

# Risk for Commercial Banks

## Physical Risk

**National:** 10% of the value of mortgage exposures in England is on properties in flood-risk zones

**Global:** Some UK banks have large direct exposure to vulnerable regions, such as South-East Asia

## Transition Risk

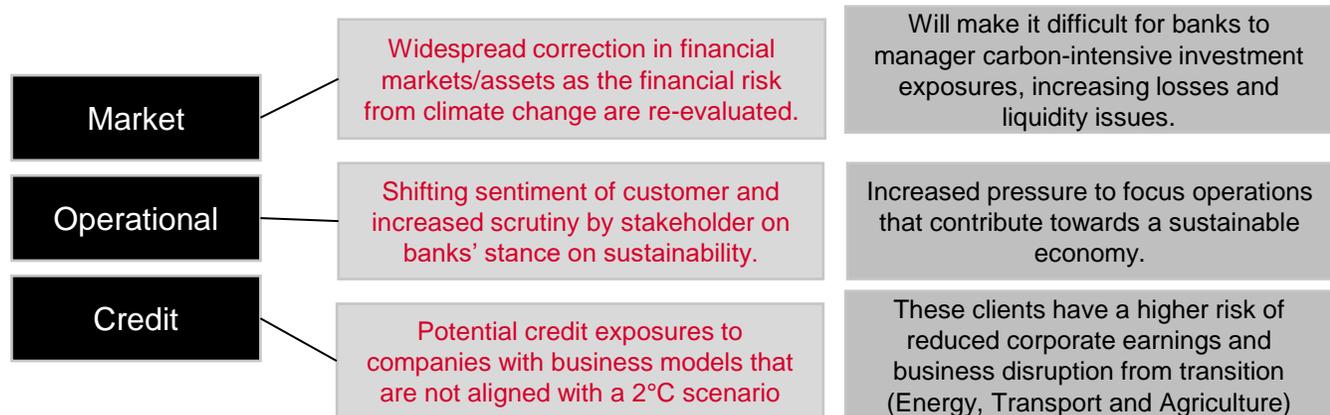
**National:** Loan exposure to emission-intensive sectors amounts to 70% of largest UK banks' CET1<sup>1</sup> Capital.

**Global:** 15% of the value of a representative global market portfolio could be at risk.<sup>2</sup>

### Risks of climate change due to extreme weather conditions



### Risk of transitioning to a new zero carbon emission world



Source: Discussion paper – "The 2021 biennial exploratory scenario on the financial risks from climate change", Bank of England (December 2019)

# Bank Of England's 2021 **Biennial Exploratory Scenario**

TESTING RESILIENCE OF INDIVIDUAL FIRMS AND FINANCIAL SYSTEM TO FINANCIAL RISKS FROM CLIMATE CHANGE

## WHO

United Kingdom's (UK) largest banks and insurers.

## WHAT

Assess vulnerability of *individual* counterparties' business models to climate-related risks.

## HOW

Perform bottom-up, counterparty-level modelling of financial risks related to **three climate scenarios** (e.g. early/late/no-policy action, provided by Bank of England), over **30 years** (i.e. up to 2050, in steps of five years) including both **transition** and **physical** risks.

## WHY

Sizing risks (loan book, trading book, investment portfolios) and responses.

### Indicative Scenario Variables

Climate-related Variables		Macro-financial Variables	
Physical Variables	Transition Variables	Macroeconomic Variables	Financial Market Variables
<ul style="list-style-type: none"> <li>Global and regional temperature pathways</li> <li>Frequency and severity of specific perils in regions with material exposure (e.g. UK floods, subsidence and freeze)</li> <li>Longevity</li> <li>Agricultural productivity</li> </ul>	<ul style="list-style-type: none"> <li>Carbon price</li> <li>Emission pathways (aggregate, by world region and sector)</li> <li>Commodity and energy prices (incl. renewables) by fuel type</li> <li>Energy mix</li> </ul>	<ul style="list-style-type: none"> <li>Real GDP (Aggregate and decomposed by sector)</li> <li>Unemployment</li> <li>Inflation</li> <li>Central bank rates</li> <li>Corporate profits</li> <li>Household income</li> <li>Residential and commercial property prices</li> </ul>	<ul style="list-style-type: none"> <li>Government bond yields for major economies</li> <li>Corporate bond yields for major economies (investment grade and high yield)</li> <li>Equity indices</li> <li>Exchange rates</li> <li>Bank rates</li> </ul>

Source: "Discussion Paper - The 2021 biennial exploratory scenario on the financial risks from climate change", Bank of England (December 2019). For illustrative purposes only

# TCFD Recommendations for Banks

Figure 1: TCFD recommendations for banks to disclose on climate-related risks and opportunities

	Governance	Strategy	Risk Management	Metrics & Targets
DISCLOSURES RECOMMENDED FOR ALL COMPANIES	<p>a. Describe the board's oversight of climate-related risks and opportunities</p> <p>b. Describe the management's role in assessing and managing climate-related risks and opportunities</p>	<p>a. Describe the climate-related risks and opportunities the organisation has identified over the short, medium and long term.</p> <p>b. Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.</p> <p>c. Describe the resilience of the organisation's strategy, taking into consideration different climate related scenarios, including a two degree or lower scenario.</p>	<p>a. Describe the organisation's processes for identifying and assessing climate-related risks.</p> <p>b. Describe the organisation's processes for managing climate-related risks.</p> <p>c. Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organisation's overall risk management.</p>	<p>a. Disclose the metrics used by the organisation to assess climate-related risks and opportunities in line with its strategy and risk management process.</p> <p>b. Disclose scope 1, scope 2, and scope 3 GHG emissions and the related risks.</p> <p>c. Describe the targets used by the organisation to manage climate-related risks and opportunities and performance against targets.</p>
SUPPLEMENTAL DISCLOSURES RECOMMENDED FOR BANKS		Banks should describe significant concentrations of credit exposure to carbon-related assets. Additionally, banks should consider disclosing their (physical and transition) climate-related risks in their lending and other financial intermediary business activities.	Banks should consider characterizing their climate-related risks in the context of traditional banking risk categories, such as credit risk, market risk, liquidity risk, and operational risk. Banks should also consider describing any risk classification frameworks used (e.g., the Enhanced Disclosure Task Force's framework for defining "Top and Emerging Risks"),	<p>Banks should provide the metrics used to assess the impact of (physical and transition) climate-related risks on their lending and other financial intermediary business activities in the short, medium, and long term. Metrics provided may relate to credit exposure, equity, and debt holdings, or trading positions, broken down by:</p> <ul style="list-style-type: none"> <li>Industry</li> <li>Geography</li> <li>Credit quality (e.g., investment grade or non-investment grade, internal rating system)</li> <li>Average tenor</li> </ul> <p>Banks should also provide the amount and percentage of carbon-related assets relative to total assets, as well as the amount of lending and other financing connected with climate-related opportunities.</p>

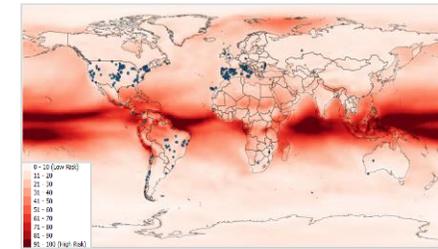
Source: Banks TCFD Reporting – "How can Banks Apply a Quantitative Lens on Climate Risk Exposure ", Trucost, part of S&P Global Market Intelligence (December 2018)

We have a range of data sets to support TCFD integration & reporting:



## Physical risk

- ✓ 7 Climate hazards
- ✓ 15,000+ companies
- ✓ 500,000+ assets



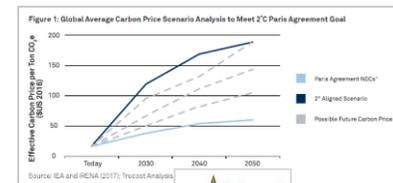
## Transition risk

### Carbon Earnings at Risk

- ✓ 44 jurisdictions
- ✓ 15,000+ companies
- ✓ 44 jurisdictions

### 2 Degrees Alignment

- ✓ Sector-specific pathways
- ✓ 1,300+ companies
- ✓ Science-Based Targets

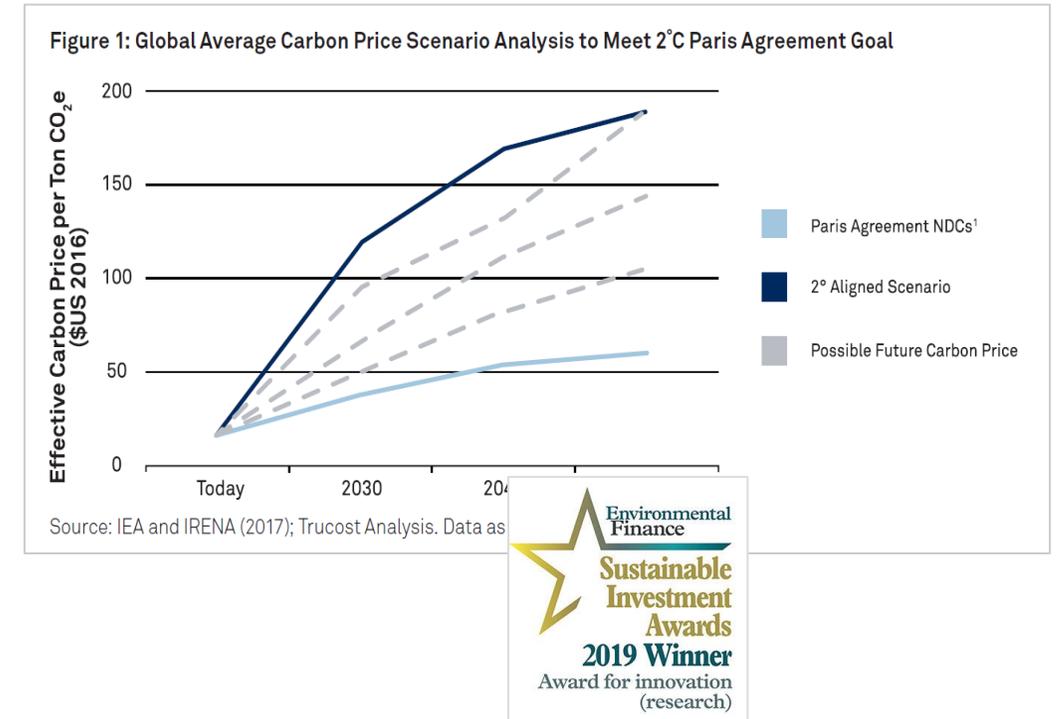


# Scenario Analysis: Carbon Earnings at Risk

Focus on the impact of carbon pricing policies on companies' balance sheets.

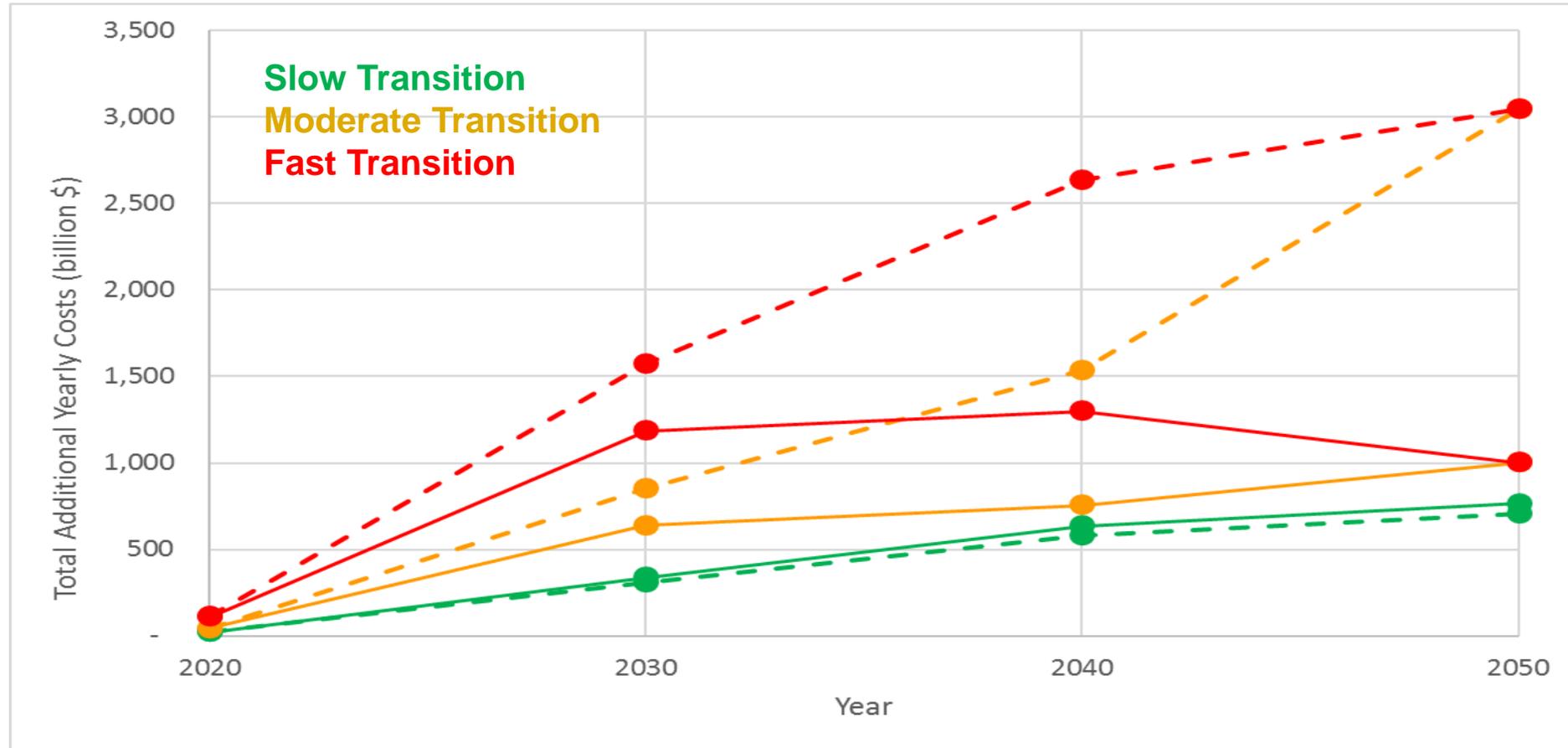
Key features of our CEaR solution:

- ✓ 15,000+ companies covered
- ✓ 3 scenarios affecting 44 carbon pricing jurisdictions.
- ✓ Results in \$-value showing impact on EBIT and EBITDA



Content pertaining to the Trucost product.  
Trucost was awarded an Award for Innovation (research) at the Sustainable Investment Awards 2019

# Estimated Carbon Earnings At Risk For Public Firms, Globally



Source: S&P Global Market Intelligence (As of May, 31 2019). For illustrative purposes only.

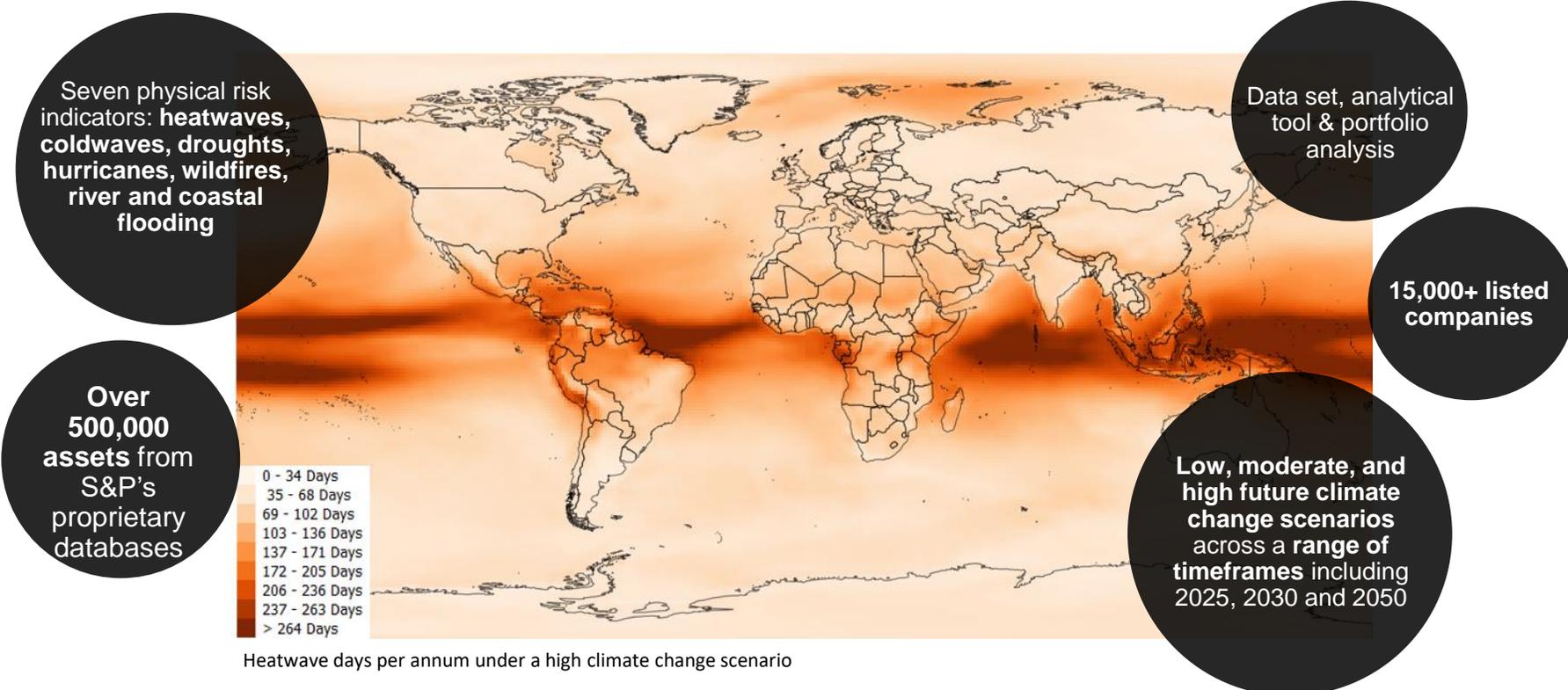
Continuous lines assume a progressive reduction of carbon emissions.<sup>1</sup>

Dashed lines assume carbon emissions remain at current levels.

<sup>1</sup> Under the slow transition, the emission reduction starts after 2050.

# Measuring **Physical Risk** Exposure for Companies, Assets & Portfolios

**Our physical risk tool evaluates risks posed by climate-related hazards on physical assets and companies.**



Source Trucost 2019, for illustrative purposes

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# Quantifying Financed Emissions for Corporate Lending

- Company disclosed emissions data
- Bottom-up emissions modelling based on company business activities and revenues
- Top-down emissions modelling based on region-sector averages

Carbon-Revenue Intensity

	World	OECD	EMEA	APAC	ROW
<b>ALL SECTORS</b>	<b>955</b>	<b>1,016</b>	<b>828</b>	<b>852</b>	<b>1,126</b>
Consumer Discretionary	325	445	365	214	274
Consumer Staples	599	591	405	765	635
Energy	2,904	2,922	3,382	2,156	3,156
Financials	38	74	23	28	27
Health Care	167	128	132	235	174
Industrials	687	750	879	556	561
Information Technology	50	26	28	33	111
Materials	2,194	1,934	1,477	2,486	2,878
Real Estate	156	153	159	148	162
Telecommunication Services	111	200	150	72	21
Utilities	3,281	3,951	2,107	2,679	4,388

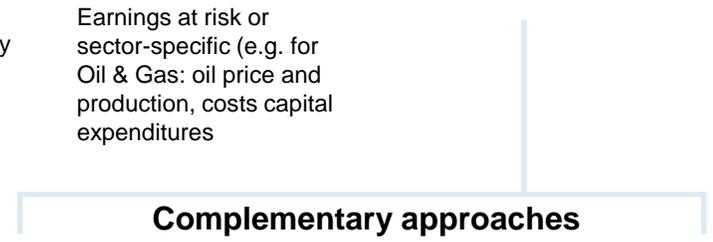
Source Trucost 2019, for illustrative purposes

- Allocate emissions to the bank based on the ratio between the lender's loan exposure and the enterprise value of the company

# Climate-Linked Credit Risk Stress Testing Framework



- Entity-level analysis
  - Aggregate analysis
- Image for illustrative purposes only.



**Fundamentals Analysis**  
*Conditioning full financial statement on drivers*

**PROS**

- Ingrained in banks' processes
- Detailed / in-depth sector-specific analysis
- Public and private companies

**CONS**

- Time consuming/not easily scalable to Small and Medium Enterprises (SMEs)
- Extrapolation over long-time horizons

**Market Valuation Analysis**  
*Conditioning market capitalization on earnings at risk*

- Compact set of variables / fast
- Comparable framework for all sectors
- Can be expanded to private companies / SMEs

- Not as detailed as fundamentals analysis
- Extrapolation over long-time horizons

## COMPLEMENTARY USE CASES: EXAMPLES

**Carbon-intensive sectors - stress testing**  
**In-depth scenario analysis (largest exposures)**

**All sectors - stress testing**  
**Quick scenario analysis, screening, monitoring**

# S&P Global Market Intelligence's Climate-Linked Credit Analytics

**Market Signal PD Transition Risk Scenario Template**  
POWERED BY CREDIT ANALYTICS

**PARAMETERS**

Clear Existing List CLEAR LIST

Company / WatchList  ADD  
Remove Watchlist ID to add companies manually.

Run ID Check RUN ID CHECK

	Model Inputs	User Override
Current Date	08/04/2020	
Scenario	Fast	
Response Type	Adaptation	
Year	2050	
Projected Global Emissions Growth (Current Policy)	30.9%	
Targeted Emission Reduction from current level (%)	67.5%	
Abatement Costs	Yes	
Transition Opportunity	Yes	
Future Long-term interest rate	4.0%	
Future Oil Price (\$/barrel)	60	

RUN SCENARIOS

Tickers / CIQ ID(s)	Company Name	Notes
NYSE:MMM	3M Company	
NYSE:AOS	A. O. Smith Corporation	
NYSE:ABT	Abbott Laboratories	
NYSE:ABBV	AbbVie Inc.	

Instructions | **Inputs** | Scenario\_View

Various scenario settings support tailored analysis

Enables pre-canned or user-defined scenarios

Portfolio insight into overall distribution of scenario outcomes



Detailed insight into model drivers

Comprehensive model outputs enable individual counterparty analysis

Company Name	Industry Group	Primary Industry	Country	Revenues (\$ m)	Capex (\$ m)	Scope 1	Scope 2	Total Emissions	Current carbon tax costs on current emission	Scope 1 Additional Carbon Tax Costs (\$)	Scope 2 Additional Carbon Tax Costs (\$)	Additional Carbon Tax Costs on current emissions levels (\$m)	Abatement costs to reduce emissions (from current levels, or from BAU growth)	Additional Total Costs after reduction of emissions (if any)	Opportunity Share	Revenues Opportunity and Valuation Multiple	Current Market Cap	Future Market Cap	Credit score change (notches) - User Defined View	
3M Company	Capital Goods	Industrial Conglomer	United States	32,136	0	4,609,951	1,824,293	6,434,244	0	278,097,862	96,803,765	375	0.00	324.29	0.47%	-4,160	85,708	40,730	0.00	
A. O. Smith Corp	Capital Goods	Building Products	United States	2,993	64	88,384	52,055	140,438	0	5,340,946	2,632,444	8	0.00	6.90	0.19%	-400	12.15	6,516	2,432	1.00
Abbott Laborato	Health Care Equip	Health Care Equipm	United States	31,904	1,638	557,818	527,942	1,085,760	0	32,408,914	25,712,270	58	0.00	50.27	0.10%	-4,267	17.82	149,804	97,984	0.00
AbbVie Inc.	Pharmaceuticals, t	Biotechnology	United States	33,266	552	303,185	324,135	627,320	0	19,782,831	17,978,437	38	0.00	32.66	6.22%	-4,465	7.79	116,007	51,925	1.00
Abiomed Inc.	Health Care Equip	Health Care Equipm	United States	841	42	17,679	15,233	32,911	0	1,205,981	840,101	2	0.00	1.77	0.00%	-112	26.52	7,042	5,674	0.00

Source: S&P Global Market Intelligence. For illustrative purposes only.

# Green Financing: Green Evaluations & EU Taxonomy Data Set

**S&P Global Ratings**  
Green Evaluation  
**Ergon Peru S.A.C.'s Proposed \$219.4 Million Senior Secured Bond**

**Transaction Overview**  
Ergon Peru S.A.C. (Ergon) or the project plans to issue \$219.4 million of senior secured notes due in 2034. We expect that proceeds will be applied to refinance existing bank debt with which the project's construction is being financed, fulfill a construction account to finance the unfinished installation phase, pay transaction related costs, and fund certain reserve accounts.  
The project is responsible for designing and installing several small-scale photovoltaic systems (RER Kits, or kits) in off-grid rural areas in the north-central and southern regions of Peru.  
Ergon is 90% owned by the Italian company Tozzi Green SpA and 10% by Gardini 2002 S.R.L.

**Green Evaluation Overview**

<b>Transaction's Transparency</b>	70		
Use of proceeds reporting			
Reporting comprehensiveness			
<b>Transaction's Governance</b>	88		
Management of proceeds			
Impact assessment structure			
<b>Mitigation</b>			
<b>Sector</b>	<b>Net Benefit Ranking</b>	<b>Hierarchy Adjustments</b>	<b>83</b>
Green power generation	Solar photovoltaic	Carbon	
Adaptation			NA

**Overall Score E1/81**  
Weighted aggregate of three: (Transparency + Governance + Mitigation)

**Entity:** Ergon Peru S.A.C.  
**Subsector:** Infrastructure  
**Location (HQ):** Peru  
**Financing value:** \$219.4 million  
**Amount evaluated:** 100%  
**Evaluation date:** June 18, 2019  
**Contact:** Candella Macchi +54-114891-2110 candella.macchi@spglobal.com

**S&P Global Ratings**  
**Environmental, Social, And Governance (ESG) Evaluation**  
**NextEra Energy, Inc.**

**Executive Summary**  
NextEra Energy, Inc. (NextEra) is a large diversified energy holding company that primarily consists of regulated transmission, distribution, and generation utilities (about 70% of EBITDA), competitive generation (about 20% of EBITDA), proprietary trading (about 5% of EBITDA), and natural gas exploration and production (about 5% of EBITDA). Through its regulated utility subsidiaries the company provides electric services throughout most of Florida.  
NextEra's best-in-class preparedness assessment speaks to its ability to identify disruptive forces in industry faces, such as climate change regulation and an aging workforce, and develop and implement plans to mitigate them and create opportunities. The company also has fostered an effective culture to combat with ESG-related risks. NextEra has significant exposure to environmental issues, most notably greenhouse gas (GHG) emissions. NextEra has been more proactive than peers in decarbonizing its fleet, but continues to face long-term challenges over nuclear waste.  
Maintaining effective relationships with customers and communities has generally had a positive impact on NextEra. The industry also faces other social risks, such as safety and an aging workforce, though NextEra has been more effective than sector peers in mitigating these issues.  
The governance team benefits from the company's U.S. presence and stronger roots and culture than many American companies. We believe the combined ESG chairman role is not in line with international best practices, but it's somewhat offset by a supportive structure and high board engagement on ESG issues.

**Profile Score** 72/100  
**Preparedness Opinion** Best In Class

Company specific strengths and actual scores

S&P Global Ratings: Environmental, Social, And Governance (ESG) Evaluation

**Trucost ESG Analysis EU Taxonomy Revenue Share**  
**S&P Global**  
The EU Taxonomy

In the transition to a low carbon economy there are activities that can be identified as greater contributors to climate change. These activities are either prone to a potential to shift in their technologies towards low emission solutions or are mitigating the effects of climate change by default due their activities. They correspond to the categories of 'greening of' and 'greening by' categories of the EU's Taxonomy by its Technical Expert Group on Sustainable Finance. In measuring the portfolio's exposure to these high impact sectors, Trucost used the Taxonomy's explicitly define NA&C activities in the climate change mitigation section and their codes in a bespoke mapping to its 484 sectors used in identifying companies' activities. Additionally Trucost also used a custom approach in identifying the sectors where the manufacturing of low carbon technologies could be possible according to the guidance by the Taxonomy. The list of activities can be amended in the future as the scope of work intends to include for example attractives our pulp and paper in later iterations.

**Results**  
The chart below provides a high-level overview of exposure to companies engaged in high impact activities. The height of each bar represents the weighted average revenues for the portfolio or benchmark of companies deriving any revenues from the activities, while the red triangles represent the overall VGH or exposure in to any company that has at least one activity defined to be part of the Taxonomy.

The charts below illustrate the exposure of the portfolio and the benchmark by type of high impact activities grouped into macro sectors based on NA&C categories as referred to by the EU taxonomy. These are also based on a 0% threshold of exposure to any high impact activity.

On the top of the chart to the left, the exposure is aggregated by value of holdings exposure and the bottom of the chart uses the companies' revenue exposure weighted by the investment weights. Because some Trucost sectors are mapped to multiple NA&C sectors according to the Taxonomy, the exposure can be understood as being linked to multiple activities, which is what the category 'Multiple' represents. In the graph to the right, the results can be evaluated by reviewing the not exposed proportion of revenues weighted by investment values and the total proportion of the portfolio that has no exposure to any of the Taxonomy activities.

**Part of portfolio not exposed to EU Taxonomy activities**

**Green Evaluations:** Analyzes and estimates a security or asset's environmental impact and/or resilience level and its alignment with the Green Bond Principles (GBP)

**EU Taxonomy revenue share: XXXX**

Source Trucost 2019, for illustrative purposes

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