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New York City Retirement Systems (Systems)

Board of Education Retirement System of the City of New York (BERS)
New York City Employees' Retirement System (NYCERS)
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Investment and Fiduciary Analysis of Prudent Strategies for Divestment of Securities Issued by Fossil Fuel Reserve Owners

Phase 1: Asset Owner Survey and Definitions of Fossil Fuel Reserves

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I. Executive Summary

Meketa Investment Group's ("Meketa") report for Phase 1 of the New York City Retirement Systems ("Systems") project on divestment from fossil fuel ("FF") reserve owners covers two research elements. First, we analyze results from Meketa's research on how global leading asset owners manage fossil fuel reserves and climate investment risk. For this report, we concentrate on asset owners' approach to divestment of fossil fuel reserve companies. The analysis covers 25 asset owners that range in size from $1 billion in assets under management ("AUM") to $1.5 trillion. The second section of this report discusses common approaches to defining fossil fuel reserves companies for potential exclusion and examines BERS, NYCERS, and TRS exposure to fuel reserve owners.

A growing group of large institutional investors is concerned about the financial impact and risks of climate change and potentially stranded fossil fuel assets. How investors define fossil fuel reserve owners and act varies widely. The results from the two tasks in this report show that this systemic issue is complex, at best. We found no clear, widely accepted "best practice." The goal of this report is to generate information and analysis that provides focus and clarity in an area which, for many reasons, lacks both.

Leading asset owners share certain key characteristics. Attention is growing beyond fossil fuel producers to users, financiers, and insurers of fossil fuels. We also found a rapid evolution in asset owner approaches to monitoring climate risks, with a growing emphasis on climate risk key performance indicators ("Climate KPIs") including forward looking assessments of corporate climate risk management and developments of climate scenario analysis.

All reviewed asset owners devote significant attention to proxy voting and engagement. Some focus on engagement and do not use divestment as a tool; some use divestment in select cases as a top-down category across the portfolio (such as thermal coal, tar sands, fossil fuels used for energy purposes, fossil fuels in the energy sector, fossil fuel extractives, or all fossil fuel reserve owners), actively engage with companies in their portfolio, and support institutional investor engagement efforts of companies they have divested from; some use divestment as a company by company, bottom-up tool, to divest specific companies based on multiple criteria; and some asset owners use case by case divestment only as a last resort after they deem engagements with a company have failed.

To analyze the range of potential definitions of fossil fuel reserve owners for this project, we reviewed the definitions from the 25 leading asset owners, researched definitions used by major index providers (FTSE Russell, MSCI, and SPDJI), and examined definitions and lists developed by leading organizations involved in this field – Climate Action 100+ and the Carbon Underground 200.

We found that leading asset owners and major index providers generally use a common definition of fossil fuel reserves (proven and probable coal reserves and proven oil and gas reserves), and concentrate on thermal coal among coal producers. However, asset owners define owners of fossil fuel reserves using different factors such as absolute volume of reserves owned, percentage of revenue from fossil fuels, potential carbon emissions from reserves, and management of energy transition risks. Despite an industry-wide appreciation of the inherent risks posed by the fossil fuel sector, no universal consensus has developed on how best to selectively screen and define fossil fuel risk.

The varied nature of the approaches demonstrates that there is no conclusive, universally accepted strategy to guide research into divestment of fossil fuels. As a result, for this project, we recommend that the Systems undertake a universal evaluation of fossil fuel reserve owners to understand the Systems' total exposure to fossil fuel reserve owners and the risks they pose. An examination of all companies that own reserves is consistent with the Boards' resolutions to evaluate prudent strategies to divest from securities issued by fossil fuel reserve owners.

For this project, we propose a broad definition to be used as the universe of fossil fuel reserve owners to analyze for potential prudent exclusion: any publicly listed company in the global economy that owns proven and probable coal reserves or proven oil or gas reserves.

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As of March 31, 2020, the list of all companies owning fossil fuel reserves consists of the following number of companies in the portfolios of each System: [redacted] companies in TRS, [redacted] companies in NYCERS, [redacted] companies in BERS and [redacted] fossil fuel companies among the Systems combined. The list consists of the following market values and percentage of total Plan assets under management in the portfolios of each System: $[redacted] / [redacted]% in TRS, $[redacted] / [redacted]% in NYCERS, $[redacted] / [redacted]% in BERS and $[redacted] / [redacted]% among the combined Systems.

After establishing a definition of the universe of fossil fuel reserve owners that is approved by the Boards, during Phase 2 of the project, Meketa will evaluate the risks for each of the companies to determine potential strategies for divesting from fossil fuel reserve owners consistent with fiduciary duty. Please note that the project's Phase 2 analysis will not necessarily result in every fossil fuel reserve owner company being recommended for divestment. Each company will be assessed for both climate and financial risks, based on available data.

II. Asset Owner Leaders

Introduction

Meketa's analysis of asset owners' management of fossil fuel and climate risks covers 25 asset owners. The research on asset owners includes a survey that was sent to 58 asset owners (Appendix 1). The list of 58 was developed using source lists from the following organizations: Fossil Fuel Free ("FF Free"), C40,[1] Climate Action 100+ (CA100+), the Net Zero Asset Owner Alliance ("NZ AOA"), Principles for Responsible Investment ("PRI"), and Task Force for Climate-Related Financial Disclosure ("TCFD") supporters. We concentrated on a Tier 1 set of 21 asset owners that we determined were most relevant to this project. The Tier 1 list, developed in consultation with the Bureau of Asset Management ("BAM"), is geared toward large public pension plans that have similar fiduciary obligations to the Systems. We selected asset owners that are active leaders on climate risk. We included asset owners that exclude, and asset owners that do not exclude fossil fuel reserve owners within their investment portfolios. The list includes a handful of other prominent asset owners that have been very active, such as the Church of England Pension Fund, The Rockefeller Foundation, and Wespath Benefits and Investments.

We received 14 (six Tier 1) survey responses back in time for the writing of this report. The response set was severely constricted because of the coincidental timing of the COVID-19 health pandemic. A number of asset owners were unable to respond because of their attention to other pressing matters. To supplement these responses, Meketa analyzed public documents and/or held conversations with 11 additional Tier 1 asset owners. Our research concentrated on the following key issues for Phase 1 of this study: if an asset owner divests fossil fuels; the rationale for divestment; how the asset owner defines fossil fuels; and how the asset owner monitors its portfolio. Meketa intends to continue collecting additional survey responses throughout the later stages of this project for further analysis.

Highlights

Currently, leading asset owners adopt widely varying approaches to managing climate risks of investments in fossil fuel reserves owners.

Among 25 asset owners: eight do not exclude fossil fuel companies; 16 (five US public pension plans, eight non-US pension plans, one faith-based pension plan, one US foundation, and one non-US city) exclude some fossil fuel reserve owners; and one non-US public pension company does not divest in eight of its defined contribution ("DC") options, and excludes fossil fuels in one DC option. One US public pension plan which does not divest, is deciding how to define thermal coal companies for exclusion. Each asset owner reviewed that excludes fossil fuel companies had some refinement to their process that limits the scope of their exclusion. Some asset owners limit the definition of fossil fuel companies to something less than all fossil fuel reserve owners, such as focusing on thermal coal, tar sands, or the energy sector. Others adopt a broad definition as a starting point, then analyze companies individually for potential exclusion. Often asset owners limit the portion of the investment portfolio to which the exclusions are applied, such as excluding commingled funds, limiting exclusions to equities, or limiting exclusions to a portion of their equity portfolio. One asset owner does not divest, but will not further invest in thermal coal companies.

[1] C40 is a network of the world's megacities committed to addressing climate change.

Eleven of the 16 asset owners that exclude fossil fuels employ a definition broader than thermal coal and tar sands.

Seven of these 11 that exclude more than thermal coal and tar sands, use a standard definition. Four others determine exclusions case by case, within a standard definition.

Asset owner approaches, even among those that exclude, evolve every year.

In 2020, for example:

- CalSTRS expanded its criteria for exclusion of thermal coal companies from companies that derive at least 50% of revenues from thermal coal extraction to companies that derive 25% or more in revenues from thermal coal.
- NYSCRF announced a potential list of exclusions that includes 21 thermal coal companies with greater than 10% revenues from thermal coal. NYSCRF is currently establishing the process of determining, on a case by case basis, which companies it might exclude, based on engagements and assessments of each company's ability to succeed during the energy transition away from fossil fuels.
- SFERS announced a Net Zero by 2050 Climate Action Plan and is broadening the number of economic sectors that it looks at for company specific, material climate and financial risk. SFERS adopted a case by case approach to excluding, engaging, and monitoring fossil fuel and other companies.
- PGGM (Netherlands) is reviewing their exclusion policy, which measures a company's emissions (mostly scope 1 & 2, plus a little upstream scope 3) as a percentage of revenues and avoids high emitters. PGGM may later adopt revisions to address handling companies with a vital commodity/activity that currently have no credible/cost effective alternatives or with potential inconsistent economic points of view, such as excluding a tar sands producer, but not the pipeline company transporting the same oil.
- The District of Columbia Retirement Board is considering shifting from using the Carbon Underground200 as the list it asks its managers to scrutinize for potential exclusion to using the Transition Pathway Initiative ("TPI") rankings. The TPI non-profit organization ranks companies based on their readiness and strategy to succeed as the transition to a low carbon global economy proceeds.

All asset owners reviewed devote significant attention to proxy voting and engagement, even when they do divest, indicating that asset owners that divest seek to use divestment and engagement as complementary tools.

- Some asset owners use divestment, reducing holdings, and/or stopping any new investments in a company as a last resort measure after if it is determined that engagement efforts have yielded insufficient improvement in the company's approach to managing its climate risks.
- Leading asset owners' proxy voting and engagement attention is shifting from an early concentration on fossil fuel producers to companies whose products and services generate demand for fossil fuels, and to large financers and insurers of fossil fuels.

Asset owners continue to evolve their analytical climate risk tools and increase their monitoring of climate risks.

Approaches include regular monitoring of environmental key performance indicators and climate scenario analyses.

This analysis does not cover the entire universe of assets owners that have divested or not divested. We review the practices of a sample of asset owners, including a number of asset owners similar in size and responsibility to the Systems. There are many other asset owners globally, including pension funds, endowments, foundations, and other institutional investors, that have conducted partial or complete divestments of fossil fuel holdings, and many asset owners that have not divested or restricted their investments in fossil fuel companies. The number of asset owners that have divested from fossil fuel companies has increased, though their approaches, and the extent of divestment vary.[1] Among asset owners that have conducted some degree of fossil fuel divestment, most that we surveyed and researched have divested from companies in the higher risk subsectors of thermal coal and oil/ tar sands. In addition, all asset owners reviewed that have divested to any degree, use divestment as only one of multiple strategies, such as engagement, and investing in low carbon assets, to address the financial risks of climate change.

[1] https://www.ft.com/content/4dec2ce0-d0fc-11e9-99a4-b5ded7a7fe3f

Examples

The 25 asset owners reviewed for this study are shown in Figure 1. They are grouped by how they manage fossil fuel divestment. We indicate whether asset owners exclude fossil fuel reserve owners and whether they exclude more than thermal coal and/or tar sands fossil fuel reserve owners.

Figure 1: Asset Owners Reviewed[1] For Exclusion of Fossil Fuel Companies

Name of Organization	AUM (Billions USD) (3/31/20)	Tier	Source	Data Source*	Exclude	Exclude > thermal coal &/or tar sands
Asset Owners that Do Not Exclude						
Asset Owner				S	No	No
AustralianSuper, 8 Standard DC Options	198	Tier 1	FFree, CA100+, PRI, TCFD	S/R	No	No
Government Pension Investment Fund (Japan)	1,500	Tier 1	CA100+, PRI, TCFD	R	No	No
LACERA	61		CA100+, PRI, TCFD	S	No	No
Maryland State Retirement & Pension System	56		CA100+, PRI	S	No	No
Minnesota State of Board of Investment	104		CA100+, PRI, TCFD	S	No	No
Ontario Teachers' Pension Plan	207	Tier 1	CA100+, PRI, TCFD	R	No	No
PensionDanmark	40	Tier 1	CA100+, NZ AOA, PRI, TCFD	S	Yes**	No
Seattle City Employees' Retirement System	3	Tier 1	FFree, C40, CA100+, PRI,	S	No	No
University of Oregon Foundation	1		FFree	R	No	No
Exclude Using a Standard Definition						
Ownership of Reserves						
AustralianSuper, DC Socially Aware Option	2	Tier 1	FFree, CA100+, PRI, TCFD	S/R	Yes	Yes
Federal State of Berlin	852		FFree, C40	S/R	Yes	Yes
Rockefeller Brothers Fund	1	Tier 1	FFree, PRI	R	Yes	Yes
University of California Regents	133	Tier 1	FFree, CA100+, PRI, TCFD	S	Yes	Yes
Revenue from Reserves Threshold						
AP1 (Sweden)	38	Tier 1	FFree, CA100+, PRI, TCFD	S	Yes	Yes
CalPERS	376	Tier 1	FFree, CA100+, NZ AOA, PRI, TCFD	R	Yes	No
CalSTRS	239	Tier 1	FFree, CA100+, PRI, TCFD	S	Yes	No
Church of England Pensions Board	10	Tier 1	FFree, CA100+, NZ AOA, PRI, TCFD	R	Yes	No
PGGM (Netherlands)	275	Tier 1	CA100+, PRI, TCFD	R	Yes	Yes
Potential Carbon Emissions Threshold						
District of Columbia Retirement Board	9		FFree	S	Yes	Yes
Exclude Case by Case						
Revenue from Reserves Threshold						
London Pension Fund Authority	8	Tier 1	FFree, C40, TCFD	S	Yes	Yes
San Francisco Employees Retirement System	27	Tier 1	C40, CA100+, PRI, TCFD	R	Yes	Yes
New York State Common Retirement Fund	207	Tier 1	CA100+, PRI, TCFD	R	Yes	No
Exclude by Income Share, & other Criteria						
Government Pension Fund Global (Norway)	895	Tier 1	FFree, PRI	R	Yes	Yes
Potential Carbon Emissions and Mgt of Risk						
ATP (Denmark)		Tier 1	FFree, PRI, TCFD	R	Yes	Yes
Exclude by "Do Not Live up to Paris Agreement"						
PFA Pension (Denmark)	88	Tier 1	FFree, CA100+, NZ AOA, PRI, TCFD	R	Yes	No

* Data Source: S = Survey, R= Research documents and conversations.
** PD believe in engagement and active ownership, not divestment as a way for investors to mitigate climate change, but is not invested in coal production as it is considered a sunsetting business with bad return prospects.
Definitions: FFree = Fossil Fuel Free; CA100+ = Climate Action 100+ signatory or participant; TCFD = Task Force on Climate-Related Financial Disclosure; PRI = Principles for Responsible Investment , C40 = C40 Cities; NZ AOA = Net-Zero Asset Owner Alliance.

[1] Source: Meketa survey and research.

Among the seven asset owners that exclude more than thermal coal/tar sands and use a standard exclusion definition, four exclude companies with proven and probable coal, oil or gas reserves. The University of California Regents excludes fossil fuel companies across the portfolio except for their commingled active accounts; the Rockefeller Brothers Fund excludes all fossil fuels using the MSCI definition - reserves used to produce energy. The Federal State of Berlin excludes fossil fuel companies in 20% of their equity portfolio, investing this portion in an Environmental, Social, and Governance ("ESG") ex-fossil fuel strategy; AustralianSuper[1] does not exclude fossil fuel companies in eight of its nine DC options, but excludes fossil fuel companies in its Socially Aware defined contribution option. AustralianSuper integrates material ESG criteria (including climate risks) across all nine options.

Two asset owners, AP1 and PGGM, exclude companies that fit their standard definition of percentage of revenues from fossil fuels. The District of Columbia Retirement Board requires that its active managers scrutinize the CU200 list for climate risks and possible exclusion.

Four asset owners that exclude more than thermal coal/tar sands, and determine exclusions case by case within a standard definition, use varying approaches. San Francisco Employees Retirement System and the London Pensions Fund Authority set revenue thresholds to determine companies for potential case by case exclusion; Government Pension Fund Global (Norway) employs a case by case approach within three broad categories that include: a) product-based thermal coal (with varying minimums based on income from thermal coal, operations in thermal coal, and million tons per year of thermal coal extracted, b) conduct-based severe environmental damage, and c) conduct-based unacceptable carbon emission. ATP adopted a risk-based approach. ATP assesses how exposed a company is to CO_2 and how company management addresses climate risks and opportunities.

Below we provide 17 summary examples of asset owner approaches, including four asset owners that do not divest from fossil fuel companies, 10 asset owners that divest some type of fossil fuel companies using a standard definition, and three asset owners that divest on a case by case basis. The information available for this report was not uniform across the asset owners. In the summaries below, we seek to focus, to the degree available, on identifying each asset owner's approach, their rationale, how they monitor their exclusions, and, when available, information on the number of companies and market value of their exclusions.

Asset Owners That Do Not Exclude Fossil Fuel Reserve Owners

Some asset owners that are active leaders in addressing climate risk and sustainable investment do not divest or exclude any fossil fuel reserve owners. They typically concentrate their efforts on proxy voting, engagement, and investing in sustainable strategies. Asset owners that address climate risk without divestment include Government Pension Investment Fund (Japan), PensionDanmark, Los Angeles County Employees Retirement Association, and Seattle City Employees Retirement System.

Government Pension Investment Fund ("GPIF") (Approach: Do Not Exclude Fossil Fuel Reserve Owners)

GPIF, the Japanese government pension fund, with approximately $1.5 trillion in AUM, the second largest pension fund in the world after the US Social Security Trust Fund, states in the opening of its latest published ESG report (2018) "GPIF is committed to fulfilling our fiduciary duty to secure adequate retirement funds for both current and future beneficiaries. We believe that improving the governance

[1] AustralianSuper offers nine defined contribution options, one of which is the Socially Aware option.

of the companies that we invest in, while minimizing negative environmental and social externalities – that is, ESG (environment, social, and governance) integration – is vital in ensuring the profitability of the portfolio over the long term." GPIF views themselves as a 'universal owner' – a long-term investor with a substantial level of assets under management that invests in securities spanning the entire capital market. GPIF states that they do not practice divestment. "If we were to exclude a company with a significant environmental footprint from our portfolio, the value of our assets may eventually be damaged by the negative impact generated by this company in the long run. Rather, we view it as vital to encourage companies that have considerable negative ESG-related externalities to improve their business processes. The opportunity for constructive dialogue will be lost if we choose to no longer be a shareholder, and selling off our stake could result in the transfer of shareholder rights from a responsible investor to an indifferent investor, as pertaining to ESG issues. External asset managers are responsible for investing the majority of GPIF's assets, and we proactively engage in dialogue with companies with ESG issues through these asset managers."

GPIF works actively as a long-term universal owner on climate issues. Their actions include reweighting their overall portfolio by shifting assets into two global environmental stock indices, endorsing the Task Force on Climate Related Financial Disclosures, joining Climate Action 100+, providing external asset managers with a proposal to invest in Green, Social and Sustainability Bonds, continuing to critically evaluate external asset managers through ESG criteria, using the PRI definition of ESG integration, encouraging external asset managers to engage with companies and investees, directing research on ESG information disclosure, and regularly endorsing and presenting views encouraging companies to act as long-term value creators and investors to act as long-term value accelerators, as indicated by their March 3, 2020 letter cosigned by CalSTRS and the United Kingdom's USS Investment Management LTD.

PensionDanmark ("PD") (Approach: Do Not Exclude Fossil Fuel Reserve Owners)

PensionDanmark, with $40 billion AUM is one of the 50 largest pension funds in Europe, and is a non-profit labor market pension fund. PensionDanmark believes in engagement and active ownership, not divestment, as the most effective way for investors to mitigate climate change. As such, they are active members of CA100+, and in September 2019, became one of six asset owners to initiate the United Nations-convened NZ AOA. At launch, the initiators were joined by seven additional asset owners, including CalPERS from the US. Today, the NZ AOA has grown to become an international group of 25 asset owners representing nearly $4.7 trillion AUM. The NZ AOA members have committed to transition their investment portfolios to net-zero greenhouse gas emissions ("GHG") emissions by 2050, aligning their portfolios with a 1.5°C scenario, addressing Article 2.1c of the Paris Agreement.

Although PensionDanmark approaches climate change through active ownership rather than divestment, the fund is not invested in coal production, since it is considered a sunsetting business with bad return prospects.

Los Angeles County Employees Retirement Association ("LACERA") (Approach: Do Not Exclude Fossil Fuel Reserve Owners)

LACERA, with approximately $61 billion AUM, actively implements its Corporate Governance Climate Risk principle, which states: "Climate change may present financial, operational, and regulatory risks to a firm's ability to generate sustainable value, as well as to the broader economy. Firms should assess and disclose material climate-related risks and sufficient, non-proprietary information to enable

investors to prudently and adequately evaluate the prospective impact of climate risk on firm value." LACERA has not taken divestment/exclusion action regarding climate risks.

LACERA monitors market wide risks and opportunities related to climate change to inform engagement strategies. Some asset class structure reviews – such as real assets – have incorporated climate. LACERA actively engages on climate risk issues. The Plan endorsed the Climate Action 100+ initiative and signed the 2018 Global Investor Statement to Governments on Climate Change. Proxies are voted consistent with LACERA's policy.

Seattle City Employees Retirement System ("SCERS") (Approach: Do Not Exclude Fossil Fuel Reserve Owners)

SCERS, with approximately $3 billion AUM, SCERS is predominantly a passive investor. As a result, the Plan endeavors to improve company operations through shareholder advocacy, and is active in CA100+. SCERS has conducted five studies of fossil fuel divestment (three from its investment consultant, one from staff, and one from the SCERS Investment Advisory Committee), and decided not to exclude or divest. The Board Policy states that it will not divest from or invest in a targeted company, sector, or other set of investments with the primary goal of advancing an ESG priority because doing so would be inconsistent with SCERS': 1) mission to fulfill the promise made to our members by delivering the retirement benefits they have earned; 2) fiduciary duties of prudence and loyalty that are paramount; and 3) investment beliefs that emphasize the benefits of diversification, cost control and passive management. SCERS tracks its allocation to the CU200. SCERS, with its consultant, has begun to incorporate climate change scenario analysis into SCERS Strategic Asset Allocation analysis.

Asset Owners that Exclude Fossil Fuels Using a Standard Definition

Some asset owners exclude a subset of fossil fuel reserve owners, such as thermal coal owners, and some exclude across the spectrum, employing a standard definition to their exclusions. Asset owners that divest based on a standard definition applied across their portfolio include: AP1, AustralianSuper Socially Aware Defined Contribution Option, CalPERS, CalSTRS, Church of England Pensions Board, District of Columbia Retirement Board, PFA Pension, PGGM, Rockefeller Brothers Fund, and the University of California Regents.

AP1 (Första AP-fonden, Sweden) (Approach: Exclude Fossil Fuels Using Standard Definition)

AP1, a Swedish pension fund with approximately $37 billion in AUM, announced on March 16, 2020 that it would no longer invest in fossil fuels.[1] In its news release, AP1 said that "the fund's assessment concludes that the transition to a low-carbon economy, less dependent on fossil fuels, represents a substantial uncertainty for companies engaged in coal, oil, and natural gas, and that exposure to these companies can imply a higher climate-related financial risk for the fund." AP1 further stated, "Divesting from fossil fuels is an efficient way for the fund to manage the financial risk associated with a transition in line with the Paris Agreement." AP1 has cut $400 million in fossil fuel-linked investments from its internally managed portfolios.[2] AP1 is reportedly working with its external managers to "ensure a responsible transition of the remaining positions."

[1] https://www.ap1.se/en/news/ap1-divests-from-fossil-fuels/

[2] https://www.pionline.com/esg/ap1-cuts-fossil-fuels-portfolios

AP1 began divestments in companies involved in thermal coal and oil sands production in 2018. AP1 defines fossil fuel companies primarily by the Global Industry Classification Standard (GICS) sector (Energy), and by annual revenues above a certain threshold from thermal coal production or coal-based power production in addition to considering fossil fuel reserves with large potential emissions. AP1 identifies thermal coal companies as owners of reserves and companies operating in the fossil fuel value chain such as companies providing services to, or involved in, coal-based power generation. Commingled funds compliance is on a 'comply or explain' basis.

AP1 regularly measures the portfolio, including the underlying mandates, exposure to carbon risk, through an in-house developed heat map. The heat map assesses the investments' carbon emissions and carbon management. Prior to the fund's recent divestment from fossil fuels, the heat map also included exposure to fossil fuels. On an annual basis, the fund analyzes the extent to which a change in the overall carbon footprint of the portfolio is due to changes in the asset allocation/selection or from changes in the individual assets carbon emissions. To reach the Paris agreement targets, the fund needs to ensure the companies in which they invest reduce their carbon footprint. The fund can reduce its carbon footprint with the objective of managing the climate related financial risk. AP1 continues to use engagement to encourage fossil fuels companies to manage their climate risks and transition to a low-carbon economy.

University of California Regents (Approach: Exclude Fossil Fuels Using Standard Definition)

The University of California Office of the Chief Investment Officer of the Regents ("UC Investments") announced on May 19, 2020 that it had fully divested from fossil fuel assets in its pension, endowment, and working capital.1 They simultaneously announced that they have surpassed their five-year goal of investing $1 billion in promising new clean energy projects. As of April 30, 2020, UC Investments had a total of $126 billion in AUM including $68 billion in the pension, $13.4 billion in the endowment and $15.9 billion in working capital. As of September 2019, UC Investments had sold approximately $150 million from the endowment. Since that date, UC Investments had sold $900 billion of fossil fuel assets in the pension and working capital pool. UC Investments followed a glide path to de-risk their portfolio. They began with exclusions in thermal coal and oil sands in 2015 and further broadened to all fossil fuel reserves in 2019.

UC Investments define fossil fuel companies as any constituent identified as having proved & probable coal reserves, oil & natural gas reserves that are used for energy purposes. Thus, for example, thermal coal reserves are divested, while companies with coal reserves used for only metallurgic purposes, such as steel making, would not be divested. The exclusions apply across all asset classes. The exclusion does not apply to actively managed, commingled accounts, but does apply to separately managed accounts, which includes passively and actively managed assets. The UC Regents continues to increase their shareholder engagement on climate change as they move away from owning fossil fuels.

Rockefeller Brothers Funds ("RBF") (Approach: Exclude Fossil Fuels Using Standard Definition)

The Rockefeller Brothers Fund is a private charitable foundation with $1.1 billion in AUM. Citing the moral tension arising from the RBF's work on climate change on one hand, and its investments in fossil fuels on the other, in September, 2014 the Fund pledged to a two-step process to address its desire to divest from investments in fossil fuels. RBF committed to reducing its exposure to coal and tar sands – two of the most intensive sources of carbon emissions – to less than 1% of the total portfolio. Second, RBF began a comprehensive analysis of its exposure to other fossil fuel investments and began developing a strategy to eliminate the Fund's exposure to these energy sources as quickly as possible.

[1] https://www.universityofcalifornia.edu/press-room/uc-s-investment-portfolios-fossil-free-clean-energy-investments-top-1-billion

As of March 31, 2020, the Fund's exposure to coal and tar sands has been reduced to less than 0.1% of the total portfolio (compared to 1.6% when RBF first analyzed the issue in April 2014). The Fund's total fossil fuel exposure is estimated to be 0.8% (compared to 6.6% in April 2014).

The RBF uses the MSCI Fossil Fuel Reserves Screen to evaluate its fossil fuel exposure for publicly listed holdings. The MSCI ex-fossil fuel indexes excludes companies, regardless of industry, that have proved & probable coal reserves and/or oil and natural gas reserves used for energy purposes. For RBF private holdings and funds where individual holdings are not available, total energy sector exposure is used to conservatively estimate fossil fuel exposure.

RBF continues to adhere to its trustees longstanding mandate that RBF assets be invested with the goal of achieving financial returns that will enable the foundation to meet its annual philanthropic obligations, while maintain the purchasing power of the endowment, so future generations will also benefit from the foundation's charitable giving. Therefore, mission-aligned investment efforts, including continued divestment from fossil fuels, will be accomplished through a fiscally prudent process.

AustralianSuper (Approach: Exclude Fossil Fuels Using Standard Definition)

AustralianSuper is the largest superannuation (pension) fund in Australia with approximately $198 billion AUM. Australia's superannuation funds are defined contribution funds. AustralianSuper offers nine different investment options to its members, one of which excludes fossil fuel companies. AustralianSuper offers members is a 'Socially Aware' portfolio option. The Socially Aware portfolio comprises 1.25% of the total AustralianSuper portfolio. This portfolio excludes shares of listed companies, including all companies that directly own fossil fuel (thermal coal, oil, gas) or uranium reserves that can be extracted from known fields at an economical cost. The exclusion applies across all asset classes in both private and public market investments. The exclusion list is reviewed monthly and is not public.

Eight of the nine options that represent 98.75% of the total assets under management operate with no top down exclusions. For all nine investment options, AustralianSuper fully integrates material ESG factors, including climate energy transition and physical climate risks into their investment decision-making process. For the eight options with no exclusions, but with integrated material ESG factors, the non-Australian equity portfolio is 44% less carbon emissions intensive than the MSCI ACWI ex-Australian benchmark. We did not have information in time for this publication on the total equity portfolio carbon emissions intensity for the eight of the nine DC options that do not include any top-down divestment.

California Public Employees' Retirement System ("CalPERS") (Approach: Exclude Fossil Fuels Using Standard Definition)

CalPERS, with $376 billion AUM as of March 31, 2020 is the largest public pension plan in the US. CalPERS has been a leading active institutional investor on climate issues for decades. CalPERS' primary focus, rather than divestment, is on engaging with companies and managers collaboratively with other asset owners to drive change to a low carbon economy, and on advancing measurement, monitoring and analysis of climate risks and opportunities across their portfolio. In 2019, CalPERS became a founding member of the NZ AOA. Regarding divestment of fossil fuels, in 2017, CalPERS divested from publicly traded thermal coal producers with more than 50% in revenues derived from thermal coal. Among other efforts, CalPERS is currently developing solutions to decarbonize their passive investments, consistent with their overall fiduciary duties and their beliefs.

CalPERS summarizes on their website: "As an investor in the global economy, the scale and multi-faceted nature of climate change presents a systemic risk to our portfolio. Climate change impacts investors like us in two main ways: through physical impact and energy transition risks. Through our engagement and advocacy efforts we're working to minimize the absolute risk from climate change to our portfolio. Through our research and integration efforts we are working to understand the financial risks to our portfolio and prepare for the long-term changes that will accompany climate change. Our Sustainable Investments Program leverages the best available science and tools to inform investment decisions with key insights into the highest-value climate change-related risks and opportunities. We also work to identify and focus on the largest opportunities for financially attractive emission reductions across the fund, and advocate for policies that can drive the transition to a thriving low-carbon global economy in which we can invest."

California State Teachers' Retirement System ("CalSTRS") (Approach: Exclude Fossil Fuels Using Standard Definition)

CalSTRS, with approximately $239 billion AUM is the second largest public pension fund in the US. In May 2016, CalSTRS began divestment of publicly traded companies that generate 50% or more of their revenue from the sale of thermal coal. Divestment from US thermal coal holdings was broadened to non-US thermal coal holdings in June 2017. On July 1, 2020 (the Plan's fiscal year), this percentage threshold became stricter and was lowered to 25%. CalSTRS has reported a total divestment of $1.5 million from US companies and $8.3 million from non-US companies across their passive, active, commingled, and separately managed strategies. CalSTRS amended its custom benchmarks to exclude thermal coal companies and uses the benchmark to reweight securities within the portfolio. To monitor the exclusions, staff contracts with an external service provider, and conducts a quarterly aggregate analysis of divestment programs (publicly disclosed semiannually).

Separately, CalSTRS invests in a low carbon equity benchmark. CalSTRS, has an extensive history of engaging companies on ESG risks including climate-related risks and participating actively in institutional efforts to support long-term investing and support for climate energy transition and physical climate risk management. CalSTRS identifies their procedures in their published ESG Policy.

CalSTRS' TCFD-aligned Green Initiative Task Force Report highlights the CalSTRS investments climate-related governance framework, strategy, and risk management processes. These include: CalSTRS ESG Policy, transition and physical risk assessments, proxy voting, corporate and public policy engagement, quantitative and qualitative scenario assessments, and manager and security selection due diligence. Consideration and assessments related to stranded asset risk, litigation and regulation are conducted during the various stages of due diligence for CalSTRS active holdings. For CalSTRS passive holdings, staff regularly engage portfolio companies on such risks to better understand the companies' low-carbon transition assumptions and underwriting practices.

Church of England Pensions Board (Approach: Exclude Fossil Fuels Using Standard Definition)

The Church of England Pensions Board, with approximately $10 billion in AUM, in 2015, adopted a climate change policy that states that, from an ethical perspective, their key focus in relation to climate change should be on assisting the transition to a low carbon economy. The primary focus for the delivery of this commitment should be engagement with companies and policy. The key risk management tools set forth in the policy are: active engagement with public policy makers, companies, and our asset managers, divestment from high carbon assets, investment in low carbon assets, and monitoring the fund's carbon footprint.

Regarding divestment, the policy dictates that the pension fund should not invest in any company where more than 10% of its revenues are derived from the extraction of thermal coal or the production of oil from oil sands on the basis that such companies are unlikely to be able to assist with the transition to a low carbon economy. In a circumstance where a company breaches the 10% threshold, having previously been in compliance, then the company would be given a grace period during which the company would be expected, following engagement, to comply with policy. Should the breach of the threshold persist then the investment exclusion will be implemented. The Climate Policy also directs the fund to divest, after appropriate engagement, from companies that make a significant contribution to emissions of greenhouse gasses, and that the National Investing Bodies determine are not taking seriously their responsibilities to assist with the transition to a low carbon economy. The Climate Policy also directs the fund to increase investments in climate change adaption.

In February, 2020 the Church of England announced that its pension fund shifted 600 million pounds ($789 million), which they said represented its entire passive equity portfolio, into a new equity index that invests in companies that are progressing towards the Paris climate agreement targets. The index, created by FTSE Russell, includes oil producers Royal Dutch Shell and Repsol, but not others such as BP, ExxonMobil, and Chevron. The climate index is based on the London School of Economics' Transition Pathway Initiative ("TPI") which assesses companies' alignment with the Paris agreement's goal to keep global warming below 2 degrees Celsius.

The Church of England Pensions Board remains active in intensive engagement with companies that continue to contribute significantly to global greenhouse gas emissions. The Board monitors and reports publicly on an annual basis on their implementation of this policy, with its disclosures on climate change guided by the recommendations for asset owners of the TCFD.

Government Pension Fund Global ("GPFG," Norway) (Approach: Exclude Fossil Fuels Using Standard Definition)

The GPFG is Norway's sovereign wealth fund and the world's largest sovereign wealth fund at approximately $900 billion in AUM. In 2015, GPFG divested from coal holdings. In 2019, GPFG announced a partial divestment from fossil fuels from their benchmark index and investable universe, stating they would divest from companies exclusively involved with oil and gas exploration and production. The fossil fuel divestment will be implemented over time and does not apply to major integrated energy companies such as Exxon and Royal Dutch Shell. The rationale for this divestment is to reduce the vulnerability of Norway from a permanent oil price decline, considering Norway's economy substantially relies on revenue from oil and gas exploration and production. This divestment reportedly amounts to 95 companies and approximately $5.9 billion as of September 2019.[1]

Specifically, GPFG defines their excluded fossil fuel reserve owners as mining companies and power producers which themselves, or through entities they control, derive 30% or more of their income from thermal coal, base 30% or more of their operations on thermal coal, extract more than 20 million tons of thermal coal per year, or have a coal power capacity of more than 10,000 megawatts from thermal coal. Additional exclusions for "Criteria for Conduct-Based Observation" include companies that contribute to severe environmental damage that on an aggregate company level lead to unacceptable greenhouse gas emissions. The GPFG also specifies that these exclusions do not include green bonds issued by the company in question where such bonds are recognized through inclusion in specific indices for green bonds or are verified by a recognized third party. Among the companies on these three lists, GPFG has 91 exclusions and 19 companies under observation.

[1] https://www.reuters.com/article/us-norway-swf-oil/norway-sovereign-wealth-fund-to-divest-oil-explorers-keep-refiners-idUSKBN1WG4R9

PFA, Denmark (Approach: Exclude Fossil Fuels Using Standard Definition)

PFA, with approximately $90 billion AUM, is the largest customer-owned pension company in Denmark, and ranks among the largest pension companies in Europe. PFA works systematically towards corporate responsibility in investments, and has committed to meeting the objectives of the Paris Agreement. PFA outlined its policy and methodology for incorporating the Paris Agreement into the investment process. As one outcome, announced in September 2019, PFA divested from seven companies that failed to meet the company's climate requirements, and, in their assessment, did not live up to the Paris Agreement. PFA stated that "we decided to divest seven companies to ensure that PFA complies with the objectives of the Paris Agreement. These seven companies were primarily exposed to coal. At the same time, this sends a clear message that it will have consequences if the companies we are investing in are not working on reducing their climate footprint, or we do no longer consider their conduct compatible with the way in which we want to make sustainable investments". Another seven companies became subjected to stricter supervision. PFA Pension evaluates their equity divestments semi-annually. PFA Pension reports using TCFD recommendations.

In September, 2019, PFA stated that, while they had been focused on major CO2-emitting companies, which they had mainly found in the supply sector, their screening shows conclusively that they need to monitor companies that are actually causing environmental damage within their sector and, with that, contributing towards an increased energy production (and consumption). Therefore, they have developed a method to analyze not only the energy supply sectors but also the overall equity portfolio. PFA states that "Over the past few years, PFA has reduced its investments in CO_2-heavy companies significantly, while investments in green energy were increased massively.

In May 2020, PFA announced that it joined the NZ AOA, and committed to achieving zero CO_2 emissions from investments by 2050. PFA is also committed to set five-year goals for the developments in CO_2 emissions leading up to 2050.

PGGM, Netherlands (Approach: Exclude Fossil Fuels Using Standard Definition)

PGGM is a leading Dutch pension fund service provider that manages approximately $268 billion in pension assets for more than 4.4 million Dutch participants, primarily PFZW. As an active CA100+ participant and PRI signatory, PGGM addresses climate risks and opportunities as it continues to evolve its overall climate change strategy. PGGM, at the direction of PFZW, set a primary climate risk management strategy aimed at reducing the carbon intensity of its global equities portfolio by 50% by 2020 from a 2014 baseline, and also by engaging companies in the energy and other carbon intensive sectors.

The carbon footprint was defined as the weighted average of CO_2 intensity of companies in its portfolio (Scopes 1, 2, and first tier upstream scope 3 emissions per million dollars in company revenue). The 2014 baseline of 339 tons CO_2 per $1 M was reduced to 203 tons/$1 M turnover by the end of 2019. The reduction is being accomplished by reallocating investments in companies in the most energy-intensive sectors (energy, utilities, and materials) to more carbon efficient companies. This has resulted in divestment of approximately 200 companies in these sectors. PGGM keeps its sector allocations unchanged, based on the belief that all sectors will play a significant role in the transition to a low carbon economy. In the electric utility sector, some of the reallocation was to utilities that emphasize renewable energy generation.

PGGM explains in their June 2019 public communique why they have a strategy that does not rely solely on divestment. In "Getting our hands dirty for a cleaner world," they comment: "Calls to divest from coal

never come with the advice: sell to whom? A true and sustained shareholder dialogue with companies is more effective," argues PGGM's Han van der Hoorn, Senior Advisor, Responsible Investment.

PGGM is currently reviewing their exclusion policy, which is based on a company's emissions as a percentage of revenues to avoid high emitters. PGGM may adopt revisions later in 2020. Questions that may well shape the choices PGGM makes in the revised policy, include: "Is this a vital commodity/activity for society, and do we have credible and cost-effective alternatives?" (relevant, for example, in discussions of divesting thermal coal vs. metallurgic coal used for making steel); and "Is it inconsistent to base on carbon emissions?", (for example a company involved in oil extraction from sands will likely disappear, while a company building pipelines to transport the same oil would not).

PGGM is also making significant investments in climate solutions, as part of a mandate from PFZW to increase the fund's overall investments in solutions to major global challenges. These investments include public equities and green bonds. PGGM actively conducts climate scenario analyses, and physical climate risk research to further evolve its climate risk approach to investments.

Asset Owners that Divest Case by Case

Several asset owners evaluate companies on a case by case basis, rather than adopt a blanket divestment or exclusion policy, including the London Pensions Fund Authority, San Francisco Employees Retirement System, and the New York State Common Retirement Fund.

London Pension Fund Authority ("LPFA") (Approach: Divest Case by Case)

The LPFA is the largest local government pension provider in London with about $8 billion (approximately £6.1 billion) as of March 31, 2020. The LPFA executed a partial divestment from fossil fuels and established a policy for case-by-case assessment of the financial risks and performance of their fossil fuel holdings. The main criteria that the LPFA examines to determine whether to divest is how companies plan for a low carbon future and transition their businesses to comply with the goals of the Paris Agreement. They also utilize engagement in their divestment decision. Their fundamental reason for divestment is to avoid financial risk to the future value of their pension fund. The LPFA has specifically divested from seven energy companies[1] totaling approximately £9 million in their actively managed public equity assets and have 11 energy companies totaling approximately £11.6 million remaining in their actively managed public equity assets. The LPFA has not divested from energy companies in their passive investments because those investments cannot be redeemed until 2024 without significant cost. The LPFA estimates they may have approximately £100 million invested in energy companies in their passively managed investments.

The LPFA defines the total universe of fossil fuel companies with the term extractive fossil fuel companies ("EFFC") which indicates a broad sector of activity related to companies owning reserves and active in extraction. LPFA references a range of sources to define EFFC's and their effectiveness at transitioning to lower emissions including Transition Pathway Initiative ("TPI"), Carbon Disclosure Project ("CDP") data, and MSCI ESG metrics. Divestment is one aspect of the LPFA's strategy to address climate risk. They have a climate policy under which they assess the carbon emissions and transition-readiness of their portfolio primarily using the framework and rating system of the Transition Pathway Initiative.

[1] Exxon Mobil, Gazprom, YPF Sociedad Anonima, Canadian Natural Resources, Devon Energy, Lekoil, Tullow Oil.

New York State Common Retirement Fund ("NYSCRF") (Approach: Divest Case by Case)

NYSCRF is the third largest pension fund in the US, with approximately $210 billion in AUM as of March 31, 2020. NYSCRF approaches divestment of fossil fuel companies using a phased case-by-case assessment. In their Climate Action Plan released in 2019, NYSCRF states they will use an "enhanced, phased, risk assessment process…to evaluate companies in high impact sectors on climate transition readiness."[1] NYSCRF will place companies with poor performance on a watch list and prioritize them for engagement. If these companies fail to improve, NYSCRF will consider actions such as underweighting, restricting new investment, and divestment consistent with the NYSCRF's investment policies, processes and fiduciary duty. NYSCRF has begun this assessment process by identifying, in 2020, 21 thermal coal companies to engage with and potentially exclude from the portfolio.

NYSCRF'S 2019 Climate Action Plan delineates the Fund's next level of climate-related assessment, investment, engagement, and advocacy work. For years, the Fund used a multi-faceted approach to climate change, employing investment, active stewardship, and public policy advocacy strategies. Over the last 10 years, the Fund has identified and assessed its risks through scenario analysis and carbon footprint analysis; committed to investing $10 billion in sustainable strategies, including climate solutions; engaged with the largest emitters to reduce risks and assess transition readiness; and advocated at the international, national, and state levels for policies to reduce climate-related investment risks and create opportunities for the Fund and the economy as a whole. NYSCRF is active in CA100+.

San Francisco Employees' Retirement System ("SFERS") (Approach: Divest Case by Case)

SFERS had over $27 billion in AUM as of March 31, 2020 and takes a phased, case-by-case assessment approach to divesting from fossil fuel companies. As of their October 2019 report, SFERS had excluded 59 fossil fuel companies, including 42 thermal coal companies and 17 oil and gas companies. SFERS engages with 54 fossil fuel companies identified as presenting higher risk in their public markets portfolio, and assesses them for potential exclusion on a case-by-case basis.

SFERS adopted a phased approach to determine exclusions of fossil fuel reserve companies, beginning with an examination of thermal coal reserve owners. SFERS will not invest in public securities of companies if the company either derives greater than 50% of their revenues from thermal coal or derives between 10%-50% of group revenues from thermal coal activities and has not announced plans to substantially reduce or cease its thermal coal activities. SFERS makes efforts to engage with companies generating between 10% and 50% of revenue from thermal coal with the objective of understanding each company's long-term strategy for its thermal coal business segment. In addition, SFERS restricted investment in oil & gas reserves companies that display the highest climate transition risk according to SFERS' newly developed Climate Transition Risk Framework. The SFERS Framework assesses climate and financial risk metrics. SFERS monitors and engages with oil and gas companies who display high risk according to their risk framework, and/or are engaged in tar sand activities.

SFERS continues to increase the scope of its review of sectors and climate risk, most recently adding the utilities sector to its analysis, and establishing climate and financial risk metrics specifically for the utilities sector.

[1] https://www.osc.state.ny.us/sites/default/files/reports/documents/pdf/2019-07/climate-action-plan-2019.pdf

III. Defining Fossil Fuel Reserves Owners

Introduction

In this section, we review common approaches to defining fossil fuel reserves companies for potential exclusion, and examine BERS, NYCERS, and TRS exposure to fossil fuel reserve owners based on a broad definition of any company in the global economy that owns fossil fuel reserves.

We analyzed the Systems exposure as follows. First, we found the number of fossil fuel reserve owner companies to which the Systems are exposed, using ISS ESG data, and the Systems investment holdings data provided by BAM. Second, we calculated the System's public equity and fixed income assets invested in these companies as a percent of the System's total publicly listed assets. Third, we show the number of fossil fuel companies by GICS Sector and by number of companies that generate revenues from fossil fuel extraction.

All carbon reserves data is from ISS ESG. The definition of fossil fuel reserve owners includes all companies in any economic sector that own any proven and probable coal reserves, or any proven oil or gas reserves. ISS ESG data on carbon reserves covers fossil fuel projects that are greater than or equal to 10% owned by the company either directly or indirectly through subsidiaries/joint ventures/associates/affiliates.[1]

As long as there is 10% or more fossil fuel reserve ownership either by the company or its subsidiaries, the company will be included as an owner of fossil fuel reserves. Thus, the ISS definition encompasses companies that directly own reserves, companies that have a direct investment in a subsidiary that owns reserves, or have an indirect investment in a subsidiary of a subsidiary that own reserves. For this analysis, we only counted companies once. For example if Company A owns Company B that owns fossil fuel reserves, if Company A is counted, Company B is not counted as an additional company owning reserves, as it is included as a subsidiary of Company A. Companies are not included that do not directly own reserves, but are a subsidiary, or part of a parent company that directly owns reserves (an example would be a clean energy company owned by [redacted]). All investment holdings data for BERS, NYCERS, and TRS is from the Office of the New York City Comptroller, Bureau of Asset Management ("BAM").

Highlights

We found that leading asset owners and index providers take different approaches to defining fossil fuels, and that these approaches are evolving. Typically, leading asset owners and major index providers use a common definition of fossil fuel reserves (proved and probable coal reserves and proved oil and gas reserves). Second, asset owners commonly focus on thermal coal companies within coal mining for potential divestment for two reasons. First thermal coal – coal used for energy purposes – results in higher carbon emission than coal used to make materials such as steel. Second, unlike coal for energy purposes, where there are viable renewable energy market alternatives, there are not (yet) sufficient market alternatives to steel for many critical products that continue to be essential in global

[1] Fossil fuel projects refer to projects that explore for or produce fossil fuels. Fossil fuel reserves are usually accounted for on a project level given their geologic nature. Companies own interests in fossil fuel reserves that are discovered in these fossil projects. The ISS layers of ownership are not confined to any limit, but the ultimate ownership percentage is limited to 10%. In the following example, Company A's ownership in Company D is 80%*50%*50%=20%, which is above 10%, so Company A would be flagged for fossil fuel reserves in ISS database (so would Company B and Company C). This ownership chain can get longer, but what ultimately matters is the percentage of equity stake the ultimate parent company has over the subsidiary in question. ISS applies a 10% threshold for fossil fuel reserves owners, mainly because, given the complexity of exploring for and extracting fossil fuels, it is common for multiple companies to join forces and divide up the ownership to below 10%. Given the large amount of reserves at stake, a 10% interest can be huge in itself.

economies. Beyond that, asset owners seek to integrate additional financial parameters (e.g. revenue or income thresholds) and climate risk parameters (e.g. carbon emission potential and greenhouse gas management) to identify high risk areas of their portfolio, as discussed above.

Figure 2 shows the Systems' March 31, 2020 exposure to companies under an inclusive definition of fossil fuel reserve owners: all companies that own fossil fuel reserves throughout the economy. Exclusions based on this definition would be in addition to Systems current exclusion of 33 companies with 50% or more in revenues from thermal coal.

Figure 2: NYC Pension Systems Total Public Equity and Fixed Income Fossil Fuel Reserves Exposure[1] (March 31, 2020)

Total Public Equity and Fixed Income	BERS	NYCERS	TRS	Systems Combined
Total Plan AUM ($mm)	6,141.3	62,943.1	73,652.9	142,737.4
Total Plan Publicly Listed AUM ($ mm)	5,024.3	50,439.9	61,092.2	116,556.4
Total FF Exposure ($ mm)	[redacted]	[redacted]	[redacted]	[redacted]
FF Percent of Total Plan AUM (%)	[redacted]	[redacted]	[redacted]	[redacted]
FF Percent of Total Plan Publicly Listed Assets (%)	[redacted]	[redacted]	[redacted]	[redacted]
FF Companies Represented	[redacted]	[redacted]	[redacted]	[redacted]

Total Equity	BERS	NYCERS	TRS	Systems Combined
Total Equity AUM ($ mm)	2,989.9	27,885.5	32,811.1	63,686.4
Total FF Exposure ($ mm)	[redacted]	[redacted]	[redacted]	[redacted]
FF Percent of Total Assets (%)	[redacted]	[redacted]	[redacted]	[redacted]
FF Companies Represented	[redacted]	[redacted]	[redacted]	[redacted]

Total Fixed Income	BERS	NYCERS	TRS	Systems Combined
Total Fixed Income AUM ($ mm)	2,034.4	22,554.4	28,281.1	52,869.9
Total FF Exposure ($ mm)	[redacted]	[redacted]	[redacted]	[redacted]
FF Percent of Total Assets (%)	[redacted]	[redacted]	[redacted]	[redacted]
FF Companies Represented	[redacted]	[redacted]	[redacted]	[redacted]

As shown in Figure 2, TRS and NYCERS held [redacted] and [redacted] fossil fuel companies in their respective total combined public equity and fixed income portfolios, as of March 31, 2020. BERS held [redacted] fossil fuel owners. As a percent of each System's total AUM, fossil fuel company holdings were [redacted]% for TRS, [redacted]% for NYCERS, and [redacted]% for BERS. Combined, the three Systems held $[redacted] in [redacted] fossil fuel owners, [redacted]% of total Plan AUM, and [redacted]% of publicly listed AUM.

TRS and NYCERS respectively held [redacted] and [redacted] publicly listed fossil fuel reserve owner companies as of March 31, 2020. BERS held [redacted] fossil fuel owners. As a percent of each System's total AUM, fossil fuel company holdings were [redacted]% for TRS, [redacted]% for NYCERS, and [redacted]% for BERS. Combined, the Systems held $[redacted] in [redacted] fossil fuel owners.

[1] Source: BAM and ISS ESG.

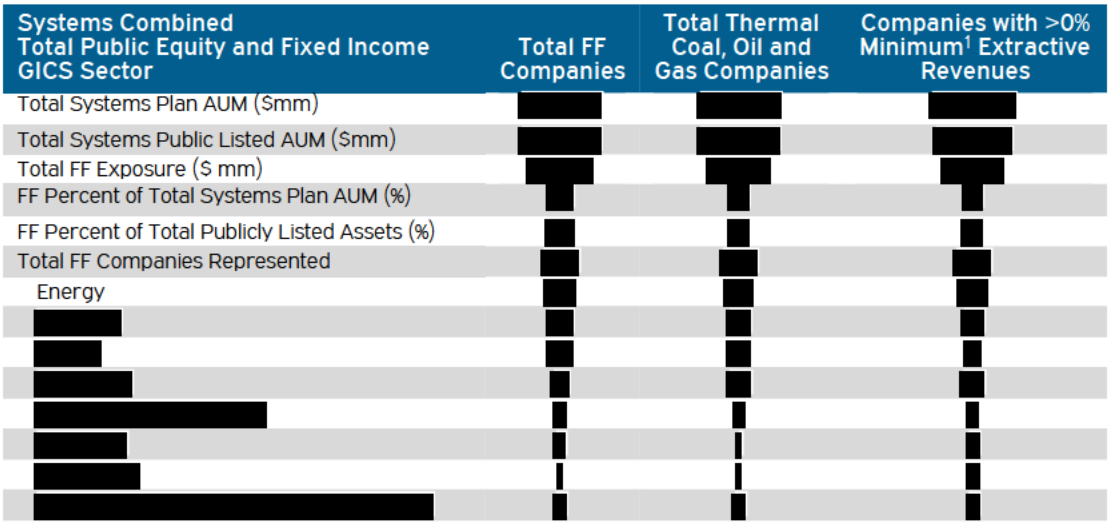
Each System held most of its fossil fuel reserve owner company exposure in its equity portfolio. Combined, the Systems held $[redacted] in equities of fossil fuel companies ([redacted]% of combined equities), and $[redacted] in fixed income securities of fossil fuel companies ([redacted]% of the Systems combined Fixed Income portfolios). TRS held [redacted]% of its equity portfolio in fossil fuel reserve owners. NYCERS held [redacted]%, and BERS held [redacted]%. TRS held [redacted] companies representing [redacted]% of the TRS fixed income portfolio. NYCERS held fixed income securities of [redacted] fossil fuel companies that together represented [redacted]% of the NYCERS Fixed Income portfolio. BERS held [redacted] fossil fuel companies that accounted for [redacted]% of the BERS Fixed Income portfolio.

Each System held most of its fossil fuel reserve owner company exposure in its equity portfolio. Combined, the Systems held fossil fuel company listed securities worth $[redacted] in equities ([redacted]% of combined equities), and $[redacted] in fixed income securities of fossil fuel companies [redacted]% of combined fixed income).

Most fossil fuel reserve owners in the Systems portfolios ([redacted] of the total [redacted]) are energy sector companies. [redacted] of the total [redacted] generated revenues greater than $0 from extraction of fossil fuels. Among these, [redacted] are energy sector companies.

As shown in Figure 3, the largest share of fossil fuel reserve owners in the Systems portfolios ([redacted] of the total [redacted]) are energy sector companies, as defined by the Global Industrial Classification System (GICS). This all-inclusive definition of fossil fuel reserve owners includes companies that generate zero revenues from extraction of oil, gas, or coal. As shown in Figure 3, [redacted] of the total [redacted] generated revenues greater than $0 from extraction of fossil fuels. Among these, [redacted] were energy sector companies. The Systems combined were exposed to fewer companies if only coal companies with some thermal coal revenues (coal for energy purposes) are included, not companies whose reserves are used only for metallurgical (non-energy) purposes. This is illustrated in the Figure 3 column entitled 'Total Thermal Coal, Oil and Gas Companies'. The total number of companies with thermal coal, oil or gas reserves for the Systems combined was [redacted] of the [redacted].

Figure 3: Systems Combined Fossil Fuel Reserve Companies Exposure by Sector and Revenues from Extraction[1] (March 31, 2020)



Among asset classes, equity passive exposure far outstrips active. In Fixed Income, the majority of the exposure is in [redacted] (Appendix 3).

[1] Source: BAM and ISS ESG.

Discussion

As illustrated above, large institutional investors employ a wide range of definitions of fossil fuel reserves owners, and widely varying strategies for investment and engagement when addressing climate and fossil fuel company risks. The Systems first prohibited certain investments in fossil fuel companies in 2015. At that time, the Boards of TRS, NYCERS, and BERS prohibited investment in companies that derived at least 50% of revenues from the extraction of thermal coal. Thirty-three companies are currently excluded based on revenues from the extraction of thermal coal.

Defining fossil fuel reserve owners involves multiple decisions.

1) **Define fossil fuel reserves.**

   The most common definition utilized by institutional investors, ESG data vendors, index providers, and climate institutional investor organizations is proven and probable coal reserves, and proven oil and gas reserves. We use this definition for this report.

We use proven and probable coal reserves and proven oil and gas reserves in the definition of fossil fuel reserves.

2) **Decide what type of fossil fuel reserves.**

   Asset owners look at the different types of fossil fuel reserves primarily for differences in carbon emissions intensity. Broadly, fossil fuels are categorized by coal, oil, and gas. Each of these types of reserves may be further subdivided. Coal is often subdivided into thermal coal, used for energy production, and metallurgical coal, used to produce materials such as steel. Thermal coal generates much higher carbon emissions than metallurgical coal. Oil and gas reserves may also be subdivided, often by the method of production, such as tar sands, hydraulic drilling, or offshore drilling.

For this project we included all oil, gas, and coal reserves to capture the full universe of fossil fuel reserve owners.

   For this project, we included all oil, gas, and coal reserves to capture the full universe of fossil fuel reserve owners.

3) **Decide what economic sector to apply the definition.**

   Asset owners, index providers, and climate investor organizations typically take one of two approaches. One approach has been to look at fossil fuel reserve owners for possible exclusion within the Energy Sector, because fossil fuel reserve extraction and production is concentrated in the Energy Sector. A benefit of this approach is the ability to analyze companies that share similar business models. A drawback is that there are additional companies that own fossil fuel reserves, including some with significant amounts of reserves, in other economic sectors, including utilities, materials, industrials, and finance.

   A second approach focuses on identifying fossil fuel reserve owners throughout the economy. This approach includes any company that may own fossil fuel reserves throughout the economy regardless of sector. An advantage of this definition is that it captures all fossil fuel reserve owners without limitation. A drawback to this approach is that it is more difficult to compare companies on material financial and climate risks. For example, a utility company may own a thermal coal extraction plant. However, if its business relies primarily

For this project we included all fossil fuel reserve owners throughout the economy to capture the full universe of companies.

on the generation of electricity, rather than extraction of fossil fuels, the company may face much lower financial risk from potential stranded coal, or gas mining assets.

For this project, we included all fossil fuel reserve owners throughout the economy to capture the full universe of companies.

4) **Decide focus on extractive or total production revenues.**

Companies that own fossil fuel reserves range from businesses that solely focus on the extraction of reserves to companies in which the extraction of reserves represents 0% of their overall revenues. Revenues from reserves may be specified in different ways. Two standard approaches are to identify total fossil fuel production revenues, and revenues from extraction only. Total production revenue encompasses revenue from involvement in fossil fuel production, including extraction, power generation, and processing and refining. A benefit of the total production revenue metric is that it provides the broadest revenue measure associated with fossil fuel reserves. A benefit of extraction revenues is that it focuses on companies involved in the supply of fossil fuel reserves.

The major index providers vary in defining types of companies they aim to exclude in ex-fossil fuel indexes. The FTSE Russell ex-fossil fuel index series is designed to focus on companies directly engaged in the extraction of fossil fuels, concentrated in the Energy Sector, which have been central to stranded asset concerns. Companies that provide services to the fossil fuel industry, use fossil fuels, or finance exploration are not excluded. The MSCI and the SPDJI ex-fossil fuel index series capture any company that owns fossil fuel reserves with evidence of reserves used most likely for energy purposes (excludes metallurgical coal), and include companies whose primary business is not the extraction of fossil fuels, such as utilities (Appendix 4).

The drawbacks of each approach depend on the goal for which the definition is used. If the aim is to concentrate on suppliers/producers of fossil fuel reserves, then a definition that takes into account whether the company generates revenue from extraction is relevant. If the goal is to identify any owner of reserves, regardless of the company's role as a supplier of reserves, then a broader definition would likely be more appropriate.

For this project, we included all fossil fuel reserve owners, regardless of whether their business is focused on the extraction of reserves, to capture a full universe of companies. We include both the total production and the extraction revenue percentages, and thermal coal mining revenues for each company in Appendix 5.

5) **Decide if and how to refine the overall definition.**

Asset owners often use additional information to refine their set of fossil fuel reserves companies. The base definition used is typically whether a company owns fossil fuel reserves. The set of companies can be refined by, for example, concentrating on companies that meet a threshold of reserves ownership. Asset owners use other metrics to set minimum thresholds. The most commonly used are percent of revenues generated from fossil fuels, income generated from fossil fuels, and potential carbon emissions generated from reserves. Increasingly, asset owners seek to identify companies with more forward looking measures, such as how well prepared the company is for the energy transition. We review drawbacks and benefits of each approach below.

- **Ownership of fossil fuel reserves**

  Definitions of fossil fuel reserves owners that are not further filtered by a revenue/income threshold, carbon emissions threshold, or management preparedness threshold, offer the benefit that they capture a broad set of companies that have exposure to fossil fuel reserves. Reserves ownership data is becoming more and more available. However, there are companies that do not report reserves. Data vendors have significantly improved their techniques for estimating fossil fuel reserves for companies that do not report reserves. This critical data for investors assessing climate risks is not yet as easily available as standard financial metrics. However, reserve ownership data is fairly accessible overall. Data is more available and more likely to be better quality for larger companies, and for companies headquartered in developed market economies.

  The ex-fossil fuel indexes from the major index providers use definitions based on ownership of fossil fuel reserves used for energy application. For coal reserves, definitions are typically restricted to thermal coal – coal used to produce energy - to identify companies for exclusion. Asset owners often use fossil fuel reserves data to distinguish the type of reserves. One asset owner we reviewed uses a reserves threshold to further refine a definition of fossil fuel reserve owners, along with other parameters. Asset owners frequently apply additional financial risk (e.g. % of revenues threshold, % of income threshold) and/or climate risk (e.g. carbon emissions intensity) metrics to further refine their definition of fossil fuel reserve owners. More asset owners are incorporating forward-looking measures of how companies manage their climate change risks.

- **Revenues from reserves threshold**

  As seen from the asset owner findings, many large institutional investors adopt a definition of reserves that relies on some threshold of revenues from extraction and production of fossil fuels. The larger the percent of revenues from fossil fuels, the more material fossil fuels are assumed to be to the company's business.

  A benefit of a percent revenue from fossil fuels threshold is that it can provide an indication of the financial importance of fossil fuels to the overall company. In addition, revenues are relatively standardized metrics. It is fairly straightforward to gather reliable data from large and small companies and monitor companies using revenue thresholds. A drawback of revenue thresholds may be that it does not provide information on how important reserves extraction and production are to a company's earnings. For example, Carbon Tracker comments that in today's economy, if a >50%, or even >25% of revenues from reserves threshold is applied, companies with lower revenues from reserves that rely on extraction as a high profit center may be missed in screening for critical financial risks related to potential stranded assets. A general drawback of revenue thresholds is that, they do not, by themselves provide distinctions between companies on the climate risk associated with the business. Some asset owners use revenue thresholds in combination with other climate risk metrics, such as type of reserve, carbon emissions intensity, and management preparedness.

  Asset owners use varying revenue thresholds in efforts to look at specific types of fossil fuels, such as thermal coal or tar sands, and to analyze all fossil fuels. Index providers also turn to revenue thresholds to develop climate-related indexes. For example, FTSE Russell produced its Green Revenue Index to identify companies across the economy, large and small, that have 20% or greater in revenues from green products and services. This type of

metric allows investors to broaden their approach in seeking to invest in publicly listed renewables or green companies, which tend to be smaller cap securities, and recognizes that the energy transition is systemic, across all companies, not limited to pure play renewable and clean tech companies. The May 2020 publication of the SPDJI Paris-Aligned Index brought the first publicly available Paris-aligned index series. The index incorporates exclusions based on different revenue thresholds for different types of reserves. The index includes multiple considerations after a set of exclusions. The revenues from reserves exclusions are set for any company in any economic sector that has either: 1% or > of revenues from thermal coal reserves; 10% or > oil reserves revenues; or 50% or > gas reserves revenues.

- **Income from reserves threshold**

  Income from reserves threshold can be used to filter fossil fuel reserve owners. Income thresholds, like revenue thresholds aim to identify companies with a material financial risk from their fossil fuel reserve ownership. A benefit of an income from reserves threshold, such as EBITDA, is that it may, more accurately than revenue thresholds, capture the financial materiality of fossil fuel extraction to a business. A drawback of income thresholds is, they do not, by themselves, distinguish degrees of climate risk associated with different companies. Like revenue thresholds, income thresholds can be used in combination with other climate risk metrics. A second drawback of relying on an income threshold approach is the difficulty in finding quality comparable income data across the fossil fuel reserves companies. Monitoring based on an income threshold will likely be more difficult than other approaches. We reviewed one asset owner (GPFG) that applies an income threshold as one element in its determination for excluding thermal coal companies. We are not aware of any index providers that use an income threshold to define fossil fuel reserves companies.

- **Carbon emissions threshold**

  While revenue and income thresholds are geared toward better identification of company's financial risk from reserves, a benefit of adopting a potential carbon emissions threshold is that the measure focuses directly on the key climate risk for fossil fuels – carbon emissions. Some asset owners, such as PGGM in their current policy, and organizations, such as Fossil Free, which produces the Carbon Underground 200, use historic carbon emissions to identify highest emitters for exclusion lists. Although the CU200 definition does not distinguish thermal from metallurgic coal, 93 of the latest CU Coal 100 list were companies that produce coal for energy, or for both thermal and metallurgical uses. Seven companies were included that had ownership in coal mines whose only use of the coal is metallurgical.

  Drawbacks may be that carbon emission measures, such as carbon emissions, or carbon intensity, cannot identify the financial risks to companies; they can result in exclusions of companies that produce critical products for which there is currently no credible alternatives (such as metallurgic coal where there may not be sufficient viable alternatives to, for example a critical product like steel), and may result in economically inconsistent policies, such as exclusions of a high emitting tar sands oil producer while not excluding a lower emitting transporter of the same oil.

  Carbon emissions, and potential carbon emissions from reserves, can be used in conjunction with financial risk metrics to further refine a definition of fossil fuel reserve owners. Reliable carbon emissions data, like carbon reserves data, is not as easy to obtain as standard financial metrics. For carbon emissions, Scope 1 and 2 emissions are becoming fairly

standardized, and easier to retrieve and to monitor across a large part of the market of publicly listed companies. Scope 3 carbon emissions are more difficult to estimate and are just now becoming part of ESG data vendor standard offerings.

6) **Management preparedness for energy transition**

Institutional investors increasingly seek metrics that look forward, and distinguish companies that may have large carbon emissions today, but are actively seeking to transition their businesses to reduce their reliance on products and services with high carbon emissions, from companies that have large emissions and are not actively transitioning. In this vein, institutional investors continue to identify applicable management strategies and preparedness for the energy transition to a low carbon economy. Measures such as the Transition Pathway Initiative (TPI) scores are gaining traction as forward-looking indicators for both engagement efforts and potential exclusion and reweighting of portfolios for lower carbon exposures. For example, in February 2020, the Church of England shifted all of its passive equity portfolio to a new index based on the TPI. The District of Columbia Retirement Board currently asks its managers to review the CU200 list for exposures. The Board is reviewing a change to request that its managers review the TPI scores for high risk climate exposures.

Drawbacks of these measures can be that they introduce a lot of judgement into the scores that are produced. The scores aggregate and rate different elements of information to assess a company's strategy and efforts. A second limit may be that these are relatively new, and, for example, TPI scores currently are available for approximately 360 companies globally, but are not available for a broad set of companies in which institutional investors typically invest. Additional management energy transition preparedness information is available on a much broader set of publicly listed companies, from data vendors such as ISS, MSCI, and Sustainalytics, that can be useful to develop a TPI-like assessment of company's climate risk management for a broad set of publicly listed companies.

7) **Decide to apply definition as a standard for exclusions, or to define a set of companies for potential exclusion, and then determine exclusions case-by-case.**

Asset owners use both methods. A benefit of a standard definition is that it can be more easily applied to an investment portfolio. Drawbacks may be that it can be challenging to design a definition that captures the differences in material financial and climate risks among companies, and that it is difficult to use exclusion as a 'last resort', as part of an engagement approach unless exclusion is approached case-by-case. A drawback of the case-by-case method may be that it typically requires more asset owner effort and attention to individual companies.

Proposed Universe for Analysis:

For this project, we propose a broad definition for the universe of fossil fuel reserve owners, based on any publicly listed company in the economy that owns fossil fuel reserves. Phase 2 of the project will concentrate on evaluating companies for potential, prudent divestment. This wide universe of every fossil fuel owner is not necessarily a list that would be recommended for divestment.

We propose a broad definition as the universe of fossil fuel reserve owners to analyze: any publicly listed company in the economy that owns fossil fuel reserves. Phase 2 of the project will concentrate on evaluating companies for potential, prudent divestment.

IV. Conclusions

Meketa's research on how leading asset owners manage climate risk in their portfolios, and details on how institutional investors define fossil fuel reserve owners for potential exclusion, indicates that the issue is complex. The global economy and institutional investor approaches to climate risk management are both rapidly evolving. We found a range of high quality, prudent strategies to address a future that cannot be known clearly.

Leading asset owners share certain key characteristics. Whether they exclude a zero, few, or many fossil fuel reserve owners, every asset owner devotes significant attention to proxy voting and engagement. Asset owner attention is growing beyond fossil fuel producers to users, financiers, and insurers of fossil fuels. We found a rapid evolution in how asset owners approach monitoring climate risks, with a growing emphasis on climate risk key performance indicators (Climate KPIs), forward-looking indicators, and climate scenario analysis.

We propose a broad definition as the universe of fossil fuel reserve owners to analyze for potential prudent exclusion: any publicly listed company in the global economy that owns proven fossil fuel reserves.

For this project, we propose a broad definition as the universe of fossil fuel reserve owners to analyze for potential prudent exclusion: any publicly listed company in the global economy that owns proven and probable coal or proven oil or gas reserves. Please note that the project's Phase 2 analysis will not necessarily result in every company on the list being recommended for divestment. Each company will be assessed for both climate and climate related financial risks, based on available data.

Based on this wide universe of fossil fuel reserve owners, as shown in Figure 2, as of March 31, 2020, the Systems combined, held public equity and/or fixed income securities were [redacted] companies, which represented [redacted]% of the Systems combined Total Plan AUM, and [redacted]% of the Systems combined public equity and fixed income assets.

As of March 31, 2020, the Systems combined held public equity and/or fixed income securities of [redacted] companies, which represented [redacted]% of the Systems Combined total Plan AUM, and [redacted]% of the Systems combined public equity and fixed income assets.

V. Appendices

Appendix 1:
Survey Questions

Appendix 2:
Survey Recipients

Appendix 3:
Sub-Asset Class Fossil Fuel Reserve Exposures (March 31, 2020)

Appendix 4:
Ex-Fossil Fuel Index Definitions

Appendix 5:
List of Companies– Fossil Fuel Reserve Exposures (March 31, 2020)

Appendix 6:
List of Companies– Fossil Fuel Reserve Exposures (March 31, 2020) (continued)

Appendix 1

Survey Questions

(See the following pages.)

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Section I: Contact Information

* 1. Name of Organization

* 2. Type of Organization (e.g., public pension plan, foundation, endowment, educational institution, faith-based institution)

* 3. Primary Contact Name

* 4. Primary Contact Title

* 5. Primary Contact Email Address

* 6. Primary Contact Phone Number

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Section II: Organization - Overview (as of December 31, 2019)

* 7. Total Assets Under Management (AUM) $billions

8. What percentage of your assets are internally managed?

9. What percentage of your assets are passively managed?

10. What percentage of your passive assets are internally managed?

11. Number of dedicated investment staff

12. Number of dedicated ESG Investment/Corporate Governance staff

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Section III: Climate Change Investment Analysis and Monitoring

13. Please describe how you assess and monitor your portfolio for climate change risks. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

14. Please describe how you identify, assess and address investment risks posed by fossil fuel reserve owners and their securities, including risks related to stranded assets, litigation and regulation? If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

15. Do you use a specific definition for "fossil fuel reserve owners" or "fossil fuel companies"? If yes, what is the definition? If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

16. What, if any, governmental/regulatory mandates regarding climate change is your organization required to take into account in its investment approach? Please identify, and attach relevant document/s and note the name/s of the documents in your comment below. An option to upload documents is provided at the end of the survey.

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Section IV: Exclusion/Divestment and Reweighting of Fossil Fuel Companies

17. Have you conducted a study or analysis regarding potential divestment from fossil fuel companies? If yes, please provide a copy and note the name/s of the document/s in your comment below. An option to upload documents is provided at the end of the survey. If a copy cannot be provided, please describe the study or analysis.

18. Have you decided to divest from or exclude any fossil fuel companies?

- Yes
- No

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Section IV: Exclusion/Divestment and Reweighting of Fossil Fuel Companies

19. What is the total AUM of the divestment or exclusion?

20. What criteria do you use to identify the companies/securities for divestment or exclusion? If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

21. On what date (month/year) did or will the divestment/exclusion commence? If it is undetermined, please provide an estimated date if possible.

22. Please describe the timeline or pacing for the divestment or exclusion. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

23. To which asset classes or sub-asset classes do you apply your divestment/exclusion?

24. Does your divestment apply to passively and actively managed assets? If no, please clarify.

- Yes
- No

P ease c ar fy here

25. Does your divestment/exclusion apply to commingled funds and separately managed accounts? If no, please clarify.

- Yes
- No

P ease c ar fy here

26. Does your divestment apply to internally managed and externally managed assets? If no, please clarify.

- Yes
- No

P ease c ar fy here

27. Please list the companies and securities divested or excluded and any planned for future divestment or exclusion. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

28. How do you re-weight securities in your portfolio to address potential impacts of divesting or excluding fossil fuel securities? Please describe your approach. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

29. Please provide any information available on the impact of the divestment/exclusion on your portfolio such as on return, risk, volatility, diversification, tracking error, and costs. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

30. Please describe how you monitor the impact of the divestment or exclusions on your portfolio? E.g. do you use benchmarks; compare to portfolios that hold the divested/excluded securities; other approaches? If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

31. Does your divestment or exclusion approach include proxy voting and engagement with fossil fuel companies? If yes, please describe your approach. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

- Yes
- No

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Section IV: Exclusion/Divestment and Reweighting of Fossil Fuel Companies

32. In addition to, or as an alternative to divestment or exclusion of specific securities, have you adopted any investment approaches that reduce the proportional weight of fossil fuel securities: e.g., low carbon, climate risk, Paris Aligned, green investments, other?

- Yes
- No

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Section IV: Exclusion/Divestment and Reweighting of Fossil Fuel Companies

33. Please describe your approach. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

34. Please provide any information available on the financial results of these investment approaches, such as impacts on return, risk, volatility, diversification, tracking error and costs. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

35. If there are ways in which you would like to improve your approach, please describe. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

Section V: Additional Comments

36. Please comment on any issues not raised in this survey that you consider material to your organization s ability to address climate change investment risks and opportunities, including but not limited to those relevant to any exclusion/divestment/reweighting of fossil fuel companies. If you would like to include any documents, please note the names of the documents in your comment below. An option to upload documents is provided at the end of the survey.

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Section VI: Confidentiality Agreement

37. Please let us know how you would like Meketa to identify your organization when using the results of the survey:

- P ease keep our responses conf dent a , nc ud ng that we are a respondent to the survey.
- P ease dent fy us as a respondent to the survey, but keep a nformat on spec f c to our organ zat on conf dent a .
- P ease dent fy us as a respondent to the survey, and responses spec f c to our organ zat on may be dent f ed n work for Meketa c ents but not n a pub c Wh te Paper.
- P ease dent fy us as a respondent to the survey, and on y after our approva of the anguage be ng used, may responses spec f c to our organ zat on be dent f ed n a work for Meketa c ents and n a Meketa Wh te Paper.

Other (p ease spec fy)

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Section VII: Document Upload

Please use the following questions to upload relevant documents for this survey. Please note, the maximum file size is 16MB per question. If you wish to provide more supporting materials than supported by this section, please feel free to email additional documentation to sbernstein@meketa.com.

38. Supporting Document #1

Choose File Choose File No f e chosen

39. Supporting Document #2

Choose File Choose File No f e chosen

40. Supporting Document #3

Choose File Choose File No f e chosen

41. Supporting Document #4

Choose File Choose File No f e chosen

42. Supporting Document #5

Choose File Choose File No f e chosen

43. Supporting Document #6

Choose File Choose File No f e chosen

44. Supporting Document #7

Choose File Choose File No f e chosen

45. Supporting Document #8

Choose File | Choose File | No f e chosen

46. Supporting Document #9

Choose File | Choose File | No f e chosen

47. Supporting Document #10

Choose File | Choose File | No f e chosen

48. Supporting Document #11

Choose File | Choose File | No f e chosen

49. Supporting Document #12

Choose File | Choose File | No f e chosen

50. Supporting Document #13

Choose File | Choose File | No f e chosen

Appendix 2

Asset Owner Recipients[1]

US/Non US	Tier	Name of Organization	Source	Type
[redacted]				

[1] Source: Meketa survey and research.
Definitions: FFree = Fossil Fuel Free; CA100+ = Climate Action 100+ signatory or participant; TCFD = Task Force on Climate-Related Financial Disclosure; PRI = Principles for Responsible Investment; C40 = C40 Cities; NZ AOA = Net-Zero Asset Owner Alliance.

US/Non US	Tier	Name of Organization	Source	Type
[redacted]				

Definitions: FFree = Fossil Fuel Free; CA100+ = Climate Action 100+ signatory or participant; TCFD = Task Force on Climate-Related Financial Disclosure; PRI = Principles for Responsible Investment; C40 = C40 Cities; NZ AOA = Net-Zero Asset Owner Alliance.

Appendix 3

Sub-Asset Class Fossil Fuel Reserve Exposures (March 31, 2020)

BERS Exposure to Fossil Fuels (March 31, 2020)
Source: BAM and ISS ESG

	BERS Plan	Any FF Reserves (All Sectors)
Total Equity & FI (Public) ($ mm)	5,024.3	[redacted]
% of Market Value	100	
# of fossil fuel companies	-	
Total Equity ($ mm)	2,989.9	
% of Market Value	-	
# of fossil fuel companies	-	
Active		
Market Value ($ mm)	1,280.5	
Passive		
Market Value ($ mm)	1,709.4	
Domestic Equity ($ mm)	1,810.1	
Active		
Market Value ($ mm)	214.1	
Passive		
Market Value ($ mm)	1,596.0	
International Equity ($ mm)	1,179.8	
Active		
Market Value ($ mm)	1,066.4	
Passive		
Market Value ($ mm)	113.3	
Global Equity ($ mm)	0.0	
Total Fixed Income (Public) ($ mm)	2,034.4	
% of Market Value	-	
# of fossil fuel companies	-	
Active		
Market Value ($ mm)	1,477.7	
Passive		
Market Value ($ mm)	556.7	
Structured ($ mm)	1,338.2	
Active		
Market Value ($ mm)	1,099.4	
Passive		
Market Value ($ mm)	242.6	
TIPS ($ mm)	314.1	
Active		
Market Value ($ mm)	0.0	
Passive		
Market Value ($ mm)	314.1	
High Yield ($ mm)	265.8	
Active		
Market Value ($ mm)	265.8	
Passive		
Market Value ($ mm)	0.0	
Bank Loans ($ mm)	112.5	
Active		
Market Value ($ mm)	112.5	
Passive		
Market Value ($ mm)	0.0	
Targeted ($ mm)	0.0	

NYCERS Exposure to Fossil Fuels (March 31, 2020) Source: BAM and ISS ESG	Plan	Any FF Reserves (Any Sectors)
Total Equity & FI (Public) ($ mm)	50,439.9	[redacted]
% of Market Value	100	
# of fossil fuel companies	-	
Total Equity ($ mm)	27,885.5	
% of Market value	-	
# of fossil fuel companies	-	
Active		
Market Value ($ mm)	11,062.3	
Passive		
Market Value ($ mm)	16,823.2	
Domestic Equity ($ mm)	16,957.7	
Active		
Market Value ($ mm)	3,753.3	
Passive		
Market Value ($ mm)	13,204.4	
International Equity ($ mm)	10,673.3	
Active		
Market Value ($ mm)	7,054.5	
Passive		
Market Value ($ mm)	3,618.8	
Global Equity ($ mm)	254.5	
Active		
Market Value ($ mm)	254.5	
Passive		
Market Value ($ mm)	0.0	
Total Fixed Income (Public) ($ mm)	22,554.4	
% of Market Value	-	
# of fossil fuel companies	-	
Core - FI EM		
Market Value ($ mm)	132.8	
Structured		
Market Value ($ mm)	13,662.8	
TIPS		
Market Value ($ mm)	3,114.4	
High Yield		
Market Value ($ mm)	2,709.2	
Bank Loans		
Market Value ($ mm)	1,088.8	
Opportunistic Fixed Income		
Market Value ($ mm)	182.2	
Convertible Bonds		
Market Value ($ mm)	729.7	
Targeted		
Market Value ($ mm)	934.4	

TRS Exposure to Fossil Fuels (March 31, 2020) Source: BAM and ISS ESG	Plan	Any FF Reserves (Any Sectors)
Total Equity & FI (Public) ($ mm)	61,092.2	[redacted]
% of Market Value	100	
# of fossil fuel companies	-	
Total Equity ($ mm)	32,811.1	
% of Market Value	-	
# of fossil fuel companies	-	
Active		
Market Value ($ mm)	10,652.0	
Passive		
Market Value ($ mm)	22,159.2	
Domestic Equity ($ mm)	19,075.6	
Active		
Market Value ($ mm)	885.3	
Passive		
Market Value ($ mm)	18,190.3	
International Equity ($ mm)	13,481.7	
Active		
Market Value ($ mm)	9,512.8	
Passive		
Market Value ($ mm)	3,968.9	
Global Equity ($ mm)	253.8	
Active		
Market Value ($ mm)	253.8	
Passive		
Market Value ($ mm)	0.0	
Total Fixed Income (Public) ($ mm)	28,281.1	
% Market Value	-	
# of fossil fuel companies	-	
Core - FI EM		
Market Value ($ mm)	137.8	
Structured		
Market Value ($ mm)	18,606.0	
TIPS		
Market Value ($ mm)	3,407.6	
High Yield		
Market Value ($ mm)	3,462.4	
Bank Loans		
Market Value ($ mm)	1,645.1	
Targeted		
Market Value ($ mm)	643.6	
Convertible Bonds		
Market Value ($ mm)	189.5	
Opportunistic Fixed Income		
Market Value ($ mm)	189.0	

Appendix 4

Ex-Fossil Fuel Index Definitions

FTSE/Russell ex-Fossil Fuel indexes exclude stocks that are companies whose principal business activity is identified by a combination of Industry Classification Benchmark1 (ICB) Subsector; and Standard Industrial Classification2 (SIC) System. Companies that provide services to the fossil fuel industry, use fossil fuels, or finance exploration are not excluded from the index. The index is tailored to specifically exclude those companies directly engaged in extracting the fossil fuels that are at the heart of stranded assets. Companies that satisfy the following conditions are excluded from the index:·classified as in the ICB subsectors – Exploration & Production (0533), Integrated Oil & Gas (0537), Coal Mining (1771) and General Mining (1775); and either have revenues arising from Bituminous Coal and Lignite Surface Mining (SIC code: 1221), Bituminous Coal Underground Mining (SIC code: 1222), Anthracite Mining (SIC code: 1231), Crude Petroleum and Natural Gas (SIC code: 1311) or Natural Gas Liquids (SIC code: 1321); or proved and probable reserves in coal, oil or gas based on the companies' published Annual Report and Accounts..

MSCI ex-fossil Fuel indexes identifies companies, regardless of their industries, with evidence of owning fossil fuel reserves used most likely for energy applications. For high-intensity industries (belonging to Energy and Utilities GICS Sector & Diversified Metals & Mining GICS Sub-Industry), this factor flags companies with evidence of fossil fuel reserves (excluding Metallurgical Coal). For other industries, it flags companies with evidence of fossil fuel reserves (excluding Metallurgical Coal) and deriving revenue from business segments associated with energy application of fossil fuels such as Thermal Coal mining, Oil & Gas exploration & production and downstream activities e.g. refining; distribution & retail; pipeline & transportation; trading and fossil fuel-based power generation. Fossil fuel reserves are defined as proved and probable reserves (i.e. 2P) for coal and proved reserves (i.e. 1P) for oil and natural gas.

S&PDJI Fossil Fuel Free indexes are constructed based on economically and technically recoverable sources of crude oil, natural gas and thermal coal. The exclusion rules are based on any ownership of fossil fuels, including for third party and in-house power generation. With respect to coal, the exclusion relates to thermal coal and does not cover companies which are exclusively engaged in the extraction of metallurgical or coking coal. The research for ownership of fossil fuel reserves is conducted by RobecoSAM across a number of priority sectors including oil & gas, coal & consumable fuels, and mining, materials and utilities.