Greening Institutional Investment

INPUT PAPER

UNEP FINANCE INITIATIVE

PRI Principles for Responsible Investment

Greening Institutional Investment

About this paper

This input paper has been prepared by the authors as a contribution to the G20 Green Finance Study Group (GFSG) but has not been endorsed by it nor does it represent the official views or position of the GFSG or any of its members.

Co-chaired by the People's Bank of China and the Bank of England, with support from UNEP as the secretariat, the G20 Green Finance Study Group was established to examine how green finance can be scaled up throughout the G20, focusing on banking, green bonds, institutional investors, risk analysis and measuring progress. PRI and UNEP FI have provided input to the study as knowledge partners, including through this paper focusing on institutional investment. The study's overall findings are available in a separate synthesis report published during the G20 2016 Summit in China.

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Executive summary

This paper takes stock of institutional investor experience with mobilising green capital for green investment and mainstreaming green factors across asset classes. It identifies key drivers for action and barriers preventing progress. It reviews investors' experience within their own organisations as well as with aligning market and policy frameworks with green investment. It suggests possible options for consideration by G20 members.

- **Growth and spread of responsible investment:** Green issues are a key component of responsible investment,[1] which is an approach to investment that explicitly acknowledges the relevance to the investor of environmental, social and governance (ESG) factors, and the long-term health and stability of the market as a whole. Globally, support for the Principles for Responsible Investment has grown consistently, from 100 signatories representing US$6.5 trillion in 2006 to 1,380 signatories representing US$59 trillion by 2015. Although the largest number of signatories is in the US (256) and Europe (696), a significant number are in emerging markets including Brazil (57), South Africa (52) and China including Hong Kong SAR (17).

- **Key drivers:** Investor awareness of the materiality of green issues has progressed substantially since the Rio Earth Summit in 1992 and the launch of the PRI in 2006. There are five key drivers for sustained investor interest in green finance:

    - *Long-term value:* There is growing belief across the G20 – including for example CPPIB (Canada) and GPIF (Japan) – that consideration of ESG factors is important to long-term value for pension fund recipients.

    - *Risk management:* This is a driving factor for large asset owners such as CalPERS (US$300 billion in assets), with green risk factors included in investment beliefs[2] as well as for mainstream investment managers such as State Street Global Investors (US$2.4 trillion in assets under management).

    - *Client demand:* This is growing across markets, including emerging markets. 52% of YouGov survey respondents in Brazil say they would like information on how companies in their funds deal with ESG issues such as climate change, with civil society one driver of beneficiary interest.[3]

    - *Strategic policy signals:* Investors welcome The Paris Agreement and the Sustainable Development Goals[4] as signals of the policy trajectory.

    - *Regulatory action:* Within the G20, this includes the French Energy Transition Law and SRI fund labelling, as well as Stewardship codes and developments underway at the EU to improve company and investor transparency. Eight countries within the G20 have pension fund regulation covering ESG disclosure and seven stock exchanges have a sustainability listing rule.

- **Actions investors are taking:** Investors are already considering green issues across G20 countries, asset classes and topics, and also building industry capacity:

    - In 2015, over 900 investors from 48 countries completed PRI's reporting framework. Investors are considering green issues in infrastructure, real estate, private equity, fixed income and equities. Case studies of Allianz SE (Germany) and Itau Asset

Management (Brazil) illustrate how investors are integrating green risks into equities and fixed income investment analysis. Over 305 investors have engaged with companies on green issues in 2015, ranging from water risk in agricultural supply chains to toxic chemicals.[5]

- The investment industry is building its own capacity on green issues, with CFA-approved training available through the *PRI Academy*,[6] tools such as the *Bloomberg Water Risk Valuation Tool*[7] and guidance including a *Sustainable Real Estate Investment* guide[8] and *GRESB Infrastructure Assessment Tool*.[9]

- Green investments are small, but growing, with momentum from the Paris Agreement. US$50 billion is registered in low carbon investments by asset owners,[10] with US$41.8 in labelled green bonds in 2015.[11] AXA Group recently committed €3 billion to green bonds and New York State Comptroller's Office has allocated US$5 billion into sustainable investing strategies.

- **Greening market and policy frameworks:** Investors recognise that wider market shifts are needed on green issues and are already making interventions for these.

  - Closer investor collaboration with policy makers includes the industry-led Financial Stability Board Taskforce on Climate-related Financial Disclosures.[12] The G20 Energy Efficiency Investor Statement[13] and a new Green Infrastructure Coalition,[14] both launched in 2015, illustrate investors asking for supportive policy frameworks for green investment.

  - Investor efforts are also underway to harmonise a global understanding through a new international statement on fiduciary duty. *Fiduciary Duty in the 21st Century*,[15] already clarifies that failing to consider long-term investment drivers including ESG issues in investment practice is a failure of fiduciary duty.

  - Investors are stimulating market action and disclosure, with 100 investors representing US$10 trillion calling for 77 stock exchanges to provide ESG guidance for issuers by the end of 2016. Investors are also encouraging credit rating agencies integrate ESG factors into credit ratings formally.

- **Options to strengthen institutional demand for green investment include:**

  - *Principles:* promote the increased adoption and implementation of good practice responsible investment and green finance principles by institutional investors across G20 countries, including public financial institutions.

  - *Definitions & standards:* develop a broad definition of green finance meaningful across the G20, and internationally comparable green finance indicators, and encourage industry development of green standards for bonds.

  - *Policy frameworks:* identify policy levers and incentives for mobilising private investment across asset classes, while providing policy stability to encourage green investment flows.

  - *Investor governance:* encourage strong investor governance focusing on fiduciary duty and encouraging responsible investment, stewardship codes and disclosure. Encourage

asset owners to be key drivers of green finance through including responsible investment in investment beliefs, strategy and mandates.

- *Capacity:* build capacity for mainstreaming of green finance among investment professionals and policy makers within G20 countries, particularly emerging markets, building on existing platforms such as PRI.

- *Transparency:* encourage transparency by institutional investors on how they are managing environmental factors as part of their strategies for responsible investment.

- **Options to expand the efficient supply of green assets include:**

  - *Product innovation:* facilitate the development of liquid markets for quality green assets, focusing on listed fixed income and equities.

  - *Market intermediaries:* support integration of environmental factors by key intermediaries such as stock markets, credit rating agencies, sell-side equity research and investment consultants.

  - *Risk mitigation:* facilitate the development of risk mitigants to crowd-in private investment (e.g. credit enhancement and revenue guarantees) and aggregation of assets.

  - *Data:* strengthen ESG disclosure by listed companies and issuers.

  - *Risk analysis***:** encourage companies and investors to develop risk analysis methodologies for green issues and to consider the recommendations of the FSB Task Force on Climate-related Financial Disclosure due in December 2016.

  - *Investment Agreements, Policies and Regulations:* incorporate environmental factors in investment policies, regulations and agreements.

1. Mainstreaming – where does the industry stand?

Responsible investment is an approach to investment that explicitly acknowledges the relevance to the investor of environmental, social and governance (ESG) factors, and the long-term health and stability of the market as a whole. Responsible investment requires investors to take a wider view, acknowledging the full spectrum of risks and opportunities facing them, in order to allocate capital in a manner that is aligned with the short and long-term interests of their clients and beneficiaries.[16]

Green, or environmental issues, are one of the three key factors considered within responsible investment. Investors across G20 countries are engaged on green issues, seeing these as investment risks and opportunities. This includes a broad range of topics – not only climate change, but also water, deforestation, toxic chemicals, biodiversity and pollinators.[17] While the degree of investor engagement varies by country, it is set to be sustained over the next decade. Drivers include consistent growth in responsible investment, potential for long-term value and risk management, client and civil society interest, momentum from The Paris Agreement and Sustainable Development Goals, and growing regulatory interest.

Social and governance factors do also matter to investors. The weighting of E, S and G by investors varies depending on investor profile, beneficiary and client priorities, investment beliefs and objectives, region and the materiality of ESG factors for specific investments.

Responsible investment across the G20

Globally, the Principles for Responsible Investment (PRI), an investor initiative supported by the United Nations, has strong mainstream investor support. As at 2015, approximately 63% of professionally managed assets globally were held by PRI signatory investment managers and 19% by PRI signatory asset owners.[18]

Within the G20, there are 1,330 signatories as at March 2016[19] (see Figure 3).

The six principles embody incorporation of green issues across investment practices – in investment decisions, active ownership and disclosure.

1.1. The growth and spread of responsible investment

Globally, responsible investment[20] has seen consistent growth; from 100 signatories representing US$6.5 trillion in 2006 to 1,380 signatories representing US$59 trillion by 2015.

This has included strong 3-year growth[21] in North America (25%), continental Europe (38%), Africa (28%) and Japan (28%).[22]

There are geographic differences in the level of engagement on responsible investment within the G20 (see Figures 3 and 4). The largest numbers of PRI signatories are in the US (256) and European Union (696), but there are a significant number of PRI signatories in other regions including Australia (118), Canada (76) Brazil (57), South Africa (52), Japan (39) and China (17).

Figure 1: The six principles of responsible investment

1 We will incorporate ESG issues into investment analysis and decision-making processes.

2 We will be active owners and incorporate ESG issues into our ownership policies and practices.

3 We will seek appropriate disclosure on ESG issues by the entities in which we invest.

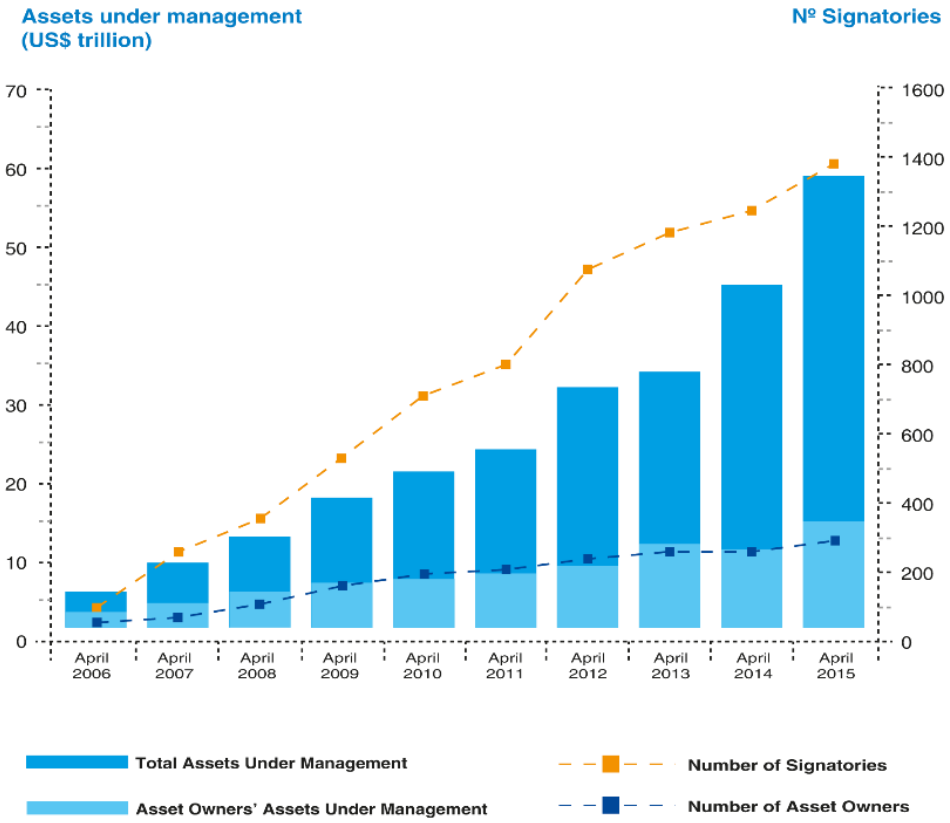
4 We will promote acceptance and implementation of the Principles within the investment industry.

5 We will work together to enhance our effectiveness in implementing the Principles.

6 We will each report on our activities and progress towards implementing the Principles.

Source: PRI, 2016[23]

Figure 2: Global PRI signatory growth 2006-2015



Source: PRI, 2015[24]

Figure 3: Number of investors engaged on responsible investment across the G20

Source: PRI Signatories, 2016[25]

Investor engagement within the G20

Within the G20, some of the largest asset owners and investment managers have committed to responsible investment, including Allianz SE and Old Mutual plc. Investors with smaller assets under management are also engaged, such as Ak Asset Management in Turkey and Ainda, Energia & Infraestructura in Mexico.

Figure 4: Examples of PRI signatories within G20 countries

PRI Signatory Asset Owners	AUM (US$bn)	G20 country
Allianz SE	2,528	Germany
AXA Group	1,675	France
GPIF	1,146	Japan
Generali Group	630	Italy
Old Mutual plc	529	United Kingdom
Caisse des dépôts et consignations - CDC	403	France
California Public Employees' Retirement System CalPERS	300	United States
Korea National Pension Service (NPS)	283	Korea, Republic of
Canada Pension Plan Investment Board	201	Canada
Government Employees Pension Fund of South Africa	148	South Africa
AustralianSuper	80	Australia
PREVI - Caixa de Previdência dos Funcionários do Banco do Brasil	74	Brazil

PRI Signatory Investment Managers	AUM (US$bn)	G20 country
BlackRock	4,594	United States
Deutsche Asset and Wealth Management	1,558	Germany
Omni Partners LLP	820	United Kingdom
Legal & General Investment Management (Holdings)	778	United Kingdom
Sumitomo Mitsui Trust Bank, Limited	627	Japan
Macquarie Asset Management	368	Australia
Manulife Asset Management	313	Canada
Eurizon Capital SGR	287	Italy
BB DTVM	224	Brazil
Public Investment Corporation (PIC)	95	South Africa
Ak Asset Management	5	Turkey
Mirae Assets Global Investments	4	China including Hong Kong SAR
SEDCO Capital	4	Saudi Arabia
UFG Asset Management	2	Russian Federation
Ainda, Energia & Infraestructura	1	Mexico

Source: PRI, 2016[26]

1.2. Drivers of investor action

Drivers for responsible investment and green finance:

There has been long-standing investor interest in green topics but the last decade has seen deeper investor recognition of the materiality of green issues. The five key drivers of investor action on green issues over the next decade are: long-term value, risk mitigation, client demand, strategic policy signals and growing regulatory action.

Figure 5: Green finance timeline from an investor perspective

Year	Key event
1992:	Rio Earth Summit with conventions on climate change and biodiversity
2006:	Freshfields report on *ESG and fiduciary duty*, Principles for Responsible Investment launched
2006:	*Stern Review on the Economics of Climate Change* highlighting materiality of green issues
2010:	*Universal Ownership: Why Environmental Externalities Matter to Institutional Investors*
2012:	$100 million in damages from Hurricane Sandy, Green Investment Bank launched in the UK
2015:	*Inquiry: Design of a Sustainable Financial System, Fiduciary Duty in the 21st Century* report,
	Financial Stability Board Taskforce on Climate-related Financial Disclosures
	Sustainable Development Goals adopted
	The Paris Agreement
2016:	G20 Study on Green Finance, The Year of Green Finance launched

Source: UNEP FI and Principles for Responsible Investment, 2016[27,28]

1.2.1. Long-term value

There is growing and widespread belief among mainstream investors within the G20 that consideration of ESG factors is a source of long-term value creation.

Canada Pension Plan Investment Board states that: "We believe that organizations that manage Environmental, Social and Governance (ESG) factors effectively are more likely to create sustainable value over the long-term than those that do not…we consider responsible investing simply as intelligent long-term investing."[29]

Similarly, Government Pension Investment Fund (Japan) states: "It is our belief that considering Environmental, Social and Governance (ESG) issues properly will lead to increase in corporate value, foster sustainable growth of the investee companies, and enhanced the medium to long term investment return for the pension recipients."[30]

There is also a body of academic evidence on enhanced investment returns. In 2016, Deutsche Asset & Wealth Management and the University of Hamburg analysed over 2,200 studies on the effect of ESG on corporate financial performance (CFP).[31] Overall, 62.6% of meta-analyses find a positive correlation between ESG and corporate financial performance and 90% of studies a non-negative relation, with a strong correlation between ESG and corporate financial performance in emerging markets.

Figure 6: Findings from Deutsche Asset & Wealth Management and University of Hamburg Study

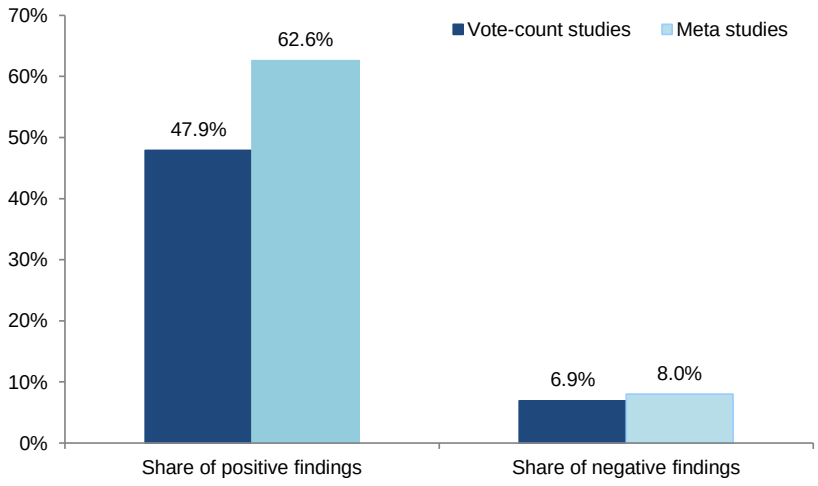
Definitions for Figure 6 charts

ESG refers to environmental, social and corporate governance factors. Typically they are qualitative objectives that are not readily quantifiable in monetary terms and have a medium- to long-term horizon.

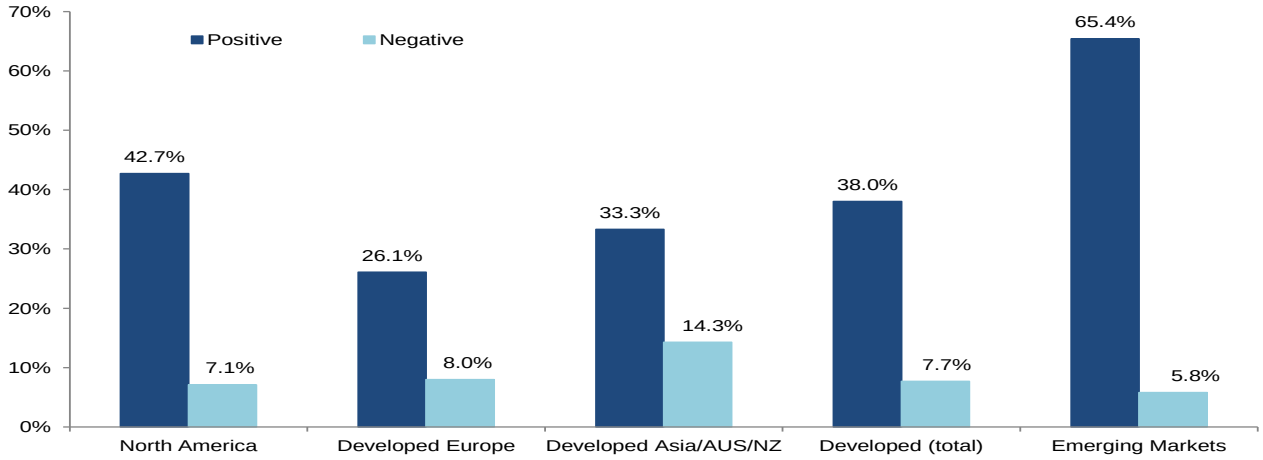
Corporate financial performance (CFP) measures accounting-based performance, market-based performance, operational performance, perceptual performance, growth performance, risk performance, and the performance of ESG portfolios

Vote-count studies typically count the number of primary academic studies with significant positive, negative and non-significant results and "votes" the category with the highest share as winner

Meta-analyses aggregate findings of academic studies econometrically. They directly import effect sizes and sample sizes of primary studies to compute a summary effect across primary studies



The ESG-CFP Link by Region



Source: Deutsche Asset & Wealth Management and the University of Hamburg, 2016[32]

1.2.2. Risk management:

Risk is a driving factor for investors to consider green issues, including both reputation risk and portfolio-level risk.[33] Examples of inadequately managed green risks commonly cited by investors include the Volkswagen emissions scandal and BP's Deepwater Horizon accident in the Gulf of Mexico. Asset owners are actively seeking to encourage their portfolio managers to understand and mitigate such risks. CalPERS (US$300 billion in assets under management, ranked sixth globally[34]), for example, has developed investment beliefs to manage investments and determine prioritise in 2013. These state that "strong governance, along with effective management of environmental and human capital factors, increases the likelihood that companies will perform over the long-term and manage risk effectively."[35]

Large investment managers such as State Street Global Advisors (US$2.4 trillion in assets under management, ranked third globally by assets[36]) already place emphasis on the need for company directors to demonstrate strong risk oversight of material environmental issues.[37]

Figure 7: CalPERS Investment Beliefs (extract)

Investment Belief 9

Risk to CalPERS is multi-faceted and not fully captured through measures such as volatility or tracking error Sub-beliefs:

• CalPERS shall develop a broad set of investment and actuarial risk measures and clear processes for managing risk

• The path of returns matters, because highly volatile returns can have unexpected impacts on contribution rates and funding status

• As a long-term investor, CalPERS must consider risk factors, for example climate change and natural resource availability, that emerge slowly over long time periods, but could have a material impact on company or portfolio returns

Source: CalPERS Beliefs[38]

1.2.3. Client demand

Demand for ESG is growing and according to a YouGov survey, emerging markets investors are more engaged on green issues than their counterparts in developed countries.[39] This survey covered pension fund holders in the UK, USA, France, Japan, Australia, South Africa and Brazil, to identify attitudes towards and companies and ESG issues. 52% of respondents in Brazil and 43% in South Africa said it would be helpful if their fund manager sent them information on how companies in their funds deal with ESG issues such as climate change. In all countries except the UK, at least 23% of respondents said they would like more consultation with their fund managers about issues that are meaningful to investors. Investors have indicated to the authors that pressure from civil society has also been a driver of growing beneficiary interest in ESG and green issues.

1.2.4. Strategic policy signals: The Paris Agreement and the Sustainable Development Goals

The Paris Agreement has been welcomed by investors as a clear signal of the long-term global policy trajectory on green issues and an important foundation for national policies.[40] The 17 Sustainable Development Goals[41] (SDGs) were adopted by 193 of countries at the UN Sustainable Development Summit in September 2015.

As an indicator of investor engagement, in a recent global investor survey[42] over 65% of respondents agreed that acting on the goals aligned with their fiduciary duties. Over half of respondents believe that working towards achieving all 17 goals would have high or medium potential to help meet their organisation's investment objectives. Investors already plan to take action on the Sustainable Development Goals, with 75% of respondents already taking action on three or more goals. Of the top three goals investors are prioritising this year, two are green goals.

Figure 8 The Sustainable Development Goals and investor focus areas

The top three Global Goals investors are currently focusing on:

Goals 13: Take urgent action to combat climate change and its impacts

Goal 5: Achieve gender equality and empower all women and girls

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy for all

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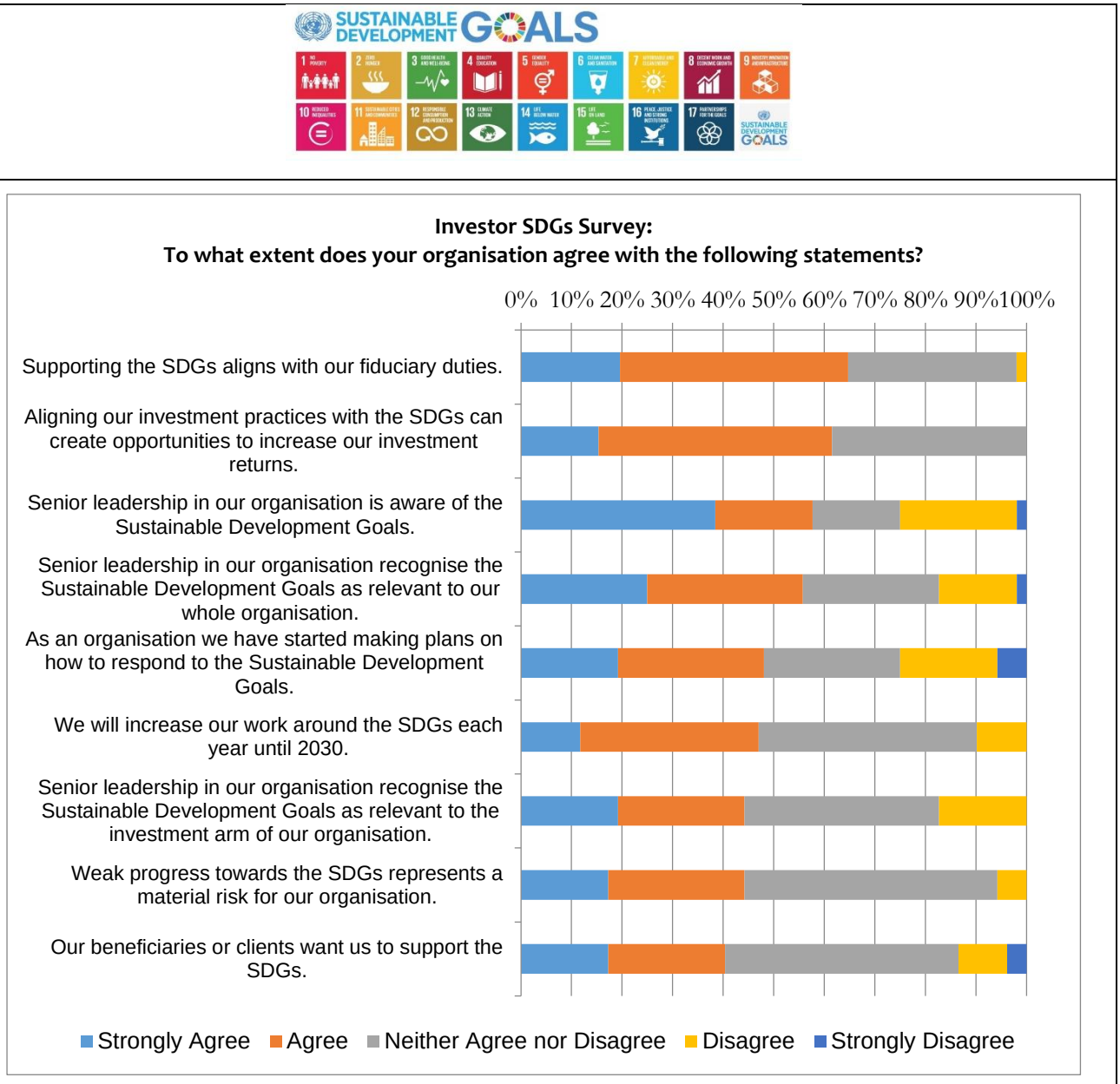


Source: ShareAction and PRI research, 2016[43]

1.2.5. Growing regulatory action

This includes growing reporting requirements such as the *Energy Transition Law* and policy action to assist in SRI fund labelling in France, as well as Stewardship codes. Globally, there are nearly 400 disclosure schemes relating to climate or sustainability developed by regulators, industry groups, NGOs and international organisations.[44] Within the G20, eight countries have pension fund regulation covering ESG disclosure, seven stock exchanges have a sustainability listing rule and 16 countries have environmental regulation.

Several developments are under way at the EU:

- The EU requires certain large companies to disclose information on environmental matters, through Directive 2014/95/EU,[45] adopted in 2014, which will be transposed into national legislation by December 2016, with a public consultation underway on non-binding guidelines on methodology for reporting non-financial information.

- The EU also adopted a legislative proposal for new rules on occupational pension funds (IORPs) in 2014,[46] requiring them to cover in their risk evaluation a qualitative assessment of new or emerging risks relating to climate change, use of resources and the environment. Trilogues started on this from February 2016.

- The European Commission adopted an amendment to the Shareholder Rights Directive in 2014,[47] which aims to increase transparency in the investment chain and sets out a framework for better engagement between companies and their shareholders. Trilogues are underway on this for a final legal text.

- In March 2016, the European Commission completed a public consultation on long-term and sustainable investments.[48]

Regulatory action is detailed further in section 3.

1.3. Barriers to green investment

This section is informed by PRI's multi-year and multi-asset class dialogue on ESG with pension funds and investment managers, with non-PRI signatories and external investor organisations, as well as dialogue with the G20 Study Group on Green Finance in March 2015.

Global G20 policy collaboration on green issues is essential for investors, who typically have global investment portfolios. While the global investment industry is already mainstreaming green finance, investors believe that the barriers below need to be addressed by policymakers. Policy makers' efforts are presently disjointed and fragmented,[49] but with commitment to addressing these barriers, it is possible to scale-up green finance.

1.3.1. Demand for green investment

- **Definition and market standards:** Investors find there is lack of definition of "green finance" at a global level, with green standards under development. Meanwhile there are significant concerns about "greenwashing" by listed companies and issuers. Environmental issues are complex and multi-dimensional. Without generally accepted definitions and standards, mainstream investors face hurdles prior to and during investment, increasing transaction costs. Where standards are in place, for example for green real estate, the process is less burdensome for investors. At the same time, investors do not want over-prescriptive standards or that the search for "perfect clarity" on definitions and standards slows down the pace of green investment. Challenges presently include:

    - Due diligence: Portfolio managers and analysts having sufficient specialist knowledge and time to establish environmental criteria then individually evaluate and select investment opportunities against these in a consistent manner, while factoring in regional and sector-specific nuances.

    - Monitoring: Portfolio managers do not like "surprises" and to be forced into exit strategies when investments are found to have a negative impact on the environment. This can impact directly on returns, as well as the trust placed in portfolio managers by clients and beneficiaries.

- **Policy frameworks:** Investors are unclear on the extent to which the G20 and individual countries prioritise environmental protection and green finance in policy.

- Predictability of country policy, particularly risks to investors from retroactive policy changes, but also lack of policy or conflicting policy signals can impact on overall investor confidence and green investment flows. Investors need visibility on the overall policy trajectory for green issues such as energy efficiency and pollution standards, and for specific investment areas, as well as policy incentives to encourage green investment. Investors have indicated to the authors that a high level of policy risk translates into increased risk premiums, generating higher financing costs or lower funding of projects.

- Lack of price signals, such as failure to price carbon and natural capital, are also seen as barriers to scaling up by investors.

- There could be significantly more investor-G20 dialogue on how investors and policy makers can work together to scale up green finance, and on clearer policy frameworks, with policy fragmentation across the G20

- The majority of G20 countries' sovereign wealth and public pension funds are not yet participating in green finance, meaning there is a discrepancy between action on green finance among government and private investors.

- **Investor governance:** While many asset owners do incorporate green risks, others may not do so until they hear policy encouragement to consider material green risks as part of their fiduciary duty and to include ESG within their mandates (contracts).

  - Fiduciary duty: The findings of legal reviews undertaken recently in seven G20 countries – including Brazil, South Africa and the USA – find that in all cases, failure to consider material green issues is a breach of fiduciary duty.[50]

  - Mismatch in time horizons: Misalignment of interests in the investment chain can mean that green issues are insufficiently factored into an investment decision. One party (an asset owner, investment manager or consultant) may not be sufficiently motivated to act on behalf of another (a beneficiary or a client). Conflicts of interest and lack of incentives can result in short-term investment decisions and inadequate consideration of long-term environmental issues within asset allocation and investment analysis. A lack of inclusion of ESG factors in asset owner mandates (contracts) and instructions to investment managers can limit the extent to which green issues are considered and communicated to clients and beneficiaries[51]. The shift away from defined benefit to defined contribution pension schemes requires strong communication on the impact of investment choices to a wider investor base. Underfunded pension funds can also impact on the investor time horizon.

- **Capacity for green:** There remains a gap between high-level commitment to principles and full implementation in investment practice.

  - Investor and policy maker understanding of green investment is evolving, with varying degrees of knowledge at the country, trustee and portfolio manager level.

  - Many investors and policy makers continue to consider green issues as "moral" or "ethical," rather than recognising the financial and economic imperatives for green investment practices and flows.

- For investors, difficulties in embedding skills throughout organisations can prevent taking full account of sustainability issues in company assessment and valuation.[52] While ESG training materials and tools do already exist, provided by bodies such as PRI, not all investors are implementing these. There are limited incentives for investment professionals to undertake training to improve their skills in this area, meaning there is lack of internal expertise to assess environmental risks and undertake due diligence on green investment opportunities

1.3.2. Supply of green investment

- **Investment opportunities and pipeline:** Investors find challenges with the small size of certain green investment opportunities, which are difficult to include within regular asset allocation decisions. Asset owners (i.e. pension funds and endowments) are typically more likely to make significant allocations (over 10% of the total portfolio) into fixed income and equities, although private equity, infrastructure and real assets are also invested in significantly by some asset owners.

  - There is insufficient development of regular equity and debt capital market options in green finance for institutional investors looking to make green investments.

  - Many mainstream asset owners are less willing to invest in private equity and venture capital, where financial support is needed for new environmental technologies, while infrastructure allocation is hindered by liquidity constraints and currency risks. Project-driven investments are less typical for mainstream institutional investors and perceived as requiring specialist knowledge. Lack of aggregation of small-sized green projects is a barrier to accessing these.

  - Investors do make significant investments in emerging markets, but need to know that potential risks associated with these are mitigated, and they may be risk averse.

  - Certain green funds lack performance track record, with investors need to spend more time researching new green funds as part of their due diligence, and poor experiences in the past of early clean tech investments

  - Demand for green bonds is presently outstripping supply – this is covered in a separate Green Bonds Workstream paper. Investors look for credit ratings and high quality due diligence material that is not always available for green investments. Investors are not willing to “pay more” for green benefits associated with green bonds.

  - Early adopters of green investment do not capture the wider benefits of growing a new sector.

- **Inadequate data:** Data on company environmental practices and performance is still developing, with considerable variability by region and within sectors, meaning global investors cannot always compare and use such data to inform regular investment analysis and decisions.

- **Inadequate risk analysis:**

  - Among pension funds and investment managers, scenario analysis and risk assessment of material green issues is also still developing.

- The FSB Taskforce on Climate-related Financial Disclosures will conclude by 2017 and could significantly help in improving company data and in developing environmental risk analysis methodologies.

- Risk is covered in a separate G20 Study on Green Finance Risk Workstream paper.

Figure 9: Investor Experience by asset class

Asset class	Demand barriers to green investment flows	Supply barriers to green investment flows	Challenges in green investor practices	Primary gap identified
Listed Equities	Technology and policy risk associated with certain sectors and areas e.g. renewables.[53]	Portfolios heavily invested in certain domestic economies may have limited opportunities. (Global portfolios offer more opportunities).	Incorporation of green issues and active ownership underway, but challenges with usefulness of company data.[54]	Data Policy framework
Fixed income	Greenwashing linked to lack of standards for green bonds and clarity on use of proceeds.[55]	Oversubscription of green bonds,[56] although overall issuance is low.[57]	Green bonds standards under development. Investor incorporation of green issues underway for corporate and sovereign bonds, but challenges with credit rating agencies' consideration of green issues and private debt.[58]	Standards Policy framework
Private equity	Technology and policy risk associated with certain areas. Limited demand for thematic private equity with mixed performance records.	Early stage and high-risk investments are unsuitable for many mainstream investors.[59]	Limited Partners asking General Partners to integrate green issues, with due diligence tools underway. Challenges in quantifying and monitoring implementation.[60]	Supply Policy framework
Infrastructure	Considered a specialist asset class outside regular asset allocation by some asset owners.	Deals are considered unsuitable by asset owners lacking specialist knowledge, or may fall outside regular asset allocation.[61]	Industry capacity-building underway through GRESB on green issues.[62]	Demand and Supply
Real estate and property	-	-	Green practices underway including certification and for energy efficiency, but challenges in quality and consistency of reporting by companies.[63]	Data
Real assets e.g. farmland, timberland	-	-	Responsible investment practices underway covering green issues.[64]	-

Source: PRI, 2016

2. What actions have investors been taking?

Mainstream investor action on green finance can be categorised as:

- Green investment practices – integrated analysis and active ownership with companies and policy makers, focused on meeting risk objectives and protecting investor value;
- Green investment flows – focused on investment opportunities; and
- Green capacity-building – to accelerate industry capacity in green finance.

2.1. Mainstreaming green investment practices

The sheer depth and breadth of investor action on green issues demonstrates that mainstreaming is well underway in the global investment industry.

- Over 900 investors from 48 countries across six continents publish *RI Transparency Reports*[65] on how they govern and implement the PRI's six principles, of which green issues are a key component.
- Listed equity is the most commonly held asset class for PRI signatories. Within this asset class, the proportion of investment managers incorporating ESG into decision-making grew to 95% in 2015, from 93% the year before. Integrating ESG factors into company analysis remains the most common ESG incorporation strategy, with 84% of PRI signatories reporting this for listed equity.[66]
- 63% of investors engage policy makers or standard setters on ESG topics, with 50% of investment managers doing so.

2.1.1. Asset classes

Investors are taking action across asset classes, indicated in *Corporate Bonds – Spotlight on ESG Risks* guide,[67] a new *Sustainable Real Estate Investment* guide,[68] *Limited Partners Responsible Investment Due Diligence Questionnaire,*[69] *GRESB Infrastructure Assessment Tool*[70] *and Responsible Investment in Farmland*.[71]

Figure 10 Investor actions across asset classes

Asset classes	Investor action underway on green finance	Incorporation of green issues within investment decisions underway	Engagement with companies/projects on green issues underway	Asset allocation to support green finance underway
Fixed income	Yes	Yes	Yes	Yes
Equities	Yes	Yes	Yes	Yes
Private equity	Yes	Yes	Yes	Yes
Property	Yes	Yes	Yes	Yes
Infrastructure	Yes	Yes	Yes	Yes

Source: PRI 2015 Report on Progress and PRI Climate Change Asset Owner Strategy Framework[72]

Figure 11 Infrastructure case study

The GRESB Infrastructure Assessment Tool, for example, provides investors with benchmark reports and portfolio analysis tools, capturing performance of infrastructure assets and projects for a range of green issues:

Source: GRESB Infrastructure Assessment Tool[73]

Private equity case study: AP7

This case study illustrates how long-term investors are supporting solutions to green finance and how public policy is essential to scaling up such investments.

Background – a long-term universal owner AP7 is the default fund in the Swedish premium pension system managing US$36 billion in assets. As a government pension fund, its values are based on democratic decisions taken in parliament and enforced by the government.

As AP7 follows an index, it owns a small part of the entire global stock market and its portfolio reflects the risks and opportunities embedded in the whole global economy, with a 30-40-year investment horizon. AP7 has multiple climate change strategies: carbon footprinting, active ownership and €1.5 billion invested in environmental technologies.

Why clean tech? AP7 believes that it can invest in climate change solutions while making a return. Pure venture is not viable as the losses are too great, while it is difficult to find less risky buyout investments. Private equity clean tech is a good space; although savers reaching retirement age are less keen on such investments, the younger generation of savers and millennials are very positive about them.

How? AP7's clean tech private equity programme started in 2007. It has US$200 million invested in unlisted clean tech companies, with two outsourced managers. The majority of the investments are in the US, and the remainder in Nordic countries. AP7 was one of the first investors in Tesla Motors (a successful investment) and co-invested with a Swedish buyout fund in Nordic recycling company Norskgjenvinning. It currently invests in Solar City, a company with a technological edge in solar panel manufacturing.

What is important to successful clean tech investment from AP7's perspective?

- **Have long timeframes:** Private equity programs typically run for 5-10 years, but clean tech investments need to be even longer, requiring strong support from the board.
- **Use realistic returns targets:** AP7 requires private equity investments to outperform public equity by 2% per year. Initially, the same targets were set for private equity clean tech, but this had to be modified as returns were 5% below public equity returns.

- **Diversify:** Initially, AP7 could not find enough attractive investments in the Nordic region so had to diversify to international investments.

- **Specialist knowledge:** A classic mistake is to underestimate development time or be over-altruistic, resulting in poor returns. Challenges include the significant impact of the oil price on clean tech companies. AP7's in-house specialist has over ten years' experience in private equity and eight years' in clean tech.

How can more finance be channelled into clean tech? AP7's view:

Clean tech is maturing – five years from now, AP7 expects that there will be more investment opportunities and is investigating how it can increase financing solutions. However, AP7 cannot scale up its investment significantly as the current returns would risk capital for savers. A key reason is the time lag between start-up technologies and monetising their value, although US companies are better at this than companies in other markets. AP7 considers the following is needed to scale up clean tech investment:

- **Close the funding gap:** Governments could play a role in financing companies during the middle gap, between start-up and achieving more financially successful scale, when a large asset owner can invest in a company. Governments could potentially share in the upside, too.

- **New technologies:** The Volkswagen scandal, for example, indicates that technology for reducing emissions is reaching a dead end. In the long run, investors need companies with new technologies that make it on their own, driven by consumer demand and not over-dependent on government subsidies.

- **Carbon price:** AP7 strongly believe a price on carbon is needed, so that there is a financial driver for alternative power generation and clean tech.

Fixed income case study: Itau Asset Management

This case study highlights how investors are quantifying the impacts of more strictly enforced environmental regulation in fixed income.

Background: Itaú Asset Management[74] operates in Brazil, with BRL473 billion/US$126 billion in asset under management. Itaú Asset Management (IAM)'s ESG integration process began in 2004 with the launch of our first SRI fund (Social Excellence Fund – FITES), which served as a laboratory to develop our ESG capabilities. Since 2010, we have been expanding our proprietary ESG integration method to listed equity valuation, credit and, most recently, sovereign bonds. Presently, we apply ESG integration to 100% of the IBOVESPA and Corporate Sustainability (ISE) indices, 70% of corporate bonds in our portfolio and 100% of Brazilian sovereign bonds. IAM employs a specialist portfolio manager and a dedicated ESG analyst, who work with other PMs and financial analysts to disseminate the method and related research.

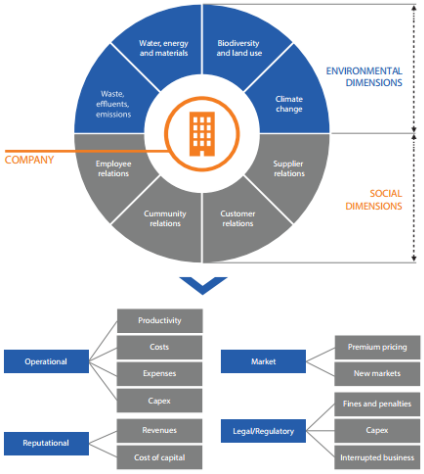
The cost of stricter environmental regulation on Brazilian fuel retail: Liquid fuels production and trading is an important economic activity in Brazil, representing 5.6% of Brazil's GDP (2014).[75] Service stations are one of the most important agents of the sector. Estimates indicate that there are 40,632 service stations in the country (September 2015) and almost 40% of them do not have exclusivity contracts with any fuel distributor.[76] The National Agency for Oil, Gas and Biofuels (ANP)

is responsible for the supervision of these stations. In 2014, the Agency performed 11,973 inspections and 24% resulted in penalties, mainly due to improper infrastructure and irregular documentation.

Brazilian environmental laws determine that service stations must have environmental licenses,[77] primarily due to the risk of soil contamination. However, this regulation has been under-enforced by the responsible environmental agencies due to their limited resources and reach. In August 2015, ANP declared that it would also demand environmental licenses from service stations in its inspections, enhancing environmental law enforcement and aiming to identify and avoid cases of soil contamination.

Since many of the service stations in the country were built during the 1970's, when the technology and awareness to avoid soil contamination was limited, and the environmental licensing law for them came into force only in 2000, it is expected that 20%-30% of these stations have already contaminated the soil.[78] A study estimates that 75% of the contamination of underground water derives from service stations.[79]

Integrating environmental regulations considerations into fixed income analysis:



IAM's ESG Integration Method in Fixed Income estimates the impact of these issues directly into companies' cash flows, which allows us to analyze how they affect traditional credit / solvency ratios such as debt/equity, net debt/EBITDA or EBITDA/interest expenses.

We monitor eight cross-sector social and environmental dimensions, allowing our team to identify ESG risks and opportunities, such as water stress, community unrest or customer rights before they materialize in balance sheets.

We understand that these risks/opportunities can materialize in different forms, like unplanned capex, operational restrictions, opening of new markets and reputational impacts. For this reason, we track the ESG trends in various economic sectors and create scenarios for how different issues will evolve and how companies respond.

The impact of soil contamination in fuel retailers (service stations) in Brazil: We first estimated the impact of soil contamination by service stations (included under the "Waste, effluents and emissions" dimension of our ESG radar) during the analysis of the fuel distribution and retail sector back in 2014. At the time, we calculated the fines and decontamination costs and how they affect the debt ratios of these firms'. To explore the potential impact of ANP's new regulation, we updated the model to consider stronger enforcement towards environmental licenses and best practices to avoid/mitigate soil contamination in the cash flow of the firms for the next 5 years.[80]

Assumptions: The assumptions we used to estimate the financial impact of the original and updated model are the following:

- BRL 10,000 penalty for service stations without environmental licenses. Even though environmental licenses will be necessary for service stations to operate, Fecombustíveis

highlighted that most will not be able to meet the new standards in the short term. It is also reasonable to assume that the entities responsible for issuing the licenses will have limited capacity to deal with the considerable increase in demand. Therefore, in the short/medium term, it is expected that these service stations will be financially penalized instead of being unable to operate. The estimated value of the penalty is based on a large number of past cases.

- BRL 250,000 for decontamination and adaptation costs for the new regulation. ANP and Fecombustíveis estimated these costs.
- 40% of each company's service stations do not have environmental licenses and 30% will have to deal with decontamination costs. These values are based on the national average, as indicated before, because neither company disclosed this information nor responded to the inquiries.
- Growth in net debt and EBITDA based on CAPEX and development expectations for the sector, respectively. These factors are considered in all scenarios described below.

The following tables include three different scenarios:

- **Ex-ESG analysis.** Environmental licensing enforcement is not considered, only growth in net debt and EBITDA;
- **ESG Baseline.** The financial impact considering the enforcement of environmental licensing as in 2014;
- **ESG Stress.** The total financial impact of ANP's new regulation, considering all service stations without licenses and with soil contamination will demand investment.

It is important to highlight that the stress scenario (3) assumes all costs will happen in each specific year, and not cumulatively.

- Company 1

Debt indicators (scenarios)	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5
Net debt / EBITDA (1)	**3.98**	4.01	4.04	4.08	4.11	4.14
Net debt / EBITDA (2)		4.47	4.49	4.51	4.54	4.56
Net debt / EBITDA (3)		5.56	5.55	5.53	5.52	5.51
EBITDA / Interest expenses (1)	**1.51**	1.50	1.49	1.48	1.46	1.45
EBITDA / Interest expenses (2)		1.35	1.34	1.33	1.33	1.32
EBITDA / Interest expenses (3)		1.08	1.08	1.09	1.09	1.09

- Company 2

Debt indicators (scenarios)	Baseline Year	Year 1	Year 2	Year 3	Year 4	Year 5
Net debt / EBITDA (1)	**1.75**	1.85	1.96	2.08	2.21	2.34
Net debt / EBITDA (2)		1.98	2.09	2.21	2.34	2.48
Net debt / EBITDA (3)		2.23	2.35	2.48	2.62	2.76
EBITDA / Interest expenses (1)	**3.91**	3.69	3.48	3.28	3.10	2.92
EBITDA / Interest expenses (2)		3.46	3.27	3.09	2.92	2.76
EBITDA / Interest expenses (3)		3.06	2.90	2.76	2.61	2.48

Results and Conclusion: In short, ANP's new resolution has the potential to affect companies' cash flow significantly and, thus, their credit ratios. Decontamination costs and investments in infrastructure, in addition to the value of penalties, can represent relevant CAPEX or unexpected expenses, which might boost debt and interest expenses. Given these costs are relatively fixed for all companies in the sector, those with higher liquidity and better debt/equity ratios may be better prepared for the worst-case scenario.

Company 1 relies significantly more on debt to finance its operations. It has also demonstrated a lower level of management regarding soil contamination (awareness, initiatives and technology) than Company 2. In this sense, our stress scenario indicates that Company 1 could get into highly uncomfortable credit ratios and risk of breaking covenants with debt-holders.

A bond investment in company 1 or 2 would need to be backed by a strong due diligence scrutinizing environmental licenses, along with company engagement to obtain an adequate action plan for mitigating such risks. The investment decision is a responsibility of the Credit Committee, which takes into account the ESG analyst analysis on the subject. To avoid higher impacts, companies will have to invest in the adaptation of the older service stations in their portfolio, whilst considering best practices and technologies in the development of new ones. During the acquisition of "*non-branded*" stations, such issues must also be considered.

Source: Itau Asset Management[81]

Passive investing strategies

Index tracking funds, ETFs and smart beta funds have become increasingly popular, offering reduced running costs and simplicity, among other benefits. Passive institutional investors may still be active owners on green issues through their company engagement and voting activities.[82] Low carbon index strategies have also been developed, combining low tracking error and low carbon exposure. FRR (France), ERAFP (France) and AP4 (Sweden) are among funds investing in the MSCI Low Carbon Leaders Indices, developed with Amundi (France). Through these, investors are hedging climate risk while obtaining the same returns as on a benchmark index.[83]

2.1.2. Integrated analysis of green risks is underway

Integrated analysis involves taking account of ESG data and information in investment research and decision-making, with decisions driven by the financial implications of ESG issues. In an Accenture study,[84] 78% of investors already see sustainability as a differentiator in determining industry leaders. The case study below highlights the valuable practices underway in this area, illustrating how Allianz SE is integrating green risks into investment analysis in equity portfolios.

Investor case study: assessing carbon risks in equity portfolios:[85]

Background: Allianz Global Investors – a subsidiary of Allianz SE – is a global asset manager that provides a wide range of actively managed investment strategies and solutions across the risk / return spectrum. Our investment teams manage EUR446 billion[86]* of assets on behalf of clients across equity, fixed income, alternative and multi-asset strategies. Allianz Climate Solutions GmbH is the competence centre on climate change of Allianz SE. This case study highlights how carbon and energy risks can be leveraged for stock-picking in key sectors, tested for cement and dairy, to assess and price in potential risks – before and after company response to these risks – and inform company engagement.

Pilot study: carbon and energy risks in cement and dairy industries: In 2014, Allianz Global Investors and Alliance Climate Solutions in partnership with The CO-Firm and WWF Germany ran a pilot to model carbon and energy risks for stock-picking. The pilot focused on the cement and dairy industries in the US (California), China (Guangdong Province) and Germany. The aim was to assess the financial impact associated with carbon and energy regulation – as the most material short-term risk from scaled-up climate policy – on corporate return. The model develops plausible development paths for that regulation, resulting in scenarios that can be used for stress-testing purposes. This is not captured by conventional financial analysis.

Study findings: To a large extent the margin impact is a function of a company's ability to adjust operations, carbon exposures and business models to a changing regulatory environment. As might be expected, the pilot study found that margin effects are strongest in the energy-intensive industries and in particular in an environment where costs pass-through power is limited. In a scenario based on politically plausible increases in carbon and energy prices over the next five years, regulatory costs might lower current margins by more than 70 % (see table below – in the case of Germany, 12.4 EUR/t of cement).

If a cement company anticipates regulatory changes and takes operational measures by e.g. investing in waste heat recovery (a key technical improvement lever among a sample of measures), the negative margin impact is reduced and can even turn into a gain. It allows to improve margins in the selected scenario by 4.7 EUR/t cement (Germany), 1.6 EUR/t cement (USA, California) and 2.1 EUR/t cement (China, Guangdong) respectively (see table). This results in a margin gain of 1.1 EUR/t cement in China, Guangdong.

Enhancing financial analysis with carbon risk measurements – cement sector pilot

Region [EUR/t cement]	Margin as of today	Margin at risk	Margin improvement potential
Germany	17.3	-12.4	4.7
USA - California	20.3	-3.2	1.6
China - Guangdong	12.0	-1.0	2.1

Implications for portfolio analysis: In short, this approach takes a bottom-up view on risk, allowing investors to identify the factors that differentiate future corporate performance (such as alternative technological or business strategies) and thus make better investment decisions. This differentiation capability will allow investors to price in potential risks associated with the use of energy and GHG emissions, engage industries and companies on mitigating strategies (e.g. upgrading technologies), and support stock-picking.

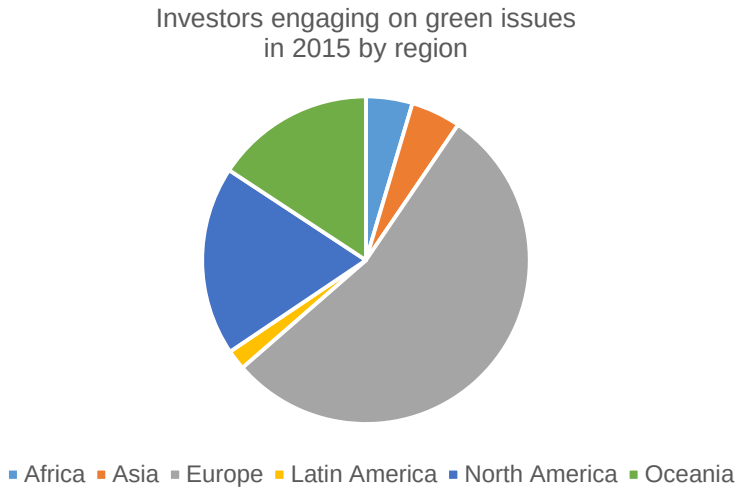
2.1.3. Investor Engagement

Active ownership refers to investors using their formal rights – proxy voting and filing shareholder resolutions – and their position as an investor to influence the activity or behaviour of companies or other entities.

In 2015, over 305 investors engaged with companies on green issues, comprising 65% investment managers and 35% asset owners.[87] The highest investor engagement activity was in Europe and North America. Investors are engaging on a broad range of green issues. The most common green issues in 2015 were fracking, palm oil, water risk and biodiversity. Other green issues included toxic chemicals, damming of rivers and the impact of micro plastics on marine environments.[88] As an indicator of 2016 investor priorities, collaborative investor engagement with companies is underway not only on climate change but also on:

- **Palm oil:** 39 investors are engaging with palm oil buyers and growers to improve transparency of certified palm oil, encourage yield gains to minimise the need for further land-use and policies prohibiting deforestation.
- **Water risks:** 41 investors are engaging on agricultural supply chain water risk in the food, beverage, food retail and apparel sectors to encourage strong risk management of water-related risks.[89]

Figure 12 Investor engagement with companies on green issues



Source: PRI 2015 Reporting Framework data

Figure 13: Water and investor engagement with companies

To inform investor engagement with companies on water, PRI, the World Wildlife Fund (WWF) and PwC Germany collaborated on an in-depth research report.

The research found a strong correlation between individual company revenue and estimated water consumption in water scarce regions, and large differences between the average and median water consumption of companies researched. Companies in the food and soft drink, agricultural products and food retail sectors had greater supply chain water footprints than apparel, brewing, distilling and wine-producing companies. Overall performance in risk management by companies was poor.

The research findings have been used to inform investor engagement with high-risk companies, to encourage stronger transparency and risk management practices on water.

Source: PRI, WWF and PwC Germany, 2014[90]

2.1.4. Building capacity

Across the G20, investors are preparing for green finance through greater information-sharing and a proliferation of “how to” tools, indicating that mainstreaming of green is underway. This includes investor initiatives on long-term investing, with the Canada Pension Plan Investment Board, having taken a leading role in encouraging investment strategies aimed at maximizing long-term results.[91]

- UNEP FI has undertaken significant work through The Natural Capital Declaration Initiative and to assist investors in understand carbon asset risk[92] and develop appropriate metrics. This includes assisting investors in distinguishing between climate risk assessment focused on identifying winners and losers, and climate performance – which focuses on how investors contribute to a low carbon transition.[93]

- The PRI Academy[94] provides online education on green issues and responsible investment. PRI's *Developing an Asset Owner Climate Change Strategy* provides a new framework for asset owners to develop climate change strategies across their portfolios.[95] *How Asset Owners can drive responsible investment*, demonstrates how asset owners can contribute to the implementation of responsible investment at scale and depth that has a multiplier effect through the investment chain. It also offers solutions to the barriers that asset owners face when implementing responsible investment, in particular, implementing responsible investment beliefs, strategy and mandates.[96]

- The *Long-Term Portfolio Guide*, provides practical guidance on how investors can reorient portfolios to emphasise long-term value creation, with better outcomes for portfolios, companies and broader stakeholders. This was developed by *The Focusing Capital on the Long-term Initiative* and involved nine investors representing $6 trillion in assets under management including CPPIB, Blackrock and Washington State Investment Board. The guide recommends focusing on five key areas: investment beliefs, risk appetite statement, benchmarking process, evaluations, incentives and investment mandates.[97]

Figure 14 Investor engagement on natural capital

The Natural Capital Declaration Initiative seeks to assist the finance sector in integrating natural capital including water and soft commodities into loans, fixed income, accounting and insurance products, as well as in accounting, disclosure and reporting frameworks. 29 financial institutions have signed the Natural Capital Declaration re-affirming the importance of natural capital in maintaining a sustainable global economy. Natural capital refers to soil, air, water, flora and fauna, and the ecosystem services resulting from them. Investors that have signed the Natural Capital Declaration include Caisse des Depots (France), Infraprev (Brazil) and VicSuper (Australia).

The initiative has developed a new water risk valuation tool with Bloomberg LP, enabling analysts to evaluate how water risk factors can be incorporated into valuations using a DCF model.

Bloomberg Water Risk Valuation Tool and White Paper

Integrating water stress into equity valuations in the mining sector

Source: The Natural Capital Initiative[98]

Figure 15: Investor engagement and professional training

The PRI Academy
Created in response to investor demand, the PRI Academy provides web-based training on responsible investment for financial analysts, trustees and other investment professionals. The PRI Academy is CFA-approved and includes an *Enhanced Financial Analysis* course for incorporation of ESG issues into modelling and valuation.

Source: PRI Academy[99]

2.2. Mobilising green investment

2.2.1. Small, but growing

In the absence of a single global tracker for green finance flows, several market-driven initiatives exist. These indicate small but growing investor allocations to green investment. A subset of this is climate finance, available at http://climatefundingsnapshot.com/

- **A range of green investments:** The Low Carbon Investment Registry[100], a global public online database created by The Global Investor Coalition on Climate Change,[101] aims to capture and share low carbon and emissions reducing investment examples, with over US$50 billion in entries. Investments registered include not only wind, solar and hydro, but also green buildings, energy efficiency, national rail and freight systems, and forestry. The registry was launched in 2015 and investors are still making entries.

- **Growing investment in clean energy:** this stands at US$329 billion globally, with record-breaking growth in 2015, particularly in solar.[102] PV new build is forecast to be 80 GW globally by 2018, with India bringing on new projects in 2017 and the ambition of 100 GW solar power capacity by 2022.[103] Of the top 15 investing countries in clean energy, 13 are G20 countries. In terms of regions, year-on-year growth in investment in clean energy is evident, particularly in China, South Africa and Mexico. In 2016, China's Goldwind became the world's largest onshore wind turbine manufacturer.

- **A rapidly growing green bonds market:** with significant growth in 2015 including US$41.8 billion issued in labelled green bonds. 2015 saw inaugural green bonds, green bond framework and policy development in China and India involving Goldwind, Agricultural Bank of China, Yes Bank, CLP, Export-Import Bank of India, and IDBI.[104] Green bond proceeds included renewable energy (45.8%), energy efficiency (19.6%), low carbon transport (13.4%) and sustainable water (9.3%), waste and pollution (5.6%), climate adaptation (4.1%), agriculture and forestry (2.2%).

2.2.2. The new momentum for green investment: the Paris Agreement

Within one week of The Paris Agreement, over 100 investors signed *The Paris Pledge,* publicly declaring their support for implementation of the Paris Agreement. Mainstream investors from nine G20 countries made commitments for COP 21 going beyond renewable energy and covering areas such as green bonds and low carbon infrastructure.

Figure 16: G20 investor leadership on green finance:

G20 country	Investor	Action announced during/ before Paris COP 21, December 2015	Total assets under management (US$)
France	Caisse des dépôts et consignations	€55 billion to be decarbonized by 20% by 2020. No shares in companies with over 20% in coal.	$402.7 billion
Netherlands	ABP	€29 billion allocated to investments into a "clean world," €4 billion into renewable energy by 2020, carbon budget for equities (€100 billion) and carbon foot printing.	$449.7 billion
US	New York State Comptrollers Office	$5 billion allocated to sustainable investing strategies, of which US$2 billion for a new low carbon index that will reduce fund's carbon footprint, with tracking error of 25 basis points. Pure coal will be divested. Carbon footprint of fund will be 70% below that of FTSERussell.	$146.5 billion
Germany	Allianz SE	€4 billion allocated to renewable energy, phase out of coal investments, ESG incorporation	$2,528 billion
France	AXA Group	€3 billion allocated to green bonds, divesting from €0.5 billion from coal, ESG incorporation, active ownership and carbon footprinting.	$1,674.8 billion
South Africa	Old Mutual plc	Climate change position including carbon footprinting for portfolios.	$529.3 billion
United Kingdom	Aviva Investors	Climate change strategy including low carbon infrastructure, incorporation of ESG, active ownership, divestment and carbon footprinting.	$406.6 billion

Source: PRI, 2016

Figure 17: Global investor initiatives on green finance

Global initiative	Investors involved	Objective
Montreal Carbon Pledge	120 investors with US$10 trillion convened by PRI. Investors include Old Mutual plc, HSBC Global Asset Management and CalPERS.	Investor commitment to undertake and disclose portfolio carbon footprint.[105]
Portfolio Decarbonization Coalition – global initiative	25 investors convened with decarbonization goal of $600 billion in AUM. Co-founded by UNEP FI. PRI is a supporting partner. Investors include AP4, Amundi, CDC and BNP Paribas.	Systematic effort to align investment portfolios with a low carbon economy. Includes but not limited to efforts to reduce the carbon footprint of investment portfolios, to increase investment in areas such as renewable energy, to withdraw capital from high energy consumption activities and to encourage companies and other entities to reduce their emissions and support the transition to a low carbon economy.[106]

Source: Portfolio Decarbonization Coalition[107] and Montreal Carbon Pledge

3. Greening market and policy frameworks for institutional investment

Investors are already making interventions on green issues for better functioning markets and recognise that wider market shifts are needed to accelerate investor action. *The Case for Investor Engagement on Public Policy*, highlights the growing importance of public policy to long-term investors and frameworks for this.[108] The CRISA code in South Africa, initiated by investors, illustrates how investors are increasingly working with policy makers.

Reflecting investors' needs for clear incentives and policy stability, over 400 investors representing US$24 trillion have already called for governments to strengthen regulatory support for energy efficiency and renewable energy, where this is needed to facilitate deployment, and support innovation in and deployment of low carbon technologies, including financing clean energy research and development.[109]

Figure 18 Investor engagement with policy makers – South Africa

CRISA, South Africa: In 2009 and 2010, institutional investors met to discuss the implementation of the King Code in South Africa. They were concerned that investors would not monitor the Code's "comply or explain" provisions. They encouraged the South African Institute of Directors to lead the development of the Code for Responsible Investment in South Africa, CRISA. A draft was published in 2011 and came into effect in 2012. CRISA provides guidance on how institutional investors should carry out their investment activities and use their influence to promote good governance. Since CRISA was launched, there has been industry support and a significant increase in the level of collaboration on company engagement. Investors attribute this to an inclusive policy process.

Source: The Case for Investor Engagement on Policy[110]

3.1. Investors stimulating market action and company disclosure

- **Stock exchanges:** Stock exchanges play a critical role in raising capital for green flows through new issues, IPOs and green bonds. SRI indexes for companies with strong green practices can help raise the bar. Green finance examples across the G20 include:
    - LSE: designated green bond segment on its London market.
    - HKEX: introduced "comply or explain" environmental reporting from 2017.
    - JSE: SRI index for South African companies with green criteria including climate change, air and water pollution, waste and water consumption.
    - The World Federation of Exchanges' (WFE): WFE's Sustainability Working Group published *ESG Recommendation, Guidance and Metrics* in 2015.[111]

Investors are actively encouraging action on green issues by stock exchanges. 18 stock exchanges within the G20 are already part of the Sustainable Stock Exchanges Initiative.[112] This is a collaborative initiative for enhancing corporate transparency on ESG issues and encouraging sustainable investment. The *SSEI Model Guidance*[113] encourages listed companies to provide strong disclosure on material environmental factors to investors.

In 2009, PRI launched investor collaboration with stock exchanges, led by Aviva Investors (UK) now known as the *Sustainable Stock Exchanges' Investor Working Group*, comprising 43 investors

representing US$7.6 trillion in assets under management. In 2015, Allianz GI, one of the investor working group members, led a coalition of 100 investors representing US$10 trillion to encourage 77 stock exchanges worldwide to produce or update ESG guidance for issuers by the end of 2016. Already, 20 exchanges have agreed to do this.

- **Credit rating agencies:** Investors are actively encouraging integration of ESG within credit ratings, with 100 investors representing US$10 trillion in assets reporting their support for this this.[114] In 2016, investors and credit rating agencies are agreeing a joint *Statement on ESG in Credit Ratings*. This statement specifically covers among other areas:

    - Formal integration of ESG factors into credit ratings, with the aim of enhancing systematic and transparent consideration of ESG factors in the assessment of creditworthiness;

    - Evaluating the extent to which E (green) factors are credit-relevant across different issuer types in the corporate sectors; and

    - Transparent publication on how such factors are considered in credit ratings.

Figure 19: Statement on ESG in credit ratings

> "In order to more fully address major market and idiosyncratic risk in debt capital markets, underwriters, credit rating agencies and investors should consider the potential financial materiality of ESG factors in a strategic and systematic way. Transparency on which ESG factors are considered, how these are integrated, and the extent to which they are deemed material in credit assessments will enable better alignment of key stakeholders. In doing this they should recognise that credit ratings reflect exclusively an assessment of an issuer's creditworthiness."

Source: PRI, 2016[115]

3.2. Investors working with policymakers

Investors are already collaborating with policy makers to improve company information for risk analysis. An example of this is the Financial Stability Board Task Force on Climate-related Financial Disclosures, whose recommendations are due by 2017. The industry-led taskforce aims to develop voluntary, consistent climate-related financial risk disclosures for use by companies in providing information to investors, lenders, insurers and other stakeholders.[116]

Members of the taskforce act in a personal capacity, with their backgrounds including AXA Group, Blackrock, Generation Investment Management, Industrial and Commercial Bank of China, the Singapore Exchange, Storebrand and the Principles for Responsible Investment.[117]

In terms of current listed company practices in disclosure, both mandatory and voluntary green reporting initiatives already exist in most G20 countries, with mandatory initiatives in Canada, Turkey and Russia.

Examples of recent investor engagement with policy makers includes the Institutional Investor Group on Climate Change (IIGCC)'s engagement on how the EU's Investment Plan for Europe can unlock private sector capital to achieve €315 billion infrastructure investment over the next three years.[118]

3.2.1. Improving investor governance: fiduciary duty, disclosure and stewardship codes

Fiduciary duties exist to ensure that those who manage other people's money act in the interests of beneficiaries, rather than servicing their own interests. The most important of these duties are:

- **Loyalty:** Fiduciaries should act in good faith in the interests of their beneficiaries, impartially balance the conflicting interests of different beneficiaries, avoid conflicts of interest and not act for the benefit of themselves or a third party.
- **Prudence:** Fiduciaries should act with due care, skill and diligence, investing as an "ordinary prudent person" would do.

Legal context for fiduciary duty: Investors have varying degrees of discretion as to how they invest the funds they control. Within the discretion left to investors, certain legal rules define their ability to integrate green risks into decision-making. In both common law (e.g. Australia, Canada, South Africa, the UK and the US) and civil law jurisdictions (e.g. Brazil, Germany and Japan), the rules that affect investment decision-making take the form of both specific laws and general duties that must be fulfilled.

Generally, the rules do not prescribe how investors should go about integrating ESG risks in their investment practices and processes, or the timeframe over which investors define their investment goals. In most cases, it is left to investors to determine the approach that will enable them to meet their legal obligations in the particular circumstances. When evaluating whether or not an institutional investor has delivered on its fiduciary duties, courts will look at the evaluation and integration process of ESG issues into the investment decision-making.

Over the past decade, there has been relatively little change in law relating to fiduciary duty. However, throughout the G20, there has been an increase in ESG disclosure requirements for investors, and in the use of soft law instruments such as stewardship codes that encourage investors to engage with the companies in which they are invested. Stewardship codes encouraging active ownership already exist in eight G20 countries: Japan, Germany, United Kingdom, Italy, South Korea, Indonesia, France, Belgium, the Netherlands and Portugal.

Figure 20: Fiduciary Duty in the 21st Century

Following on from a 2005 report on fiduciary duty commissioned by UNEP FI from Freshfields Bruckhaus Deringer, Fiduciary Duty in the 21st Century, clarifies that failing to consider long-term investment value drivers including ESG issues in investment practice is a failure of fiduciary duty.

The report, published in 2015, covered eight countries: Australia, Brazil, Canada, Germany, Japan, South Africa, the UK and the USA.

It identifies that challenges today include perceptions about fiduciary duty and responsible investment, a lack of clarity on prevailing definitions, lack of transparency, inconsistency in corporate reporting and weaknesses in implementation of legislation and industry codes.

The report's recommendations include that policy makers and regulators should:

- Clarify that fiduciary duty requires investors to take account of ESG issues in their investment processes, active ownership and public policy engagement

- Strengthen implementation of legislation and codes clarifying these refer to ESG issues, and

require investor transparency on ESG integration

- Support efforts to harmonise legislation and policy instruments on responsible investment globally

From 2016, the report has been developed into a 3-year project by UNEP FI, PRI and The Generational Foundation to engage investors and policy makers to harmonise a global understanding of fiduciary duty. The project will include legal reviews of Asian markets and encourage a new international statement on fiduciary duty.

Source: PRI 2016[119]

3.2.2. Policy frameworks for green investment

The G20 Energy Efficiency Statement provides a strong example of investors calling for supportive policy, while demonstrating investors will also take action. Convened by UNEP FI, the statement is supported by 100 banks and investors representing approximately $4 trillion. Investors have also created a new Green Infrastructure Coalition for closer collaboration with governments to scale-up infrastructure investment. In certain G20 countries such as France, policy makers have already supported evolution of SRI labels to assist investors in selecting green funds.

Figure 21: The G20 Energy Efficiency Statement

"As our contribution to the work of the G20 Energy Efficiency Finance Task Group, as managers and investors, we share a common understanding of the positive economic and societal benefits of energy efficiency. In order to ensure that our activities promote and support energy efficiency, and in consideration of our fiduciary responsibility: We recognize the need to fully embed energy efficiency into our investment process. We, the undersigned, undertake to:

1. Embed material energy efficiency considerations into the way in which we evaluate companies;

2. Include energy efficiency as an area of focus when we engage with companies;

3. Take into consideration energy efficiency performance, to the extent relevant to the proposal being considered, when we vote on shareholder proposals.

4. To the extent relevant, incorporate energy efficiency investment considerations when we select managers;

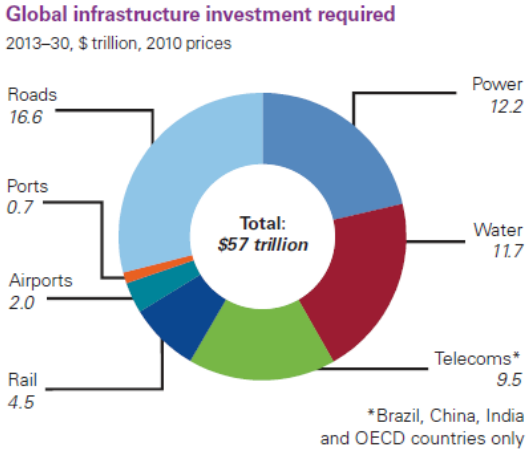
5. Assess our existing real estate assets and managers and monitor and report on their energy efficiency performance;

6. Seek appropriate opportunities to increase energy efficiency investments in our portfolios."

Source: The Energy Efficiency Finance Task Group (IPPEC) and UNEP FI, 2015[120]

Figure 22: Green infrastructure investment

A new *Green Infrastructure Coalition:* launched in 2015 seeks to increase the flow of institutional investor capital to green infrastructure investments by assisting investors in understanding the forward pipeline and addressing barriers to capital flows.[121]



Source: Unlocking Investment in Infrastructure, B20 Panel[122]

Source: Green Infrastructure Coalition, 2015[123]

4. Next steps: emerging policy options

Existing private sector initiatives are underway to mainstream green finance. The following would assist in building on these, accelerating the pace of scale-up and implementation of green finance by investors across the G20.

4.1. Strengthen demand for green investment

Options to strengthen institutional demand for green investment include:

- **Principles**: promote the increased adoption and implementation of good practice responsible investment and green finance principles by institutional investors across G20 countries, including public financial institutions (such as sovereign wealth funds).
    - Pros: global industry principles already exist and are being implemented through the Principles for Responsible Investment initiative.

      Cons: without strong implementation, accountability and investor capacity-building, principles could result in box-ticking.
    - **Definitions & standards:** develop a broad definition of green finance meaningful across G20 countries and internationally comparable green finance indicators. High quality definitions, indicators and standards would assist investors, although there is recognition of country-level nuances and investors caution against over-prescriptiveness. Policy makers could also encourage development of robust green standards for bonds, and ESG disclosure by listed companies and issuers through existing voluntary initiatives such as The Sustainable Stock Exchanges Initiative. This would assist investors in assessing whether potential investments meet their environmental requirements. Standards for green bonds are separately covered in the G20 Study on Green Finance workstream paper on Green Bonds.
    - Pros: a broad definition would provide clarity on purpose and a policy reference point for investors, while industry standards and strong disclosure would help ensure the credibility of green investment.
    - Cons: consensus across the G20 is required for a high-level definition, with flexibility for regional definitions. Time is needed for standards and good practice disclosure to evolve and be implemented. Care must be taken to ensure standards do not become a barrier for innovation or that they are over-prescriptive.
- **Policy frameworks:** Identify policy levers and incentives (e.g. tax incentives) for mobilising green finance across asset classes, while providing longer-term policy visibility and stability to encourage green investment flows. Policy frameworks need to focus on leveraging private investment, incuding for financing the implementation of The Paris Agreement and the Sustainable Development Goals. Research such as the OECD's mapping of channels to mobilise institutional investment[124] assist in building understanding of policy levers for scaling up green infrastructure, bonds, real estate, private equity and direct project investment. See the separate G20 Study on Green Finance paper by the OECD.

  Public pension funds can also signal government support for green finance through green investment practices and allocations to green investments, where this is aligned with

mandates. Caisse des dépôts et consignations (CDC), for example, already plays an important role in driving green finance in France.

  - Pros: policy levers can play a key role in facilitating green finance across the G20.
  - Cons: potential impacts on sectors not exposed to or involved in green finance.

- **Investor governance** – fiduciary duty, disclosure and stewardship codes: Encourage strong investor governance including on fiduciary duty and through encouraging stewardship codes, disclosure and implementation of responsible investment. Policy makers can encourage asset owners to be key drivers in green finance, through including responsible investment and ESG in investment beliefs, strategy and mandates.
  - Pros: improve investor governance through accelerating industry efforts.
  - Cons: adequate infrastructure needed to encourage better investor governance, including policy maker knowledge of existing industry practice.
- **Capacity:** build capacity for mainstreaming of green finance among investment professionals and policy makers within G20 countries. A G20 knowledge hub or centre of excellence providing responsible investment guidance, tools and networking in collaboration with existing professional bodies could operationalise this. Existing platforms such as the PRI and the Sustainable Banking Network could be expanded to assist but need to cover more countries, investors and banks. Capacity-building could also be expanded to include technical assistance for early-stage project developers and entrepreneurs, further detailed work to address currency risk and to align with other efforts such as the G8 Social Impact Investment Taskforce recommendations.[125] G20 countries could encourage large public and private pension funds to undertake professional training and become PRI signatories over time.
  - Pros: policy makers and investors better-equipped to implement green finance**.**
  - Cons: modest investment needed to build capacity, building on existing platforms.
- **Transparency:** Ensure effective transparency by asset owners and investment managers on how they are managing material environmental factors as part of wider strategies for responsible investment. This would assist beneficiaries and clients in making informed choices on investments, supporting strong demand for green finance.
  - Pros: transparency to beneficiaries and clients on green investing, and also to policy makers on implementation of green finance by investors.
  - Cons: potential reporting burden and presents challenges for smaller investors.

4.2. Expand supply

Options to expand the efficient supply of green assets include

- **Product innovation:** Facilitate the development of liquid markets for quality green assets, focusing on listed fixed income and equities (such as green infrastructure investment trusts). See the separate G20 Study on Green Finance Banks and Green Bonds workstream papers.

- Pros: Green bonds and equity vehicles will enable investors to scale up their allocations to green finance.
- Cons: Short-term investment needed to encourage development of green bonds and equity vehicles, including engagement with banks.

- **Market intermediaries:** Support effective integration of environmental factors by key intermediaries such as stock markets, credit rating agencies, sell-side equity research and investment consultants.
  - Pros: alignment of market intermediaries with green finance goals.
  - Cons: potential cost to changing current practices, with limited client recognition.
- **Risk mitigation:** Facilitate the development of risk mitigants to crowd-in private investment (e.g. credit enhancement and revenue guarantees), particularly for projects that are otherwise too risky, small or unprofitable for mainstream investors. Aggregation of assets can assist in attracting investors that find current investment opportunities are too small.
  - Pros: investments more feasible for mainstream institutional investors
  - Cons: not presently regular practice.
- **Data and risk analysis:** Strengthen ESG disclosure by listed companies and issuers. Encourage companies and investors to develop further risk analysis methodologies for green issues and to consider the recommendations of the FSB Taskforce on Climate-Related Financial Disclosure due in December 2016.
  - Pros: Stronger disclosure on green issues will assist investors in risk analysis and comparability. The FSB Taskforce recommendations will be globally applicable, accounting for diversity within the G20, providing greater clarity on company data and risk analysis needed.
  - Cons: initial time burden to improve data for users and to develop risk analysis methodologies further.
- **Investment Agreements, Policies and Regulations**: Incorporate material environmental factors in investment policies, regulations and agreements.
  - Pros: formal alignment of the investment chain with green finance goals.
  - Cons: compliance-driven approach may discourage innovation and leadership.

5. Questions for policymakers to consider

Investors welcome further dialogue with policy makers on the three questions below:

- How does the perspective of global investor practitioners on mainstreaming of green finance and barriers compare to that of policy makers? Where is there most convergence of views?
- How could the options outlined above assist in catalysing further global and country-level actions, to broaden and deepen investor action underway?
- What kind of future collaboration and co-ordination is needed between investors and policy makers to implement green finance?

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