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 Pensioenfonds ABP (ABP)
Norway	Government Pension Fund of Norway (GPFG)
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, GPFG). 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]

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[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/CPP-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 - GPIF[66]

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]

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[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 Infortmation 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]

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[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

<u>Exclusion and observation</u>

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

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[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 overweighing 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."