HIGH MEADOWS
INSTITUTE

ESG Integration Across Asset Classes

A Report from the ESG Path to Value Forum

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Executive Summary

ESG Integration Across Asset Classes

Despite the growth of ESG Integration as a mainstream investment tool, investment professionals are still challenged on how to integrate environmental, social and governance issues for several reasons: a lack of standardized data, heterogeneous notions of materiality, variability of material ESG issues by asset class, and the holding period of the underlying investment strategy.

This report shares how three leading asset managers and a large state pension fund implement ESG integration for public equity, real estate, private equity and fixed income investments. This panel also shared its opinions on the latest evolving trends/area of innovation and how active ownership differs from shareholder activism.

Introduction

"ESG Integration" describes the incorporation of various environmental, social or governance factors into the investment analysis for either security or external manager selection. Examples of specific environmental, social and governance factors are shown in Figure 1.

ESG integration is one of the activities encompassed under the broader umbrella of "sustainable investing" or "responsible investing", which includes:

- ESG Integration
- Best-in-class approaches (Positive & Negative Screening or portfolio tilting)
- ESG Thematic Investing
- Impact Investing
- Corporate Engagement

For ESG integration, the specific factor selection depends on the underlying objective of a given investor. Some investors seek to maximize a social outcome, such as directing capital toward companies with strong ESG practices, while others will focus on identifying material ESG issues that enable them to reduce risks or detect undervalued opportunities for their portfolios ("socially responsible investing").

Environmental	Social	Governance
• Water scarcity	• Labor relations	• Board structure
• Climate change	• Health & safety	• Compensation
• Energy efficiency	• Supply chain	• Shareholder rights
• Pollution	• Corruption	• Transparency

Figure 1: Environmental, Social, and Governance Factors

In the past decade, ESG integration has evolved from a niche belief-driven practice to a more mainstream investment tool. According to U.S. SIF, the demand by investors for actively managed ESG assets has grown by 29% CAGR since 2010.[1] There has also been a marked increase in the amount of ESG data disclosed by companies, with over 80% of S&P 500 companies reporting ESG data in 2016.[2]

Despite this growth, investment professionals are still challenged by how to do ESG integration because the data lacks standardization and is self-reported. In addition, notions of ESG materiality varies by asset class and the holding period of the underlying investment strategy.

With this in mind, the High Meadows Institute sought to explore the current state of ESG Integration, across a number of different dimensions, in its November 2017 ESG Forum, co-sponsored by Deutsche Asset Management. Specifically, HMI sought to answer the following questions:

- How does the degree of ESG integration vary by asset class and region?
- Which ESG issues are considered material by asset class?
- How do some of the leading asset managers and institutional investors implement ESG considerations into their traditional and alternative investments selection?

In collaboration with KKS Advisors, HMI led a research effort to answer the first two questions, with results shared during the ESG Forum in New York City. This was followed by a robust panel discussion on how ESG integration is conducted for real estate, fixed income, private equity, and public equity investing, in which the third question was explored. This report highlights key learnings from the research presentation and panel discussion.

1. US SIF Report, 2016
2. Governance and Accountability Institute, 2017

ESG Integration by Asset Class

As shown in figure 2, ESG integration applied to only 15% of global AUM in 2016.[3] Our assessment is that Europe has been at the forefront of sustainable investing, while adoption and interest in the U.S. has lagged. While the figures shows the U.S. with the largest amount of ESG integration ($5.5 billion) and Europe lower with ($2.6 billion), this may reflect that Europe practices the other forms of sustainable investing at higher rates than the U.S., where ESG integration is the dominant activity. Additionally, ESG investing in Europe is likely higher on a percentage of total money invested basis.

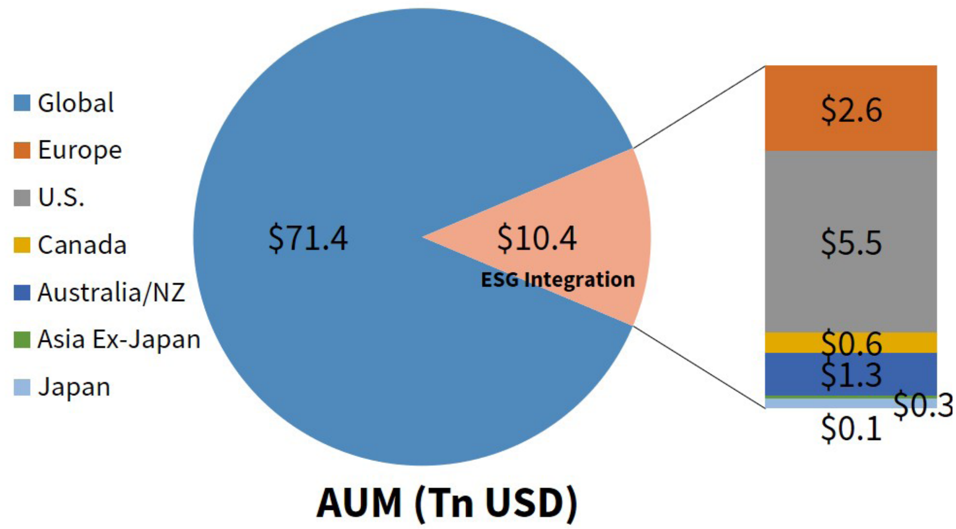


Figure 2: Global vs. ESG Integration AUM by Region, 2016

In the Pacific Rim, Australia and New Zealand show the largest amount of ESG integration for their assets, with this activity just getting started in other regions of Asia. That said, Japan's Government Pension Investment Fund (GPIF), the world's largest pension fund with $1.3 trillion under management, has raised its allocation to environmentally and socially responsible investments from 3 percent of its stock holdings to 10 percent.[4]

The variation in ESG integration by asset class in the U.S. is shown in Figure 3.[5] For U.S. markets in 2016, the largest degree of ESG Integrations occurs in the U.S. stock market (41%) and the least amount for the U.S. bond markets (5%).[6] Using publicly traded Real Estate Investment Trusts ("REITS") as a proxy, the percentage of ESG integration is estimated to be 37% for the U.S. real estate market. The U.S. private equity market is estimated to have 15% ESG integration.[7]

The relatively high adoption of ESG integration in public equities is consistent with negative screening applied to stocks being the first

3. ESG Integration AUM - 2016 Global Sustainable Investment Review, GSIA; Global AUM - Global Asset Management 2016, The Boston Consulting Group
4. www.reuters.com/article/us-japan-gpif-esg/japans-gpif-expects-to-raise-esg-allocations-to-10-percent-ftse-russell-ceo-idUSKBN19Z11Y
5. Based on original analysis done by HMI and KKS Advisors . Methodology for U.S. ESG Integration by Asset Class found in Appendix A
6. Russell 3000 total market capitalization was used as proxy for U.S. stock market; amount of U.S. Debt outstanding, excluding loans, used as proxy for U.S. bond market.
7. This estimate is based on evaluating the ESG policies, 10-K and PPMs for the ten largest global private equity firms with U.S. dedicated funds.

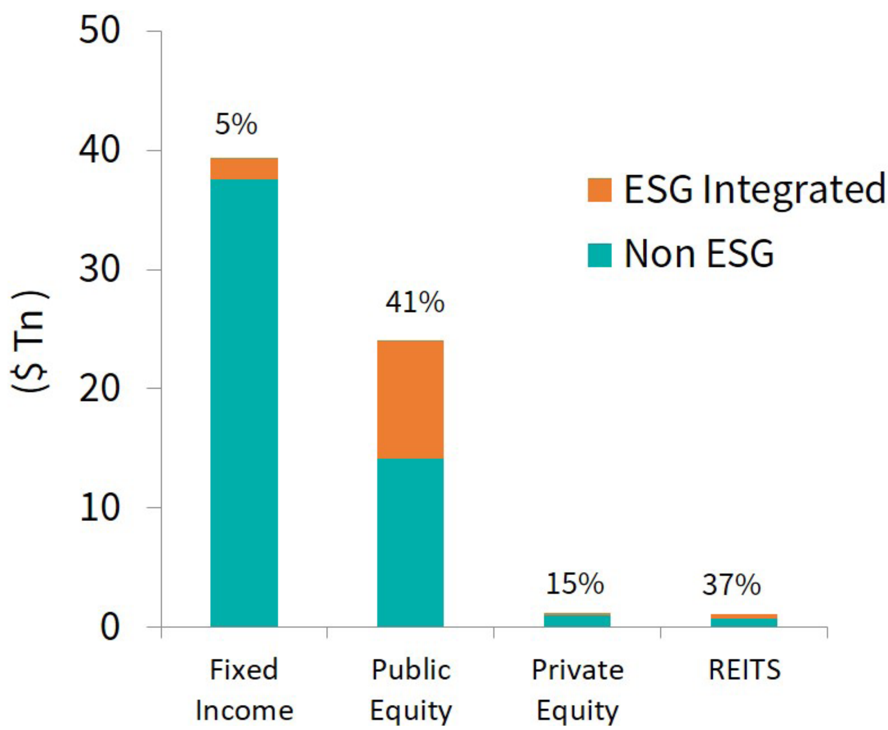


Figure 3: Percentage ESG Integration vs US Markets, 2016

and longest-standing SI approach. Further, ESG reporting by publicly traded companies enables ESG integration in public equities.

Similarly, LEED certification[8] being an accepted industry standard for green buildings and GRESB being an accepted industry benchmark[9] make ESG Integration more straightforward to evaluate for real estate investments.

The smaller degree of ESG integration observed in private equity may reflect the increased challenge of obtaining ESG information from private companies, the deal teams' consequent challenge when integrating this data into company valuations, and a potential lack of internal ESG specialists to assist the deal teams. In addition, institutional investors with a strong interest in sustainable investing may opt to allocate capital to impact investing funds over traditional PE firms, which may lessen client demand for ESG integration for traditional PE firms.

The limited degree of ESG integration observed for U.S. bonds (5%) may arise for a number of reasons, including creditor vs. shareholder rights, quantifying ESG issues vis-à-vis interest rate and credit risk models, and emphasis on product development (i.e. green bonds).

Corporate engagement, defined as the use of shareholder rights to influence a company's behavior, has an extensive institutional investor history dating back to 1985 when CalPERS co-founded the Council of Institutional Investors, an industry association devoted to improving corporate governance.[10] As majority shareholders, institutional investors can influence a company's behavior through proxy voting, filing resolutions or direct engagement. Bond holders have no such rights or ways of engaging a company. Moreover, fixed income professionals and credit rating agencies have well-established quantitative models for evaluating both interest rate and credit risks for bonds. In particular, term-structure models for interest rate risk are largely driven factors related to either the shift of the yield curve or movements of short versus long term interest rates,[11] with no evidence for any ESG factors influencing the yield curve.

In contrast, the three major credit agencies have begun incorporating relevant ESG factors into their rating models.

8. Leadership in Energy and Environmental Design (LEED) is a rating system devised by the United States Green Building Council (USGBC) to evaluate the environmental performance of a building and encourage market transformation towards sustainable design.

9. GRESB is the Global Real Estate Sustainability Benchmark; https://gresb.com/

10. https://www.cii.org

11. http://www2.risklab.ch/ftp/papers/TermStructureSurvey.pdf

That being said, Fitch is explicit in stating that it is rare for an ESG factor to be the main driver for a credit rating.[12] The exception is governance factors for sovereign bonds, as they correlate strongly with the ability of a country to make its bond payments and with risk arising from civil strife, political instability, and underlying management of the economy. The key governance factors, shown below, have a weighing coefficient of approximately 18% in Fitch's Sovereign Rating Model.

- Government effectiveness
- Rule of law
- Control of corruption
- Voice and accountability
- Business environment

Fitch also captures environmental issues that impact capital and operational spending for corporate and public bond issuers, including the manufacturing, energy, natural resources and utility sectors. The credit risks associated with the reliability of long term supply and regulatory compliance/costs are incorporated in these rating models for these types of bonds. Social risks are typically not captured in these models.

Moody's incorporates similar ESG factor in its Sovereign Ratings Model:

- Economic competiveness
- Government efficiency
- Rule of law
- Political risk
- Control of corruption

And these ESG factors influence the following financial parameters in Moody's Sovereign Rating Model: economic strength, fiscal strength, institutional strength, and susceptibility to event risk.

In contract to Fitch, for corporate bonds ratings, Moody's evaluates how ESG issues may impact demand for an issuer's bonds, so the rating model captures a broader number of factors related to reputational risk, cost of issuance, and issuer's financial strength which, in turn, influence the following financial inputs for their model: leverage, cash flow, profitability, revenue/assets and financial policy.[13]

While Standard & Poor's (S&P) also splits its ratings methodology into corporates and sovereign categories, it is more explicit about how time horizon impacts its ratings forecast (two years for high yield bonds, five years for investment grade bonds) and which ESG factors are material during those time windows.[14] For its corporate ratings, S&P evaluates ESG factors through the following risk lens:

- Business risk (specifically, an issuer's competitive position)
- Financial risk (linked to cash flow/leverage assessment and financial forecasts
- Management and governance

S&P also explicitly considers environmental and climate concerns in its corporate ratings. For example, between July 2016 and August 2017, environmental and climate concerns affected the ratings of 717 companies and resulted in credit rating changes (upgrade, downgrade, revision or placement on credit watch) in 106 cases.[15]

For its sovereign ratings, S&P will consider ESG issues in the evaluation of a country's institutional quality and governance effectiveness, which accounts for approximately 25% of a sovereigns' credit rating. Social factors are linked to economic growth. Environmental issues are typically considered over a five-to-ten year time horizon. S&P also considers ESG factors when rating U.S. municipal bonds (management/ governance, environmental/climate concerns) and the credit quality of banks and insurance companies.[16]

All three agencies do credit ratings for green bonds, which are debt securities issued by various public and private entities to support

12. "Fitch Ratings Approach to Capturing Environmental, Social and Governance Risk in Credit Ratings" November 7, 2017. p.1
13. https://www.moodys.com/sites/products/ProductAttachments/ESG-considerations-on-credit-analysis.pdf
14. "How Does S&P Global Ratings Incorporate Environmental, Social and Governance Risks Into Its Rating Analysis" November 21, 2017. p.3
15. "How Does S&P Global Ratings Incorporate Environmental, Social and Governance Risks Into Its Rating Analysis" November 21, 2017. p.2
16. "How Does S&P Global Ratings Incorporate Environmental, Social and Governance Risks Into Its Rating Analysis" November 21, 2017. pp. 14-16

climate or environmentally related projects. It is important to note that none of the agencies certify that these bonds are green or that bonds proceeds are being used in way consistent with the Green Bond Principles, a voluntary industry code established by International Capital Markets Association.[17]

The demand for product development over ESG integration in fixed income may also be driven by investors who may find it more straightforward to buy green bonds than parse through which ESG factors may be material for credit risk for bonds.

ESG MATERIALITY

A critical issue of complexity for ESG integration is the determination of which factors are material. This varies both by asset classes and between them. While there are different notions of materiality, HMI defines materiality as any information that impacts the value/price of a security or investment transaction. This definition is consistent with an investment professional's understanding of materiality and with the Sustainability Accounting Standards Board (SASB) framework, which defines material ESG issues by industry sectors.[18] Using SASB's framework, Figure 4 shows the variability of material ESG issues by four asset classes and how these material factors are linked to financial performance measures specific to each asset class.

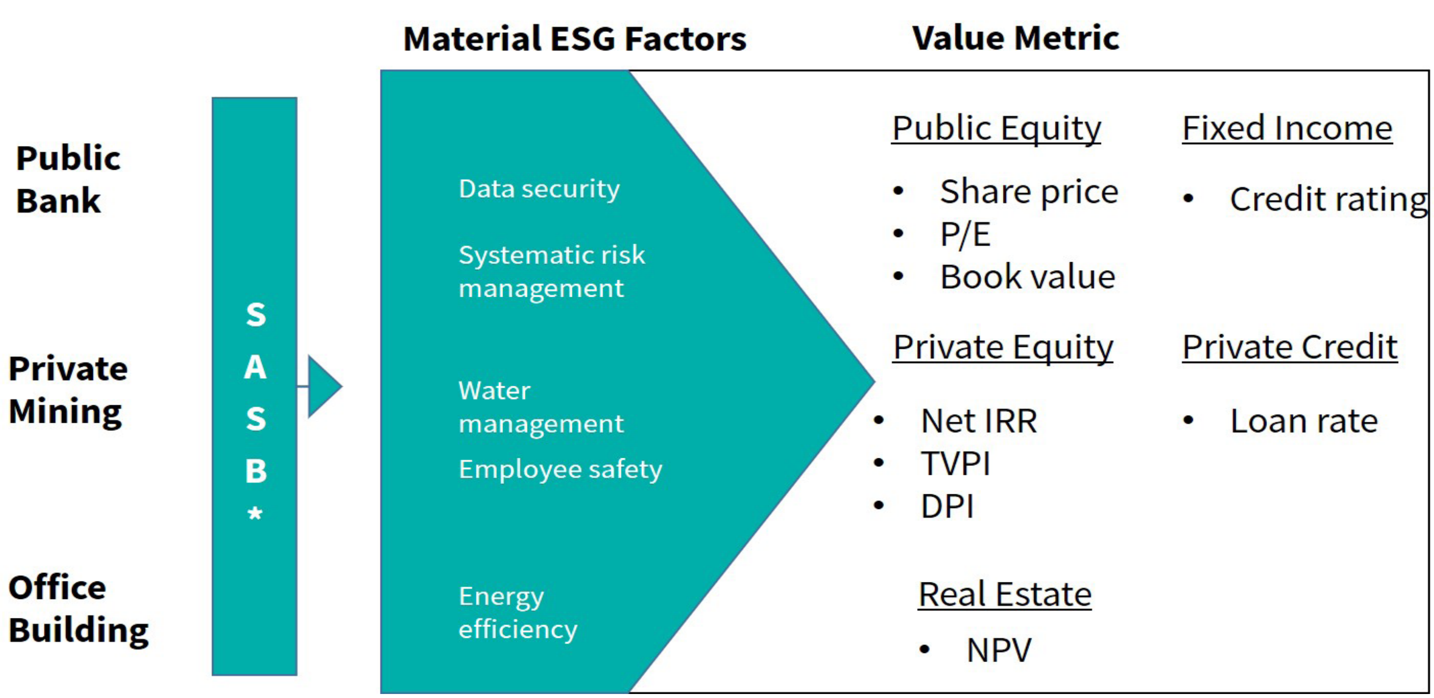


Figure 4: Variability of Material ESG Factors by Asset Class

17. https://www.icmagroup.org/green-social-and-sustainability-bonds/green-bond-principles-gbp
18. https://www.sasb.org/

Case Studies

The final challenge addressed in the Forum program is how ESG integration is actually done by select asset managers and allocators for real estate, fixed income, private equity and public equity. The remainder of this report focuses on how ESG integration is implemented in these asset classes by the respective firms on the panel.

ESG Integration for Public Equity

Panelist: Mariela Vargova, Rockefeller Asset Management

Mariela Vargova is a Senior Vice President and Senior Sustainability Analyst for the Sustainability and Impact Investing team at Rockefeller Asset Management (RAM), which manages approximately $12.7B across public equities and fixed income.[18] In this role, she focuses on the integration of environmental, social, and governance factors in the investment process and is responsible for corporate engagement strategies and external collaborations.

Motivation for ESG Integration

- Longstanding interest in sustainable investing dating back to 1970's when Rockefeller family started making investments related to environmental sustainability and improving peoples' health/quality of life.
- Active ownership improves portfolio companies' ESG performance.

Type of Investments

Rockefeller Asset Management has a variety of portfolio offerings that reflect the evolution of ESG in public equities, including traditional, socially responsible, sustainable & ESG, and impact.

Socially responsible investing aligns stock selection with specific values and often uses negative screening, while sustainable investing uses both positive screening and ESG integration in the stock selection process. Impact investing may be thematically-oriented towards a specific environmental or social objective or solutions-oriented in these areas. RAM offers both segregated and blending portfolios across each of types of sustainable investing. RAM applies systematic ESG integration across its sustainable portfolios and relies on SASB's framework to define which issues are material for a given stock. For example, equity analysts would evaluate climate change risk and the health safety record for a company in oil and gas industry but look at retail customer practices and risk management for a bank.

ESG Integration Approach

RAM supports an ESG Integration approach for equity investing espoused by PRI. As shown in Figure 4, this involves four stages

18. As of December 31, 2017. This number includes net assets under management and excludes advisory services.

for evaluating and monitoring a stock.

ESG integration and active ownership are key parts of RAM's investment process. In Stage 1, ESG analysts consider material ESG issues relevant to the industry vertical of a company as well as its governance quality. The ESG specialist then works with the equity analyst to incorporate relevant ESG factors into valuation models for this company and consider how its stock may impact the overall portfolio. If a "buy" or "hold" decision is made by the portfolio manager, the ESG team will continue monitoring any material ESG risks identified and directly engage the company to help mitigate them. This team will ensure that the proxy voting done is in alignment with a given sustainability portfolio's guidelines.

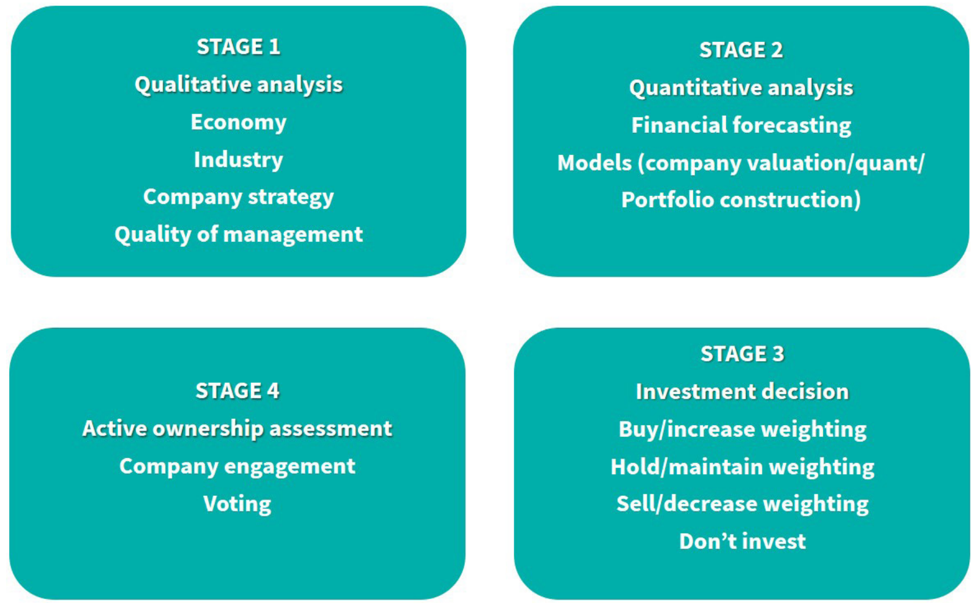


Figure 4: ESG Integration Approach

Regulatory & Corporate Governance Evolution

In the past five years, several important regulatory changes and corporate government recommendations have occurred in the U.S. and globally that have supported ESG integration into the investment process. Examples include:

- U.S. Stewardship Code - January 2017.[19] This framework is an investor-led effort, written by senior corporate governance staff at sixteen firms, that outlines a set of six fundamental governance principles for U.S.-listed companies and stewardship principles for U.S. institutional investors. The Investor Stewardship Group covers $17 trillion AUM and includes BlackRock, State Street, T. Rowe Price, Value Act, and Vanguard as well as other asset managers and pension funds.
- U.S. Department of Labor Memo - October 2015.[20] This memo enabled pension funds and other fiduciaries to consider ESG factors in their investment decisions without worrying about repercussions from the Department of Labor.
- Under the new guidance, fiduciaries cannot accept lower expected returns or greater risks, but may take ESG benefits into account as "tiebreakers" when investments are otherwise equal. DOL also recognized that in some cases, ESG factors may have direct relationship in financial value of an investment so need not only be considered in "tiebreaker" situations.
- European Union Directive on Disclosure of non-financial Information – 2014.[21] EU law requires large public companies (with 500 or more employees) to disclose certain information regarding the way they operate and manage social and environmental challenges. Specifically, these companies must publish reports on the policies they implement in relation to:
    - Environmental protection

19. https://corpgov.law.harvard.edu/2017/02/09/investor-coalition-publishes-u-s-stewardship-code/
20. https://www.dol.gov/opa/media/press/ebsa/ebsa20152045.htm
21. https://ec.europa.eu/info/business-economy-euro/company-reporting-and-auditing/company-reporting/non-financial-reporting_en

- Social responsibility and treatment of employees
- Respect for human rights
- Anti-corruption and bribery
- Diversity on company boards.

- Australian Revision of Corporate Governance Code – March 2014.[22] This is a revision of a framework originally created in 2003 by the ASX Corporate Governance Council, a collection of Australian business, investor, legal and corporate groups that seek to improve corporate governance. This revision advocates 8 central principles and 29 specific recommendations involving improving board quality, reporting, executive compensation, and risk management.
- Japan Stewardship Code – February 2014.[23] This framework was laid out by Council of Experts Concerning the Japanese Version of the Stewardship Code, a group organized by the Japan's Financial Services Agency (FSA); the goal of this framework is "to promote sustainable growth of companies through investment and dialogue." In other words, the government hoped to encourage the country's institutional investors to get more involved with the companies that they invest in, and that this would eventually lead to better run, faster growing companies.
- UK Revision of Stewardship Code – 2012.[24] Originally developed in 2010 and revised in 2012 by Financial Reporting Council, a UK corporate governance group, this framework aims to enhance the quality of engagement between investors and companies to help improve long-term risk-adjusted returns to shareholders. The code is based on seven principles related to effective board management and being an actively engaged shareholder.

ESG Integration for Real Estate

Panelist: Jessica Elengical, Deutsche Asset Management

Jessica leads ESG Strategy for Alternatives at Deutsche Asset Management, where she is responsible for integrating ESG into the investment processes for each of the businesses. Within real estate, Jessica manages the implementation of DAM's global sustainability initiatives, including investment in energy efficiency, renewables, and green technology as well as development of its long-term energy reduction plans for the platform. Alternatives represent approximately $90 billion of the $843 billion managed by DAM for global institutional clients.

Motivation for Implementing ESG Integration

- Deutsche Asset Management has a strong ESG culture with roots dating back 20 years to its first Sustainable Investing opportunity in microfinance.
- Real estate is a long-term investment that requires a long-term view of risk management.

Drivers for Real Estate

- Demand by tenants looking for high quality living spaces to live and work.
- Landlords looking to drive down operating expenses through investments in energy efficiency, ultimately increasing NOI and asset value.
- In Europe, desire to contribute to goals outlined in Paris Climate Agreement, where reduction of greenhouse emissions from real estate can make meaningful contributions to achieving goals.
- In U.S., state and municipal governments continue to increase regulations around new and existing buildings, e.g. California requirement to install solar roof top panels in certain buildings.

Investment Framework

For its real estate investments, DAM takes a holistic approach for integrating ESG considerations across four areas in the investment process, with each

22. Australian Revision
23. https://www.fsa.go.jp/en/refer/councils/stewardship/20140407/01.pdf
24. https://www.frc.org.uk/investors/uk-stewardship-code

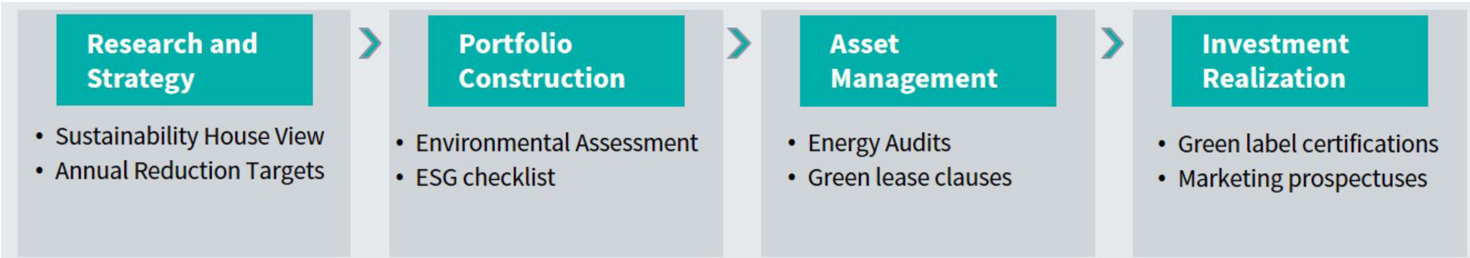


Figure 5: ESG Investment Framework & Deliverables for Real Estate

ESG consideration clearly linked to increasing NOI and reducing environmental risks to increase building value:

- Research & Strategy

- Develop and obtain agreement on sustainability strategy
-Use initiatives to drive energy efficiency/carbon reduction goals

- Portfolio Construction

-Identify ESG risks and opportunities during underwriting
-Include initiatives identified in asset management plan

- Asset Management

-Implement energy efficiency/ carbon emission reduction programs
-Monitor performance and quantify value enhancement from retrofit

- Investment Sale

-Pursue green labels where feasible

As shown in Figure 5, each group within real estate is responsible for contributing to the ESG integration process with tangible deliverables.

ESG Integration for Private Equity

Panelist: Sondra Vitols, High Meadows Institute

As a Senior Investment Officer at North Carolina's pension fund, Sondra Vitols led a team of investment and corporate governance staff on an 18-month research project whose key findings were the basis for the pension's ESG policy ("Long Term Stewardship") and its implementation approach. North Carolina's approach is based on identifying material ESG factors by asset class to lower the risk of the $94 billion portfolio. How material ESG issues were considered in the due diligence process for its private equity managers was discussed.

Motivation for ESG Integration

- Interest by senior management and investment staff to explore ESG issues for potential alpha capture and better risk management.
- Help corporate governance prioritize issues to address through corporate engagement.

As shown in Figure 6, North Carolina's ESG Integration approach was developed during the second phase of its rigorous research effort.

ESG Integration is one of the three key aspects of NC's Long-term Stewardship policy, with the other two being focused on governance and risk management, at the total portfolio level:

- Integration: Systematically integrating material ESG risk considerations in the portfolio investment and corporate

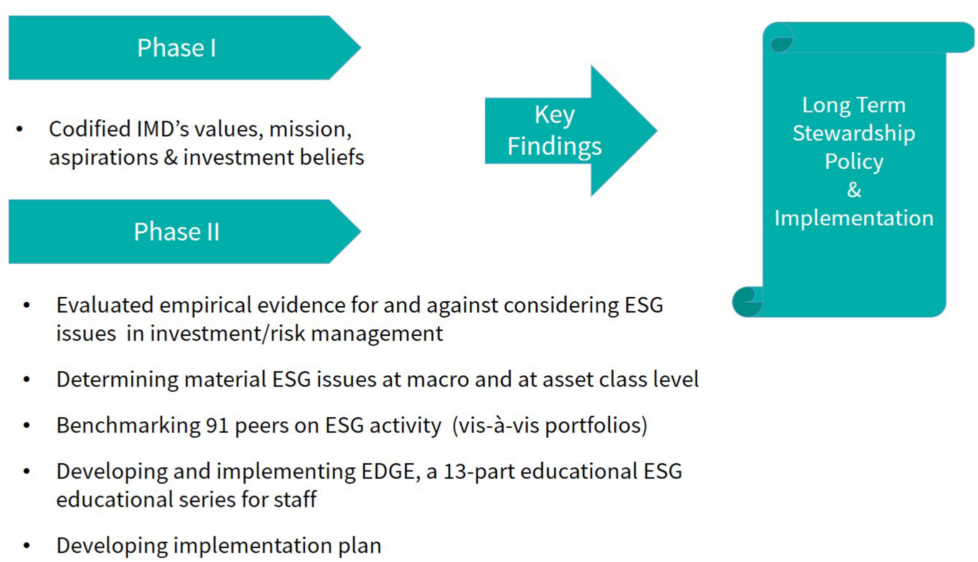


Figure 6: North Carolina's ESG Integration Approach

government processes.

- Risk Management: Evaluating and managing assets with awareness of material, long-term economic, environmental, geopolitical, societal and technological risks.
- Governance: Adopting and advocating well-recognized governance and regulatory principles for securities and investments.

North Carolina invests in private equity through external managers. The PE allocations serve either a return-seeking or hedging purpose for the plan. In the due diligence process, investment staff used the following resources and tools to identify material ESG risk factors:

Resources:

- World Economic Forum: for identifying macro risk factors
- SASB: for identifying material risk factors by industry
- Investment staff experience: for aligning interests/mitigating conflicts of interest with General Partners (PE firms)

Tools:

- Due diligence questionnaire
- ESG risk list
- Critical assessment of ESG risks in investment memo

The due diligence questionnaire serves as a guide for exploring how a Private Equity firm considers ESG risk across five areas, shown in Figure 7.

The information obtained during the due diligence process is then summarized in the investment memo, with investment staff commenting on whether the ESG risks identified have been adequately addressed by the PE firm and if reporting of those risks back to the pension plan is adequate, (see Table I).

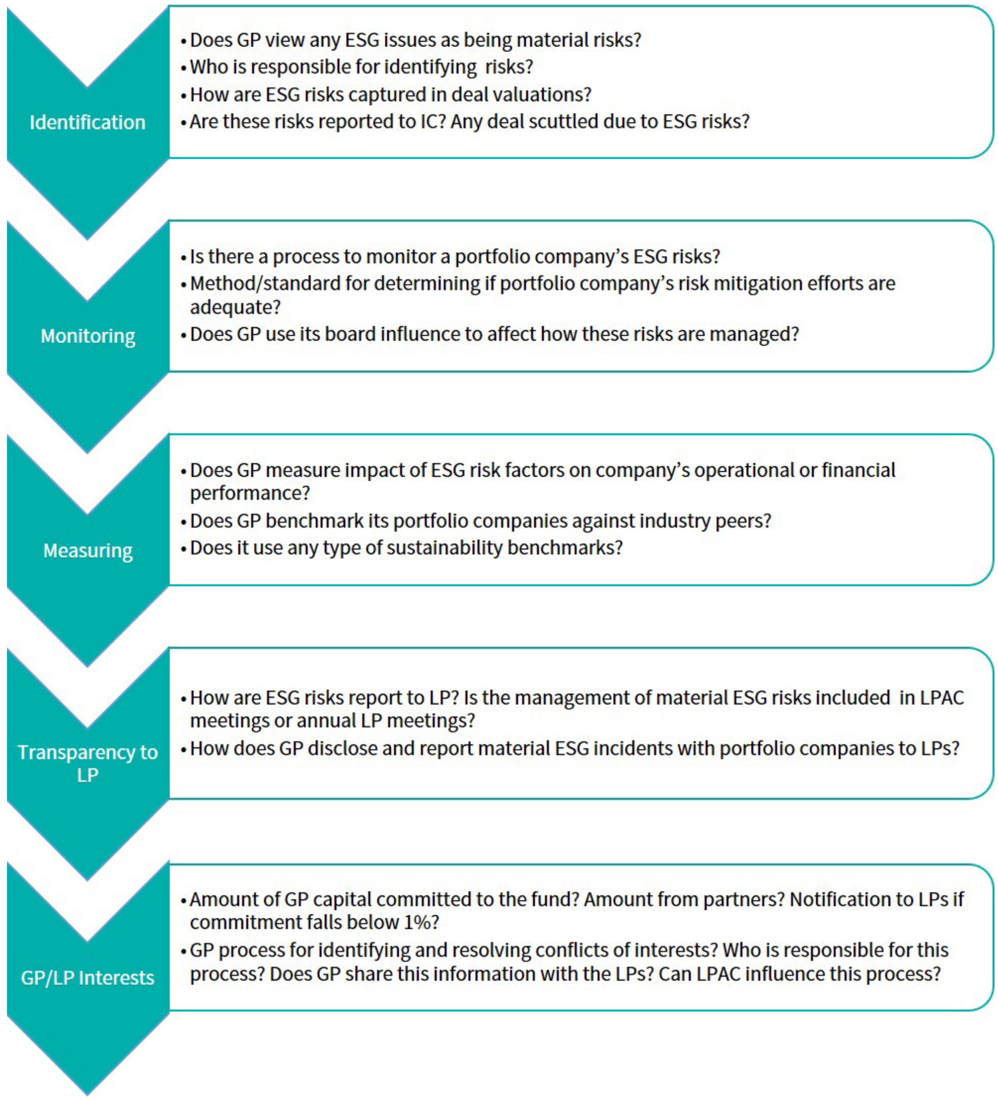


Figure 7: ESG Due Diligence Questionnaire

	Questions	Answers		
1	Does GP consider any ESG risk factors for its investments?	YES	NO	
	If yes, what type of ESG approach does GP use?*	Integrated		
2	Does GP have written description of its ESG risk approach?	YES	NO	
	If yes, please provide copy			
3	Does GP consider any ESG risk factors pre-investment?	YES	NO	
4	If yes, indicate category for ESG risks	E	S	G
5	Level of materilaity of ESG risk factors considered	High	Med	Low
6	Does GP monitor ESG risks factors post -investment?	YES	NO	
7	Does GP measure ESG risk factors impact on investments?	YES	NO	
8	Does GP provide ESG risk reporting to LPs	YES	NO	
	If yes, indicate type of reporting and provide copy	Quarterly & Annual		

Table 1: Summary of ESG Risk for Hypothetical PE Fund

ESG Integration in Fixed Income

Panelist: Jem Hudson, Formerly with Breckinridge Capital Advisors

Jem Hudson, former Director of Engagement at Breckinridge Capital Advisors, a Boston-based investment management firm with over $35 billion in fixed income assets under management. In her former role, Jem was primarily responsible for helping strengthen Breckinridge's ESG and sustainability-related dialogue with a range of key stakeholders including issuers, clients, industry peers, and thought leaders.

Breckinridge's Motivation for Implementing ESG Integration

- The long-term perspective of sustainable investing aligns well with Breckinridge's long term investment horizon.
- Breckinridge integrates ESG analysis in order to gain a more holistic view of a bond issuer's strength and weaknesses.
- Defining Bond Eligibility in Sustainable Portfolios

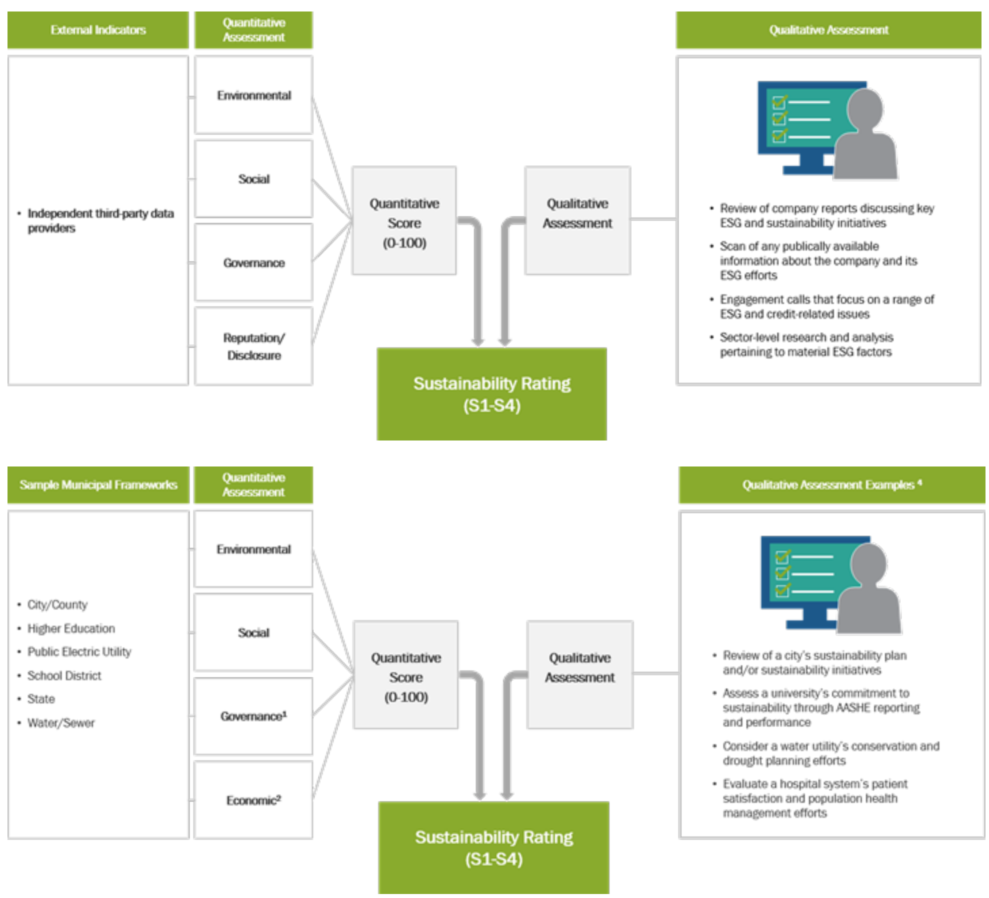
Breckinridge takes a two-pronged approach in defining bond eligibility for its SI portfolios by asking if the proceeds of a corporate or municipal bond is intended for an explicit environmental or social purpose. If "yes", a purpose assessment is made on the bond's proceeds.. If "no", ESG analysis is done to generate a sustainability rating for the bond.

ESG Integration Approach

As shown in Figure 8a & 8b, Breckinridge's ESG integration methodology combines a quantitative assessment of ESG factors with a rigorous review of qualitative ESG considerations to derive a sustainability rating for municipal and corporate bonds, with S1 being the highest score.

The differences between corporate and municipals bonds are shaded in gray in the respective Figures 8a and 8b. For the quantitative assessment step, corporate bonds incorporate reputational and disclosure risk factors while relevant economic issues are considered for municipal bonds. Moreover, municipal bonds have sector-based frameworks. In contrast, a different set of external indicators are used in the ESG analysis for corporates. The qualitative issues probed will be different as well.

A distinguishing feature of Breckinridge's ESG approach is its direct engagement with bond issuers. The two primary goals of its engagement process are to learn more about the bond issuer's ESG efforts/initiatives and to provide feedback to the issuer on further improving the quality of ESG management. Breckinridge also communicates, to an issuer, what ESG issues are material to the firm as an investor as part of this feedback process.



Figures 8a & 8b: ESG Approach for Corporate and Municipal Bonds

Panel Discussion

Moderator: Asha Mehta, CFA, Acadian Asset Management

Asha Mehta is a Senior Vice President at Acadian Asset Management, a Boston-headquartered investment management firm that specializes in systematic investment strategies, with over $85 billion in assets under management. In this role, she is responsible for providing portfolio management, leading ESG research, and subsequent integration of ESG factors throughout Acadian's investment process and serving as the chair of their Responsible Investment Committee.

The following are highlights from the discussion between Ms. Mehta, the audience, and the panel regarding their opinions on five questions:

- What are some evolving trends and new areas of innovation for ESG Integration?
- How is idea generation & implementation done at your firm, given some of the challenges associated with ESG Integration?
- How does active ownership align with ESG Integration and differentiated itself from shareholder activism?
- Is it breach of fiduciary responsibility to ignore ESG issues now?
- What is currently the most important ESG issue?

What are some evolving trends?

Main streaming

ESG integration is shifting from being a niche activity to being part of mainstream investment analysis. However, there is still a need to make ESG analysis more systematic across the investment process as well as a need for a dynamic versus static ESG framework that reflects changing risks as companies change.

ESG integration has helped help shift perceptions away from the negative connotation associated with early SRI performance, with (certain) ESG issues now being viewed as being financial factors affecting performance.

More certification

There is also still a need to develop more industry certification standards along the lines of LEED, especially for Green Bonds.

What are areas of Innovation?

Impact Investing

ESG integration is transitioning from mainstream investing to impact investing. Much of the recent innovation in impact investing has been on developing tools and methods to begin quantifying the social impact sought from making an investment.

An example is development of the "social progress" index in 2016 (by Breckinridge), which measure's a city's or county's standard of well-being relative their economic baseline; this work was done by Michael Porter at Harvard Business

School and is now being applied to municipal bonds at Breckinridge.

Blockchain & Big Data
Applying machine learning data mining techniques to vast quantities of ESG data will potentially make ESG Integration more efficient and less costly.

Blockchain holds potential for creating transparent and cost-efficient supply chains for tracking a product from start to finish, for example artisanal tomatoes, and particularly for products originating in emerging markets.

How is idea generation & implementation done at your firm?

Shift of perspective can help when trying to assess impact of new ESG approach. It's not always about the metrics and investors should consider looking at the process in a new way. For example, with Walmart, a company looking to make incremental ESG changes can create impact at scale. Given its size, Walmart can impact an entire industry and a large number of people. As an investor, these incremental changes can change an investment decision to "buy" versus dismissing this company.

Pilot first. Always start by considering what the portfolio manager is trying to achieve, then see how a pilot does. For example, a PM is more likely to try piloting health and wellness certification for one of his/her assets versus their entire portfolio. He/she may begin the process with skepticism, but if they see performance benefits, they may roll it out to entire portfolio and may even be a champion for other PMs to adopt it.

Explore beyond parameters of own portfolio to see where ESG integration may uncover new investment opportunities, e.g. in venture capital, relating to blockchain or renewable energy. Spending time getting quality data may help mitigate the corruption and political instability risks associated with emerging markets.

How does Active Ownership align with ESG Integration and differentiate itself from activism?

Improves fundamental research process: The "guns blazing" approach to engaging a company does NOT work. Constructive engagement strengthens understanding of a company, for example understanding the quality of its management. This type of engagement also helps a company think about what kinds of ESG issues impact its financial performance and how to quantify and report that impact to investors.

Improves operational performance (for holding companies): Active engagement involves asking questions that make the holding company think about how to improves its operational performance; e.g. how to report on its health and safety for infrastructure investments.

Improves staff and GP/LP alignment: ESG integration allows investment and corporate governance staff to work together to prioritize which issues may have the most impact on improving a company's performance. In Private Equity, it can also help align GP/LP interests and improve the way of mitigating conflicts of interest. In Public Equity, alignment of ESG and Equity analyst helps make a better business case for a company making changes that improve financial performance and reputation.

Is it breach of fiduciary responsibility to ignore ESG issues now?

Fiduciary duty is a legal term that is defined differently by different countries, so what it means varies. In the U.S., the recent Department of Labor memo provided guidance on ESG integration for ERISA plans. This memo enabled pension funds and other fiduciaries to consider ESG factors in their investment decisions without worrying about repercussions from the Department of Labor.

What is currently the most important ESG issue?

Encouraging colleagues to be thoughtful and thorough in how ESG issues are approached.

Primary and secondary effects, such as drought and demographic shifts, from climate change (on a portfolio).

Technological developments making ESG data analysis easier and less costly.

Appendix

Analysis for % ESG Integration in Select US Markets for 2016

REITS

- Market Size = 1.1 Trillion, total market cap for US public REITS
  Source: Global Perspectives: 2016 REIT Report, EY
- % ESG = Market cap for US Public REITs reporting to GRESB (Global Real Estate Sustainability Benchmark)
  Sources: GRESB, Bloomberg

Private Equity

- Market Size = 1.2 Trillion AUM
  Source: " A Routinely Exceptional Year" McKinsey Private Market Report 2016
- % ESG = U.S. related AUM in PE funds for BX, KKR, FIG, CG, APO, ARES, Bain, OAK, Ardian & TPG
  Sources: 10-K filings & PPMs

Fixed Income

- Market Size = 39.4 Trillion, US Debt outstanding (excluding loans)
  Source: SIFMA Fact Book 2017
- % ESG = AUM of US FI UN PRI Signatories to AUM of Global FI UN PRI Signatories
  Source: www.unpri.org/signatory-directory, "State Play for Fixed Income" UN PRI 2017 Report

Public Equity

- Market Size = 24.1 Trillion, total market cap for Russell 3000
- % ESG = 9.9 Trillion, total market cap for FTSE4 Good US 100 Index
  Source: www.ftserussell.com , calls with FTSE Russell

Biographies

Real Estate: Jessica Elengical, Head of ESG Strategy - Alternatives, Deutsche Asset Management

Jessica leads ESG Strategy for the Alternatives at Deutsche Asset Management, where she is responsible for integrating ESG into the investment processes for each of the businesses. Within Real Estate, Jessica manages the implementation of our global sustainability initiatives, including investment in energy efficiency, renewables, and green technology as well as development of our long-term energy reduction plans for the platform. Additionally she works with the other real assets businesses to incorporate a comprehensive framework to consider ESG risks and opportunities in asset selection. Jessica joined the Company in 2015 with over a decade of energy, sustainability, and finance experience. Prior to joining the bank, she led the origination, development, and financing of large-scale solar and wind projects for a number of renewable energy start-up companies. She also held roles in commodities structuring and structured finance at Barclays Capital, JPMorgan Chase, and Standard & Poor's. She serves on the GRESB North American Benchmark Committee as well as the UNEP-FI's Responsible Property Working Group.
Jessica has a BA in Economics from Georgetown University and an MBA from The Wharton School, University of Pennsylvania.

Fixed Income: Jem Hudson, Former Vice President and Director of Engagement, Breckinridge Capital Advisors

Jem Hudson is the former Director of Engagement at Breckinridge Capital Advisors, a Boston-based investment management firm with over $30 billion in fixed income assets under management. In her role, Jem was primarily responsible for helping strengthen Breckinridge's ESG and sustainability-related dialogue with a range of key stakeholders including issuers, clients, industry peers, and thought leaders. Jem has over 11 years of financial services and sustainability experience. Prior to Breckinridge, Jem was the CEO of Caldy Group, a boutique strategy consulting firm she founded to advise financial institutions seeking to expand their presence in sustainable investing. Before Caldy Group, Jem was a researcher with Professor Michael E. Porter at Harvard Business School, where she made contributions in the areas of competitive strategy, competitiveness of nations and creating shared value. Jem started her career as an analyst in Deutsche Bank's investment banking division. She holds an AB from Harvard College and an MBA from The Wharton School of the University of Pennsylvania.

Moderator: Asha Mehta, Senior Vice President, Acadian Asset Management

Asha Mehta joined Acadian in 2007. She is responsible for portfolio management, leading ESG research and subsequent integration of ESG factors throughout Acadian's investment process and serving as the chair of our Responsible Investment Committee. Prior to joining Acadian, Asha worked as an investment banker at Goldman Sachs and at Johnson & Johnson in a strategy role. Early in her career, she conducted microfinance lending in India. Asha holds an

M.B.A. with Honors from The Wharton School (University of Pennsylvania) and undergraduate degrees from Stanford University. Asha is a CFA charterholder and a member of CFA Society Boston. She was named one of the Top 10 Women in Asset Management by Money Management Executive in 2016.

Public Equity: Mariela Vargova, Senior Sustainability and Impact Analyst, Rockefeller & Co

Mariela M. Vargova, Ph.D., is a Senior Vice President and Senior Sustainability Analyst for the Sustainability and Impact Investing team. She focuses on the integration of environmental, social and governance factors in the investment process, and is responsible for corporate engagement strategies and external collaborations. Prior to joining Rockefeller & Co. in 2005, Mariela had an extensive academic experience in the social sciences, and before that she worked in Eastern Europe on a non-governmental project for the Open Society Institute. Currently, Mariela sits on the Principles for Responsible Investments (PRI) Investor Engagements Advisory Committee. She has been actively involved with US SIF: The Forum for Sustainable and Responsible Investment. She is a member of the CFA Society New York and the International Corporate Governance Network (ICGN). Mariela holds an M.A. in Political Science from Sofia University, Bulgaria, and an M.A. and a Ph. D. in Political Science from the New School for Social Research, New York.

Private Equity: Sondra Vitols, Investment Consultant, High Meadows Institute

Sondra Vitols currently serves as a consultant for High Meadows Institute and for Duke University's endowment (DUMAC). Prior to this, Sondra worked for several years as a senior investment officer for North Carolina's pension plan where she sourced and managed alternative and sustainable investments.

Sondra began her finance career at McKinsey & Company. Sondra has also held senior roles at Credit Suisse First Boston and D.E. Shaw & Company, in New York and Hong Kong. At Clark University, Sondra served both as investment staff for the endowment and as an associate professor at the business school. She has also held academic positions at the University of Pennsylvania and Princeton University.

Sondra received B.A. degrees in chemistry and philosophy (with honors) from the University of North Carolina at Chapel Hill and a Ph.D. in chemical physics from Princeton.

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