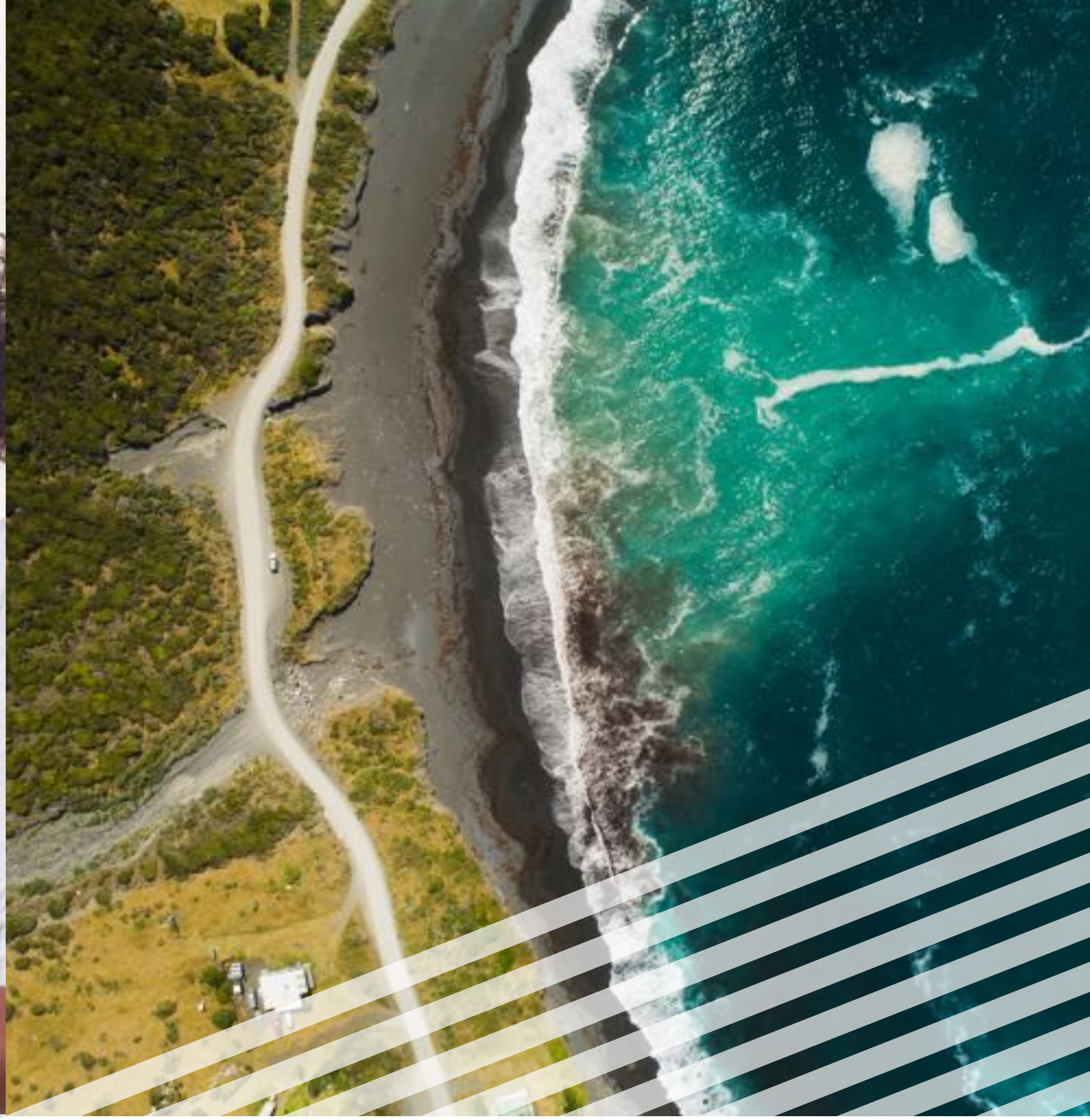


Future First℠ Insights

Helping Investors Understand Climate Risk

By Corinne Neale, Kristina Church and Dr. Ron Dembo

riskthinking.AI™

BNY MELLON
Consider Everything

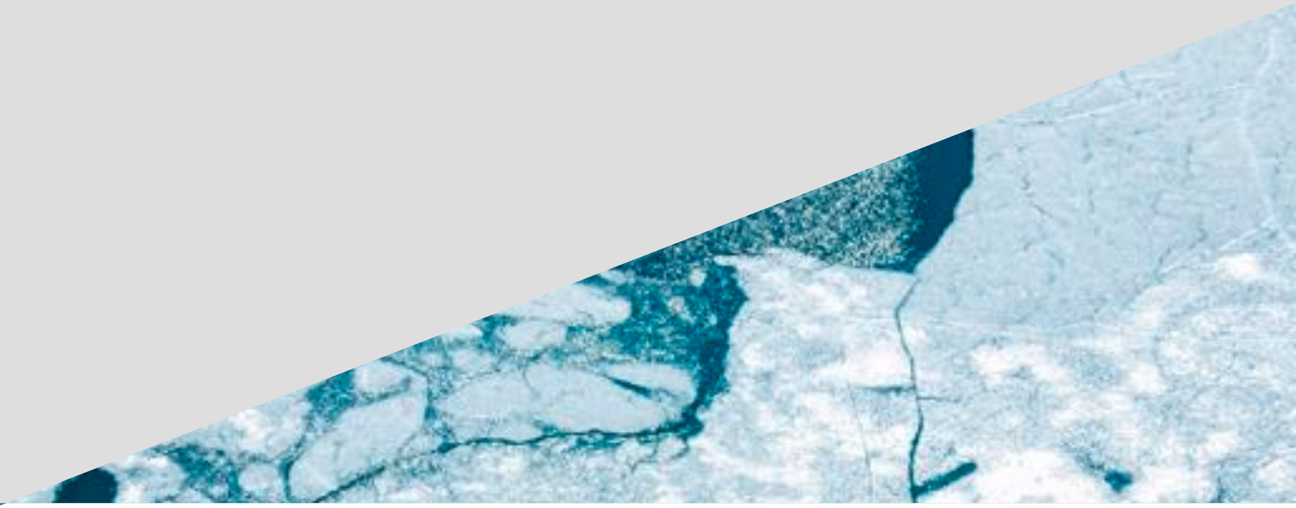
When a large Canadian institutional investor approached BNY Mellon with the challenge of providing transparency to retail stakeholders around the investment impact of climate risk, the question came as no surprise. According to a Pew Research Center survey of 20,000 people in 17 countries published in September 2021,[1] climate change is a personal concern so acute that citizens would be willing to change the way they live and work to mitigate it.

But answering that question in a simple, factual way presents much more of a challenge. There are more than 100 climate models in current use, even at the broadest level, per Columbia Climate School.[2] Tracing how factors in those models then manifest as risks for specific holdings in a portfolio or fund becomes even more complex. And beyond that, investment advisors face the difficulty of translating those risks into sufficiently clear layperson's terms to help retail investors understand how and where to invest in alignment with their values and investment goals.

The best approach for responding to this question requires a willingness to examine all potential scenarios, made possible by two elements: 1) robust ESG data and 2) AI-enabled analysis of the enormous amounts of information on climate risks as they affect economic sectors, regions, and even individual companies.

[1] https://www.pewresearch.org/global/2021/09/14/in-response-to-climate-change-citizens-in-advanced-economies-are-willing-to-alter-how-they-live-and-work/

[2] https://news.climate.columbia.edu/2018/05/18/climate-models-accuracy/



Creating the Right Test Case

We selected the Mellon Global Infrastructure Dividend Focus Fund for testing out that approach. As a popular mutual fund reflecting investors' current preferences, it has a broad dual mandate — exposure to infrastructure and a 6% dividend yield. To meet its mandate, the fund invests in the Energy / Utilities sector across a number of markets, many of which are early in their decarbonization strategies. As individual companies in the fund consider transitioning toward a greener mix of assets, there is value in looking at holdings both financially and from a climate-risk mitigation perspective.

Constructing Plausible Scenarios

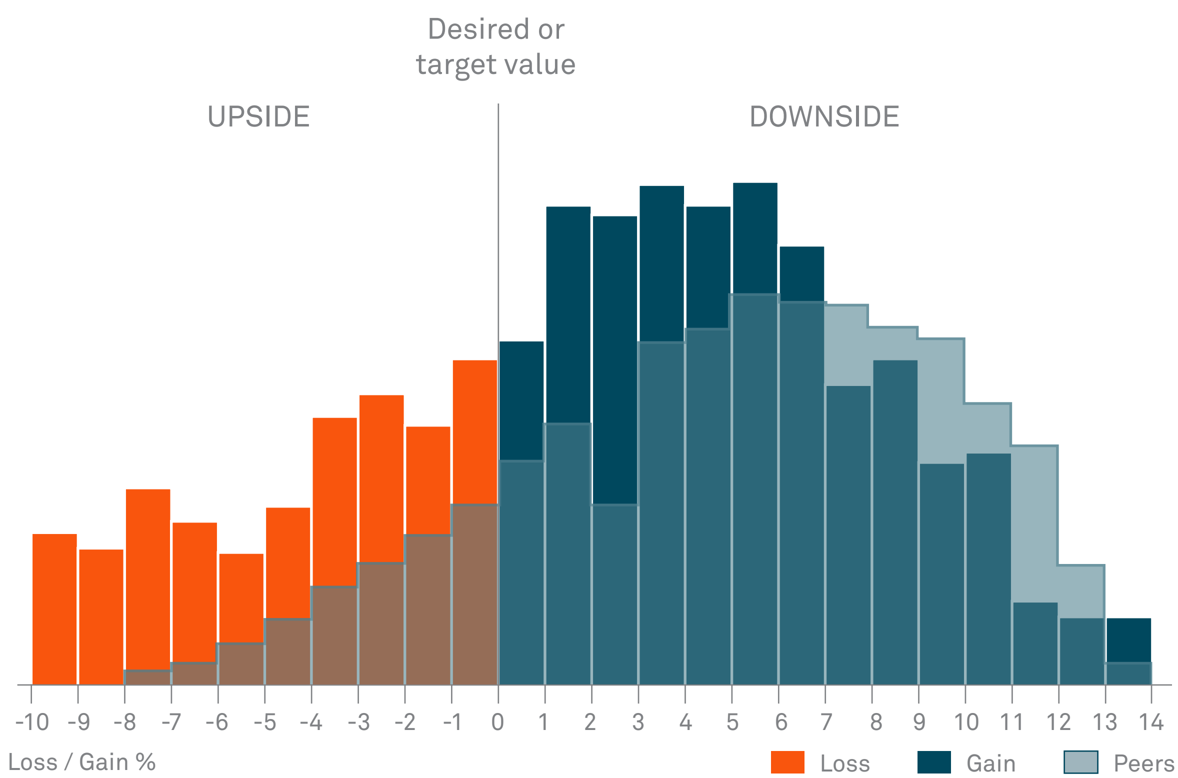
Given the many paths the future can take, we conducted a climate-risk scenario analysis to understand the stakes.

- First, what is the impact of companies doing nothing to change their current practices?
- Second, what are the areas in which a portfolio manager should engage?
- Third, how can the portfolio manager best serve investors' interests in this process?

ESG Data Analytics is the application BNY Mellon provides to clients to analyze ESG risk and opportunities. The application operates on Microsoft Azure in an ecosystem of more than 40 fintech and data providers, including RiskThinking.AI™ – which provided the data and methodology framework to account for the sensitivity of and high scrutiny on climate-risk assumptions, especially over long-term horizons. These data-intensive capabilities help us to mitigate bias by reverse-engineering government-provided target scenarios, and assigning scenario weighting derived via natural language processing exploration of scientific papers and scientist surveys over millions of scenarios.

We conditioned the scenario analysis on the likelihood of achieving net-zero by 2050 and calculated interdependent exposures to policy, economic, carbon, climate, and social impacts. The information used included 44 transition scenarios, 58 global climate models, 500+ socioeconomic variables and over 80,000+ data sets. As a result, we could then examine the distribution of scenarios (see Figure 1) based on scientific observations of each pathway's positive and negative impacts on securities.

Figure 1: *Distribution of Potential Scenarios*



Extracting Meaningful Scenario Guidance

Our approach to scenario analysis allowed us to assess the investment impact of climate risk in a way that accounts for what we do know, from existing facts and data, and what we do not know, from the many possible outcomes for holdings in a portfolio.

Because the fund included exposures to Energy / Utilities, we expected climate risk to affect the fund, and the scenario analysis did find the potential financial downside of climate risk in the portfolio to be potentially double the potential upside. Yet, we were also able to see that the fund's selective portfolio approach could help to insulate it from climate risk relative to its benchmark. Looking through the ratio of potential downside over upside across all pathways, the fund, for instance, is better positioned to minimize the social impact of climate risk than its benchmark (see Figure 2).

Figure 2: *Risk Exposure of Fund vs. Benchmark*

FACTORS	BENCHMARK	PORTFOLIO
Policy	2.21	2.21
Economic	4.14	4.64
Carbon	3.40	2.55
Climate	1.59	2.55
Social	**1.87**	**0.24**
Exposure Score	2.64	2.44
CRR	**D3**	**D2**

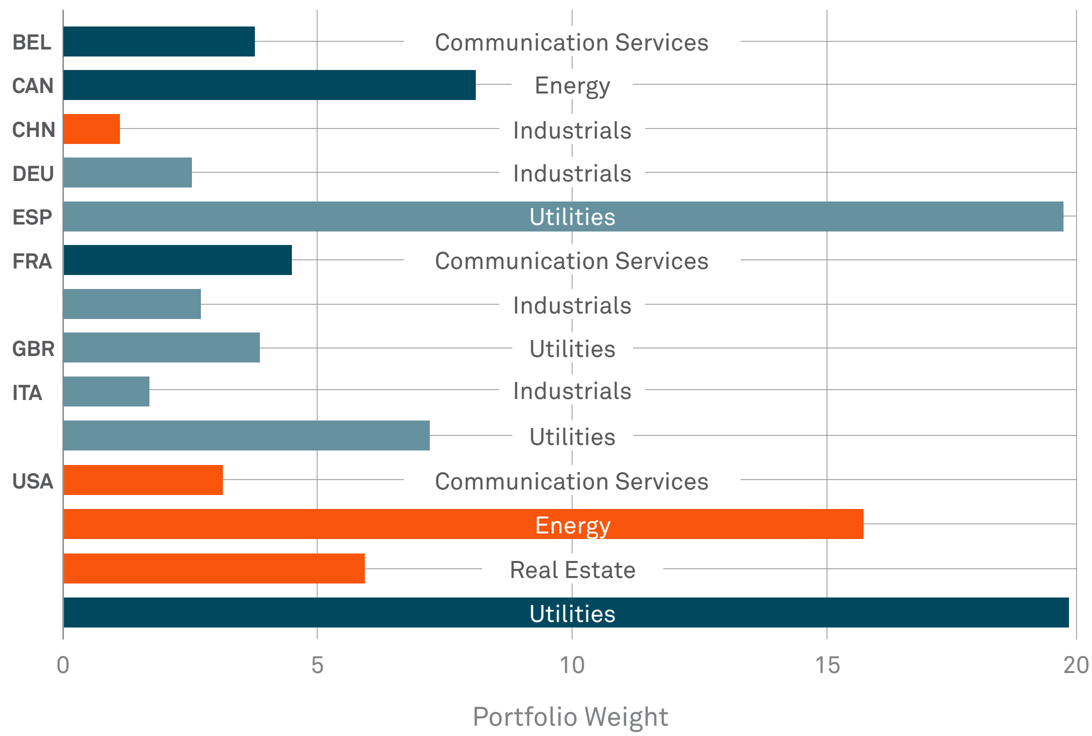
CRR = Downside / Upside

D2: Downside is twice the upside

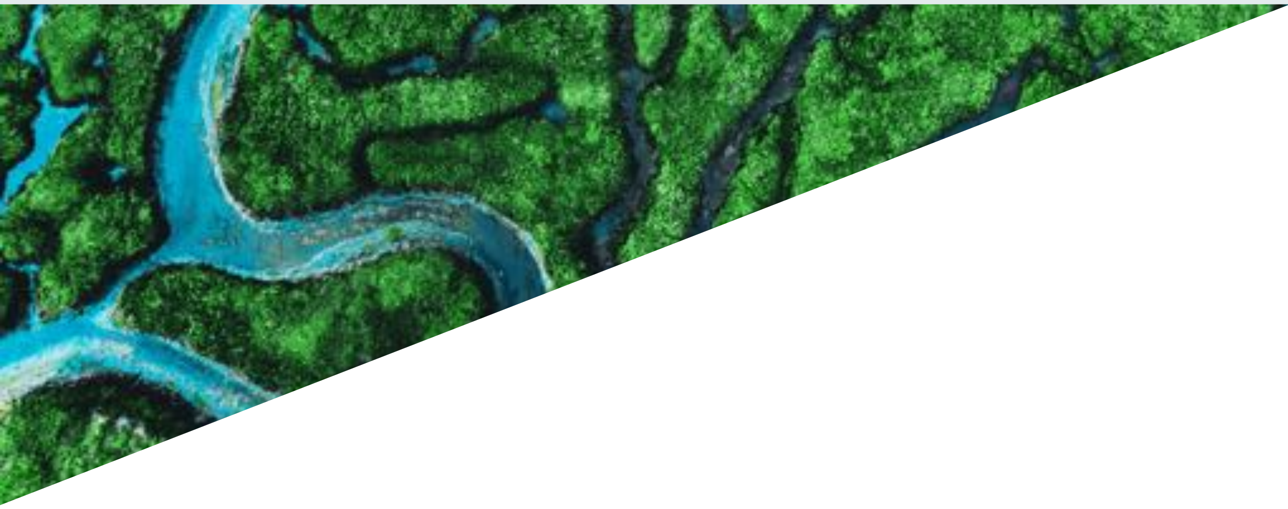
Moreover, further exploration of carbon and climate pathways allowed us to narrow the geography and sector of climate risks for the fund. The climate risk of doing nothing is high within Spain and Italy, because they have aggressive national renewable energy mandates and the fund is overweight on these securities. Although U.S. utilities also carry high climate scenario risk, they are underweight in the portfolio and of less concern (see Figure 3).

Figure 3: *Climate Risks by Geography and Sector*

Country and Sector Exposure



In other words, we went from a broad and vague concern about climate risks, riddled with deficient data and insufficient predictive methodologies, to pinpointing potential impacts. We have a better sense of the transformation required from these utilities and the potential for financial value upon their successful transformation. As a result, our process resulted in a way to help investors see where climate risk emerges in a fund, while giving portfolio managers a better way to identify which companies to engage with and on what topic.



Reflecting on the Process

Our process adds value to the current debate on capital allocation by addressing climate risk in three ways:

- First, using millions of scenario pathways enhances transparency.
- Second, pathways based on scientific foundations provide a higher degree of confidence in the outcomes.
- Third, combining knowledge of what is factual with rigorous consideration of what is possible brings greater integrity to the process, and yields a better outcome in both analysis and communication to investors.

Most importantly, this process can help investors better align their investment decisions to their responsible investing preferences and risk appetite. It also enhances clarity and meaningful accountability for the underlying holdings and portfolio managers, supported by key performance indicators (KPIs) that investors can follow both to do well and do good.

Corinne Neale is Global Head of Business Applications for Data & Analytics Solutions at BNY Mellon.

Kristina Church is Head of Responsible Strategy at BNY Mellon Investment Management.

Dr. Ron Dembo is Founder and CEO of RiskThinking.AI™.

BNY Mellon is the corporate brand of The Bank of New York Mellon Corporation and may be used to reference the corporation as a whole and/or its various subsidiaries generally. This material and any products and services may be issued or provided under various brand names of BNY Mellon in various countries by duly authorized and regulated subsidiaries, affiliates, and joint ventures of BNY Mellon, which may include any of those listed below:

The Bank of New York Mellon, a banking corporation organized pursuant to the laws of the State of New York, whose registered office is at 240 Greenwich St, NY, NY 10286, USA. The Bank of New York Mellon is supervised and regulated by the New York State Department of Financial Services and the US Federal Reserve and is authorized by the Prudential Regulation Authority (PRA) (Firm Reference Number: 122467).

In the U.K., a number of services associated with BNY Mellon Wealth Management's Family Office Services – International are provided through The Bank of New York Mellon, London Branch. The Bank of New York Mellon also operates in the UK through its London branch (UK companies house numbers FC005522 and BR000818) at One Canada Square, London E14 5AL and is subject to regulation by the Financial Conduct Authority (FCA) at 12 Endeavour Square, London, E20 1JN, UK and limited regulation by the PRA at Bank of England, Threadneedle St, London, EC2R 8AH, UK. Details about the extent of our regulation by the PRA are available from us on request.

Investment management services are offered through BNY Mellon Investment Management EMEA Limited, BNY Mellon Centre, One Canada Square, London E14 5AL, which is registered in England No. 1118580 and is authorised and regulated by the Financial Conduct Authority. Offshore trust and administration services are through BNY Mellon Trust Company (Cayman) Ltd.

BNY Mellon Fund Services (Ireland) Limited is regulated by the Central Bank of Ireland.

The Bank of New York Mellon SA/NV, a Belgian public limited liability company, with company number 0806.743.159, whose registered office is at 46 Rue Montoyerstraat, B-1000 Brussels, Belgium, authorised and regulated as a significant credit institution by the European Central Bank (ECB), under the prudential supervision of the National Bank of Belgium (NBB) and under the supervision of the Belgian Financial Services and Markets Authority (FSMA) for conduct of business rules, a subsidiary of The Bank of New York Mellon.

The Bank of New York Mellon SA/NV operates in Ireland through its Dublin branch at Riverside II, Sir John Rogerson's Quay Grand Canal Dock, Dublin 2, D02KV60, Ireland and is registered with the Companies Registration Office in Ireland No. 907126 & with VAT No. IE 9578054E. The Bank of New York Mellon SA/NV, Dublin Branch is subject to limited additional regulation by the Central Bank of Ireland at New Wapping Street, North Wall Quay, Dublin 1, D01 F7X3, Ireland for conduct of business rules and registered with the Companies Registration Office in Ireland No. 907126 & with VAT No. IE 9578054E.

The Bank of New York Mellon SA/NV is trading in Germany as The Bank of New York Mellon SA/NV, Asset Servicing, Niederlassung Frankfurt am Main, and has its registered office at MesseTurm, Friedrich-Ebert-Anlage 49, 60327 Frankfurt am Main, Germany. It is subject to limited additional regulation by the Federal Financial Supervisory Authority (Bundesanstalt für Finanzdienstleistungsaufsicht, Marie-Curie-Str. 24-28, 60439 Frankfurt, Germany) under registration number 122721.

The Bank of New York Mellon SA/NV operates in the Netherlands through its Amsterdam branch at Strawinskylaan 337, WTC Building, Amsterdam, 1077 XX, the Netherlands. The Bank of New York Mellon SA/NV, Amsterdam Branch is subject to limited additional supervision by the Dutch Central Bank ("De Nederlandsche Bank" or "DNB") on integrity issues only (registration number 34363596). DNB holds office at Westeinde 1, 1017 ZN Amsterdam, the Netherlands.

The Bank of New York Mellon SA/NV operates in Luxembourg through its Luxembourg branch at 2-4 rue Eugene Ruppert, Vertigo Building – Polaris, L- 2453, Luxembourg. The Bank of New York Mellon SA/NV, Luxembourg Branch is subject to limited additional regulation by the Commission de Surveillance du Secteur Financier at 283, route d'Arlon, L-1150 Luxembourg for conduct of business rules, and in its role as UCITS/AIF depositary and central administration agent.

The Bank of New York Mellon SA/NV operates in France through its Paris branch at 7 Rue Scribe, Paris, Paris 75009, France. The Bank of New York Mellon SA/NV, Paris Branch is subject to limited additional regulation by Secrétariat Général de l'Autorité de Contrôle Prudentiel at Première Direction du Contrôle de Banques (DCB 1), Service 2, 61, Rue Taitbout, 75436 Paris Cedex 09, France (registration number (SIREN) Nr. 538 228 420 RCS Paris - CIB 13733).

The Bank of New York Mellon SA/NV operates in Italy through its Milan branch at Via Mike Bongiorno no. 13, Diamantino building, 5th floor, Milan, 20124, Italy. The Bank of New York Mellon SA/NV, Milan Branch is subject to limited additional regulation by Banca d'Italia - Sede di Milano at Divisione Supervisione Banche, Via Cordusio no. 5, 20123 Milano, Italy (registration number 03351).

The Bank of New York Mellon SA/NV is trading in Denmark as The Bank of New York Mellon SA/NV, Copenhagen Branch, filial af The Bank of New York Mellon SA/NV, Belgien, and has its registered office at Strandvejen 60/5, 2900 Hellerup, Denmark. It is subject to limited additional regulation by the Danish Financial Supervisory Authority (Finanstilsynet, Århusgade 110, 2100 København Ø).

The Bank of New York Mellon SA/NV operates in Spain through its Madrid branch with registered office at Calle José Abascal 45, Planta 4ª, 28003, Madrid, and enrolled on the Reg. Mercantil de Madrid, Tomo 41019, folio 185 (M-727448). The Bank of New York Mellon, Sucursal en España is registered with Banco de España (registration number 1573).

The Bank of New York Mellon SA/NV operates in England through its London branch at 160 Queen Victoria Street, London EC4V 4LA, UK, registered in England and Wales with numbers FC029379 and BR014361. The Bank of New York Mellon SA/NV, London branch is authorized by the ECB (address above) and is deemed authorised by the Prudential Regulation Authority. Subject to regulation by the Financial Conduct Authority and limited regulation by the Prudential Regulation Authority. Details of the Temporary Permissions Regime, which allows EEA-based firms to operate in the UK for a limited period while seeking full authorisation, are available on the Financial Conduct Authority's website.

The Bank of New York Mellon (International) Limited is registered in England & Wales with Company No. 03236121 with its Registered Office at One Canada Square, London E14 5AL. The Bank of New York Mellon (International) Limited is authorised by the Prudential Regulation Authority and regulated by the Financial Conduct Authority and the Prudential Regulation Authority.

Regulatory information in relation to the above BNY Mellon entities operating out of Europe can be accessed at the following website: https://www.bnymellon.com/RID.

The Bank of New York Mellon, Singapore Branch, is subject to regulation by the Monetary Authority of Singapore. For recipients of this information located in Singapore: This material has not been reviewed by the Monetary Authority of Singapore. The Bank of New York Mellon, Hong Kong Branch (a branch of a banking corporation organized and existing under the laws of the State of New York with limited liability), is subject to regulation by the Hong Kong Monetary Authority and the Securities & Futures Commission of Hong Kong.

The Bank of New York Mellon is exempt from the requirement to hold, and does not hold, an Australian financial services license as issued by the Australian Securities and Investments Commission under the Corporations Act 2001 (Cth) in respect of the financial services provided by it to persons in Australia. The Bank of New York Mellon is regulated by the New York State Department of Financial Services and the US Federal Reserve under Chapter 2 of the Consolidated Laws, The Banking Law enacted 16th April 1914 in the State of New York, which differs from Australian laws.

The Bank of New York Mellon has various other branches in the Asia-Pacific Region which are subject to regulation by the relevant local regulator in that jurisdiction.

The Bank of New York Mellon Securities Company Japan Ltd, as intermediary for The Bank of New York Mellon.

The Bank of New York Mellon, DIFC Branch, regulated by the Dubai Financial Services Authority (DFSA) and located at DIFC, The Exchange Building 5 North, Level 6, Room 601, P.O. Box 506723, Dubai, UAE, on behalf of The Bank of New York Mellon, which is a wholly-owned subsidiary of The Bank of New York Mellon Corporation.

Pershing is the umbrella name for Pershing LLC (member FINRA, SIPC and NYSE), Pershing Advisor Solutions (member FINRA and SIPC), Pershing Limited (UK), Pershing Securities Limited (UK), Pershing Securities International Limited (Ireland), Pershing (Channel Islands) Limited, Pershing Securities Canada Limited, Pershing Securities Singapore Private Limited, and Pershing India Operational Services Pvt Ltd. Pershing business also includes Albridge Solutions, Inc. and Lockwood Advisors, Inc., an investment adviser registered in the United States under the Investment Advisers Act of 1940. Pershing LLC is a member of SIPC, which protects securities customers of its members up to $500,000 (including $250,000 for claims for cash). Explanatory brochure available upon request or at sipc.org. **SIPC does not protect against loss due to market fluctuation. SIPC protection is not the same as, and should not be confused with, FDIC insurance.**

Past performance is not a guide to future performance of any instrument, transaction or financial structure and a loss of original capital may occur. Calls and communications with BNY Mellon may be recorded, for regulatory and other reasons.

Disclosures in relation to certain other BNY Mellon group entities can be accessed at the following website: http://disclaimer.bnymellon.com/eu.htm.

This material is intended for wholesale/professional clients (or the equivalent only), is not intended for use by retail clients and no other person should act upon it. Persons who do not have professional experience in matters relating to investments should not rely on this material. BNY Mellon will only provide the relevant investment services to investment professionals.

Not all products and services are offered in all countries.

If distributed in the UK, this material is a financial promotion. If distributed in the EU, this material is a marketing communication.

This material, which may be considered advertising, is for general information purposes only and is not intended to provide legal, tax, accounting, investment, financial or other professional advice on any matter. This material does not constitute a recommendation or advice by BNY Mellon of any kind. Use of our products and services is subject to various regulations and regulatory oversight. You should discuss this material with appropriate advisors in the context of your circumstances before acting in any manner on this material or agreeing to use any of the referenced products or services and make your own independent assessment (based on such advice) as to whether the referenced products or services are appropriate or suitable for you. This material may not be comprehensive or up to date and there is no undertaking as to the accuracy, timeliness, completeness or fitness for a particular purpose of information given. BNY Mellon will not be responsible for updating any information contained within this material and opinions and information contained herein are subject to change without notice. BNY Mellon assumes no direct or consequential liability for any errors in or reliance upon this material.

This material may not be distributed or used for the purpose of providing any referenced products or services or making any offers or solicitations in any jurisdiction or in any circumstances in which such products, services, offers or solicitations are unlawful or not authorized, or where there would be, by virtue of such distribution, new or additional registration requirements.

BNY Mellon Wealth Management conducts business through various operating subsidiaries of The Bank of New York Mellon Corporation.

Any references to dollars are to US dollars unless specified otherwise.

The Bank of New York Mellon, member of the Federal Deposit Insurance Corporation (FDIC).

bnymellon.com

Please click here for additional information regarding disclaimers and disclosures.