TCFD-BASED REPORTING

A Practical ESG Guide for Institutional Investors

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August 2019

(updated on January 23, 2020)

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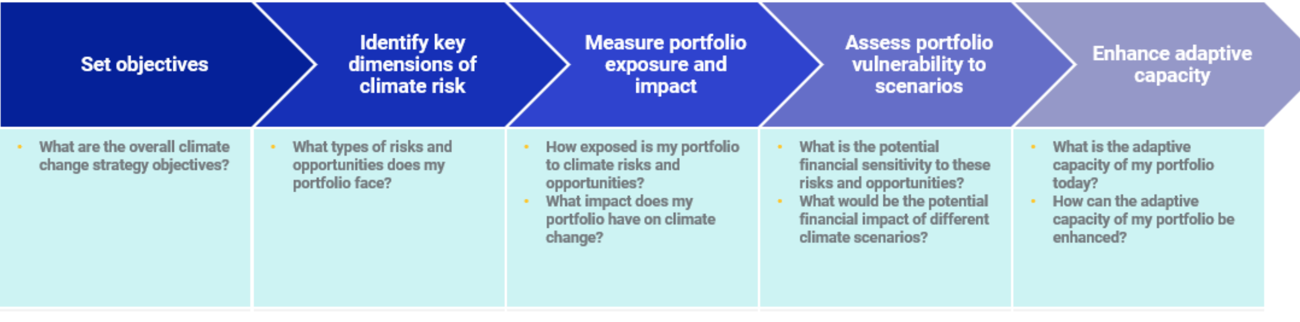
Executive summary

This guide is aimed at supporting institutional investors who intend to report on their climate-related risk management processes according to the Task Force on Climate-related Financial Disclosures (TCFD) recommendations. With climate-related risks posing a potential threat to the long-term resilience of investment portfolios and with climate reporting frameworks and regulations gaining momentum, there is a growing focus on investors' climate risk management practices and disclosures.

We identified several approaches that can be used to develop a robust climate change strategy, depending on the investor's objectives, investment strategy and time horizon. Such approaches, however, often require robust data and analytics to identify key climate-related risks and opportunities, measure portfolio exposure, assess potential vulnerability, and inform the best course of action to manage those risks.

Each section of this guide, organized around the four TCFD principles, will identify key questions to consider, share examples from market participants and outline the tools available from MSCI to support TCFD implementation. The final section provides definitions and guidance around possible forward-looking metrics to include in a comprehensive climate change portfolio assessment.

Exhibit 1. Typical climate change strategy framework for institutional investors (summary)



Source: MSCI ESG Research LLC (hereafter, MSCI ESG Research)

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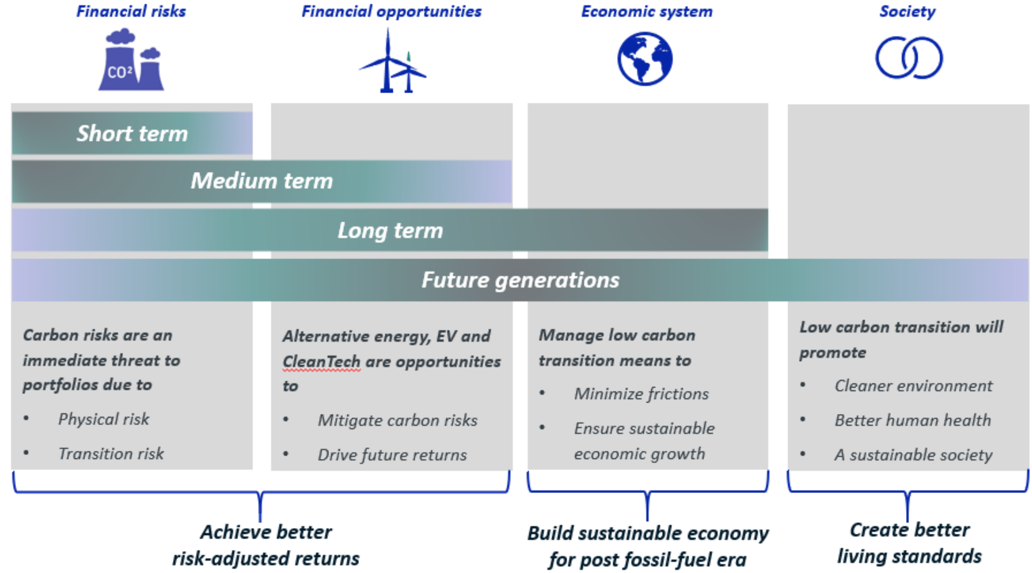
Climate change – an important issue for institutional investors

Companies are already facing both physical impacts such as water shortages and hurricane damage,[1] and transition risks such as growing carbon regulations or reduced fossil fuel demand.[2] Carbon risks can pose an immediate threat to some investor portfolios.

Exhibit 2. Financial, economic and social dimensions of climate change



Source: MSCI ESG Research

[1] Risk Management Solutions, 2017, 2017 North Atlantic Hurricane Season Review, https://forms2.rms.com/NAHU2017Report.html

[2] Carbon Tracker 2020 vision: why you should see peak fossil fuels coming. https://www.carbontracker.org/reports/2020-vision-why-you-should-see-the-fossil-fuel-peak-coming/

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A NEW LANDSCAPE FOR INVESTOR CLIMATE CHANGE REPORTING

To support the goals of the Paris climate agreement,[3] the Financial Stability Board (FSB) created the Task Force on Climate-related Financial Disclosure (TCFD) in 2015. This **voluntary disclosure platform** was designed to "provide a framework for companies and other organizations to develop more effective climate-related financial disclosures through their existing reporting processes"[4] and support "more informed investment, credit [or lending], and insurance underwriting decisions"[5]. Further, it suggests describing the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2˚C or lower global temperature rise scenario.

In February 2019, the UN Principles of Responsible Investment (PRI) stated that its climate risk strategy and governance indicators, which are aligned with the TCFD guidelines, would become mandatory for PRI signatories from 2020 but voluntary to disclose publicly.

In September 2018, the California Bill 964 was signed into law, requiring the nation's two largest pensions funds (CalSTRS and CalPERS) to assess climate-related financial risks within their portfolios and publicly disclose the assessment in January 2020 and every 3 years hence forth.[6] This shift from institutional investors using TCFD-disclosed information to being disclosers themselves is a major change in expectations for investors on their climate change risk management practices.

In May 2019 the TCFD released its 2019 status report,[4] which articulated the increasing uptake of TCFD disclosure and the gaps still prevalent. Over 340 investors were asking companies to report under TCFD as of that date, and 374 financial companies had committed to support the TCFD.

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[3] In response to the growing systemic risk from climate change, the Paris Agreement was established in December 2015 and came into force on Nov 4, 2016 with 195 UNFCCC members signing the Agreement. Its aim was to "strengthen the global response to the thread of climate change by keeping a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius." Insurance Business Canada, 2018, https://www.insurancebusinessmag.com/ca/news/catastrophe/insurance-companies-facing-us20-billion-exposure-from-hurricane-florence-111280.aspx,

[4] TCFD, 2019, https://www.fsb-tcfd.org/wp-content/uploads/2019/06/2019-TCFD-Status-Report-FINAL-053119.pdf

[5] TCFD, 2017, https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Annex-062817.pdf

[6] Centre for International Environmental Law, 2019, https://www.ciel.org/news/spotlight-on-california-as-pension-funds-climate-risk-reporting-deadline-approaches/

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Institutional investor reporting according to the TCFD

The TCFD is split into four sections: Governance, Strategy, Risk Management, and Metrics & Targets. There are 11 recommended sub-categories to help guide disclosing entities.

Appendix I illustrates the relationship between the TCFD and UN PRI frameworks according to the UN PRI,[7] and describes examples of MSCI ESG Research's climate solutions to enable institutional investor's climate-related analysis, integration processes and reporting.

A. GOVERNANCE

The organization's own governance of its climate related risks and opportunities

This section of the TCFD's recommendations is focused on the board's oversight and management's role in assessing and managing climate related risks and opportunities.

i. PRI Governance suggestions

According to the PRI, several core categories articulate actions institutional investors could take to improve climate-related governance matters. [8]

- **Clarifying responsibilities,** e.g. board and management involvement, skills and expertise, link to strategy, management and operations
- **Articulating risks**, e.g. fiduciary duty, risk mitigation, beneficiary expectations
- **Board approved policies**, e.g. goal and target setting, progress measurements, and disclosure
- **Defining processes,** e.g. climate-related risk and opportunity assessment processes
- **Disclosure**, e.g. progress made on climate related management

[7] UNPRI, 2019, https://www.unpri.org/Uploads/z/r/r/14.sgclimatechangereporting_718999.pdf

[8] UNEPFI PRI, May 2018, https://www.unpri.org/download?ac=4652

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Examples: Governance

BMO Financial Group

BMO Financial Group's board-level oversight of sustainability is embedded in the charter of its board's Audit and Conduct Review Committee. This committee meets annually with the Chief Sustainability Officer, Corporate Secretary and General Counsel to review and discuss the findings of the BMO Environmental, Social and Governance Report (ESG Report) and to consider matters related to sustainability. Commencing in Fiscal 2018, the ESG Report and climate-related disclosure will be reviewed by the full Board of Directors.[9]

Learn more →

Manulife

Manulife's governance surrounding climate change risk management is provided by its Executive Sustainability Council and the Corporate and Nominating Committee of its Board of Directors.[10]

Learn more →

Aviva

Aviva's Climate-Related Financial Disclosure (2018) stipulates the structure of its climate governance, and states its Group Chief Risk Officer, Group General Counsel / Company Secretary oversee the company's climate disclosure. At the board level, Aviva's Board Risk Committee and Governance Committee oversee its climate related risks and opportunities, and the compensation of the internal fund managers is linked to ESG performance. [11]

Learn more →

[9] BMO Financial Group, 2018, https://www.bmo.com/cr/files/BMOClimateChangeDec2018.pdf

[10] Manulife, 2018, https://www.manulife.com/content/dam/corporate/global/en/documents/pas/MFC_SR_PAS_2018.pdf

[11] Aviva, 2018, https://www.aviva.com/content/dam/aviva-corporate/documents/socialpurpose/pdfs/climate-related-financial-disclosure-2018-report.pdf

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B. STRATEGY

The actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.[12]

This section of the TCFD guidelines is focused on the types of risks and opportunities posed by climate change, and the processes to identify them. It further relates to how these have affected asset allocation, and the processes to assess performance. Finally, it recommends using scenario analysis to assess how resilient the investment strategy is under multiple climate related scenarios, including one in which warming is limited to 2^{0}C or less.[13]

We typically observe institutional investors following five key steps when developing a climate change strategy (illustrated in Exhibit 3 below).

Exhibit 3. Typical climate change strategy framework

Set objectives	Identify key dimensions of climate risk	Measure portfolio exposure and impact	Assess portfolio vulnerability to scenarios	Enhance adaptive capacity
• What are the overall climate change strategy objectives?	• What types of risks and opportunities does my portfolio face?	• How exposed is my portfolio to climate risks and opportunities? • What impact does my portfolio have on climate change?	• What is the potential financial sensitivity to these risks and opportunities? • What would be the potential financial impact of different climate scenarios?	• What is the adaptive capacity of my portfolio today? • How can the adaptive capacity of my portfolio be enhanced?
MITIGATE RISKS: • Reduce carbon footprint • Reduce exposure to carbon intensive assets • Divestment CAPTURE OPPORTUNITIES: • Increase green investments PROMOTE STEWARDSHIP: • Engage companies to encourage behavioral changes and develop climate strategies	TRANSITION: • Policy • Market • Technological • Reputational PHYSICAL: • Acute • Chronic	TRANSITION: • Carbon footprint • Exposure to carbon transition risks and opportunities (%) • Exposure to fossil fuels (%) • Exposure to climate solutions (%) PHYSICAL: • Exposure to climate hazards (%) (e.g. flood, extreme weather, heat, water stress) BENCHMARK: • Exposure over time • Market benchmark • Low carbon benchmark • Carbon budget (e.g. 1.5° or 2° scenario)	• Model economic assumptions based on policy, socio-economic and climate scenarios • Translate economic assumptions into value at risk and impact on asset valuations	MEASURE: • Transition risk management of investee companies ENGAGE: • Sign onto collective engagement initiatives • Engage companies to improve adaptability • Target company outliers • Track company progress against targets INVEST AND ALLOCATE • Select climate leaders over climate laggards • Diversify into climate opportunities • Integrate climate into portfolio construction and allocation decisions

Source: MSCI ESG Research

[12] FSB, 2017, https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Report-062817.pdf

[13] UNEPFI PRI, May 2018, https://www.unpri.org/download?ac=4652,

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i. **Set objectives – to build a more resilient planet or portfolio?**

A useful first step may be to establish the core climate change objective. For example, is the purpose of the climate change strategy to build a more resilient planet (i.e. investing in an effort to mitigate climate change), or to build a more resilient portfolio (i.e. investing in an effort to stay afloat financially despite what happens to the climate)? The answer to this question can help shape the strategy.

According to MSCI ESG Research, once the core objective is clear the following three key dimensions are often considered when developing a climate investment strategy:

1. **Mitigate transition risk**

   For example, divestment/re-investment, or reducing exposure to stranded assets

2. **Capture disruptive opportunities**

   This could mean increasing exposure to companies providing environmentally-friendly technologies and solutions

3. **Promote stewardship**

   Actions such as engaging with companies to encourage behavioral changes to improve operations and develop long term climate change strategies like incentives for better climate risk management

ii. **Identify key climate risks and opportunities**

Risks and opportunities are typically categorized as either transition or physical. Transition risks may arise from the policy, market and technological changes required to mitigate climate change and enable a transition to a low carbon economy. Physical risks may arise from acute or long-term shifts in climate patterns, including extreme weather, extreme temperature changes, changing precipitation patterns and the indirect socio-economic consequences of these changes.

iii. **Measure exposure to key climate risks and opportunities**

These risks and opportunities can be further broken down as shown in Exhibit 4 below, with examples provided to demonstrate possible approaches to measure an investor's exposure.

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Exhibit 4. Sample questions to help institutional investors attempting to measure exposure to potential climate change risks and opportunities.[14]

	Risk	Opportunity
Transition		
Policy	*What % of your portfolio faces high risks from carbon regulation?* MSCI World Index MSCI World ESG Index 10 12 14 16 18 Exposure (%) to companies with business activities in regions facing strong climate regulation	*What % of your portfolio is in regions with low carbon regulation?* MSCI World Index MSCI World ESG Index 8 8.5 9 9.5 10 Exposure (%) to companies with business activities in regions facing minimal climate regulation
Market	*What % of your portfolio may be facing reduced demand for high emitting products?* MSCI World Index MSCI World Climate Change Index 0 0.5 1 1.5 2 2.5 Exposure (%) to holdings deriving revenue from thermal coal	*What % of your portfolio has the potential to benefit from growing demand for low carbon products?* MSCI World Index MSCI World Climate Change Index 0 2 4 6 8 10 Exposure (%) to Low Carbon Transition "Solutions" Category
Technological	*What % of your portfolio is facing reduced operational activity due to newer competing technologies?* MSCI World Index MSCI World ESG Index 32 34 36 38 40 Average fossil fuel generation (%) per utility	*What is your exposure to renewable energy generating utilities, and how does this compare to benchmarks?* MSCI World Index MSCI World ESG Index 0 5 10 15 20 Average renewable energy generation (%) per utility
Reputational	*What % of your portfolio has faced social license to operate controversies?* MSCI World Index MSCI World ESG Index 10 10.5 11 11.5 12 12.5 Exposure (%) to Severe/Very-severe local community related controversies	*What % of your portfolio is aligned with low carbon products or operations?* MSCI World Index MSCI World Climate Change Index 0 2 4 6 8 10 Exposure (%) to Low Carbon Transition "Solutions" Category

[14] Source: MSCI, as of July 2019; ESG Data as of July 18, 2019

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Physical		
Acute	*What % of your real estate portfolio is in flood prone areas?*	*What % of your real estate portfolio is positioned to benefit from demand shifting from flood prone areas to higher land?*
Chronic	*What % of your portfolio's assets are exposed to regions of high water stress?* MSCI World Index MSCI World ESG Index 40 41 42 43 44 Average estimated % of assets exposed to regions of high water stress	*What is the average maximum % of revenue to sustainable water from your portfolio constituents?* MSCI World Index MSCI World ESG Index 0.25 0.26 0.27 0.28 Average maximum % of revenue to sustainable water

These risks and opportunities can differ by region and sector, and thus careful attention to the current and future states of all transition and physical risk and opportunities is an important aspect in assessing the total risks and opportunities facing any portfolio.

iv. **Examine the vulnerability or resilience of your investment strategy: scenario analysis and stress testing**

A range of institutional investors may see transition and physical risks materialize over the medium to long term. Because of this, climate-related scenario analyses and stress testing are evolving as methods to assess future conditions and the resilience of institutional investor portfolios.

Portfolio climate stress testing approaches include both top-down and bottom-up methods for estimating the financial implications of climate scenarios. For example, in June 2019, the Bank of England released preliminary financial parameters for stress testing investment portfolios against multiple greenhouse gas scenarios. [15] Bottom-up approaches attempt to estimate value at risk under climate scenarios at the company or asset level.

[15] Bank of England Prudential Regulation Authority, Life Insurance Stress Test 2019 – Scenario Specification, Guidelines and Instructions, https://www.bankofengland.co.uk/-/media/boe/files/prudential-regulation/letter/2019/life-insurance-stress-test-2019-scenario-specification-guidelines-and-instructions.pdf

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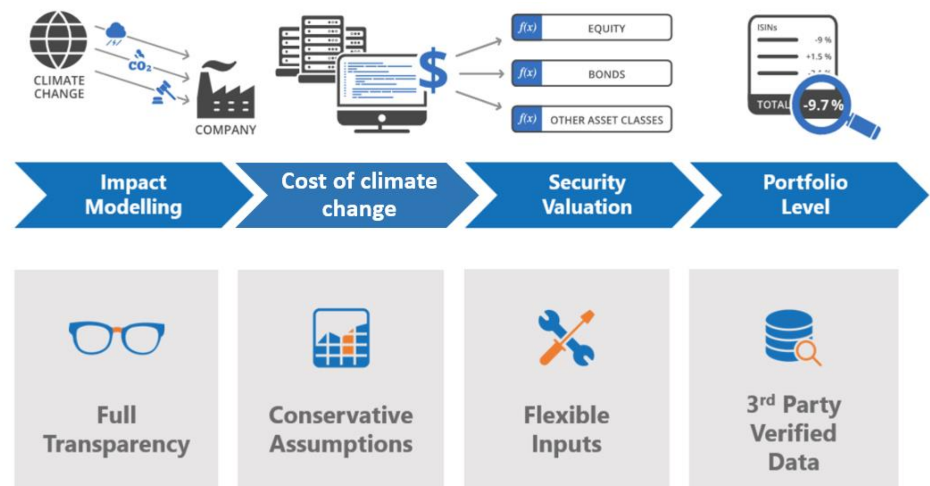
One example of a stress testing product is MSCI's Climate Value-at Risk (CVaR) solution (previously Carbon Delta's CVaR). Carbon Delta is now part of MSCI ESG Research LLC.[16]

Carbon Delta created a forward-looking financial climate risk metric called 'Climate Value-at-Risk' (CVaR) that incorporated nine transition scenarios and two physical climate scenarios, with its methodology closely aligned with the TCFD recommendations. Using the CVaR framework, MSCI ESG Research conducts assessments of climate change risks and opportunities embedded within investment portfolios through a hybrid top-down and bottom-up approach to its climate change scenario modelling.

Exhibit 5. Carbon Delta's modelling philosophy



Source: MSCI ESG Research

The top down aspect is based on quantification of national emission reduction targets obtained from NDCs which are attributed to sectors and then companies, whilst the bottom-up aspect utilizes a global asset level database from which facility and company specific estimations of emission reduction requirements can be computed.

Seven extreme weather hazards provide physical risk analysis based on both probabilistic and re-analysis modelling at high resolution; risk values are calculated for individual company facilities. In addition, an analysis of each company's low carbon innovation through technology opportunity patent analysis is incorporated into the CVaR assessment.

[16] Press release: MSCI Completes Acquisition of Carbon Delta, October 2, 2019. https://www.msci.com/documents/10199/2ef93b17-d537-c3a6-4f23-90d37662a0e7

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v. **Enhance your adaptive capacity by assessing the impact on your investment strategy through asset allocation**

A possible next step for asset owners is to enhance their adaptive capacity by determining where and how climate risks and opportunities should be reflected in asset allocation. This can be done at various levels:

- **Policy level:** Define carbon risk reduction targets across the entire portfolio. This may be achieved by defining appropriate global policy benchmarks (i.e. indexes). The definition of global policy targets with respect to carbon risks may be based on scenario analysis, stress testing and using carbon related measures such as carbon footprint, exposure to fossil fuel and/or low carbon transition risks measures for the entire portfolio.

- **Strategic level:** Breakdown of carbon risk reduction targets into regional or industry allocations. This may be achieved by using appropriate regional or industry benchmarks (i.e. indexes) and/or by using carbon risk measures and definition of low carbon transition categories. For instance, certain companies highly exposed to transition risks could be underweighted or divested.

- **Mandate level:** Define an appropriate carbon risk reduction target for each specific allocation (broken down from the policy and/or strategy level), based on carbon risk measures. Attribute appropriate performance benchmarks to each mandate that reflects these limits to ensure a fair performance measurement.

Examples: Strategy

New Zealand Super Fund

New Zealand Super Fund shifted its NZD 14 billion (USD 9.22 billion) global passive equity portfolio, 40% of the overall fund, to a low carbon portfolio, seeking to reduce its carbon exposure while taking into account companies' carbon risk management abilities. The low-carbon portfolio is based on a bespoke carbon measurement methodology developed by NZ Super in concert with MSCI ESG Research. MSCI ESG Research also provided independent carbon data and company ratings.[17]

Learn more →

[17] New Zealand Super Fund, 2017, https://nzsuperfund.nz/news-media/nz-super-fund-shifts-passive-equities-low-carbon

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C. RISK MANAGEMENT

Disclose how the organization identifies, assesses, and manages climate-related risks.

This section of the TCFD guidance is focused on processes used to assess materiality and locate and use climate related data. It provides guidelines surrounding core risk management steps, including risk measurement, prioritization, mitigation, and monitoring.

Once investors have clarified their overarching climate objectives and identified the key risks and opportunities present in their portfolios, there are several options to manage those risks and opportunities, which we have identified and described below.

These approaches are not mutually exclusive and the effectiveness of each may depend on the investment strategy, with some investors choosing to follow multiple approaches.

1. **Monitoring**: investors seek to understand the overall exposure to climate related risks and opportunities in their portfolio. Increasingly, this function is carried out by risk management teams and integrated into traditional processes to monitor credit, counterparty and market risk exposures across portfolios. Comprehensive monitoring includes external managers as well as portfolio exposures. For more information on common metrics used to monitor climate risk, see Metrics and Targets section below.
2. **Engagement**: investors engage with companies to encourage sustainable practices and operations. Engagement may include direct investor engagement, collaborative engagement[18] and the use of engagement service providers. Climate risk metrics may be used to monitor portfolio companies post-engagement.
3. **Financial analysis and security selection**: investors can use climate risk metrics to identify carbon-related risks at the company level, enabling a deeper financial analysis of potential risks and an assessment of company management practices employed to mitigate such risks. Metrics useful for this purpose may include carbon intensity, fossil fuel reserve and revenue data,

[18] We note many investors who want to engage companies on climate change turning to The Investor Agenda's suggestions. "The Investor agenda is a collaborative initiative that seeks to speed the transition to a low-carbon economy", 2019, https://theinvestoragenda.org/areas-of-impact/corporate-engagement/

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power generation fuel mix, strength of climate risk management, low carbon transition scores, and green revenue.[19]

4. **Fund selection**: investors can use various fund metrics to assess carbon risk exposure at the fund level and to inform fund selection. Fund scores commonly reflect the ability of the underlying holdings to manage medium- to long-term risks and opportunities.[20]

5. **Divestment**: Whether out of concern for the inability to limit financial risk, the future of the planet or both, the number of institutions under pressure to explicitly divest from fossil fuel holdings is growing.[21] With several paths available to investors to address fossil fuel exposure and potential divestment, there may be multiple objectives that require balancing, including:[22]

    - Minimizing short-term financial risk and deviation from standard market returns;
    - Mitigating long-term climate and financial risk posed by potentially stranded assets;
    - Minimizing stakeholder risk through simplicity of implementation and communication;
    - Sending a clear, strong message to the market.

    Investors typically consider fossil fuel type, revenue and/or reserves, as well as business activity within their divestment strategy.

6. **Systematic portfolio construction:** investors can also tackle climate related risks and opportunities through systematic portfolio construction. For example, a passive approach using MSCI Low Carbon Indexes or Climate Change Indexes[23] (Exhibit 6 below) historically has been able to reduce carbon

[19] For more information on common metrics used to identify stock related risks, see Metrics and Targets section below.

[20] MSCI ESG Fund Metrics cover over 24,000 multi-asset class mutual funds and ETFs, https://www.msci.com/esg-fund-metrics

[21] 350.org, 2019, https://350.org/category/topic/divestment/

[22] MSCI, Fossil Fuel Divestment: A practical introduction, 2019

[23] MSCI ESG Indexes and MSCI Analytics utilize information from, but are not provided by, MSCI ESG Research LLC. MSCI Equity Indexes are products of MSCI Inc. and are administered by MSCI UK Limited. For more information on MSCI's Climate change indexes, please see our 2019 report "Climate change and Climate risk, An Index Perspective", https://www.msci.com/documents/10199/af536c28-e115-8253-b40c-ea3fa404b56a

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emissions as well as increase exposure to companies providing solutions to the low carbon transition, while offering broad market exposure.

Exhibit 6. Carbon exposure and historical performance of select MSCI indexes

	MSCI ACWI Index	MSCI ACWI Low Carbon Target Index	MSCI ACWI Climate Change Index
Total Return*** (%)	6.4	6.4	7.1
Total Risk (%)	11.3	11.3	11.3
Return/Risk	0.57	0.56	0.63
Tracking Error (%)		0.4	1.0

Source: MSCI ESG Research. This exhibit refers to the MSCI ACWI Index, MSCI ACWI Low Carbon Target Index ("Low Carbon") and MSCI ACWI Climate Change Index ("Climate Change") as of May 29, 2019; ESG Data as of April 30, 2019.
** Carbon emissions: t CO2e/$M Invested; Carbon intensity: t CO2e/$M Sales*
*** Index weight by Low Carbon Transition Category, for definitions see Appendix III.*
**** Gross returns annualized in USD, period: Nov 29, 2013 to May 31, 2019.*

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Examples: Risk Management

AP2

During 2017, AP2 developed a tool (through Business Intelligence) to make climate data accessible for the internal portfolio managers of listed share mandates. The climate data used in this tool consists of various indicators and metrics from MSCI ESG Research, which are selected based on the climate risks and opportunities.[24]

Learn more →

CCLA

CCLA does not invest clients' assets in companies identified by MSCI ESG Research as generating more than 5% of their returns from the extraction of energy coal or tar sands. This has been designed to increase their clients' portfolio resilience to climate change, and to limit exposure to companies facing the greatest climate risk. [25]

Learn more →

Climate Action 100

Climate Action 100+ requires investors to sign on to the Climate Action 100+ Sign-on Statement, which sets out the investor signatories' commitment and expectations of the companies on the initiative's focus list. As of DATE, it had been signed by 342 investors across dozens of countries, collectively managing more than USD 33.6 trillion in assets. [26]

Its aims are directed towards company boards and senior management, to:

•Implement a strong governance framework to clearly articulate climate change risk and opportunity oversight

•Take action to reduce GHG emissions across members' value chain

•Provide enhanced corporate disclosure in line with the recommendations of the TCFD

Learn more →

[24] AP2, 2019, https://www.ap2.se/globalassets/hallbarhet-agarstyrning/klimat/tcfd/ap2s-tcfd-reporting_190307_gb.pdf

[25] CCLA, 2019, https://www.ccla.co.uk/our-policies/climate-change-and-investment-policy

[26] Climate Action 100+, 2019, http://www.climateaction100.org/

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D. METRICS AND TARGETS

Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities, when such information is material.

This section of the TCFD guideline is focused on the types of metrics institutional investors can use and the steps they can take to understand and manage their climate-related risks and opportunities. This includes metrics such as GHG emissions, targets, processes to assess risks, and the linkage to their strategy.

Here we define different types of climate change metrics that currently exist, define how these metrics are constructed and explain how they can be used.

Measure exposure to transition risk

i. Carbon footprinting

To date, carbon footprinting has been the industry standard for measuring institutional investors' climate transition risk exposure to provide a baseline from which to take action.[27] This has involved various carbon footprint calculations, with the **weighted average carbon intensity metric being the approach recommended by the TCFD.** Exhibit 7 touches on the different carbon footprinting metrics, and which questions they answer.

[27] FSB TCFD, Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures, 2017, https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Annex-062817.pdf

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Exhibit 7. Carbon footprint metrics[28]

	Carbon Emissions tons CO2e / $M invested	Total Carbon Emissions tons CO2e	Carbon Intensity tons CO2e / $M sales	Weighted Average Carbon Intensity tons CO2e / $M sales
Question:	*What is my portfolio's normalized carbon footprint per million dollars invested?*	*What is my portfolio's total carbon footprint?*	*How efficient is my portfolio in terms of carbon emissions per unit of output?*	*What is my portfolio's exposure to carbon-intensive companies?*
Key Strengths:	✓ Allows for comparison regardless of portfolio size ✓ Enables portfolio decomposition and attribution analysis	✓ Most literal carbon footprint from GHG accounting perspective ✓ Absolute number can be used for carbon offsetting	✓ Provides overall intensity of portfolio by adjusting for company size ✓ Allows for comparison regardless of portfolio size	✓ Applicable across asset classes, including fixed income ✓ Simple and intuitive calculation ✓ Does not require corresponding market cap or sales data ✓ Enables simple attribution analysis and portfolio decomposition
Key Weaknesses:	o Requires underlying issuer market cap data o Ownership perspective means it is only applicable to equity portfolios o Sensitive to changes in market value of portfolio	o Limited usefulness for benchmarking and comparison to other portfolios due to link to portfolio size o Requires underlying issuer market cap data o Ownership perspective means it is only applicable to equity portfolios	o Complex calculation, challenging to communicate and understand o Requires underlying issuer market cap data o Ownership perspective means it is only applicable to equity portfolios	o Does not capture any measure of investor responsibility o Sensitive to outliers

Source: MSCI ESG Research

While carbon footprinting is a crucial first step in understanding a portfolio's current carbon emission profile, it is important to note it is a static metric that measures only one aspect of a portfolio's exposure to climate-related transition risk.

ii. Climate transition metrics

Exhibit 8 outlines several available low carbon transition metrics. As recommended in the TCFD guidance document "Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures," disclosures should include metrics associated with products and services designed for a lower-carbon economy, consider

[28] For more information on Carbon Footprinting, see our Carbon Footprinting 101 paper, 2015, https://www.msci.com/documents/10199/2043ba37-c8e1-4773-8672-fae43e9e3fd0

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Scopes 1, 2 and 3 emissions, provide historical data for trend analysis, and detail information on targets.[29]

Exhibit 8. MSCI ESG Research climate transition metrics

Transition metrics
Low Carbon Transition Scores
What do they measure?
The Low Carbon Transition (LCT) score assesses companies' exposure to transition risks across three key dimensions: company operations (carbon emissions), company business models (carbon intensive products and services and clean tech exposure), and management practices (to provide an adjustment where companies have efforts in place to mitigate risks). Based on the size and nature of the transition risk exposure, companies are then assigned a low carbon transition category: Asset Stranding, Product Transition, Operational Transition, Neutral and Solutions. See Appendix III for LCT definitions, and further methodological information on the Low Carbon Transition Risk Assessment.
Why are they important?
As economies transition to a low carbon state, the Low Carbon Transition scores and categories provide information to investors regarding their portfolio's exposure to transition risks and opportunities. Companies classed in the "Solutions" category provide services and/or products aligned with economies transitioning to a low-carbon state and thus may capture opportunities during this transition, while those companies in the "Asset Stranding" or "Product and/or Operational Transition" categories are more likely to face serious challenges during this transition. Understanding portfolio exposure to companies in each category may support a more comprehensive climate change risk assessment.
Metrics available
• Portfolio exposure to companies in each Low Carbon Transition Category (e.g. 20% exposure to companies classed as "Solutions")
Fossil Fuel Exposure
What do they measure?
Fossil fuel exposure metrics provide information to investors regarding their portfolios exposure to companies associated with certain fossil fuel-based activities. This includes exploring and mining fossil fuel reserves (e.g. thermal coal miners), producing fossil fuel products (e.g. O&G refiners), and producing electricity using fossil fuels (e.g. thermal coal power generating utilities). Fossil fuel exposures can be viewed in multiple ways, including but not limited to: reserves vs. production, extraction vs. refining vs.

[29] FSB TCFD, Implementing the Recommendations of the Task Force on Climate-related Financial Disclosures, 2017, https://www.fsb-tcfd.org/wp-content/uploads/2017/06/FINAL-TCFD-Annex-062817.pdf

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transport vs. marketing, % revenue, offshore vs. onshore O&G, unconventional vs. conventional gas production, and % electricity produced with fossil fuels.

Why are they important?

As the world continues to decarbonize, companies' operations or products may require a certain amount of transition as policy, technological, and/or reputational risks mount. Companies with business models reliant on the fossil fuel value chain, may potentially face financial risks if pressure to reduce fossil fuel consumption increases. Further, companies could potentially face their assets becoming stranded as global fossil fuel use declines. These associated fossil fuel risks could result in financial losses at the portfolio level.

Metrics available

- Portfolio exposure to companies with coal related business activities
- Portfolio exposure to companies with thermal coal activities (mining, power generation, T&D)
- Portfolio exposure to companies with conventional oil and gas (O&G) reserves and revenues
- Portfolio exposure to companies with unconventional O&G reserves and revenues (e.g. shale, oil sands)
- Portfolio exposure to power generating companies using fossil fuels (e.g. gas, oil, coal)

Climate solutions exposure

What do they measure?

Climate Solutions metrics measure portfolio exposure to companies that derive revenues from solutions to climate change, e.g. energy efficiency projects, alternative and/or renewable energy production, or avoided emission potential.

Why are they important?

Companies that actively pursue emission-reduction activities via the services and products they provide, are potentially minimizing the transition risks they may face in the transition to a low-carbon economy. These companies are shifting their business models to support global climate change goals, positioning their businesses to capitalize on shifting energy and climate demand opportunities.

Metrics available

- Portfolio exposure to companies in the Low Carbon Transition Solutions category
- Portfolio exposure to companies with energy efficiency-related revenue
- Portfolio exposure to companies with alternative energy revenue
- Portfolio exposure to companies with green building revenue
- Portfolio exposure to companies with other clean technologies revenue such as sustainable water or pollution prevention
- Portfolio exposure to utilities generating power from renewable energy

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Transition risk management

What do they measure?

Transition risk management metrics provide an indication of how well a company has established risk management practices, policies, and targets to mitigate the financial impacts of climate change on the company's business activities.

Why are they important?

Companies that have management practices and policies to reduce emissions are more likely to mitigate potential transition related risks going forward. Companies with publicly disclosed targets have committed to minimizing their carbon footprint, in turn reducing their risk when faced with potential climate regulation. Aligning portfolios with similar carbon reduction targets could help position the overall portfolio to limit risk from regulatory action.

Metrics available

- portfolio exposure to companies with emission reduction targets and assessment of the aggressiveness of the target compared with peers
- portfolio exposure to companies with executive remuneration linked to carbon emission reductions
- portfolio exposure to companies with leading carbon management scores

For more information on carbon transition data and other carbon metrics provided by MSCI ESG Research, please refer to the MSCI ESG Climate Change Metrics factsheet.[30]

iii. Target setting

Target setting for institutional investors is an important component of the TCFD recommendations. Because there are various options when setting targets, ranging from portfolio emission reductions to the phasing out of thermal coal,[31] we believe it is important that they be informed by the institution's overall climate change objective and strategy. As articulated in the "Strategy" section above, strategy development and hence target setting can be split into three major categories, described in Exhibit 9 below. For each category's set of targets, we recommend disclosing the base year, time frame, and scope (for individual portfolios or across investments).

[30] MSCI, 2019, https://www.msci.com/documents/1296102/15233886/ESG-ClimateChangeSolutions-FactSheet-03_17June.pdf/9b691450-c015-a0ad-52e2-cafa2ad7bed9?t=1561016906317

[31] The Investor Agenda, 2019, https://theinvestoragenda.org/areas-of-impact/investment/

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Exhibit 9. Possible investor targets aligned with common strategic climate objectives

Mitigating risks

Actions

- Reduce portfolio carbon intensity or carbon footprint to align with a global temperature rise to no more than 1.5^{0}C above pre-industrial levels
- Reduce exposure to carbon-intensive assets (selective or phased-in divestment), starting with the most carbon-intensive, e.g. thermal coal and oil sands
- Reduce exposure to sectors highly exposed to climate change[32]

Capturing opportunities

Actions

- Increase "green" or low carbon investments, such as:
  - Supporting Mission2020 targets to multiply the green bond market annual issuance by ten-fold from 2016, and reach the target of USD 1 trillion per year of green investment[33]
  - Increasing investment allocation to clean technology sectors

Promoting stewardship

Actions

- Sign on to collective engagement initiatives (e.g. Climate Action 100+)
- Target companies for direct engagement (e.g. actively engage all companies falling below a certain climate risk threshold)

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[32] EU Technical Expert Group on Sustainable Finance, Report on Benchmarks: TEG Interim Report, 2019, https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/190618-sustainable-finance-teg-report-climate-benchmarks-and-disclosures_en.pdf

[33] Mision2020, 2019, http://www.mission2020.global/milestones-alternative-energy/#finance

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Examples: Metrics and Targets

Aviva

Aviva uses MSCI's ESG Ratings and carbon footprinting information to take stock of climate change and ESG risks in its investment portfolio and track progress against its 2015 climate strategy. [34]

Learn more →

[34] Aviva, 2018, https://www.aviva.com/content/dam/aviva-corporate/documents/socialpurpose/pdfs/climate-related-financial-disclosure-2018-report.pdf

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Appendix I: How MSCI ESG Research supports investor TCFD reporting

MSCI offers a range of solutions to support investors looking to implement TCFD recommendations, including company data, ESG Ratings, ESG indexes and portfolio construction and reporting tools. More details are provided in the table below.

TCFD		PRI [35]	MSCI SOLUTIONS TO SUPPORT TCFD IMPLEMENTATION
GOVERNANCE	Board oversight	SG 7.5 CC Oversight, accountability, and/or management roles and responsibilities for climate-related issues SG 7.6 CC Board level climate related roles and responsibilities, with oversight and execution detailed	MSCI has over 350+ ESG experts, including specialists focused on Corporate Governance and Climate Change. We work with over 1400 investors around the world[36] on integrating ESG and climate risk into their investment process – sharing examples of best practices and guidance on how to best use our tools.
	Role of management	SG 7.5 CC Oversight, accountability, and/or management roles and responsibilities for climate-related issues SG 7.7 CC Management level climate roles and responsibilities.	
STRATEGY	Identify risks and opportunities	SG 1.6 CC Details on climate related risks and opportunities, which have been factored into the organization's investment strategy and products SG 1.8 CC Time horizons for climate related risks and opportunities, and potential impacts and likelihood of these risks	• Dedicated research team located in 17 offices worldwide producing thought leadership, thematic, industry and market reports investigating material climate risks and opportunities • ESG Rating framework determines the relevance and time horizon of key climate-related risks and opportunities facing each industry

[35] UNPRI, 2019, https://www.unpri.org/Uploads/z/r/r/14.sgclimatechangereporting_718999.pdf

[36] Source: MSCI ESG Research as of March 2019. Includes full time employees, employees of foreign affiliates providing investment advisory services to MSCI ESG Research LLC, and global allocated staff performing non-investment advisory tasks

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	Impact on investment strategy	SG 1.6 CC Details on climate related risks and opportunities, which have been factored into the organisations investment strategy and products. Disclosure on how this impacts portfolios, asset classes, sectors and regions also welcome	• Robust climate data covering core aspects of climate risk across equity, fixed income and funds (see Metrics & Targets) • Portfolio analytics and risk management tools (BarraOne®, Barra® Portfolio Manager, RiskManager®, MSCI BEON™)[37] • Climate change and low carbon indexes covering global and regional equity markets; ESG fixed income indexes and custom index capabilities*
	Resilience of investment strategy	SG 13.1 Does the organization conduct scenario analysis and/or modelling, and if so, describe it (asset class, sector, asset allocation etc.)	• Risk management tools* (e.g. RiskManager) integrating climate data with the ability to stress test multi-asset portfolios against a range of client-inputted scenarios
RISK MANAGEMENT	Assess risks	SG 14.8 CC Process for identifying, assessing, managing, and integrating climate related risks into overall risk management SG14.9 CC Does your organization take active ownership activities to encourage TCFD adoption	***Monitoring:*** • Multi-asset class portfolio analytics and risk management tools* ***Engagement + bottom-up analysis:*** • Company reports detailing exposure to and management of climate-related risks and opportunities • Peer benchmarking capabilities to identify a focus list and track progress ***Divestment:*** • Fossil fuel screening capabilities • Ex-fossil fuel equity and fixed income indexes* ***Fund selection:*** • Fund ratings, metrics and reports measuring key dimensions of mutual fund and ETF exposure to climate-related risks
	Manage risks	SG 14.8 CC Process for identifying, assessing, managing, and integrating climate related risks into overall risk management	
	Integrate risks	SG 14.8 CC Process for identifying, assessing, managing, and integrating climate related risks into overall risk management	

[37] * MSCI ESG Indexes and MSCI Analytics utilize information from, but are not provided by, MSCI ESG Research LLC. MSCI Equity Indexes are products of MSCI Inc. and are administered by MSCI UK Limited.

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			Portfolio construction: • Portfolio construction tools (e.g. Barra Portfolio Manager), with optimization capabilities and 'what if' functionality* • Climate change indexes: MSCI Low Carbon Indexes, MSCI Climate Change Indexes*
METRICS & TARGETS	Use of metrics	SG 14.6 CC Details on key metrics used to assess climate-related risks and opportunities	Robust climate data covering core aspects of climate risk across equity, corporate bonds, sovereign debt, mutual funds, ETFs and indexes, including: • **Carbon emissions** (scope 1, 2 and 3, disclosed and estimated, history available since 2008) • **Fossil fuel reserves**, revenues, power generation, and installed capacity by fuel type • **Green revenues** from alternative energy and energy efficiency solutions; renewable energy installed capacity and power generation • **Water metrics**, water risk management and exposure to water stress • Detailed **geographic and business segments** across over 1,000 categories of activity • **Company risk management** governance, strategy and practices, including carbon, water, and energy reduction targets
	Measurement of GHG emissions	SG 14.6 CC Details on key metrics used to assess climate-related risks and opportunities	
	Set targets	SG 14.7 CC Describe further detail of key targets	

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Appendix II: TCFD portfolio metrics sample framework

Weighted average carbon S1&2 intensity (t CO2e /$m sales)

	MSCI ACWI Climate Index	MSCI ACWI
	126.8	227.3

44% lower intensity

Weighted average carbon S3 intensity (t CO2e /$m sales)

	MSCI ACWI Climate Index	MSCI ACWI
	267.57	401.2

33% lower intensity

Weight of companies by LCT Category (%)

	Solutions	Neutral	Operational Transition	Product Transition	Asset Stranding
MSCI ACWI Climate Index	7.3	84.6	5.6	2.4	0.07
MSCI ACWI	2.7	77.9	8.4	9.8	0.4

170% more exposure to solutions

Weight of companies offering clean technology solutions (%)

	>0-20%	>20-50%	>50%
MSCI ACWI Climate Index	42.1	24	13.4
MSCI ACWI	17.2	11.2	4.3

144% more exposure to clean technologies

Weight of companies generating revenue from alternative energy (%)

	>0-20%	>20-50%	>50%
MSCI ACWI Climate Index	23.8	5.3	2.4
MSCI ACWI	10	1.7	0.6

138% more exposure to alternativie energy

Potential emissions from fossil fuel reserves (tCO2e)

	Total	Thermal coal	Conventional oil	Conventional gas	Unconventional oil	Unconventional gas
MSCI ACWI Climate Index	603,972	183,559	220,963	199,450	164.595	6.611
MSCI ACWI	3,002,250	892,275	960,280	1,149,694	806.25	24.431

79% lower potential emissions

Source: MSCI Index constituents, as of July 22, 2019; ESG Data as of July 29, 2019

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TCFD PORTFOLIO DISCLOSURE EXAMPLE

Metrics	Units	MSCI ACWI Climate Index	MSCI ACWI
Carbon footprint			
Weighted average carbon intensity (Scope 1 + 2)	**t CO_2e/$M**	**126.8**	**227.3**
Weighted average scope 3 carbon emissions intensity	t CO2e/$M	267.57	401.2
Low Carbon Transition (weight of stocks by LCT Category)			
Net Solutions (minus Transition Risk)	**%**	**-0.8**	**-16.0**
• Solutions	%	7.3	2.7
• Neutral	%	84.6	77.9
• Operational Transition	%	5.6	8.4
• Product Transition	%	2.4	9.8
• Asset Stranding	%	0.07	0.46
Fossil fuel exposure			
Weight of companies owning fossil fuel reserves	**%**	**3.2**	**8.4**
• thermal coal reserves	%	0.9	1.6
• conventional oil reserves	%	1.5	5.6
• conventional gas reserves	%	1.5	5.7
• unconventional oil reserves*	%	0.8	3.9
• unconventional gas reserves**	%	0.2	1.1
Potential emissions from fossil fuel reserves	**tCO2e**	**603,972**	**3,002,250**
• from thermal coal reserves	tCO2e	183,559	892,275
• from conventional oil reserves	tCO2e	220,963	960,280
• from conventional gas reserves	tCO2e	199,450	1,149,694
• from unconventional oil reserves*	tCO2e	164.595	806.25
• from unconventional gas reserves**	tCO2e	6.611	24.431

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Metrics	Units	MSCI ACWI Climate Index	MSCI ACWI
Fossil fuel exposure (continued)			
Weight of companies generating revenue from thermal coal extraction	>0-20%	0.6	1.1
	>20-50%	0.1	0.5
	>50%	0.0	0.1
Weight of companies generating revenue from thermal coal power generation	>0-20%	1.1	1.5
	>20-50%	0.4	0.7
	>50%	0.4	1.0
Weight of companies generating revenue from conventional O&G exploration	>0-20%	0.6	1.9
	>20-50%	0.4	1.9
	>50%	0.3	1.8
Weight of companies generating revenue from unconventional O&G exploration* (e.g. shale)	>0-20%	0.4	2.0
	>20-50%	0.2	0.9
	>50%	0.1	0.8
Climate solutions exposure			
Weight of companies offering clean technology solutions	>0-20%	42.1	17.2
	>20-50%	24.0	11.2
	>50%	13.4	4.3
Weight of companies offering climate change solutions	>0-20%	40.6	16.9
	>20-50%	20.2	9.9
	>50%	11.1	4.0
Weight of companies generating revenue from energy efficiency solutions	>0-20%	26.9	12.3
	>20-50%	11.6	7.4
	>50%	5.0	2.7
Weight of companies generating revenue from alternative energy	>0-20%	23.8	10.0
	>20-50%	5.3	1.7
	>50%	2.4	0.6

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Metrics	Units	MSCI ACWI Climate Index	MSCI ACWI
Transition risk management			
Weight of companies with an emission reduction target	**%**	**46.3**	**44.7**
• emission reduction target: 2020-2030	%	46.3	44.7
• emission reduction target: 2030-2040	%	8.0	6.5
• emission reduction target: 2040-2050	%	9.9	9.9
• aggressive emission reduction target***	%	4.5	4.1

For a full list of over 500 available metrics, please contact esgclientservice@msci.com.

Source: MSCI Index constituents, as of July 22, 2019; ESG Data as of July 29, 2019
** Shale oil and oil sand*
*** Shale gas*
**** Period: 2019 - 2050*

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Appendix III: Low Carbon Transition Category definitions

MSCI ESG Research's Low Carbon Transition Risk assessment is designed to identify potential leaders and laggards by holistically measuring companies' exposure to and management of risks and opportunities related to the low carbon transition.

The final output of this assessment is two company-level factors, as described below:

(1) Low Carbon Transition Category: This factor groups companies in five categories that highlight the predominant risks and opportunities they are most likely to face in the transition.

(2) Low Carbon Transition Score: This score is based on a multi-dimensional risks and opportunities assessment and considers both predominant and secondary risks faced by company. It is industry-agnostic and represents an absolute assessment of a company's position vis-à-vis the transition.

For more information on the Low Carbon Transition, please refer to the Low Carbon Transition Methodology document.[38]

LOW CARBON TRANSITION SCORE	LOW CARBON TRANSITION CATEGORY		LOW CARBON TRANSITION RISK/ OPPORTUNITY	
SCORE = 0	**ASSET STRANDING**		Potential to experience "stranding" of physical/ natural assets due to regulatory, market, or technological forces arising from low carbon transition.	Coal mining & coal based power generation; Oil sands exploration/production
	TRANSITION	**PRODUCT**	Reduced demand for carbon-intensive products and services. Leaders and laggards are defined by the ability to shift product portfolio to low-carbon products.	Oil & gas exploration & production; Petrol/diesel based automobile manufacturers, thermal power plant turbine manufacturers etc.
		OPERATIONAL	Increased operational and/or capital cost due to carbon taxes and/or investment in carbon emission mitigation measures leading to lower profitability of the companies.	Fossil fuel based power generation, cement, steel etc.
	NEUTRAL		Limited exposure to low carbon transition carbon risk. Through companies in this category could have exposure to physical risk and/or indirect exposure to low carbon transition risk via lending, investment etc.	Consumer staples, healthcare, etc.
SCORE = 10	**SOLUTIONS**		Potential to benefit through the growth of low-carbon products and services.	Renewable electricity, electric vehicles, solar cell manufacturers etc.

[38] MSCI, 2019, Climate Change Metrics – Low Carbon Transition Assessment

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