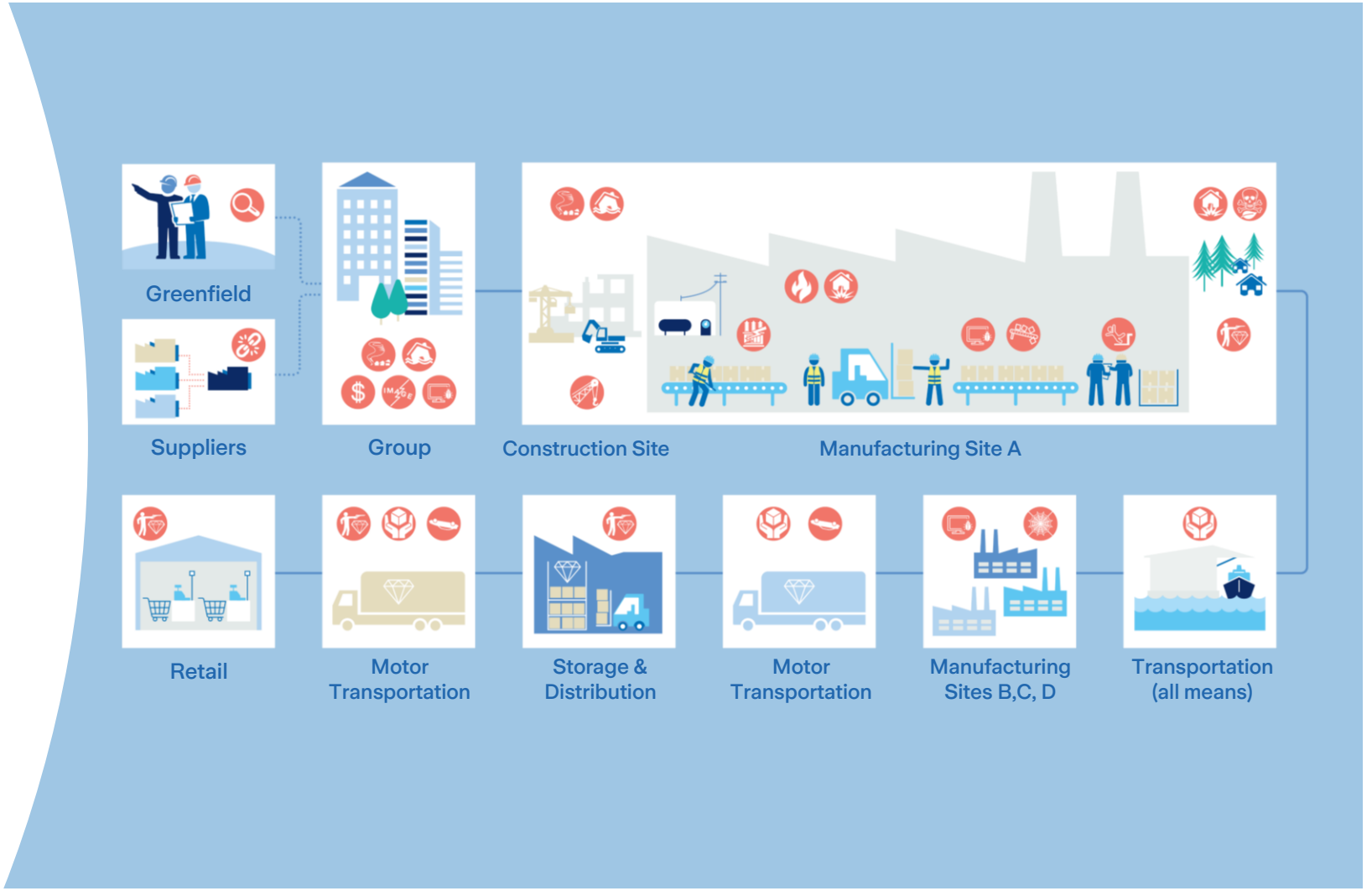

Managing climate risk

Assess the risk, not just the hazard

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The risk landscape is dynamic, with each dimension of risk changing with time and location.

Controls (protection) mechanisms must consider this dynamic landscape.

Changing exposure on-site
e.g. due to sustainability goals

Changing exposures off-site
e.g. due to local development

Image Credits: USGS: Satellite view of urban development, Edwards Aquifer Recharge Zone San Antonio, TX

Key takeaways

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Sustainability goals

- Realistic & implementable
- Measurable
- Within risk tolerance (enhance resilience)

Risk management

- Include all dimensions of risk
- Multi-function/stakeholder exercise
- Existing tools (“backward looking”) may be used to assess future risks
- Develop scenarios: Counterfactual analysis (how could it get worse?)

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Thank you.

Any questions?

For more information, view Zurich Resilience Solutions and follow us on LinkedIn.

Appendix

Useful links

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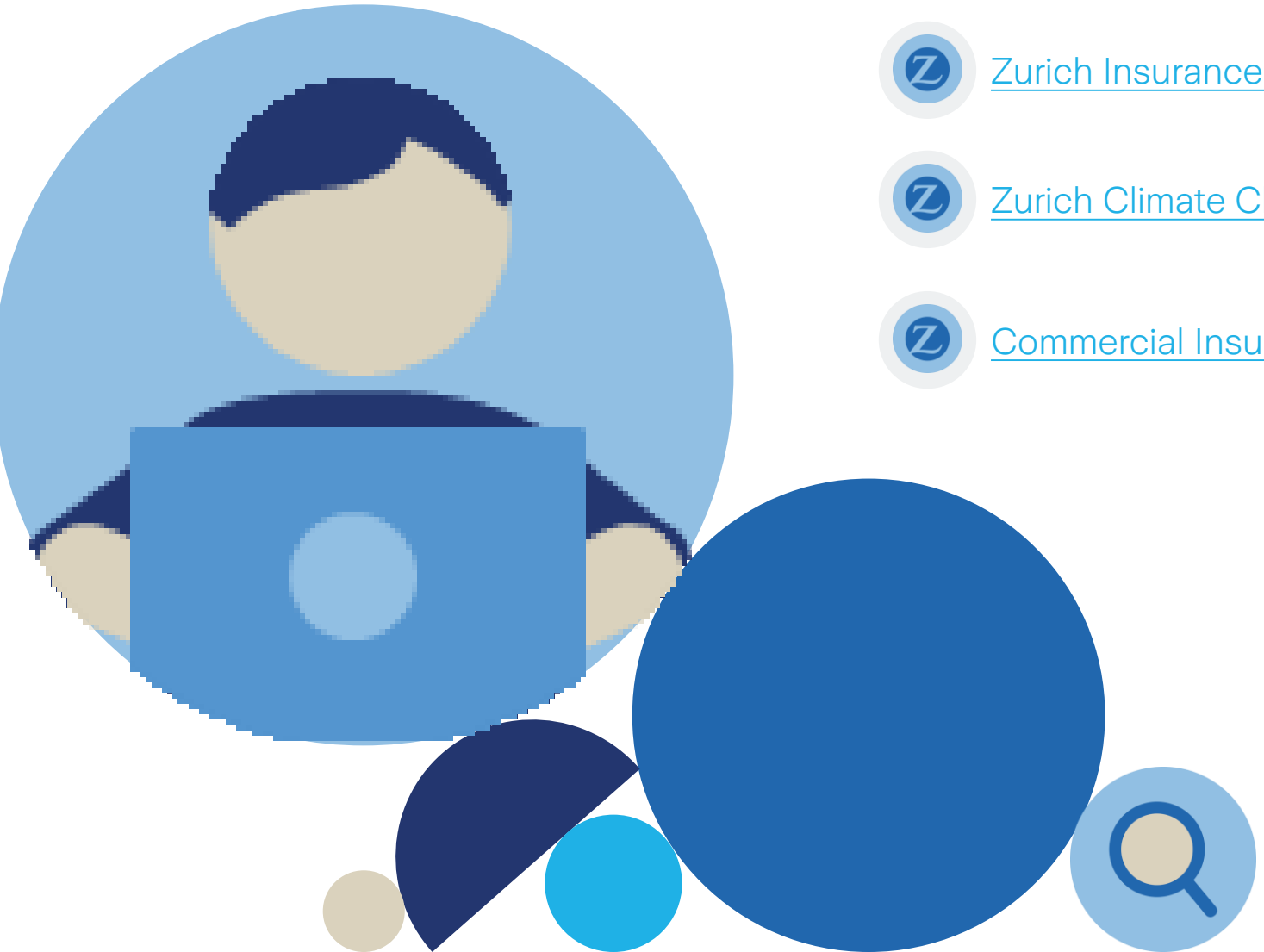

- Zurich Insurance 2021 Sustainability Report
- Zurich Climate Change Resilience Services
- Commercial Insurance - supporting a sustainable future

Speakers' Biography

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Amar Rahman

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Amar, a civil engineer with a PhD from the University of Canterbury (New Zealand), joined Zurich Risk Engineering in 2011. Amar developed the Natural Hazards Resilience Service after the 2011 Thailand floods and has since then been advising key customers on physical and organizational resilience strategies. He leads the Climate Change Resilience Service since its launch in Sept 2020.

Before joining Zurich Risk Engineering he was an academic and subsequently worked in the construction industry as a Design Consultant and Project Manager for large-scale infrastructure projects for over 20 years.

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