

Third Quarter 2022

ESG Integration in Fixed Income

Prepared for UN PRI & SEC Thailand

September 2022



Manulife Investment Management

Part of a leading global financial services group

Manulife

Protecting customer assets since **1887**

More than **38,000** employees serving more than **33M** customers worldwide

\$1.1T in assets under management and administration

- Global wealth and asset management
- Financial advice
- Insurance

Manulife Investment Management

- Institutional asset management
- Retirement
- Retail investments

1,000+ institutional accounts

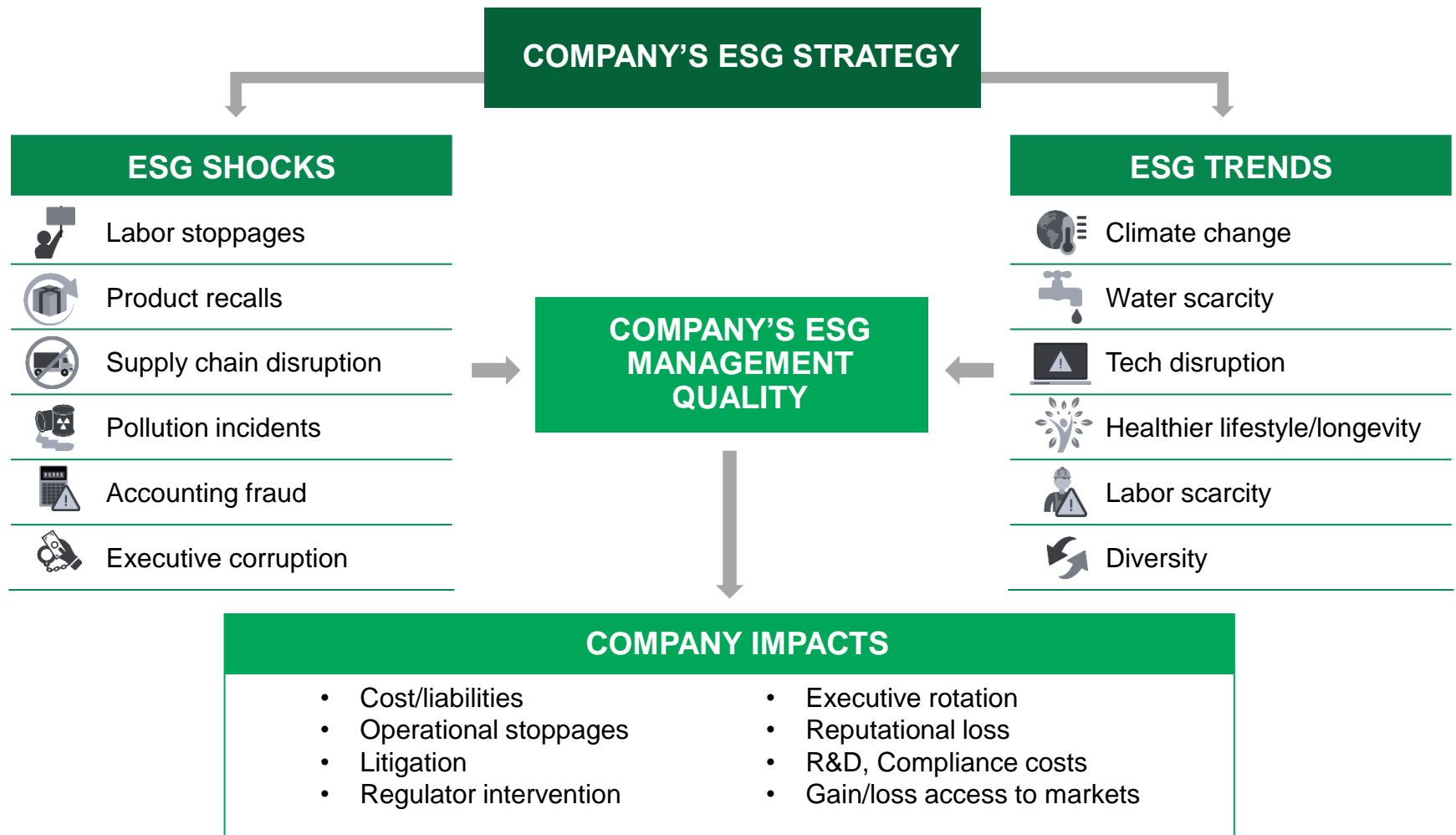
\$869B in assets under management and administration

More than **15M** retirement plan participants and investor accounts

250,462 retirement plans served globally

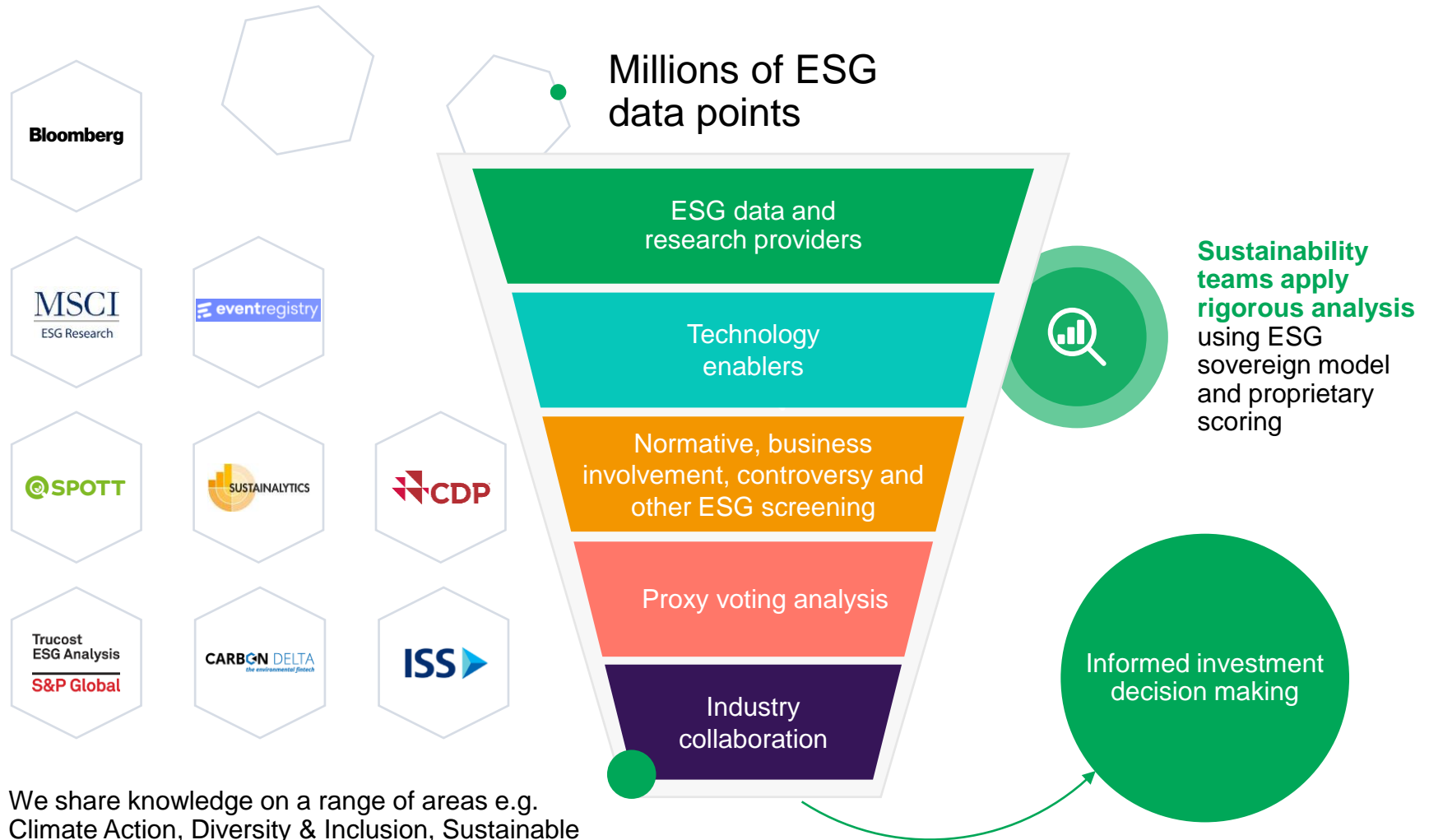
Source: MFC Statistical Information Package. Manulife Investment Management is the unified global brand for Manulife's global wealth and asset management business, which serves individual investors and institutional clients in three businesses: retirement, retail and institutional asset management (public and private markets). Global Wealth and Asset Management AUMA at December 31, 2021, which includes \$194.6 billion of assets managed on behalf of other segments and \$147.9 billion of assets under administration. Assets shown in U.S. dollars.

How does ESG actually affect companies?



For illustrative purposes only

We combine analysis of proprietary data with external sustainability data providers to deliver insights for our investment teams



We share knowledge on a range of areas e.g. Climate Action, Diversity & Inclusion, Sustainable Real Estate & Infrastructure, Governance

For illustrative purposes only. The logos above are registered trademarks of the respective organizations/ firms represented. Illustrative of our process and information sources may change over time.

ESG Due Diligence: Industry Handbooks

- Manulife IM has developed an in-house view on the materiality of certain ESG issues to specific industries (based on the SASB materiality framework)
- A series of industry-specific ESG integration ‘handbooks’ are available on Bloomberg research management function to enable investment staff to efficiently identify the value drivers which can be impacted by material ESG issues

Manulife Industry Specific Materiality Map

Ranking of ESG Issues	Revenue			Operating Expenses		Non-Operating Expenses		Assets		Liabilities	
	Market Share	New Markets	Pricing Power	Cost of Reven	R&D	CapEx	Extraordinary I	Tangible Asse	Intangible Ass	Contingent Lia	Pension & Oth
1,Materials Sourcing	Medium Risk			High Risk							
2,Water Management	Medium Risk			High Risk		Medium Risk	Medium Risk			Medium Risk	
2,Waste Management	Medium Risk			High Risk		Medium Risk	Medium Risk			Medium Risk	
3,Energy Management in Manufacturing				High Risk		Medium Risk					
4,Greenhouse Gas Emissions	Medium Risk			Medium Risk		Medium Risk					
4,Product Lifecycle Management	Medium Risk			Medium Risk	High Risk	Medium Risk	Medium Risk			Medium Risk	
4,Employee Health & Safety							Medium Risk		Medium Risk	Medium Risk	
7 Recruiting & Managing a Global & Skilled Workforce	Medium Risk		Medium Risk	High Risk							

Manulife Industry Specific Due Diligence Questions

Category	Sub-Category	Questions
Environment	Greenhouse Gas Emissions	› What is the company's strategy to reduce its Scope 1 and perfluorinated compound emissions?
Environment	Energy Management in Manufacturing	› How is the company managing energy consumption and related price and supply risks?
Environment	Energy Management in Manufacturing	› What strategies are in place to increase energy efficiency and manage the company's energy mix?
Environment	Water Management	› What strategies does the company employ to minimize potential water supply disruptions or cost increases, particularly in water stressed regions?
Environment	Waste Management	› What are the company's primary sources of hazardous waste, and what strategies, including recycling, are in place to reduce these waste streams?
Human Capital	Recruiting and Managing a Global Skilled Workforce	› What strategies does the company employ to attract, recruit, and retain qualified technical candidates?
Human Capital	Employee Health & Safety	› How does the company assess, monitor, and reduce exposure to health and safety risks in the workplace?
Business Model & Innovation	Product Lifecycle Management	› What strategies does the company employ to monitor, reduce, or eliminate the presence of potentially harmful chemicals in its products?
Business Model & Innovation	Product Lifecycle Management	› How does the company design and market energy efficiency in its products and respond to increasing customer demand for sustainable products?
Business Model & Innovation	Materials Sourcing	› What is the company's exposure to risks of potential disruptions in the supply chain arising from the use of critical materials, and how is the company managing these risks?
Leadership & Governance	Intellectual Property Projection & Competitive Behavior	› How does the company manage the legal environment surrounding anti-competitive behavior and the protection of its intellectual property?
CONTEXTUAL CONSIDERATIONS	-	Total Production
CONTEXTUAL CONSIDERATIONS	-	Percentage of products from owned facilities

Source: Manulife Investment Management. For illustrative purposes only.

Corporate Credit Analysis in North American Fixed Income

- Credit spread assessment

- Ensures standard regional format for incorporating ESG factors into internal credit ratings across credit analysts
- Leverages third party ESG research to inform credit analyst's in-house view on company's ESG profile

ESG Analyst's Inputs				
ESG Risks	Risk Intensity Ranking (PIs Select)	Metrics	Analysis	Momentum
Operational Safety, Emergency Preparedness and Response	High Risk (Emerging)	Number of reportable pipeline incidents, percentage significant		Negative
Greenhouse Gas and Other Air Emissions	High Risk (Emerging)	Gross global Scope 1 emissions, percentage methane, percentage		Neutral
Ecological Impacts	High Risk (Emerging)	Number and aggregate volume of hydrocarbon spills		Negative
Community Relations	Moderate Risk	Controversies		Positive

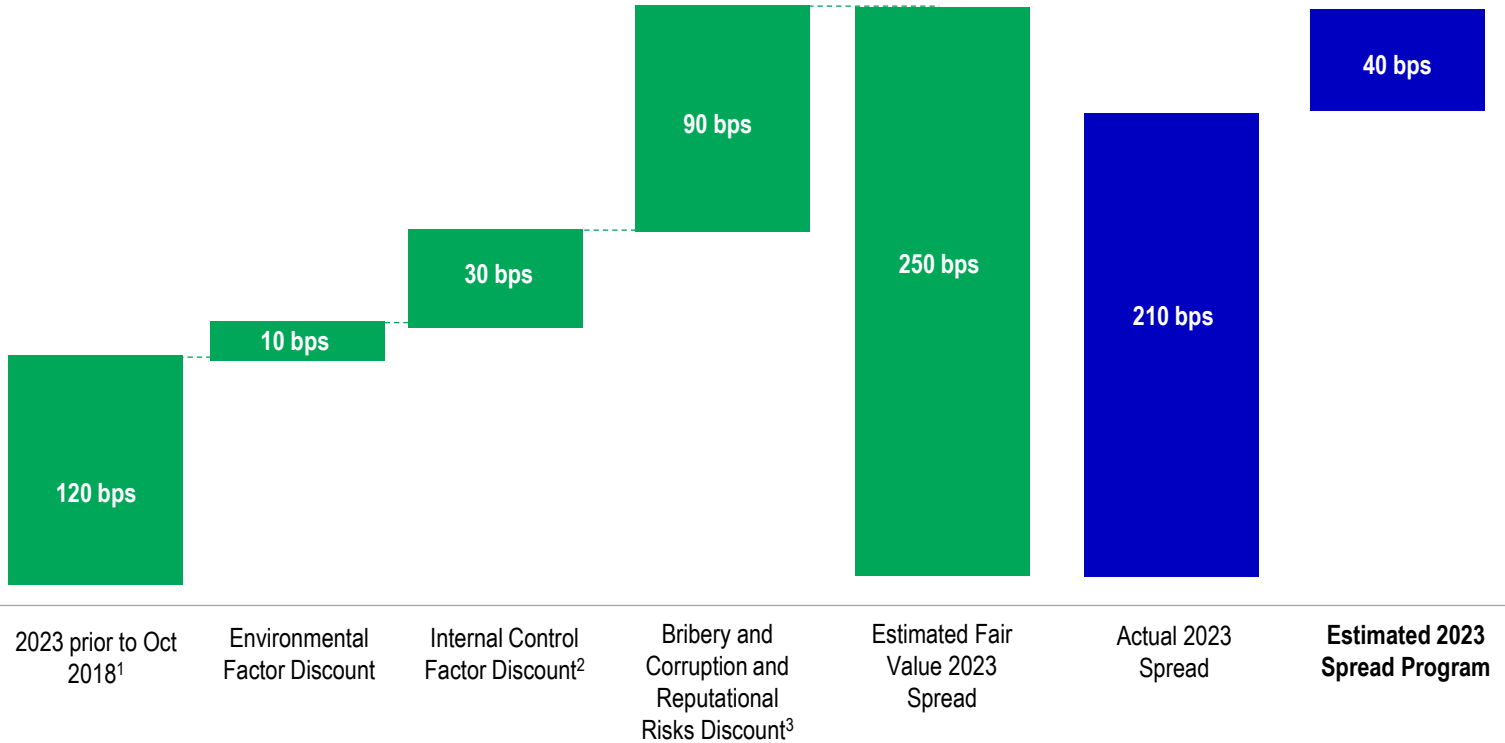


Analysts provide views on impacts to credit spread

Credit Analyst Assessment of ESG and Valuation Impact		
Realization Probability of ESG risks using 1 year time horizon		Med.
Materiality of ESG Risk? ESG Factors Likely to Effect Yield Spread		Med.
Compensation required in terms of yield spread for ESG risks?	Est. bps range?	Med.
If high credit rating with poor ESG score/metrics, does this indicate potential for spreads to widen?		No
Issue at risk because bond spreads are too tight relative to material ESG risks?		No

For illustrative purposes only.

Applying ESG research to fixed income valuation



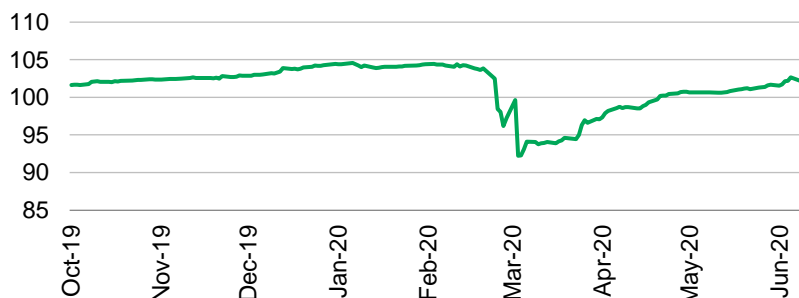
For illustrative purposes only.

ESG Credit Case Study

Consumer Products (China)

Issuer name	Consumer Products – Nutrition
Country	China
Ticker	BTSDF
Bond Rating (S&P/Moody's/Fitch)	BB (S&P) / Ba3 (Moody's)
MSCI ESG Rating	BBB
Industry & Description	Manufacturer and distributor of packaged food products. A leading provider of infant milk formula in China. The company offers pediatric nutritional, baby care products, and other healthcare supplements.

	Risk Intensity Ranking	Best-in-class
Environmental	Moderate Risk	
Social	Moderate Risk	✓
Governance	Moderate Risk	



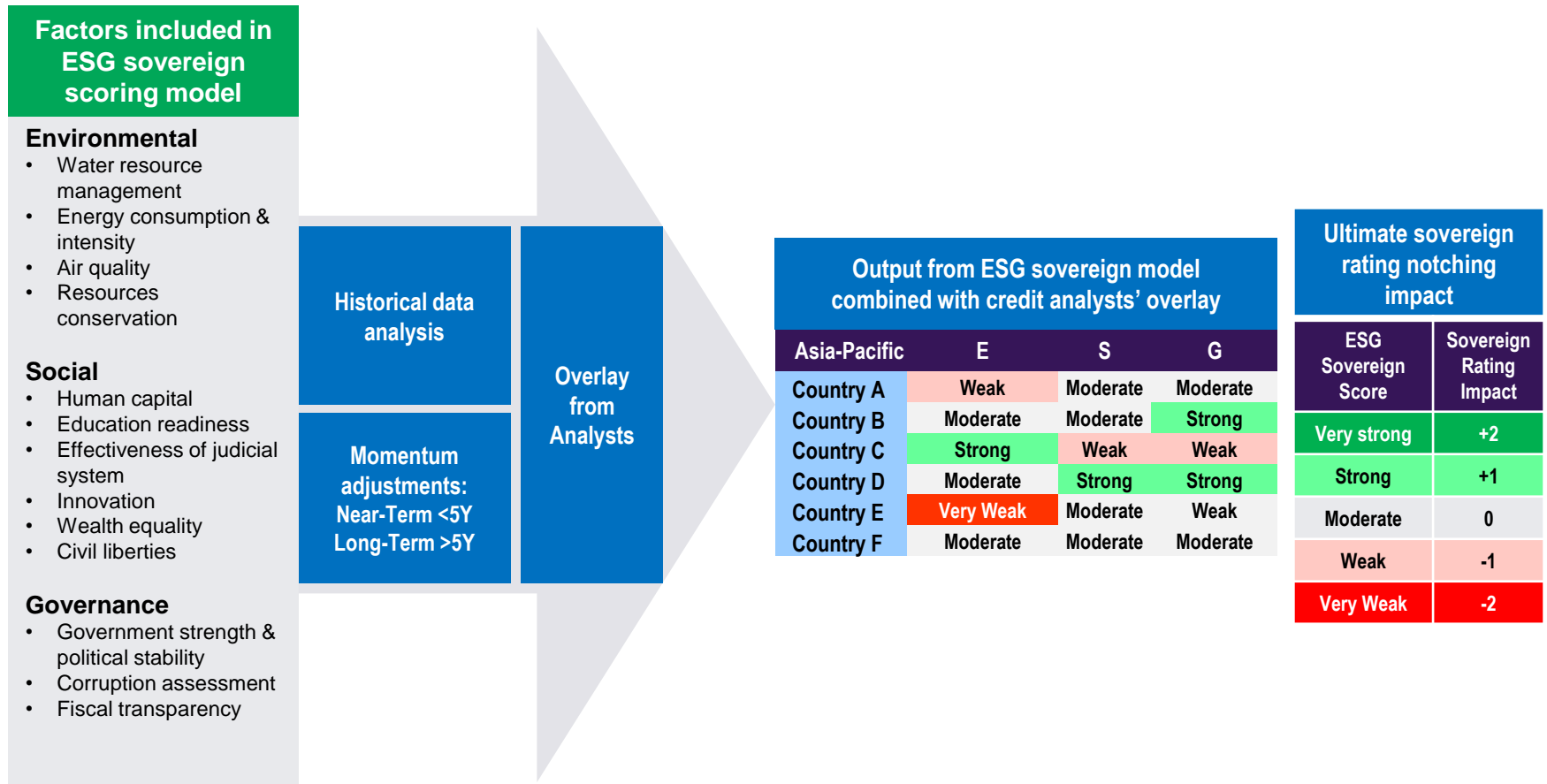
Source: Manulife Investment Management, 30 June 2020. Chart shows bond price (cents). For illustrative purposes only.

This information is intended only to illustrate some of the investment methodologies and philosophies of the strategy team. The material does not constitute an offer or an invitation by or on behalf of Manulife Investment Management to any person to buy or sell any security. This material should not be viewed as a current or past recommendation or solicitation of an offer to buy or sell any investment products or to adopt any investment strategy. The historical success, or the strategy team's belief in future success, of any of the strategies is not indicative of, and has no bearing on, future results. Risk controls and other proprietary technology do not promise any level of performance or guarantee against loss of principal. Past performance is not indicative of future results. The securities described do not represent all of the securities purchased, sold or recommended for the portfolio. It should not be assumed that an investment in these securities or sectors was or will be profitable.

Manulife Asia Credit Committee (MACC) – Action → Recommend as core holding since 2016

- Core products are infant milk formulas and health supplement products, which could be vulnerable to regulatory and product safety risks.
- **Social:** The business has capitalized on the growing opportunities in nutrition and health products, as rising disposal income, changing lifestyles from urbanization and greater awareness of health and wellness issues have led to substantial growth in demand for its products over the last decade.
- Product quality and safety risks are well managed with a solid operating track record, premium product positioning and few product recalls relative to industry peers.
- **Governance:** While the company's shareholding is concentrated with substantial influence from its founder, the risk is partly mitigated by its listing status and good financial disclosures.
- **The company was upgraded by S&P in 2018 while Moody's has a "positive" outlook on its rating. We see potential for further upgrades in the medium term considering the company's good operating track record, prudent financial management, and favorable industry outlook.**

How Our ESG Sovereign Model Works



Our ESG and investment teams have engineered a proprietary model to assess sovereign ESG factors and subsequent impact on ratings

For illustrative purposes only.

How We Engage with Companies

Engagement yields greater insight into the quality of a company's management and performance. This helps to enhance investment decisions and long-term value.

How We Engage

- Our engagement objectives can be **fact-finding** or **outcome-driven**.
- We may engage **directly** or in **collaboration**.
- Engagement activity is logged for progress tracking; it is available to ESG analysts and all investment teams.

Examples of outcome-driven engagement

Policy Adoption

Board Composition & Structure

Sustainability Disclosure

Sustainability Targets

Shareholder Rights

Why We Engage

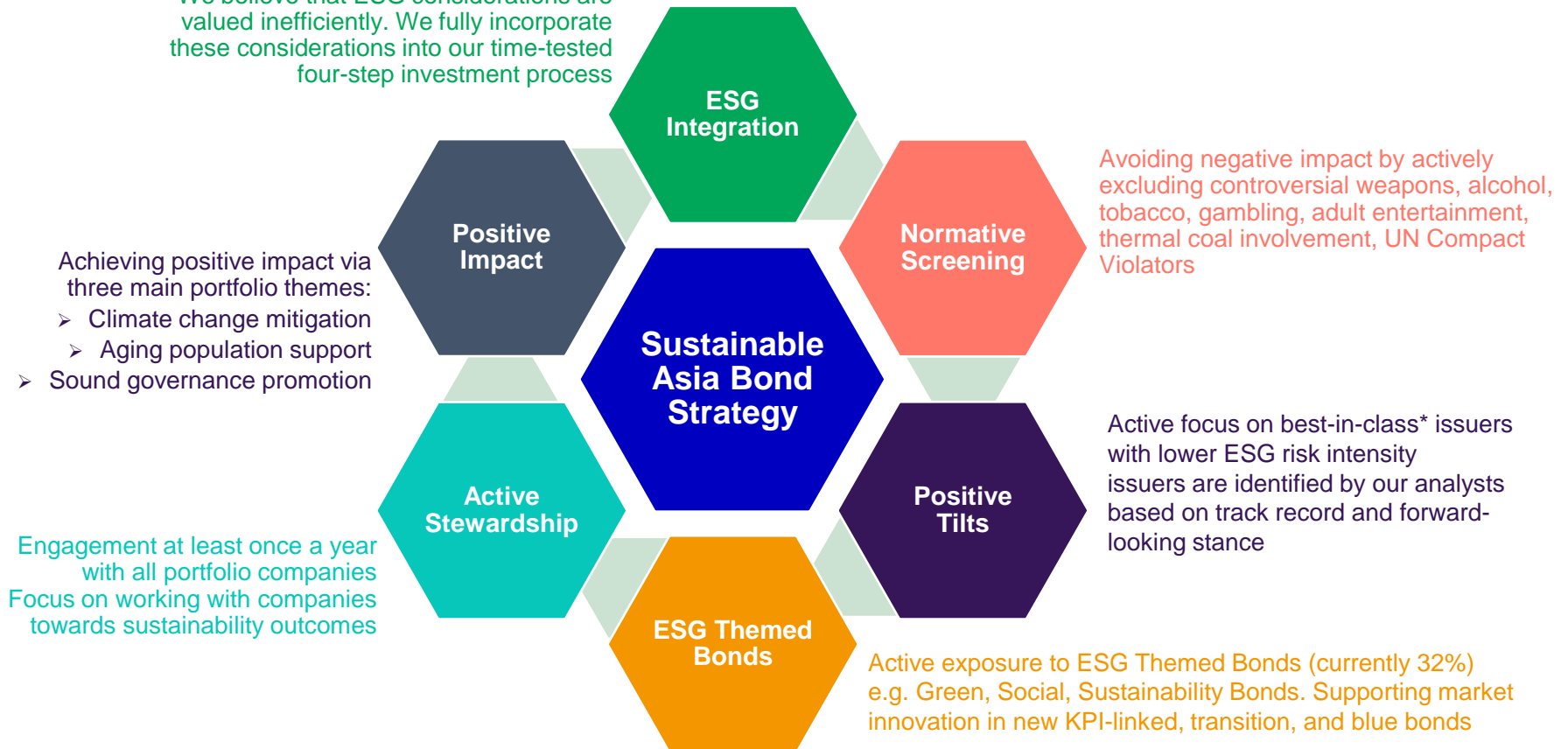
- **Value Creation:** On behalf of our clients, we engage companies with an outcome oriented approach to mitigate risks and support long-term returns.
- **Due Diligence:** Evaluation of ESG factors is a natural extension of our fundamental research and engagement yields greater insight into the quality of a company's management and performance overall. This supports investment decision-making in a changing world.
- **Stewardship:** We collaborate on issues of systemic importance to support the long-term interests of our client's capital. We also participate in industry and regulatory groups to support resilient capital markets.

We also engage collaboratively in industry-wide engagements for example as founder members of Climate Action 100+¹

For illustrative purposes only.
¹<https://www.climateaction100.org/>

Manulife GF Sustainable Asia Bond Fund's Holistic Approach

We believe that ESG considerations are valued inefficiently. We fully incorporate these considerations into our time-tested four-step investment process



Our holistic approach to sustainable investing enables us to build a portfolio seeking to generate sustainable risk-adjusted returns

Source: Manulife Investment Management, 31 January 2022.

For illustration purposes only. **Best-in-class** ESG is industry terminology referring to an investment approach that selects companies that are leaders from an ESG perspective. We consider that the integration of sustainability risks in the decision-making process is an important element in determining long-term performance outcomes and is an effective risk mitigation technique. Our approach to sustainability provides a flexible framework that supports implementation across different asset classes and investment teams. While we believe that sustainable investing will lead to better long-term investment outcomes, there is no guarantee that sustainable investing will ensure better returns in the longer term. In particular, by limiting the range of investable assets through the exclusionary framework, positive screening and thematic investment, we may forego the opportunity to invest in an investment which we otherwise believe likely to outperform over time.



Investment Considerations

A widespread health crisis such as a global pandemic could cause substantial market volatility, exchange-trading suspensions and closures, and affect portfolio performance. For example, the novel coronavirus disease (COVID-19) has resulted in significant disruptions to global business activity. The impact of a health crisis and other epidemics and pandemics that may arise in the future, could affect the global economy in ways that cannot necessarily be foreseen at the present time. A health crisis may exacerbate other pre-existing political, social and economic risks. Any such impact could adversely affect the portfolio's performance, resulting in losses to your investment.

Any performance information shown is the investment strategy composite gross of fees, including advisory and investment management fees and other expenses an investor would incur, but net of transaction costs, unless otherwise noted; deduction of such expenses would reduce returns. Net performance results reflect the application of the highest incremental rate of the standard investment advisory or management fee schedule to gross performance results, unless otherwise indicated. Changes in exchange rates may have an adverse effect. Actual fees may vary depending on, among other things, the applicable fee schedule, portfolio size and/or investment management agreement. For example, if \$100,000 were invested and experienced a 10% annual return compounded monthly for 10 years, its ending value, without giving effect to the deduction of advisory or investment management fees, would be \$270,704 with an annualized compounded return of 10.47%. If an advisory or investment management fee of 0.95% of the average market value of the account were deducted monthly

for the 10-year period, the annualized compounded return would be 9.43% and the ending dollar value would be \$246,355. Unless otherwise noted, returns greater than 1 year are annualized; calendar year returns for each one year period end in December. Discrepancies may occur due to rounding. Past performance does not guarantee future results.

Performance information shown is generally for discretionary strategies/solutions and managed by a Manulife entity which is GIPS compliant and falls under the definition of a corresponding Manulife GIPS firm. Some investment strategies/solutions may not be included in a GIPS compliant firm under certain circumstances, such as SMA/UMA business in Canada.

Any characteristics, guidelines, constraints, or other information provided for this material was selected by the firm as representative of the investment strategy and is provided for illustrative purpose only, may change at any time, and may differ for a specific account. Each client account is individually managed; actual holdings will vary for each client and there is no guarantee that a particular client's account will have the same characteristics as described herein. Any information about the holdings, asset allocation, or sector diversification is historical and is not an indication of future performance or any future portfolio composition, which will vary. Portfolio holdings are representative of the strategy, are subject to change at any time, are not a recommendation to buy or sell a security, and do not represent all of the securities purchased, sold or recommended for the portfolio. It should not be assumed that an investment in these securities was or will be profitable. Top ten holdings information combines share listings from the same

issuer, and related depositary receipts, into a singular holding to accurately present aggregate economic interest in the referenced company.

No investment strategy or risk management technique can guarantee returns or eliminate risk in any market environment. Diversification or asset allocation does not guarantee a profit or protect against the risk of a loss in any market. The indices referenced herein are broad-based securities market indices and used for illustrative purposes only. The indices cited are widely accepted benchmarks for investment performance within their relevant regions, sectors or asset classes, and represent non-managed investment portfolios.

If derivatives are employed, note that investing in derivative instruments involves risks different from, or possibly greater than, the risks associated with investing directly in securities and other traditional investments and, in a down market, could become harder to value or sell at a fair price.

Information about SFDR

Unless otherwise noted, any references in this presentation to ESG or sustainability reflect the general approach of Manulife Investment Management to integrating sustainability risk considerations into our investment decision-making processes. Further details on Manulife Investment Management's general approach to sustainability are available at www.manulifeim.com/institutional/global/en/sustainability.

The source for all information shown is Manulife Investment Management, unless otherwise noted.

Important Information

© 2022 Manulife Investment Management. All rights reserved. Manulife, Manulife Investment Management, Stylized M Design, and Manulife Investment Management & Stylized M Design are trademarks of The Manufacturers Life Insurance Company and are used by it, and by its affiliates under license.

This confidential document is for the exclusive use of the intended institutional investors or their agents and may not be transmitted, reproduced or used in whole or in part for any other purpose, nor may it be disclosed or made available, directly or indirectly, in whole or in part, to any other person without our prior written consent.

About Manulife Investment Management

Manulife Investment Management is the global wealth and asset management segment of Manulife Financial Corporation. We draw on more than a century of financial stewardship to partner with clients across our institutional, retail, and retirement businesses globally. Our specialist approach to money management includes the highly differentiated strategies of our fixed-income, specialized equity, multi-asset solutions, and private markets teams—along with access to specialized, unaffiliated asset managers from around the world through our multimanager model.

This material has not been reviewed by, is not registered with any securities or other regulatory authority, and may, where appropriate, be distributed by the following Manulife entities in their respective jurisdictions. Additional information about Manulife Investment Management may be found at manulifeim.com/institutional

Australia: Manulife Investment Management Timberland and Agriculture (Australasia) Pty Ltd, Manulife Investment Management (Hong Kong) Limited. **Canada:** Manulife Investment Management Limited, Manulife Investment Management Distributors Inc., Manulife Investment Management (North America) Limited, Manulife Investment Management Private Markets (Canada) Corp. **China:** Manulife Overseas Investment Fund Management (Shanghai) Limited Company. **European Economic Area:** Manulife Investment Management (Ireland) Ltd. which is authorised and regulated by the Central Bank of Ireland

Hong Kong: Manulife Investment Management (Hong Kong) Limited. **Indonesia:** PT Manulife Aset Manajemen Indonesia. **Japan:** Manulife Investment Management (Japan) Limited. **Malaysia:** Manulife Investment Management (M) Berhad 200801033087 (834424-U) **Philippines:** Manulife Investment Management and Trust Corporation. **Singapore:** Manulife Investment Management (Singapore) Pte. Ltd. (Company Registration No. 200709952G) **South Korea:** Manulife Investment Management (Hong Kong) Limited. **Switzerland:** Manulife IM (Switzerland) LLC. **Taiwan:** Manulife Investment Management (Taiwan) Co. Ltd. **United Kingdom:** Manulife Investment Management (Europe) Ltd. which is authorised and regulated by the Financial Conduct Authority **United States:** John Hancock Investment Management LLC, Manulife Investment Management (US) LLC, Manulife Investment Management Private Markets (US) LLC and Manulife Investment Management Timberland and Agriculture Inc. **Vietnam:** Manulife Investment Fund Management (Vietnam) Company Limited.

No Manulife entity makes any representation that the contents of this presentation are appropriate for use in all locations, or that the transactions, securities, products, instruments or services discussed in this presentation are available or appropriate for sale or use in all jurisdictions or countries, or by all investors or counterparties. All recipients of this presentation are responsible for compliance with applicable laws and regulations.

This material is intended for the exclusive use of recipients in jurisdictions who are allowed to receive the material under their applicable law. The opinions expressed are those of the author(s) and are subject to change without notice. Our investment teams may hold different views and make different investment decisions. These opinions may not necessarily reflect the views of Manulife Investment Management or its affiliates. There can be no assurance that actual outcomes will match the assumptions or that actual returns will match any expected returns. The information and/or analysis contained in this material has been compiled or arrived at from sources believed to be reliable, but Manulife Investment Management does not

make any representation as to their accuracy, correctness, usefulness or completeness and does not accept liability for any loss arising from the use of the information and/or analysis contained here. Neither Manulife Investment Management or its affiliates, nor any of their directors, officers or employees shall assume any liability or responsibility for any direct or indirect loss or damage or any other consequence of any person acting or not acting in reliance on the information contained here.

The information in this material may contain projections or other forward-looking statements regarding future events, targets, management discipline or other expectations, and is only current as of the date indicated. The information in this material including statements concerning financial market trends, are based on current market conditions, which will fluctuate and may be superseded by subsequent market events or for other reasons. This material was prepared solely for informational purposes and does not constitute, and is not intended to constitute, a recommendation, professional advice, an offer, solicitation or an invitation by or on behalf of Manulife Investment Management or its affiliates to any person to buy or sell any security or to adopt any investment strategy, and shall not form the basis of, nor may it accompany nor form part of, any right or contract to buy or sell any security or to adopt any investment strategy. Nothing in this material constitutes investment, legal, accounting, tax or other advice, or a representation that any investment or strategy is suitable or appropriate to your individual circumstances, or otherwise constitutes a personal recommendation to you. Neither Manulife Investment Management nor its affiliates provide legal or tax advice, and you are encouraged to consult your own lawyer, accountant, or other advisor before making any financial decision. Prospective investors should take appropriate professional advice before making any investment decision. In all cases where historical performance is presented, note that past performance does not guarantee future results and you should not rely on it as the basis for making an investment decision.

Important Information (continued)

The distribution of the information contained in this presentation may be restricted by law and persons who access it are required to comply with any such restrictions. The contents of this presentation are not intended for distribution to, or use by, any person or entity in any jurisdiction or country in which such distribution or use would be contrary to any applicable laws or regulations. By accepting this material you confirm that you are aware of the laws in your own jurisdiction relating to the provision and sale of the funds, portfolios or other investments discussed in this presentation and you warrant and represent that you will not pass on or use the information contained in this presentation in a manner that could constitute a breach of such laws by any Manulife entity or any other person.

Australia: Manulife Investment Management (Hong Kong) Limited (Manulife IM (HK)) is exempt from the requirement to hold an Australian financial services license under the Corporations Act in respect to the financial services being offered in this material. Manulife IM (HK) is regulated by the Securities and Futures Commission of Hong Kong ("SFC") under Hong Kong laws, which differ from Australian laws. This presentation is directed at wholesale investors only.

China: No invitation to offer, or offer for, or sale of any security will be made to the public in China (which, for the purposes of this paragraph, does not include the Hong Kong or Macau Special Administrative Regions or Taiwan) or by any means that would be deemed public under the laws of China. The offering document of the subject fund(s) has not been submitted to or approved by the China Securities Regulatory Commission or other relevant governmental authorities in China. Securities may only be offered or sold to Chinese investors that are authorized to buy and sell securities denominated in foreign exchange. Prospective investors resident in China are responsible for obtaining all relevant approvals from the Chinese government authorities, including but not limited to the State Administration of Foreign Exchange, before investing.

Hong Kong: This material is provided to Professional Investors, as defined in the Hong Kong Securities and

Futures Ordinance and the Securities and Futures (Professional Investor) Rules, in Hong Kong only. It is not intended for and should not be distributed to, or relied upon, by members of the public or retail investors.

Malaysia: This material was prepared solely for informational purposes and is not an offer or solicitation by anyone in any jurisdictions or to any person to whom it is unlawful to make such an offer or solicitation.

Singapore: This material is intended for Accredited Investors and Institutional Investors as defined in the Securities and Futures Act.

South Korea: This material is intended for Qualified Professional Investors under the Financial Investment Services and Capital Market Act ("FSCMA"). Manulife Investment Management does not make any representation with respect to the eligibility of any recipient of these materials to acquire any interest in any security under the laws of Korea, including, without limitation, the Foreign Exchange Transaction Act and Regulations thereunder. An interest may not be offered, sold or delivered directly or indirectly, or offered, sold or delivered to any person for re-offering or resale, directly or indirectly, in Korea or to any resident of Korea, except in compliance with the FSCMA and any other applicable laws and regulations. The term "resident of Korea" means any natural person having his place of domicile or residence in Korea, or any corporation or other entity organized under the laws of Korea or having its main office in Korea.

Switzerland: This material is intended for Professional Clients, including Institutional Clients, as defined in the Federal Financial Services Act ("FinSA") and its implementing ordinance, at the exclusion of Professional Clients with an opting-out pursuant to Art. 5 (1) FinSA ("Opting-Out Clients"), and/or Qualified Investors pursuant to the Federal Collective Investment Schemes Act ("CISA") and its implementing ordinances, at the exclusion of Opting-Out Clients and Managed/Advisory Retail Clients pursuant

to Art. 10 (3ter) CISA where relevant. The information provided in this material is for information purpose only and does not constitute an offer, a solicitation or a recommendation to contract a financial instrument or a financial service as defined under FinSA. This material does not constitute an implicit or explicit investment advice. The information provided herein is general in nature and does not constitute an advertisement of financial products in Switzerland pursuant to FinSA and its implementing ordinance.

European Economic Area and United Kingdom: The data and information presented is directed solely at persons who are Professional Investors in accordance with the Markets in Financial Instruments Directive (2004/39/EC) as transposed into the relevant jurisdiction. Further, the information and data presented does not constitute, and is not intended to constitute, "marketing" as defined in the Alternative Investment Fund Managers Directive.

United States: Manulife Investment Management (US) LLC (Manulife IM US) and Manulife Investment Management (North America) Limited (Manulife IM NA) are indirect wholly owned subsidiaries of Manulife. John Hancock Investment Management LLC and Manulife Investment Management (US) LLC are affiliated SEC-registered investment advisors using the brand name John Hancock Investment Management. This material is not intended to be, nor shall it be interpreted or construed as, a recommendation or providing advice, impartial or otherwise.