



MOODY'S | ESG Solutions

# Moody's ESG conference



June 2021

# Priorities for Strategic Growth: ESG Integrated Across All Platforms, Driving Growth and Enhanced Relevance



## MIS Integration

- Credit Ratings & Research
- ESG Credit Scores
- ESG Classification
- Heat Maps

## MA Integration

- Real Estate Solutions
- Moody's.com
- Risk Analytics & regulatory reporting
- Lending solutions and tools
- APIs, and Data Feeds

## Moody's ESG Solutions

- ESG Measures
- Climate Solutions
- Index Solutions
- SME Solutions
- Sustainable Finance

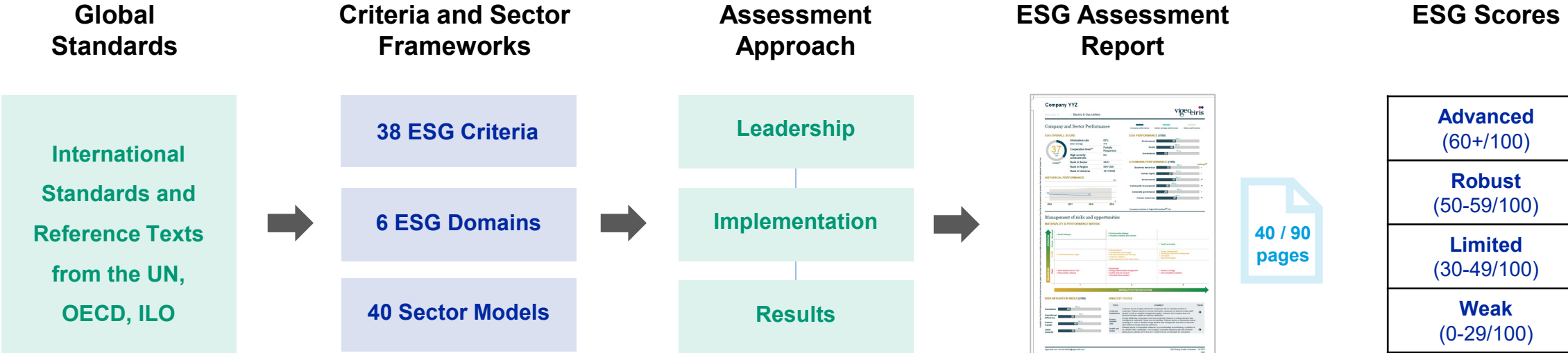
# Agenda

1. ESG and climate risk assessment : Richard Porte
2. Extend the ESG scoring to the non rated universe : Wilfrid Xoual
3. Context and challenges for banks : Omar Megzari
4. Climate adjusted probabilities of default : Alexis Hamar

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ESG Assessment  
Methodology

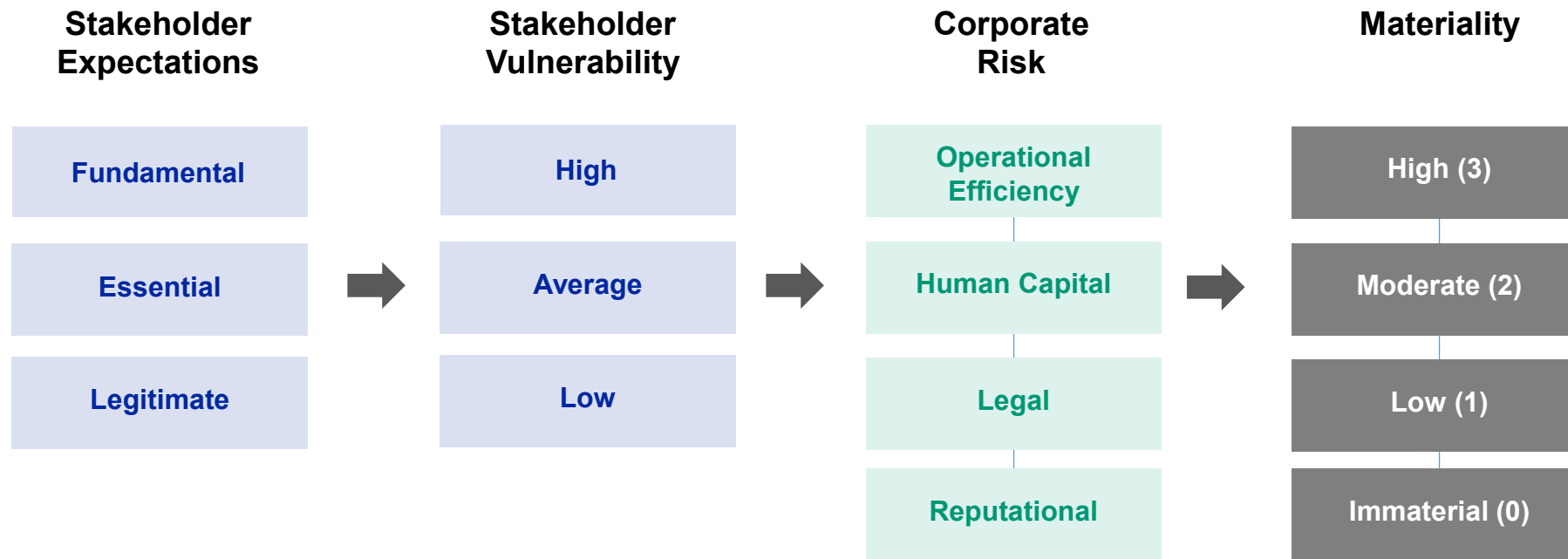
# Methodology



ESG assessment methodology built around international standards and reference texts. ISO9001 quality certified research methodologies and processes



# Materiality Approach

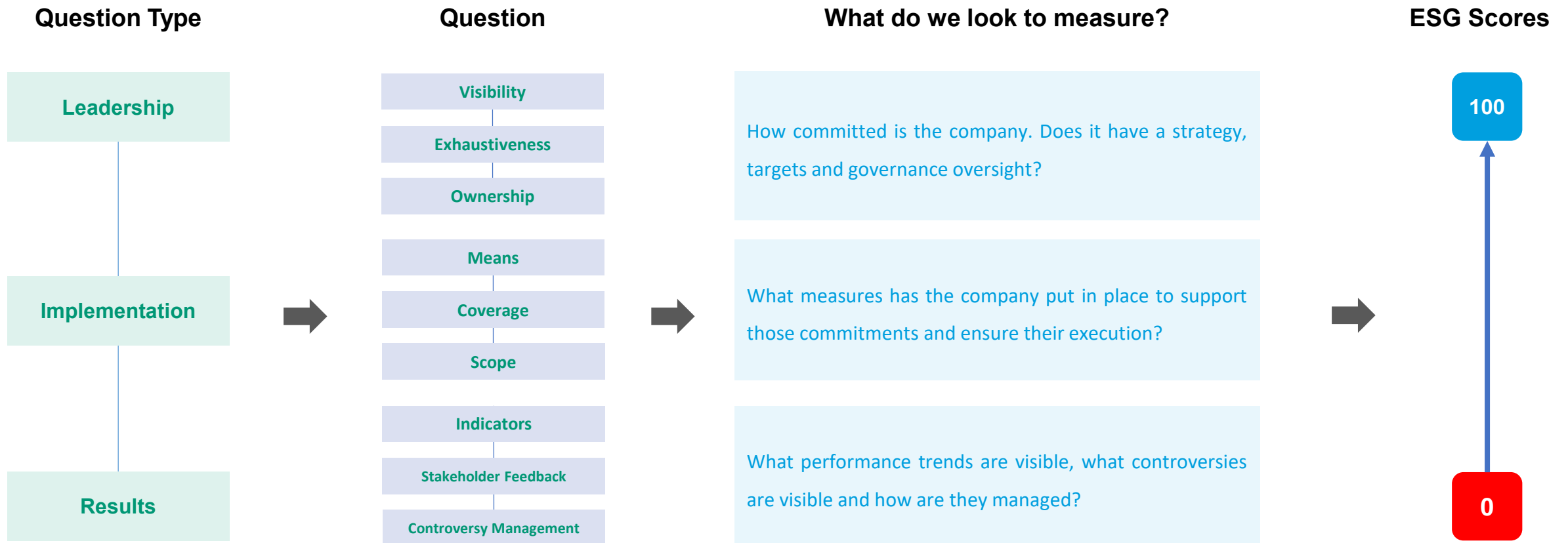


A distinct approach, integrating the impact of ESG factors **on companies** as well as the impact of companies **on stakeholders**.



# Managerial Analysis

Providing the full picture on ESG management



# ESG Criteria

## ESG CRITERIA

### Environmental Domain

Environmental Strategy  
 Pollution Prevention and Control  
 Green Products and Services  
 Biodiversity  
 Water  
 Energy  
 Atmospheric emissions  
 Waste management  
 Local Pollution (noise/vibration)  
 Transportation  
 Impacts of Product Use and Disposal

### Business Behaviour Domain

Product Safety  
 Information to Customers  
 Customer Relations  
 Sustainable Supplier Relationships  
 Environmental Standards in the Supply Chain  
 Social Standards in the Supply Chain  
 Corruption  
 Anti-Competition  
 Lobbying

### Human Resources Domain

Social Dialogue  
 Employee Participation  
 Reorganisations  
 Career Development  
 Remuneration Systems  
 Health and Safety  
 Working Hours

### Human Rights Domain

Fundamental Human Rights  
 Fundamental Labour Rights  
 Non Discrimination and Diversity  
 Child and Forced Labour

### Corporate Governance Domain

Board of Directors  
 Audit and Internal Controls  
 Shareholders  
 Executive Remuneration

### Community Involvement Domain

Social and Economic Development  
 Societal Impact of Products and Services  
 Philanthropy



# 2

## Climate Risk identification & quantification

# Moody's Climate Solutions

Forward-looking exposure metrics and risk analytics

## Climate Risk Identification

### Physical Risk Data

Forward-looking data capturing exposure to 6 climate hazards with 2.5m corporate facilities globally; 17m commercial real estate properties in the US; and global sovereigns. On-demand scoring is available.

### Transition Risk Data

Assessments to identify transition risk exposure from different fossil fuel resource types and power generation technologies. On-demand scoring is available.

### Climate Governance

Assessments of climate risk disclosures and their ability to seize opportunities presented by climate change.



## Climate Risk Quantification

### Macroeconomic Scenarios

Climate-adjusted macroeconomic forecasts with an 80-year horizon. Fully aligned with the Network for Greening the Financial System's (NGFS) representative scenarios for physical and transition risk.

### Climate-Adjusted PDs

Climate-adjusted probability of default (PD) for listed and unlisted companies powered by Moody's award-winning Expected Default Frequency (EDF™) model.

### Climate Pathway Scenarios

Tools that translate climate pathways into financial risk variables to inform asset allocation and liability models. Based on Moody's award-winning scenario generation software.

# What's Delivered to You for Climate Solutions

## Comprehensive Asset Class Coverage and More to Come

Asset Class	Coverage	Climate Risk Identification		Climate Risk Quantification
		Transition Risk Scores, Carbon Emission, and Fossil Fuel Involvement	Physical Risk Scores and Underlying Data	Climate Adjusted PD/LGD
Publicly Traded Entities (Corporate Bonds/Equity)	5,000 companies assessed (10,000 by year end), 50,000 estimated	✓	✓	✓
Private Entities	On-demand, unlimited	✓	✓	✓
Muni Bonds, sub-sovereign	US states, counties, 30,000 cities, etc.		✓	
Sovereign	Global	forthcoming	✓	forthcoming
Commercial Real Estate	US	forthcoming	✓	✓
Residential Mortgages	US, UK		✓	✓
Structured Products	On-demand		✓	forthcoming

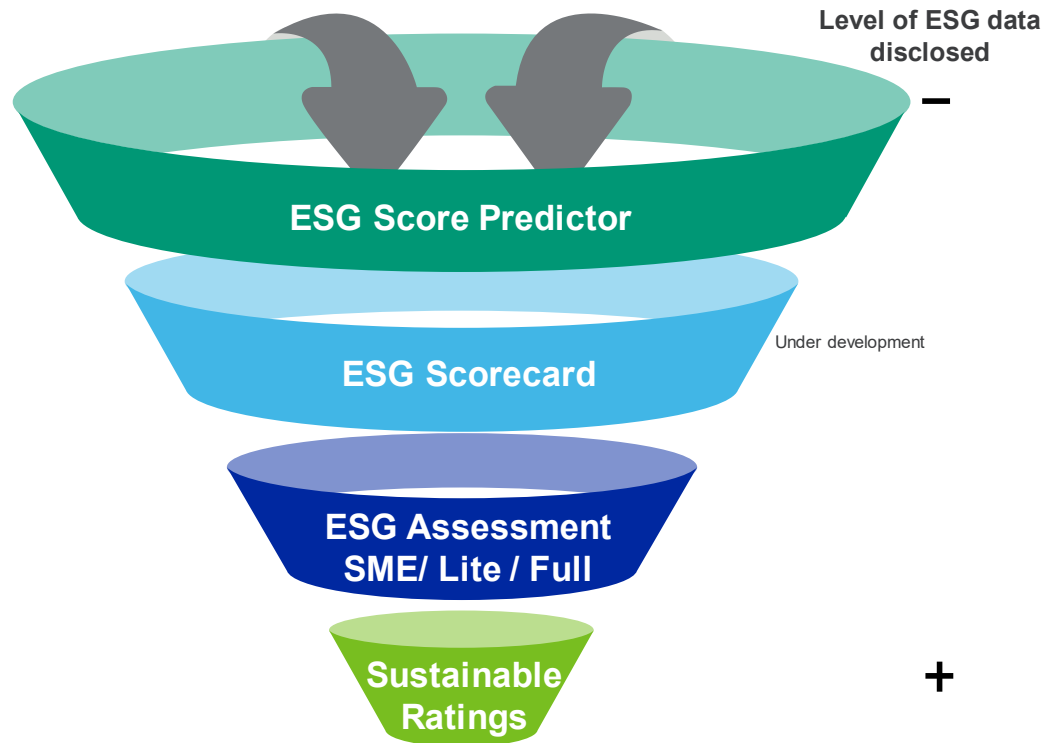
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ESG Score Predictor

# A coherent suite of assessments on a common scale

Companies need to develop their own ESG risk framework to address the lack of data and the heterogeneity of companies in their portfolios

## Moody's ESG assessment framework



## Approaches

### Build an exhaustive ESG framework for the whole portfolio:

- Define ESG assessment level required per type of companies
- Ability to integrate end to end ESG assessments
- Anticipate emerging regulations or legal obligations

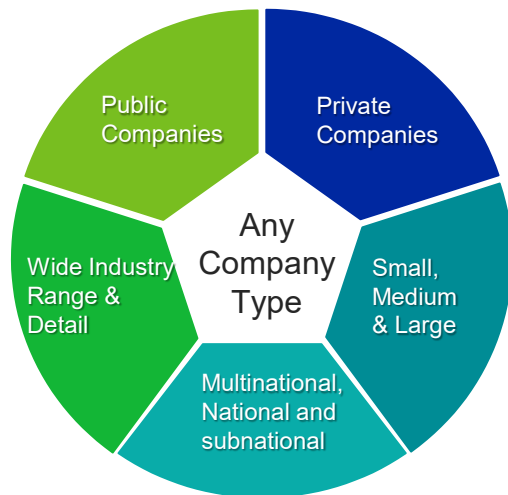
### Implement forward looking and monitoring approaches of ESG assessments

- Define monitoring requirements levels (controversies/adverse media)
- Define rules for ESG review frequency
- Use scenarios and adapted framework to stress climate change impact

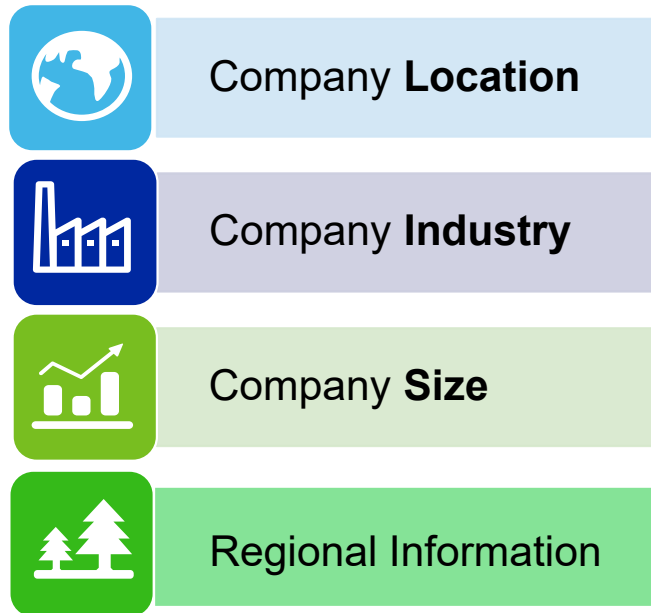
# ESG Score Predictor: a tool to fully cover a portfolio

A comprehensive ESG risk framework needs to fill non-disclosure data gap to properly manage unlisted assets

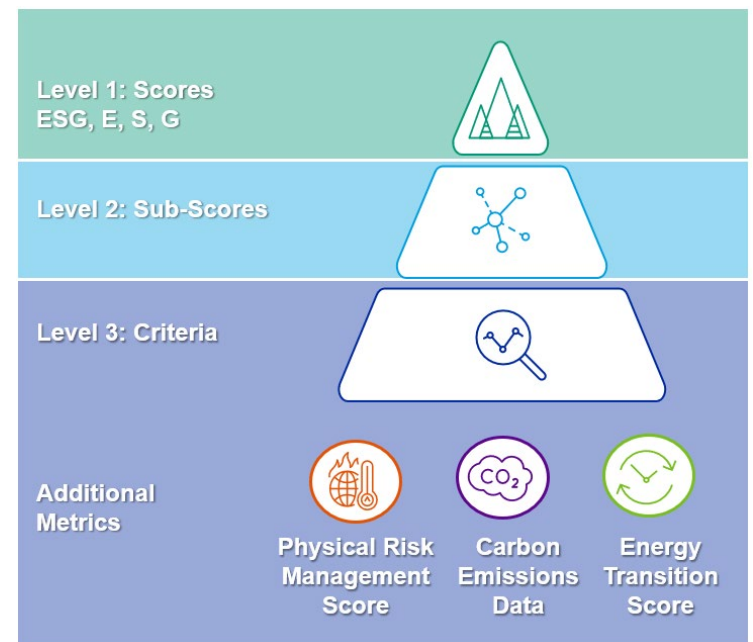
## 1 Portfolio



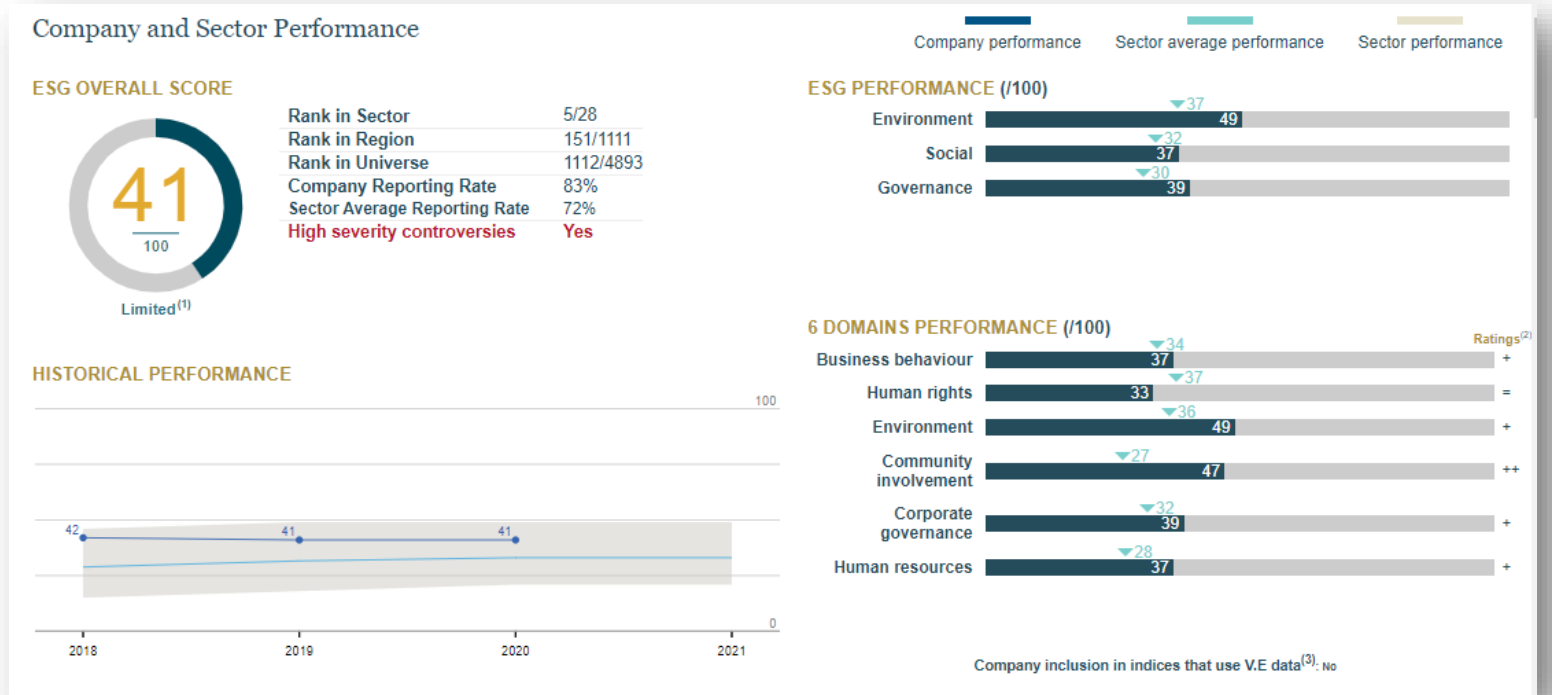
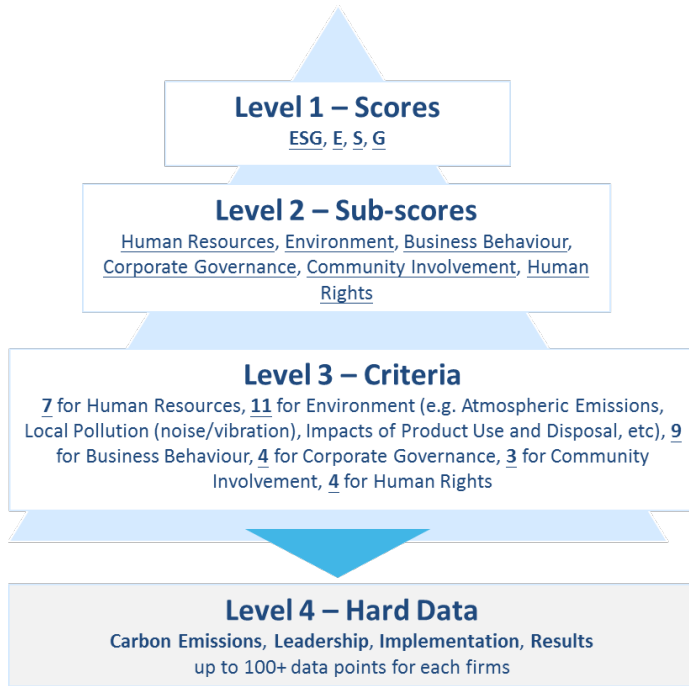
## 2 Analytics



## 3 Metrics Estimates



# ESG Scoring – Multiple Layers of Data



The ESG Assessment provides multiple levels of data alongside scorecards at company level.



# ESG Score Predictor Data Sourcing

## Complementary data dimensions for model building

Country- and region-level datasets

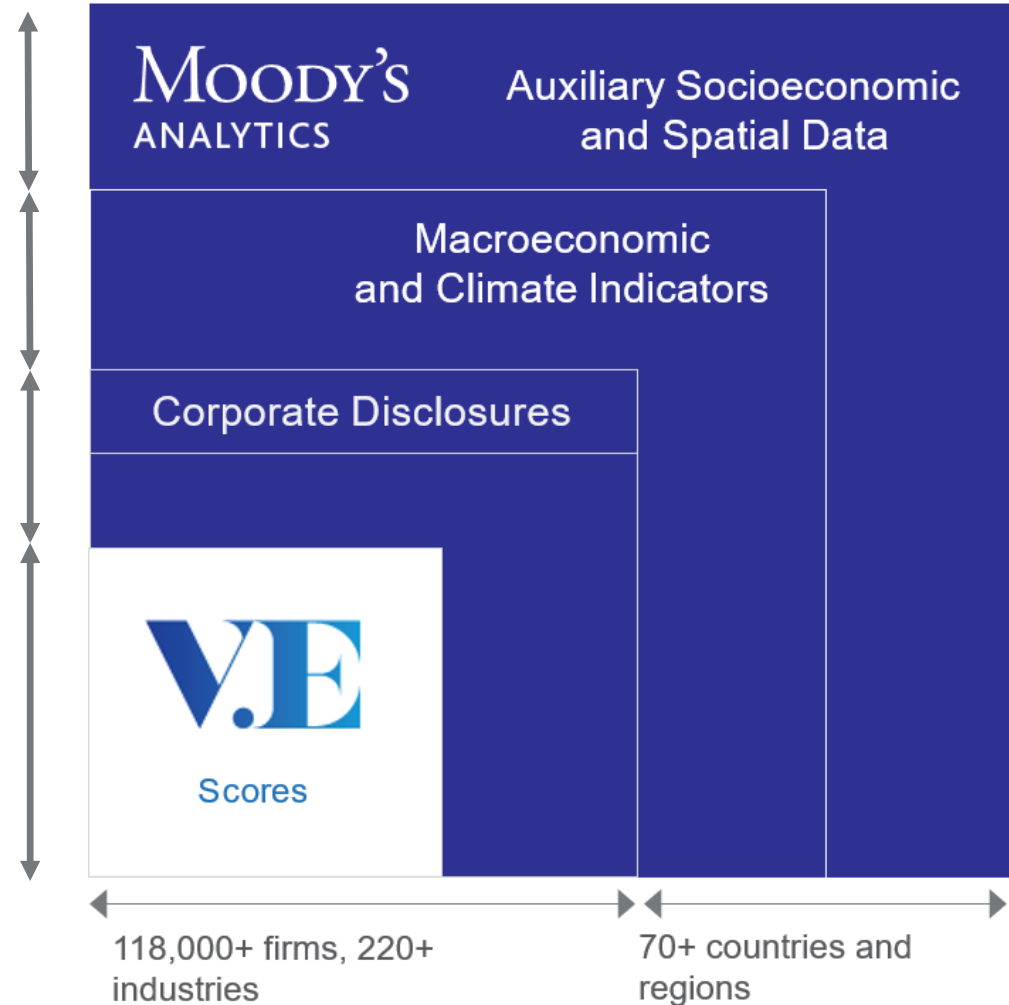
- » Development indicators
- » Indicators related to human, natural and social capital
- » Macroeconomic performance data and climate hazard indicators

Corporate disclosures and market data

- » Globally comparable company information including size, industry and location
- » Financial performance indicators

ESG scores and drill-down to indicator level

- » VE ESG scores and sub-scores universe
- » Corporate and sovereign sustainability indicators, ESG scores and sectoral information





# ESG Score Predictor Methodology

Combining complementary approaches for innovative metric



## Regression-Based

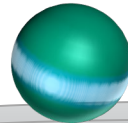
Linear Regression



Logistic Regression



Fractional Response



## Alternative Machine Learning

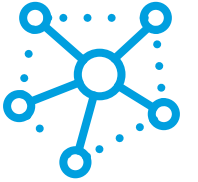
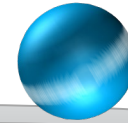
Neural Networks



Gradient Boosting



Random Forests



Ensemble Model:

- Generalized Linear Model
- LASSO
- Elastic Net

**ESG Score Predictor**

# Two Illustrative Portfolios

Company composition differs by size, industry and location

## PORTFOLIO A

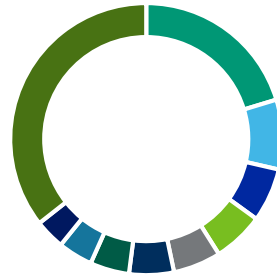
107 Countries

20 Industries

62,632 companies

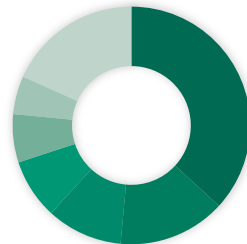
### Location

- US (20.31%)
- Japan (8.28%)
- China (6.39%)
- Canada (6.05%)
- UK (5.68%)
- India (5.32%)
- Australia (4.66%)
- South Korea (4.12%)
- Taiwan (3.58%)
- Other (35.60%)



### Industry

- Manufacturing (37%)
- Financial & insurance (15%)
- Information & communication (10%)
- Mining & quarrying (8%)
- Wholesale & retail trade (7%)
- Real estate (5%)
- Other (18%)



### Size

Company Turnover mln USD	Exposure
< 1	2.04%
[1-100)	35.11%
[100-1,000)	44.12%
1,000>=	18.73%

Source: Moody's Market Implied Ratings (MIR)

## PORTFOLIO B

2 Countries

18 Industries

17,094 companies

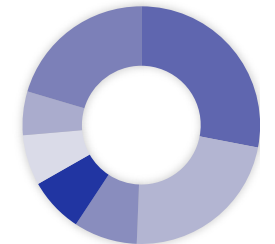
### Location

- Italy (58%)
- Spain (42%)



### Industry

- Wholesale & retail trade (28%)
- Manufacturing (23%)
- Construction (9%)
- Accommodation & food service (7%)
- Transportation & storage (7%)
- Real estate (6%)
- Other (20%)



### Size

Company Turnover mln USD	Exposure
< 1	1.59%
[1-100)	43.60%
[100-1,000)	54.38%
1,000>=	0.43%

Source: European Data Warehouse(EDW)

# Portfolio A: Multifaceted ESG and Climate Risk

Metrics in deviations from portfolio average

Industries, NACE 1	Exposure	ESG	E	S	G	Physical Risk Management	Energy Transition	Carbon Emissions (Scope 1 +2)
Manufacturing	37%	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Yellow
Financial & insurance	15%	Green	Green	Green	Green	Green	Green	Green
Information & communication	10%	Orange	Red	Orange	Orange	Orange	Orange	Green
Mining & quarrying	8%	Yellow	Yellow	Yellow	Green	Yellow	Red	Orange
Wholesale & retail trade	7%	Orange	Orange	Orange	Orange	Orange	Orange	Yellow
Real estate	5%	Orange	Yellow	Red	Yellow	Orange	Yellow	Yellow
Professional, scientific & technical	3%	Yellow	Yellow	Yellow	Green	Orange	Yellow	Green
Construction	3%	Yellow	Yellow	Yellow	Red	Yellow	Yellow	Orange
Administrative & support service	3%	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Green
Transportation & storage	2%	Yellow	Green	Yellow	Yellow	Orange	Green	Orange
Electricity, gas, steam & AC supply	2%	Green	Green	Green	Green	Green	Green	Red
Accommodation & food service	2%	Orange	Orange	Orange	Yellow	Yellow	Yellow	Yellow
Agriculture, forestry & fishing	1%	Yellow	Yellow	Yellow	Yellow	Yellow	Orange	Green
Human health & social work	1%	Orange	Red	Orange	Yellow	Yellow	Red	Green
Arts, entertainment & recreation	1%	Orange	Orange	Red	Yellow	Red	Orange	Green
Water supply, sewerage & waste mgmt	1%	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Orange
Education	0.42%	Orange	Orange	Orange	Orange	Orange	Orange	Green
Other services	0.29%	Red	Orange	Orange	Orange	Orange	Red	Green
Public administration & defence	0.01%	Green	Green	Green	Green	Green	Green	Yellow
Households as employers	0.01%	Green	Green	Green	Green	Yellow	Green	Yellow

# Portfolio B: Multifaceted ESG and Climate Risk

Metrics in deviations from portfolio average

Industries, NACE 1	Exposure	ESG	E	S	G	Physical Risk Management	Energy Transition	Carbon Emissions (Scope 1 +2)
Wholesale & retail trade	28%	Red	Orange	Orange	Orange	Orange	Orange	Yellow
Manufacturing	23%	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Orange
Construction	9%	Orange	Yellow	Yellow	Orange	Orange	Orange	Yellow
Accommodation & food service	7%	Red	Orange	Orange	Orange	Red	Orange	Yellow
Transportation & storage	7%	Green	Green	Yellow	Yellow	Orange	Green	Orange
Real estate	6%	Yellow	Orange	Red	Green	Yellow	Yellow	Green
Professional, scientific & technical	6%	Yellow	Orange	Yellow	Orange	Yellow	Orange	Green
Administrative & support service	4%	Yellow	Yellow	Yellow	Orange	Yellow	Yellow	Yellow
Human health & social work	3%	Yellow	Orange	Red	Red	Orange	Orange	Green
Information & communication	3%	Yellow	Yellow	Green	Yellow	Orange	Yellow	Green
Other services	2%	Red	Yellow	Orange	Orange	Red	Orange	Yellow
Arts, entertainment & recreation	2%	Red	Orange	Orange	Orange	Yellow	Orange	Green
Education	1%	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
Water supply, sewerage & waste mgmt	1%	Yellow	Green	Green	Green	Yellow	Yellow	Orange
Electricity, gas, steam & AC supply	1%	Green	Green	Green	Green	Green	Green	Red
Agriculture, forestry & fishing	0.22%	Orange	Red	Orange	Yellow	Orange	Orange	Green
Financial & insurance	0.21%	Green	Green	Green	Green	Green	Green	Yellow
Mining & quarrying	0.01%	Orange	Red	Yellow	Green	Yellow	Red	Yellow

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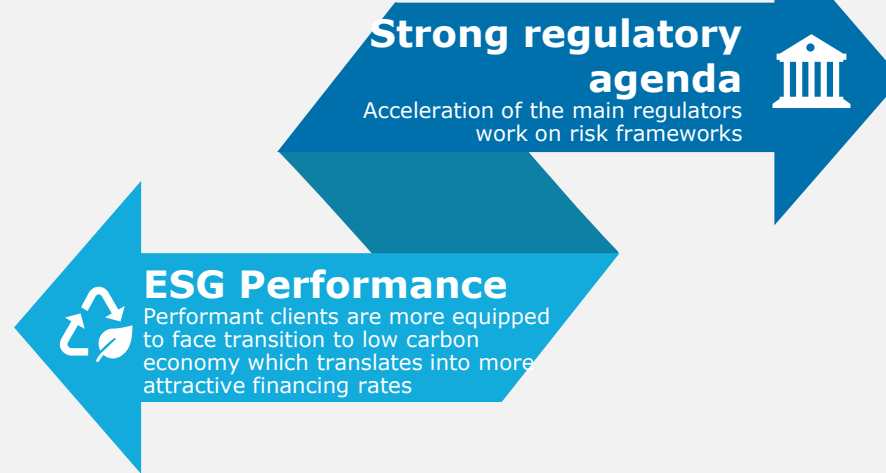
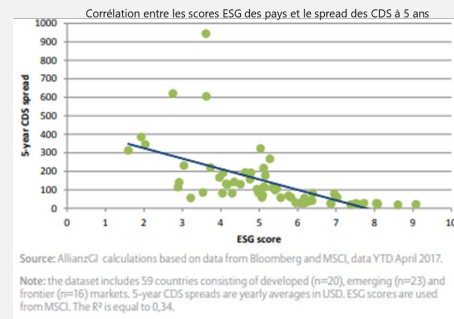
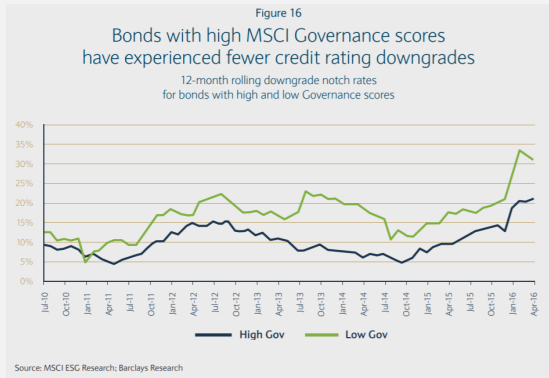
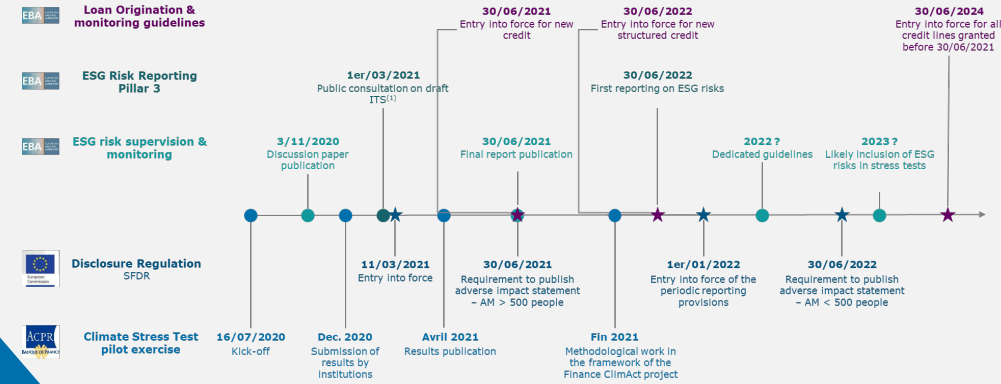
## ESG Risks Context & Challenges for Banks

# ESG Risks

## Context & Challenges for Banks

June 2021

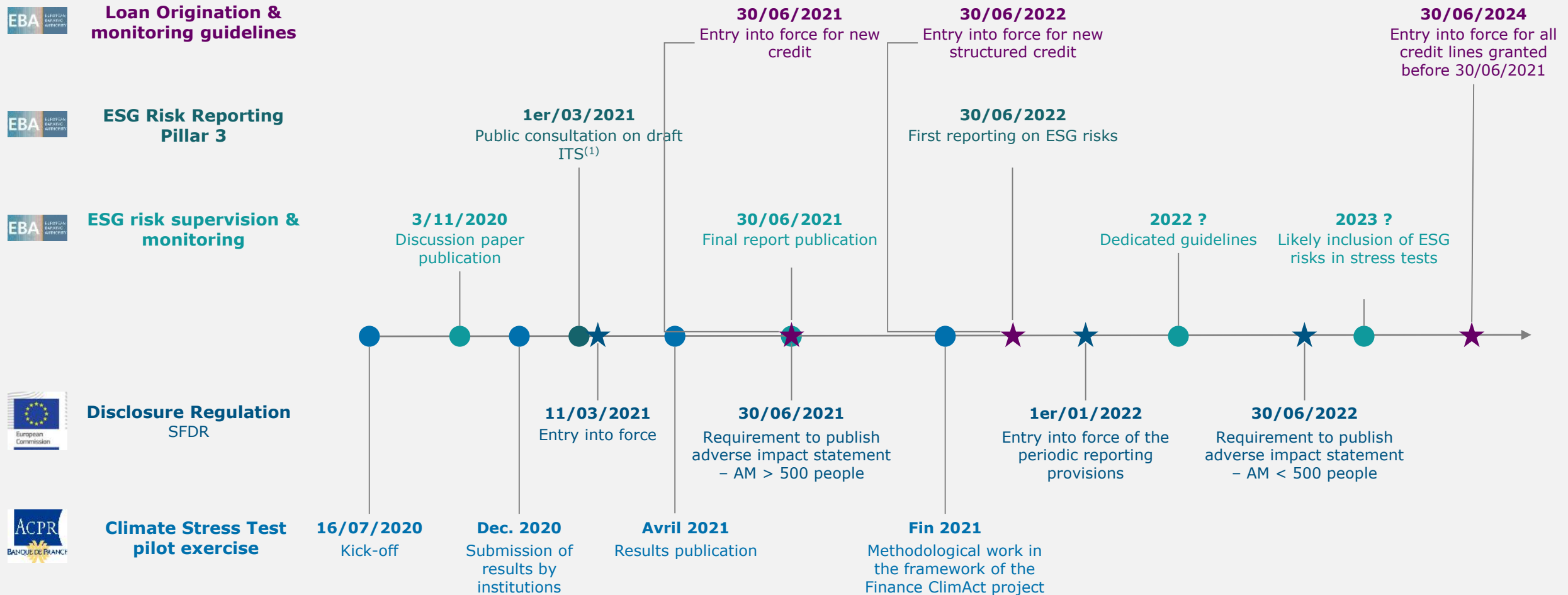
# ESG risk management is on the verge to become a new normal for financial institutions



# The EU is putting in place an ambitious program of measures to promote sustainable growth



The EBA has been mandated by the European Commission to define a normative framework for integrating ESG factors into risk management and reporting, while the ACPR has launched an unprecedented pilot exercise in climate stress testing



(1) ITS : Implementing Technical Standards



# The challenge of ESG Risk measurement



We have conducted a study in DACH market highlighting main issues related to ESG Risk measurement

## ESG risk management issues

- Overall governance structures for ESG risks are not well developed
- Only 50% of participants implemented measures to manage CR-E risks, which are consequently executed by another party
- Institutions struggle to allocate CR-E risks to one specific risk category

## Lack of data and ratings

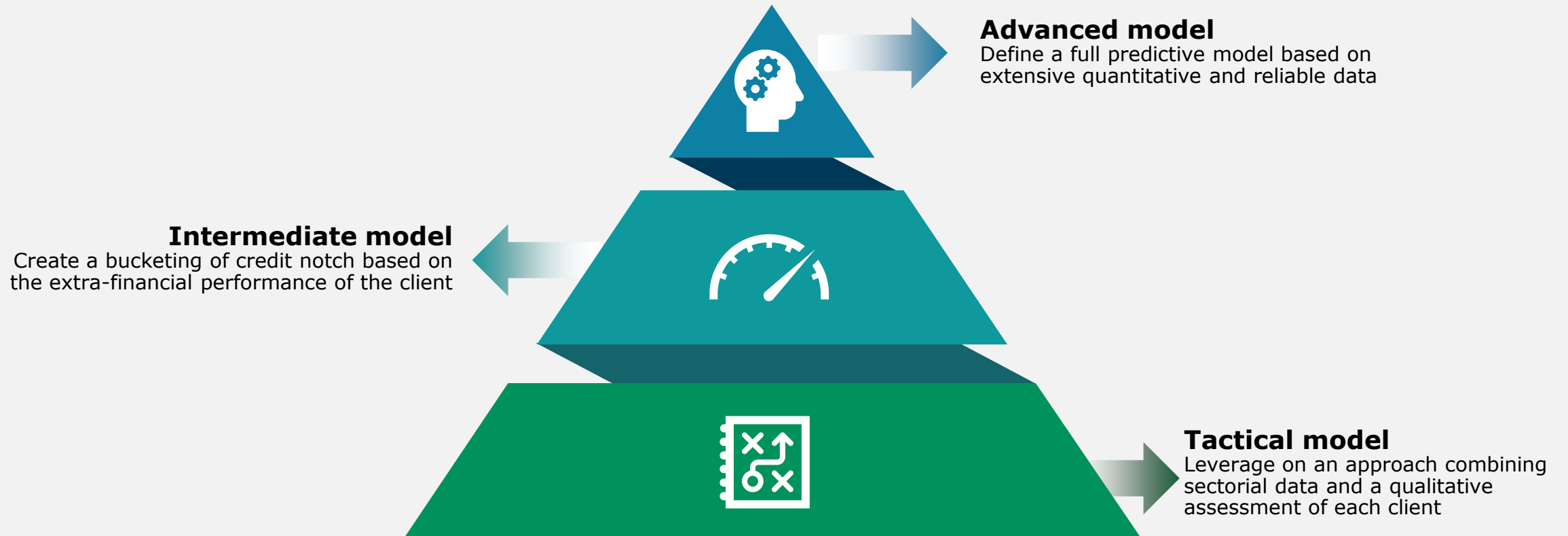
- The lack of data and rating availability and quality represents one of the main challenges
- The effort to obtain one of the two is linked to high costs and low comparability
- Particularly global players depend on reliable and comparable sources of data to rate their operations on any level



**Adoption of proxy**

Leverage on extra-financial indicators as a proxy for transition risk scoring (Environmental in ESG)

# Setting up a risk score by leveraging on extra-financial indicators



Currently only tactical and intermediate models are reachable due to lack of extensive historical and reliable datasets across portfolio (large, mid-cap and small enterprises)

# APPENDIX

# Main operational challenges raised by the implementation of EBA requirements related to ESG factors

Operational challenges for Banks affect the whole credit granting process as well as loan portfolio management

## Strategy & Monitoring

- Define and set up **credit risk limits** for various lending activities and portfolios based on qualitative and quantitative **climate risk indicators**



**Our accelerator:** a climate risk assessment tool providing climate risk indicators

## Risk Methodology & Calculation

- Define a **methodology** to assess environmental and climate risk at economic sector level
- Calculate and **allocate a climate risk score to every economic sector**
- Adapt collateral valuation models** to include the impact of climate risk depending on the type of collateral (real estate...)
- Define and calculate quantitative **climate risk indicators allowing for a better risk analysis of loan applications** and more documented credit decisions



**Our accelerator:** a climate risk assessment tool providing an estimate of real estate properties depreciation for climate risk



## Data Management

- Define a reference list of **sustainable economic activities** consistent with the European taxonomy and set up a **reference data base** to make these activities available whenever needed during the credit granting process
- Add **information on climate-related and environmental objectives and activities** to client profiles in the SME & Corporate client reference database



**Our accelerator:** an AI solution for client reference database enrichment by adding external information with a ML matching algorithm

## Data Visualization & Reporting

- Build a **climate risk dashboard** for data visualization and reporting:
  - Limits & thresholds by activities and portfolios
  - Climate risk score by economic sector
  - Climate risk indicators and collateral depreciations by portfolios



**Our accelerator:** a strong track record on similar projects for major financial institutions combined with a long-term partnership with Tableau software

# The compliance with expected regulations on climate risks management poses several challenges to financial institutions



## Business Model & Governance

**Review business strategy** and set up a compliant governance framework

- Adjust **financial products and services offerings** depending on climate risk assessment and think ESG-friendly innovation as a way to lower risks and increase financial performance
- Adapt the organizational structure to include the management of climate risk in accordance with the **three lines of defense model**

## Operating Model

**Readapt processes** from business activities to risk reporting

- The integration of climate risks implies **modifications throughout banks' value chains** (e.g. loan management process from origination to portfolio monitoring) and risk management frameworks
- Comply with current **reporting obligations** (NFRD) and futures ones, notably to reinforce the comparability between banks which often follow different ESG indicators today<sup>(1)</sup>

## Capital Allocation

**Assess impacts on capital allocation** of anticipated regulatory constraints

- Design and incorporate **climate transition scenarios** (temperature- and event-based scenarios) in the ICAAP process and **stress-tests** internally performed
- Anticipate **impacts on capital and P&L** even if it remains to be seen how, and when, binding regulations and capital requirements for ESG risks will be introduced.

## Data & Tools

Design and implement a dedicated **Data & IT architecture**

- Climate data and climate-related corporate information may be hard to get as efforts to agree **common definitions & taxonomy** are underway
- Build a **governance around ESG data**, leveraging on promising global initiatives such as PACTA<sup>(2)</sup> and SBT<sup>(3)</sup>
- Extend both existing **data & IT strategies** and architecture

The main challenge for banks is to align their business and operating models with regulatory trends which requires a constant regulatory watch and implies a strong capacity of anticipation and adaptation

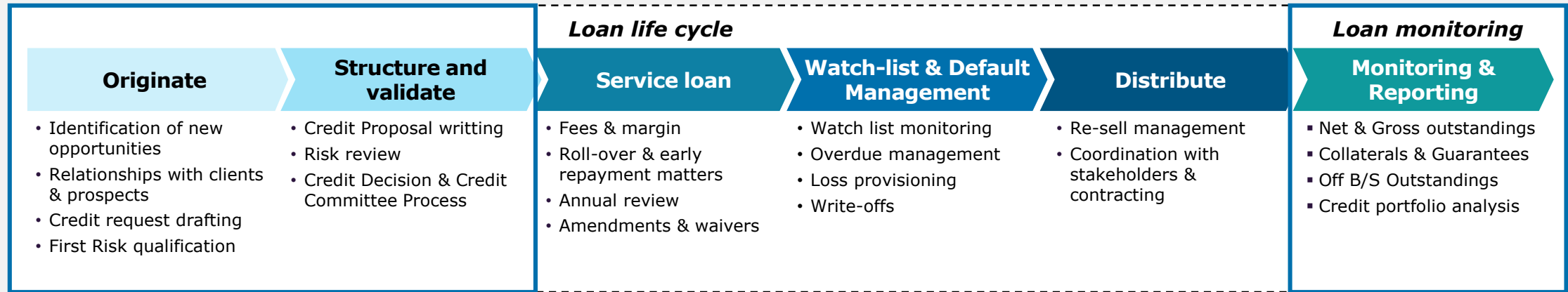
(1) Based on our own review of integrated activity reports issued by the main French banking institutions for FY2019

(2) Paris Agreement Transition Capital Assessment (PACTA) offers an open-source credit portfolio methodology as well as a climate scenario analysis toolkit for banks


(3) Science Based Targets (SBT) provides guidance and target-setting methods to help companies meet their sustainable goals



# Focus on final uses – A useful tool to consider climate risk in credit granting and real estate loan portfolio monitoring

## LOAN MANAGEMENT PROCESS



## FINAL USAGES FOR REAL ESTATE LENDING ACTIVITY

- **Adapt the credit granting process to climate and environmental change** 
  - Use a relevant indicator to assess the compliance of the loan request with **ESG criteria**, according to the Bank's strategy and commitments
  - Measure the **climate risk impact** on property value
  - Increase the **cross-selling of insurance policies** as a protection against climate risk
  - Calculate an adjusted Loan to Value ratio taking into account the **property value depreciation** due to climate risk
  - Add the **climate risk adjusted Loan to Value ratio** as a criteria for loan amount assessment and credit granting decision
  - Allocate a **climate risk score** to every loan at origination

- **Monitor the real estate loan portfolio according to the climate risk** 
  - **Reassess the property value depreciation** due to climate risk on a regular basis
  - **Define climate risk buckets** according to the risk level
  - Define the climate risk appetite and **set up thresholds & limits** accordingly
- **Include climate risk indicators in Risk Dashboards and Extra-Financial Reporting** 



**People matter, results count.**

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Climate adjusted  
probabilities of default



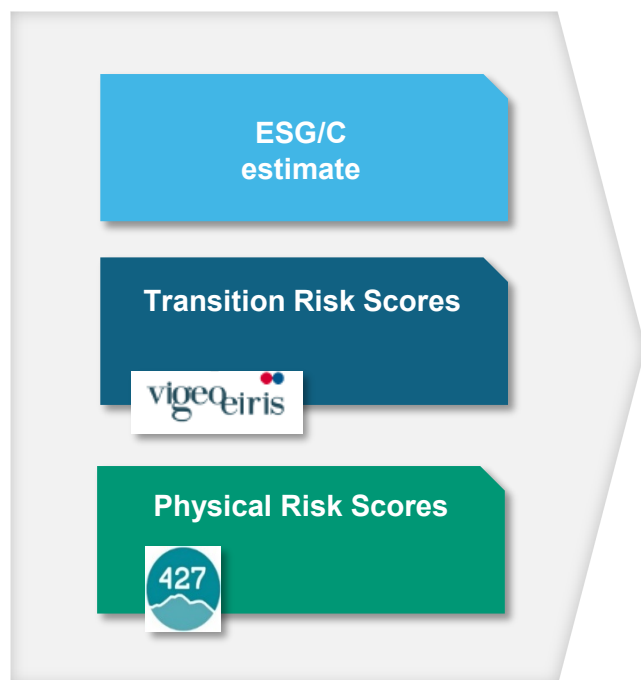
# Our approach to ESG & climate-adjusted framework

Enabling the comprehensive journey

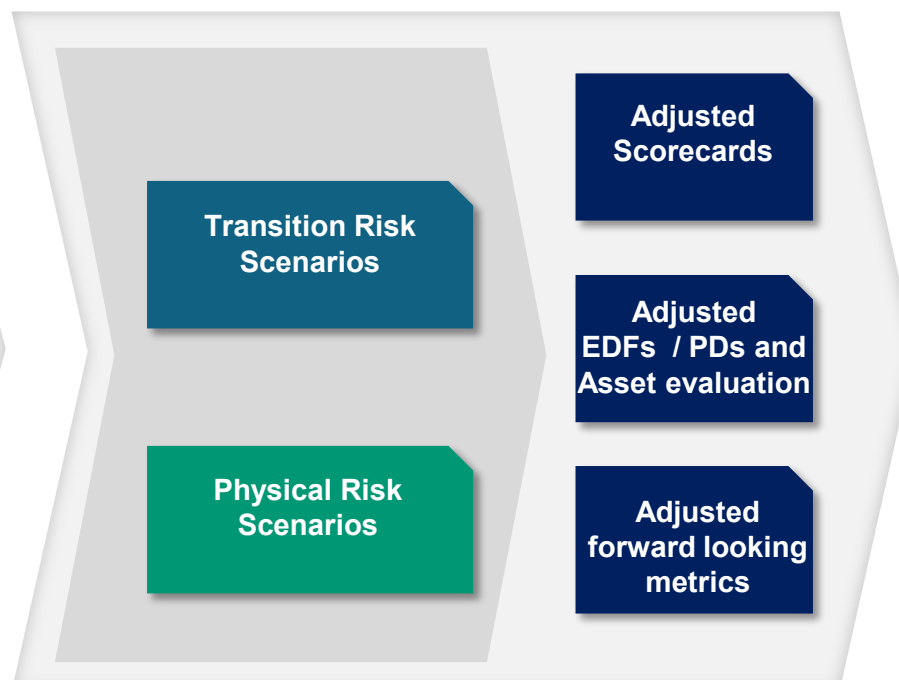


FROM ESG & CLIMATE RISK TO CLIMATE-RELATED FINANCIAL RISK METRICS

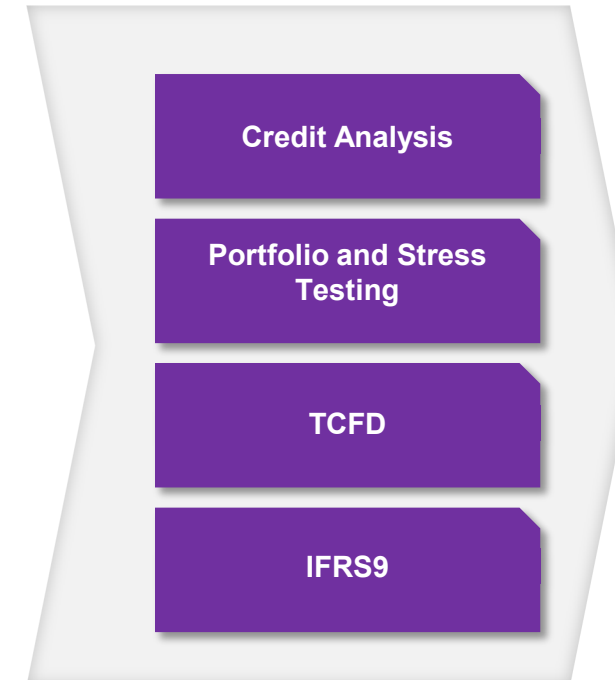
## Risk Identification



## Risk Quantification

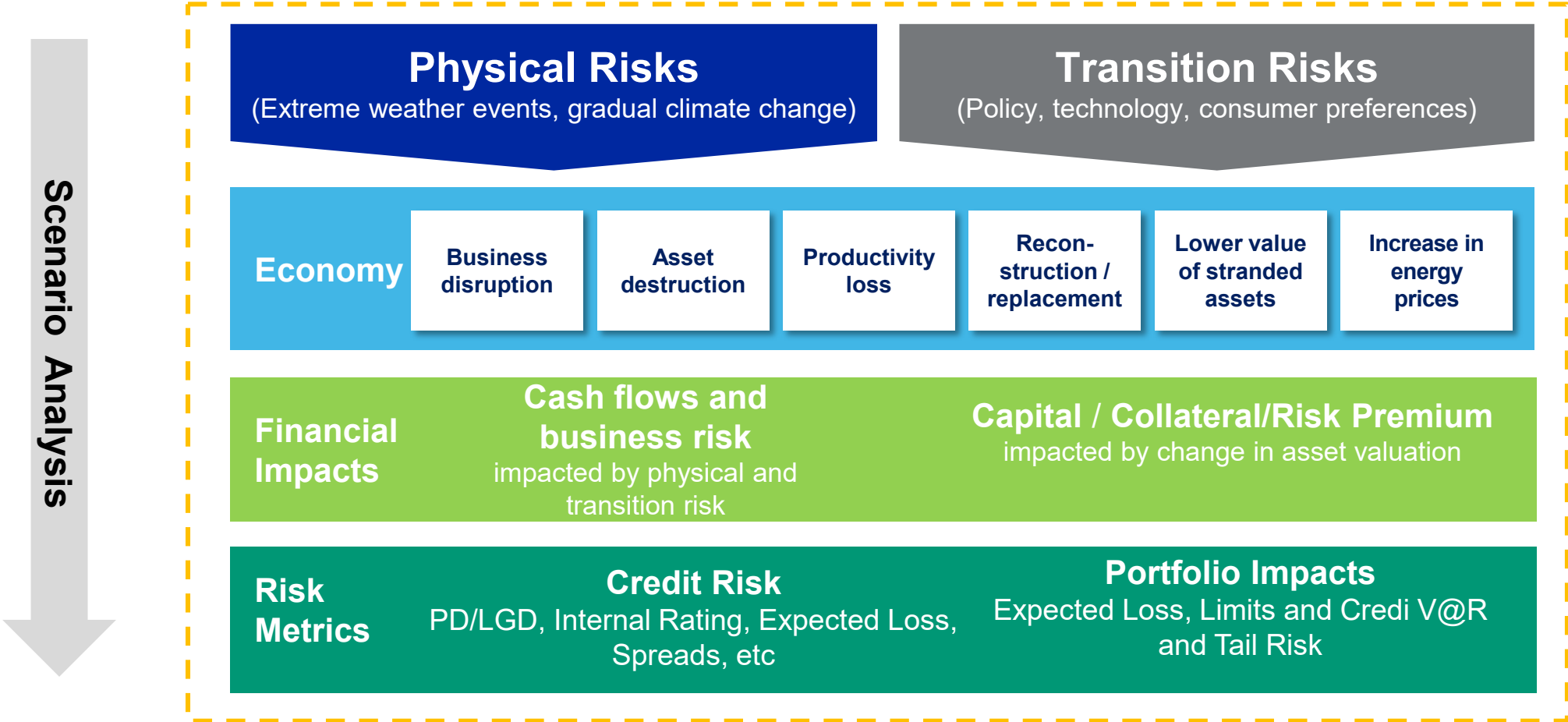


## Reporting



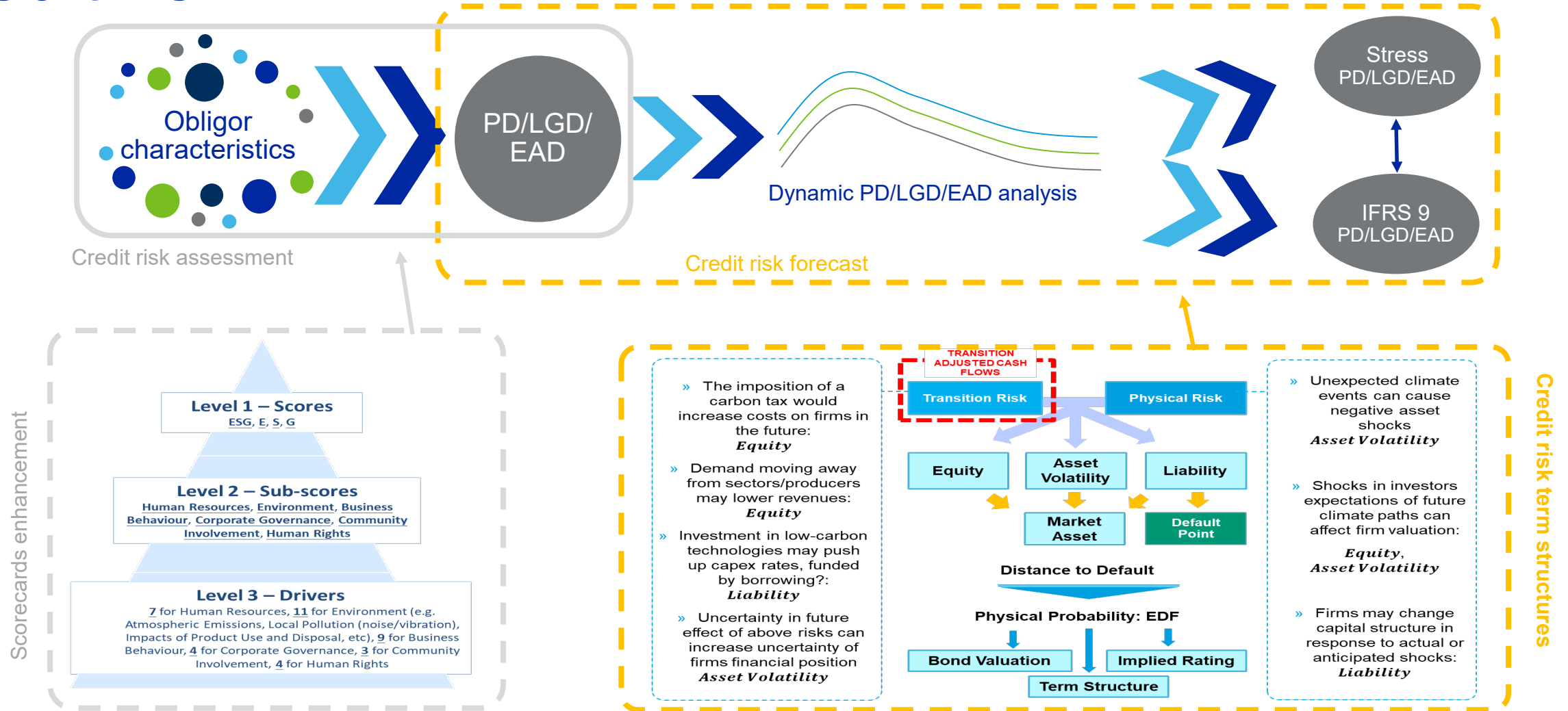
# From Climate Risks to Financial Metrics

» Our credit and portfolio metrics will be part of a full-suite of scenario-conditioned data analytics:



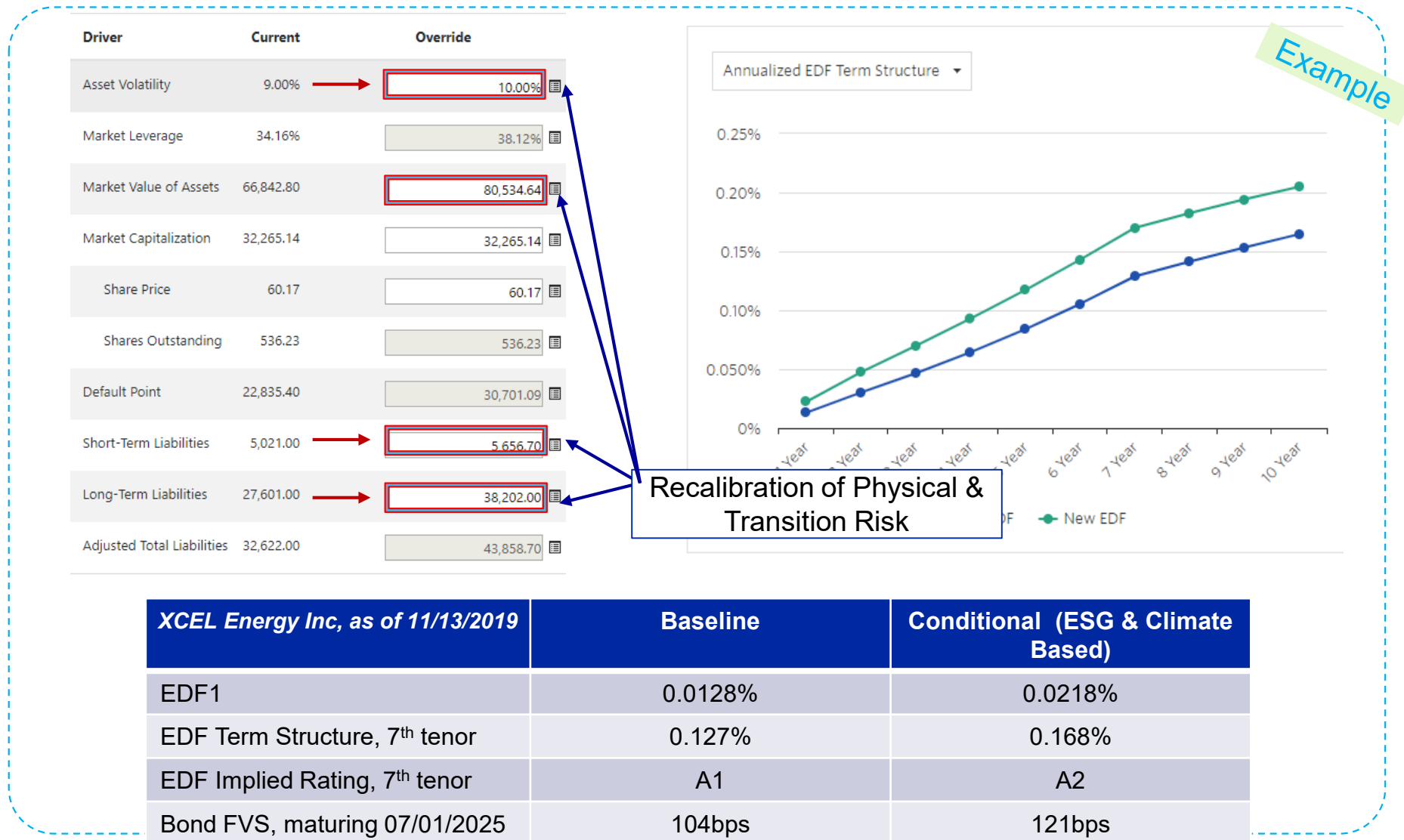
**ESG training curriculums to support the matrix**

# Linking Climate Change and Transition risks to credit risk



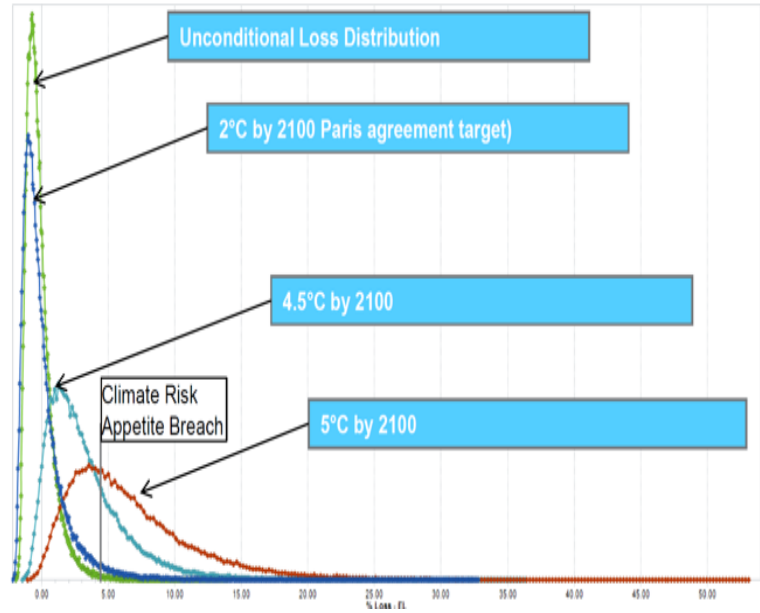
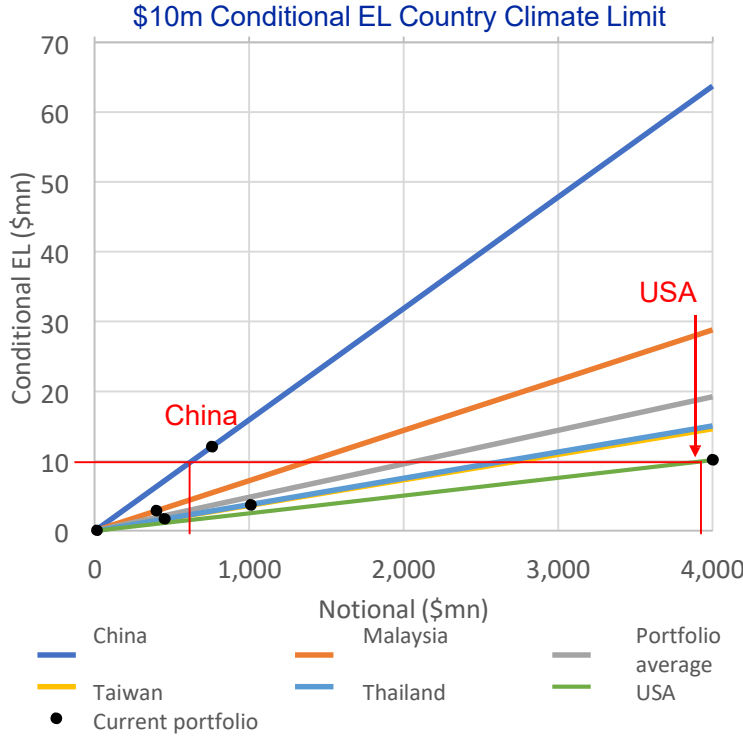
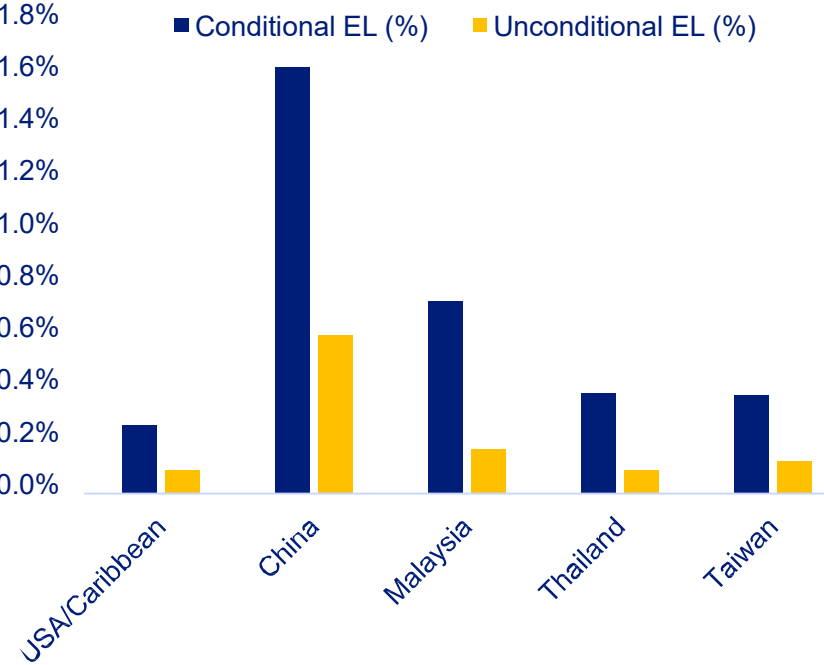
# Climate-adjusted bond evaluation

Illustrative Model Framework – incorporating Physical & Transition Risk



# Credit Portfolio Dynamics under Climate Change Scenarios

Incorporating Temperature shocked PD Term structures to derive conditional Expected Loss and corresponding Limits + Climate Credit VaR Distributions and associated statistics.



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