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PENSION SYSTEM GREENING: MEASURING AND MONITORING

In completion of the Columbia SIPA capstone requirement

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Your willingness to participate in our research has furthered our understanding of how climate risk will impact the financial system and we are hopeful that it will advance future climate finance solutions.

Abstract

This report examines how pension systems are currently evolving and how they must continue to change in response to the most pressing environmental issues. The objective is to identify the main barriers that prevent pension assets from flowing into sustainable investment vehicles, whether these barriers arise from regulation or other incentives. Additionally, this report aims to make the business case to pension regulators and pension fund managers that climate risks and opportunities are financially material. The capstone team focused both on high income countries, given the significant absolute size of their pension assets, and low and middle income countries, given the considerable size of their pension assets relative to GDP.

This report consists of three parts. First, a pension climate risk heatmap that shows which countries' pension systems are most at risk from climate change. Second, a review of the regulatory landscape that shows which pension systems have the most comprehensive ESG regulation, and how that regulation compares to the level of climate risk that each country faces. Third, an analysis of a survey administered to pension supervisors that asks how regulators are approaching climate risk, and how the pension funds in their jurisdictions are responding.

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Executive Summary

1. The private sector and in particular pension funds can play a critical role in combating climate change. Two-thirds of the world facing water insecurity; sea level rise of up to 2 meters drowning Pacific islands; average temperatures reaching up to 30°C in malaria-prone East Africa. These exemplify the disasters that await the world without an effective market-based response to climate change. On one hand, intervention is necessary to bridge the financing gap of between \$1.6 trillion to \$3.8 trillion in mitigation costs and \$180 billion in adaptation costs to limit global temperature rise and ecosystem breakdown.¹ On the other hand, if the investor community does not act to finance mitigation, it could face a potential portfolio value loss of \$10.7 trillion triggered by the materialization of transition, physical and regulatory risks. Conversely, a 2C scenario is expected to yield \$2.1 trillion in global “green” profits.²

2. This report fills a gap in the literature on institutional investors and climate change by focusing on pension system greening and aims to provide data-driven recommendations to orient climate-aligned investment practices. To date, only a handful of reports have focused on the role of pension systems in green investing.³ In order to undertake a holistic analysis, this report consists of the following sections: an in-depth literature review outlining the need to green the pension system (Chapter 1), a review of national and international actions taken (Chapter 2), a climate risk exposure landscape based on quantitative analysis deriving country pension fund climate risk scores (Chapter 3), a complementary regulatory mapping and score that uses quantitative and qualitative approach (Chapter 4.1), a survey of pension regulators to identify how each supervisory authority is interpreting practices and standards on ESG integration in the pension industry (Chapter 4.2). The final section of the report (Chapter 5) summarizes the conclusions and key policy recommendations. In addition, this report relies on insights from a series of case studies we conducted, which profile several leading pension funds and their climate investment strategies (appendix 1).

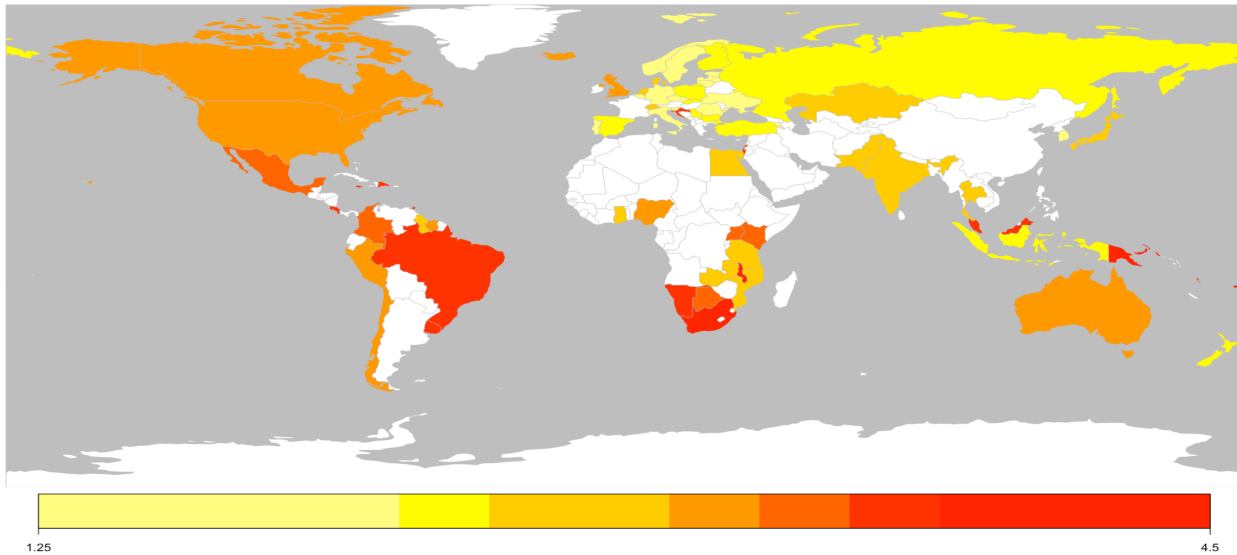
3. While all pension systems will face the material effects of climate change, some pension systems will be more vulnerable than others. To identify such risks and challenges of climate change, an in-depth data review and quantitative analysis was undertaken to create the *Pension Climate Risk Heatmap* for 71 countries. The derived pension climate risk measure was a composite measure based on data from the *Notre Dame Global Adaptation Index*, pension asset-to-GDP ratio, and percentage of pension assets held domestically. This approach allows us to estimate pension fund exposure to climate change risk, account for relative fund size and the level of asset diversification. Overall, our analysis indicates that pension funds are vulnerable to climate risk in varying degrees and forms.

¹ Barbara Buchner et al., “Global Landscape of Climate Finance 2019” (Climate Policy Initiative, November 2019), <https://climatepolicyinitiative.org/wp-content/uploads/2019/11/2019-Global-Landscape-of-Climate-Finance.pdf>.

² Beate Antonich, “Institutional Finance Update: Investors’ Decisions Impact Climate Change, and Climate Risks Impact Their Portfolios,” May 30, 2019, <http://sdg.iisd.org/news/institutional-finance-update-investors-decisions-impact-climate-change-and-climate-risks-impact-their-portfolios/>.

³ See (ShareAction 2018) and (OECD 2011).

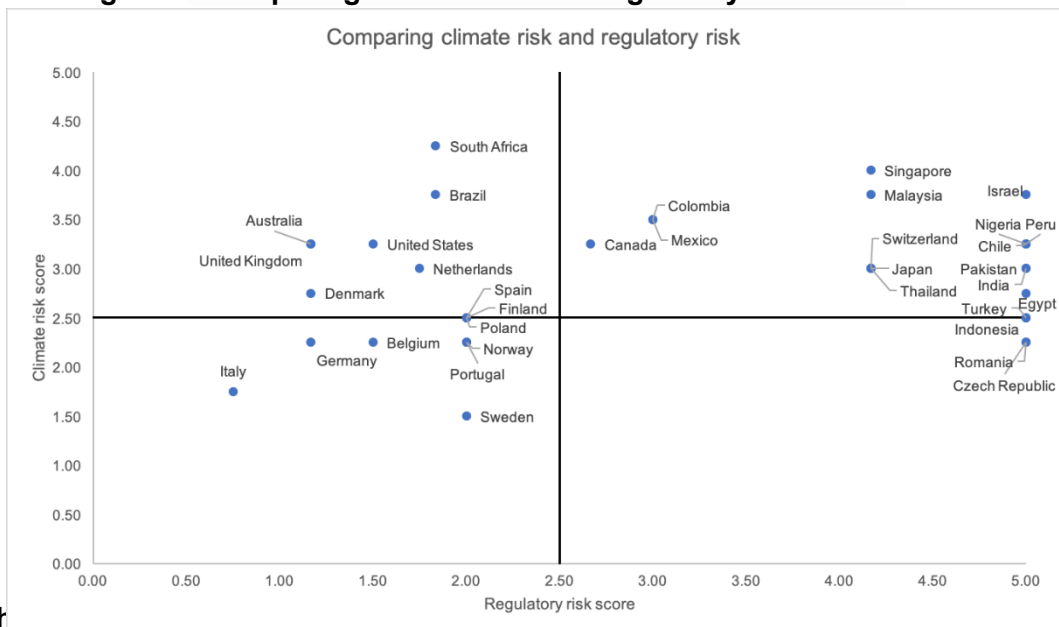
Figure 1: Country Pension Climate Risk Heatmap



4. An important counterpart to the *Pension Climate Risk Heatmap* is the **regulatory environment in which pension funds operate**. Using an in-depth quantitative and qualitative approach, ESG pension regulations of 50 countries were mapped and scored the aim of outlining potential regulatory enablers of sustainable investment. This review was complemented by a survey administered to members of the International Organisation of Pension Supervisors (IOPS), which provided further details on their ESG regulatory approach.

5. Comparing these regulatory scores with the pension climate risk score allowed for the **identification of four key country groups combining exposure to climate change and level of ESG-related regulatory alignment**. These comprise of pension systems with low climate vulnerability and low regulatory risk, those with low climate vulnerability but medium to high regulatory risk, countries with high climate vulnerability and low regulatory risk, and finally those with high climate vulnerability and medium to high regulatory risk.

Figure 2: Comparing climate risk and regulatory risk scores



6. The... in the low-

carbon climate resilient pathway. In the context of rising risks and opportunities posed by climate change, pension funds have to reinvent themselves to comply with their global presence and a definition of fiduciary duty aligned with today's challenges. Based on the analysis undertaken, our recommendations for regulators and pension funds alike are to:

- **Adopt a holistic definition of fiduciary duty, fully aligned with today's challenges.** *Revisit pension funds' definition of fiduciary duty, in line with financial, environmental, social and good governance imperatives, and adapt their mandate and investment-practices consequently.*
- **Build ESG literacy and awareness in-house.** *Offer and promote educational tools and incentives to develop a robust internal expertise on climate and other ESG-related considerations.*
- **Adopt climate-friendly and climate-hedging investment practices.** *Incorporate green and sustainability carve outs in the fund's portfolio in alignment with clearly defined goals and KPIs.*
- **Prioritize engagement.** *Engaging with the pension fund's portfolio holdings must be a priority to effectively address risks and align with best regulatory and investment practices. Pension funds have to put engagement at the center of their practices: allocate resources, push for regulatory and target compliance, and take investment decisions based on the results of engagement.*
- **Share and adopt best practices.** *Take a stronger and common stance on sustainable finance practices, including ESG disclosure and reporting, and the regulatory framework led by IOPS and supported by a global coalition of pension funds.*

1. Literature Review

The World Economic Forum estimates that approximately \$44 trillion of economic value generation is moderately or highly dependent on nature and its services.⁴ To prevent complete ecosystem breakdown, the world must limit global temperature rise to 1.5°C. Reaching this scenario is estimated to require between \$1.6 trillion to \$3.8 trillion in mitigation costs and \$180 billion in adaptation costs. In 2018, climate finance flows fell far below that number at \$542 billion, 93 percent of which went to mitigation activities and five percent to adaptation activities.⁵ Institutional investors can and should be the primary actors to finance such a response. Their financial might is significant, with total assets under management amounting to approximately \$84 trillion.⁶ Moreover, recent reports show that mitigation and adaptation actions would have a net positive economic impact. If the investor community does not act to finance mitigation, it could face a potential portfolio value loss of \$10.7 trillion. Conversely, a 2°C scenario is expected to yield \$2.1 trillion in global “green” profits.⁷

In practice, though, institutional investors have delayed greening their investments. Less than one percent of global institutional investors’ holdings are in low-carbon assets, and they accounted for just 0.2 percent of total climate finance flows in 2016.⁸ Approximately seven percent of their equity portfolio remains exposed to the fossil fuel industry, and broader exposure to climate-policy-relevant sectors reaches roughly 45 percent.⁹ As such, the academic and institutional literature often calls the investor community to action.

This report adopts the Principles for Responsible Investment (PRI) definition of responsible investment as “a strategy and practice to incorporate environmental, social, and governance (ESG) factors in investment decision and active ownership”.¹⁰ Academic literature focuses on four main themes: risk, disclosure, fiduciary duty, and shareholder engagement. Recent works on climate risk suggest that it is a long-run source of financial risk, one that is currently mispriced in financial markets. This body of literature highlights institutional investors’ current perceptions of climate risks and identifies several types of risk: physical risk, transition risk, and liability risk.¹¹ The debate on climate-related disclosure centers on the effectiveness of mandatory versus voluntary disclosures, the content of the disclosures, and their ultimate effect on the climate crisis.¹² Specifically, some scholars question whether disclosure is bound to remove

⁴ World Economic Forum, “Nature Risk Rising: Why the Crisis Engulfing Nature Matters for Business and the Economy.”

⁵ Buchner et al., “Global Landscape of Climate Finance 2019.”

⁶ Dirk Röttgers, Aayush Tandon, and Christopher Kaminker, “OECD Progress Update on Approaches to Mobilising Institutional Investment for Sustainable Infrastructure: Background Paper to the G20 Sustainable Finance Study Group,” Environmental Working Paper (OECD, November 21, 2018), http://unepinquiry.org/wp-content/uploads/2018/11/OECD_Progress_Update_On_Approaches_to_Mobilising_Institutional_Investment_for_Sustainable_Infrastructure.pdf; Christopher Kaminker and Fiona Stewart, “The Role of Institutional Investors in Financing Clean Energy,” OECD Working Papers on Finance, Insurance and Private Pensions (OECD, September 24, 2012), <https://doi.org/10.1787/5k9312v2116f-en>.

⁷ Antonich, “Institutional Finance Update.”

⁸ B.K. Buchner et al., “Global Landscape of Climate Finance 2017” (Climate Policy Initiative, 2017), <https://climatepolicyinitiative.org/wp-content/uploads/2017/10/2017-Global-Landscape-of-Climate-Finance.pdf>; G20, “G20 Green Finance Synthesis Report” (G20 Green Finance Study Group, July 15, 2016), 20, http://unepinquiry.org/wp-content/uploads/2016/09/Synthesis_Report_Full_EN.pdf.

⁹ Stefano Battiston et al., “A Climate Stress-Test of the Financial System,” *Nature Climate Change* 7, no. 4 (April 2017): 283–88, <https://doi.org/10.1038/nclimate3255>.

¹⁰ “What Is Responsible Investment?,” PRI, 2019, <https://www.unpri.org/pri/an-introduction-to-responsible-investment/what-is-responsible-investment>.

¹¹ Philipp Krueger, Zacharias Sautner, and Laura T. Starks, “The Importance of Climate Risks for Institutional Investors,” SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, November 11, 2019), <https://papers.ssrn.com/abstract=3235190>; NGFS Secretariat, “A Call for Action: Climate Change as a Source of Financial Risk” (Network for Greening the Financial System, April 2019), https://www.banque-france.fr/sites/default/files/media/2019/04/17/ngfs_first_comprehensive_report_-_17042019_0.pdf.

¹² Rüdiger Hahn, Daniel Reimsbach, and Frank Schiemann, “Organizations, Climate Change, and Transparency: Reviewing the Literature on Carbon Disclosure,” *Organization & Environment* 28, no. 1 (March 1, 2015): 80–102, <https://doi.org/10.1177/1086026615575542>.

a variety of barriers, notably agency issues and short-termism, currently impeding the spread of green finance.¹³

Fiduciary Duty in the 21st Century, a joint initiative of the PRI, Generation Foundation, and the UN Environment Program, aims to outline how traditional concepts of loyalty and prudence translate into modern fiduciary duty. Their seminal publication argues that modern fiduciary duties of investors include:

- accounting for financially material ESG factors;
- incorporating stakeholder preferences into decisions;
- supporting the stability and resilience of the financial system;
- disclosing investment practices; and,
- practicing active ownership.¹⁴

In particular, shareholder engagement is seen as the cornerstone of sustainable investing. Where literature previously focused on the more traditional hedge fund activism which sought to advance shareholder interests, scholars are now focusing on ESG activism. Researchers are discussing whether shareholder activism is effective, and if so, how it impacts shareholder and stakeholder values. There is significant evidence that successful engagements are followed by positive financial returns.¹⁵

Among institutional investors, none are better positioned than the pension fund industry to lead the transition to green finance. Global pension assets amounted to an estimated \$44.1 trillion in 2018, \$28 trillion of which was held by pension funds. Over the last decade, they have seen significant growth with almost all reporting countries reporting positive nominal growth in assets and absolute enrolment numbers. The average global ratio of pension assets to GDP has steadily increased from 49.7 percent in 2008 to 126 percent in 2018. Pension assets even exceeded GDP in 8 out of 36 OECD countries in 2018.¹⁶ In terms of assets under management, pension funds are the second-largest institutional investors following mutual funds. Given their long-term perspective and their unique positioning of “universal investors”, they are remarkably suited to invest in illiquid assets and foster the green transition.

As the regulatory environment has started to favor ESG considerations, pension funds have been increasingly focusing on sustainable investments. Among high income countries, the EU is leading regulatory action requiring institutional investors to disclose and consider climate risk.¹⁷ It is important to note that the pension industry is highly concentrated—22 countries hold \$40 trillion of the total assets and seven of those hold \$36 trillion. They are Australia, Canada, Japan, the Netherlands, Switzerland, the United Kingdom and the United States.¹⁸ Many of them are facing their own climate challenges: Australia’s wildfires, Canada’s melting Arctic, the Netherlands’ sea-level rise.

Low- and middle-income countries should also consider the effects of climate change on their pension systems. While these systems are smaller in absolute size, their relative size is comparable to that of high-income countries. The ratio of pension assets to GDP is 95.1 percent in South Africa, 91.3 percent in Namibia, and 40.9 percent in El Salvador, and similar in many other countries.¹⁹ In fact, it is doubly important for low and middle income countries to safeguard their pension system as it serves as an

¹³ Nadia Ameli et al., “Climate Finance and Disclosure for Institutional Investors: Why Transparency Is Not Enough,” *Climatic Change*, October 31, 2019, <https://doi.org/10.1007/s10584-019-02542-2>.

¹⁴ Rory Sullivan et al., “Fiduciary Duty in the 21st Century” (PRI, October 2019), <https://www.unpri.org/download?ac=9792>.

¹⁵ Eun-hee Kim et al., “When Does Institutional Investor Activism Increase Shareholder Value? The Carbon Disclosure,” *The B.E. Journal of Economic Analysis & Policy* 11, no. 1 (2011); Elroy Dimson, Oğuzhan Karakaş, and Xi Li, “Active Ownership,” SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, August 7, 2015), <https://papers.ssrn.com/abstract=2154724>.

¹⁶ OECD, “Pension Markets in Focus 2019,” 2019, <https://www.oecd.org/daf/fin/private-pensions/Pension-Markets-in-Focus-2019.pdf>.

¹⁷ Francesco Guarascio, “EU Rules on Responsible Investments to Kick in from 2021,” *Reuters*, November 4, 2019, <https://www.reuters.com/article/us-eu-regulations-sustainablefinance/eu-rules-on-responsible-investments-to-kick-in-from-2021-document-idUSKBN1XE1U3>.

¹⁸ Willis Tower Watson, “Global Pension Assets Study 2019,” 2019, <https://www.thinkingaheadinstitute.org/en/Library/Public/Research-and-Ideas/2019/02/Global-Pension-Asset-Survey-2019>.

¹⁹ OECD, “Funded Pensions Indicators,” OECD.Stat, 2019, https://stats.oecd.org/Index.aspx?DataSetCode=PNNI_NEW#.

important source of domestic investment and shock-absorption.²⁰ Regulators have increasingly recognized the need to invest in the energy transition, and have allowed e.g. Colombia to shift to 20 percent alternative investments and South Africa to invest 10 percent in private equity.²¹ It is thus clear that pension funds are both well-positioned and incentivized to green their investments.

To date, the two most comprehensive reports on pension system greening are the Asset Owners Disclosure Project's "*Pensions in a Changing Climate*" and the OECD's "*The Role of Pension Funds in Financing Green Growth Initiatives*".²² This report thus contributes to bridge a critical gap in the pension system greening literature.

In short

- There is a significant financial gap to address climate change, while less than one percent of global institutional investors invest in the low-carbon climate resilient pathway.
- So far, the global institutional investment community has supported regulatory efforts led by the PRI and the TCFD on identifying and disclosing climate-related financial risks.
- European pension funds lead regulatory action on ESG disclosure and climate risk consideration.
- In low-and middle-income countries, where pension funds have a critical weight in the economy, several regulators and pension managers have started acting proactively in favor of the green transition.
- This report contributes to a critical gap in the pension system greening literature.

2. Action Review

Climate change and the role of private finance has long been a focus on the international stage. The United Nations Framework Convention on Climate Change (UNFCCC) was ratified in 1994. Since then, there have been numerous commitments to increase climate finance including the Cancun Agreement and most recently the Paris Agreement in 2015.²³

In 2005, the United Nations Environment Programme Finance Initiative commissioned Freshfields Bruckhaus Deringer to publish a report on the legal framework needed to integrate ESG issues into institutional investors. The report argued that "integrating ESG considerations into an investment analysis so as to more reliably predict financial performance is clearly permissible and is arguably required in all jurisdictions". The G20 under the presidency of Mexico established the Climate Finance Study Group with the aim of mobilizing resources taking into account the objectives of the UNFCCC.²⁴ Subsequently, the G20 Green Finance Study Group (GFSG) was established under the leadership of China in 2015. The GFSG has the mandate to "identify institutional and market barriers to green finance, and based on country experiences, develop options on how to enhance the ability of the financial system to mobilize

²⁰ David Amaglobeli et al., "The Future of Saving : The Role of Pension System Design in an Aging World" (IMF, January 2019), <https://www.imf.org/en/Publications/Staff-Discussion-Notes/Issues/2019/01/09/The-Future-of-Saving-The-Role-of-Pension-System-Design-in-an-Aging-World-45138>.

²¹ PwC Luxembourg, "Global Pension Funds: Best Practices in the Pension Funds Investment Process," 2015, 134.

²² Paul Kirjanas et al., "Asset Owners Disclosure Project: Pensions in a Changing Climate" (ShareAction, 2018), <https://aodproject.net/wp-content/uploads/2019/01/AODP-PensionsChangingClimate.pdf>; Raffaele Della Croce, Christopher Kaminker, and Fiona Stewart, "The Role of Pension Funds in Financing Green Growth Initiatives," OECD Working Papers on Finance, Insurance and Private Pensions, September 1, 2011, <https://doi.org/10.1787/5kg58j1lwdjd-en>.

²³ Richard K Lattanzio, "Paris Agreement: U.S. Climate Finance Commitments," October 2, 2019, 2.

²⁴ Climate Finance Study Group, "Promoting Efficient and Transparent Provision and Mobilization of Climate Finance to Enhance Ambition of Mitigation and Adaptation Actions," June 2016, <http://www.g20.utoronto.ca/2016/2016-promoting-efficient-transparent-provision.pdf>.

private capital for green investment.”²⁵ Under Argentina’s presidency the scope of the group has expanded.

The Financial Stability Board created the Task-force on Climate-related Financial Disclosure (TCFD) in 2015. The remit of the TCFD was to develop voluntary and consistent climate-related financial risk disclosures that would aid institutional investors in improving understanding of material risks. Members of the Task Force include banks, insurance companies, credit rating agencies and pension funds. The TCFD published its final report and recommendations based on four areas in 2017 and the report made the following recommendations:

- “Governance: Disclose the organization’s governance around climate related risks and opportunities.
- Strategy: Disclose the actual and potential impacts of climate-related risks and opportunities on the organization’s businesses, strategy, and financial planning where such information is material.
- Risk Management: Disclose how the organization identifies, assesses, and manages climate-related risks.
- Metrics and Target: Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.”

Currently, the TCFD represents 930 organizations with a market capitalization of \$11 trillion, 87 of these are pension funds. Despite an increase in the disclosure of climate related financial information, the 2019 TCFD progress report found that progress was not sufficient and greater clarity is needed on the potential financial impact of climate related risks or issues.²⁶

On the industry side, the Institutional Investors Group on Climate Change (IIGC) was established in 2001 as a forum between European pension funds and asset managers. Currently, the organization has 200 members and works towards mobilizing capital for low carbon investments and increasing resilience to the impacts of climate change. In 2019, the IIGC launched the Paris Aligned Investment Initiative which aims to provide guidance and methodologies for investors to align portfolios with the Paris Agreement. The group is co-chaired by representatives from APB and the Church of England Pensions Board.²⁷

The Network for Greening the Financial System (NGFS) was created in 2017. The group shares best practices and works to contribute amongst policymakers, with the aim of promoting climate risk management in the financial sector.²⁸ NGFS members acknowledged that “climate-related risks are a source of financial risk. It is therefore within the mandates of central banks and supervisors to ensure the financial system is resilient to these risks.”

Some national supervisory authorities have already made ESG integration and disclosures mandatory. For example:

- In November 2018, Sweden introduced new investment guidelines for AP funds 1-4. These include flexibility to invest more in illiquid asset classes and more in-house oversight. Most importantly, AP 1-4 must invest in a way that contributes to sustainable development.²⁹

²⁵ G20, “G20 Green Finance Synthesis Report” (G20 Green Finance Study Group, July 15, 2016), http://unepinquiry.org/wp-content/uploads/2016/09/Synthesis_Report_Full_EN.pdf.

²⁶ TCFD, “Task Force on Climate-Related Financial Disclosures: 2019 Status Report,” 2019.

²⁷ IIGCC, “2019 Year in Review” (The Institutional Investors Group on Climate Change, 2019).

²⁸ NGFS Secretariat, “A Call for Action: Climate Change as a Source of Financial Risk” (Network for Greening the Financial System, April 2019), https://www.banque-france.fr/sites/default/files/media/2019/04/17/ngfs_first_comprehensive_report_-_17042019_0.pdf.

²⁹ Rachel Fixen, “Swedish Parliament Approves Buffer Fund Investment Freedoms Bill,” IPE, November 2018, <https://www.ipe.com/swedish-parliament-approves-buffer-fund-investment-freedoms-bill/10028423.article>.

- In March 2020, Mexico's National Commission for the Retirement Savings Systems (CON SAR) published mandatory provisions for pension funds relating to ESG integration in debt and equity, ESG risk and investment policies, and ESG disclosure will go into effect in 2022.³⁰

Alongside international and national action, some pension funds have individually taken progressive action on greening their assets.

- The New York State Common Retirement Fund (NY Common) recently published a comprehensive climate action plan addressing: identification and assessment, investment and divestment, and engagement and advocacy. Crucially, the plan recognizes that green investment is consistent with fiduciary duty.³¹
- ABP and PGGM, the Netherlands' two largest pension funds, have developed an Artificial Intelligence (AI) which identifies how their 10,000+ investments meet the Sustainable Development Goals (SDGs).³²

In short

- Several international platforms since 1994 have raised awareness on the role of the investment community to address climate change and the need to align investment practices with ESG considerations.
- In 2001, the investment community joined these efforts through the IIGC.
- In 2015, the TCFD defined guidelines to identify and disclose climate-related financial risks.
- At the national level, there is a diversity of approaches, with a few regulations requiring mandatory integration of ESG factors. The definition of fiduciary duty does not encompass sustainable considerations in many countries, even though that is currently changing.
- Some pension funds have started investing and defining self-rules that align with PRI principles.

³⁰ "DISPOSICIONES de carácter general en materia financiera de los Sistemas de Ahorro para el Retiro" (2020), https://www.gob.mx/cms/uploads/attachment/file/542142/CUF_compilada_20200303.pdf.

³¹ "New York State Common Retirement Fund: Climate Action Plan 2019," June 2019, <https://www.osc.state.ny.us/pension/climate-action-plan-2019.pdf>.

³² ABP, "Sustainable and Responsible Investment 2018," 2018, <https://www.abp.nl/images/responsible-investment-report-2018.pdf>.

3. Climate Risk Exposure Landscape

Introduction

Climate risk has increasingly emerged as one of the main risks to the current financial system. Financial institutions are, and will increasingly be, exposed to climate risks, which covers physical, transition and liability risks.³³

An allocation of capital consistent with the transition is based on and is reinforced by adequate management of the risks and opportunities posed by climate change to the financial sector. These risks are multifaceted and can affect the financial sector through three channels (See Table 1):

- "physical risks" that can arise from weather and climate events
- "transition risks" that result from the adjustment process towards a low-carbon economy
- "liability risks", which is a particular form of the two categories above.³⁴

To identify the risks and challenges of climate change that pension funds across the world face, we conducted in-depth data review and quantitative analysis to create a heatmap of pension fund climate risk for 71 countries.³⁵ In order to derive a measure for pension fund climate risk, three key variables were used:

- Country climate change risk
- Pension assets-to-GDP ratio
- Percentage of pension assets held domestically.

This approach allows us to estimate pension fund exposure to climate change risk, account for relative pension fund size and the level of pension asset diversification. While all countries will face the material effects of climate change, some pension systems will be more vulnerable than others. The purpose of this analysis is to map pension risk and identify pension funds most at risk from the negative effects of climate change both in low, middle, and high-income countries. This will allow us to identify key trends and policy recommendations in order to help countries mitigate climate exposure and pension asset risk. The following sections outline the data sources, methodology, and findings.

Throughout the comprehensive research and data analysis process, many data sources and indexes were considered. While there is no one comprehensive source of climate risk data, the final output used datasets that were available for the largest group of countries and had the most comprehensive country climate data. Where possible, three-year averages of data from 2015-2017 were used due to data limitations and to ensure coverage for the largest number of countries. For 19 observations three-year averages were not available using pension data—latest available data was used instead.

Climate risk data: Notre Dame Global Adaptation Index

The base country climate change score used Notre Dame Global Adaptation Initiative Index (ND-GAIN), which scores 181 countries across 45 indicators on their vulnerability to climate change and ability or readiness to adapt.³⁶ Vulnerability is defined as "*the propensity or predisposition of human societies to be negatively impacted by climate hazards*" and is measured across six key areas: food, water, health, ecosystem services, human habitat, and infrastructure. The six sectors in turn are given a composite measure based on six indicators which measure *exposure* to climate change hazards, *sensitivity* within

³³ Mark Carney, "Breaking the Tragedy of the Horizon - Climate Change and Financial Stability," 2015, <https://www.bis.org/review/r151009a.pdf>.

³⁴ NGFS Secretariat, "A Call for Action: Climate Change as a Source of Financial Risk."

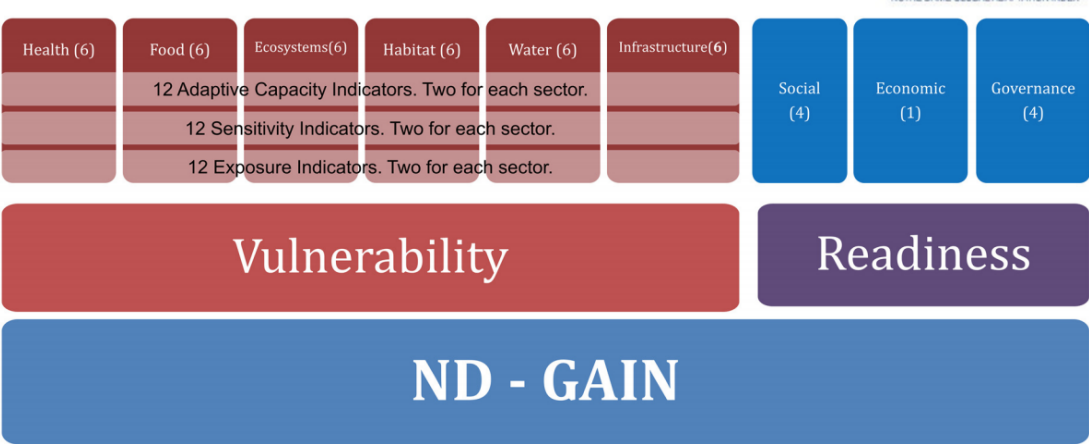
³⁵ This report defines a pension system as any plan, fund, or scheme which provides retirement income. Pension funds are pooled monetary contributions from pension plans set up by employers, unions, or other organizations to provide for their employees' or members' retirement benefits.

³⁶ In this analysis we use the ND-GAIN score unadjusted by GDP.

the sector to impacts of climate change and the *adaptive capacity* of sectors to cope with the impact of climate change. Readiness is defined as the ability of a country to use effective investments to undertake adaptation actions. Readiness is measured on three areas by the index: a) economic - measured as the ease of doing business, b) governance - a composite measure taking into account rule of law, regulatory quality, corruption and political stability, and c) social readiness a composite measure taking into account inequality, ICT infrastructure, education, and innovation.³⁷

Figure 3 gives an overview of how the ND-GAIN score is derived. A comprehensive technical note with detail on each indicator is publicly available.³⁸

Figure 3: ND-GAIN measure summary³⁹



This data set is comprehensive in that it accounts for water scarcity, sea level rise, risk of climate change-induced diseases, and more. However, it is limited in that it does not account for extreme weather events or natural disasters, e.g. hurricanes. A potential extension of this mapping would be to incorporate data from indexes such as Germanwatch, which explicitly map the risks of extreme weather events.⁴⁰ Climate change can have compounding effects and increase the likelihood of extreme weather events, which will increase in frequency if we reach tipping points.

Pension asset data

The country data on pension assets-to-GDP ratio and the percentage of pension fund assets invested domestically came from several sources. The primary source of pension data was the OECD *Global Pension Statistics*, which offers the most comprehensive global coverage.⁴¹ This data details the size of countries’ pension assets as a percentage of GDP and the percentage of assets held domestically for 49 countries. Further data on pension fund domestic assets was derived from the OECD *Annual Survey of Investment Regulation of Pension Funds 2019*.⁴² Countries that have legislation or laws banning foreign investment by pension funds were assumed to have 100 percent of pension fund assets held domestically. In addition, countries that had pension fund foreign investment limits, and where other data was unavailable, were assumed to invest up to that limit i.e. if a country had a 15 percent limit on foreign investments pension funds were assumed to diversify their assets and invest 15 percent in foreign assets with the other 85 percent held domestically.

³⁷ C. Chen et al., “University of Notre Dame Global Adaptation Index: Country Index Technical Report” (University of Notre Dame, November 2015), https://gain.nd.edu/assets/254377/nd_gain_technical_document_2015.pdf.

³⁸ Chen et al.

³⁹ Chen et al.

⁴⁰ “Germanwatch,” 2020, <https://germanwatch.org/en>.

⁴¹ “Global Pension Statistics,” OECD, 2019, <http://www.oecd.org/daf/fin/private-pensions/globalpensionstatistics.htm>.

⁴² “Annual Survey of Investment Regulation of Pension Funds” (OECD, 2019), <http://www.oecd.org/daf/fin/private-pensions/2019-Survey-Investment-Regulation-Pension-Funds.pdf>.

Other supplementary sources of data were used to fill data gaps on percentage of domestic assets. This was important in order for a more comprehensive understanding of climate risks faced by SIDS and high-income economies that had data missing. The team used the World Bank and Pacific Island Investment Forum pension funds data to provide a detailed breakdown of the size of and assets of pension funds across the Pacific Islands including Fiji, Papua New Guinea, and Vanuatu. Pension asset data for Germany, Canada, and Australia was used from the PwC *Beyond their Borders 2020* publication.⁴³ In order to include the US in our analysis, data from CEM Benchmarking on US pension funds was used as a proxy for the percentage of US pension funds held domestically and in foreign assets.⁴⁴

Methodology

To derive the overall country pension score, countries were split into quintile groups based on their values across ND-GAIN score, pension assets-to-GDP ratio, and percentage of pension assets held domestically. Quintile thresholds were identified, and each country was assigned a corresponding quintile group based on their relative score. A quintile group of “1” indicates the best score and “5” indicates the worst score. For this purpose, the ND-GAIN index was inverted so that a higher score indicates higher vulnerability and lower readiness to implement climate change adaptation measures.

Two other important assumptions were made in this process. First, countries with larger pensions asset-to-GDP ratios potentially face greater negative economic impacts from climate change. In the event of severe climate impacts, pension investment returns could plummet with increased risk of stranded assets. While every pension fund is vulnerable from the material effects of climate change, larger pension funds that fail to adapt will have larger economic ramifications. Second, a country with pension fund assets held in several geographical areas in the event of a domestic climate shock will have limited exposure compared to a country whose assets are solely held domestically. Therefore, the percentage of domestic pension assets offers a useful proxy for the level of climate risk diversification.

Table 1 details the cut-off score for each quintile group. A country’s raw scores on each variable determine the quintile group allocation. Any country with pension asset-to-GDP ratios above 50.8 percent, with 95 percent of those assets held domestically would be assigned the worst quintile score of 5 for both variables. Thus, if a country has 100 percent of pension assets held domestically, they will be assigned to quintile group 5 for this measure, and if these assets represent under 1 percent of GDP, the country will be assigned a quintile score of 1 for this measure. An ND-GAIN score of 5 would be assigned to quintile group 1, a score of 9 to quintile group 2 and so on.

Table 1: Quintile groupings

	Inverted ND-GAIN score	Pension assets as a percent of GDP	Percent of pensions assets held domestically
Q1: 0-20%	33.51492188	5.663666667	59.86666667
Q2: 20-40%	41.32910328	8.990666667	75.64
Q3: 40-60%	48.60772015	16.3	86.43333333
Q4: 60-80%	54.98604968	50.84966667	95
Q5: 80-100%	<54.9860496799179	<50.8496666666667	<95

The final step to derive the overall pension climate risk score involved weighting the quintile groups across the three variables. Pension asset-to-GDP ratio was double-weighted to reflect the higher economic

⁴³ “Beyond Their Borders: Evolution of Foreign Investments by Pension Funds” (PwC, 2020), <https://www.alfi.lu/getattachment/bbd902ee-feb9-4534-b68c-ae8c6706f4e/alfi-evolution-of-foreign-investments-by-pension-funds.pdf>.

⁴⁴ “CEM Benchmarking,” 2020, <https://www.cembenchmarking.com/>.

exposure countries with much larger pension assets face from climate risks. Moreover, the double-weighting also accounts for the fact that many countries face limited pension risk simply because pension systems are non-existent or represent a small percentage of GDP. The ND-GAIN index and percentage of assets held domestically were weighted equally. Therefore, the pension risk score for each country is:

$$(0.25 \times \text{ND-GAIN quintile}) + (0.5 \times \text{percent GDP pension assets quintile}) + (0.25 \times \text{percent domestic assets quintile})$$

For example, if a country was in quintile group 5 for ND-GAIN, 4 for percentage of pension assets of GDP and 2 for domestic pension assets the overall pension fund climate risk would be:

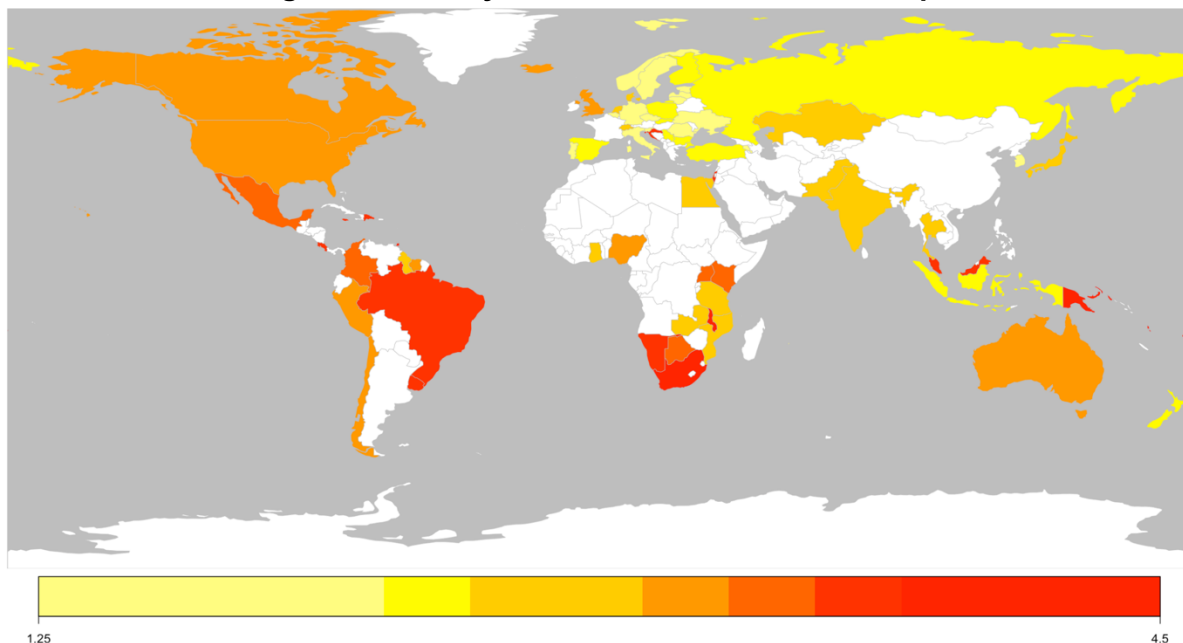
$$(0.25 \times 5) + (0.5 \times 3) + (0.25 \times 4) = 3.75$$

After each country score was calculated with the formula described, a heatmap was generated using the *Rworldmap* package to identify regional and country level trends.

Findings

Figure 5 is a heatmap of the pension fund climate risk scores as described above. On this heatmap, yellow indicates a country with a lower pension fund climate risk; orange, medium; and red, high pension fund climate risk. The mapping indicates countries' risk relative to each other and a low pension risk score does not preclude mitigative action. Indeed, no country scored in the top quintile for each variable and climate risks of country pension funds is often different in nature.

Figure 5: Country Pension Climate Risk Heatmap



European countries such as Italy, Latvia, Lithuania, Sweden and Slovenia have the lowest pension fund climate risk. This is in part because all have a much lower percentage pension assets relative to GDP compared to other high-income countries and, indeed, many low income countries. The asset-to-GDP ratio for Latvia is only 1.5 percent and 5.6 percent in Sweden. Likewise, these countries have higher levels of diversification of assets (i.e. small percentages of assets held domestically) and score relatively well on the ND-GAIN index. Despite facing high climate risk, Armenia faces comparatively low pension risk due to small asset-to-GDP ratio and with pension funds holding approximately 30 percent of assets abroad.

Perhaps unsurprisingly, small island economies such as Papua New Guinea, Fiji, and Vanuatu have the highest levels of pension fund climate risk scoring relatively poorly on every measure. In addition to facing high country climate risk as SIDS, their pension funds hold most assets domestically, with 100 percent of assets invested domestically in Vanuatu, 93 percent in Fiji, and 87.2 percent in Papua New Guinea. Moreover, compared to other smaller economies, these countries have relatively high pension assets as a percentage of GDP. Small island countries in particular are vulnerable to effects of climate change such as sea level rise. In addition, their pension funds face substantial risk because of limited geographical portfolio diversification.

Similarly, South Africa has one of the highest levels of pension risk overall and compared to other African countries. While pension funds in South Africa invest 23 percent in foreign - a medium risk score - the country performs poorly on the ND-GAIN index and has a relatively large asset-to-GDP ratio. Many countries in the region face high levels of pension risk with high climate risk and the majority of assets invested domestically. That said, countries such as Egypt, Mozambique, and Zambia perform well compared to their peers. However, this is driven for the most part by their small pension fund size compared to GDP as these countries perform poorly otherwise.

While performing relatively well on country level climate measures, high income countries such as the United States, Canada, Australia and the United Kingdom are classified as medium to high level risk because of the large relative size of their pension fund assets. All of these countries have average pension assets-to-GDP ratios over 80 percent for the 2015-2017, with Australia's ratio above 120 percent. These economies are better equipped to adapt to climate challenges, but the potential material risk on pension fund assets is large. Many of these countries should take advantage of the opportunities that greening the pension system can bring, with green finance markets increasing in prominence and offering long-term returns.

The majority of South American countries score medium to high risk. Brazil, Costa Rica, and Uruguay score high to medium on pension climate risk indicators. For the most part, the pension assets of these countries are held domestically (above 90 percent for all three) and the countries score relatively poorly on the ND-GAIN index. Mexico and Colombia, while facing higher country climate risk than Uruguay and Costa Rica, have a lower level of pension climate risk. Mexican pension fund foreign assets are slightly higher and the asset-to-GDP ratio is lower than both Uruguay and Costa Rica. Conversely, Colombian pension funds invest approximately 32 percent in foreign assets, which is comparatively high for the region. The majority of the countries in this region perform poorly on all measures with the exception of Chile and Peru. Chile scores well on the ND-GAIN index and has comparatively higher diversification of pension fund portfolios with slightly over 59 percent of its assets held domestically. Peru, while facing high domestic climate risk, similarly has geographically diversified pension assets.

Asian countries, broadly defined, fare relatively better compared to other regions, with the exception of Singapore. Singapore has one of the highest pension climate risks due to a high asset-to-GDP ratio and the fact that the entirety of its pension assets are held domestically. In contrast, South Korea has the lowest pension climate risk of the region, scoring well on the ND-GAIN index and with an asset-to-GDP ratio of 8.9 percent. However, the South Korean pension assets are 90 percent domestic scoring it in the second lowest quantile grouping. India and Pakistan face higher levels of pension risk, in particular because they either have bans on pension funds investing in foreign assets or no effective rules to do so. As a result, all pension assets are held domestically in these two countries. Indonesia's pension risk is comparatively low overall and for the region, however, this is driven by a very low asset-to-GDP ratio of 1.8 percent, with high country climate risk and low pension asset diversification otherwise. Table 2 further details the top and bottom scoring countries on the pension fund climate index.

Table 2: Highest and lowest pension risk scores by country

Top 3 Lowest Pension Climate Risk Score and Countries		Top 3 Highest Pension Climate Risk Scores and Countries	
1.25	Latvia	4.5	Fiji, Vanuatu
1.5	Sweden	4.25	Papua New Guinea, South Africa
1.75	Armenia, Italy, Lithuania, Slovenia	4	Malawi, Singapore, Trinidad and Tobago

Conclusion

Overall our analysis indicates that pension funds face climate risk and different countries are vulnerable in different ways. While many high-income countries may have the capacity to adapt to the challenges of climate change, large asset-to-GDP ratios mean the material effects of climate change could be large. In addition, the limited capital invested in green assets even by pension funds leading in the green finance space should be a cause for concern. Nine low income countries in our analysis have 100 percent of pension assets invested domestically. Indeed, the general trend is that low income countries have much lower geographical diversification of assets despite facing high levels of pension risk in most cases. These risks are particularly prominent for SIDS. Greater geographical diversification of assets, and in some cases changes of regulation to allow this, are recommendations that follow from this analysis.

While every effort was made to use the most comprehensive data and coverage, there are some limitations that future research should seek to address. First, missing data on several pension funds means that the analysis is restricted to 71 countries. Following works could seek to analyze the pension fund risk of a wider number of countries. Second, this analysis assumes the same level of pension fund climate risk and allocation of pension fund assets across entire countries. For large countries such as the US and Australia, where regional pension funds are more or less active in the green finance space, this might not necessarily be true. A more granular regional analysis could provide further interesting insights. Third, the analysis could benefit from incorporating other important measures of climate risk such as the impact of extreme weather events and measures indirectly related to climate change - e.g. air pollution, waste management - should be considered. Factoring in risks from extreme weather events would highlight an increased vulnerability and risk for small island nations, which already face the highest pension risk according to our measure, but are likely underweighted in terms of e.g. hurricane risk. In addition, the robustness of these findings may be checked against other climate risk indexes.

An important assumption made in this analysis is that geographical diversification of assets reduces climate risk unanimously. While this is often plausible in many scenarios, future research could account for foreign asset risk by deriving a measure of average world climate risk. This, however, would have to take into account feasible assumptions about world pension asset allocations by geography. A potential proxy for the risk of pension foreign asset allocations could be world equity indexes such as the MSCI All Country World Index (MSCI AWCI). These could be used to derive a weighted value for the climate risk of foreign assets based on the percentage of assets invested in each country.

This climate risk map should serve as a starting point to identify country level pension fund risk and for pension systems and pension funds to begin addressing them.

In short

- Our methodology uses three variables and a system of quintiles to assess the exposure to climate-change of pension funds in 71 countries.
- Our findings emphasize that pension systems are vulnerable in different ways.
- Many European countries have the lowest pension climate risk, notably because of a much lower pension asset to GDP ratio compared to other countries.
- Small island economies have the highest levels of pension climate risk and their pension systems face substantial risk because of limited geographical portfolio diversification.
- Most African countries, with some notable exceptions, face high levels of pension risk with high climate risk and the majority of assets invested domestically.
- Some high-income countries are classified as medium to high level risk because of the large relative size of their pension fund assets.
- The majority of South American countries perform poorly on all measures, except Chile and Peru.
- Asian countries fare relatively better compared to other regions.

4. Regulatory Landscape

Introduction

An important counterpart to mapping country pension climate risk is the regulatory environment that pension funds operate in. Since 2008, there has been a strong momentum towards stricter regulatory measures across the world's 50 largest economies in the area of sustainable investments applicable to asset owners with a 250 percent growth in the number of regulatory measures in this field, reaching 350 in 2016. In 2019, across some 500 policy instruments, more than 730 hard and soft law policy revisions existed to encourage or require investors to consider long-term value factors.⁴⁵ Most of the regulations focus on long-term value drivers, including ESG factors. Regulatory initiatives that reinforce responsible investment practice for pension funds can catalyze ESG incorporation into investment decision making and help reduce the material risks climate change poses to pension funds. Regulatory norms, in particular in relation to fiduciary duty, put further impetus behind the agenda of responsible investment.

This extensive review of regulations on sustainable investment for pension funds aimed at:

- a. Providing an overall picture of the level of advancement on socially responsible investment (SRI) and responsible investment (RI) legal frameworks;
- b. Identifying best practices and laggards;
- c. Comparing this legal backdrop with the exposure of national pension funds to climate-related financial risks;
- d. Measuring the extent to which international regulatory standards and recommendations around ESG have been implemented.

The goal is to outline potential regulatory enablers of sustainable investment that mitigate climate exposure and vulnerability and foster positive social and environmental impacts. We explore this relationship with two methodologies: a regulatory map and a survey.

4.1 Regulatory mapping

Data

The main database is the United Nations Principles for Responsible Investment's regulation map. This map covers 500 responsible investment-related legislation and soft law initiatives across the 50 largest economies in the world.⁴⁶

Per the PRI's methodology, the regulation map indicates the year of implementation, the responsible authority, whether the measure is voluntary or mandatory, the integration of environmental, social and/or governance issues, and whether it addresses these issues in isolation or in combination. We selected data pertaining to ESG regulation targeting pension funds, which included requirements to incorporate ESG or disclose how ESG is considered, stewardship codes, and best principles for engagement and voting.

Additionally, we supplemented our research with the following reports and databases:

- OECD 2019, *Annual Survey of Investment Regulation of Pension Funds*⁴⁷

⁴⁵ "Taking Stock: Sustainable Finance Policy Engagement and Policy Influence" (Principles for Responsible Investment, 2019), https://www.unpri.org/Uploads/c/j/u/pripolicywhitepapertakingstockfinal_335442.pdf.

⁴⁶ "Responsible Investment Regulation Map," Principles for Responsible Investment, September 9, 2019, <https://www.unpri.org/sustainable-markets/regulation-map>.

⁴⁷ "Annual Survey of Investment Regulation of Pension Funds."

- EUROSIF 2011, “*Corporate Pension Funds and Sustainable Investment Study*”⁴⁸
- PRI 2016, *Global Guide to Responsible Investment Regulation*⁴⁹
- World Bank 2018, *Incorporating Environmental, Social and Governance (ESG) Factors into Fixed Income Investment*.⁵⁰

Almost half—23 of the 50 countries analyzed in the PRI database—possess or are working on rules regarding pension funds and ESG criteria. Most regulatory frameworks do not refer to ESG issues with explicit directives on how to integrate them. However, there is an upside to such flexibility; these frameworks do not prevent pension funds from making further effort on ESG integration.⁵¹

Methodology

The regulatory map combined quantitative and qualitative approaches.

Our qualitative approach, based on a granular review of the existing regulatory frameworks and norms of 23 countries aimed at identifying the requirements, binding or non-binding, related to:

- The definition of asset owners’ fiduciary duties as regards ESG issues in their investment processes and capital allocations;
- The nature and scope of the requirements to disclose ESG issues;
- The nature and scope of the requirements to engage with companies and issuers on ESG issues;
- The nature and scope of the requirements to report on ESG issues, and the mention of specific reporting guidelines;
- The differentiated weight given to each pillar of ESG issues;
- The attention given in legal frameworks to the long-term impact of climate change and the recognition of its materiality to investment outcomes;
- The mention of exclusion requirements by negative screening (e.g. exclusion of investments in the tobacco industry);
- The presence of control mechanisms or sanctions attached to SRI regulation.

We compared these data across regions to identify similarities based on geography, type of pension funds (i.e. defined benefit or defined contribution), size in terms of assets under management, and type of law (e.g. Common Law or French law).

Our quantitative analysis built on the findings of our qualitative research. First, we mapped pension funds for 50 countries in our database by identifying the legal specificities applicable to pension funds pertaining to sustainable investment. Specifically, we examined whether ESG regulation pertained to pension funds, whether it was mandatory, voluntary, or comply-or-explain, whether it requires ESG integration and how each pillar is considered, whether there is an exclusion policy, and whether there is a requirement to report or disclose ESG issues. The mandatory regulation designation indicates that some type of

⁴⁸ “Corporate Pension Funds & Sustainable Investment Study” (Eurosif, 2011), <http://www.eurosif.org/wp-content/uploads/2014/07/corporate-pension-funds.pdf>.

⁴⁹ “Global Guide to Responsible Investment Regulation” (Principles for Responsible Investment, 2016), <https://www.unpri.org/download?ac=325>.

⁵⁰ Georg Inderst and Fiona Elizabeth Stewart, “Incorporating Environmental, Social and Governance Factors into Fixed Income Investment” (The World Bank, April 1, 2018), <http://documents.worldbank.org/curated/en/913961524150628959/Incorporating-environmental-social-and-governance-factors-into-fixed-income-investment>.

⁵¹ “Responsible Investment: 2017 Annual Study” (Governart and VigeoEiris, 2017), <http://www.vigeo-eiris.com/wp-content/uploads/2017/09/Estudio-2-Ingles-C2%20B4s.pdf>.

stewardship law exists that does not directly address ESG, whereas the mandatory ESG regulation designation is given to countries where clear ESG guidance exists.

Second, for each above-mentioned criterion, we allocated a numerical score between one and ten. Lower scores indicate higher regulatory risk. The score came from both ESG regulations and national stewardship codes. We discounted stewardship code guidelines by one-third, to reflect our focus on regulation. The below grid indicates our scoring matrix (See Table 3).

Table 3: Scoring Matrix for Regulatory Risk

Mandatory ESG	M*ESG	10
Mandatory Environmental	M*E	9
Mandatory Social	M*S	8
Mandatory Governance	M*G	8
Comply-or-Explain ESG	C*E*ESG	7
Mandatory Voluntary ESG	M	7
	V*ESG	5
No ESG	N	1

Findings

Our methodology yielded the below comparison of climate risk to regulation risk data (See Figures 6 and 7).

Figure 6: Comparing pension climate risk and regulatory risk

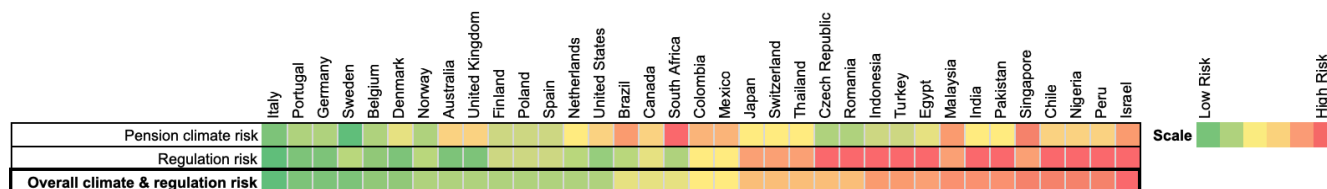


Figure 7: Disaggregated scores for pension climate risk and regulatory risk



Overall, the majority of countries have several regulatory frameworks that pertain to sustainable investing for pension funds, weaving mandatory and voluntary elements together. The interpretation and nature of

sustainable investment regulation tend to vary across geographical regions. In Europe, regulations tend to be relatively prescriptive, whereas in Asia and North America they are almost exclusively voluntary (See Focus Box 1).

Focus Box 1⁵²

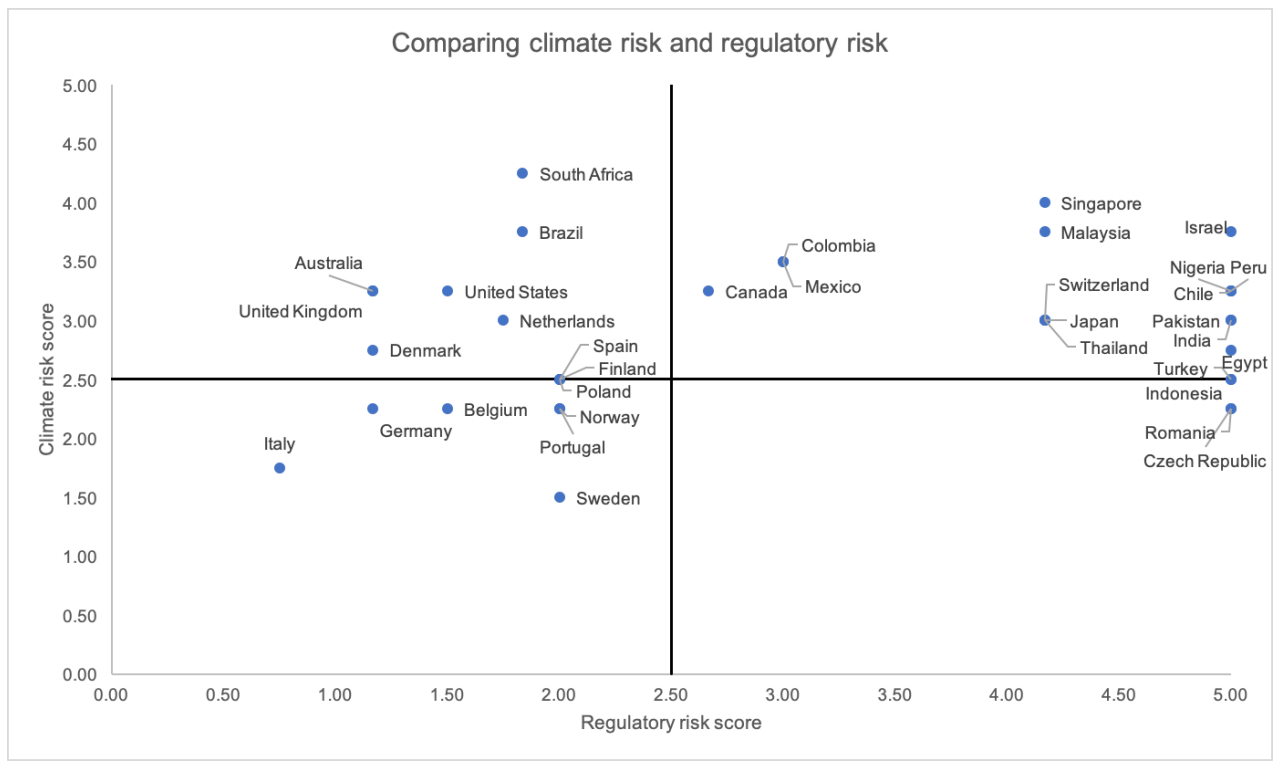
Defining mandatory and voluntary guidelines:

- “hard” or mandatory regulations: sustainable investment norms applicable to pension funds set out legally binding and specific duties and obligations.
- “soft” or voluntary guidelines: sustainable investment guidelines applicable to pension funds refer to a large spectrum of quasi-legal instruments that are not clearly defined, leaving the level of application to the pension funds.

Additionally, 21 out of 50 national jurisdictions have implemented regulations regarding ESG reporting and disclosure requirements. Some jurisdictions implemented “comply-or-explain” policies in their disclosure process, e.g. South African, Norway. Most others require disclosure without issuing specific guidelines on how such disclosure should occur. Self-regulation plays an important role in many countries, with many pension funds recognizing the materiality of ESG factors and adjusting investment strategies accordingly.

Examining each jurisdictions climate risk score against its regulatory risk score, as indicated in the tables below for select jurisdictions, allowed us to identify four important categories of combined risk (See Figures 8): highly regulated low climate risk countries, highly regulated high climate risk countries, lightly regulated low risk countries, and countries with high climate risk and improving regulation.

Figure 8: Four-quadrant matrix of combined climate and regulatory risk in 35 jurisdictions



⁵² Agnes Neher, “Sustainable Investment Spotlight: Stricter European Regulations Favour Sustainable Investments” (J. Safran Sarasin, 2017), https://www.jsafrasarasin.ch/internet/ch/en/sustainable_investment_spotlight_stricter_european_regulations_favour_sustainable_investments_en.pdf.

1. Countries with *low* pension vulnerability to climate change and *low* regulatory risk:

This category consists of exclusively European countries, all of which displayed a high level of ESG-related regulatory measures and frameworks (See Focus Box 2).

France is particularly ahead with far-reaching requirements in terms of ESG reporting by pension funds. The French Article 173-VI of the Energy Transition Act requires pension funds to provide information on how they integrate ESG factors in their investment, voting decisions, exposure to climate risks, and contribution to the transition to a low carbon economy in their portfolio construction.

Amongst European countries, Scandinavian countries have pioneered the introduction of standards and frameworks promoting ESG activities in financial management. For example, the Norwegian Government Pension Act of 2005 led the government to introduce a set of ethical guidelines. Given the influence and size of the Norwegian pension fund, these guidelines have become a benchmark for responsible investment across Europe and beyond.

Focus Box 2⁵³

At the EU level, the Institutions for Occupational Retirement Provision (IORP) Directive provided a common set of basic requirements across member states until recently. Its second iteration, IORP II defined the importance attached to ESG factors both in terms of the potential impact of ESG factors on portfolio risks and returns, and pension funds' role as long-term investors. However, it allowed pension funds the liberty not to integrate ESG factors in their investment policy. Moreover, "Member States should require IORPs to explicitly disclose where these factors are considered in investment decisions and how they are part of their risk management system".

With the new EU Action Plan on sustainable finance, the level of requirement regarding ESG integration will increase.

The taxonomy disclosure requirements apply to pension funds, as they are financial market participants. For each relevant product, pension funds will be required to state:

- how and to what extent they have used the Taxonomy in determining the sustainability of the underlying investments;
- to what environmental objective(s) the investments contribute;
- the proportion of underlying investments that are Taxonomy-aligned, expressed as a percentage of the investment, fund or portfolio.

FRANCE

Since 2001, France has enacted a vast number of laws governing sustainable investments targeted at pension funds, state pension schemes, and investment companies. The 2015 revision of the law on the energy transition for green growth signaled a very ambitious policy on ESG integration by asset owners and investors.

- **The Act of 19 February 2001** (Loi Fabius) introduced an incentive for pension funds to take environmental and social criteria into account in their asset management policy, and enabled the creation of solidarity-based employee savings funds.
- **The Act of 17 July 2001** stipulates that investors' management board, which implements the orientations of the institution's investment policy, reports to the supervisory board on "the manner

⁵³ "European SRI Study" (Eurosif, 2018), <http://www.eurosif.org/wp-content/uploads/2018/11/European-SRI-2018-Study.pdf>;
"L'investissement socialement responsable," Ministère de la Transition écologique et solidaire, February 7, 2019, <https://www.ecologique-solidaire.gouv.fr/linvestissement-socialement-responsable>.

in which the general orientations of the fund's investment policy have taken into account social, environmental or ethical considerations".

- **The law of 12 July 2010** on national commitment to the environment requires "société d'investissement à capital variable" (SICAVs) and management companies to disclose how they consider ESG issues in their investment policy and how they exercise the voting rights attached to the financial instruments resulting from these choices.
- **The law of 17 August 2015** on the energy transition for green growth extends these obligations to institutional investors and requires them to fully disclose their investment guidelines, the carbon footprint of their portfolios and their orientation to climate targets, as well as reporting their climate risks. This is the first law of its type worldwide.

UNITED KINGDOM

Similarly to France, the UK is particularly ahead on sustainable investment guidelines for investors and asset owners. Notably, several laws promote transparency of pension funds and investment strategies in charities, and include tax breaks for investments for solidarity purposes.

- **The Occupational Pension Schemes (Investment) Regulation** (1995-2001) compels local government pension funds' Statement of Investment Principles to report (in their Statement of investment principles or Declaration of Investment Principles) the extent to which social, environmental and social criteria are taken into account; and when they select, retain or carry out their investments.
- **The "Code of practice for defined-contribution schemes"** (2016) requires pension funds to take into consideration all financially relevant factors, including ESG criteria, in their investments.

EU LEVEL

Many European countries have adopted new regulations on this subject. In terms of the law applicable to the field of sustainable investment, European countries have evolved in a piecemeal fashion. Overall, 13 have put in place a regulatory framework, each with a very varied scope of application. Some countries, such as Austria, Germany and Spain, emphasize the transparency of pension funds, while others, such as Sweden, France and the Netherlands, go further, prohibiting the financing non-conventional weapons, or enacting the obligation to consider certain environmental, social or governance (ESG) criteria in the investment process of public pension funds.

- **The revision of the EU Pension Fund Directive "Guideline on the activities and the supervision of occupational pension schemes"** (2016). This directive is a milestone for sustainable investments. Among other things, it compels pension funds to disclose the extent to which ESG factors are considered both in their investment decisions and in their risk management systems. This regulatory measure is likely to have a "multiplier effect" by influencing the reporting practices of multinational companies.
- **The EU Shareholder Rights Directive** (2017). Amongst other things, this measure facilitates voting right exercise by shareholders across national borders and requires data transparency from companies, investors and proxy advisors.
- **The revised Occupational Retirement Provision Directive (IORP II)** requires European pension funds to disclose how they consider ESG issues in their investment approach through a Statement of Investment Policy Principles and establish risk management processes for emerging ESG issues.
- **The EU Taxonomy** (final report published in March 2020): EU High-Level Expert Group on Sustainable Finance is in charge of publishing a classification system for sustainable activities (EU taxonomy) and to clarify fiduciary duties of asset managers and institutional investors pertaining to sustainable investment.

2. Countries with *low* pension vulnerability to climate change and *medium to high* regulatory risk:

Some EU countries have regulatory frameworks and standards that are not aligned with best-in-class member states, notably those in Eastern Europe.

Romania and the Czech Republic have a low level of ESG-related regulatory measures and frameworks. The Czech Republic in particular does not have any pension fund regulation regarding ESG, nor a stewardship code. In terms of disclosure requirements, none of the regulatory frameworks in Slovakia, Hungary, and Poland require pension funds to disclose their approach regarding ESG investing. Albania, which is set to accede to the EU, also lacked disclosure regulation.

3. Countries with a *high* pension fund vulnerability to climate change and *low* regulatory risks:

These countries have a high level of ESG-related regulatory measures and frameworks. This category includes Brazil, the Netherlands, South Africa, and the United States. The high level of ESG integration is often related to regulatory tradition and historical development. The more profoundly the ESG concept is rooted in the public's awareness and the earlier codes have come out, the more advanced later regulation is.

Socially responsible investing (SRI) is deeply rooted in the South African market. In fact, some of the earliest records of such investments date back to the Apartheid boycott of South African companies. Initiatives such as the King Code on Corporate Governance (revised repeatedly from 1994 to 2017) have also played a role. As awareness of the importance of ESG issues has grown, so has investor demand for greater transparency.

Focus Box 4

SOUTH AFRICA

Circular 130 (2007), created by the financial regulatory agency, provides guidance on how to include responsible investment policies and suggests that risk management should not be limited solely to financial aspects.

The revised Regulation 28 of the Pension Fund Act (effective in 2011) states that pension funds should address all factors (including ESG) that may affect an investment on the long term.

CRISA – the Code for Responsible Investing in South Africa (2011) encourages the entire investor community to implement ESG components of the regulation 28 as long as other aspects belonging to international voluntary codes (e.g. UN-PRI). It also requires investors to consider the King Report on Corporate Governance South Africa (King III) with regard to the principles for governance structures and sustainable operations.

4th iteration of the King Code (2016) underlines that institutional investors are compelled to implement an active engagement strategy.

4. Countries with *medium to high* pension vulnerability to climate change and an *improving, but medium to high*, level of regulatory risk

These countries have been steadily improving their level of ESG-related regulatory measures and frameworks. They are not geographically concentrated. This category includes some Asian countries like Japan, Malaysia, some Latin American countries like Chile. In Japan, the strong central government impetus will mean that any regulation will be government-driven.

According to the Chilean pension regulatory agency, Chile has just started to implement ESG integration at the national level. As of yet, they do not have any explicit regulations or guidelines related to climate change or ESG factors. However, since hosting COP25 last year, Chile has started the regulation design

process. Led by the Ministry of Finance, pension fund administrators and other financial sector representatives signed a green agreement to establish a working plan beginning in 2020. The agreement defines a series of specific commitments to incorporate ESG guidelines and considerations and to manage the risks and opportunities associated with climate change.

Focus Box 3

JAPAN

The Japanese State pension fund, the GPIF, is leading the sustainable investment agenda for pension funds, along with significant changes in the regulation. In 2014, Japan became one of the first markets in Asia to adopt a Stewardship Code. The seven-principle code aimed to encourage investors to promote sustainable returns and growth through the use of shareholder voting and engagement. In 2017, the amended Code explicitly asked signatories to consider medium- to long-term sustainability criteria in their engagements, including ESG factors, and required institutional investors to disclose the rationale of their vote to combat conflicts of interest in voting decisions.

In 2017, the Japanese Ministry of the Environment released green bond guidelines, which boosted green issuances from four to eleven in one year. Continuing on this path, the High-Level Meeting by the Government on ESG Finance in 2018 led to the report entitled “Toward becoming a big power in ESG finance”. This ambitious publication included a set of non-binding recommendations on climate disclosure, engagement, regional ESG finance, ESG literacy, and development of ESG products across asset classes.

4.2 Survey

The survey aimed to supplement the regulatory map by identifying how each supervisory authority is interpreting global best practices and standards on ESG integration in the pension industry. The IOPS recently released ESG guidelines to provide voluntary guidance to regulators, supervisors, and other entities who supervise the consideration of ESG factors in the investment and risk management processes of pension funds. In terms of environmental risk, the guidelines consider physical, transition, and liability risks to be material. This is in addition to social risk, e.g. child labor and slavery, health and safety, discrimination, and governance risk, e.g. executive pay issues, bribery and corruption. The guidelines are divided into four sections: overall consideration of ESG factors, integration of ESG factors, disclosure of ESG factors, and scenario of investment strategies. A summary of the guidelines is included in the appendix (see appendix 3).

The survey reflected the IOPS guidelines and their structure. In order to effectively capture the current ESG trends at both the policy and practice level, the survey was divided into three sections: Section I Regulatory Framework and Section II Market Practice. Section I examined whether, and if so how, each supervisory agency incorporates ESG factors into its regulatory framework on areas including investment methodologies, risk assessment, stress-testing, and disclosure of information. Several questions focused on details of the regulatory agency’s efforts on ESG factors such as providing guidance on ESG disclosure and ESG reporting standards to pension funds under its jurisdiction. Section II focused on the pension funds under each regulatory agency’s jurisdiction, specifically on their practices towards ESG factors, green investing, climate-related risks and investment as well as the main barriers to incorporating ESG factors.

The IOPS Secretariat, in coordination with the client, administered the circulation and participation of the survey. The full survey questionnaire is available under the appendix of this report (appendix 2). In total,

the survey contained 15 questions with estimated time-to-complete of under 20 minutes. Due to the COVID-19 pandemic, the survey received fewer responses than expected. Despite its sample size, the team expects the survey to be beneficial in two ways:

- a) The written portion of the survey, in which many supervisors highlighted relevant laws and regulations in their jurisdictions, allowed us to identify clear trends in pension regulation as it pertains to ESG factors.
- b) As the survey closely follows the IOPS guidelines, the survey can serve as a tool for further research and/or monitoring the implementation of the guidelines.

Focus Box 5⁵⁴

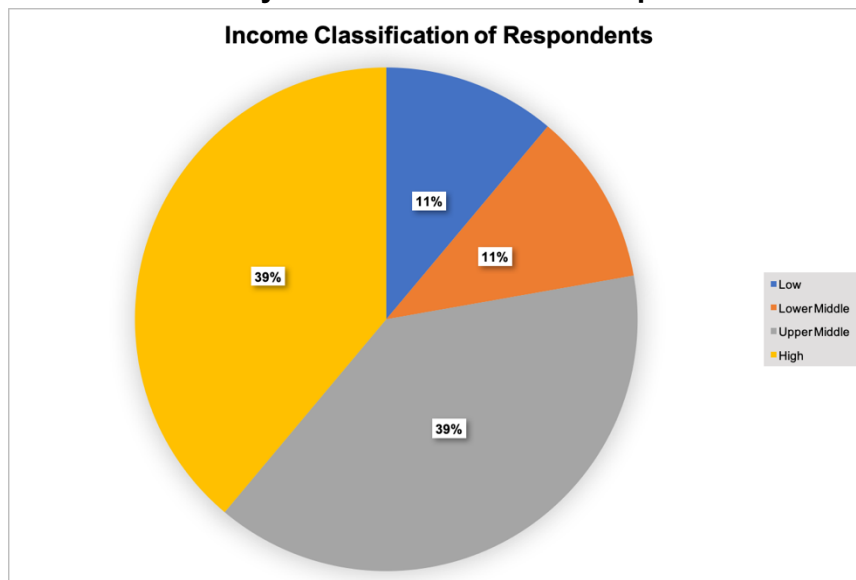
The IOPS is an independent international body that cooperates closely with the OECD, the World Bank, International Social Security Association (ISSA), International Association of Insurance Supervisors (IAIS), and the IMF. Its overarching goal is to support effective supervision of private pension systems worldwide. Its main objectives are to: serve as a pension supervisory standard-setting body; facilitate international cooperation; promote the implementation of international standards; and assist countries with less developed private pension arrangements. The IOPS currently has 90 Members and Observers, representing members from 79 jurisdictions and territories.

Findings

Geographic and Income Distribution

The survey received 18 responses: Angola, Australia, Austria, Bulgaria, Chile, Colombia, Guernsey, Iceland, Ireland, Kenya, Malawi, Mexico, Namibia, North Macedonia, Romania, Slovakia, South Africa, and Uganda. The respondents' income classification is shown in the figure below.

Figure 9: Income Classification by World Bank Income Groups

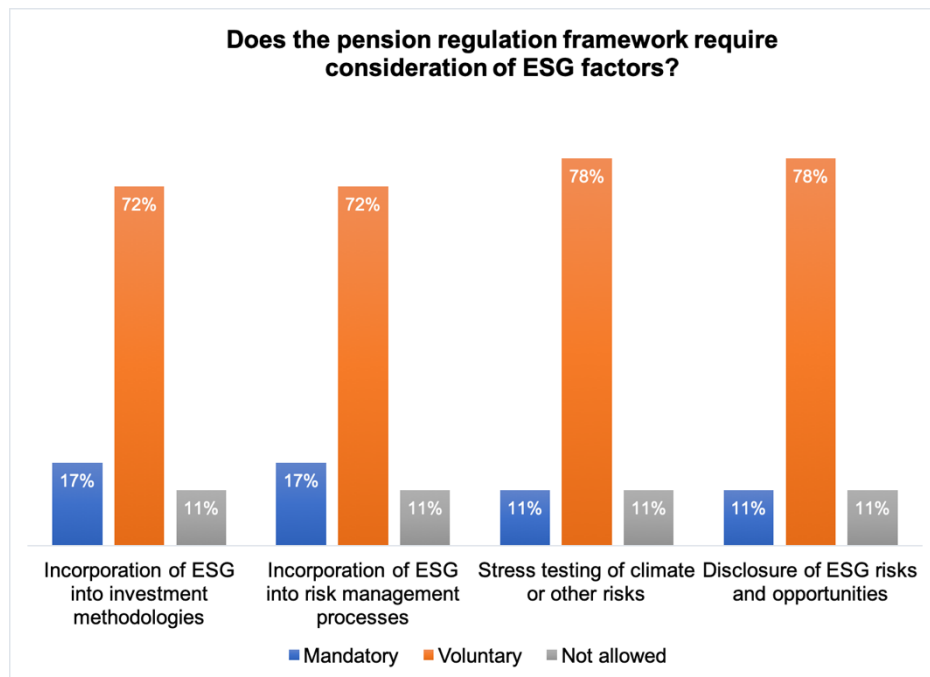


⁵⁴ "International Organisation of Pension Supervisors (IOPS)," 2020, <http://www.iopsweb.org/about/>.

Section I. Regulatory Framework

The survey allowed us to map out the various regulatory frameworks ruling how to consider and incorporate ESG factors into investment-processes (See Figure 10).

Figure 10: Types of ESG regulations implemented



ESG integration: Pension supervisors overwhelmingly reported that ESG integration is voluntary in their jurisdiction. Only 22.2 percent of the respondents had at least one mandatory requirement on ESG consideration in either investment methodology, risk management, or disclosure. One country reported mandatory consideration of all three categories. Seventy-two percent reported that all current ESG regulations are voluntary, though many EU countries indicated that they had either already or will soon transpose the IORP II directive into mandatory national law. Among those who adopted a mandatory or voluntary ESG framework, it was common to consider ESG factors in investment decisions and reporting. Some of them also assess ESG factors in risk management. Only two respondents, one in Africa and the other in Latin America, specifically defined ESG integration as inconsistent with fiduciary duty. Finally, there was no significant difference in uptake of ESG regulations between low- and high-income countries.

ESG guidance: The majority of supervisory agencies provided no guidance on ESG integration into investment management and disclosures. None had reporting standards for green investments. Overall, 77 percent of the jurisdictions reported that they did not provide guidance on ESG investment management and 72 percent reported that they did not provide guidance on ESG disclosure. Among those that provided investment guidance, guidance on risk management and stress-testing was most prevalent. All who provided disclosure guidance required disclosing ESG investment policy to the supervisory authority itself, while some also required reporting to members and stakeholders. Most glaringly, however, no jurisdiction had implemented any type of reporting or labeling of green investment including green taxonomies, label bonds, green loans, or other investment labeling. However, this is bound to change with the recently published EU taxonomy recommendations. Finally, 84 percent of the

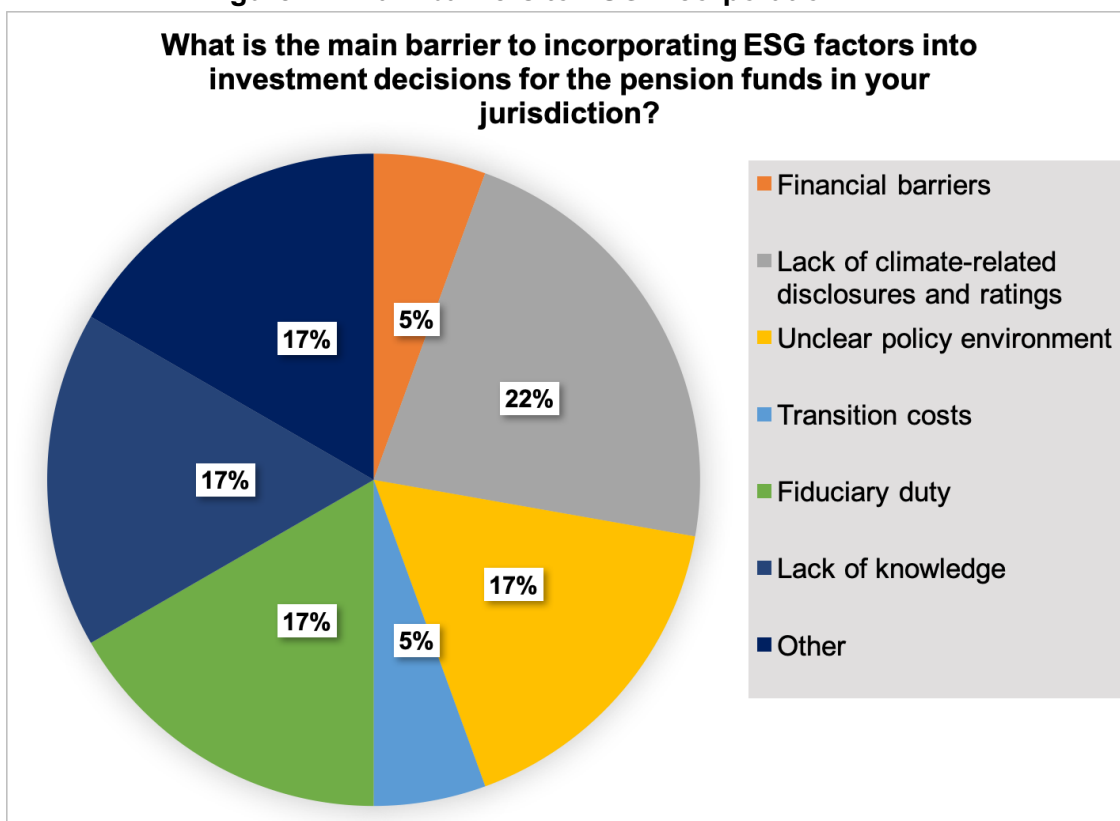
respondents indicated that they had no requirements on ESG considerations when awarding mandates or monitoring external managers, though half of those indicated they had plans to implement such guidelines.

ESG-related networks: Most supervisory authorities reported that pension funds in their jurisdiction had not joined any international ESG-related networks, or that they did not collect information about these partnerships. The PRI was most cited.

Section II. Market Practice

Main drivers to green investment: Performance is the main driver for pension funds to pursue green investments, followed closely by diversification and sustainability. Some respondents indicated that the importance of ESG factors should be balanced against the adequacy of pensions and insulation of pension savings from inflation.

Figure 11: Main barriers to ESG incorporation



Main barriers to green investment: The four most important barriers to greening investment were fiduciary duty; unclear policy environment; lack of climate-related disclosure and unreliable ratings; and lack of ESG-specific knowledge and data.⁵⁵

The overall barriers reported by pension supervisors can be divided into structural, financial or technical:

- Structural barriers: unclear policy environment (e.g. inconsistency in policy) and lack of standards and certification.
- Financial barriers: fossil fuel subsidies, unpriced carbon externality, and transaction costs due to the size of green bonds.
- Technical barriers: lack of common taxonomy, analysis and methodology as well as knowledge and data for ESG investments.

Some respondents also indicated fiduciary duty as the main barrier. Clearly, a mismatch exists between longer-term ESG-related risks and shorter-term decision making.

⁵⁵ For this section, the team manually matched write-in responses with the closest possible multiple choice option.

Climate-risk considerations: Most respondents reported that pension funds in their jurisdiction did not consider climate change risks separately from overall ESG considerations. Among six respondents whose pension funds consider climate issues separately, most do so in their reporting or investment decision-making. Only two respondents indicated that pension funds in their jurisdiction conducted climate-specific scenario analysis. The written responses indicated a clear trend among pension supervisors; many recognize that climate risk identification and management frameworks must evolve in the future.

Engagement with companies: Those pension funds that engage with companies regarding ESG are likely to promote company disclosure and encourage companies to reduce externalities. However, a majority of the respondents reported that pension funds in their jurisdiction did not engage with companies on climate change at all. Of those that did, three requested improved climate disclosures, and only one actively engaged in proxy voting.

Conclusion

The regulatory map and survey results, considered together, indicate several trends. First, the responses indicated that the current level of ESG integration remains limited and divergence exists from regulatory guidance. More often than not, ESG consideration was voluntary. All EU countries indicated that they were in the process of transposing IORP II. Consistent with the regulatory map, we observed that older EU members had pre-existing national ESG legislation, while newer members had not yet or only recently started regulating ESG issues.

Second, the responses in the market practice section indicated that pension funds in many jurisdictions did not consider nor engage with companies on climate risks separately from overall ESG risks. The pension supervisors attributed the lack of green investment to barriers including a lack of environmental policy support, regulatory disincentives, lack of appropriate investment vehicles and market liquidity, transaction cost issues, and a lack of knowledge, track record, and expertise among pension funds regarding ESG investments and their associated risks.

Third, among countries with medium to high pension climate risk, levels of regulatory improvement differed dramatically. Some countries in this category had immediate plans to implement guidance on ESG investment management and disclosure, whereas others still legally prohibited ESG incorporation for pension funds. South Africa is notable as the country with the highest climate vulnerability score, but also a highly robust and established mandatory ESG framework. This is consistent with our observation that countries that do not have an urgent climate threat have been slow to act, while those who do have been quick to act on regulation.

Overall, there is significant interest in and a trend towards developing new regulations to assist and encourage pension funds to integrate ESG considerations. To tap into this source of capital, pension supervisors have a role to play in enhancing the availability of attractive opportunities and instruments to pension funds. The solutions may include regulatory support to develop new investment vehicles for desired risk-return profiles, improved knowledge and training, and the consolidation of pension funds. Additionally, many of the countries that had both high climate risk and high regulatory risk did not respond to the survey, including Israel, Nigeria, Pakistan, India, Singapore, and Malaysia. We would recommend that the IOPS administer the survey to these jurisdictions to track their progress on global ESG guidelines.

In short

- The regulatory map used a mixed approach of qualitative and quantitative analysis of the sustainable investment frameworks, guidelines, and legal instruments of 51 countries.
- Our findings reveal four categories of sustainable investment regulations for pension funds.
 - Countries with low pension vulnerability to climate change and low regulatory risk—exclusively European countries;
 - Countries with low pension vulnerability to climate change and medium to high regulatory risk—notably those in Eastern Europe;
 - Countries with medium to high pension vulnerability to climate change and a decreasing level of regulatory risk—notably dispersed countries in Asia and in Latin America.
 - Countries with a high pension fund vulnerability to climate change and low regulatory risk (e.g. Brazil, the Netherlands, South Africa, and the United States).
- These results are confirmed by our survey instrument:
 - ESG integration is overwhelmingly voluntary in the jurisdictions of our respondents;
 - There is a lack of guidance on ESG integration and on reporting standards for green investments;
 - Most pension funds have not joined any international ESG-related networks;
 - Performance is the main driver for green investments, followed by diversification and sustainability;
 - The top three barriers to greening investment are fiduciary duty; unclear policy environment; and lack of climate-related disclosure and unreliable ratings;
 - Most respondents reported that pension funds in their jurisdiction did not consider climate change risks separately from overall ESG considerations;
 - Pension funds that engage with companies regarding ESG are likely to promote company disclosure and encourage companies to reduce externalities.

5. Conclusions and recommendations

As institutional investors, pension funds play a critical role in the low-carbon climate resilient pathway. Endorsing this role means aligning their definition of fiduciary duty with contemporary expectations: promoting ESG considerations *and* achieving financial returns. In the context of rising risks and opportunities posed by climate change, pension funds have to reinvent themselves to account for their global presence. Our set of recommendations aims to accelerate this change.

1. Adopt a holistic definition of fiduciary duty, fully aligned with today's challenges

- The findings of our survey and literature review reveal that regulators and managers have a very extensive definition of intentionality. The assumption that fiduciary duty is only about maximizing financial returns—“alpha”—ignores other important considerations that affect this same financial efficiency. Fiduciary duty on one hand, and intentionality about environmental and social considerations on the other hand are not mutually exclusive. Research increasingly shows that accounting for environmental factors positively impacts financial performance, notably by minimizing downside risk.⁵⁶
- Similarly, our findings show that intentionality—defined as a data and impact-driven focus on ESG criteria—is the key missing ingredient in the efforts of pension regulators and managers. By intentionality, we mean a sincere focus on achieving improved impact and outcomes, facilitating meaningful action and progress on climate change. Despite the affirmation of principle to incorporate ESG considerations, many pension funds do not implement this commitment. Intentional pension funds acknowledge and act upon their ability to effectively impact global systems, thereby hedging the funds against critical risks.

→ Revisit pension funds' definition of fiduciary duty, in line with financial, environmental, social and good governance imperatives, and adapt their mandate and investment practices consequently.

2. Build ESG literacy and awareness in-house

- Our survey results revealed that many pension funds did not have an enabling environment for greening the fund. Greening a pension fund means developing awareness and expertise within the organization regarding climate change (e.g. drivers of vulnerability and of exposure by sector, level of readiness; TCFD requirements) and ESG considerations (e.g. materiality by sector, key metrics, regulatory guidelines). Effective and performing sustainable investors not only possess a solid expertise in economics and finance, but also in climate, renewable energy, social inequality, gender, sustainable agriculture, public health, and good governance.

→ Offer and promote educational tools and incentives to develop a robust internal expertise on climate and other ESG-related considerations.

3. Adopt climate-friendly and climate-hedging investment practices

- Our analysis of individual pension fund climate plans observed the good use of green “carve-outs”—portions of portfolios allocated to particular sustainability strategies (appendix 1). Among our studied pension funds, an existing best-practice is the goal of achieving 100% sustainable

⁵⁶ Gordon L. Clark, Andreas Feiner, and Michael Viehs, “From the Stockholder to the Stakeholder: How Sustainability Can Drive Financial Outperformance,” SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, March 5, 2015), <https://doi.org/10.2139/ssrn.2508281>.

portfolio, supported by a specific commitment, within an effective time frame and with key targeted outcomes. This goal is also alpha-driven: our research shows that such practices are positively correlated with financial returns.

- Another best practice is the development and use of scenario testing. On the model of climate-risk tests led by insurances and banks, pension funds are encouraged to develop adequate scenario testing of their investment strategy for all significant financial factors, including ESG criteria and climate change. Regulators should help support this effort: only three jurisdictions in our survey indicated that they provided regulatory guidance on risk management and stress-testing for ESG factors.

→ Incorporate green and sustainability carve outs in the fund's portfolio in alignment with a clear intention and specified KPIs.

4. Prioritize engagement

- Our observations suggest that many countries are lacking a stewardship code, and that very few pension funds actively engage with management and leadership of their portfolio holdings on environmental issues. Engagement is critical to effectively advance priority topics and manage risks (e.g. stranded assets). This policy needs to be fully part of the sell discipline of investment managers and further integrated within the investment process. It goes with the principle that selling an investment should be the outcome of a thoughtful engagement process.
- To do so, engagement should first include the selection of investment managers that reflect and implement the pension fund's investment engagement policies. In many cases, we found that pension funds need to give more attention and resources to their engagement policy and establish one if missing. The pension funds that were most successful in their engagement applied strict to policies to both internal and external managers.
- Second, the end goal of engagement is to align portfolio investments with international standards as defined by the pension fund's policy (e.g. thresholds of the European Union taxonomy on Sustainable Finance, TCFD) and the targeted outcomes of the fund's investment strategy.
- Third, pension funds are encouraged to draw lessons from the results of engagement. There is an opportunity cost in not meeting such metrics and norms: misapplication of resources. Therefore, as suggested by our interviews, pension funds should sell an investment, or a set of investments, that fail to achieve specified KPIs, and replace it with more compliant opportunities.

→ Engage with the pension fund's portfolio holdings must be a priority to effectively address risks and align with best regulatory and investment practices. Pension funds have to put engagement at the center of their practices: allocate resources, push for regulatory and target compliance, supervise external managers, and take investment-decisions based on the results of engagement.

5. Encourage sharing and adopting sustainable finance best practices

- Our literature review and interviews confirmed that pension funds are looking for IOPS to provide them with a better understanding of ESG issues. There is a critical need for IOPS to foster sustainable literacy among pension funds, and inform its constituents about strategies increasingly developed by corporations, banks, asset owners and other financial institutions. Moreover, given the remaining open questions about which further regulation pension funds would benefit from—especially with regard to climate risk, e.g. island states at risk with pension portfolios invested largely in local economies highly at risk from climate change, countries without adequate

retirement schemes—there is the need for a stronger and central player.

- The lack of awareness and knowledge about ESG incorporation is an acute issue across pension funds, with some exceptions (e.g. in Western Europe). Beside IOPS, pension funds can build a platform to share best-practices and advance the sustainable investment-practices. On the model of Climate 100+ led by a coalition of companies, or on that of the TCFD, led by a network of financial institutions, there is an opportunity for pension funds to take the driving seat in the sustainable finance agenda.
- A critical area of intervention regards ESG disclosure and reporting. Pension funds should adopt a united stance on ESG disclosure and reporting. Given the scattered state of regulation on this topic—from national regulations without any ESG-related framework to others requiring pension funds to include and disclose ESG integration—there is a risk of “ESG-dumping”. A coalition of pension funds can work with IOPS and the regulators to develop knowledge on how to report on ESG factors, alongside other financially material factors, to their members and stakeholders, and to adopt a universal mandatory framework on ESG integration and disclosure. Our study stresses out the need to require pension funds to i) document and implement ESG integration in their investment policy, and ii) disclose to members and stakeholders how they plan to address ESG factors, stewardship, engagement, and any other non-financial factors.

→ Take a stronger and common stance on sustainable finance practices, including ESG disclosure and reporting, and regulatory framework led by IOPS and supported by a global coalition of pension funds.

Appendix 1: Case Studies

To gain insight into how individual pension funds were crafting their sustainable investment strategies within existing climate risk and regulation frameworks, the team conducted extensive desk review and a series of interviews with pension fund administrators. These case studies are intended to be viewed as a complementary, stand-alone counterpart to our main report. However, the conclusions we drew from these case studies were essential to our analysis. Thus, they are included here as an appendix.

The pension funds profiled were as follows:

Country	Pension Fund
Canada	Canada Pension Plan Investment Board (CPPIB)
Japan	Government Pension Investment Fund (GPIF)
The Netherlands	Stichting Pensioenfondsen ABP (ABP)
Norway	Government Pension Fund of Norway (GPFNG)
United States	New York State Common Retirement Fund (NYSCRF)

Overall, these case studies were drawn from a pool of pension funds that were relatively similar in asset size and all came from high income economies. Each pension had a specifically articulated climate strategy that was separate from its overall sustainable investment strategy, which indicates that pension funds are paying attention to greening.

Implementation of pension fund greening varied widely on:

- **Regulatory environment** ranged from those in heavy-touch (GPIF, ABP) to light touch regulatory environments (NYSCRF). Thus, the funds were likely able to execute their climate strategy regardless of the regulatory environment because of their prominence as large asset holders, and their strongly established internal investment processes. Smaller funds, however, will lag behind without the implementation of clear regulations.
- **Climate investment strategies** ranged from emissions-focused (GPIF), to more holistic environmental considerations that included natural capital (ABP, GPFNG). Pension funds that are focused solely on energy efficiency and emission-reductions could be missing climate opportunities in the adaptation space.
- **Quantitative climate goals and/or disclosures** were lacking for almost all funds. Though each fund had a well-articulated climate strategy that included specific objectives, many failed to define these objectives in numeric terms, such as CPPIB and NBIM. If they did, then they did not report how they were greening each asset class.

1. Canada - CPPIB

The Canada Pension Plan Investment Board (CPPIB) is the asset manager that invests on behalf of the Canada Pension Plan, which is located in Toronto, Ontario, and was founded in 1999. The CPPIB manages CAD\$420.4 billion in assets on behalf of the Canada Pension Plan's 20 million contributors and beneficiaries.⁵⁷ The CPPIB has a singular objective: to maximize long-term investment returns without undue risk, taking into account the factors that may affect the funding of the Canada Pension Plan and its ability to meet its financial obligations.⁵⁸

Economic, political, and regulatory context

By 2030, seniors will number over 9.5 million and make up 23 percent of Canadians, which is expected to significantly pressure its pension fund.⁵⁹ In Canada, the general public has been vocal about environmental and social issues, which provides a great context in which to develop ESG practices. For example, Canadian miner Teck Resources was forced to shelve its controversial oil sands project in Alberta after a wave of public opposition from indigenous and environmentalist groups.⁶⁰ This event, and similar events, have illustrated the financial materiality of ESG considerations to Canadian investors and shareholders.

In terms of political context, the assets are strictly segregated from government funds. CPPIB is governed by the CPPIB Act, in which the assets of the Fund are managed in the best interest of the Canadian contributors and beneficiaries who participate in the Canada Pension Plan. The CPPIB Act has safeguards against any political interference. CPP Investments operates at arm's length from federal and provincial governments with the oversight of an independent, highly qualified professional Board of Directors. CPP Investments' management reports not to the government, but to the CPP Investments Board of Directors.⁶¹ The CPP Investments Board approves investment policies, determines the organization's strategic direction with management, and makes critical operational decisions.

Sustainable Investment Strategy

CPPIB believes that considering ESG factors in investment decisions and asset management activities will lead to better long-term investment performance across the fund. The Sustainable Investing (SI) group works with the investment teams to ensure that ESG risks and opportunities are incorporated into investment decision-making and asset management activities. The group also supports CPPIB's role as an active, engaged owner. It works to enhance the long-term performance of companies in which CPPIB invests by engaging, either individually or collaboratively, with other investors. Engagement activity is directed at companies that present material ESG risks and opportunities. This is determined by research into the company, industry and region, along with an examination of industry standards and global best practices related to ESG. CPPIB helped formulate the PRI under invitation from the United Nations Secretary-General in 2005. In January 2018, a member of the SI group joined the PRI's Private Equity Advisory Committee (PEAC) for a three-year term. Rather than excluding companies from CPPIB's Investment Portfolios based on ESG factors, SI works with them to promote positive changes on ESG issues that they believe are material to investment value. The SI Group has five engagement focus areas: climate change, water, human rights, executive compensation and board effectiveness.⁶²

⁵⁷ "About Us," CPP Investments, 2020, <https://www.cppinvestments.com/about-us>.

⁵⁸ "Our Mandate," CPP Investments, 2020, <https://www.cppinvestments.com/about-us/our-mandate>.

⁵⁹ "Action for Seniors" (Government of Canada, 2014), <https://www.canada.ca/en/employment-social-development/programs/seniors-action-report.html>.

⁶⁰ "Teck Oil Sands Project Splits Canada's Indigenous People, Poses Challenge for Trudeau," *Reuters*, January 21, 2020, <https://www.reuters.com/article/us-canada-crude-teck-resources-idUSKBN1ZK2MB>.

⁶¹ "Governance Overview," CPP Investments, 2020, <https://www.cppinvestments.com/about-us/governance>.

⁶² "Sustainable Investing: How We Invest," CPP Investments, 2020, <https://www.cppinvestments.com/the-fund/sustainable-investing>.

Climate Investment Strategies

Energy & Resources

The Energy & Resources (E&R) group pursues investments in traditional energy production, mining, and transport and storage. It works with portfolio companies to prioritize evaluation and monitoring of ESG factors. This year E&R launched an Innovation, Technology and Services (ITS) strategy, with a mandate to seek early-stage investments aligned with their broader sub-sector strategies and energy transition. The E&R group has noticed that the industry is undergoing a significant shift to new, earlier-stage technology companies that are both creating and improving existing processes and technologies. This creates opportunities for innovative technology companies to become a large and critical segment of the E&R investing landscape.

Power & Renewables

The Power & Renewables (P&R) group's mandate is to explore opportunities created by the global energy market's transition, as well as overall global growth in demand for power – particularly for low-carbon energy alternatives. The group was created to help access attractive investments in the sector, since the industry's dynamics align closely with CPPIB's competitive advantages – notably its scale, flexibility and long-term horizon. P&R focuses on strategic opportunities and the ability to apply long-term investment horizons, with latitude to explore promising, less mature development and greenfield investments. Over the past year, P&R has focused on establishing and deepening strong relationships with strategic companies in renewables. This includes the continued success of its partnership with Brazil's Votorantim Energia, which provides access to a growing and attractive Brazilian power market, especially in hydropower.

Green Buildings

CPPIB's real estate team is focused on acquiring assets with high sustainability metrics that align with their long-term investment goals. The level of green certification is one of the most important metrics they use to assess asset quality. CPPIB's partners in real estate acquisition and management take Leadership in Energy and Environmental Design (LEED) or equivalent ratings into account when building and operating their property portfolios. CPPIB also looks for opportunities to enhance the performance of existing buildings through upgrades and redevelopment. Today, their 25-country portfolio has a total of 295 green-certified buildings. This includes 101 LEED-certified buildings, with 12 earning the LEED Platinum (highest level) certification, and 47 earning LEED Gold certification.⁶³

Euro-denominated Green Bond

CPPIB's Green Bond Framework defines a green bond as a type of fixed-income instrument that is specifically earmarked to raise money for climate and environmental projects, such as Renewable Energy (wind and solar); and Green Buildings (LEED Platinum certified). In 2018, CPPIB became the first pension fund manager to issue green bonds.⁶⁴ In January 2019, it reached another milestone with the issuance of euro-denominated green bonds (€1 billion in 10-year fixed-rate bonds). Green bonds provide additional funding to CPPIB to help it acquire strong and long-term investments consistent with its Green Bond Framework.⁶⁵

⁶³ "2019 Report on Sustainable Investing: Investing Responsibly for CPP Contributors and Beneficiaries" (CPP Investment Board, 2019), <https://cdn3.cppinvestments.com/wp-content/uploads/2020/05/PPP-Investments-2019-sustainable-investing-report-v5-en.pdf>.

⁶⁴ "Canada Pension Plan Investment Board to Issue Green Bonds," *CPP Investments* (blog), June 11, 2018, <https://www.cppinvestments.com/public-media/headlines/2018/cppib-issue-green-bonds>.

⁶⁵ "Canada Pension Plan Investment Board Issues Euro Green Bonds," *CPP Investments* (blog), 2019, <https://www.cppinvestments.com/public-media/headlines/2019/cppib-issues-euro-green-bonds>.

2. Japan - GPIF⁶⁶

Japan's Government Pension Investment Fund (GPIF) is the largest pension fund in the world, with approximately ¥160 trillion in assets under management. That figure includes 5,111 stocks and bonds from 3,457 issuers. GPIF invests the Japanese pension reserve fund, which pays out national pensions. Its goal is to maintain a stable pension system by earning returns on investment and making distributions. GPIF defines itself as a universal owner and super long-term investor, given its 100 year investment horizon.

Economic, political, and regulatory context

Japan is the world's oldest nation, with more than 20 percent of the population aged over 65. This demographic pressure is expected to significantly affect the pension system.⁶⁷ As a public pension fund, GPIF is an independent governmental entity. Although it is administered by a board of market practitioners, its close relationship to government creates regulatory synergy that is useful in advancing ESG objectives. For example, GPIF participated in the drafting of Japan's Stewardship Code. The 2020 revision is more prescriptive than previous iterations: under Principle 1 of the code institutional investors are directed to enhance medium- to long-term return on investments by engaging in constructive engagement or dialogue with investee companies, based on consideration of both the business environment and sustainability, which includes ESG factors.⁶⁸ At the international level, GPIF is a signatory of the PRI and Climate Action 100+, and releases climate-related financial information in accordance with TCFD guidelines.⁶⁹

Sustainable Investment Strategy

Passive investments make up 90% of GPIF's equity investments and 70% of fixed income investment. GPIF has allocated ¥3.5 trillion to passive funds tracking five ESG equity indexes. The indexes are:

- MSCI Japan Empowering Women Index (WIN);
- MSCI Japan ESG Select Leaders Index;
- FTSE Blossom Japan Index;
- S&P/JPX Carbon Efficient Index for Japanese equities; and
- S&P Global Ex-Japan LargeMidCap Carbon Efficient Index for non-Japanese equities.

Four out of five of the ESG indexes financially outperformed their parent indexes as of 2018. GPIF also measures the progression of ESG scores of its equity portfolio over time: using ESG ratings from FTSE and MSCI they calculate a market-cap weighted average ESG rating for each portfolio that is tracked over time, and so far has been improving year-on-year.⁷⁰

⁶⁶ Each reference in this section is from the GPIF's ESG database or from in-person interviews, unless otherwise stated. Database retrievable at: "ESG," Government Pension Investment Fund, 2020, <https://www.gpif.go.jp/en/investment/esg.html>.

⁶⁷ Simran Walia, "How Does Japan's Aging Society Affect Its Economy?," *The Diplomat*, November 13, 2019, <https://thediplomat.com/2019/11/how-does-japans-aging-society-affect-its-economy/>.

⁶⁸ "Japan's Stewardship Code" (The Council of Experts on the Stewardship Code, March 24, 2020), <https://www.fsa.go.jp/en/refer/councils/stewardship/20200324/01.pdf>.

⁶⁹ "Study of ESG Information Disclosure: Final Report" (Nissay Asset Management, commissioned by GPIF., March 2019), https://www.gpif.go.jp/en/investment/research_2019_EN.pdf.

⁷⁰ "ESG Report 2018" (Government Pension Investment Fund, September 6, 2019), https://www.gpif.go.jp/en/investment/190905_Esg_Report.pdf.

External managers cover approximately 90 percent GPIF's portfolio, with a very small proportion of investments being managed in-house. When choosing and subsequently monitoring external managers' investment policies and other processes, GPIF considers whether they integrate ESG in fundamentals.

Stewardship and engagement form the last pillar of GPIF's ESG Strategy. Notably, GPIF does not practice divestment in any form. GPIF's external asset must "comply-or-explain" with the Stewardship Principles and vote accordingly. GPIF also engages in dialogue with index providers and ESG evaluators. They quantitatively measure ESG score correlation between MSCI and FTSE each year to see how they converge.⁷¹

Climate Investment Strategies

Environmental Stock Indexes

Among the five ESG indexes, two are climate-specific and carbon-focused. As of March 2019, ¥87 billion domestically and ¥1.2 trillion overseas has been invested in these two portfolios. The indexes have two main characteristics: they overweigh companies that have high carbon efficiency (low Carbon-to-Revenue footprints) and/or good disclosure, and adjust companies based on the environmental impact of their industry. The S&P/JPX Carbon Efficient Index also covers all companies in the first section of the Tokyo Stock Exchange, which is broader than most ESG indexes.⁷²

Supporting the Green Bond Market

GPIF has been active in the green bonds market with ¥3 billion invested in green bonds since 2019. The fund has worked with the World Bank to generate insights into fixed income investment in ESG.⁷³ GPIF has partnered with green bond issuers and instructed external asset managers to incorporate green bonds into their portfolios. To date, GPIF has established partnerships with more than 10 global banks on their green bond initiatives, including BNG Bank, Kommuninvest, KfW, and several DFIs.⁷⁴

Portfolio Climate-Related Risk Assessment

GPIF has produced a portfolio climate-related risk assessment that is disclosed in line with TCFD recommendations. This analysis measures both current and future carbon exposure for its portfolio. In terms of current performance, GPIF reports the overall carbon footprint of its portfolio, carbon disclosure metrics of investee companies, and fossil fuel and stranded asset exposure. In its forward-looking scenario analysis, GPIF assesses the alignment of its portfolio with a 2 Degree Scenario both in terms of energy transition and GHG transition pathways.⁷⁵ As of 2018, only domestic corporate bond investments were aligned with an under 2 Degree Scenario.⁷⁶ In addition, GPIF stress-tests each investee's ability to absorb currently "unpriced" cost of carbon that is likely to materialize when carbon pricing mechanisms become mandatory.⁷⁷

⁷¹ "ESG Report 2018."

⁷² "GPIF Selected Global Environmental Stock Indices" (Government Pension Investment Fund, September 25, 2018), <https://www.gpif.go.jp/en/%28Full%20version%29GPIF%20Selected%20Global%20Environmental%20Stock%20Indices.pdf>.

⁷³ Inderst and Stewart, "Incorporating Environmental, Social and Governance Factors into Fixed Income Investment."

⁷⁴ "ESG."

⁷⁵ "GPIF Climate Related Portfolio Risk Assessment" (Trucost, August 2019), https://www.gpif.go.jp/en/investment/trucost_report_en.pdf.

⁷⁶ "ESG Report 2018."

⁷⁷ "GPIF Climate Related Portfolio Risk Assessment."

3. Netherlands - ABP

ABP is the Dutch pension fund for government and education sector employees. With approximately \$460 billion in assets under management, it is the largest pension fund in Europe and the fifth largest in the world.⁷⁸ ABP's stated mission is to secure a good pension for all, that can be enjoyed in a livable world, in exchange for an affordable contribution. Its three-part vision promises to consult stakeholders, build an attractive benefit, and guarantee both a good pension and a good future.⁷⁹

Economic, political, and regulatory context

With regards to responsible investment, Dutch pension funds are governed by The Code of Dutch Pension Funds and the Pension Act. Taken together, these mandate a) fiduciary duty, b) consultation with stakeholders regarding the responsible investment policy, c) disclosure of the responsible investment policy in the annual report or website, and d) disclosure of how their investment policy "takes account of issues relating to the environment, climate, human rights, and social relations". In addition, there are several provisions relating to governance, and all Dutch pension funds are prohibited from investing in cluster munition.⁸⁰

In the Netherlands, 19 percent of the population is elderly which is putting increasing pressure on the pension system.⁸¹ At the same time, the Dutch public are actively engaged with ESG issues: in 2007, there was significant opposition to pension investments in cluster bombs, land mines, and child labor; more recently, activists have criticized ABP's investments in fossil fuels.⁸² Thus, ABP and other funds have responded by self-regulating. ABP is a signatory of the IMVO Covenant: Dutch Pension Funds Agreement on Responsible Investment, in which pension funds committed to adhere to the OECD Guidelines for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights. Additionally, ABP has committed to the UN Global Compact, the PRI, and Climate Action 100+.⁸³

Sustainable Investment Strategy

ABP's investment strategy considers four factors: return, risk, cost, and socially responsible and sustainable values. The fund has identified three major transitions it believes will impact firm value in the long-term, and has made specific commitments to reach by 2025 in each area:

1. In terms of **climate change**, ABP commits to:
 - Reduce the CO2 concentration of their equity portfolio by 40 percent
 - Phase out investments in coals minds and tar sands
 - Establish more stringent climate criteria in the inclusion policy
 - Engage with companies that impact emissions, in conjunction with Climate Action 100+
 - Publish climate targets in line with the Dutch Climate Agreement by 2022.
2. In terms of **conservation of natural resources**, ABP commits to:
 - Invest more in companies that have circular business models, and those that create solutions for food scarcity
 - Double green real estate holdings
 - Establish criteria that assesses companies on their responsible use of natural resources

⁷⁸ "Top 20 Pension Funds' AUM Declines for First Time in Seven Years," Willis Towers Watson, September 3, 2019, <https://www.willistowerswatson.com/en-US/News/2019/09/top-20-pension-funds-aum-declines-for-first-time-in-seven-years>.

⁷⁹ "ABP Annual Report 2018" (ABP, 2018), <https://www.abp.nl/images/ABP-ENG-Annual-report-2018.pdf>.

⁸⁰ "Service Document on Responsible Investment" (The Hague: Federation of the Dutch Pension Funds, June 2016), <https://www.pensioenfederatie.nl/stream/servicedocument-responsibl-investment.pdf>.

⁸¹ "Population Ages 65 and above (% of Total Population)," World Bank Open Data, 2018, https://data.worldbank.org/indicator/sp.pop.65up.to.zs?most_recent_value_desc=true.

⁸² Vibeka Mair, "ESG Country Profile: The Netherlands," *Responsible Investor*, November 28, 2019, <https://www.responsible-investor.com/articles/esg-country-profile-the-netherlands>.

⁸³ "ABP Stewardship Policy" (ABP, n.d.), <https://www.abp.nl/images/stewardship-policy.pdf>.

3. In terms of **digitalization**, ABP commits to:

- Encourage companies to invest more in companies that are contributing to sustainable solutions with their products/services
- Establish criteria to assess whether companies are protecting the digital rights – e.g. to privacy – of workers and users

Additionally, ABP will continue to focus on its previously stated areas of interest: human rights and the Sustainable Development Goals. In 2025, they aim to have 20 percent of total assets qualify as contributing to the SDGs, and to continue to both rigorously assess and engage on human rights issues.⁸⁴ Thus, their stewardship activities will consist of proxy voting, monitoring sustainability scores of companies, engaging with laggards, and collaborating with other investors. In 2018, an assessment 7,700 investments showed that out of approximately 10,000 total investment, 5,600 were leaders and 2,100 were laggards.⁸⁵

Climate Investment Strategies

With the 2020-2025 Sustainable Investment policy, ABP identified two priority areas for green assets: climate change, and conservation of natural resources. They have yet to define how they will invest in natural resources, but the 2018 Sustainability Report provides some insight on how they invest in climate change mitigation and adaptation:

- **Climate risk assessment:** ABP has a climate dashboard that tracks 25 indicators – e.g. demand for oil and gas, investment in renewable energy – to see which indicators are on track to meet the Paris target (1.5 – 2 temperature rise). From this, ABP identifies two scenarios: a 3.7 degree scenario “climate pit” and a 2-degree, Paris-compliant scenario “good globalization”. Based on their scenario analysis, ABP compiled an inventory of the expected impact in 26 sectors in 2022, 2030, 2040. ABP recognizes three types of climate risks: policy & regulations, technology, market & reputation, and physical impact. Within each of these categories, they identify 44 unique sources of climate risk and opportunity. The likelihood of each of these occurring is determined by scenario analysis, using the 2022, 2030, and 2040 scenarios. ABP further clusters each of these sectors into four clusters, based on the expected impact of climate change: solutions (e.g. renewable energy); transition (e.g. real estate); decreasing (e.g. coal); and neutral (e.g. telecom).
- **CO2 footprint:** ABP inventories how much CO2 is emitted by each portfolio company, and how much of that can be attributed to ABP. They constantly monitor the CO2 footprint of their equity portfolio and plan to reduce it by 40 percent by 2025. ABP uses a best-in-class approach to decarbonize its equity portfolio – they look at the emission of the company per euro that they invest, and choose to invest in the companies that are the lowest emitters in the given priority sectors, e.g. mining, chemicals, steel.
- **Deforestation and fossil fuels:** ABP opposes deforestation, specifically in the Cerrado region, and calls on those who directly/indirectly support it to ban deforestation in their supply chain. Though ABP recognizes the need to reduce production and reliance on fossil fuels, its policy holds that some investment in fossil fuels is: a) necessary until renewable energy can wholly support electricity generation, and b) an avenue for engagement with fossil fuel companies that divestment would not afford.⁸⁶

⁸⁴ “ABP’s Sustainable and Responsible Investment Policy (2020-2025)” (ABP, January 30, 2020),

<https://www.abp.nl/images/summary-sustainable-and-responsible-investment-policy.pdf>.

⁸⁵ ABP, “Sustainable and Responsible Investment 2018,” 2018, <https://www.abp.nl/images/responsible-investment-report-2018.pdf>.

⁸⁶ ABP.

4. Norway - Norwegian Government Pension Fund Global

The Norwegian Government Pension Fund Global (Norway GPFG) is a Sovereign Wealth Fund located in Oslo. Established in 1990 to invest surplus revenues of the Norwegian petroleum sector, it is the world's largest sovereign wealth fund. The fund had a market value of 10,088 billion NOK at the end of 2019. The fund's return before management costs was 19.9 percent, measured in the fund's currency basket.

⁸⁷ As a long-term and global financial investor, GPFG is dependent on sustainable development, well-functioning markets, and good corporate governance.

Economic, political, and regulatory context

The formal framework for GPFG is defined by Norway's parliament - Stortinget - in the Government Pension Fund Act. Norway's Ministry of Finance has overall responsibility for the fund and has issued guidelines for its management in the Management Mandate. Norges Bank Investment Management (NBIM) implements the management mandate in accordance with instructions and mandates from Norges Bank's Executive Board.⁸⁸

Norway has a high level of GDP per capita and inclusiveness, supported by a dynamic business environment, sound petroleum-wealth management, and comprehensive welfare and public services. Strong government incentives and support for ESG integration constitute a positive policy environment for ESG integration. For example, environmental taxation is a core mechanism of the Norwegian government's plan to reduce non-ETS greenhouse-gas (GHG) emissions and address other environmental issues.⁸⁹ This sends a strong signal to other investors both at home and abroad that adopting climate-oriented investment strategies is in line with government's policies.

NBIM has operated a responsible investor strategy since 2004, when it also established the Council on Ethics and set ethical guidelines including criteria for both product- and conduct-based violations. While NBIM adheres to the Council on Ethics' guidelines, it can develop its own recommendations. In 2018, GPFG took part in a pilot project alongside 20 global institutional investors under the UN Environment Programme's Finance Initiative (UNEP FI) to develop models for reporting in line with the TCFD recommendations.⁹⁰ GPFG is also a prominent example of a transparent fund, given its disclosure of detailed information about its portfolio and responsible investments.

Sustainable Investment Strategy

Exclusion and observation

1. GPFG reduces exposure to unacceptable risks by divestment from companies with high long-term risks according to criteria for both product- and conduct-based violations. Norges Bank makes decisions on the exclusion and observation of companies after receiving a recommendation from the Council on Ethics. The Bank can also develop its own

⁸⁷ "Government Pension Fund Global Annual Report 2019" (Norges Bank Investment Management, 2019), https://www.nbim.no/contentassets/3d447c795db84a18b54df8dd87d3b60e/spu_annual_report_2019_en_web.pdf.

⁸⁸ "Government Pension Fund Global Annual Report 2019."

⁸⁹ "Better Growth, Lower Emissions: The Norwegian Government's Strategy for Green Competitiveness" (Norwegian Ministry of Climate and Environment, June 2018), <https://www.regjeringen.no/contentassets/4a98ed15ec264d0e938863448ebf7ba8/t-1562e.pdf>.

⁹⁰ "Responsible Investment: Government Pension Fund Global" (Norges Bank Investment Management, 2019), https://www.nbim.no/contentassets/aaa1c4c4557e4619bd8345db022e981e/spu_responsible-investments-2019_web.pdf.

recommendations with the direct capacity to advance its responsible investment strategies. This exclusion strategy is an important channel for NBIM to apply its responsible investment strategy. So far, NBIM has divested 282 companies that do not comply with its ethical guidelines.

2. Given the product-based criteria, GPFG must not be invested in companies that produce certain types of weapons, base their operations on coal, or produce tobacco. Since 2016, two new ethically motivated exclusion criteria have been introduced for the fund. The first is aimed at companies whose acts or omissions, to an unacceptable degree, entail greenhouse gas emissions. The second targets mining companies and energy producers with a 30 percent threshold for revenues derived from, or operations based on, thermal coal. Moreover, Norway's Ministry of Finance expanded the coal criterion in 2019 to include mining and power companies that produce more than 20 million tons of thermal coal per year or have coal-based power generation capacity of more than 10,000 MW, regardless of total revenue or total power output.⁹¹ 104 companies that produce certain types of weapons, tobacco or coal, or use coal for power production, have been excluded from the fund since 2012.
3. Apart from the product-based criteria, GPFG also divests on a conduct-based criteria from companies that impose substantial costs on other companies and on society as a whole, and so will probably not be profitable in the longer term. When companies are excluded from the fund based on ethics, they are also removed from the benchmark index, which has reduced the cumulative return on the equity benchmark index by 0.07 and 0.03 percentage point annually, respectively for the two criteria.

Responsible ownership strategy

The NBIM responsible ownership strategy involves exercising voting rights, interacting with companies and engaging with boards, in order to safeguard the GPFG's assets. Besides, NBIM publishes research documents to set out expectations for companies in terms of governance, children's rights, climate change, water management and ocean sustainability.

Climate Investment Strategies

Expectation setting

1. NBIM's Climate Strategy document is unique in that it sets out expectations for how investee companies should assess climate risks and opportunities. GPFG recommends that companies do so in four steps: a) integrate climate change considerations into policies and strategy; b) integrate material climate change risks into risk management, c) disclose material climate change information; and d) engage transparently and responsibly on climate change policy.⁹²
2. The fund's expectations are based on internationally recognized principles such as the UN Global Compact, the UN Guiding Principles on Business and Human Rights, the G20/OECD Principles of Corporate Governance, the OECD Guidelines for Multinational Enterprises and other topic-specific standards. The fund launches reports of climate change annually that serve as a starting point for interacting with companies on climate change. The fund encourages companies to address this topic in a manner meaningful to their business model and wishes to support them in their efforts.

⁹¹ "Responsible Investment: Government Pension Fund Global."

⁹² "Climate Change Strategy: Expectations Towards Companies" (Norges Bank Investment Management, 2019), <https://www.nbim.no/contentassets/acfd826a614145e296ed43d0a31fdcc0/climate-change-2019.pdf>.

Environment-related investments

1. The Bank will establish mandates for environment-related investments. At the end of 2019, GPFG had 62.3 billion kroner invested in shares in 77 companies and 17.1 billion kroner invested in green bonds under dedicated environmental mandates. The market value of the environment-related investments will normally be in the range of 30-120 billion kroner.⁹³
2. The environment-related investment mandates will be directed towards environmentally-friendly assets or technology. The investments are in three main areas: low-carbon energy and alternative fuels; clean energy and energy efficiency; and natural resource management. Companies must have at least 20 percent of their business in one of these areas to be included in the environmental universe.
3. The Bank will seek to contribute to further diversification by broadening the fund's investments by investing in renewable energy infrastructure and real estate. Unlisted renewable energy infrastructure was not added to the mandate until November 2019. In its management of the unlisted real estate portfolio, the Bank will, within the environmental field, consider, among other matters, energy efficiency, water consumption and waste management.

Carbon footprint

1. GPFG follows the recommendations for asset managers from the Task Force on Climate-related Financial Disclosures (TCFD) when calculating the fund's carbon footprint. Carbon footprint has been the standard methodology for measuring the effects of a portfolio decarbonization strategy.
2. The fund analyzes carbon emissions from companies in the portfolio and various climate scenarios for the fund. At the portfolio level, GPFG calculates emissions in relation to the fund's holding, revenue and market value. The fund reports emissions data at sector level, for the benchmark index and for the FTSE Global All Cap index, which is the starting point for the benchmark index defined by the Ministry of Finance. Based on the percentage share of ownership, companies in the equity portfolio emitted 108 million tons of CO₂-equivalents. Compared to calculations on the carbon footprint of the companies in the benchmark index would have been without any ethical exclusions, these exclusions have reduced the benchmark index's carbon footprint by 19 percent, due mainly to exclusions under the coal criterion.⁹⁴

⁹³ "Responsible Investment: Government Pension Fund Global."

⁹⁴ "Responsible Investment: Government Pension Fund Global."

5. United States - NYS Common Retirement Fund

The New York State Common Retirement Fund (NYSCRF) is the third largest public pension plan in the United States, with a market value of \$210.5 billion in assets held in trust for pension benefits as of March 31st, 2019.⁹⁵ Under its mission to provide beneficiaries with a secure pension through prudent asset management, and a vision to be a high-performing organization with the highest standards of ethics and investment management, NYS Common Retirement Fund is widely recognized as a leader in the green finance space.⁹⁶

The New York State Common Retirement Fund operates under the Office of the New York State Comptroller and the NY State Department of Finance. However, the fund is free to set its own policy regarding ESG investing. NYSCRF also adopts a sole trustee model that enables Comptroller DiNapoli, the sole trustee responsible for managing NYSCRF, to act quickly to respond to market changes and to protect the Fund. In 2019, Comptroller DiNapoli released a Climate Action Plan that delineates CRF's actions in: a) identification and assessment, b) investment and divestment, and c) engagement and advocacy. The plan serves as a roadmap for NYSCRF to address climate risks and opportunities across all asset classes.⁹⁷

Economic, political, and regulatory context

The United States is the world's largest economy with an increasing elderly population. As of 2018, there exist 51.6 million elderly Americans which counts for 15.8 percent of the total population.⁹⁸ The amount is increasing rapidly and is expected to reach 90 million in 2050, which is increasingly pressuring the nation's pension system. In the US, the Department of Labor has determined that fiduciaries can consider ESG factors as long as: a) the decision-making process complies with existing standards, and b) the investment is financially and economically competitive.⁹⁹ As a pension fund with commitment to robust ESG practices, NYSCRF continues to support environmental green programs given the climate change situation at both the state and international levels.

Sustainable Investment Strategy

NYSCRF aspires to be an industry leader in addressing ESG concerns and practicing sustainable investing. The fund rigorously considers ESG factors in its investment process under the belief that ESG factors profoundly influence both risk and return. Since it became a signatory of CDP's annual climate change disclosure request to companies in 2004, the fund has concentrated on ESG-focused investment strategies and committed over \$5 billion to investments in clean energy, clean technology, energy

⁹⁵ "Pension Fund Overview," Office of the New York State Comptroller, March 31, 2019, <https://www.osc.state.ny.us/pension/snapshot.htm>.

⁹⁶ "General Investment Policies for the New York State Common Retirement Fund" (Office of the New York State Comptroller, August 1, 2017), <https://www.osc.state.ny.us/pension/generalpolicies.pdf>; "New York State Common Retirement Fund," Office of the New York State Comptroller, March 31, 2019, <https://www.osc.state.ny.us/pension/>; "Global Climate Index 2017" (Asset Owners Disclosure Project (AODP), 2017), https://aodproject.net/wp-content/uploads/2017/04/AODP-GLOBAL-INDEX-REPORT-2017_FINAL_VIEW.pdf.

⁹⁷ "New York State Common Retirement Fund: Climate Action Plan 2019" (Office of the New York State Comptroller, June 2019), <https://www.osc.state.ny.us/pension/climate-action-plan-2019.pdf>.

⁹⁸ "Population Ages 65 and above (% of Total Population)."

⁹⁹ John J. Canary, "Field Assistance Bulletin No. 2018-01" (2018), <https://www.dol.gov/agencies/ebsa/employers-and-advisers/guidance/field-assistance-bulletins/2018-01>.

efficiency, and sustainable businesses. NYSCRF has also launched various programs such as the Corporate Governance Program as an effort to build robust industry standards that will give ESG issues the consideration they are due.

The Fund's ESG Strategy identifies the following goals for the integration of ESG factors into decisions about its directly managed portfolio and the practices of its investment managers:

- Create an ESG Risk Assessment to evaluate external managers' ESG policies and performance.
- Develop a method to assess ESG materiality for each investment.
- Pursue ESG investment initiatives, such as building a customized, Risk-Aware, Low Emission index for the Fund's public equities portfolio.¹⁰⁰

The Fund adopts both market-level and investment-level approaches to achieve these objectives. The market-level approach helps NYSCRF implement ESG strategies through active ownership, partnerships, and research. As both a "universal owner" and a perpetual owner of a range of assets, NYSCRF focuses on ESG issues that affect the market as a whole and pursues engagements on ESG issues with systemic implications across sectors.¹⁰¹ NYSCRF implements such active ownership through collaborating with its partners such as the UN PRI, CDP, and Bloomberg. To deepen the Fund's intellectual and professional analyses on key ESG issues, NYSCRF also sponsors research to facilitate innovative programs and approaches.

The investment-level approach has three elements: shareholder engagement at specific companies, assessing the Fund's direct investments against material ESG factors, and assessing its indirect investments by evaluating its external managers' ESG policies. The Fund uses a wide range of tools, including the Sustainability Accounting Standards Board (SASB) materiality map, MSCI ESG data and ratings, and company data disclosed to CDP and other sources, to evaluate ESG materiality at the investment level.

Climate Investment Strategies

NYSCRF has been a global leader in addressing the investment risks and opportunities presented by climate change. It is among the first US-based pension funds to manage climate-related investment risk. The Fund adopts a multi-faceted approach to address climate risk in the investment process. At the heart of its climate investment strategy is the Fund's effort to persuade portfolio companies to adopt responsible climate change policies and to encourage long-term business model changes for a transition to a low-carbon economy.

There are three unique strategies characterize NYSCRF's model:

- **Low Carbon Index Strategy**
In 2016, the Fund, in partnership with Goldman Sachs Asset Management, established a groundbreaking equity index strategy—the first of its kind in the United States for a public pension fund—by creating a low emissions index and seeding it with \$2 billion to further decarbonize the Fund's public equity portfolio.¹⁰² This low-carbon index has a 75 percent lower carbon emissions

¹⁰⁰ "New York State Common Retirement Fund: Environmental, Social and Governance Report" (Office of the New York State Comptroller, March 2017), <https://www.osc.state.ny.us/reports/esg-report-mar2017.pdf>.

¹⁰¹ "New York State Common Retirement Fund: Environmental, Social and Governance Report."

¹⁰² "Corporate Governance Stewardship Report" (Office of the New York State Comptroller, January 2019), <https://www.osc.state.ny.us/reports/esg-report-jan-2019.pdf>.

intensity than its benchmark, achieved by underweighting investments in high emitters and overweighting lower-emitting corporations.

- **Shareholder Engagement**

The Fund's Proxy Voting Guidelines amplify the Fund's position that boards must appropriately manage and comprehensively report on climate and other material ESG risks. Failing to do so may lead the Fund to withhold support from directors. In addition, the Fund has sponsored over 128 climate change-related shareholder proposals and reached agreements with 56 public companies in its portfolio to analyze climate risks, including setting GHG emissions reduction targets and renewable energy and energy efficiency goals.¹⁰³

- **Global Advocacy**

The Fund is actively engaging with the international community to advocate for fully implementing the Paris Agreement and transitioning to a low-carbon economy. Comptroller DiNapoli has attended and spoken at numerous global events, including the United Nations Climate Change Conference, COP23, to raise awareness of the importance of climate investment. In the US, public policy advocacy is also an important strategy. The Fund's public policy advocacy priorities include protecting shareholder rights and fighting against harmful deregulation efforts surrounding climate change through active and direct communications with Congress.¹⁰⁴

¹⁰³ "Corporate Governance Stewardship Report."

¹⁰⁴ "New York State Common Retirement Fund: Climate Action Plan 2019."

Conclusion

Overall, implementation of pension fund greening varied widely. First, in terms of government involvement, the pension funds ranged from those with significant government oversight and cooperation, such as GPIF, to those who by law are insulated from political actions, like the CPPIB. Some operated in environments where ESG integration is mandatory, such as ABP. Others, like NYSCRF, established their own policies within the bounds of voluntary national regulation. It is likely that the selected pension funds were able to execute their climate strategy regardless of the regulatory environment because of their prominence as large asset holders, and their strongly established internal investment processes. Smaller funds, however, will lag behind without the implementation of clear regulations, such as the IOPS guidelines.

Second, the climate investment strategies ranged from emissions-focused, to more holistic environmental considerations. While GPIF focused on decarbonizing its equity portfolio, the European pension funds shifted to an approach that considered natural capital. This is in line with findings mentioned earlier in this report: 93 percent of climate investments are in mitigation, compared to 5 percent in adaptation.¹⁰⁵ Pension funds that are focused solely on energy efficiency and emission-reductions could be missing climate opportunities in the adaptation space.

Third, almost all of the pension funds lacked quantitative climate goals. Though each fund had a well-articulated climate strategy that included specific objectives, many failed to define these objectives in numeric terms, such as CPPIB and NBIM. Additionally, even if the goals had been quantitatively articulated, some pension funds did not report how they were greening each asset class. Notable exceptions were ABP, which did report how many of its holdings were sustainable and GPIF, which did disclose the carbon exposure of its portfolio.

In conclusion, different requirements of risk and return profiles, demographic pressures of different levels, different government policies on energy or disclosure requirements, and changes in the perception of sustainability and climate risk as a financial risk are all factors that can cause gaps between different pension funds globally. However, it is clear that the world's largest pension funds are acting on climate risks and opportunities, and their innovative approaches provide an example of how other funds can follow their lead.

In short

- Our five case studies target pension funds relatively similar in asset size, from high income economies and articulating a robust climate strategy, distinct from their overall ESG strategy.
- The size of pension funds is a key factor influencing the possibility to rule and execute a climate strategy independently of government involvement and regulatory constraint.
- Climate investment plans range from emissions-focused, to complete environmental considerations.
- Several pension funds lacked quantitative climate goals and/or disclosures.

¹⁰⁵ Buchner et al., "Global Landscape of Climate Finance 2019."

Appendix 2: Survey Questionnaire

This survey is designed to identify how each country is thinking about and regulating Environmental, Social, and Governance considerations in the pension industry. The survey contains 15 questions and will take less than 20 minutes to complete.

Your responses will be included on an aggregated basis in a report which is currently being prepared as part of a Columbia University Capstone Research Project for the World Bank. If any direct quotes are used, your consent will be sought in advance of publication and approval requested.

We are looking forward to learning more about your organization's practice and progress.

* Required

Section I. Regulatory Framework

1. Does the pension regulation framework require consideration of ESG factors? If so, in what form? Please check all that apply. *

Check all that apply.

	Not allowed	Voluntary	Mandatory
Incorporation of ESG into investment methodologies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Incorporation of ESG into risk management processes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Stress testing of climate or other risks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Disclosure of ESG risks and opportunities			

Please describe the relevant regulatory framework:

2. Does your supervisory agency provide guidance to pension funds on integrating ESG factors into the investment process? Please check all that apply. *

Check all that apply.

- Yes, guidance on analyzing ESG factors
- Yes, guidance on inclusion and exclusion criteria
- Yes, guidance on incorporating ESG factors into risk management and stress-testing No
- guidance

Please describe the guidance you are providing on ESG integration in detail, or the reason there is insufficient guidance:

3. Does your supervisory agency provide guidance to pension funds on ESG disclosure? Please check all that apply. *

Check all that apply.

- Yes, guidance on disclosure to pension supervisory authority
- Yes, guidance on disclosing substantial financial factors, including ESG, to members and stakeholders
- Yes, guidance on disclosing sustainability factors, including ESG factors, stewardship, and other non-financial factors to members and stakeholders
- No guidance

Please describe the guidance you are providing on ESG disclosure in detail, or the reason there is insufficient guidance:

4. Are there reporting standards for ESG and green investments which are used by the pension funds in your jurisdiction as part of their investment process? Please check all that apply. *

Check all that apply.

- Green taxonomy
- Label bond standards (green/sustainable bonds etc.)
- Green/sustainable loan standards
- Other investment product labeling

Other: _____

5. Does your supervisory agency have any guidelines or requirements in place for the pension funds to consider ESG factors when awarding mandates and monitoring their external asset managers? Please choose one answer. *

Mark only one oval.

- There are strict requirements imposed on the activities of external managers
- There are guidelines for monitoring the activities of external managers but they are not mandatory
- There are no requirements at present but there are plans to implement requirements in the near future
- There are no requirements and no plans to implement requirements

Please describe the guidance you are providing on external managers in detail, or the reason there is insufficient guidance:

6. Have the pension funds under your supervision joined or planned to join SASB, TCFD, or the UN-convened Net-Zero Asset Owner Alliance? Please check all that apply. *

Check all that apply.

- SASB (Sustainability Accounting Standards Board)
- TCFD (Task Force on Climate-related Financial Disclosure)
- United Nation-convened Net-Zero Asset Owner Alliance
- None of them

Other: _____

Section II. Market Practice

7. What is the main driver for the pension funds in your jurisdiction to engage in greening investment? Please choose one answer. *

Mark only one oval.

- Performance
- Stability
- Public Benefit
- Liquidity
- Sustainability
- Diversification
- Independence
- Transparency
- Other: _____

8. What is the main barrier to incorporating ESG factors into investment decisions for the pension funds in your jurisdiction? Please choose one answer. *

Mark only one oval.

- Financial barriers (e.g. fossil fuel subsidies, unpriced carbon externality) Fragmentation
- (e.g. smaller scale of low carbon technologies)
- Trust (e.g. lack of climate-related disclosure, unreliable ESG rating agencies)
- Unclear policy environment (e.g. inconsistency in policy)
- Transition costs
- Fiduciary duty
- Other: _____

9. Which new asset classes do pension funds in your jurisdiction include in the portfolio that are sustainability-related? Please check all that apply. *

Check all that apply.

- Labeled green bonds
- Green infrastructure (e.g. electricity demand-side management technology, smart grids, coastal protection, water infrastructure, etc.)
- Green real estate (e.g. building complying with green standards) Sovereign
- bonds (ESG rated)

Other: _____

Please describe your thoughts and further considerations:

10. How do pension funds in your jurisdiction consider climate-related risks separately from ESG factors? Please check all that apply. *

Check all that apply.

- Incorporate climate-related risks into risk management (e.g. conduct stress test or scenario analysis)
- Incorporate climate-related risks into investment decisions (e.g. incorporate climate-related risks into inclusion or divestment criteria)
- Incorporate climate-related risks into reporting Do
- not consider climate-related risks

Please describe any further considerations:

11. How do pension funds in your jurisdiction engage with the key companies in which they invest on the topic of climate change? Please check all that apply. *

Check all that apply.

- Exercise shareholder voting rights based on climate
- issues Engage with companies on requesting improved disclosure
- Engage with companies on how their business can reduce negative environmental externalities
- No engagement

Please describe the activities:

Appendix 3: IOPS Supervisory Guidelines on the Integration of ESG Factors

The guidance note addresses ten guidelines, which can be summarized as follows:¹⁰⁶

- Overall consideration of ESG factors
 - Guideline 1: supervisory authorities should require consideration of ESG factors, alongside any other financial factors, in their decision-making.
 - Guideline 2: supervisory authorities should clarify to pension funds and asset managers, possibly through regulations or rules, that taking ESG factors into account is consistent with fiduciary duty.
 - Guideline 3: supervisory authorities should clarify that if accounting for non-financial factors in any way sacrifices returns, pension funds must clearly communicate this to members.
 - Guideline 4: supervisory authorities should require that pension funds consider ESG factors, while pursuing their established risk-return objectives.
- Integration of ESG factors
 - Guideline 5: supervisory authorities should require pension funds to document and implement ESG integration in their investment policy. If pension funds choose not to pursue an ESG strategy, they should be required to document their choice.
 - Guideline 6: supervisory authorities should offer guidance to pension funds on how to analyze ESG factors.
- Disclosure of ESG factors
 - Guideline 7: supervisory authorities should require that pension funds report to them on how they integrate ESG factors into their risk and investment management.
 - Guideline 8: supervisory authorities should advise pension funds on how to report ESG factors, alongside other financially material factors, to their members and stakeholders.
 - Guideline 9: supervisory authorities should require that pension funds, in their investment policy, disclose to members and stakeholders how they plan to address ESG factors, stewardship, engagement, and any other non-financial factors.
- Scenario testing of investment strategies
 - Guideline 10: supervisory authorities should encourage pension funds to develop adequate scenario testing of their investment strategy for all significant financial factors, including ESG.

¹⁰⁶ IOPS, "IOPS Supervisory Guidelines on the Integration of ESG Factors in the Investment and Risk Management of Pension Funds," October 22, 2019, <http://www.iopsweb.org/iops-supervisory-guidelines-esg-factors.htm>.

References

- “2019 Report on Sustainable Investing: Investing Responsibly for CPP Contributors and Beneficiaries.” CPP Investment Board, 2019. <https://cdn3.cppinvestments.com/wp-content/uploads/2020/05/Cpp-Investments-2019-sustainable-investing-report-v5-en.pdf>.
- CPP Investments. “About Us,” 2020. <https://www.cppinvestments.com/about-us>.
- ABP. “Sustainable and Responsible Investment 2018,” 2018. <https://www.abp.nl/images/responsible-investment-report-2018.pdf>.
- “ABP Annual Report 2018.” ABP, 2018. <https://www.abp.nl/images/ABP-ENG-Annual-report-2018.pdf>.
- “ABP Stewardship Policy.” ABP, n.d. <https://www.abp.nl/images/stewardship-policy.pdf>.
- “ABP’s Sustainable and Responsible Investment Policy (2020-2025).” ABP, January 30, 2020. <https://www.abp.nl/images/summary-sustainable-and-responsible-investment-policy.pdf>.
- “Action for Seniors.” Government of Canada, 2014. <https://www.canada.ca/en/employment-social-development/programs/seniors-action-report.html>.
- “Annual Survey of Investment Regulation of Pension Funds.” OECD, 2019. <http://www.oecd.org/daf/fin/private-pensions/2019-Survey-Investment-Regulation-Pension-Funds.pdf>.
- Antonich, Beate. “Institutional Finance Update: Investors’ Decisions Impact Climate Change, and Climate Risks Impact Their Portfolios,” May 30, 2019. <http://sdg.iisd.org/news/institutional-finance-update-investors-decisions-impact-climate-change-and-climate-risks-impact-their-portfolios/>.
- “Better Growth, Lower Emissions: The Norwegian Government’s Strategy for Green Competitiveness.” Norwegian Ministry of Climate and Environment, June 2018. <https://www.regjeringen.no/contentassets/4a98ed15ec264d0e938863448ebf7ba8/t-1562e.pdf>.
- “Beyond Their Borders: Evolution of Foreign Investments by Pension Funds.” PwC, 2020. <https://www.alfi.lu/getattachment/bbd902ee-feb9-4534-b68c-ae8c6706f4e/alfi-evolution-of-foreign-investments-by-pension-funds.pdf>.
- Buchner, Barbara, Alex Clark, Angela Falconer, Rob Macquarie, Chavi Meattle, Rowena Tolentino, and Cooper Wetherbee. “Global Landscape of Climate Finance 2019.” Climate Policy Initiative, November 2019. <https://climatepolicyinitiative.org/wp-content/uploads/2019/11/2019-Global-Landscape-of-Climate-Finance.pdf>.
- CPP Investments. “Canada Pension Plan Investment Board Issues Euro Green Bonds,” 2019. <https://www.cppinvestments.com/public-media/headlines/2019/cppib-issues-euro-green-bonds>.
- CPP Investments. “Canada Pension Plan Investment Board to Issue Green Bonds,” June 11, 2018. <https://www.cppinvestments.com/public-media/headlines/2018/cppib-issue-green-bonds>.
- Canary, John J. Field Assistance Bulletin No. 2018-01 (2018). <https://www.dol.gov/agencies/ebsa/employers-and-advisers/guidance/field-assistance-bulletins/2018-01>.
- “CEM Benchmarking,” 2020. <https://www.cembenchmarking.com/>.
- Chen, C., I Noble, J. Coffee, M. Murillo, and N. Chawla. “University of Notre Dame Global Adaptation Index: Country Index Technical Report.” University of Notre Dame, November 2015. https://gain.nd.edu/assets/254377/nd_gain_technical_document_2015.pdf.
- Clark, Gordon L., Andreas Feiner, and Michael Viehs. “From the Stockholder to the Stakeholder: How Sustainability Can Drive Financial Outperformance.” SSRN Scholarly

- Paper. Rochester, NY: Social Science Research Network, March 5, 2015.
<https://doi.org/10.2139/ssrn.2508281>.
- “Climate Change Strategy: Expectations Towards Companies.” Norges Bank Investment Management, 2019.
<https://www.nbim.no/contentassets/acfd826a614145e296ed43d0a31fdcc0/climate-change-2019.pdf>.
- “Corporate Governance Stewardship Report.” Office of the New York State Comptroller, January 2019. <https://www.osc.state.ny.us/reports/esg-report-jan-2019.pdf>.
- “Corporate Pension Funds & Sustainable Investment Study.” Eurosif, 2011.
<http://www.eurosif.org/wp-content/uploads/2014/07/corporate-pension-funds.pdf>.
- DISPOSICIONES de carácter general en materia financiera de los Sistemas de Ahorro para el Retiro (2020).
https://www.gob.mx/cms/uploads/attachment/file/542142/CUF_compilada_20200303.pdf.
- Government Pension Investment Fund. “ESG,” 2020.
<https://www.gpif.go.jp/en/investment/esg.html>.
- “ESG Report 2018.” Government Pension Investment Fund, September 6, 2019.
https://www.gpif.go.jp/en/investment/190905_Esg_Report.pdf.
- “European SRI Study.” Eurosif, 2018. <http://www.eurosif.org/wp-content/uploads/2018/11/European-SRI-2018-Study.pdf>.
- “General Investment Policies for the New York State Common Retirement Fund.” Office of the New York State Comptroller, August 1, 2017.
<https://www.osc.state.ny.us/pension/generalpolicies.pdf>.
- “Germanwatch,” 2020. <https://germanwatch.org/en>.
- “Global Climate Index 2017.” Asset Owners Disclosure Project (AODP), 2017.
https://aodproject.net/wp-content/uploads/2017/04/AODP-GLOBAL-INDEX-REPORT-2017_FINAL_VIEW.pdf.
- “Global Guide to Responsible Investment Regulation.” Principles for Responsible Investment, 2016. <https://www.unpri.org/download?ac=325>.
- OECD. “Global Pension Statistics,” 2019. <http://www.oecd.org/daf/fin/private-pensions/globalpensionstatistics.htm>.
- CPP Investments. “Governance Overview,” 2020. <https://www.cppinvestments.com/about-us/governance>.
- “Government Pension Fund Global Annual Report 2019.” Norges Bank Investment Management, 2019.
https://www.nbim.no/contentassets/3d447c795db84a18b54df8dd87d3b60e/spu_annual_report_2019_en_web.pdf.
- “GPIF Climate Related Portfolio Risk Assessment.” Trucost, August 2019.
https://www.gpif.go.jp/en/investment/trucost_report_en.pdf.
- “GPIF Selected Global Environmental Stock Indices.” Government Pension Investment Fund, September 25, 2018.
<https://www.gpif.go.jp/en/%28Full%20version%29GPIF%20Selected%20Global%20Environmental%20Stock%20Indices.pdf>.
- Inderst, Georg, and Fiona Elizabeth Stewart. “Incorporating Environmental, Social and Governance Factors into Fixed Income Investment.” The World Bank, April 1, 2018.
<http://documents.worldbank.org/curated/en/913961524150628959/Incorporating-environmental-social-and-governance-factors-into-fixed-income-investment>.
- “International Organisation of Pension Supervisors (IOPS),” 2020.
<http://www.iopsweb.org/about/>.

IOPS. "IOPS Supervisory Guidelines on the Integration of ESG Factors in the Investment and Risk Management of Pension Funds," October 22, 2019. <http://www.iopsweb.org/iops-supervisory-guidelines-esg-factors.htm>.

"Japan's Stewardship Code." The Council of Experts on the Stewardship Code, March 24, 2020. <https://www.fsa.go.jp/en/refer/councils/stewardship/20200324/01.pdf>.

Ministère de la Transition écologique et solidaire. "L'investissement socialement responsable," February 7, 2019. <https://www.ecologique-solidaire.gouv.fr/investissement-socialement-responsable>.

Mair, Vibeka. "ESG Country Profile: The Netherlands." *Responsible Investor*, November 28, 2019. <https://www.responsible-investor.com/articles/esg-country-profile-the-netherlands>.

Neher, Agnes. "Sustainable Investment Spotlight: Stricter European Regulations Favour Sustainable Investments." J. Safra Sarasin, 2017. https://www.jsafrasarasin.ch/internet/ch/en/sustainable_investment_spotlight_stricter_european_regulations_favour_sustainable_investments_en.pdf.

Office of the New York State Comptroller. "New York State Common Retirement Fund," March 31, 2019. <https://www.osc.state.ny.us/pension/>.

"New York State Common Retirement Fund: Climate Action Plan 2019." Office of the New York State Comptroller, June 2019. <https://www.osc.state.ny.us/pension/climate-action-plan-2019.pdf>.

"New York State Common Retirement Fund: Environmental, Social and Governance Report." Office of the New York State Comptroller, March 2017. <https://www.osc.state.ny.us/reports/esg-report-mar2017.pdf>.

CPP Investments. "Our Mandate," 2020. <https://www.cppinvestments.com/about-us/our-mandate>.

Office of the New York State Comptroller. "Pension Fund Overview," March 31, 2019. <https://www.osc.state.ny.us/pension/snapshot.htm>.

World Bank Open Data. "Population Ages 65 and above (% of Total Population)," 2018. https://data.worldbank.org/indicator/sp.pop.65up.to.zs?most_recent_value_desc=true.

"Responsible Investment: 2017 Annual Study." Governart and VigeoEiris, 2017. <http://www.vigeo-eiris.com/wp-content/uploads/2017/09/Estudio-2-Ingles-C2-B4s.pdf>.

"Responsible Investment: Government Pension Fund Global." Norges Bank Investment Management, 2019. https://www.nbim.no/contentassets/aaa1c4c4557e4619bd8345db022e981e/spu_responsible-investments-2019_web.pdf.

Principles for Responsible investment. "Responsible Investment Regulation Map," September 9, 2019. <https://www.unpri.org/sustainable-markets/regulation-map>.

"Service Document on Responsible Investment." The Hague: Federation of the Dutch Pension Funds, June 2016. <https://www.pensioenfederatie.nl/stream/servicedocument-responsibl-investment.pdf>.

"Study of ESG Information Disclosure: Final Report." Nissay Asset Management, commissioned by GPIF., March 2019. https://www.gpif.go.jp/en/investment/research_2019_EN.pdf.

CPP Investments. "Sustainable Investing: How We Invest," 2020. <https://www.cppinvestments.com/the-fund/sustainable-investing>.

"Taking Stock: Sustainable Finance Policy Engagement and Policy Influence." Principles for Responsible Investment, 2019. https://www.unpri.org/Uploads/c/j/u/pripolicywhitepapertakingstockfinal_335442.pdf.

"Teck Oil Sands Project Splits Canada's Indigenous People, Poses Challenge for Trudeau." *Reuters*, January 21, 2020. <https://www.reuters.com/article/us-canada-crude-teck-resources-idUSKBN1ZK2MB>.

Willis Towers Watson. "Top 20 Pension Funds' AUM Declines for First Time in Seven Years," September 3, 2019. <https://www.willistowerswatson.com/en-US/News/2019/09/top-20-pension-funds-aum-declines-for-first-time-in-seven-years>.

Walia, Simran. "How Does Japan's Aging Society Affect Its Economy?" *The Diplomat*, November 13, 2019. <https://thediplomat.com/2019/11/how-does-japans-aging-society-affect-its-economy/>.