carbon 4 finance

Measuring the full climate impact on investments

Presentation of Carbon Impact Analytics and Climate Risk Impact Screening

FEEM, 20th November 2020

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Carbon4 Finance: who we are

A data provider specialized in metrics for the financial sector

Carbon4 Finance develops Climate Data Solutions for investors and lenders. The company's clients are asset managers, asset owners, banks and index providers wishing to report their climate performance or develop climate investment tools and policies based on custom data solutions.

Carbone 4
10 years of expertise

2016 **Carbon4 Finance** creation

OUR SERVICES

- Climate data for portfolio carbon footprinting
- Scope 1, 2 & 3: induced emissions and emissions savings
- Assessment of assets' physical risks
- State-of-the-art platform for climate scenario alignment

OUR APPROACH

- An innovative bottom-up methodology
- 10 carbon data analysts specialized in different sectors
- Global coverage (c.10,000 securities, corporate and sovereign)

A multi-sector approach


BUILDINGS


ENERGY and MINING


AGRICULTURE, FOOD and WATER


TRANSPORT


FOREST, PAPER and WASTE


HEAVY INDUSTRY and MACHINERY


FINANCIAL

Carbon4 Finance: who we are

Our partners

When creating Carbone 4 ten years ago, we believed that tackling climate change had to be a core business issue for many players. It implied that we had to develop new tools and shift mindsets.

Alain Grandjean

- Over 15 years of experience as a climate economist and advisor
- Co-author of key reports on carbon pricing & climate finance:
  - For the President of the French Republic (June 2015)
  - For the President of the COP21 (June 2016)
- Member of the Strategic Committee of the FNH (Fondation pour la Nature et l'Homme)

Jean-Marc Jancovici

- Over 15 years of experience as a senior climate advisor
- Developer of the carbon footprinting methodology (*Bilan Carbone*) on behalf of the ADEME (until v6)
- Founder and President of the think-tank *The Shift Project* since 2010
- Key speaker and trainer on climate and energy (+800 lectures and speeches)
- Author of 7 books on climate change

Laurent Morel

- Former CEO for KLEPIERRE, at a time of very successful transformations, leading to a radical change in the company's profile, size & ownership.
- Former CEO for ARTEGY
- Former CFO and co-founder for ARVAL
- Study leader for Afep on the challenges of reporting climate risks

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An array of services adapted to your challenges

Consulting services

- Prospective studies, economic modeling and sensitivity tests
- Sectorial studies, mapping of stakeholders, technical and economic challenges
- Environmental and carbon footprint
- Science-based target setting, action plan for the low-carbon transition
- Marketing and communication strategy
- High-level interactive seminars and customized training sessions

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- Specialized offer for the financial sector
- Bottom-up analysis of portfolio constituents covering all asset classes
- Database access or customized analysis
- Reporting guidance and investment strategy

Data subscription & portfolio analysis

Carbon4 Finance, a pioneer in measuring the carbon impact of financial institutions

Securities portfolio

- ✓ TCFD-compliant reporting
- ✓ Transition and Physical risk
- ✓ Bottom-up data on a large investment universe (Equity, Sovereign & EURO IG issuers, Green Bonds)
- ✓ Additional sectoral data (energy, reserves, etc.)

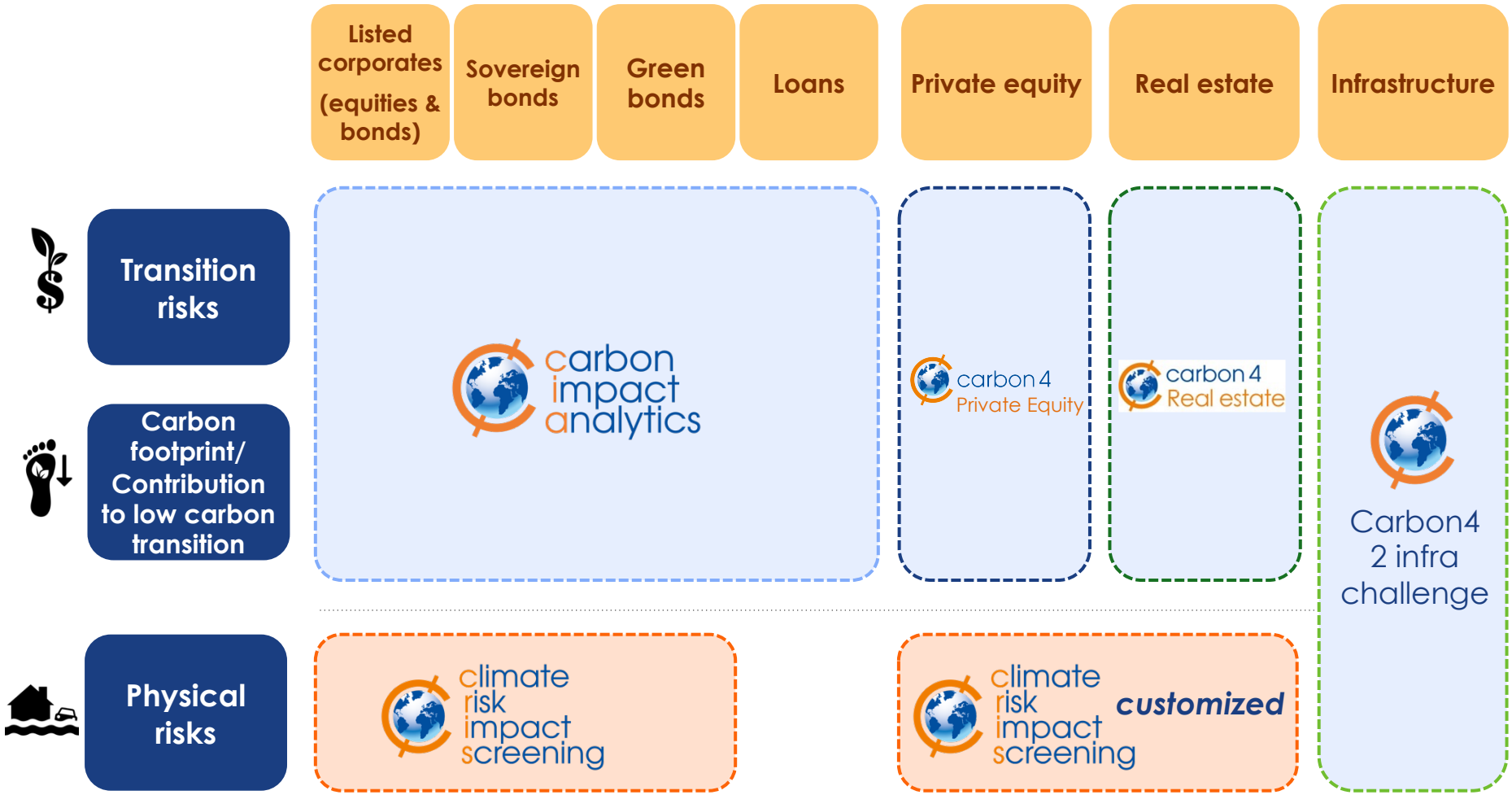
Index & Indices

- ✓ Recast of Low Carbon 100, Euronext's low carbon index
- ✓ Dataset to develop structured & derivative investment products

Real Assets & Private Debt

- ✓ Carbon footprint of Loan & Credit Portfolios
- ✓ Implementation of climate score into credit process
- ✓ Pre-investment due diligence (Private Equity / Infrastructure)
- ✓ Real Assets Portfolio review (PE, Real Estate, Infra)

Common methodological principles for all asset classes



Common methodological principles for all asset classes: bottom-up logic, measurement of Scope 3 emissions and emissions savings, qualitative forward-looking assessment, etc.

Carbone 4 offers the financial sector a complete climate risk analysis package

"With better information as a foundation, we can build a virtuous circle of better understanding of tomorrow's risks, better pricing for investors, better decisions by policymakers, and a smoother transition to a lower-carbon economy."

– Mark Carney, Financial Stability Board (FSB) Chair and Governor of the Bank of England

December 14, 2016: The ***Task Force on Climate-related Financial Disclosures*** (TCFD) issues its recommendations for disclosure of **2 major categories of climate-related risks.**

Two climate risks…

Two dedicated offers

Transition Risk

The financial risks resulting from the process of adjustment towards a lower-carbon economy *(policy changes, new technology, etc.)*

↔ carbon impact analytics

Physical Risk

Impacts on insurance liabilities and the value of financial assets that arise from climate- and weather-related events *(floods, droughts, storms, etc.)*

↔ climate risk impact screening

Agenda

Presentation of Carbon4 Finance

Presentation of Carbon Impact Analytics

Presentation of Climate Risk Impact Screening

Our solution regarding climate performance and transition risk assessment has 4 methodological pillars

- **Bottom-up approach** for more information, data precision, comparability, and qualitative analysis

  In-depth assessment of portfolio constituents, followed by aggregation at the portfolio level

- **Value chain assessment including scope 1, 2 and 3 emissions**, to shed light on the "real" carbon dependency of assets

  Sector-specific analysis with focus on high-stakes sectors and elimination of double counting

- **Assessment of emissions savings**: going beyond carbon footprinting to measure contribution and steer investments towards assets best positioned for the low-carbon transition

- **Forward-looking analysis**: where are your assets headed?

  Rating system comparing company strategy, targets, and investments to 2-degree scenarios and sectoral benchmarks

Report on carbon impact and best practices

Stock-pick and manage investments within a sector (best-in-class) and between sectors

Enhance dialogue with portfolio constituents

Bottom-up Analysis

An in-depth, security-level approach gives you…

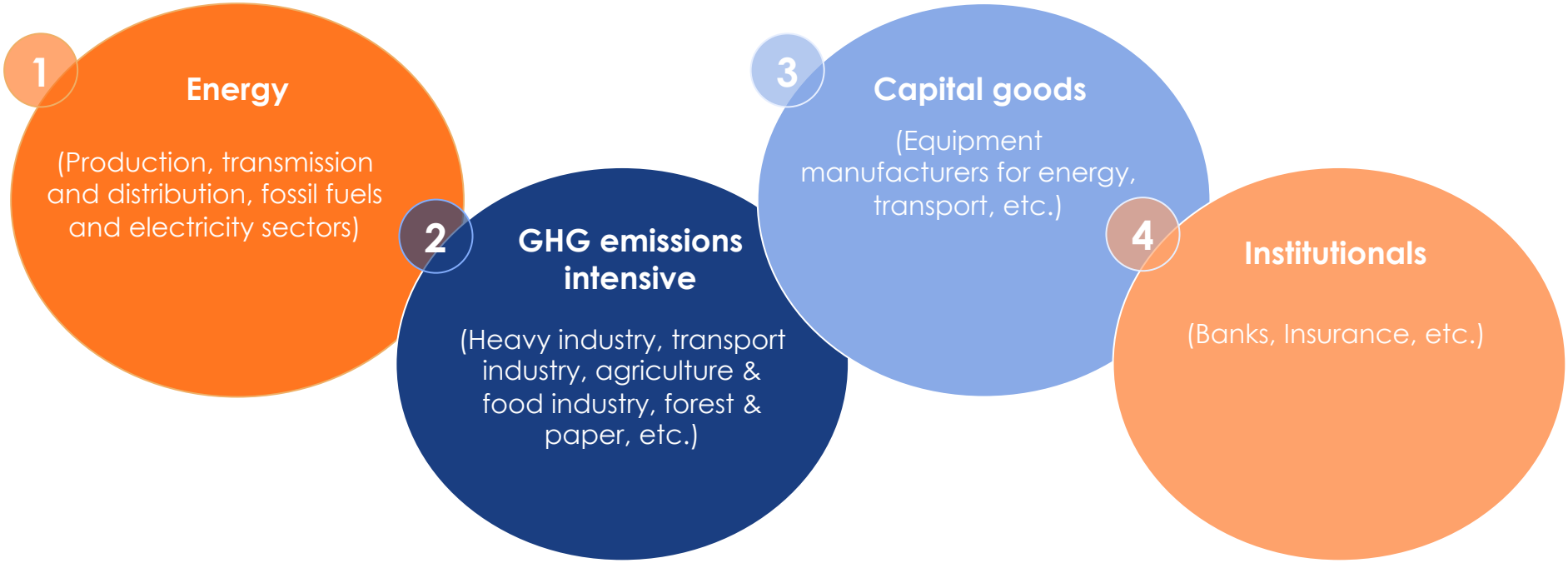
more information,

more accurately,

to better compare company performances, enhance dialogue, and reward the best in class.

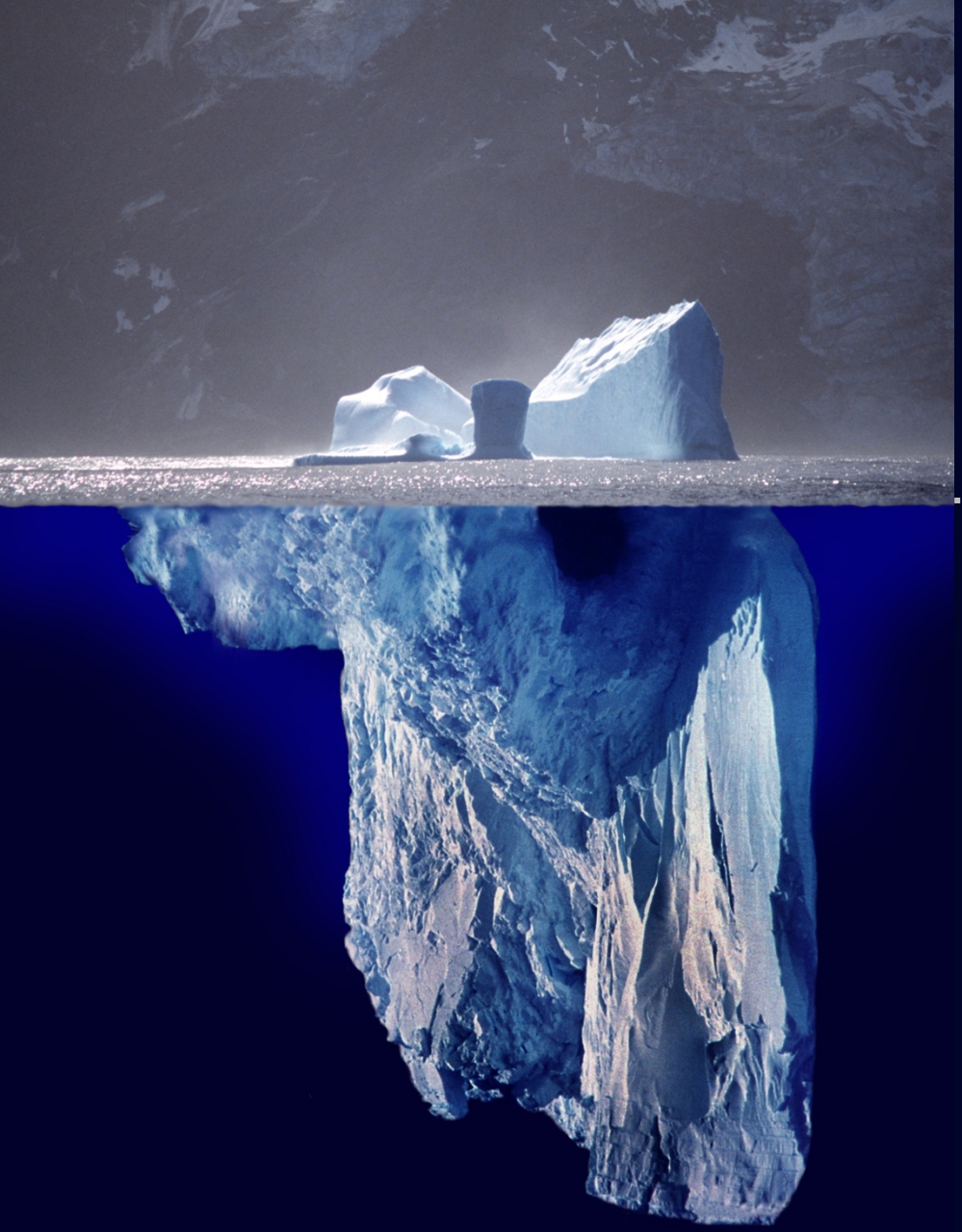
A detailed analysis focusing on high-stakes sectors for the low carbon transition

List of **high-stakes sectors*** for the low-carbon transition



- **Induced and saved emissions (scope 1, 2 & 3) are calculated** over the same scope of activity and the same time period, using around 40 sector-specific calculation modules.
- Energy players are strong contributors for scope 2 emissions through out the value chain.
- Scope 3 is calculated for every high-stakes sectors on the most material perimeter.

* All sectors identified by the TCFD are considered high-stakes and subject to detailed analysis by the CIA method.



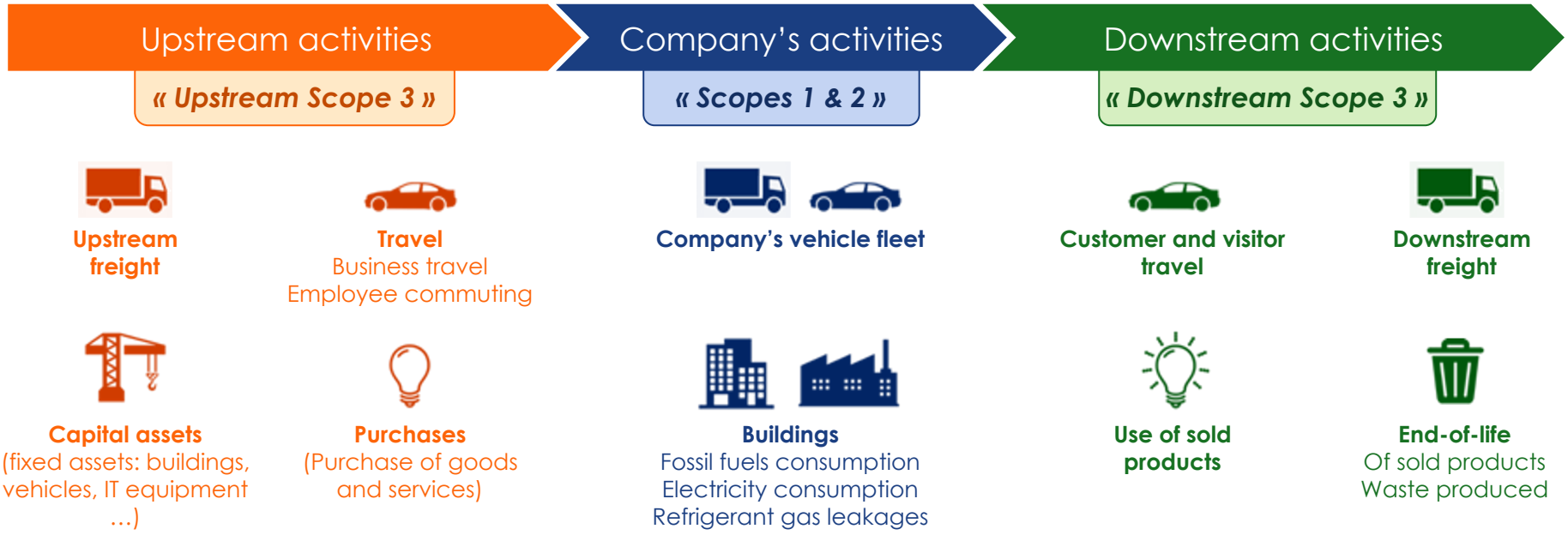
Scope 3

Shedding light on the real carbon dependency of a portfolio

Carbon accounting basis

What is scope 3?

- Accounting for scope 1, 2 and 3 emissions is the only way to capture climate challenges in a comprehensive way:



Methodology and sources used are based on the Greenhouse Gas Protocol, developed by the WRI and the WBCSD.

Please note that the following sources applying for specific activities are not represented in this illustration: investments, franchises (downstream) and leased assets (upstream). The upstream of fossil fuel is not represented either.

Emissions Savings

Measuring the contribution of investments to the low-carbon transition

How emissions savings are assessed?

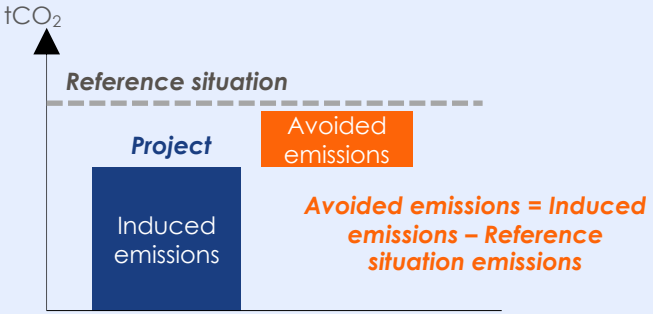
Emissions savings allow asset owners and managers to steer investments towards solutions for the low-carbon transition

Emissions savings =
avoided emissions + reduced emissions

Replacement of the emissions that would have occurred without the company's activities :

- Comparison with a **reference scenario**

(Ex.: IEA 2° C trajectory for power production's carbon intensity)



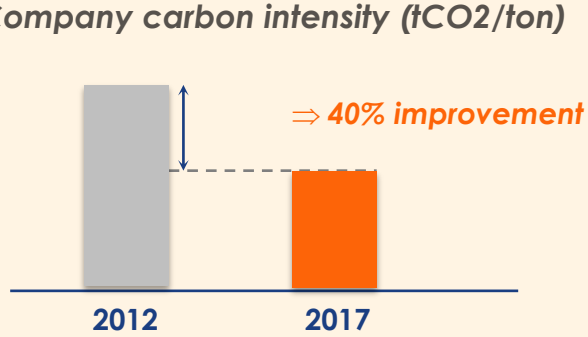
- Substitution by **low-carbon solutions**

(Ex: replacement of the fleet by more efficient vehicles)

Based on **process efficiency** over a long period :

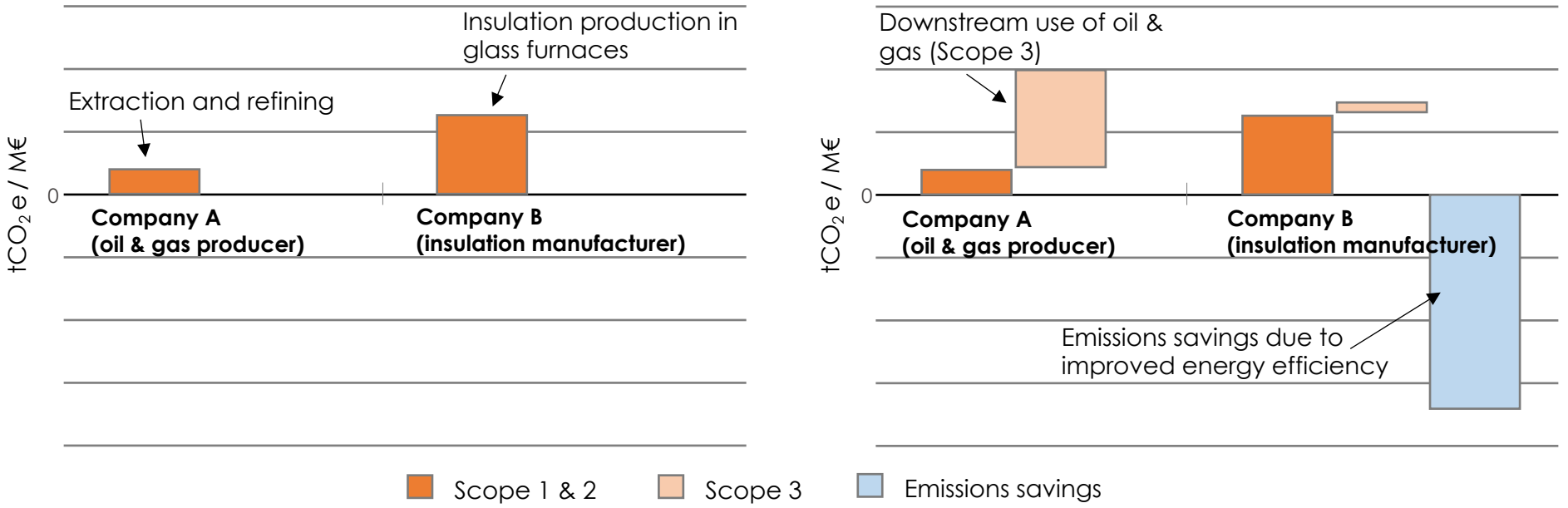
- Carbon intensity evolution

(Ex.: company's carbon intensity (tCO_2/ton or production unit) year Y-5)



Scope 3 induced emissions and emissions savings are crucial to understanding true impact of issuers

Scope 1 and 2 induced emissions only **VS.** **Scope 1, 2, and 3 emissions and savings**



When only Scope 1 & 2 emissions are considered, Company B appears more emissions intensive.

Once Scope 3 emissions are considered, Company A becomes more emissions intensive. ***Company B has significant emissions savings whereas Company A has none.***

$$\textbf{Carbon Impact Ratio (CIR)} = \frac{\text{Emissions Savings}}{\text{Induced Emissions}}$$


Forward-looking analysis
Where is your portfolio headed?
© Diego Barbieri

Focus on the forward-looking rating: carbon impact evolution

The forward-looking rating is based on the assessment of four objective sub-criteria specific to each sub-sector. Criteria are based on sectoral benchmarks and 2-degree scenarios.

Four sub-criteria

- ***Company strategy regarding climate change***
- ***Weight of investments in low carbon projects or R&D***
- ***Reduction target for scope 1+2 intensity***
- ***Reduction target for scope 3 intensity***

Scale from 1 to 4

The Company has set a target for the carbon intensity of its production lower than 184 gCO2/kWh, in line with the IEA's 2°C scenario by 2035.	The Company has set a target for the carbon intensity of its production between 184 and 381 gCO2/kWh, in line with the IEA's 2°C scenario by 2025. **2**	The Company has set a target for the carbon intensity of its production between 381 and 451 gCO2/kWh, in line with the IEA's 4°C scenario by 2025.	The Company has not set a target for the carbon intensity of its production.
The Company's capital expenditures are in line with the IEA's 2°C scenario for 2035: the share of new low-carbon sources (renewable or nuclear) in total capex is higher than 79% in $ or higher than 58% in capacity.	The Company's capital expenditures are in line with the IEA's 2°C scenario for 2025: the share of new low-carbon sources (renewable or nuclear) in total capex is higher than 72% in $ or higher than 49% in capacity.	The Company mentions specific projects and investments in low-carbon sources but without quantitative information, or resulting share of low carbon over total capex sources higher than 60% in $ or 35% in capacity (in line with the IEA's 4°C 2025 scenario). **3**	The Company does not mention specific projects and investments in low-carbon sources (renewable or nuclear), or without quantitative information, or the resulting share of low carbon in total capex is lower than 60% in $ or 35% in capacity.
The Company has set an ambitious reduction target for the carbon intensity of its production: -3% per year or more.	The Company has set an ambitious reduction target for the carbon intensity of its production: between -1.5% and -3% per year.	The Company has set an ambitious reduction target for the carbon intensity of its production: between -0.5% and -1.5% per year.	The Company expects to maintain its carbon intensity or has no reduction target. **4**
The Company has set an ambitious reduction target for emissions related to the energy consumption (in kWh/m2) of its property holdings, higher than 5% per year.	The Company has set a reduction target for emissions related to the energy consumption (in kWh/m2) of its property holdings which is higher than 3% per year.	The Company has set a reduction target for emissions related to the energy consumption (in kWh/m2) of its property holdings which is lower than 3% per year. **3**	The Company has not set a reduction target for the emissions related to the energy consumption (in kWh/m2) of its property holdings.

*Thresholds are based on **market benchmarks and 2-degree scenarios observed in each sector**.*

*A company is rated following the actions it plans to **contribute to climate change mitigation.***

Forward-looking rating is:

3

Our final score at issuer level: construction of the overall rating

High-stakes sectors overall rating

Low stakes sectors

Carbon Impact Ratio

$$\frac{\textit{Emissions savings}}{\textit{Induced emissions}}$$

Forward-looking rating
(scale from 1 to 4)

Other sectorial criteria
- *Emissions factor*
- *Share of gas in production mix*
- *…*

Level of contribution to climate change mitigation

Scale from A to E


A: High contribution


B: Significant contribution


C: Limited contribution

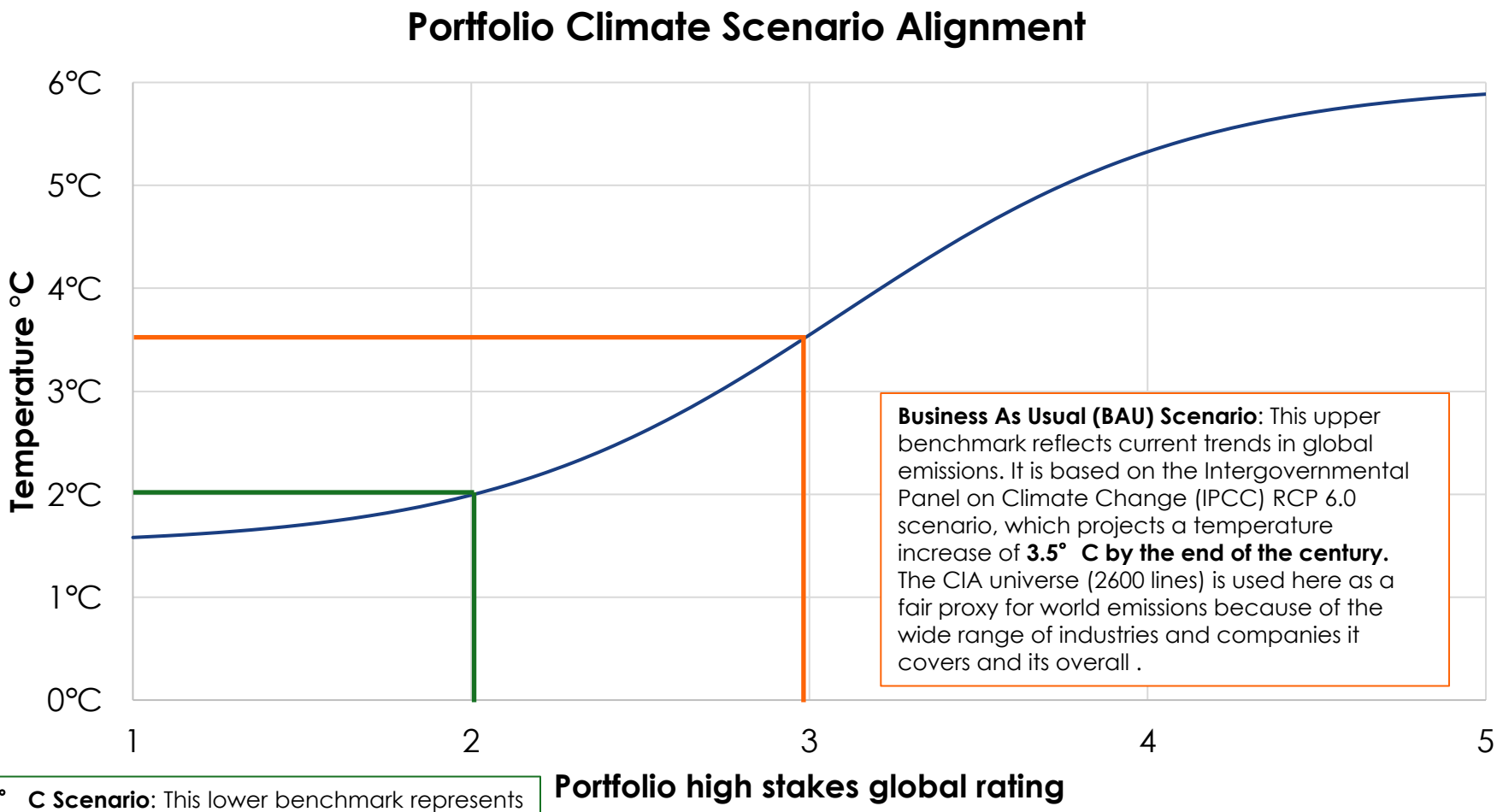

D: Insufficient contribution


E: Incompatible

Level of contribution to climate change mitigation


C : Limited contribution

Scenario-related benchmarks enable to assess the climate alignment of portfolios



2° C Scenario: This lower benchmark represents a scenario in which the ambitions of the Paris Agreement to cap temperature increase to 2°C by the end of the century is met. In order to establish this benchmark, we built a portfolio that reflects a decarbonised economy and for which the overall rating reflects a 2°C increase.

Focus on listed equity & bonds
Approach and key indicators

- Segmentation between **high-stakes sectors** (detailed on next slide) **and low-stakes sectors**
- Calculation of scope 3 emissions and savings: operational data collected from annual reports for high-stakes sectors
- Simplified analysis (induced scope 1&2) for low-stakes sectors

	Indicators provided at both the company and portfolio level	Units
Quantitative analysis	**Induced emissions scope 1, 2 & 3**	tCO_2
	Emissions savings scope 1, 2 & 3 + CIR	tCO_2
	Financial carbon intensity	tCO_2/M€ of investment or revenue
Qualitative analysis	**Forward looking strategy of the company**	From ++ to --
	Overall rating + alignment with 2°C trajectory	From A to E
Energy and sector-specific indicators	**Green and brown shares, energy consumption/production mix, fossil fuel reserves, and other sector-specific indicators**	% revenue, MWh, MMBOE, etc.

Agenda

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Physical risks materialize on assets, supply chain and revenues

The example of the 2011 Thailand floods

An economic cost estimated at more than $45bn whose only **22%** were insured: **9,859 factories** closed, **1,700 roads destroyed** or paralysed, etc.

Direct and indirect impacts on:

The automotive industry

- **6,000** cars not produced each day in the Thai car factories
- **67 M$** the cost incurred by Nissan to restore its production line
- **50%** decrease in production of Honda's factories in the US and Canada

The electronic industry

- **45%** of hard drives in the world were produced in Thailand in 2011
- **235 M$** the loss for the industrial company Western Digital
- **x2** the increase in hard drive prices following the floods

***Source**: Riverside (2012)*

Carbone 4 has developed CRIS – a methodology to assess physical risk exposure intended for financial institutions

A one-year development project

Climate Risk & Impact Screening (CRIS) is a service to evaluate **corporate, infrastructure** and **sovereign investment** portfolio exposure, to physical risks

Crisforfinance.com

Supported by major financial institutions

Sponsors

Soutiens

And international experts


Ben Caldecott
-Oxford-


Thierry Cohignac
-CCR-


Gael Giraud
-AFD-


Hervé Guez
-Mirova-


Céline Guivarch
-CIRED-


Stéphane Hallegatte
-World Bank-


Hervé Le Treut
-IPSL-


Morgane Nicol
-I4CE--

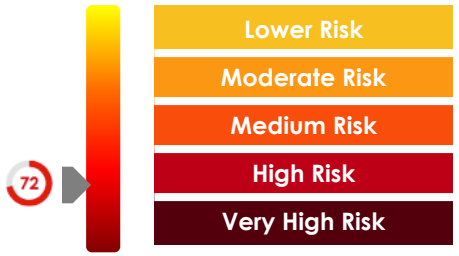

Nathalie de Noblet
-LSCE IPSL-

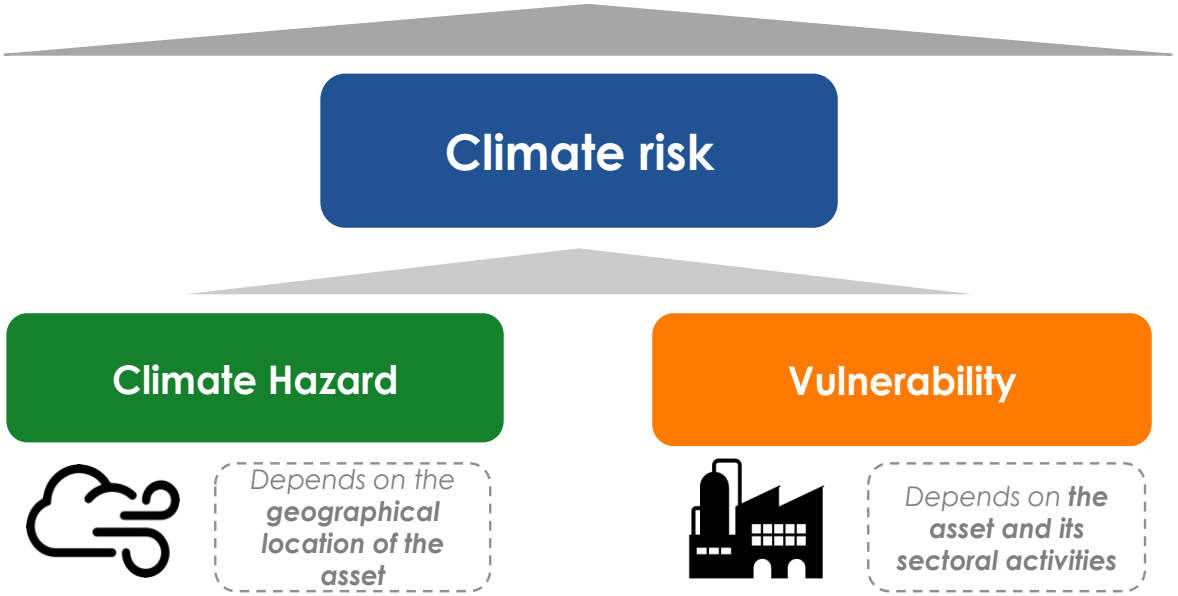

Antonin Pottier
-CERNA-


Nick Robins
-UNEP Inquiry-

Physical risk score result from Climate hazard and vulnerability matrix

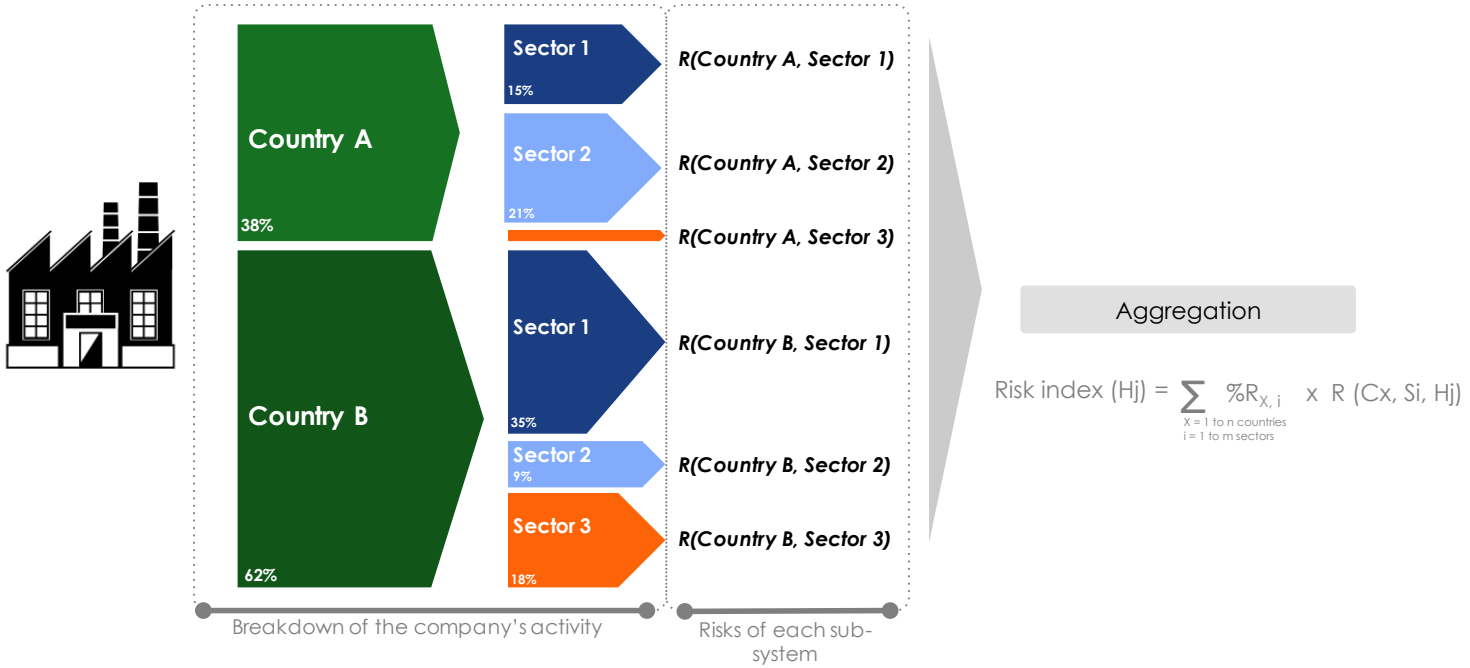
Scores on physical risks for each fiancial asset (company, infrastructure, sovereign) and at the portfolio level



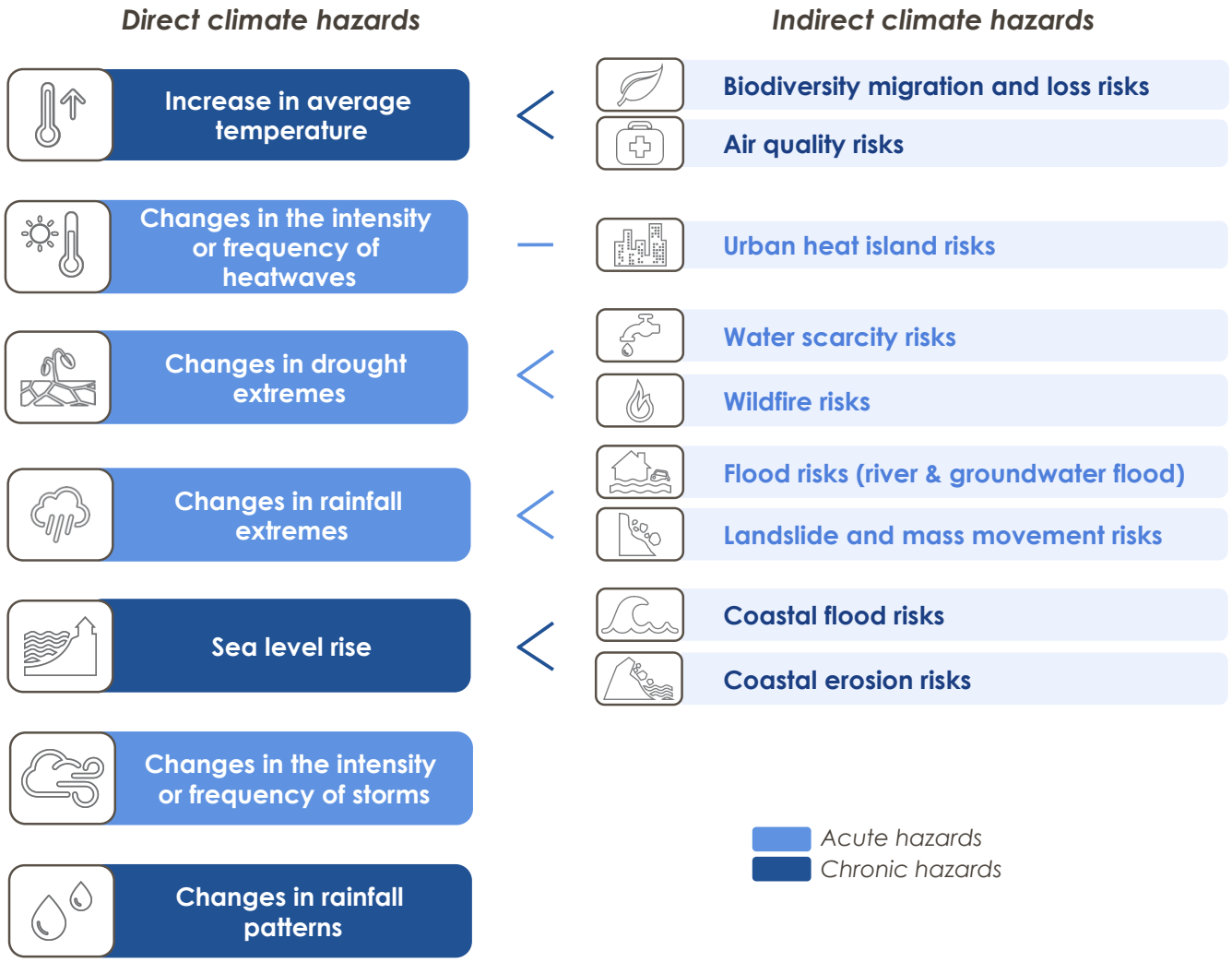


A bottom-up analysis based on the geographic and sectoral breakdown of each company's activities

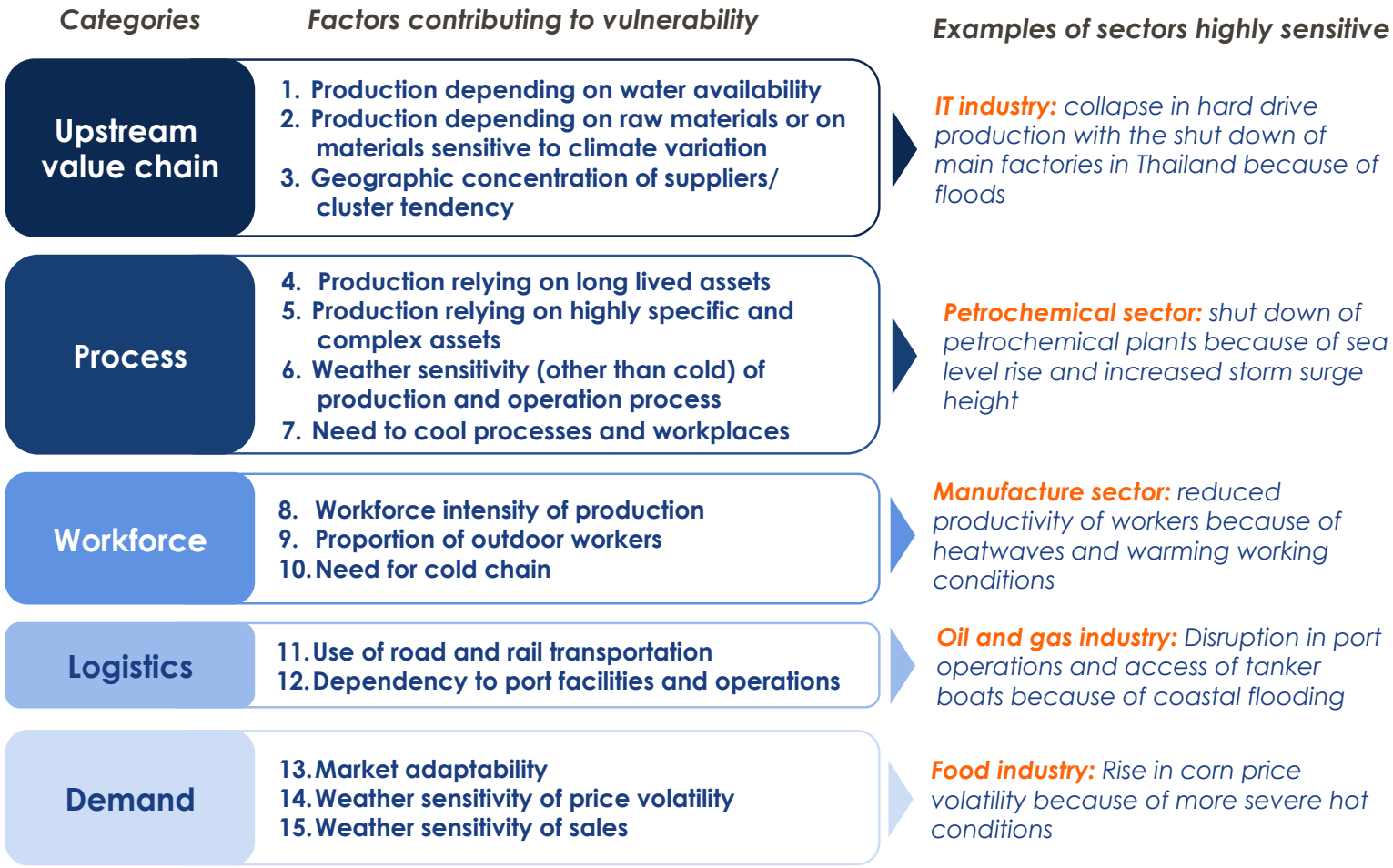
- At the company level, for each climate hazard, **risk is a combination of the risks of each country-sector coupling composing its business**, weighted by the breakdown of its activity in each of these couples.
- The **indicator used to understand the geographic breakdown depends on the capital intensity of the sector** (CAPEX to revenue ratio): fixed assets for high capital intensity sectors, and revenue for low capital intensity sectors.



CRIS covers 7 direct climate hazards and 9 indirect hazards



Our sectoral profiles are built upon 15 vulnerability factors



Establishing physical risk scoring that could be applied at portfolio and constituents levels

Portfolio XXX

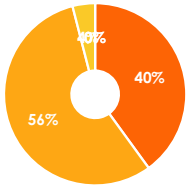
Risk rating 2050/medium scenario **35**

Portfolio rating **35**

Benchmark rating **34**

Portfolio description	XXX portfolio
Year of analysis	2016
Number of securities	25
Total value of portfolio	XXX EUR million
Asset classes covered	Listed companies
Benchmark description	278-listed-company sample

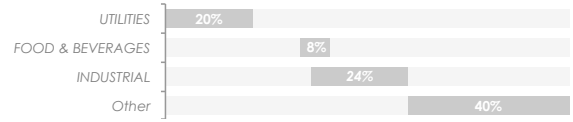
Distribution of portfolio constituent risk ratings



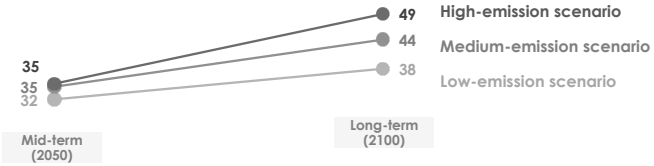
Lower Risk
Moderate Risk
Medium Risk
High Risk
Very High Risk

Score Key

Portfolio exposure to most vulnerable sectors



Aggregated risk rating sensitivity analysis for various scenarios and time horizons



Securities most at risk and their ratings

1. Alpha 1 - 51
2. Alpha 2 - 49
3. Alpha 3 - 45
4. Alpha 4 - 44
5. Alpha 5 - 43

Securities most at risk and their ratings

1. Alpha 25 - 16
2. Alpha 24 - 21
3. Alpha 23 - 22
4. Alpha 22 - 22
5. Alpha 21 - 23

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Portfolio XXX

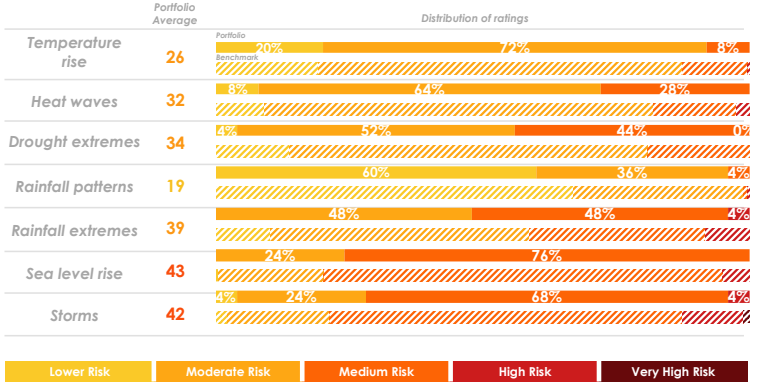
Risk rating 2050/medium scenario **35**

Top climate hazards:

- Sea level rise **43**
- Storms **42**
- Rainfall extremes **39**

Breakdown of risk rating by climate hazard, using a medium-emission scenario for 2050

Ratings for each hazard are expressed on a 0-99 scale across all scenarios, time horizons and countries.



Lower Risk | Moderate Risk | Medium Risk | High Risk | Very High Risk

Score Key

Methodology

The risk rating is a combination of location-specific climate hazards and industry-specific vulnerabilities. Mapping the sectoral and geographical breakdown of a company's activities is based on the financial information disclosed by the company. The risk assessment is carried out for each climate hazard and business unit, before being aggregated at company-level. The multi-hazard risk rating is then elaborated with more weight given to acute hazards than chronic hazards. As for each hazard-specific risk rating, the final multi-hazard rating is given on a 0-99 scale across all scenarios and time horizons. Climate information used is country-level. Vulnerability information captures value-chain potential impacts. No information on existing adaptation measures is included in this analysis.

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Measuring the full climate impact on investments

Thank you!

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