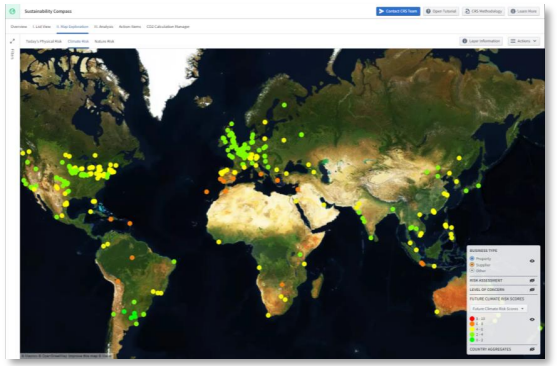
Swiss Re
Corporate Solutions

Climate Risk Solutions

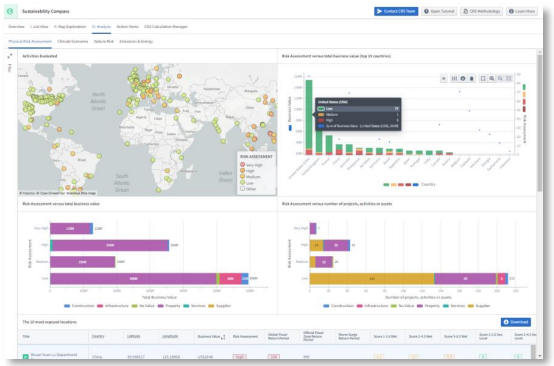
A holistic risk approach

Climate Risk Solutions



Climate Risk Scores

The **access** to climate science in ten comprehensive scores



Sustainability Compass

The **tool** for investigating your current and future physical climate risk landscape

Climate Risk Advisory

The actionable **climate risk adaptation plan** developed with risk engineering experts

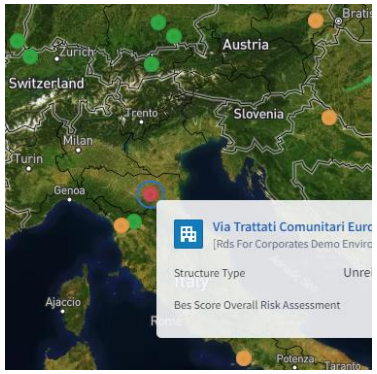
Portfolio or Location Assessment as input for climate risk reporting

Understanding **where, when, and how** to act on climate change related risks

Where

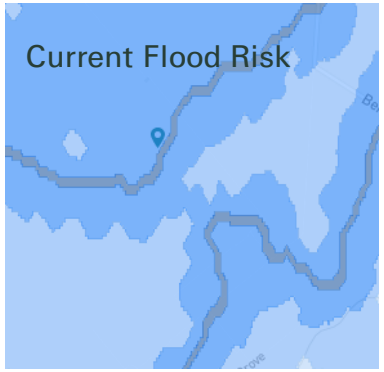
Identify the high risk countries or categories

Identify the risk driving locations or suppliers



When

Current Risk Assessment of the site



Future Risk Assessment of the site

Risk Development

	Current Risk	2030 SSP1	2030 SSP2	2030 SSP5
Flood	Moderate	↗	↗	↗
Extreme Precipitation	Moderate	→	↗	↗
Windstorm	High	→	→	→
Drought	Low	→	↗	→
Heat Wave	Low	→	→	→

How

Climate Risk Adaptation Plan to mitigate risk and make informed decisions

Providing a holistic climate risk assessment as input into a climate risk adaptation plan to **strengthen resilience** and be prepared for the **future risk landscape**.

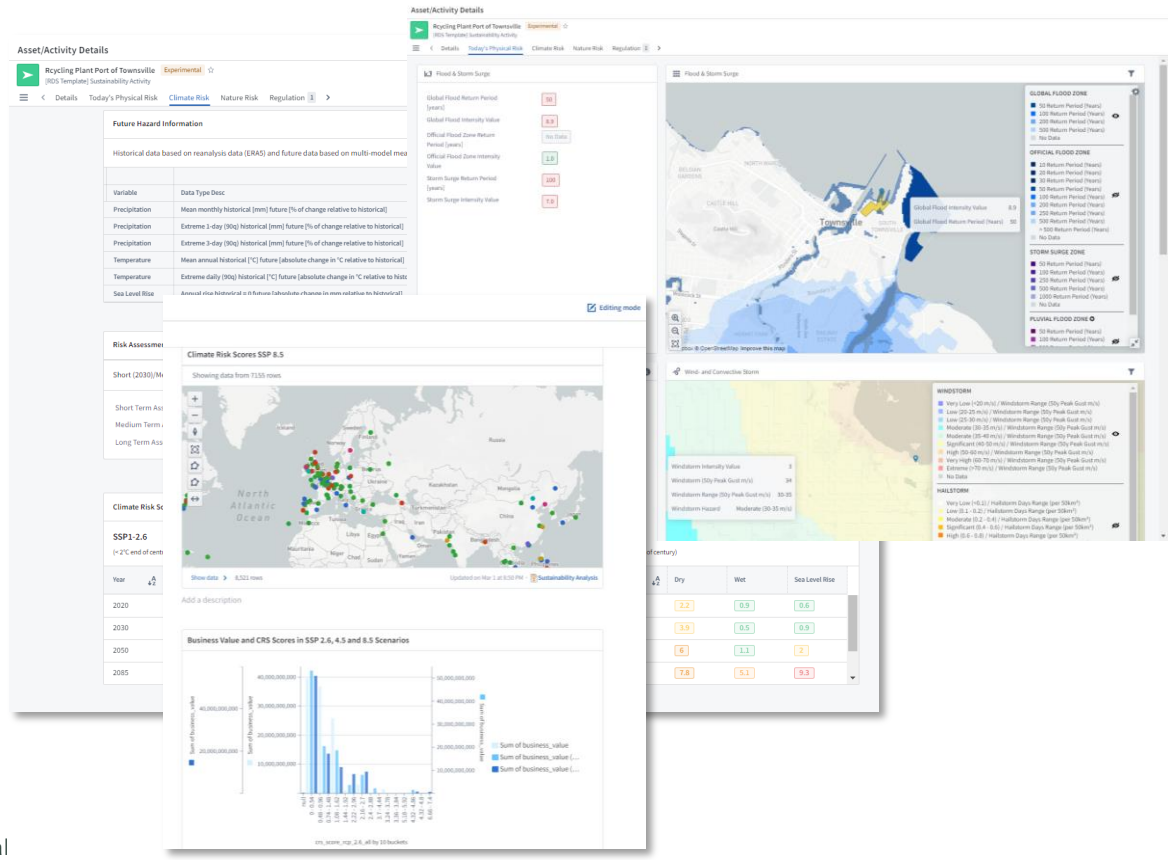
Physical Climate Risk – Climate Risk Scores

Description

Swiss Re's Climate Risk Score (CRS) framework combines the latest climate models used for the Intergovernmental Panel on Climate Change (IPCC) with both Swiss Re's 160-year experience in underwriting natural catastrophes and our proprietary hazard layers. We use three different Shared Socioeconomic Pathways[1] (SSP) scenarios to assess future climate risk: **SSP 1-2.6, SSP 2-4.5 and SSP 5-8.5**.

The key attributes, enrichments & outputs generated by the platform:

- Normalized Index (0-10) that serves as proxy to actual weather-related catastrophes such as **floods, wildfires, sea level rise, extreme precipitation and many more**
- **5-year time steps from 2020 to 2100**
- Risk Assessment: Besides the numeric index a level of concern for simplified risk assessment is provided. Today's risk view is combined with the normalized index to categorize future exposure into **Hazard Risk Categories** from very low to very high



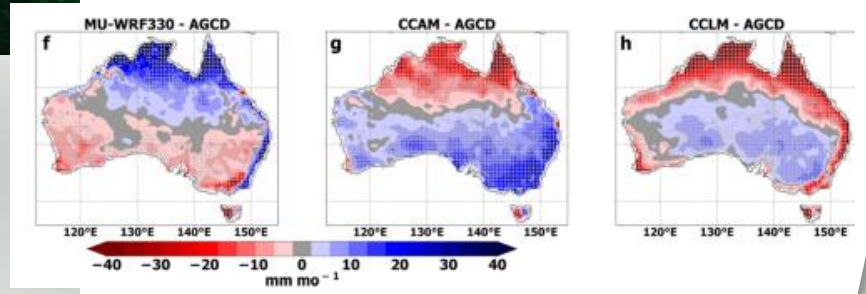
[1] These SSPs are now being used as inputs for the latest climate models, feeding into the Intergovernmental Panel on Climate Change (IPCC)

[2] Windstorm, Boreal Summer Precipitation, Boreal Winter Precipitation, Drought, Heat Wave, Cold Spell

Financial impact as common denominator for climate risks

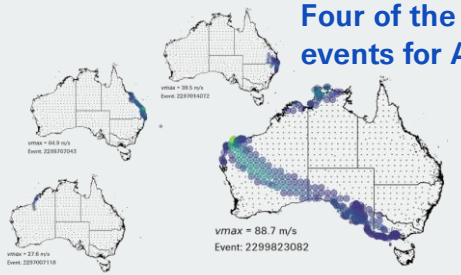
Leverage state-of-the-art climate data

Leveraging the same data on climate projections as for the Climate Risk Scores



Link to Swiss Re cat models

Reweighting of simulated natural catastrophe events



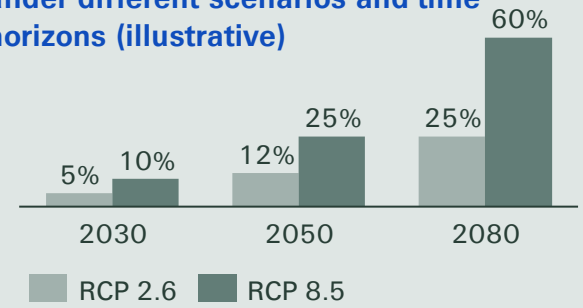
Four of the simulated TC events for Australia

Obtain relevant financial metrics

Applying to your portfolio to get

- Expected portfolio loss
- Change in extreme losses
  - 100-year loss
  - 200-year loss

Change in expected losses for flood under different scenarios and time horizons (illustrative)



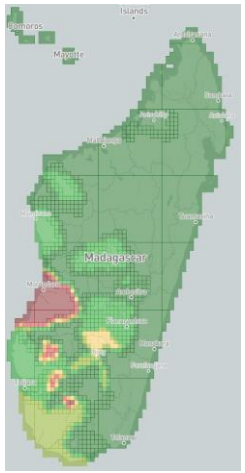
Impact on the supply due to a potential lack of ingredients
When and where: Example for vanilla

Madagascar is the biggest producer of vanilla; we can help to understand the risk of this supply chain

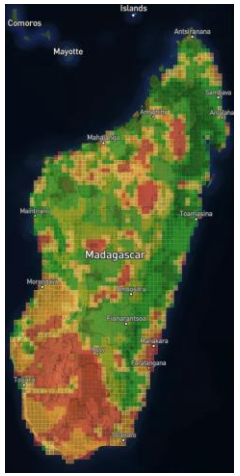
- 2018 vanilla price increased due to volatile weather of the fragile vanilla orchids
- The population of Madagascar is growing by 2-3% every year which causes additional resource shortage and already today 56% of the population lack access to safely managed drinking water
- Climate change will further increase the already fragile vanilla market of the country

Vanilla producing countries

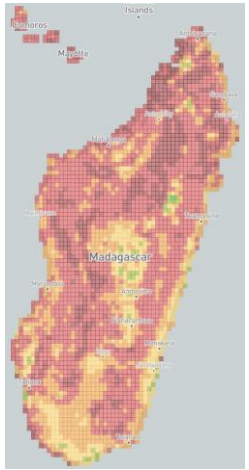
Water security



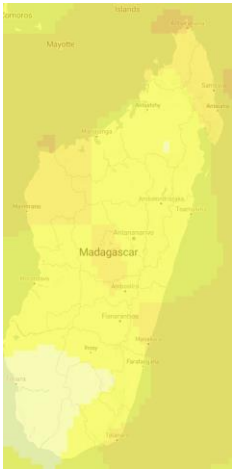
Water quality



General food provision



Drought risk by 2030



Moderate in the south, significant in the north

Financial impact on the vanilla supply chain

Appendix

Sustainability Compass for Physical Risks

1 Today's Physical Risk

Natural Hazard Layers

Evaluate present day risk exposure based on Swiss Re's natural hazard layers

Understand today's risk profile

Identify hot spots and key perils to assess and manage them in granular detail

2 Physical Climate Risk

Climate Risk Scores

Exposure assessment of property portfolios to different aspects of climate change (Future Physical Risk)

Analyze forward-looking scenarios

Build resilience by considering future uncertainties and possibilities

3 Nature Risk Exposure

Biodiversity & Ecosystem Services State, Dependency & Impact

Understand the state of Biodiversity & Ecosystem Services at any location

Identify potential dependencies

Assess the dependency & impact of your economic activities on Nature (e.g. Water Security)

Portfolio and asset level analysis: Results can be assessed as portfolio statistics or on single asset locations

Climate change impact on Nature Risk: Assess the impact of climate change on environmental changes such as water scarcity

Sustainability Reporting: Create automated reports that inform sustainability reporting (e.g. TCFD)

2 **Physical Climate Risk** – Climate Risk Score Framework

Climate Models

Global climate change projection data from different sources (CMIP6, CORDEX, NASA) used for the most recent IPCC AR6 report.

Resolutions:
- 0.44 x 0.44° (Regional CM)
- 1.0 x 1.0° (Global CM)
- 30 x 30m (Flood and Storm Surge zones)
- 300 x 300m (Wildfire)

Aligned with IPCC

Scores are calculated for 3 different IPCC scenarios:

+ Strong mitigation policy (SSP1-2.6)

+ Moderate mitigation policy (SSP2-4.5)

+ Business as usual policy (SSP5-8.5)

Acute and chronical risk

The CRS serves as proxy to actual weather-related catastrophes:

- Flood
- Extreme precipitation
- Seasonal precipitation change
- Windstorm
- Drought
- Heat wave
- Sea level rise
- Cold spell (Frost)
- Wildfire

Normalized Index

1
2
3

CRS scale range is from 0 -10, with higher scores indicating greater risk exposure.

Allows comparison across multiple hazards and locations across the globe.

Climate Risk includes 10 scores reflecting the impact of climate change on different hazards

Flood

Sea Level Rise

Extreme Rainfall

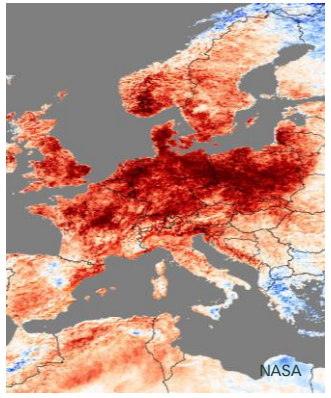
Summer Rainfall

Winter Rainfall

Windstorm

Drought

Heat Wave



Wildfire

Cold Spell

Three scenarios regarding climate change based on latest data representing different CO_2 Shared Socioeconomic Pathways (SSP):

SSP5-8.5: CO_2 emission continue to rise

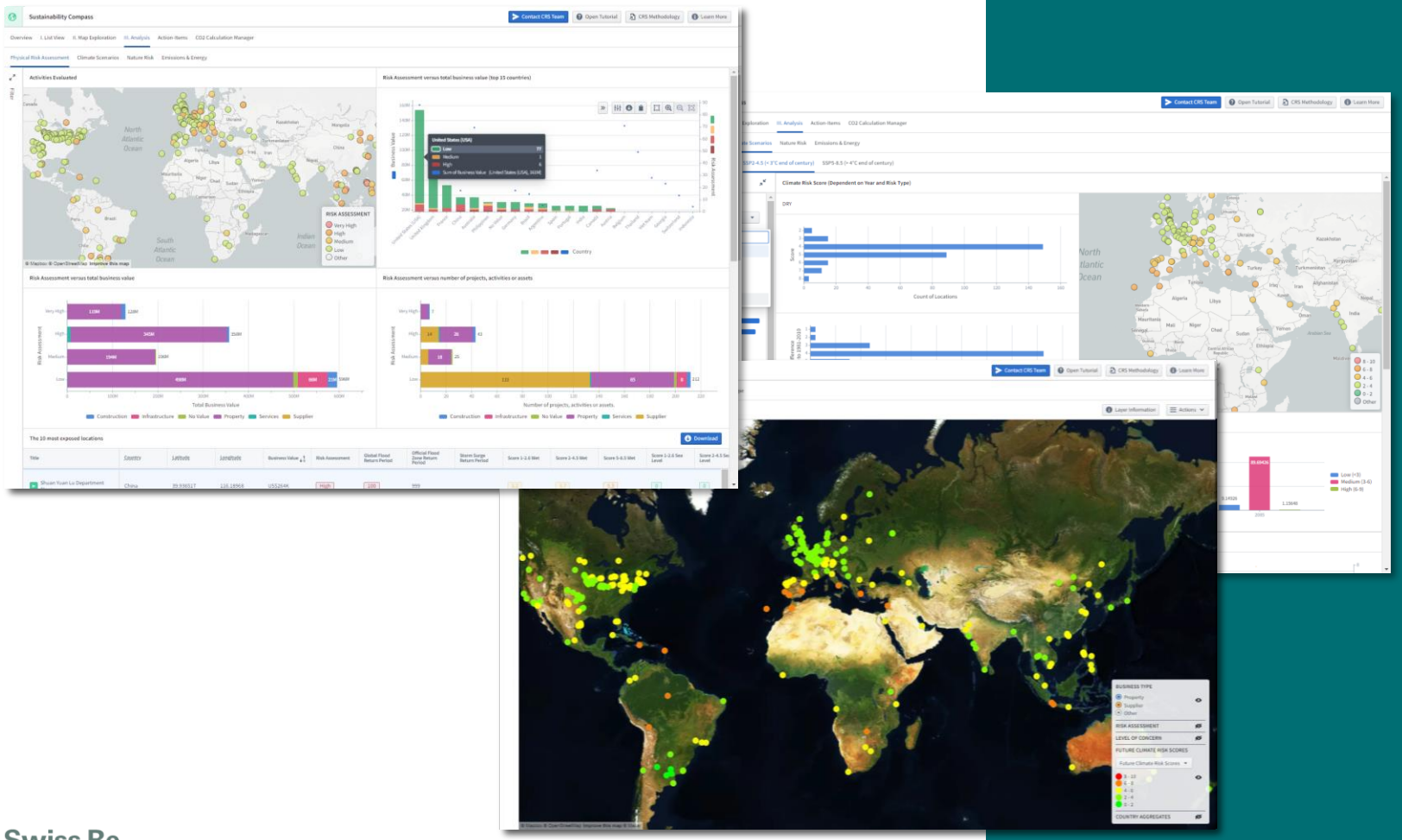
SSP2-4.5: Intermediate pathway

SSP1-2.6: Stringent pathway due to strict policies leading to less than a 2°C warming

Time steps available every 5 years from 2000 to 2100

1 Climate Scenario Analysis

Explore alternative future climate scenarios that alter the basis for “business-as-usual” assumptions



- Analyse forward-looking scenario based on the Shared Socioeconomic Pathways (SSPs) [SSP1-2.6; SSP2-4.5 & SSP5-8.5]
- Formulate mitigation and adaptation measures to be prepared for different climate future scenarios
- Build resilience by considering future uncertainties and possibilities

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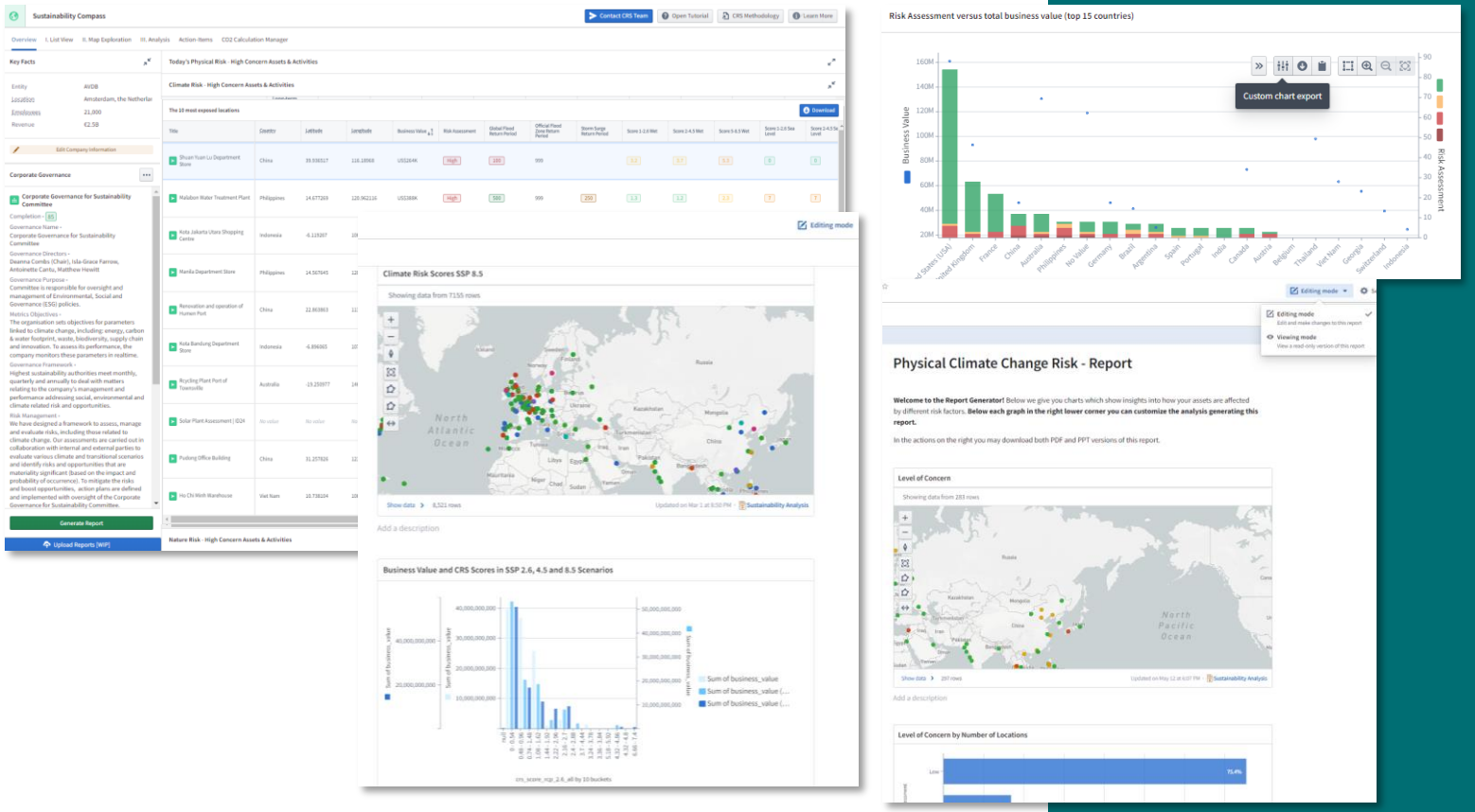
Please note data on screenshots is purely illustrative and specifically created for demo purposes

2 TCFD Reporting

Effectively meet disclosure



- Support processes and workflows to report information under the TCFD recommendations with ready to use templatized reports
- Quantify financial implications by linking CRS with Nat-Cat models to project expected loss impact (use of loss costs as a proxy for worth of assets in the future[1])
- Address individual requests for data and information on climate-related disclosure for internal and external stakeholders

[1] Explicit economic loss cost modelling for identified peril scenarios, currently not automated (annual expected losses calculated by SR climate risk experts)

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