SFERS
San Francisco Employees' Retirement System

San Francisco City and County
Employees' Retirement System

RETIREMENT BOARD MEETING CALENDAR SHEET
July 10, 2024

To: Retirement Board

From: Tanya Kemp, CFA, CAIA
Managing Director, Private Markets

Christopher Chow, CFA
Director, Real Assets

Chris Terrazzano, CFA
Associate PM, Real Assets

Date: July 10, 2024

Agenda Item: Real Assets Annual Update

Recommendation:
This is a discussion only item.

Background:
As of December 31, 2023, the Real Assets Portfolio had approximately $5.1 billion of NAV (or 14.8% of total Plan assets) and total exposure (NAV + unfunded) of $7.1 billion (or 20.5% of total Plan assets). Since inception, the Real Assets portfolio has generated a net IRR of 8.3% and a TVPI of 1.4x.

Staff and Cambridge Associates will present an update including a review of the portfolio's strategy, performance, and composition. Additionally, Staff and Cambridge Associates will discuss the current market environment, opportunities, and initiatives.

Attachment:
Staff Presentation
Consultant Presentation – Cambridge Associates

Real Assets Update

Tanya Kemp, CFA, CAIA, *Managing Director, Private Markets*
Christopher Chow, CFA, *Director, Real Assets*
Chris Terrazzano, CFA, *Associate Portfolio Manager, Real Assets*

July 10, 2024

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Agenda

- Executive Summary
- Program Overview
- Performance Review
- Portfolio Review
- Initiatives
- Appendix

Executive Summary

Executive Summary

- SFERS Real Assets performance turned negative in 2023 amid a higher rate environment and lower commodity prices
  - Overall portfolio returned -3.1% in 2023 after returning +10.2% in 2022
  - Infrastructure led the three sub-portfolios returning +5.1% while Natural Resources was mostly flat at -0.2% and Real Estate was negative at -6.7%
  - Portfolio underperformed the policy benchmark over the 1-year (-1.4%)

- 14.8% current allocation compared to the 10% target
  - $5.1 billion NAV and $2.0 billion in unfunded commitments
  - Exposure was 54% Real Estate, 30% Natural Resources, and 16% Infrastructure at year-end

Sources: Data from Aksia and Wilshire as of 12/31/2023 with sub-portfolio allocations based on NAV + Unfunded

Executive Summary (cont.)

- In 2023, $123.4 million in net contributions
- New commitments were 54% Real Estate and 46% Infrastructure
  - $383 million across six investments
  - All with existing managers
- Pacing decreased from 2022 levels and ended below targets
  - Expectation of a larger re-up calendar and re-grading of relationships
  - Market challenges led to protracted fundraising timelines, allowing for greater patience in committing capital

Source: Data from Aksia as of 12/31/2023

Program Overview

Role of Real Assets

- Designed to provide diversification, total return, yield, and inflation protection
  - Target long-term returns of 10%-12% as program continues transition away from core real estate

- Portfolio comprised of three sub-portfolios: 1) Real Estate; 2) Natural Resources; and 3) Infrastructure
  - Infrastructure formally adopted within benchmark in 2022
  - Other strategies considered, such as Intellectual Property and GP Stakes

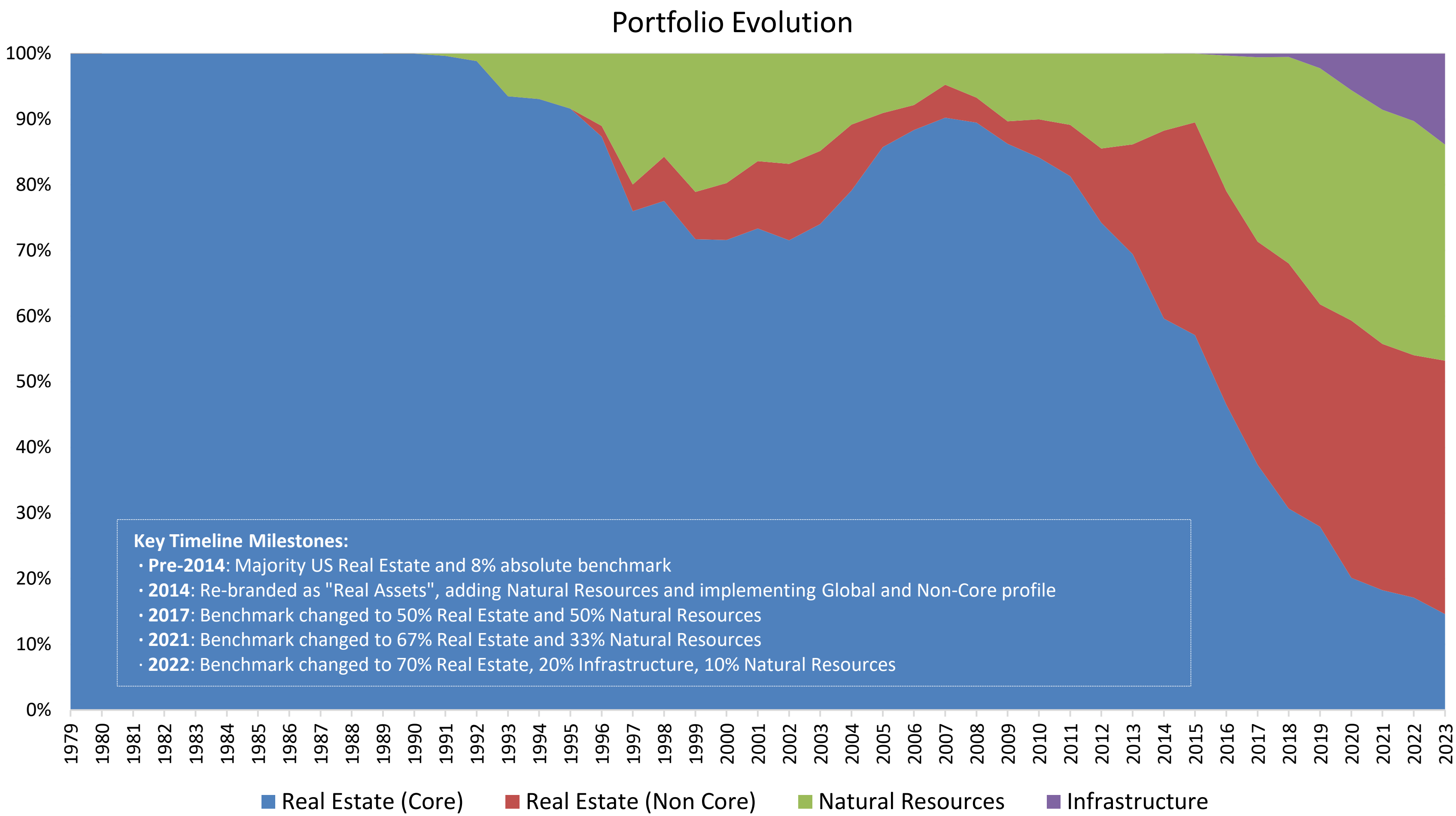
- Global program focused on private market funds and co-investments, emphasizing partnerships with high quality sponsors

Program Overview

- SFERS began investing in Real Assets in 1978
- As of December 31, 2023, the Real Assets allocation was 14.8% of Plan Assets, or $5.1 billion
  - Target allocation reduced from 17% to 10% in 2020 and maintained at 10% in 2024
- 8.3% since inception program IRR and 9.1% 20-year IRR
- Policy benchmark is 70% NCREIF NFI-ODCE/C|A Real Estate Index; 20% C|A Infrastructure Index; and 10% C|A Natural Resources Index*
- Key strategies include Real Estate at 54%, Resources at 30%, and Infrastructure at 16%

Source: Data from Aksia as of 12/31/2023, with sector allocations based on NAV + Unfunded
*The Policy Benchmark uses floating weights based on year-end NAVs until target is reached or until year 10, whichever is first; the Real Estate sub-benchmark uses floating weights based on Core and Non-Core year-end NAVs within the Real Estate portfolio

Program Overview (cont.)



Key Timeline Milestones:

- **Pre-2014**: Majority US Real Estate and 8% absolute benchmark
- **2014**: Re-branded as "Real Assets", adding Natural Resources and implementing Global and Non-Core profile
- **2017**: Benchmark changed to 50% Real Estate and 50% Natural Resources
- **2021**: Benchmark changed to 67% Real Estate and 33% Natural Resources
- **2022**: Benchmark changed to 70% Real Estate, 20% Infrastructure, 10% Natural Resources

Source: Data based on NAV from Aksia as of 12/31/2023

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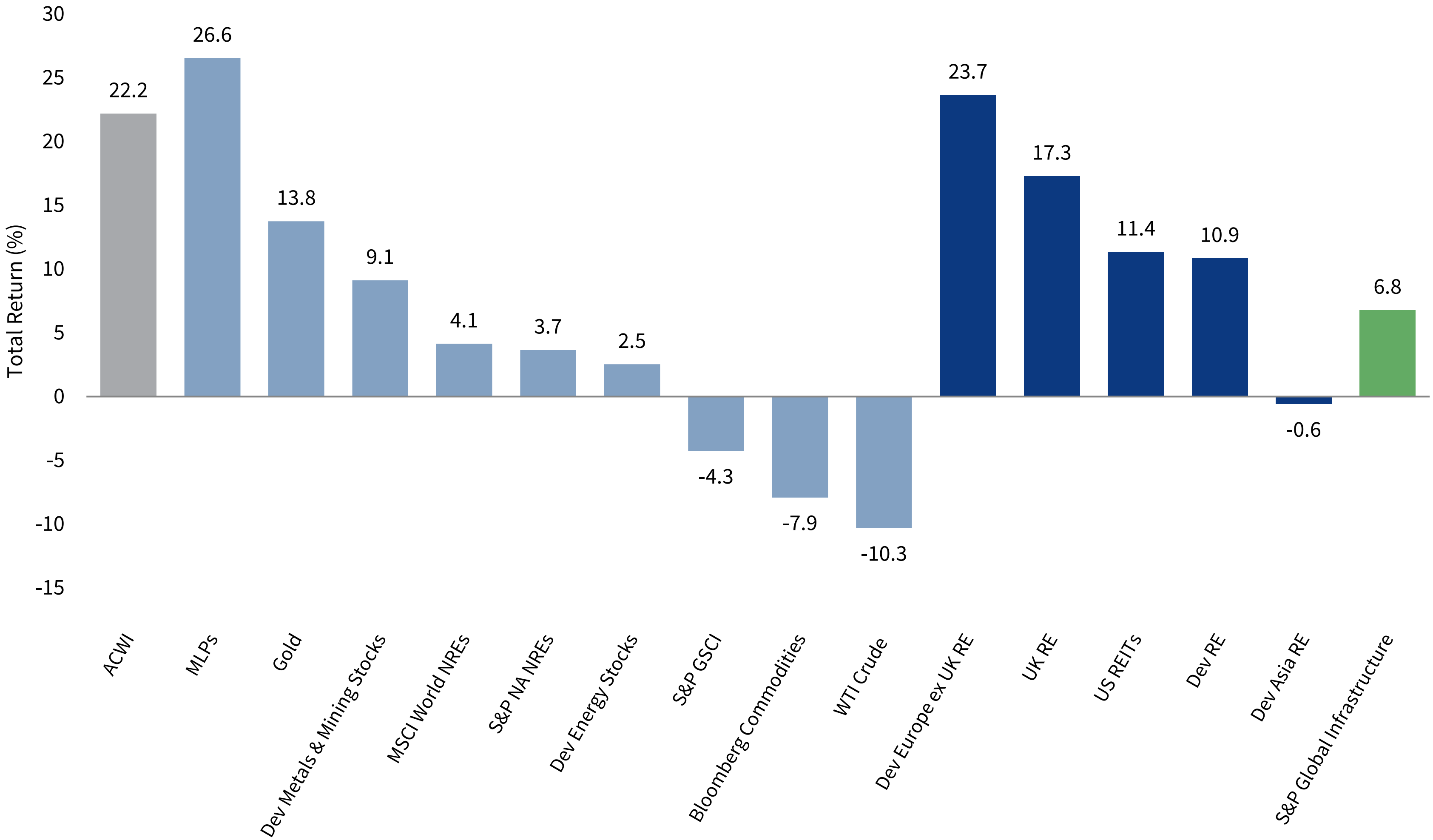
Performance Review

2023 Public Market Returns

TOTAL RETURNS FOR PUBLIC REAL ASSETS SECTORS



Sources: Alerian, Bloomberg L.P., European Public Real Estate Association, FTSE International Limited, Intercontinental Exchange, MSCI Inc., National Association of Real Estate Investment Trusts, Standard & Poor's, and Thomson Reuters Datastream. MSCI data provided "as is" without any express or implied warranties.
Notes: Data represents total returns, except for Gold ("Gold Bullion Spot Price") and WTI Crude, which are price returns. All returns are in USD terms. Total return data for all MSCI indexes are net of dividend taxes.

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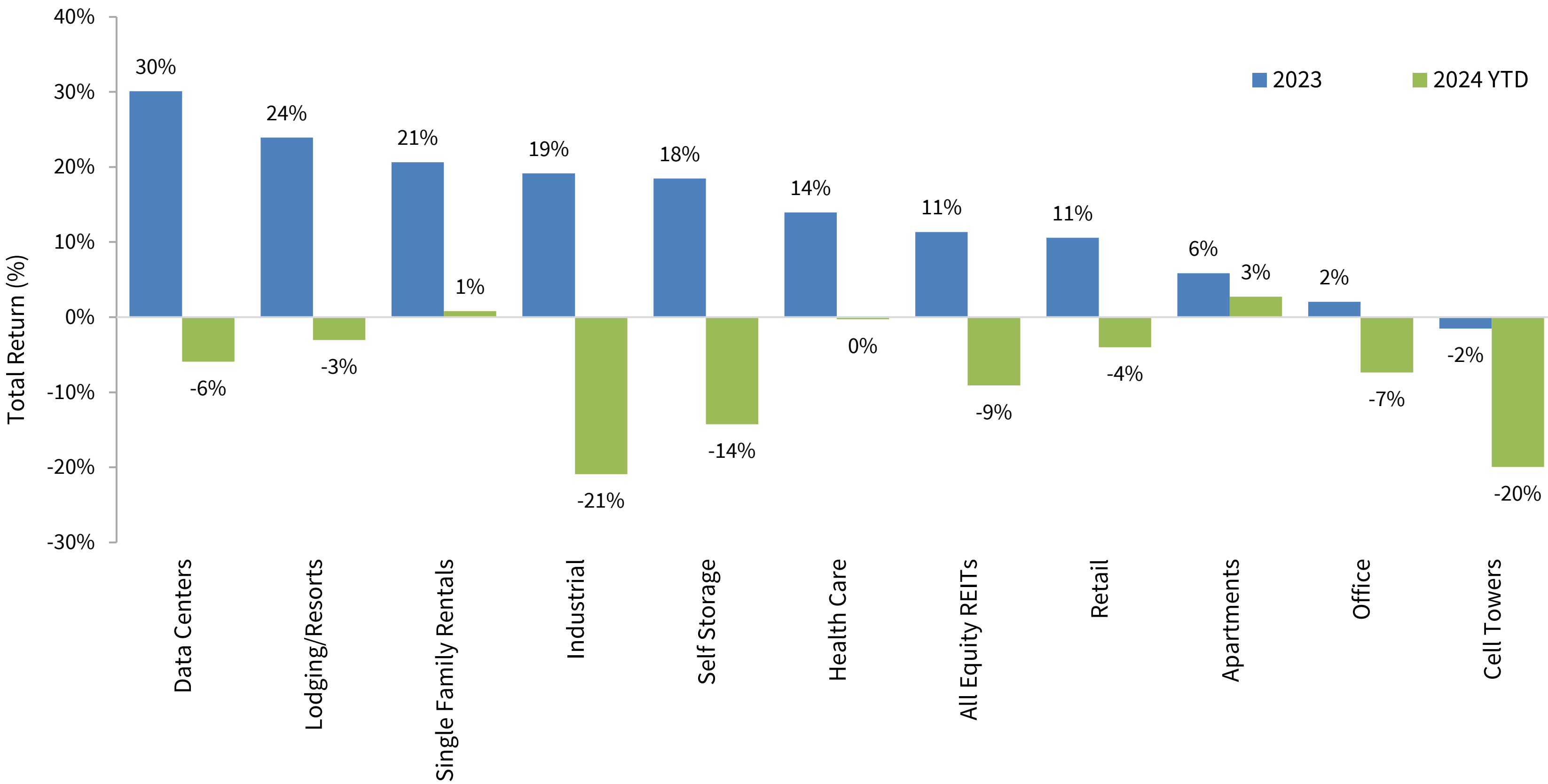
2023 REIT Performance By Sector

- REITs rebounded in late 2023 but are flat to down in 2024



# of SFERS' Sector-Focused Managers	1	0	0	3	1	1	-	0	2	0	1

Sources: Data provided by FTSE International Limited and National Association of Real Estate Investment Trusts as of 4/30/2024. SFERS sub-strategy manager classifications provided by Aksia and Cambridge Associates as of 12/31/2023.

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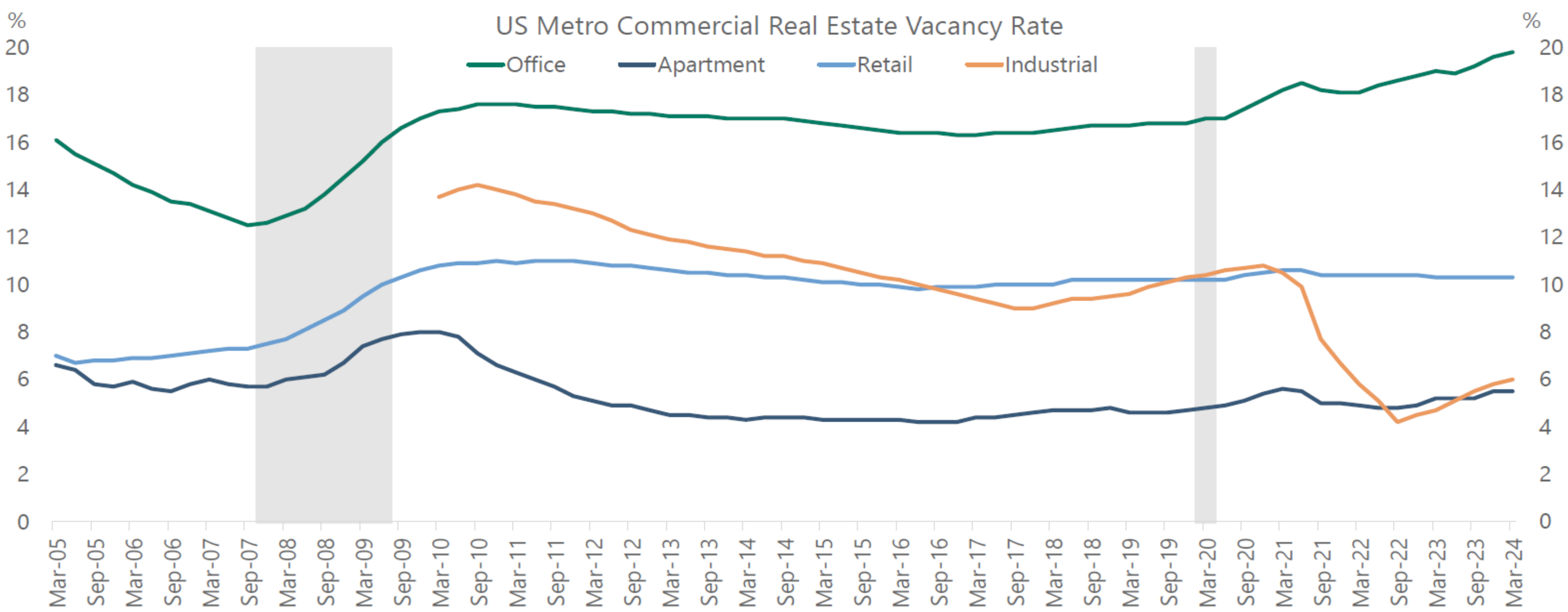
Real Estate Fundamentals

- Fundamentals are normalizing after record performance
- NOI growth is down, though in-line with long term trends
- Vacancy varies across asset class, Industrial still below pre-pandemic levels while Office continues to struggle

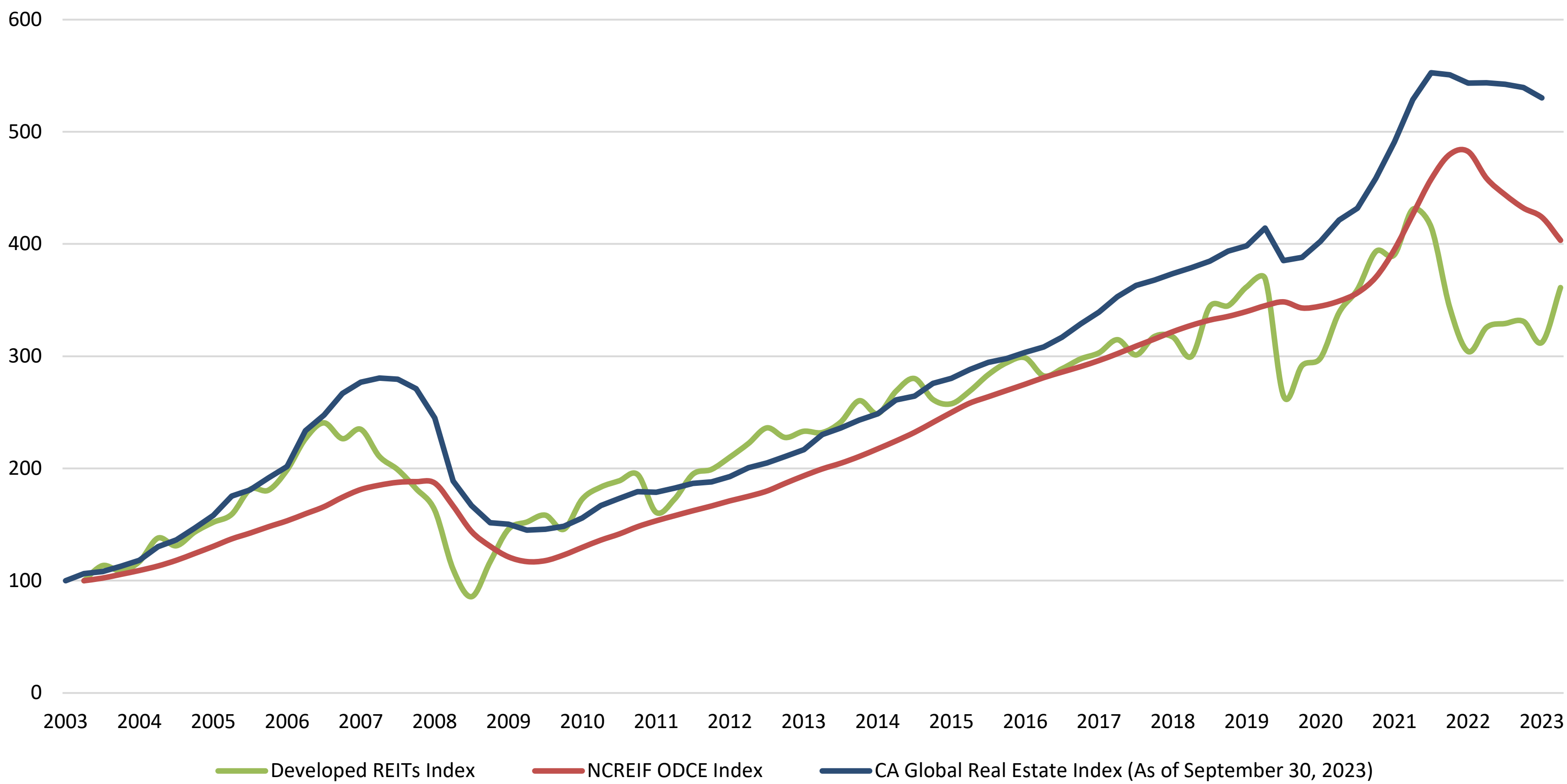
Year	Mutifamily	Industrial	Office	Retail
LTM NOI Growth				
Q4 2023	4.4%	12.3%	1.5%	2.8%
Q3 2023	3.5%	9.8%	4.6%	4.2%
Q2 2023	5.1%	11.6%	0.9%	(0.8%)
Q1 2023	8.1%	13.3%	2.9%	6.2%
Q4 2022	10.4%	12.0%	3.7%	4.6%



Sources: Apollo, Cambridge Associates

Private vs Public Real Estate

- Core funds have corrected more quickly than other private funds, though public market valuations are still lower than both segments



Source: Cambridge Associates

2023 Return Attribution

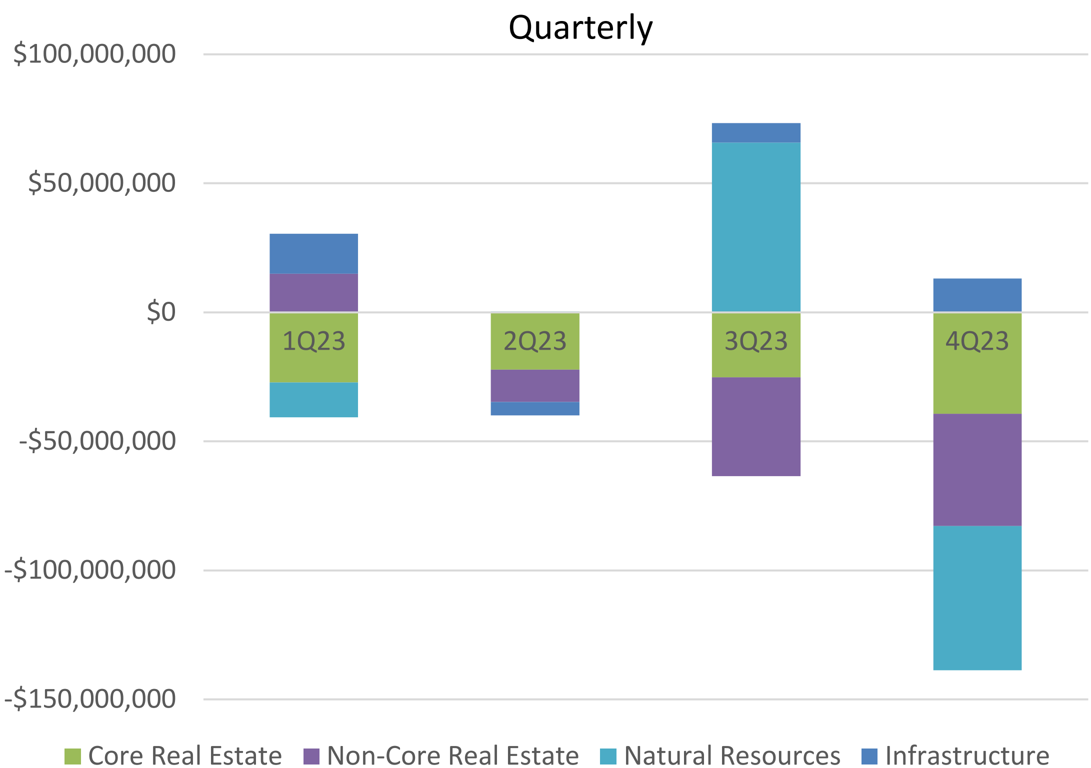
	Contributors	Detractors
Strategy	Infrastructure	Real Estate Natural Resources
Geography	Asia Pacific	US Europe

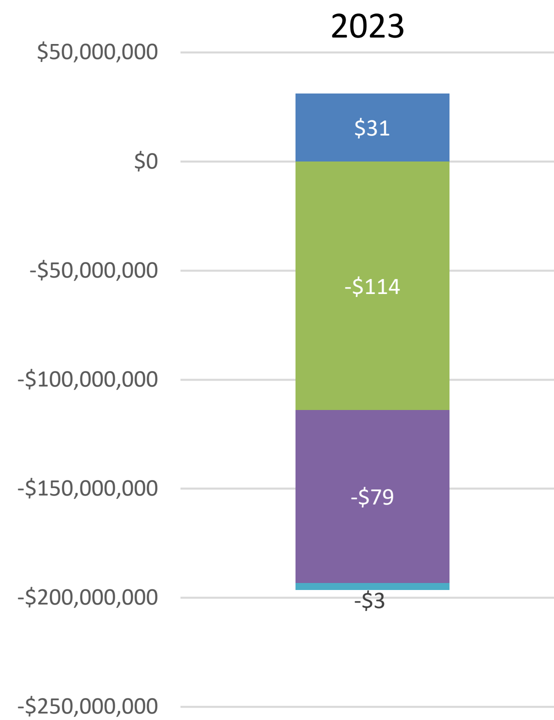
Sub-Portfolio	Contributors	Detractors
Real Estate	Specialist	Diversified Core / Non-Core
Natural Resources	Mining	Oil & Gas
Infrastructure	Operating / Greenfield Music IP	

Note: Based on absolute performance contribution

2023 Return Attribution (cont.)

- Returns were challenged in 2023, with Q3 being the only positive quarter due to a strong rally in Natural Resources.
- Infrastructure provided upside for most of the year although in relatively smaller amounts.
- Real Estate experienced a difficult year with negative returns in each quarter and significant write-downs occurring in Q3 and Q4.

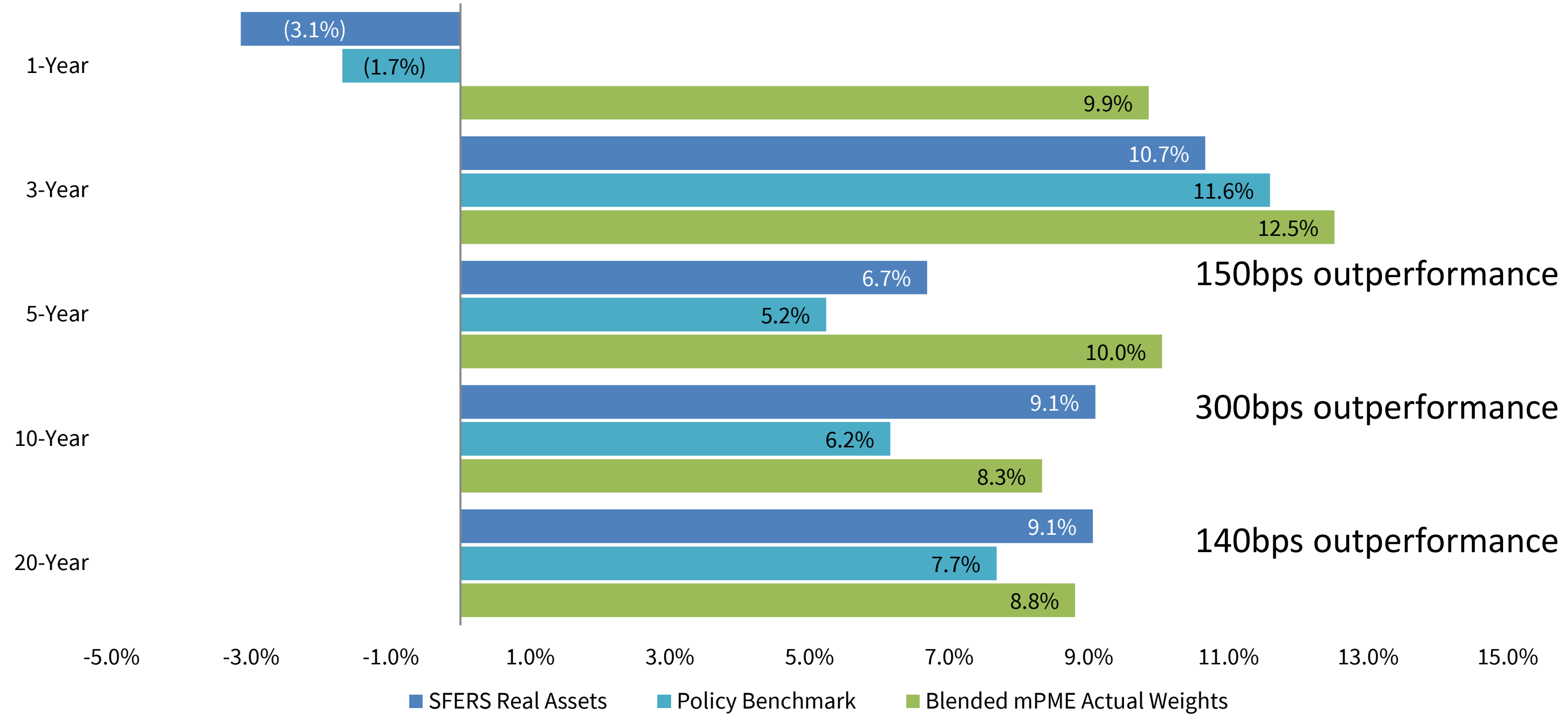




Source: Data provided by Aksia as of 12/31/2023

Real Assets Portfolio Performance

- SFERS Real Assets portfolio has underperformed over the near-term but has meaningfully outperformed over longer time periods
- Asset allocation reduction has impacted annual pacing and limited post-covid vintage year investing although macro conditions have also restricted overall market activities



Sources: mPME and Index return data provided by Cambridge Associates as of 12/31/2023. Total Real Assets Program returns provided by Aksia as of 12/31/2023.
Notes: The Policy Benchmark uses the historical benchmark that was in place for each period. The go-forward policy benchmark as of 7/1/2022, uses the NCREIF ODCE (Net) for core Real Estate, the CA Real Estate Benchmark for non-core Real Estate, the CA Natural Resources Benchmark for Resources, and the CA Infrastructure Benchmark for Infrastructure. Weightings are according to the prior year-end NAV weightings. Blended mPME calculation uses SFERS' actual weights over time to determine the blended return. The FTSE NAREIT All Equity REITs Index is used for Real Estate and Infrastructure. The MSCI World Natural Resources Index (Net) is used for Resources and is backfilled with the DataStream World Natural Resources Index to reach inception of SFERS' historical data.

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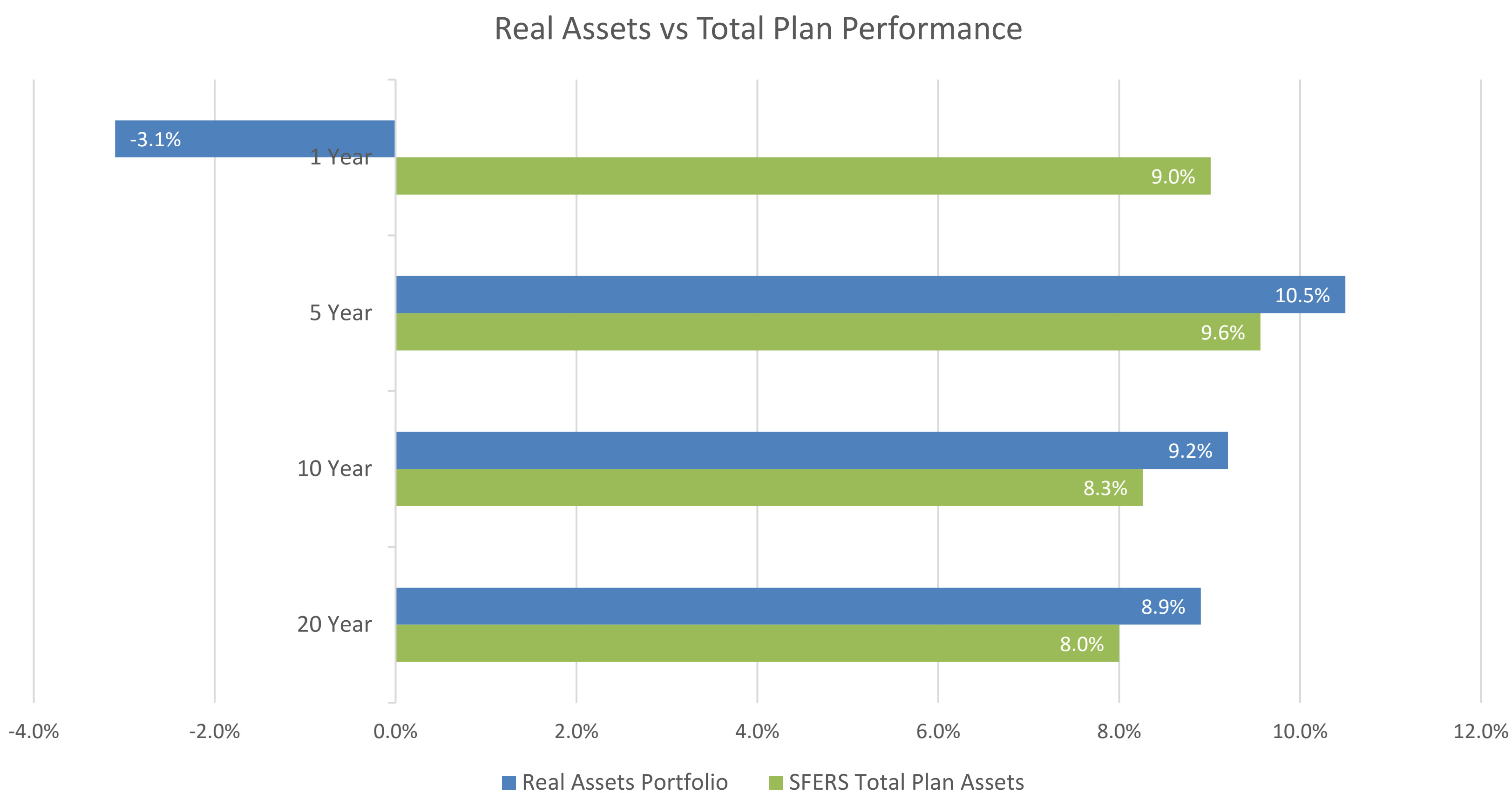
Real Assets Portfolio Performance (cont.)

- Despite a challenging environment which resulted in negative performance in 2023, the portfolio has been a meaningful contributor to overall plan assets over longer time periods



Sources: Real Asset Portfolio returns are time-weighted and provided by Aksia as of 12/31/2023. Total Plan Assets returns provided by BNYM as of 12/31/2023.

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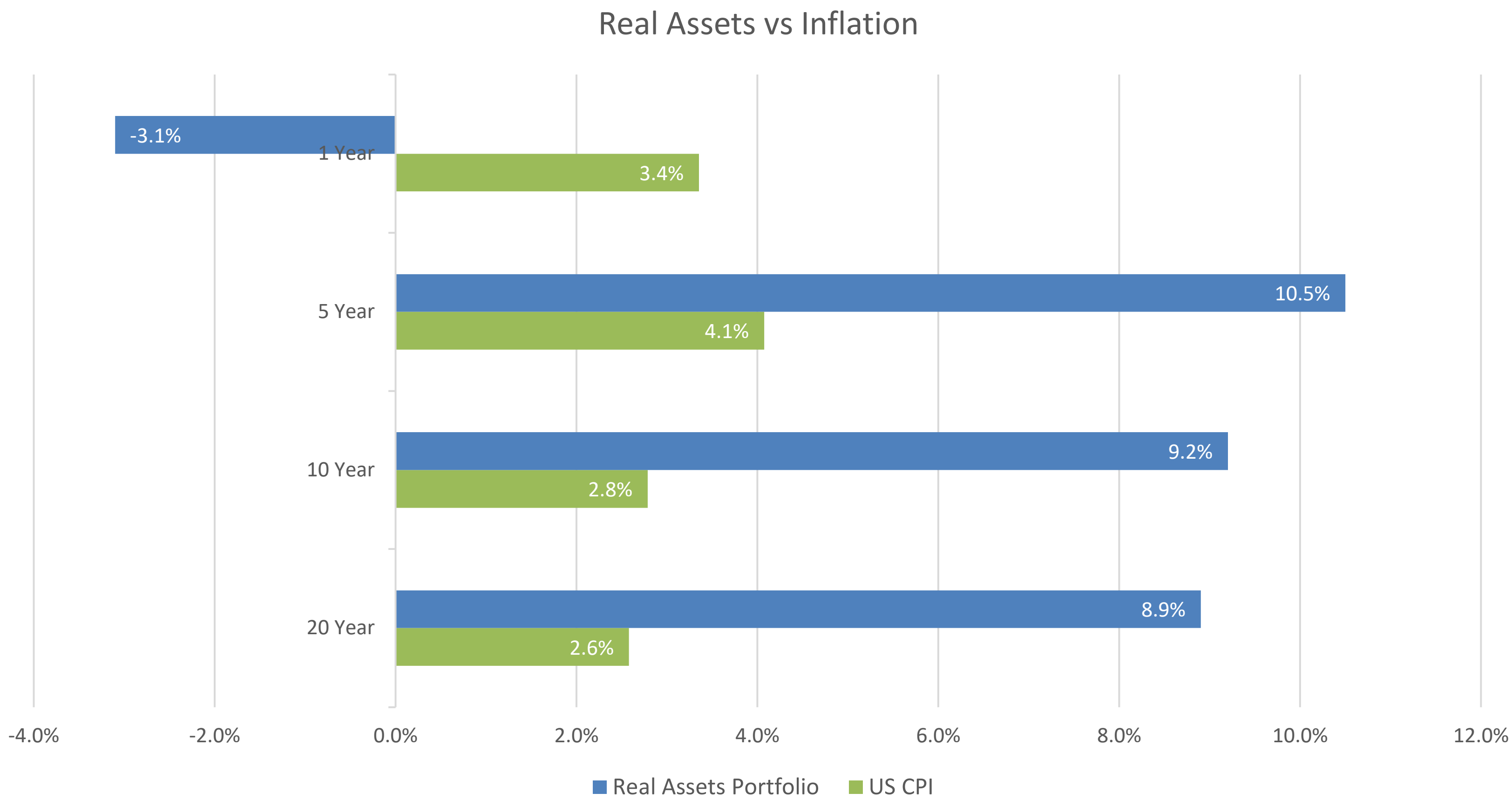
Real Assets Portfolio Performance (cont.)

- The Real Assets portfolio has outpaced US CPI over the 5-, 10-, and 20-year time periods



Sources: Real Asset Portfolio returns are time-weighted and provided by Aksia as of 12/31/2023. US CPI data from Organization for Economic Co-operation and Development, Consumer Price Index: All Items for the United States, retrieved from FRED, Federal Reserve Bank of St. Louis.

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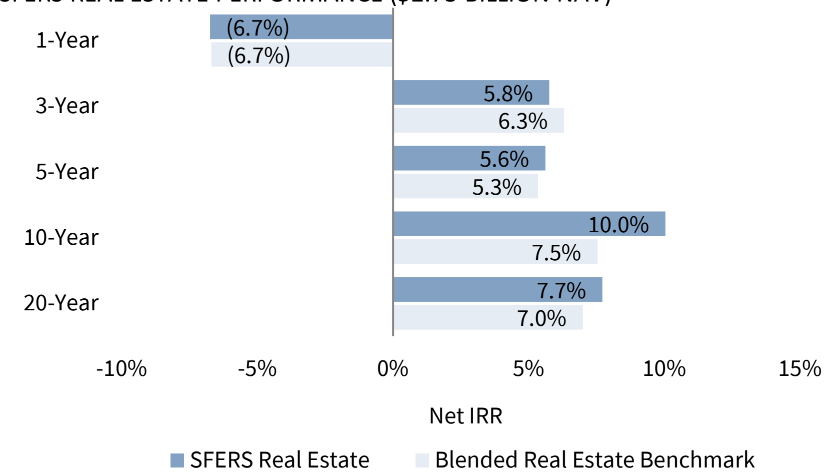
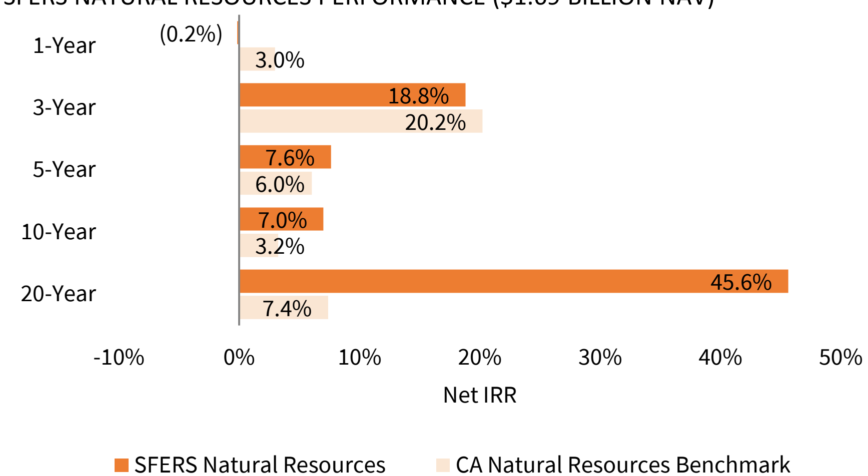
Sub-Strategy Performance

- Sub-strategy portfolios suffered in the short-term but generally outperformed over the long-term
- Real Estate performance largely in-line
- Natural Resources performance impacted by natural gas pricing in 2023 and negligible post-covid vintage year exposure
- Infrastructure portfolio remains young with recent negative impacts in fiber market multiples

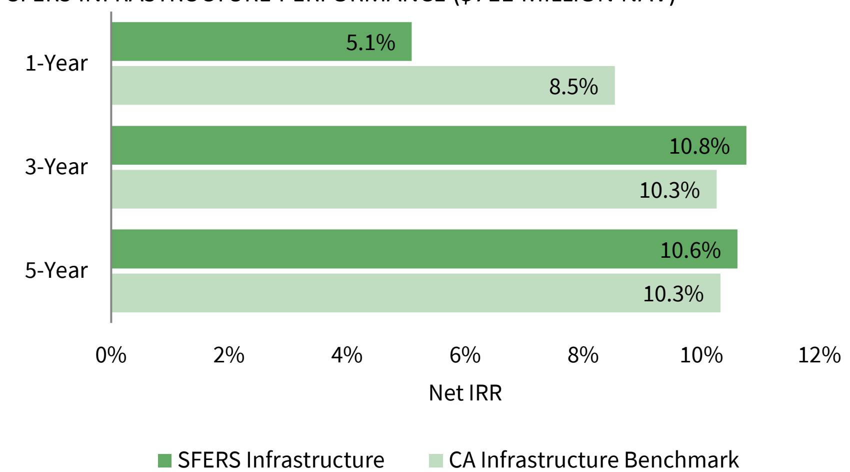
SFERS REAL ESTATE PERFORMANCE ($2.73 BILLION NAV)



SFERS NATURAL RESOURCES PERFORMANCE ($1.69 BILLION NAV)



SFERS INFRASTRUCTURE PERFORMANCE ($711 MILLION NAV)



Sources: Sub-strategy performance provided by Aksia as of 12/31/2023, Cambridge Associates.
Notes: Blended Real Estate Benchmark uses the CA Benchmark for non-core Real Estate and the NCREIF ODCE (Net) for core Real Estate which is floated to the NAV of Core investments relative to total Real Estate which was 32% as of 12/31/2022 according to the policy benchmark allocations.

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Co-investment Performance

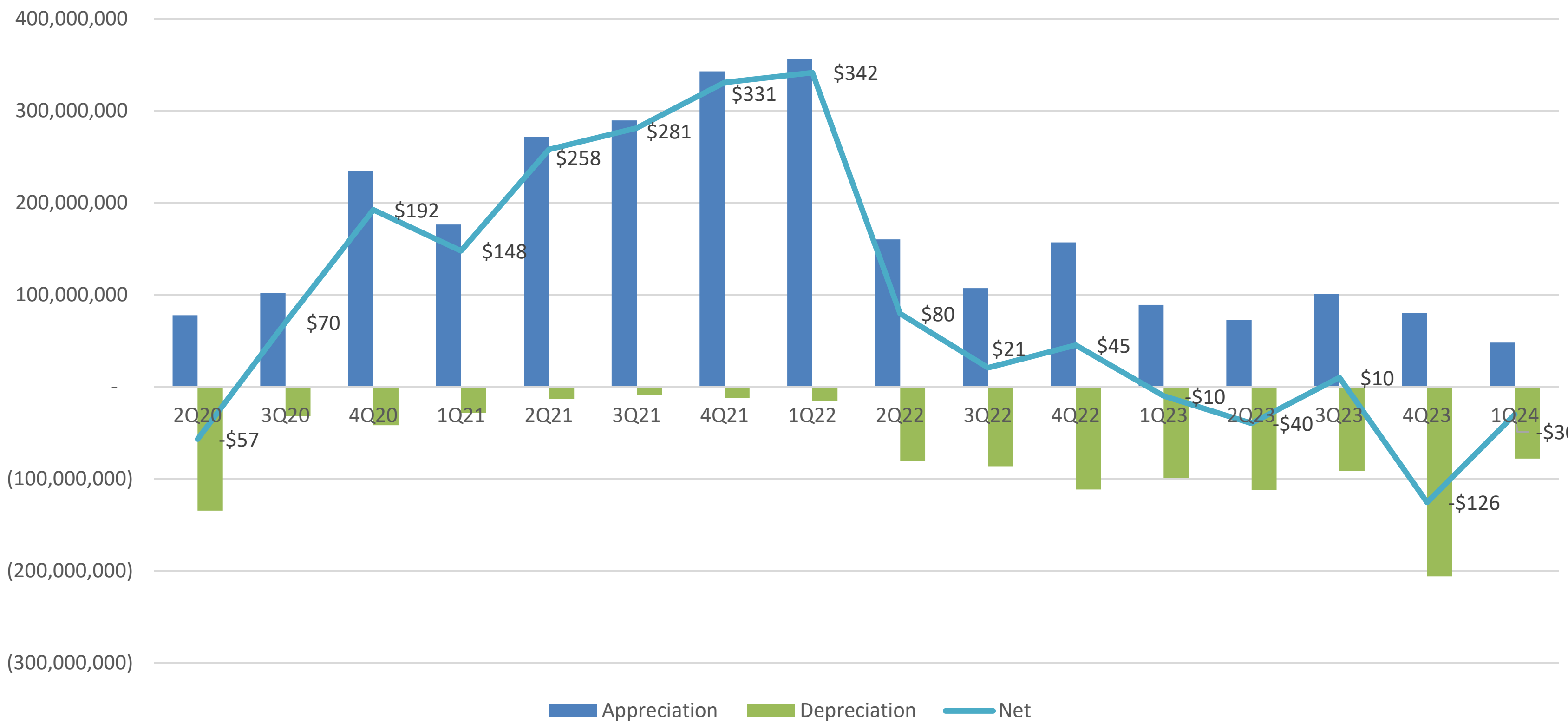
Co-investments	Total Invested	Total Distributions	Total Value	TVPI	DPI	Net IRR
18	$244MM	$70MM	$243MM	1.0x	0.3x	-0.1%

- No new co-investments in 2023
- 47% Natural Resources, 48% Real Estate, 6% Infrastructure
- 80% exposure in North America, 20% in Europe
- Average age of 4.4 years
- Six investments have been fully realized; two investments partially realized
- Material negative impact from one specific sponsor in the conventional energy sector
- Team has emphasized diversified co-investment sidecars over individual co-investments since 2020 and continues to refine its process

Sources: Co-investment performance provided by Aksia and SFERS as of 12/31/2023.
Exposure percentages based on contributed capital.

Preliminary Q1 2024 Performance

- Negative performance expected and currently -0.60%
- Negative returns expected in Real Estate and Infrastructure while positive returns expected in Natural Resources



Source: Data provided by Aksia as of 6/28/2024

Portfolio Review

Thematic Strategy Assessment

- Near-term opportunities focused on Real Estate and Infrastructure
  - Themes remain investing behind capital markets volatility, continuing population demographic and migratory trends, and assets with strong long-term market fundamentals

	Less Attractive	Neutral	More Attractive
Real Estate	Office Development	Hospitality Retail	Industrial Residential Special Situations 'Alternatives'
Natural Resources	Timber	Agribusiness Conventional Energy	Metals & Mining
Infrastructure	Transportation	Healthcare Social	Digital Decarbonization

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Portfolio Construction

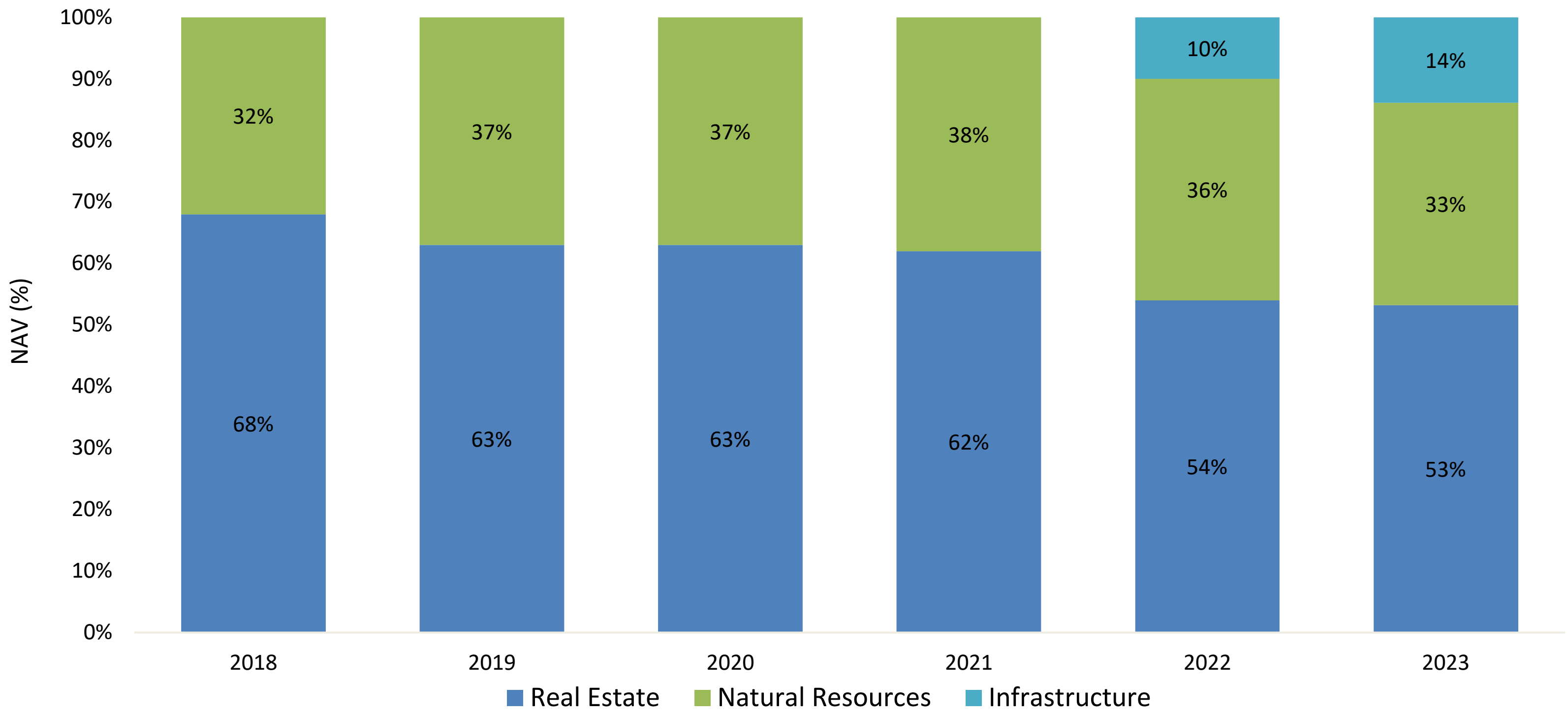
- Real Estate to remain the largest exposure given mature, global opportunity set
  - Sub-portfolio is well-diversified by sector and geography
  - Overweight alternative sectors and hospitality; slightly underweight retail, residential, and industrial; in-line in office
    - Liquidity redemptions in 2020 decreased exposure to industrial although commitments since then have materially increased exposure
  - Overweight ex-US although recent commitments and focus is domestic
  - Given underweight to long-term target, anticipate additional commitments which can capitalize on relative attractive entry valuations

- Natural Resources exposure expected to gradually decline over time
  - Expecting greater distribution activity through underlying operating cash flow and sales activity as funds are mature

- Infrastructure continues to grow meaningfully from a low base

Portfolio Construction By Strategy

- Future commitments focused on Real Estate and Infrastructure given current underweights relative to long-term target allocations
- Allocation to Natural Resources peaked at 38% in 2021 and is expected to continually decrease
- Real Estate exposure expected to increase going forward and previously impacted by a secondary sale, core fund redemptions, and infrastructure sub-portfolio addition



Source: SFERS fund-level net asset class (NAV) exposure provided by Aksia as of 12/31/2023.
Note: Infrastructure formally introduced as a sub-composite in 2022.

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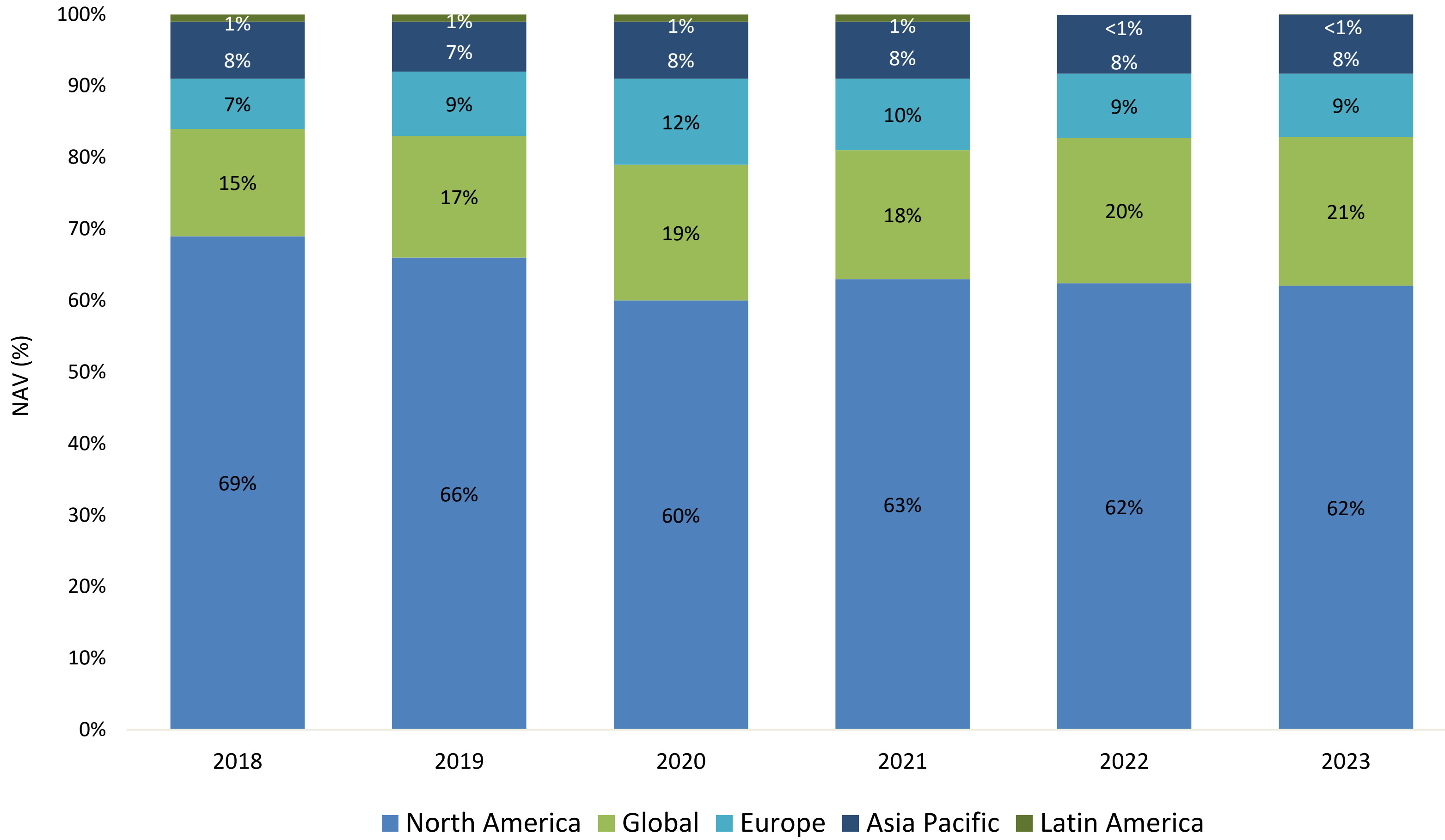
Portfolio Construction By Geography

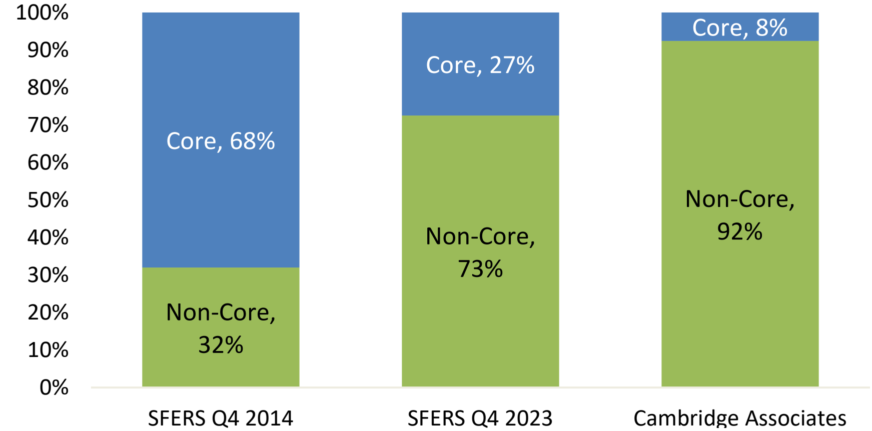
- North America exposure has remained stable over the last few years following years of increased ex-US geographic expansion

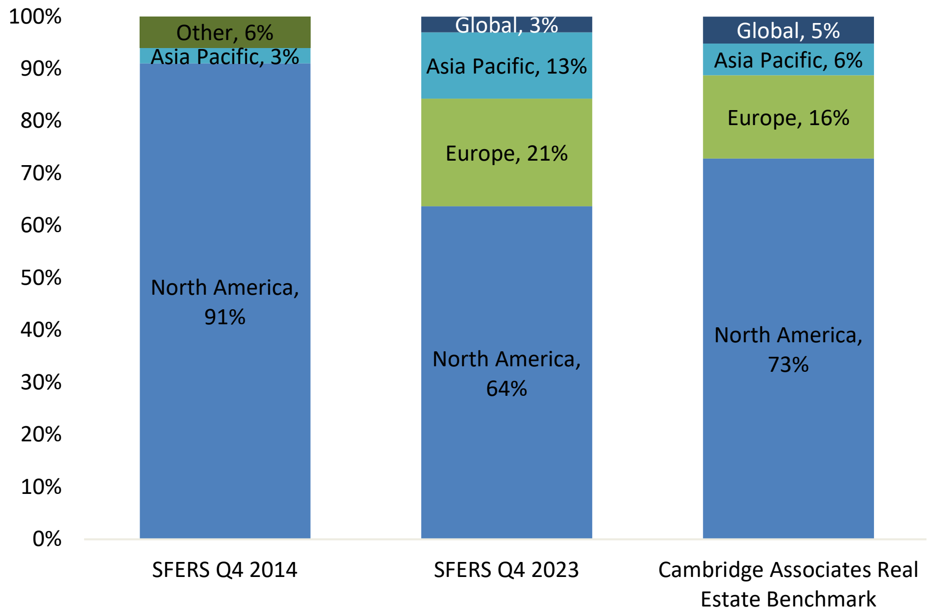


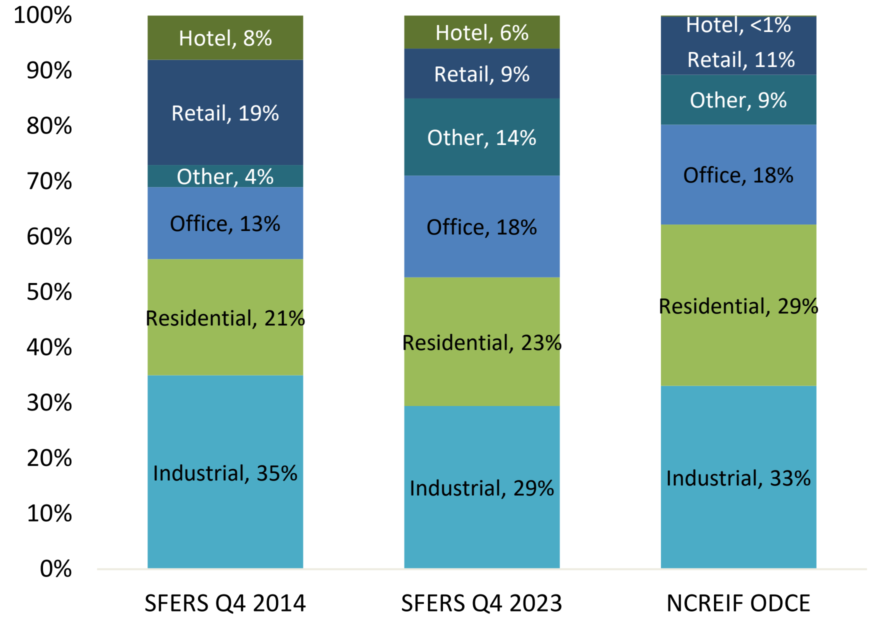
Source: SFERS fund-level net asset class (NAV) exposure provided by Aksia as of 12/31/2023.

Real Estate Risk Profile & Breakdown

- Portfolio continues to shift away from Core to Non-Core
- Exposure is well diversified by sectors with the largest weights in Industrial and Residential
- North America exposure to remain stable, and 2023 commitments were fully focused in the US







Sources: SFERS property-level Real Estate data provided by Aksia as of 12/31/2023. NCREIF Data is from NFI Quarterly report as of 12/31/2023.
Notes: "Other" includes diversified assets and assets defined at the GP's discretion. NCREIF ODCE returns are gross value-weighted.

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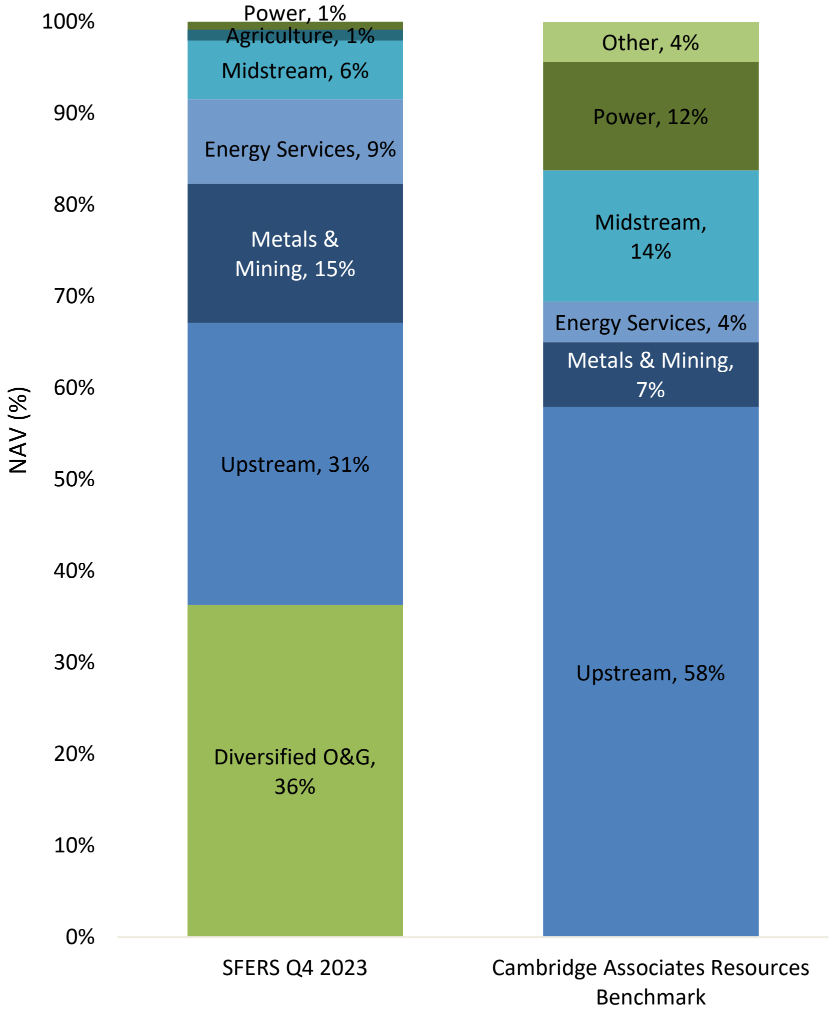
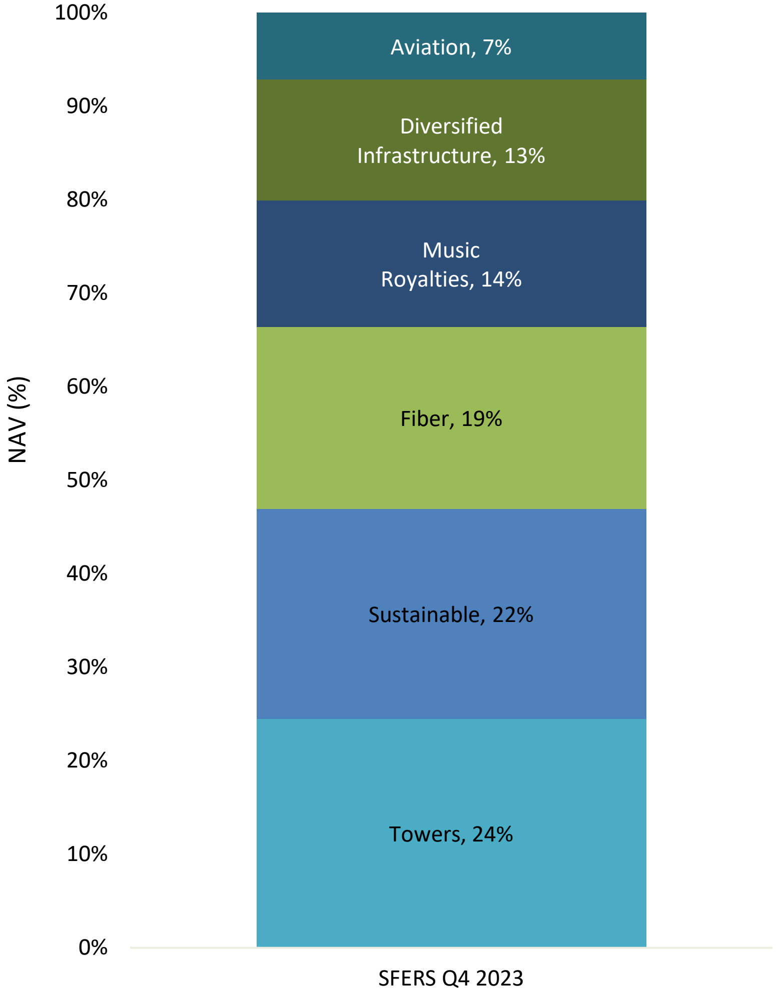
Natural Resources and Infrastructure Breakdown

NATURAL RESOURCES SECTOR EXPOSURE BY NAV



INFRASTRUCTURE SECTOR EXPOSURE BY NAV



Sources: SFERS Infrastructure and Natural Resources fund-level data provided by Aksia as of 12/31/2023. Cambridge Associates Natural Resources Benchmark fund-level data as of 12/31/2023.
Note: “Other” includes Royalty Interests and Timber.

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Annual Deployment Pace

- 2021: $563 million
- 2022: $583 million
- 2023: $383 million
- 2024YTD: $295 million

Target deployment pace is roughly $600 million annually over the next 3 years

2021-2023	# Funds	$MM Committed	%
Real Estate	19	$916	60%
Natural Resources	1	$40	3%
Infrastructure	14	$573	37%
Total	**34**	**$1,529**	**100%**

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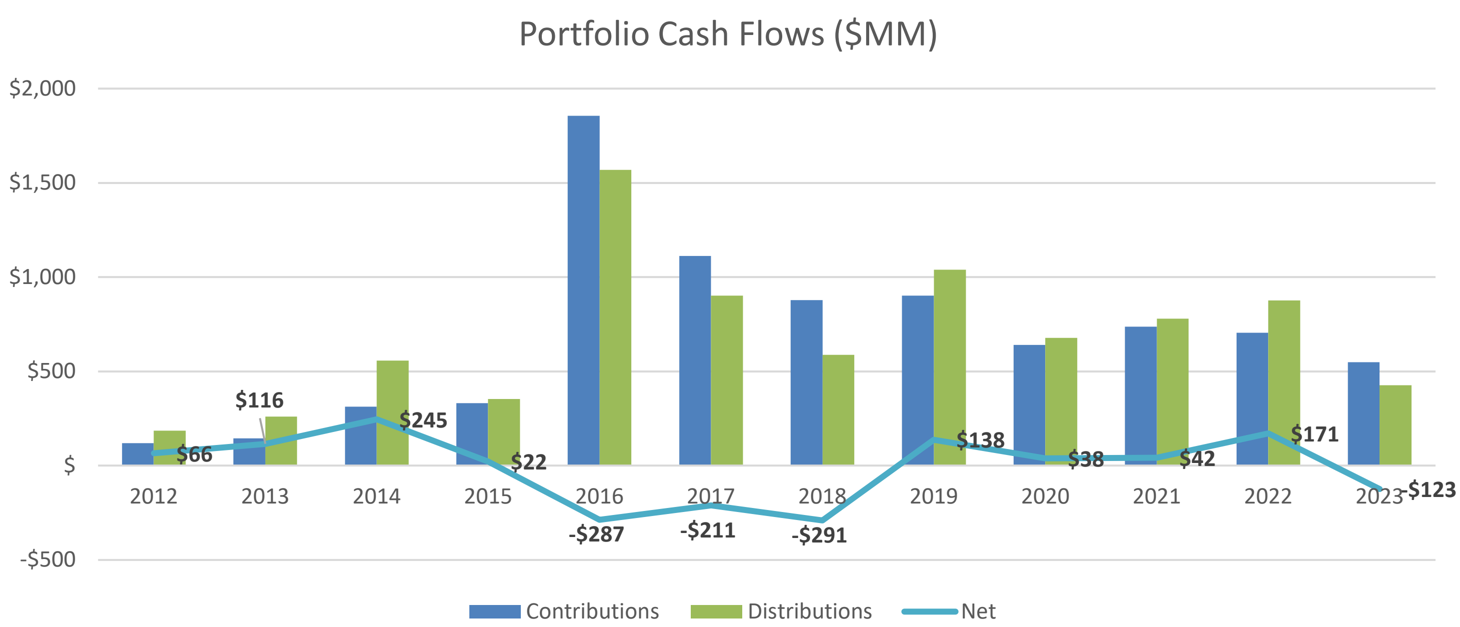
Portfolio Cash Flows

- The Real Assets portfolio produced positive cash flow from 2019 to 2022 but turned negative in 2023 as the sharp interest rates rise resulted in wide bid-ask spreads and muted distribution activity principally in real estate
- 2024 YTD is -$95.5 million and may remain negative through year-end based on current estimates



Source: Data provided by Aksia, 2024 YTD cash flow as of 6/25/2024

Initiatives

Portfolio Initiatives

Initiatives	Details
Maintain consistent yet flexible pacing	Deploy roughly $600 million while considering the current market environment and portfolio weight
Progress towards long-term policy benchmark weights	Currently underweight real estate and infrastructure
Continue to diversify portfolio in a risk-adjusted manner	Given portfolio maturation, high threshold for new relationship additions; actively pursuing 'alternative' real estate sectors exposure
Further concentrate portfolio relationships	~80% of pacing is currently expected to be with existing managers
Selectively continue co-investments program	Capitalize on pooled vehicles with greater diversification and discrete opportunities as warranted
Expand RA investment team	Near-term open recruitment for Investment Officer
Continue to strengthen internal analysis	Maintain bi-annual internal strategy meetings; continue development and usage of internal monitoring tools and templates

Appendix

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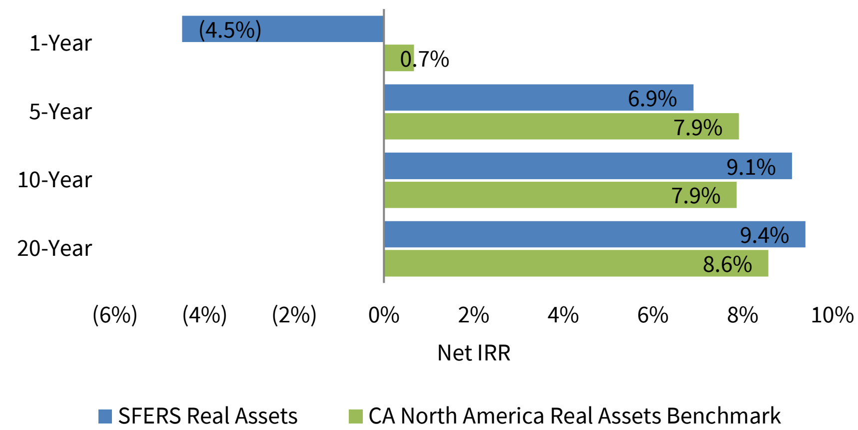
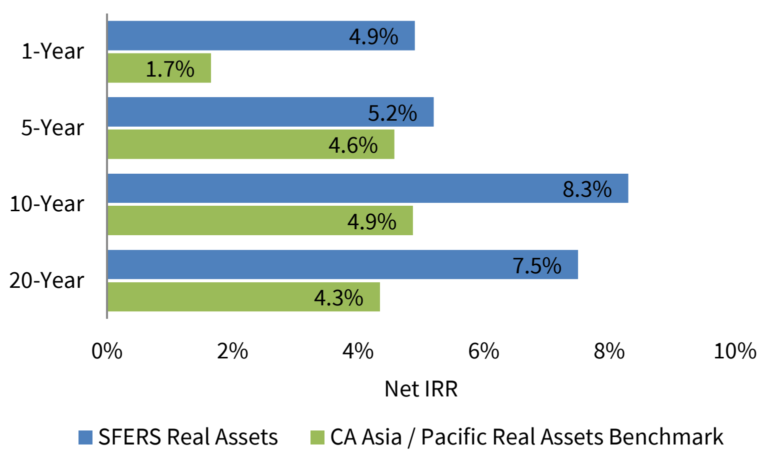
Real Assets Performance By Geography

- North America portfolio underperforms the benchmark in the 1- and 5-year while outperforms over the 10- and 20-year periods
- Europe portfolio underperforms the benchmark over the 1-year but outperforms over all other time periods
- Asia outperforms the benchmark across all time periods

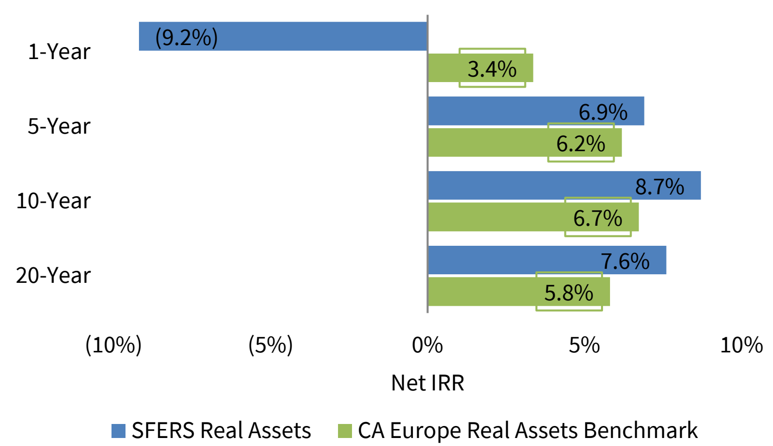
NORTH AMERICA REAL ASSETS PERFORMANCE ($3.18 BILLION NAV)



ASIA / PACIFIC REAL ASSETS PERFORMANCE ($423 MILLION NAV)



EUROPE REAL ASSETS PERFORMANCE ($455 MILLION NAV)



Sources: Performance data provided by Aksia as of 12/31/2023, Cambridge Associates.
Note: Excludes 'Global' and 'Latin America' funds.

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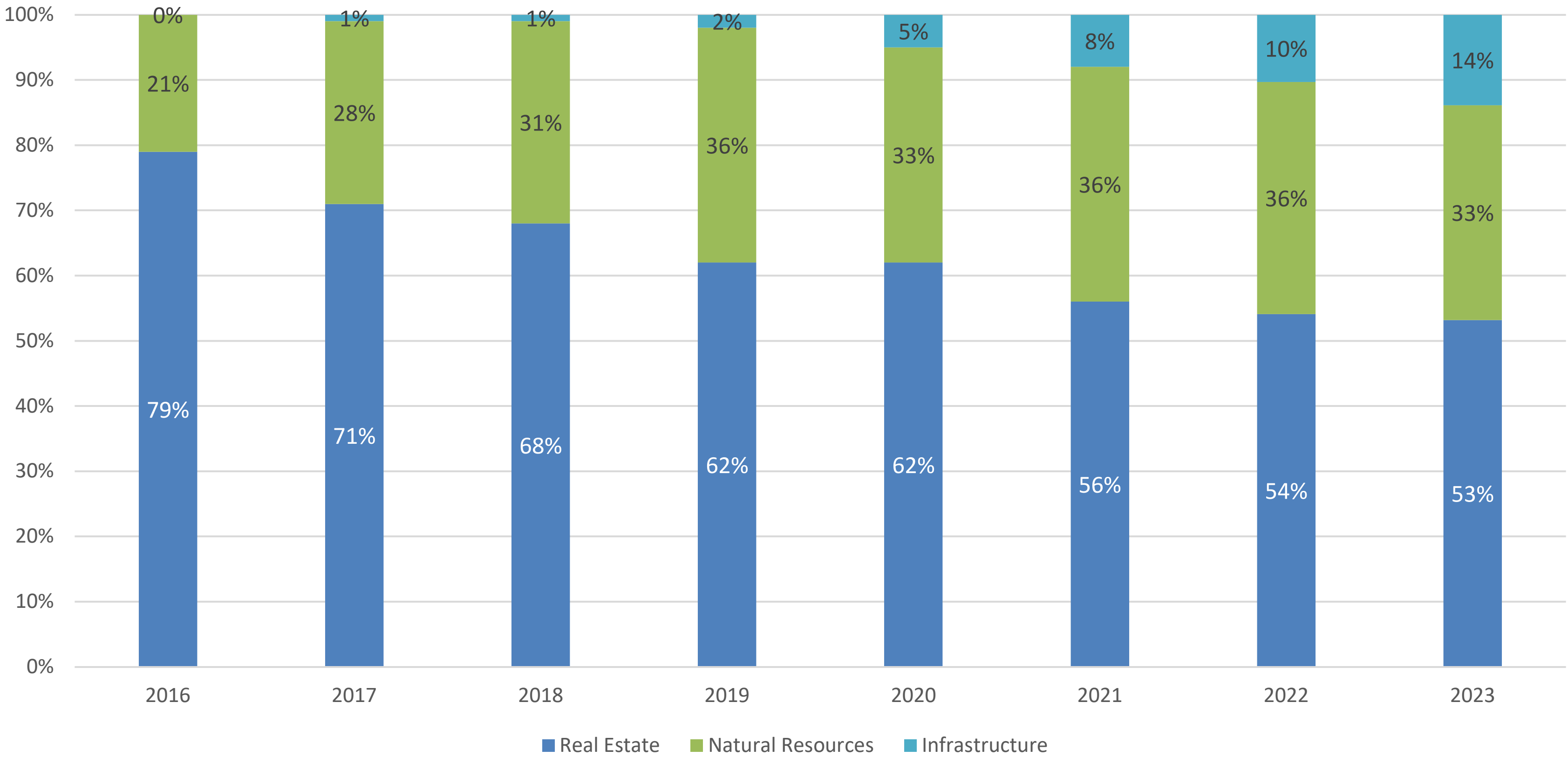
Portfolio Construction By Strategy

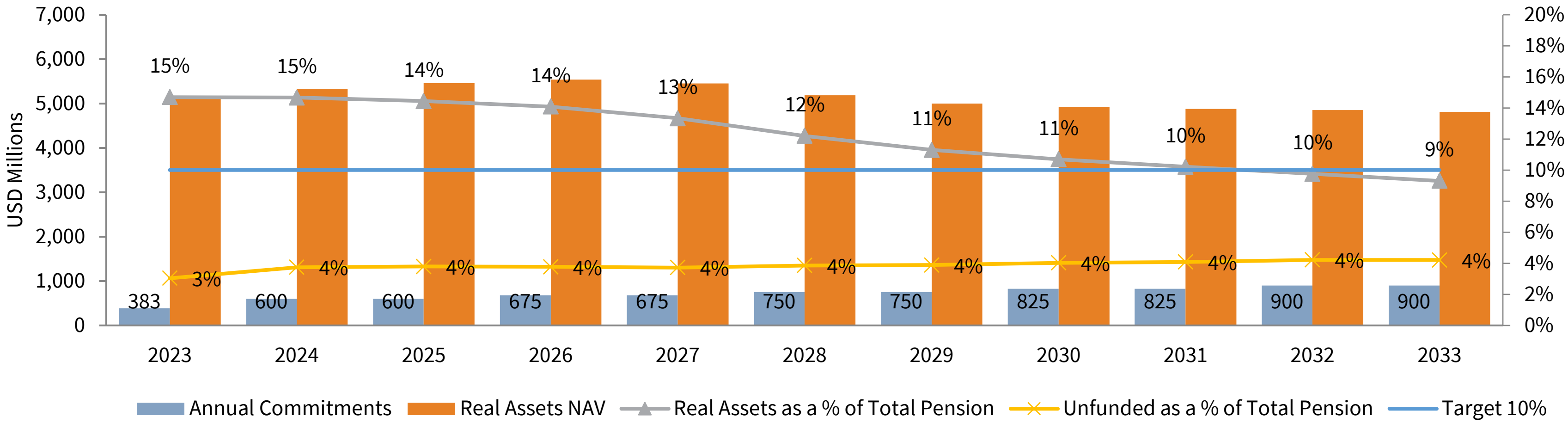
- Infrastructure was formally introduced as a sub-portfolio in 2022
- Illustration depicts historical allocations as if Infrastructure sub-portfolio was formally adopted in 2016, with investments reclassified from Real Estate or Natural Resources



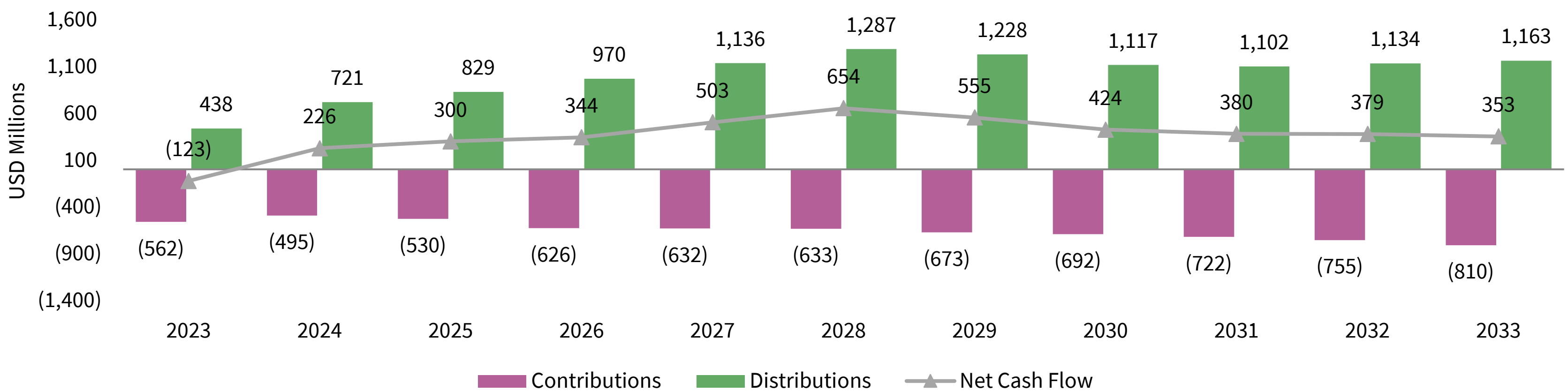
Source: Data provided by Aksia as of 12/31/2023

Base Case Pacing

COMMITMENT PACE



ESTIMATED ANNUAL CASH FLOWS



Note: Model populated with historical portfolio data as of 9/30/2023, unless otherwise noted. 2023 Annual Commitments and 2023 Annual Cash Flows are as of 12/31/2023. Projected cash flows and allocations based on CA modeling and proprietary assumptions. Modeling is intended to be used as a guideline; actual capital calls, distributions, and exposure may differ materially from projections, depending on macroeconomic and fund-specific variables.

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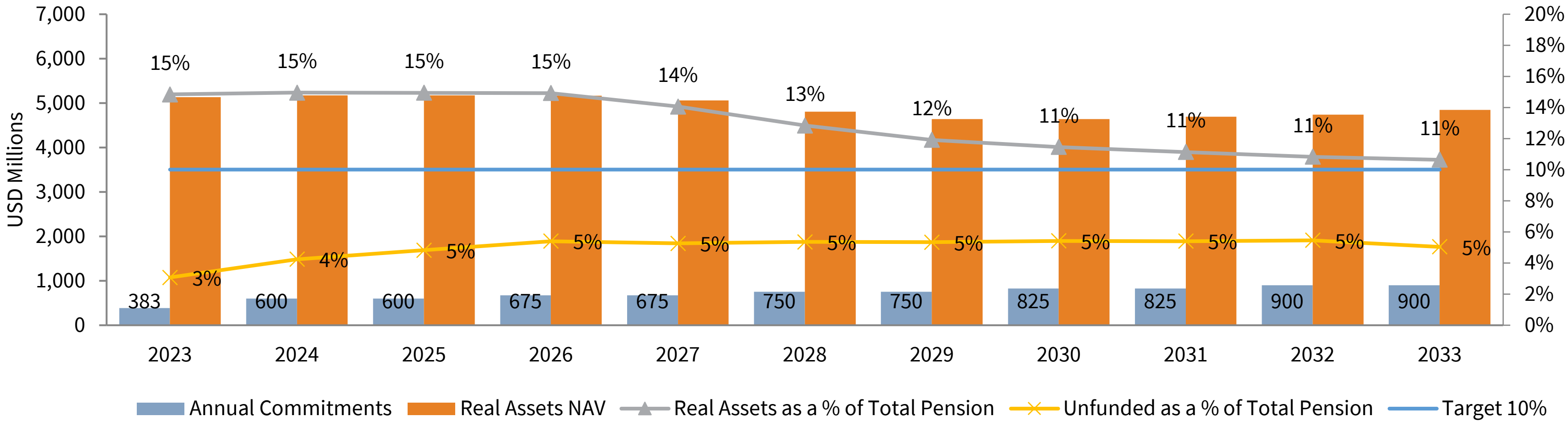
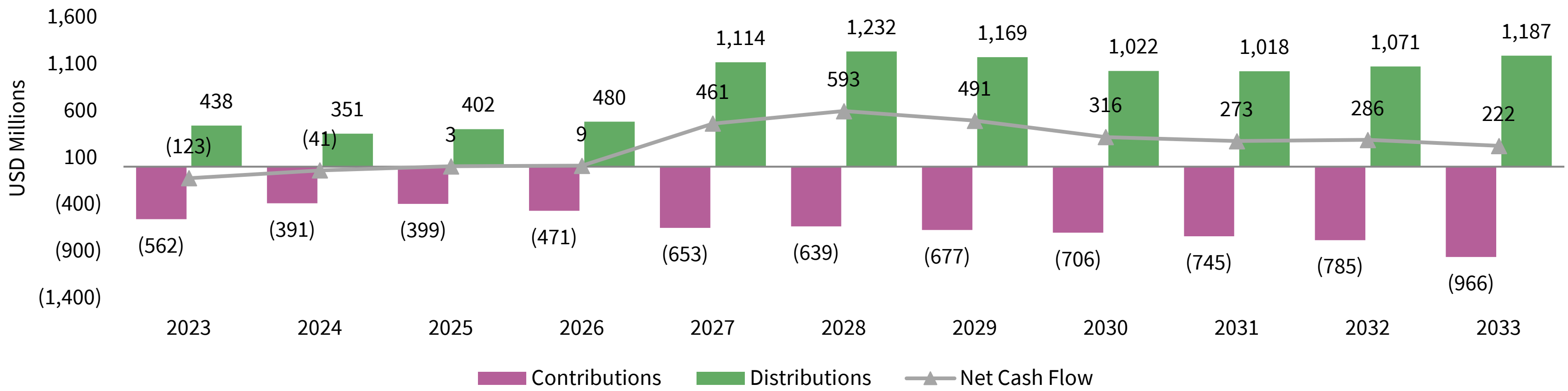
No Growth Stress Case Pacing

COMMITMENT PACE



ESTIMATED ANNUAL CASH FLOWS



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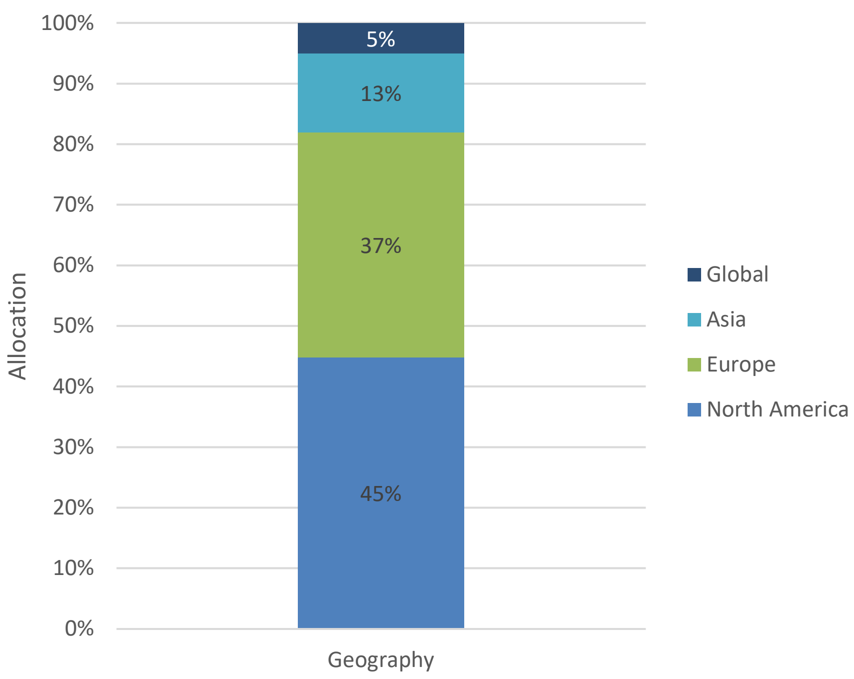
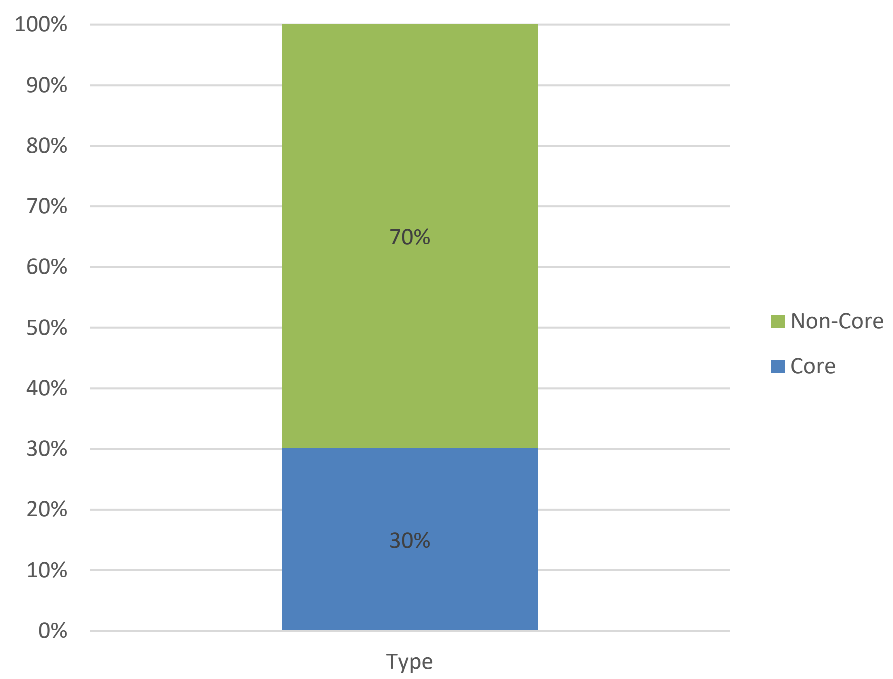
Office Exposure

- Office exposure within the Real Estate portfolio is approximately 18%, in-line with the NCREIF ODCE benchmark
- 45% of exposure is within the US while 37% is in Europe and 13% in Asia
- 70% is within Non-Core strategies





Source: Aksia as of 12/31/2023

SAN FRANCISCO EMPLOYEES' RETIREMENT SYSTEM

REAL ASSETS PORTFOLIO UPDATE

PRESENTED BY MARC CARDILLO, INVESTMENT MANAGING DIRECTOR

C|A CAMBRIDGE ASSOCIATES

JULY 2024

PORTFOLIO OVERVIEW

CAMBRIDGE ASSOCIATES

Executive Summary

- The objective of SFERS' Real Assets portfolio is to provide portfolio diversification, current income, and protection against unanticipated inflation through a focus on alpha generating, higher returning private investment strategies
- SFERS' Real Assets portfolio has performed well on an absolute basis and relative to the policy benchmark across the long-term– generating nearly 300 and 140 basis points of outperformance over the trailing ten- and twenty-year periods, respectively.
- The Real Assets portfolio stands at 14.8% of total plan assets[1] by NAV as of December 31, 2023 relative to the revised 10% target. This allocation is slowly decreasing, although saw an increase in the prior year due to the large decline in the marketable portfolio in 2022. The 10% target should be met by 2031 at the latest assuming an annual commitment pace of ~$400–$600 million over the next few years and ~$600-$800 million thereafter in a base case scenario.
- Commitments in 2023 were characterized by re-ups with existing managers and continue to focus on building the Infrastructure portfolio while maintaining exposure to Real Estate with an orientation towards sector-focused managers in the US.
  - $383 million in commitments closed in 2023 across six managers, with an additional $227 million approved.[3]
  - SFERS has thoughtfully added exposure to niche strategies that are experiencing healthy long term demand trends and has made tactical commitments to strategies that benefit from recent market volatility and ongoing dislocation.
  - The Infrastructure portfolio continues to grow and is over halfway to the target NAV allocation of 20%[2], while traditional energy funds in the Natural Resources portfolio continue to wind down. The Infrastructure allocation provides exposure to sectors with compelling long-term drivers, such as renewable energy and telecommunications / digital infrastructure, and can play a flexible role in the SFERS' portfolio given the diverse opportunity set and potential to generate current income and / or drive growth.

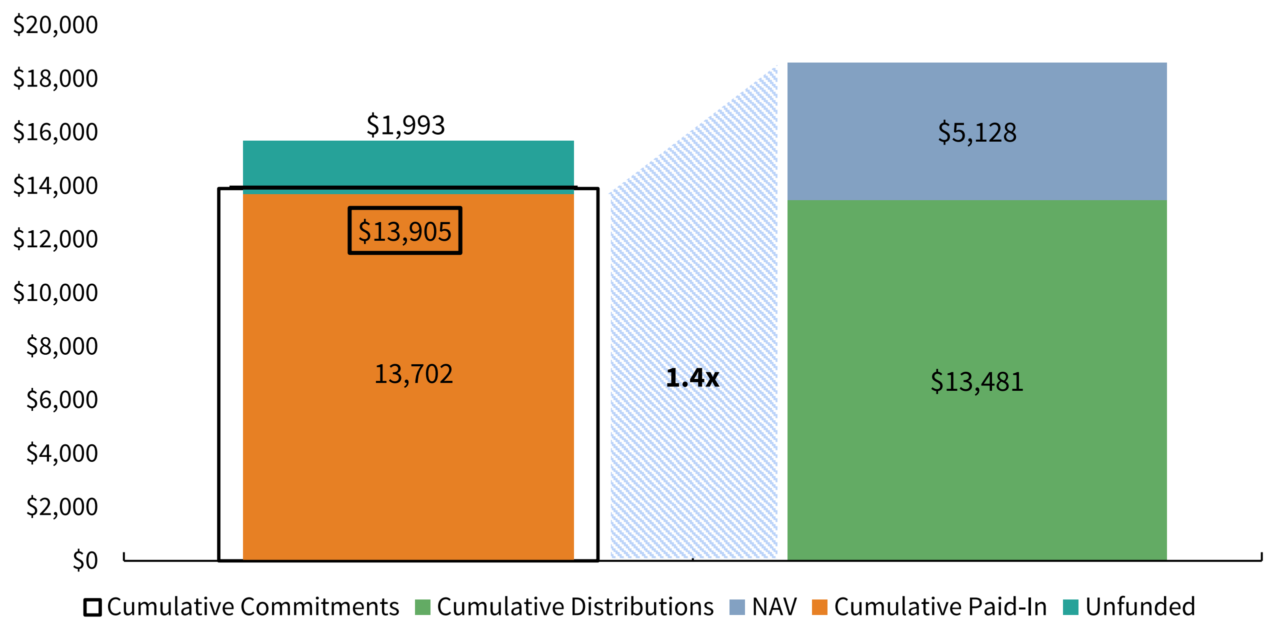
C|A

[1]Based on total plan value of $34.6 billion as of December 31, 2023.
[2]Infrastructure portfolio NAV allocation of 14% based on fund-level data as of December 31, 2023.
[3]Commitment data provided by SFERS. 2023 commitments represent commitments which were approved and closed in the 2023 calendar year.

Real Assets Portfolio Snapshot

As of December 31, 2023

- Since inception (1978) through December 31, 2023, SFERS has committed $13.9 billion to 188 funds. SFERS' investment managers have called $13.7 billion in capital commitments, or approximately 99% of total commitments.
- The portfolio has a total value to paid-in multiple of 1.4x, having generated $4.9 billion in total value creation (net of fees and carried interest).
- Current portfolio NAV stands at $5.1 billion (14.8% of total plan assets[1]). Unfunded commitments of $2.0 billion will be contributed to the portfolio over a period of several years (and offset by portfolio distributions). Approximately $642 million (~32% of unfunded commitments) are in vintages 2018 or older, and so have a lower likelihood of being called.



[1]Based on total plan value of $34.6 billion as of December 31, 2023.
Source(s): Data provided by Aksia as of December 31, 2023.
Note(s): Commitments made after December 31, 2023 are not included. Of the $13,481M in cumulative distributions, $934M is recallable as of December 31, 2023.

Program Performance

As of December 31, 2023

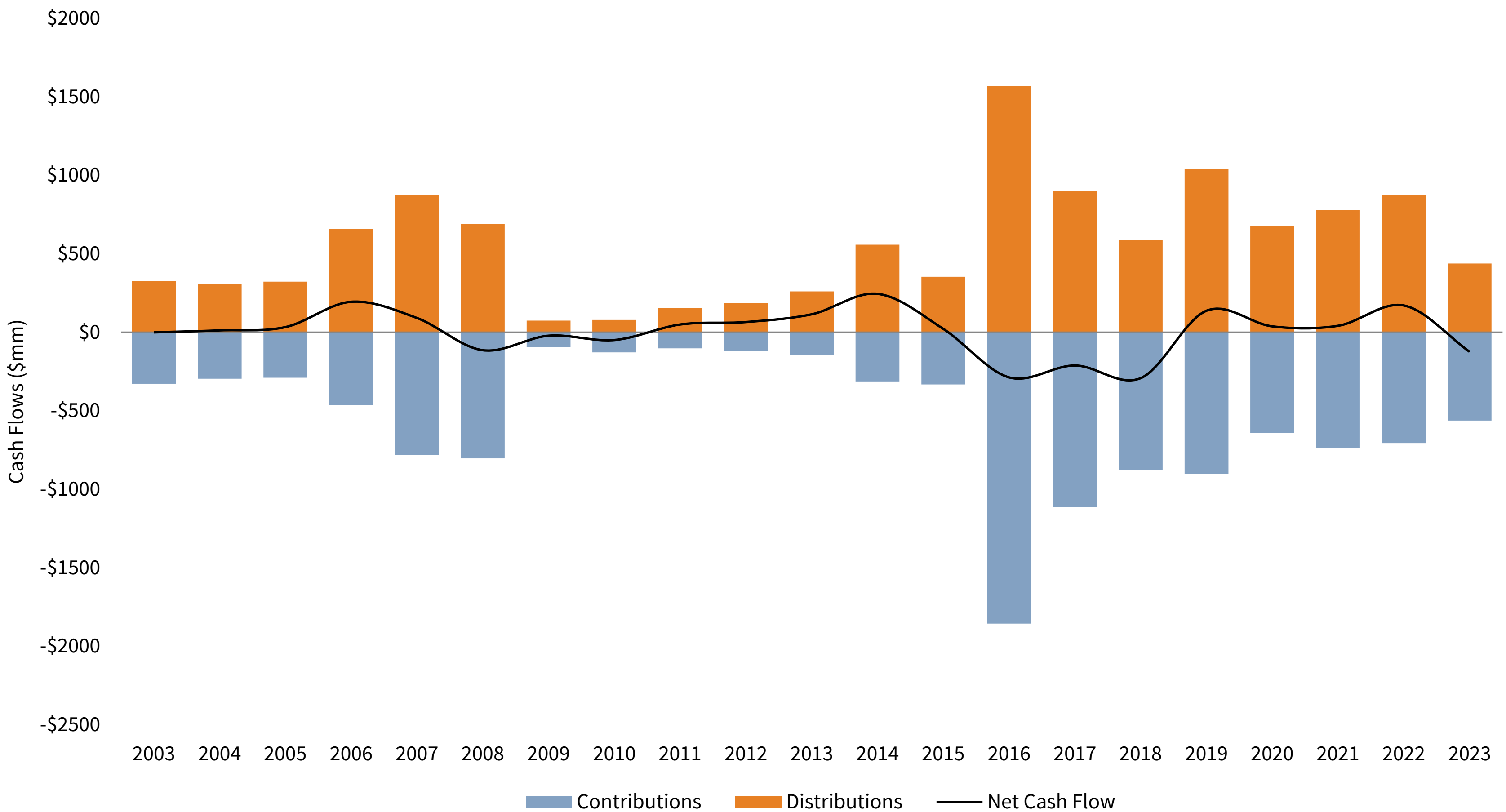
- SFERS' Real Assets portfolio has generated significant value over its custom benchmark and has outperformed the blended public benchmark equivalent over various trailing periods.
- Near-term performance is lagging due to a strong rebound in the public market sectors while private valuations reset more slowly.

	IRR (%)				
	Trailing 1-Year	Trailing 3-Years	Trailing 5-Years	Trailing 10-Years	Trailing 20-Years
SFERS Total Real Assets Portfolio	-3.1%	10.7%	6.7%	9.1%	9.1%
Real Estate	-6.7%	5.8%	5.6%	10.0%	7.7%
Infrastructure	5.1%	10.8%	10.6%	N/A	N/A
Natural Resources	-0.2%	18.8%	7.6%	7.0%	45.6%
SFERS Policy Benchmark	-1.7%	11.6%	5.2%	6.2%	7.7%
CA Real Estate & NCREIF Blended Benchmark	-6.7%	6.3%	5.3%	7.5%	7.0%
CA Real Estate Benchmark	-4.0%	7.8%	6.9%	9.0%	7.1%
CA Infrastructure Benchmark	8.5%	10.3%	10.3%	10.2%	N/A
CA Natural Resources Benchmark	3.0%	20.3%	6.0%	3.2%	7.4%
NAREIT / MSCI World NR Blend mPME	9.9%	12.5%	10.0%	8.3%	8.8%
MSCI World Core Infrastructure Index	4.0%	3.9%	7.1%	6.6%	8.7%
MSCI World Natural Resources Index	4.1%	21.8%	10.9%	2.9%	6.0%
NCREIF ODCE	-12.7%	4.0%	3.3%	6.3%	6.2%
FTSE NAREIT All Equity REITs Index	11.4%	5.7%	7.6%	8.0%	8.3%

Source(s): FTSE, Nareit, NCREIF, MSCI, Aksia, Cambridge Associates.
Note(s): Infrastructure portfolio incepted in 2016. Trailing 10-year and 20-year returns not available.
SFERS Performance data provided by Aksia as of December 31, 2023. CA benchmark IRRs are pooled returns. NCREIF ODCE (Net) index return calculated on a quarterly basis.

Annual Real Assets Cash Flows

As of December 31, 2023



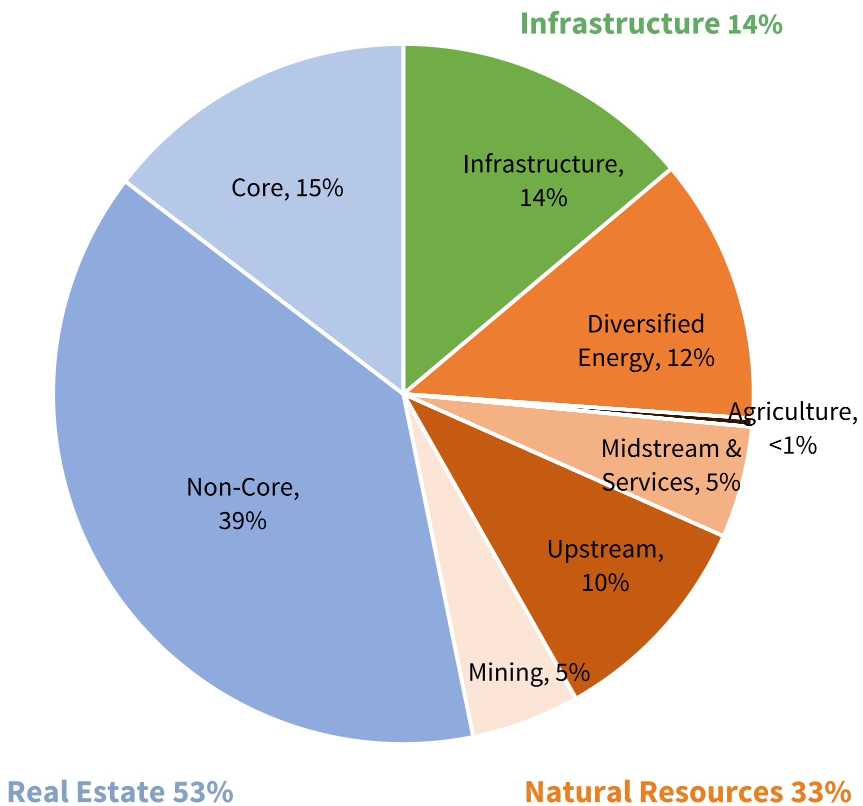
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
NET CASH FLOW ($mm)	$0	$13	$34	$195	$92	($113)	($21)	($49)	$51	$66	$116	$245	$22	($287)	($211)	($291)	$138	$38	$42	$171	($123)

Sources(s): Cash flow data provided by Aksia as of December 31, 2023.

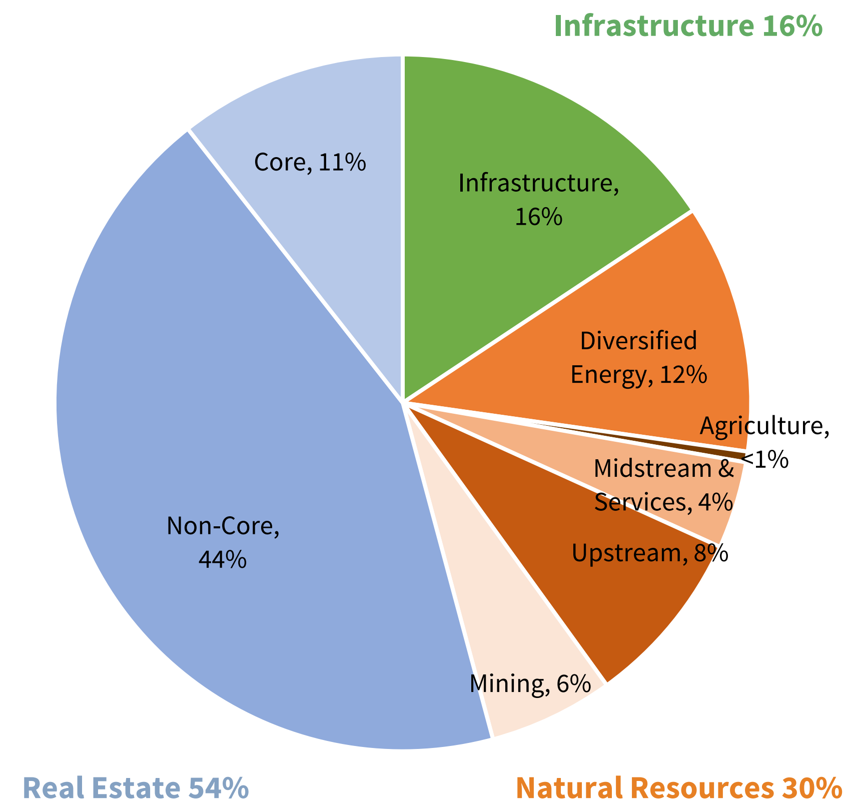
Portfolio Construction

Based on NAV, Real Estate accounts for approximately 53% of the SFERS portfolio, followed by ~33% in Natural Resources and ~14% in Infrastructure

EXPOSURE BY NAV ($5.13 BILLION)
As of December 31, 2023



EXPOSURE BY NAV + UNFUNDED ($7.12 BILLION)
As of December 31, 2023

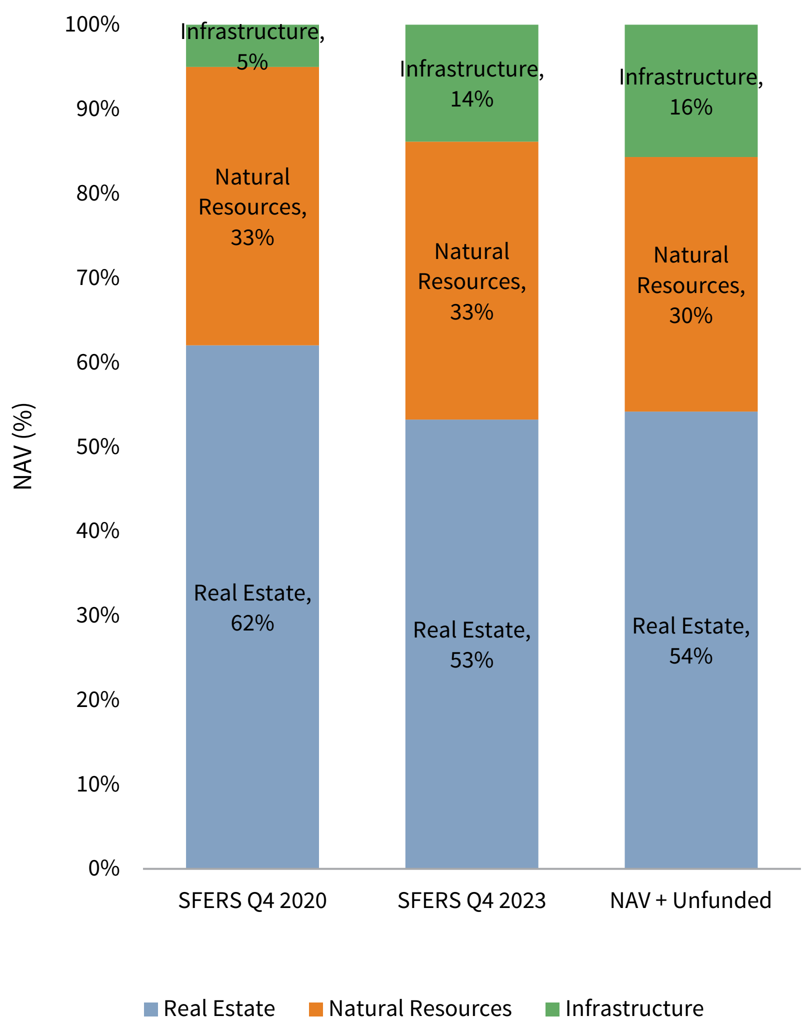


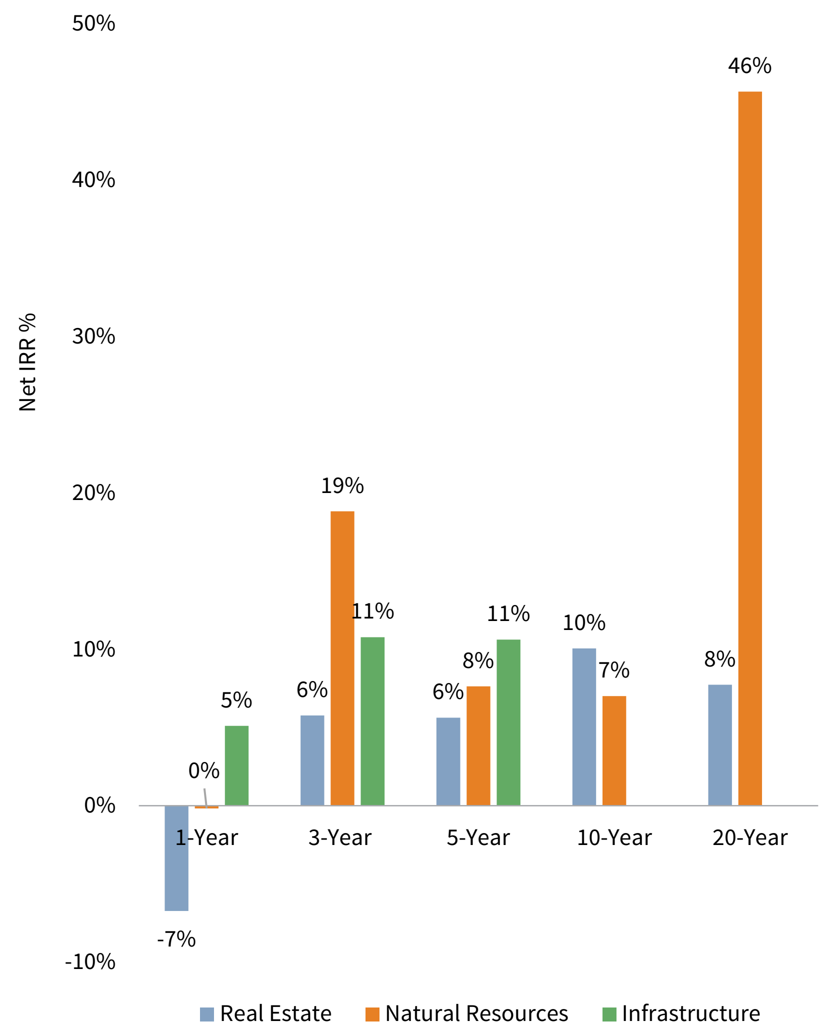
Source(s): Data provided by Aksia as of December 31, 2023.
Note(s): Asset class buckets reflect Aksia sub-strategy categorizations by fund. Totals may not sum due to rounding.

Sub-Asset Class Exposure

Natural Resources exposure continues to gradually decline, while Infrastructure allocation steadily increases

SFERS Real Assets Portfolio Exposure & Performance by Sub-Asset Class



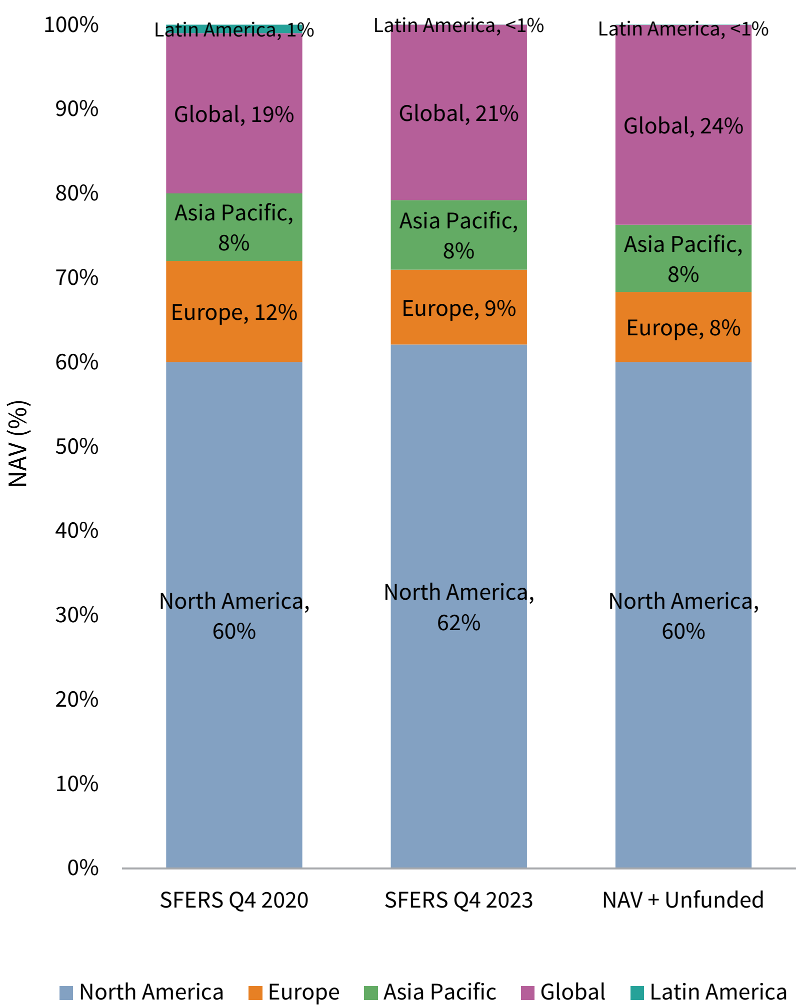


Note(s): Infrastructure portfolio incepted in 2016. Trailing 10-year and 20-year returns not available.
Source(s): Analysis based on Aksia fund-level NAV data as December 31, 2020 and December 31, 2023.

Diversified Geographic Exposure

Performance continues to benefit across short and long-term horizon from exposure to Global managers

SFERS Real Assets Portfolio Exposure & Performance by Geography



Source(s): Analysis based on Aksia fund-level NAV data as December 31, 2020 and December 31, 2023.

REAL ASSETS MARKET UPDATE

CAMBRIDGE
ASSOCIATES

North American Real Estate Outlook

Core Property Market View

- High interest rates and tight lending conditions have resulted in a wide gap between buyer and seller expectations, reducing transaction volumes by roughly 50% year-over-year[1], and impeding price discovery. The prospect of an interest rate cut in 2024 could unlock transaction activity and potentially stabilize core property valuations.
- For the one-year period ending December 31, 2023, the NFI-ODCE total return gross of fees was -12.02% comprised of 3.62% income and a -15.20% appreciation component. Core real estate values will likely continue to decline through of 2024 as values slowly reflect the higher interest rate environment.

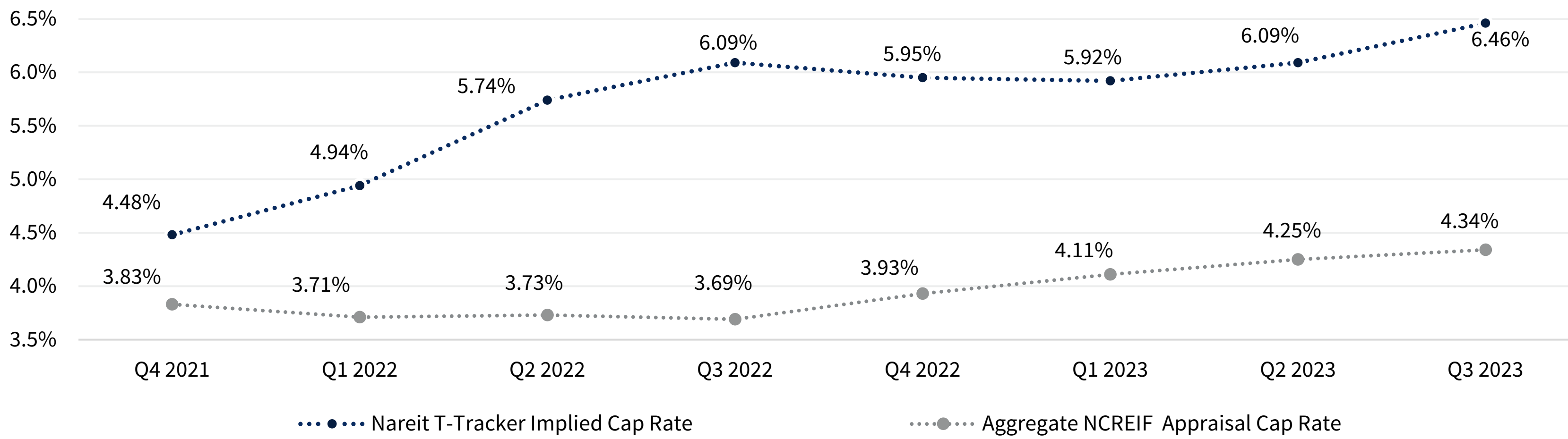
Value-Add and Opportunistic Market View

- The aforementioned capital market conditions continue to burden highly leveraged owners that need to address debt maturities. Approximately $1.1 trillion of debt will mature in 2024 and 2025[2], and approximately one-third of that debt was originated in 2020 or later, during a period of record low interest rates and high valuations. Owners with strained capital structures may require additional equity or other forms of rescue capital to maintain ownership, else they may be forced to sell in a softening market, creating potential opportunities for value-add investors in each case. Value-Add and Opportunistic managers are well positioned to fill this financing gap.
- Distressed transactions have been slow to emerge but should ramp up later in 2024. Using the Global Financial Crisis (GFC) as a point of comparison, distressed sales peaked in 2010-2011, two to three years after the crisis began.
- Capital flows continue to move away from traditional sectors like office and into niche sectors that are often characterized by fragmented ownership and opportunities to institutionalize operations benefit from greater economies of scale. Managers with the ability to underwrite these non-traditional sectors should outperform.

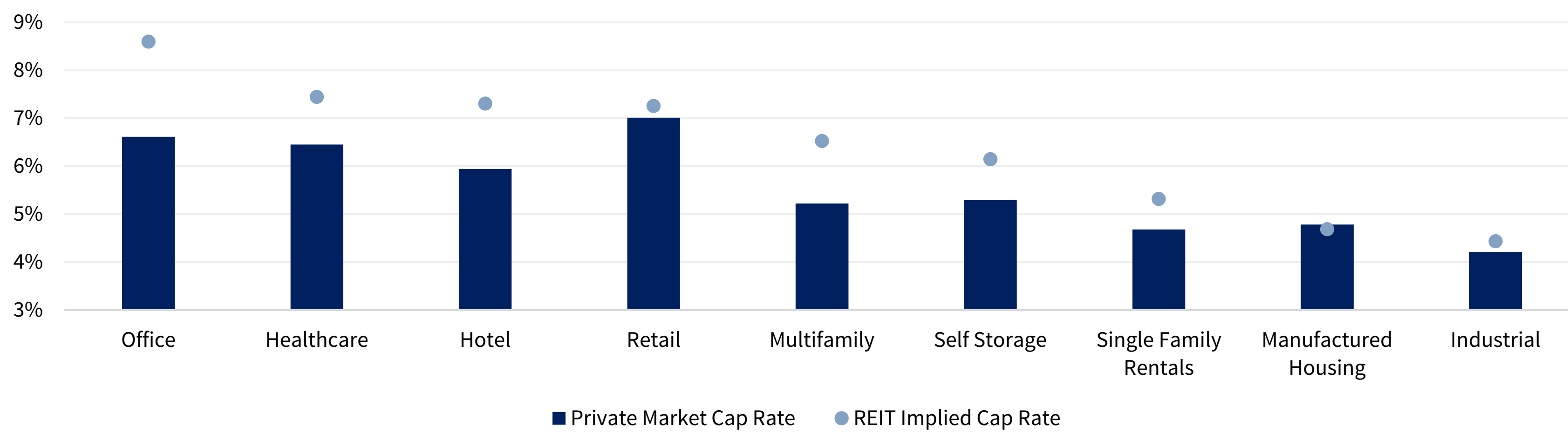
[1] Source: CBRE Research as of December 31, 2023
[2] Source: Trepp, Inc. as of December 31, 2023

Private markets have been slower to reprice relative to public markets as reflected in cap rates.

PUBLIC CAP RATES VS PRIVATE APPRAISAL CAP RATES
As of Third Quarter 2023



PUBLIC AND PRIVATE CAP RATES BY SECTOR
As of November 2023

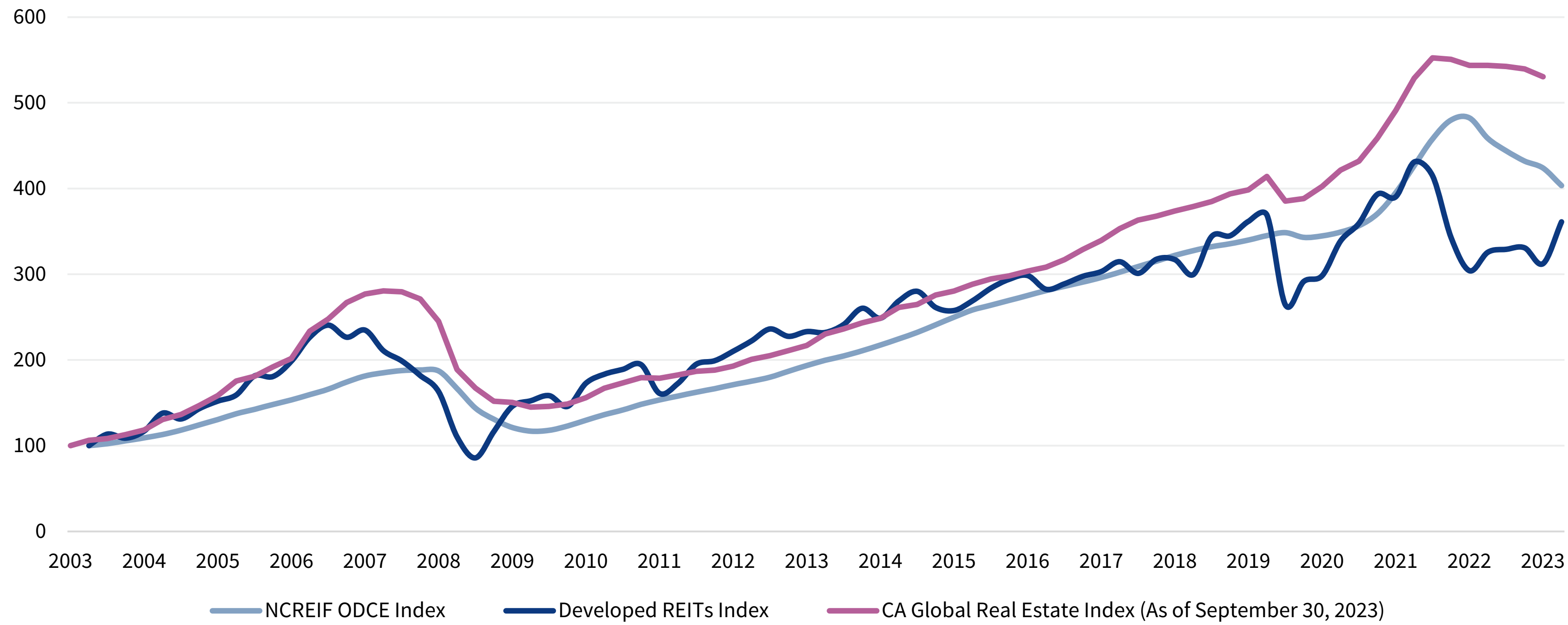


Source(s): National Association of Real Estate Investment Trusts, National Council of Real Estate Investment Fiduciaries, Centersquare.

Within private equity real estate, core funds repricing more quickly than the non-core sector.

GLOBAL REAL ESTATE INDEX CUMULATIVE RETURN COMPARED TO PUBLIC MARKET EQUIVALENTS

2003 – Fourth Quarter 2023 • US Dollar • Indexed to 100

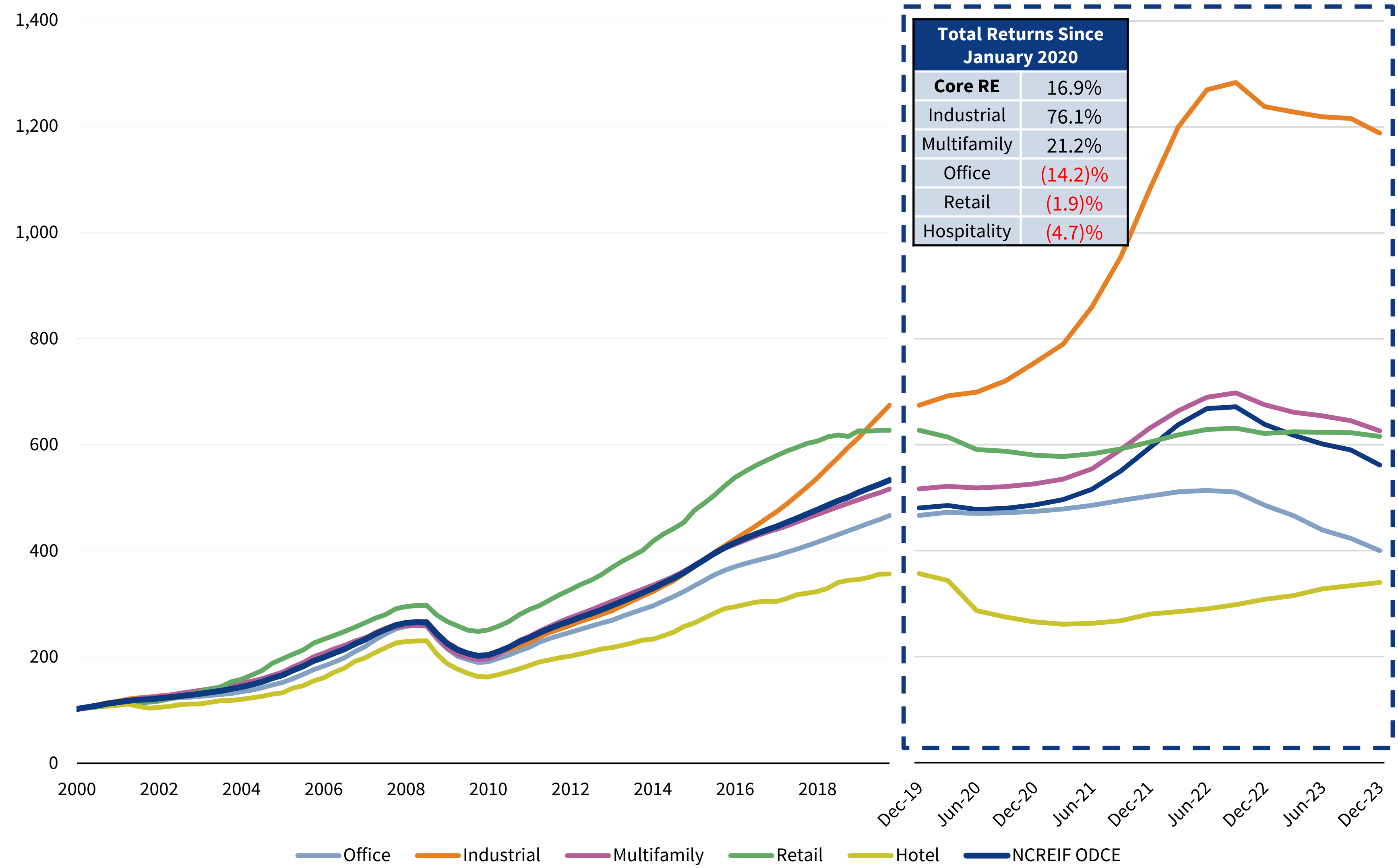


	1-YEAR	2-YEAR	3-YEAR	5-YEAR	10-YEAR	15-YEAR	20-YEAR
NCREIF ODCE INDEX	-12.02%	-2.76%	4.92%	4.25%	7.29%	6.07%	7.22%
DEVELOPED REITS INDEX	10.85%	-8.46%	2.15%	3.79%	4.52%	8.23%	6.63%
NCREIF PROPERTY INDEX	-7.94%	-1.44%	4.57%	4.33%	6.80%	6.43%	7.72%
CA GLOBAL REAL ESTATE INDEX (AS OF SEPTEMBER 30, 2023)	-2.45%	4.20%	10.17%	7.52%	9.92%	6.45%	7.32%

Sources: Cambridge Associates LLC, National Council of Real Estate Investment Fiduciaries (NCREIF), FTSE International Limited, National Association of Real Estate Investment Trusts
Notes(s): The NCREIF Property Index (NPI) and NCREIF ODCE Index represent quarterly, unleveraged composite total return for private commercial real estate properties held for investment purposes only. All properties in the NPI and ODCE have been acquired, at least in part, on behalf of tax-exempt institutional investors and held in a fiduciary environment. US REITs are represented by the FTSE ® NAREIT All Equity REITs Index representing both income and appreciation. The CA Global Real Estate Index data are pooled horizon internal rate of return (IRR) calculations (net of fees, expenses, and carried interest) based on data compiled from real estate funds (including opportunistic and value-added funds).

Aggregate performance in core real estate masks the wide disparity in returns across property types.

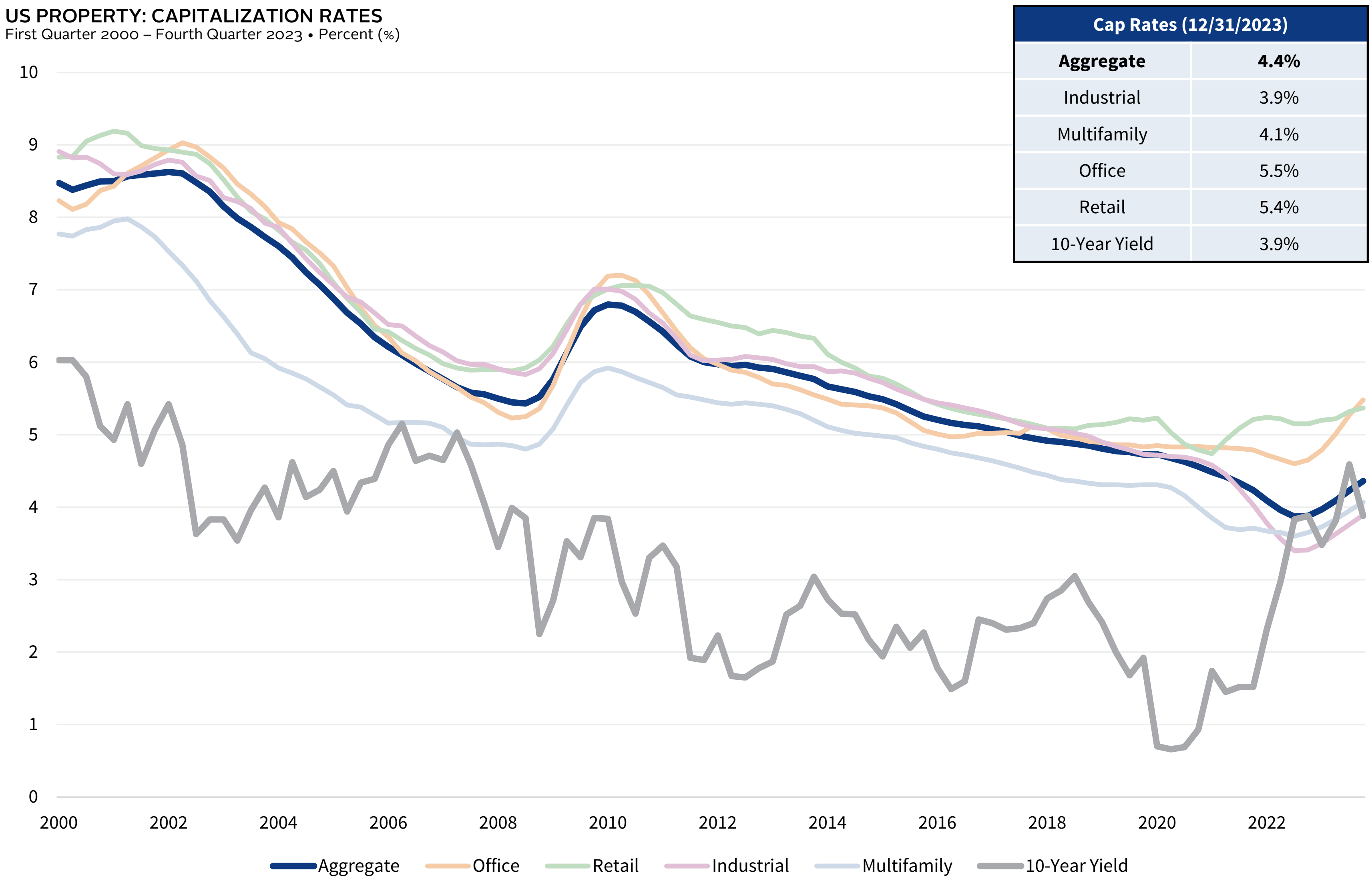
CORE REAL ESTATE PERFORMANCE
First Quarter 2000 – Fourth Quarter 2023 • Indexed to 100



Total Returns Since January 2020	
Core RE	16.9%
Industrial	76.1%
Multifamily	21.2%
Office	(14.2)%
Retail	(1.9)%
Hospitality	(4.7)%

Source: National Council of Real Estate Investment Fiduciaries

Cap rates are rising from all time lows achieved in early 2022 and are likely to rise further as financing costs exceeded unlevered yields for most property types in 2023.



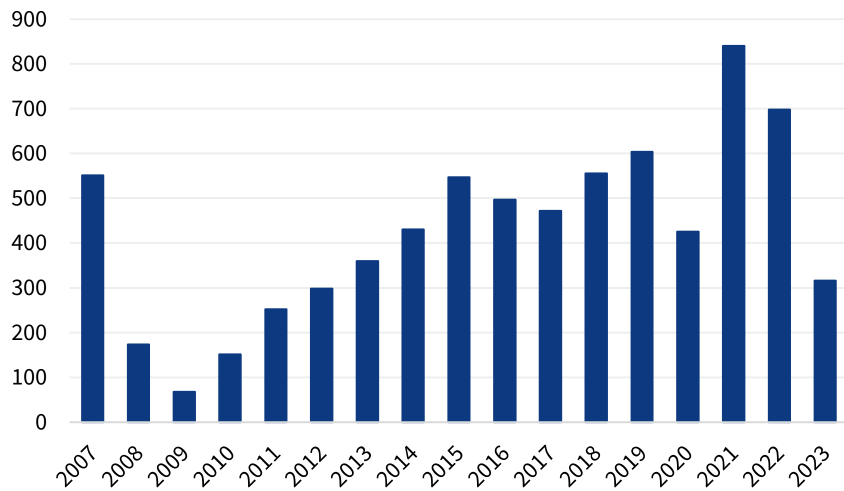
Cap Rates (12/31/2023)	
Aggregate	**4.4%**
Industrial	3.9%
Multifamily	4.1%
Office	5.5%
Retail	5.4%
10-Year Yield	3.9%

Source: National Council of Real Estate Investment Fiduciaries
Notes: The NCREIF Property Index (NPI) is a quarterly, unleveraged composite total return for private commercial real estate properties held for investment purposes only. All properties in the NPI have been acquired, at least in part, on behalf of tax-exempt institutional investors and held in a fiduciary environment. Cap rates based on appraisal value.

Real Estate Transaction Volumes

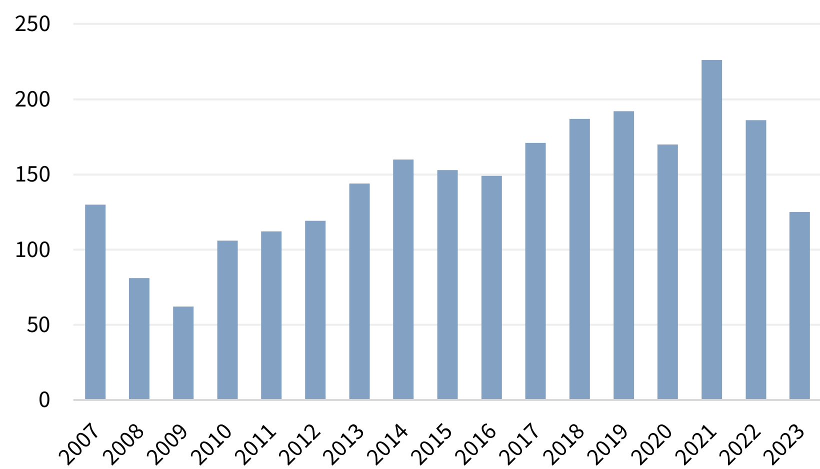
RE transaction volumes declined meaningfully in 2023. Bid-ask spreads remain wide reflecting uncertainty about interest rates and the economy

US REAL ESTATE TRANSACTION VOLUMES
2007 – 2023 • Billions ($)

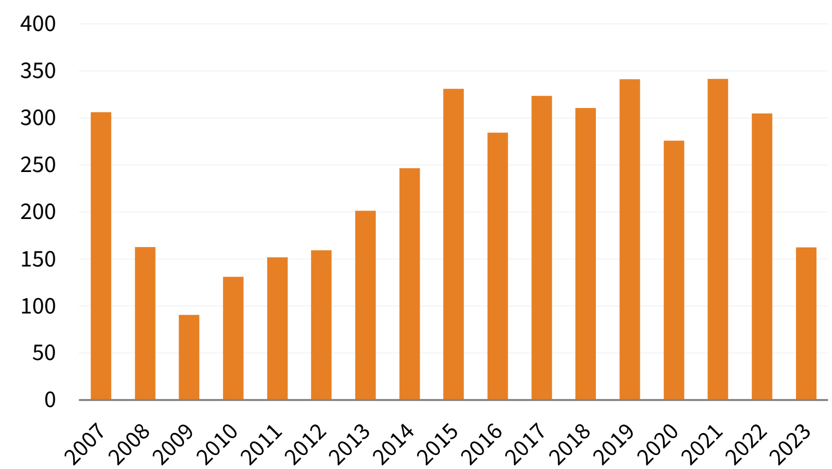


- Global commercial real estate investment volume continues to fall.
- Investment fell by over 50% in the US and similarly in Europe and Asia, driven by market uncertainty, remaining bid-ask spread, and tight lending conditions.

ASIA TRANSACTION VOLUME, EXCLUDING LAND
2007 – 2023 • Billions ($)



EMEA DEAL VOLUMES
2007 – 2023 • Billions (€)



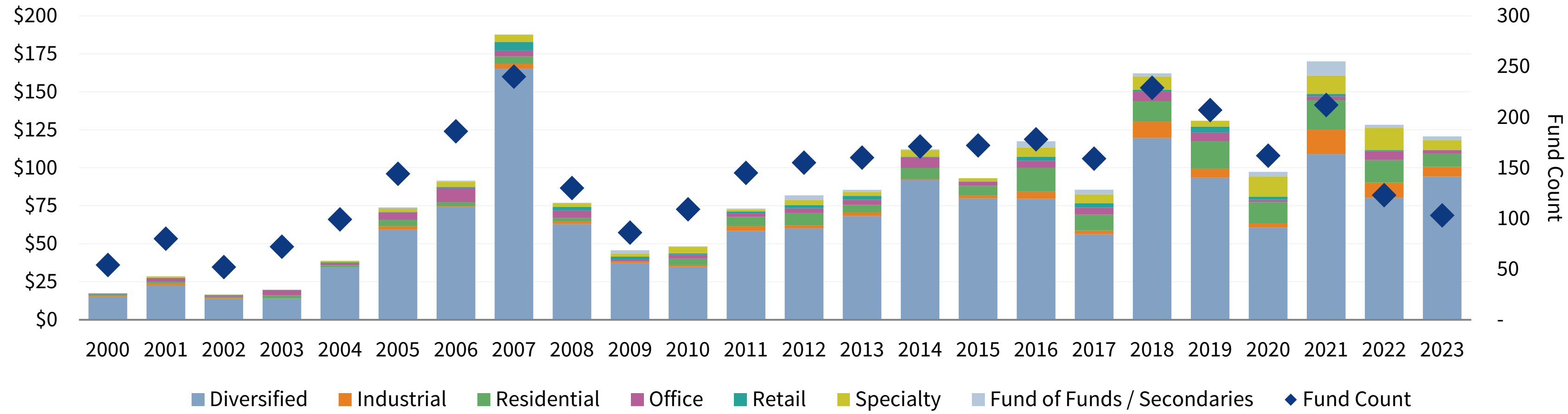
Source(s): CBRE Research, Real Capital Analytics. Cambridge Associates, LLC

Real Estate Fundraising

Real Estate fundraising dipped in 2023 but the level of "dry powder" held by closed end RE funds remains near all time highs

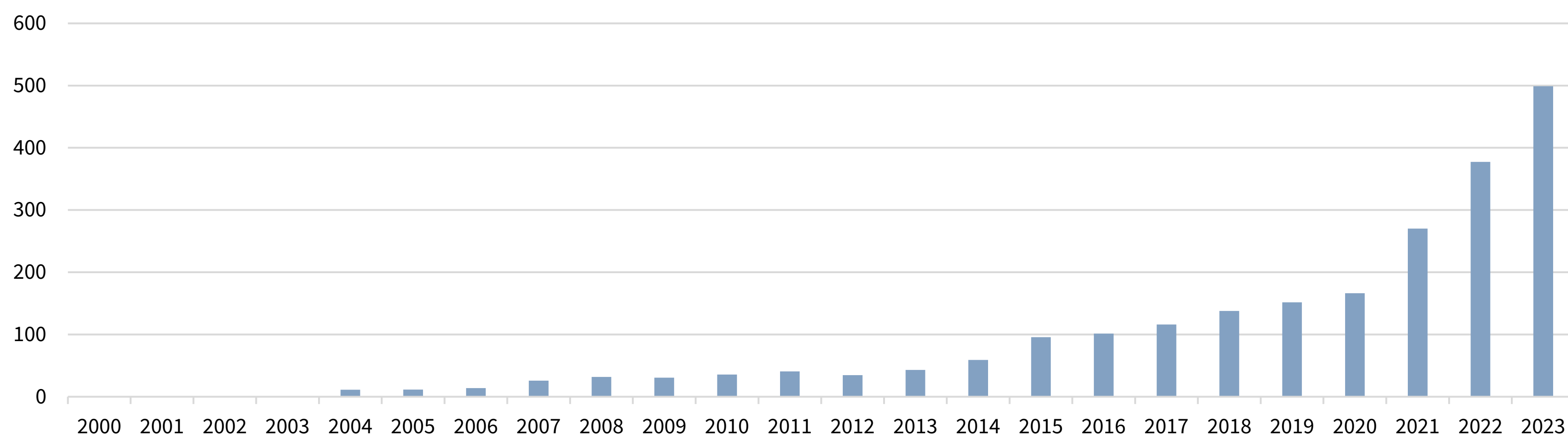
CLOSED-ENDED REAL ESTATE HISTORICAL FUNDRAISING BY SECTOR

As of December 31, 2023• Billions ($)



REAL ESTATE DRY POWDER

As of December 31, 2023• Billions ($)

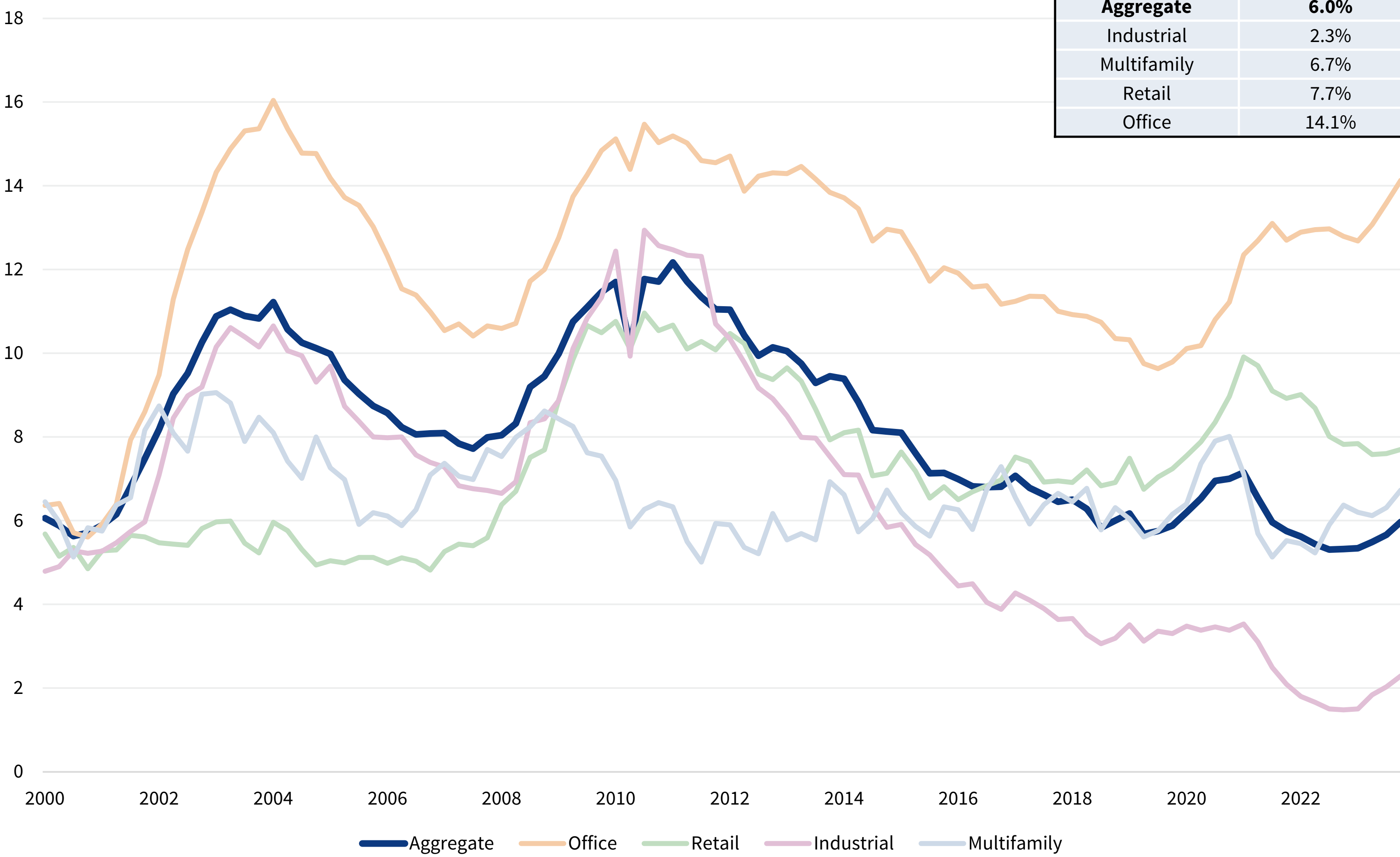


Source(s): Cambridge Associates LLC.

Notes: Data is as of December 31, 2023. Data includes close-ended funds tracked by Cambridge Associates. Open-ended funds are not included. Fundraising represents total target fund size by fund vintage year. The period of 2024 and Beyond includes the total number of real asset funds and fundraising amounts, as in our database, that are set to launch over the next two years. Dry powder for each vintage year reflects the sum of estimated dry powder remaining in funds for that year and the five prior years. For example, 2023 dry powder includes capital raised but uninvested in 2023 along with estimated uninvested capital raised between 2000 and 2022.

Industrial vacancy rates remain near all time lows while office vacancies approaching all time highs. Vacancies are expected to increase in 2024 for most sectors.

US PROPERTY: VACANCY RATE
First Quarter 2000 – Fourth Quarter 2023 • Percent (%)



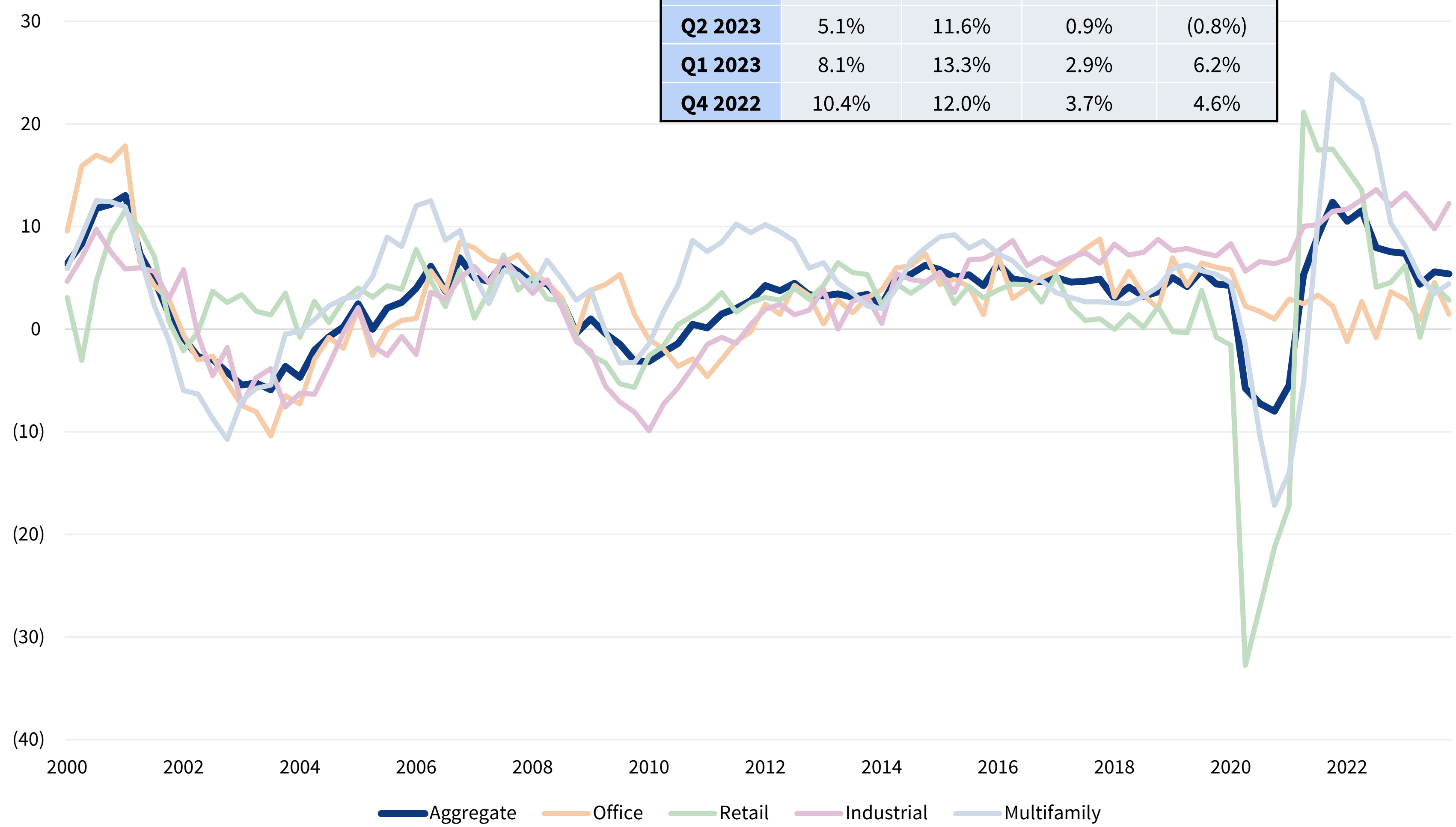
Vacancy Rates (12/31/23)	
Aggregate	**6.0%**
Industrial	2.3%
Multifamily	6.7%
Retail	7.7%
Office	14.1%

Source: National Council of Real Estate Investment Fiduciaries
Notes: The NCREIF Property Index (NPI) is a quarterly, unleveraged composite total return for private commercial real estate properties held for investment purposes only. All properties in the NPI have been acquired, at least in part, on behalf of tax-exempt institutional investors and held in a fiduciary environment.

NOI growth has decreased for most sectors aside from industrial which has remained resilient.

US PROPERTY: NET OPERATING INCOME GROWTH
First Quarter 2000 – Fourth Quarter 2023 • Percent (%)

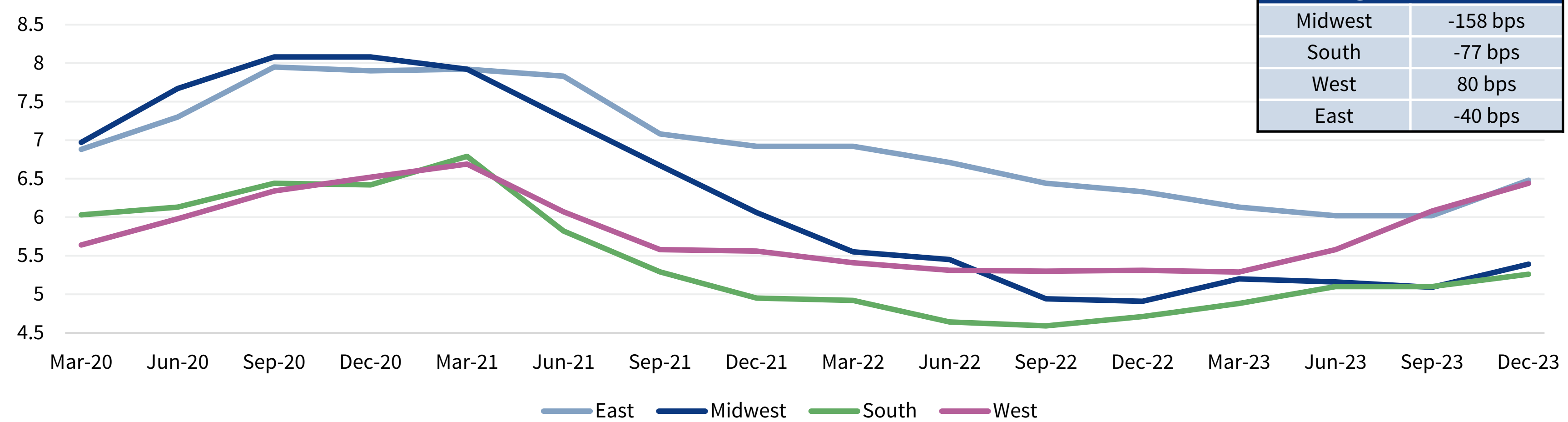
Year	Mutifamily	Industrial	Office	Retail
LTM NOI Growth				
Q4 2023	4.4%	12.3%	1.5%	2.8%
Q3 2023	3.5%	9.8%	4.6%	4.2%
Q2 2023	5.1%	11.6%	0.9%	(0.8%)
Q1 2023	8.1%	13.3%	2.9%	6.2%
Q4 2022	10.4%	12.0%	3.7%	4.6%



Source: National Council of Real Estate Investment Fiduciaries
Notes: The NCREIF Property Index (NPI) is a quarterly, unleveraged composite total return for private commercial real estate properties held for investment purposes only. All properties in the NPI have been acquired, at least in part, on behalf of tax-exempt institutional investors and held in a fiduciary environment. Data represent trailing four-quarter NOI growth.

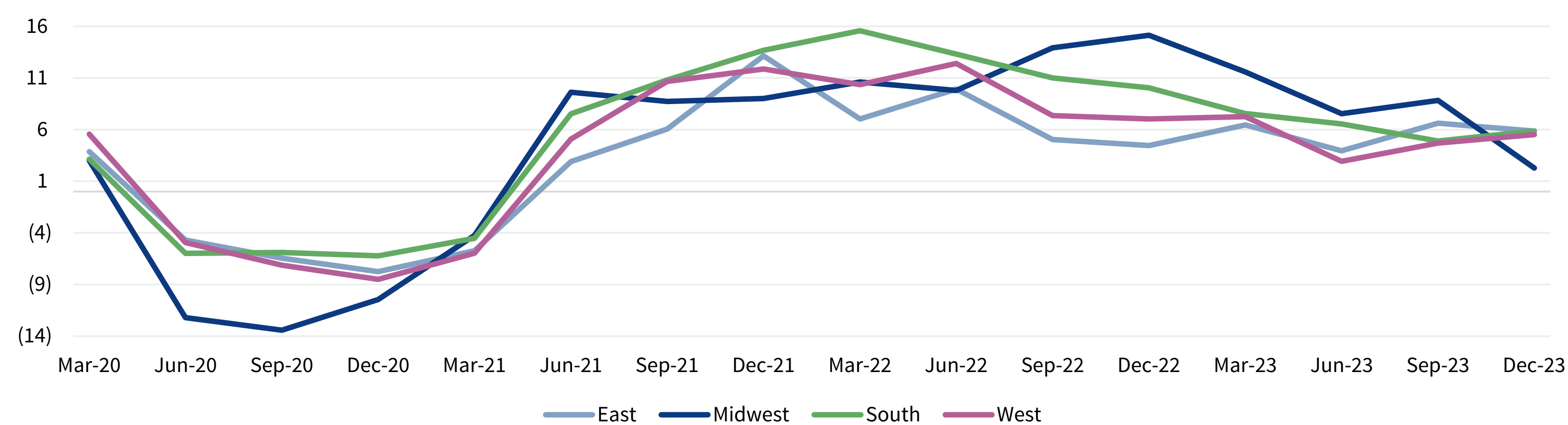
All regions have generally stabilized post COVID, although the East and West is showing signs of weaker fundamentals while the South is showing the strongest performance.

VACANCY
First Quarter 2020 – Fourth Quarter 2023 • Percent (%)



Change Since Q1 2020	
Midwest	-158 bps
South	-77 bps
West	80 bps
East	-40 bps

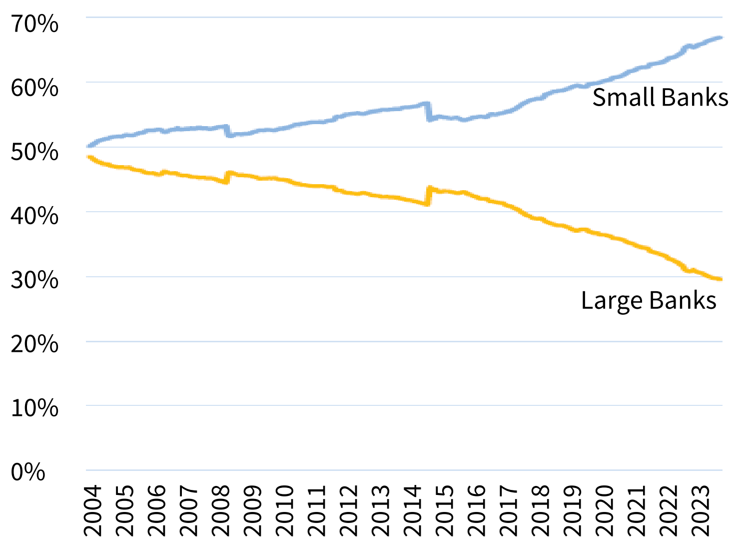
ROLLING 4-QTR NOI GROWTH
First Quarter 2020 – Fourth Quarter 2023 • Percent (%)



Sources: National Council of Real Estate Investment Fiduciaries
Notes: All data are quarterly. Performance Components represent the rolling four-quarter capital appreciation return, income return, and total return. Capitalization Rate is value-weighted and represents annualized one-quarter NOI (net operating income) relative to current market value. Vacancy Rate represents the weighted average non-leased properties relative to total properties in the current quarter. Net Operating Income Growth represents the percent change in NOI over the previous four quarters.

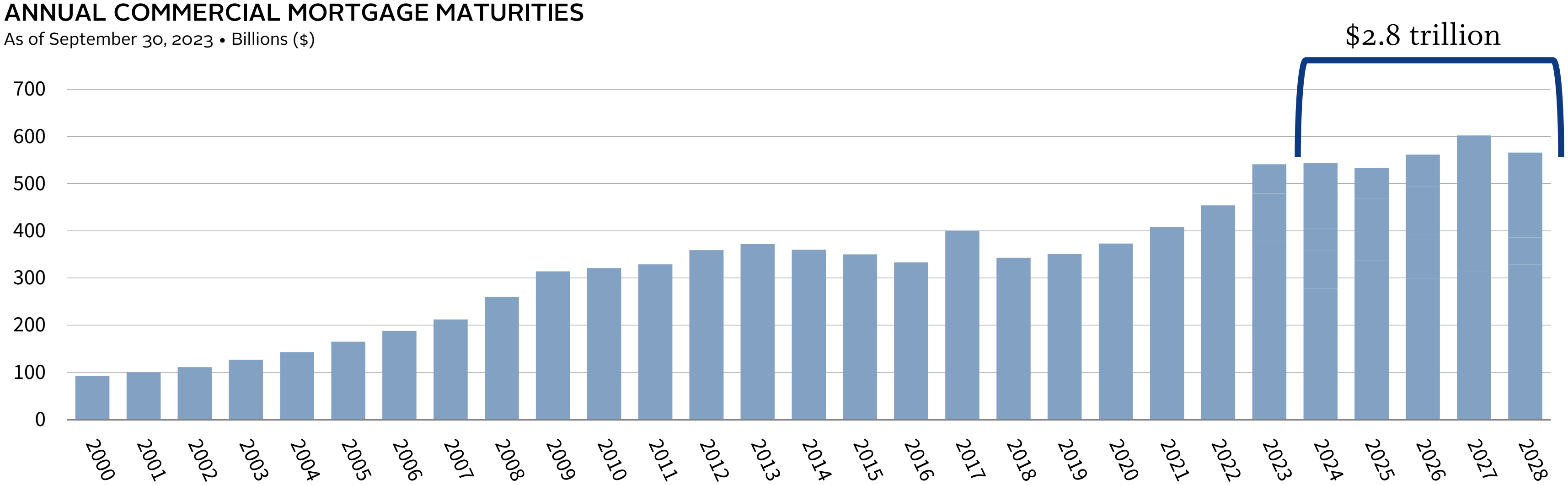
The historically large "maturity wall" through 2028 is expected to act as a catalyst to accelerate deal flow – especially from banks – and present attractive credit entry points.

COMPOSITION OF BANK CRE DEBT OUTSTANDING
As of September 30, 2023 • Percent (%)



- Banks represent about 50% of CRE debt outstanding but over the last decade smaller regional and community banks have meaningfully increased their market share of CRE lending
- These banks are now tightening lending conditions with over 40% and 50% signaling tighter standards for CRE properties and multifamily properties, respectively
- An estimated $2.8 trillion in looming maturities over the next 5 years, and limited credit availability from banks, creates opportunities for alternative lenders to originate and acquire attractive loans

ANNUAL COMMERCIAL MORTGAGE MATURITIES
As of September 30, 2023 • Billions ($)

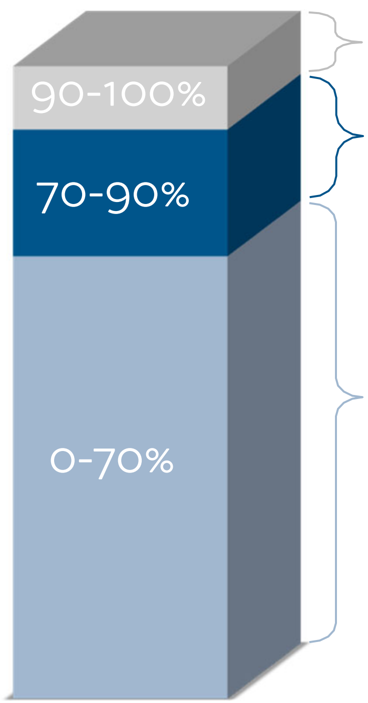


Sources: Trepp Inc., based on Federal Reserve Flow of Funds Data; Federal Reserve January 2024 Senior Loan Officer Opinion Survey; FDIC; Moody's Analytics; AEW; Cambridge Associates LLC.

This market environment is creating a widening financing gap with fewer liquidity options in real estate capital structures.

Illustration of Increasing Gap in Capital Structure

Q2 2021

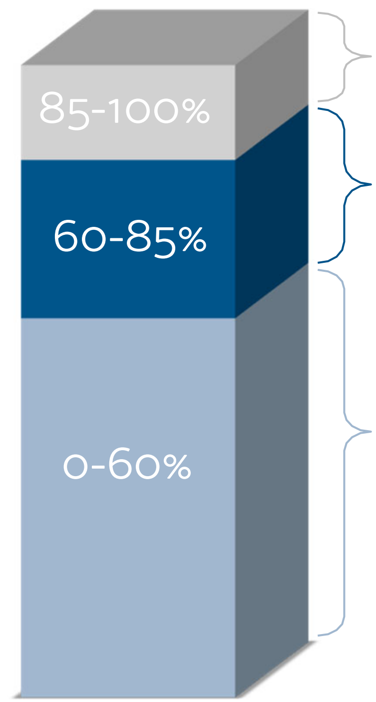


Sponsor Equity:
- First loss

Financing Gap:
- Capital met by mezzanine & preferred equity providers

Senior Financing:
- Previously 3.0 – 4.0% coupon
- Leverage constrained by LTV and debt yields

Q3 2023



Sponsor Equity:
- First loss equity increasing

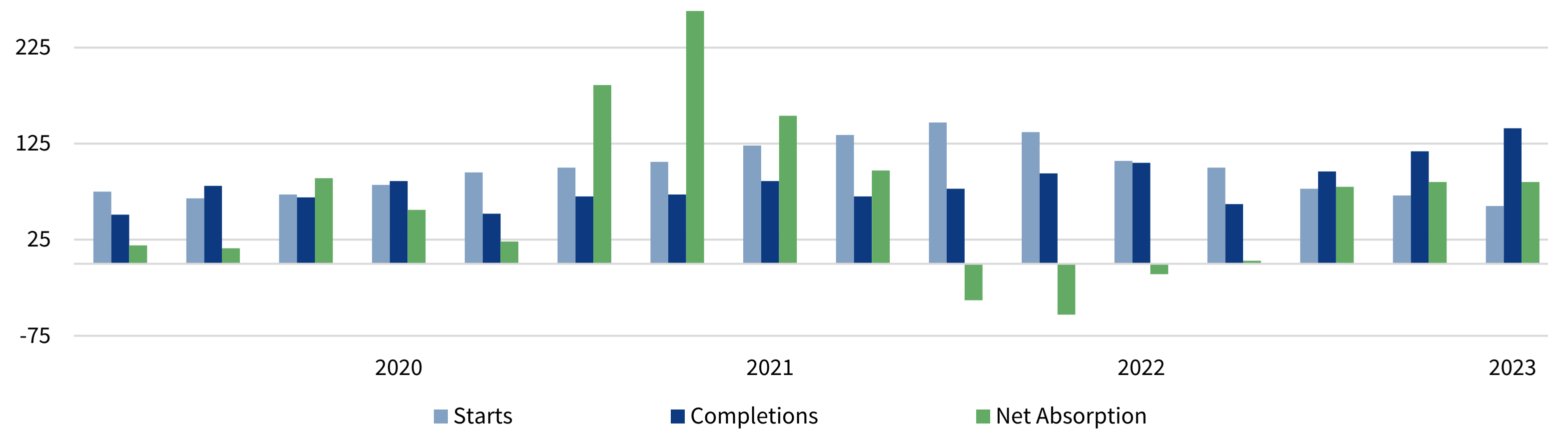
Increase in the Gap:
- Need by sponsors to finance a larger portion but preferred equity and mezzanine are in a more secure position in the capital structure with attractive pricing

Senior Financing:
- Now 5.5 – 6.5% coupon
- Leverage constrained by debt service coverage ratios (DSCR)

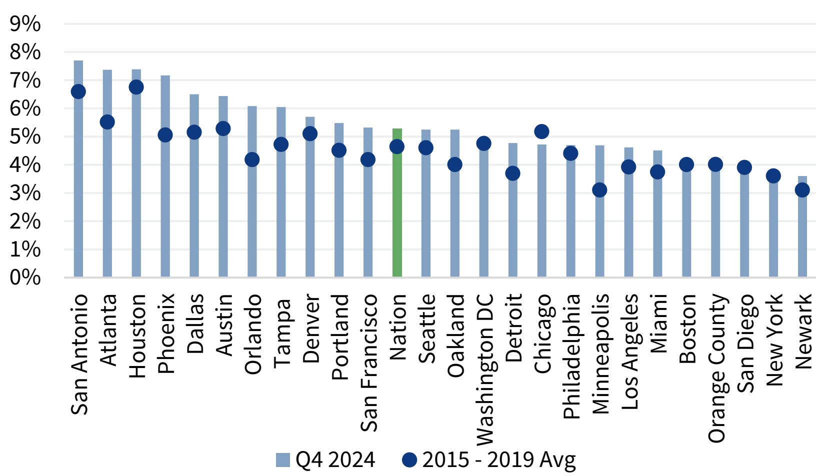
Source: ArrowMark, Cambridge Associates LLC.

Traditional multifamily assets are facing some headwinds as vacancies are expected to rise in most markets due to oversupply, but demand remains strong due to affordability /cost of homeownership.

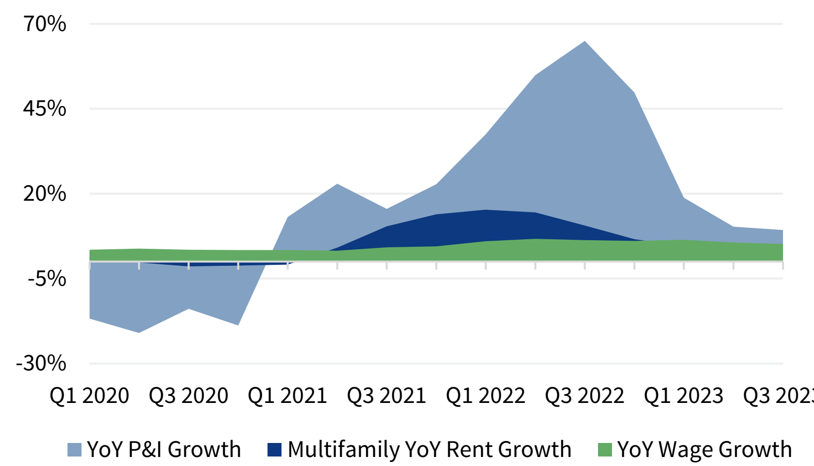
DEMAND HAS NOT KEPT PACE WITH RECORD NEW SUPPLY
Q1 2020 – Q4 2023 • Units (thousands)



MULTIFAMILY VACANCY EXPECTED TO EXCEED HISTORIC AVERAGES
As of Q3 2023



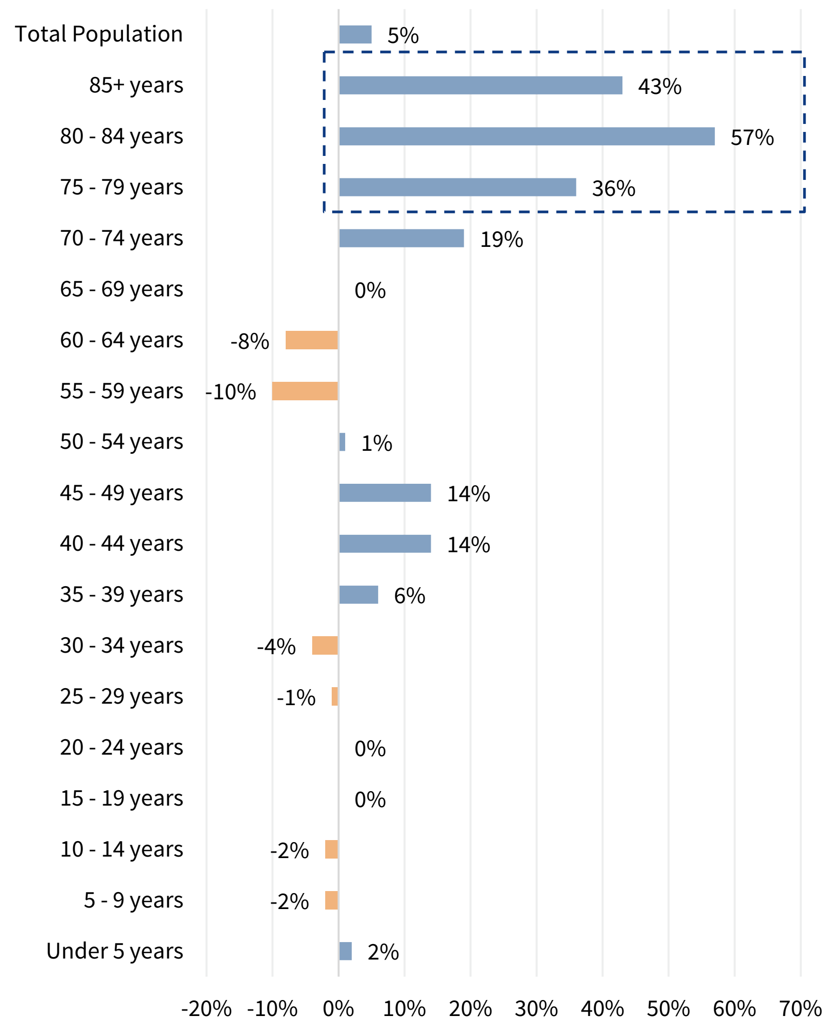
GROWTH IN COST OF HOME OWNERSHIP EXCEEDS RENTAL GROWTH
2020 – Q3 2023



Sources: CBRE, Trepp, DoubleLine Capital LP, Green Street, Freddie Mac.

The aging population and limited new supply support senior housing market fundamentals. Affordability pressure and fragmented ownership in single-family rentals, manufactured housing and build-to-rent create tailwinds for the sectors.

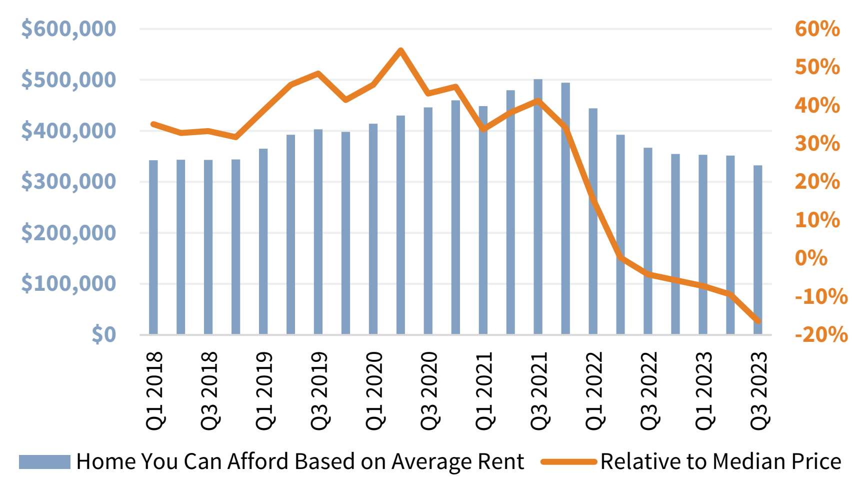
75+ POPULATION IS FORECASTED TO GROW 44% IN NEXT 10 YEARS
Population growth projection through 2032



POST-COVID DEMAND HAS RECOVERED BUT SUPPLY REMAINS CONSTRAINED
As of Fourth Quarter 2023

	Senior Housing (Independent & Assisted Living)	Nursing Care
Occupancy	85.1%	83.1%
Annual Rent Growth	5.0%	4.3%
Annual Absorption	4.3%	2.9%
Annual Inventory growth	1.4%	-1%
Construction vs Inventory	4.3%	0.2%
Rolling 4-Quarter Starts vs. Inventory	1.4%	0.0%

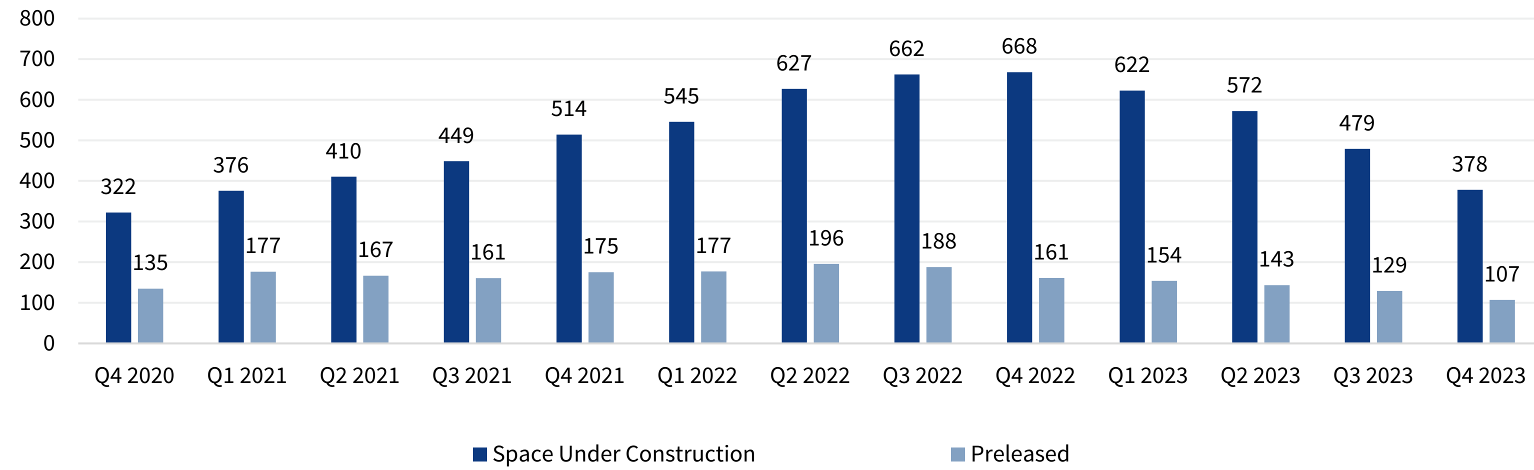
PROSPECTIVE HOME BUYERS ARE FACING A LACK OF AFFORDABILITY
As of Third Quarter 2023[1]



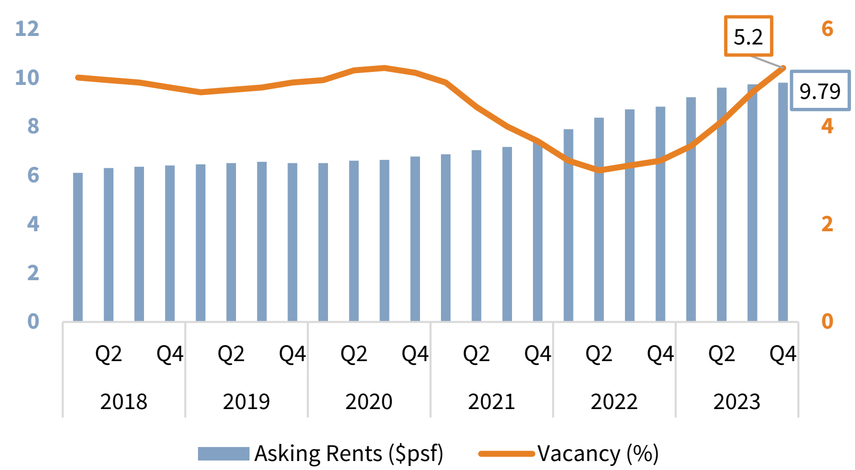
Source(s): JLL Research, U.S. Census Bureau, Lightcast, NIC MAP Vision, Cushman & Wakefield Research, NAR, Freddie Mac
Note: [1]Assumes 20% down and excludes taxes/insurance.

Industrial rental growth is moderating due to record supply entering the market, but new deliveries will decrease in the coming years and consumer preference, e-commerce, and onshoring support demand.

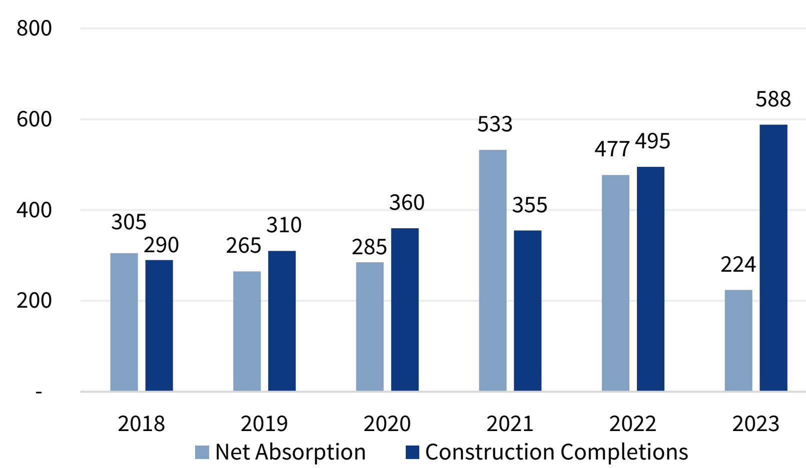
SPACE UNDER CONSTRUCTION CONTINUES TO FALL
Fourth Quarter 2020 – Fourth Quarter 2023 • Millions (SF)



GROWTH IN ASKING RENTS CONTINUES TO SLOW WHILE VACANCY RISES
First Quarter 2018 – Fourth Quarter 2023



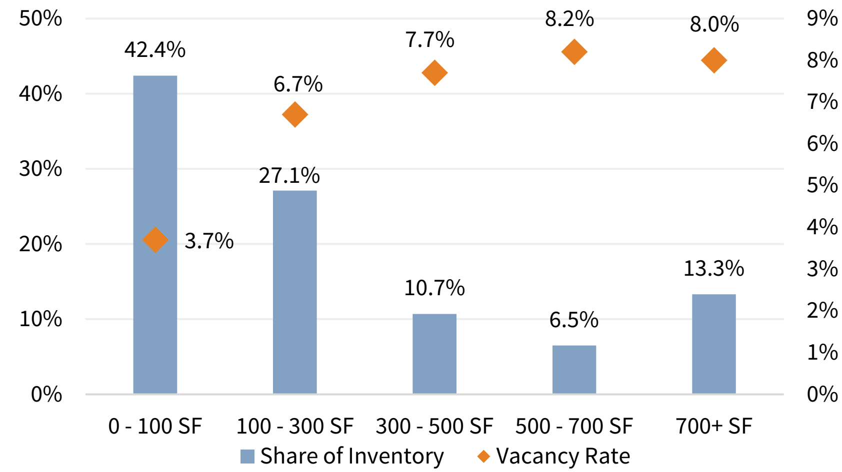
US INDUSTRIAL DEMAND LAGGING COMPLETIONS
2018 – Fourth Quarter 2023 • Millions (SF)



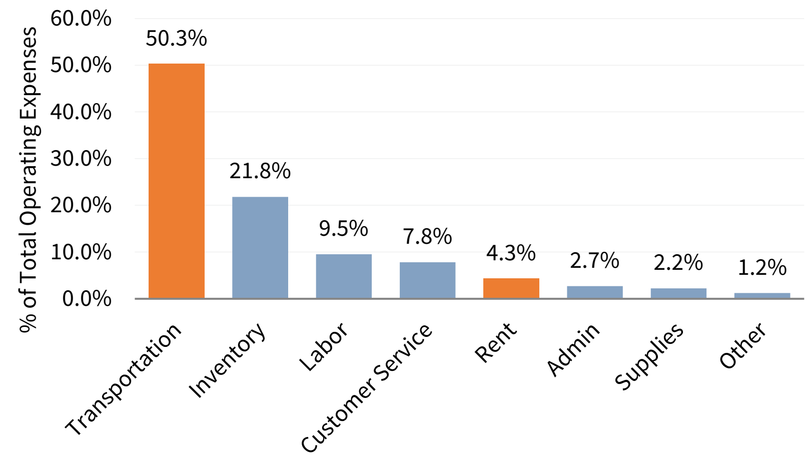
Sources: Cushman and Wakefield, CBRE, US Census Bureau

Niche industrial properties continue to benefit from positive sector fundamentals in addition to more favorable supply demand dynamics.

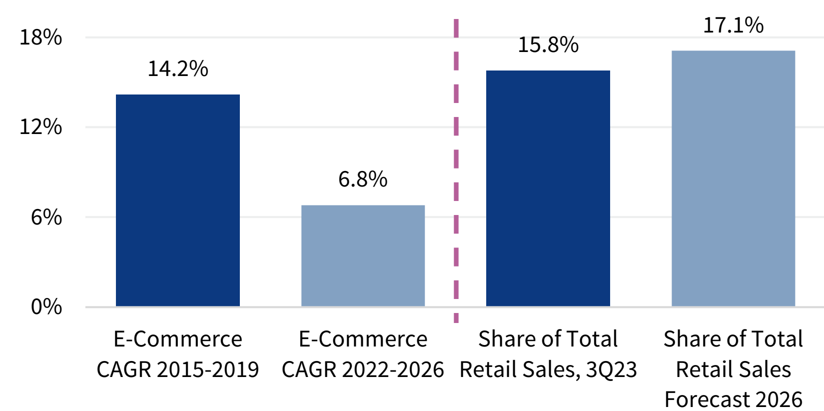
INDUSTRIAL VACANCY RATE BY BUILDING SIZE
As of December 31, 2023



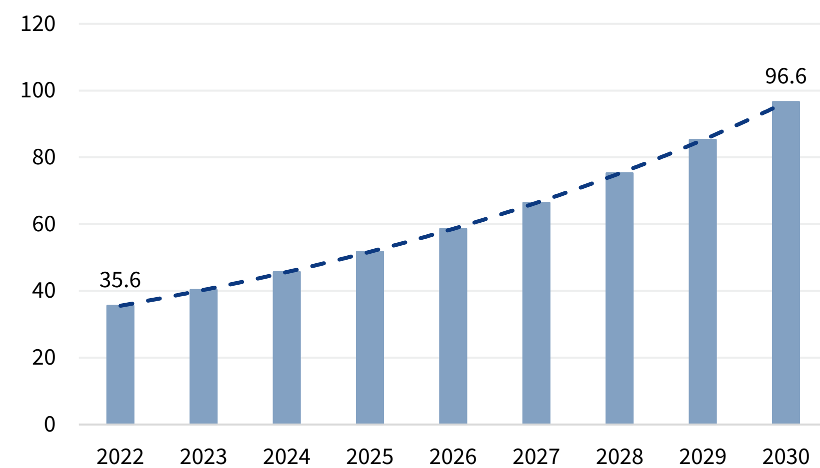
TRANSPORTATION & LOGISTICS – OPERATING EXPENSES
As of 2021 • Percent (%)



US HISTORICAL AND FORECASTED E-COMMERCE GROWTH
Percent (%)



US COLD STORAGE MARKET EXPECTED TO GROW AT A 13.3% CAGR
2022 – 2030E• Billions ($)



Source(s): CoStar, Newmark Research, Grandview Research

European Real Estate Outlook

- 2023 was a year of weak economic growth across most Europe, with households and business affected by elevated inflation and a sharp interest rate hiking cycle. Repricing of lower yielding property sectors such as logistics and residential has been notable, but it also creates attractive buying opportunities and benefit players with ample dry powder and structuring capabilities.
- Prime leasing markets proved largely resilient to the headwinds in 2023 with positive rental growth in all quarters of 2023 on both a quarterly and annual basis for office, high street retail and logistics at the European level.
- Logistics take-up will continue to ease down from earlier record highs, while in retail, better consumer fundamentals should improve footfall and sales figures. The living sector will continue to face structural undersupply challenges and strong occupier demand. Similar demand-supply imbalances may be apparent in other sectors such as hotels and data centers.
- Investors continue to balance ESG considerations, including greater focus on Net Zero and DEI initiatives, alongside their need to generate an attractive financial return. Bifurcation in the office sector remains with most tenants preferring modern offices with ample amenities and strong ESG attributes. Developers will be incentivized and rewarded for creating sustainable buildings as rental and valuations premiums are being commanded for buildings built to the with higher levels of environmental performance.
- Opportunistic strategies capable of investing across capital stack may be well positioned to take advantage of any distress that materializes.

Asian Real Estate Outlook

- Excluding Japan and more recently China, most real estate sectors within Asia remain in a negative carry environment (cap. rates below borrowing costs), which remains a persistent headwind for the asset class.
- Capitalization rates have expanded by 50- to 150-bps from 2020 to Q3 2023 and further correction is expected through 2024. Refinancing risks are also an important concern, especially for sectors with impaired income which may affect loan to value ratios and ultimately valuations.
- APAC real estate funds are generally struggling to raise capital.
- We expect capitalization rates for core properties to continue expanding given the negative carry, particularly for assets that are facing refinancing risks. We expect the correction to be led by the office sector, which has been the case in Australia. Office-investment volumes have been the worst hit thus far in 2023 (–50% YoY) due to wide bid-ask spreads, which are expected to narrow through the year into 2024.
- Logistics assets continue to hold well in jurisdictions with strong rental growth, such as Singapore, Japan, India, and Australia. However, this may change in jurisdictions with looming stock completions, such as South Korea.
- Data Centre assets are attractive given the long-term secular demand for data and the demand-supply gap in Asia. Data centers can generate unlevered development yields of 7%-9%, offering attractive yield premiums of 300- to 400-bps above core real estate.
- The increased appetite for ESG and green office buildings provides managers with an incentive to acquire older, grade-B spaces and refurbish them into modern, green offices. Nongreen offices are experiencing more difficulties in retaining or re-leasing vacant space to new tenants as occupiers seek higher quality spaces.

Infrastructure Outlook

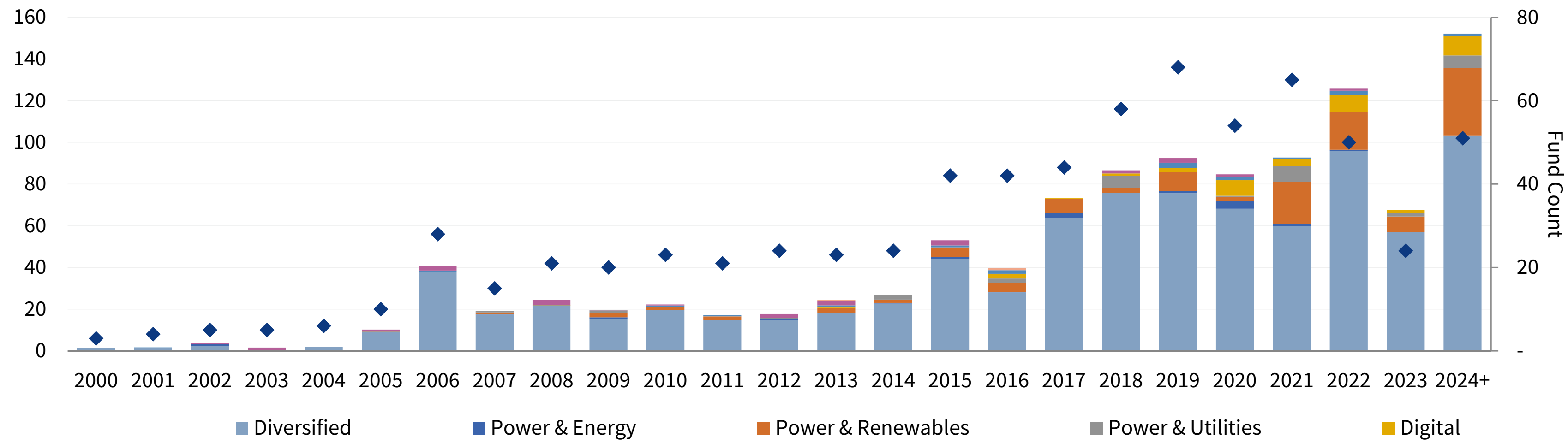
- CA has continued to see significant growth and opportunity within the infrastructure sector during 2023 and considers a strong outlook for 2024. Infrastructure fundraising dipped in 2023 but the level of "dry powder" held by the funds remains near all-time highs.
- Despite rising inflation, interest rates and a slowing economy, infrastructure valuations have remained robust. This is mainly due to the following:
  - Infrastructure assets have broadly benefited from inflation linked revenues, particularly within utilities, renewables and energy-linked assets (e.g., data centers). This has been through enforceable contracts, regulation or due to pricing power of monopolistic-like assets.
  - Value-add investors have benefited from a rise in core investors across direct and open-ended funds, growing the pool of buyers with a lower cost of capital. Green premiums have also been prevalent on renewable assets.
  - Leverage has fallen since the financial crisis within the sector, with gearing reducing to ~50% LTV, though higher leverage is more likely within core assets. Long-term hedging and move to fixed rate has also broadly protected from rising rates.
- There were challenges in some markets, such as US offshore wind and fiber-to-the-home, but this was very project specific and highlighted the need for good manager / partner selection to be able to mitigate a more complex environment (i.e., rising prices, rates).
- With inflation cooling down and the market expecting interest rates to stay higher for longer, the direction of travel for valuations may be down over the coming 12 months.
- Strong performance has been driven by the drive for energy security and decarbonization, supported by government policies particularly in the US and EU.
  - Renewables has been the key beneficiary, but opportunities remain within traditional gas and LNG as global supply and demand imbalances persist following the Russian invasion of Ukraine. Other growing opportunities include in electrification (e.g., EV charging).
  - Digital assets remain a key growth area, though some more cyclical assets (e.g., fiber to the home) highlighted the need to be focused in robust and growing areas. Cloud has remained more resistant, particularly within hyperscale data centers which has been a focus recent growth given market opportunities in AI.

Infrastructure Fundraising & Dry Powder

Infrastructure fundraising dipped in 2023 but the level of "dry powder" held by the funds remains near all-time highs

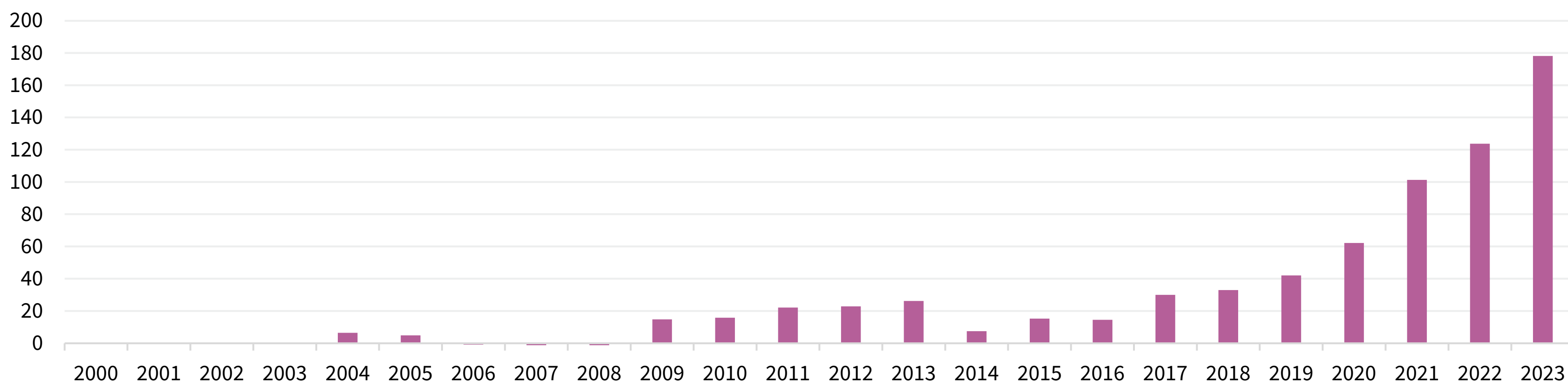
CLOSED-END INFRASTRUCTURE HISTORICAL FUNDRAISING BY STRATEGY

As of December 31, 2023• Billions ($)



INFRASTRUCTURE DRY POWDER

As of December 31, 2023• Billions ($)



Source(s): Cambridge Associates LLC.

Notes: Data is as of December 31, 2023. Data includes close-ended funds tracked by Cambridge Associates. Open-ended funds are not included.

Fundraising represents total target fund size by fund vintage year. The period of 2024 and Beyond includes the total number of real asset funds and fundraising amounts, as in our database, that are set to launch over the next two years.

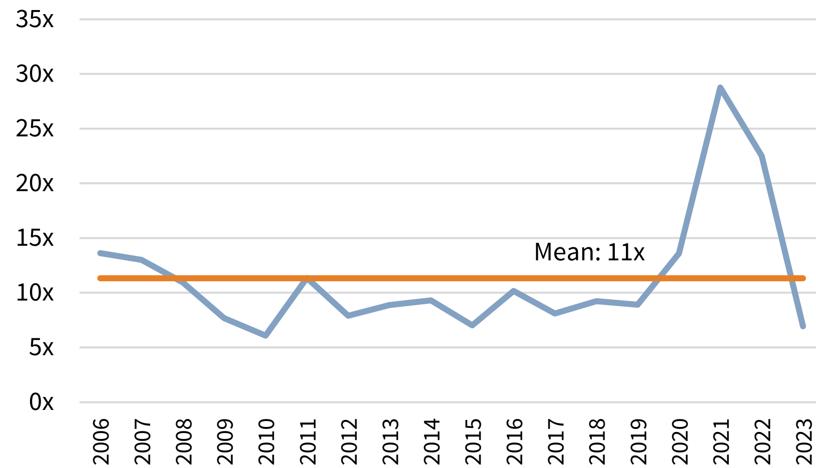
Dry powder for each vintage year reflects the sum of estimated dry powder remaining in funds for that year and the five prior years. For example, 2023 dry powder includes capital raised but uninvested in 2023 along with estimated uninvested capital raised between 2000 and 2022.

Infrastructure Valuations

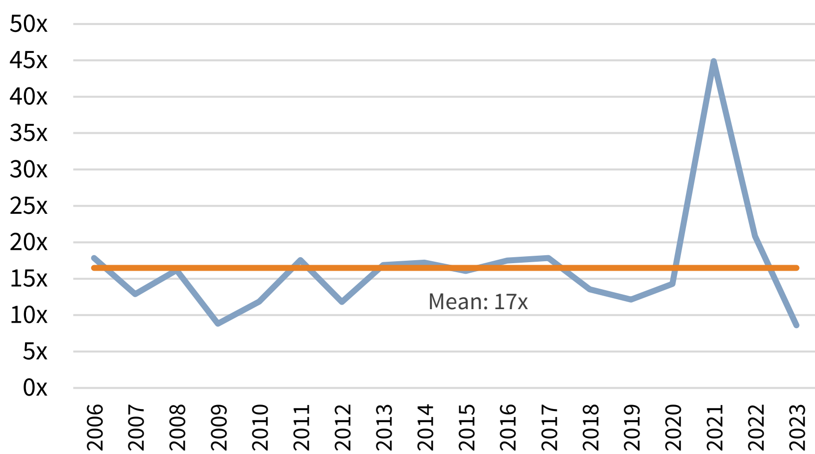
Latest Pricing Suggest Attractive Entry Points Over the Next 12 Months. Valuations Trend Towards the Mean

- In 2022 the negative impact from higher interest rates was largely offset by the positive impact of high inflation. However, to date, with inflation cooling down and the market expecting interest rates to stay higher for longer, the direction of travel for valuations may be down over the coming 12 months (except for late-stage renewables), particularly at the higher risk end of the spectrum.
- Utility valuations have converged downwards given rising interest rates and inflation impacts on capital expenditure and financing.
- Within energy, late-stage renewables valuations have risen given the sector's increased attractions. Transportation and telecoms average valuations remain high, although valuations converged downwards in 2023 given limited number of transactions.

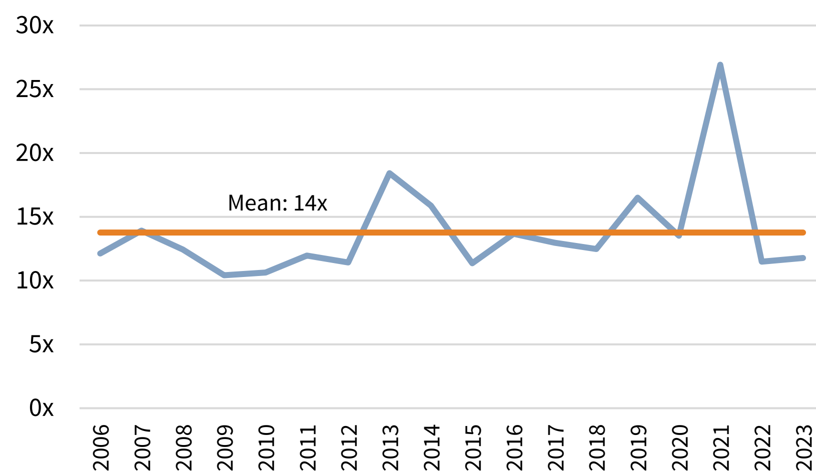
TELECOMMUNICATIONS
2006 – 2023 (EV/EBITDA)



TRANSPORTATION
2006 – 2023 (EV/EBITDA)



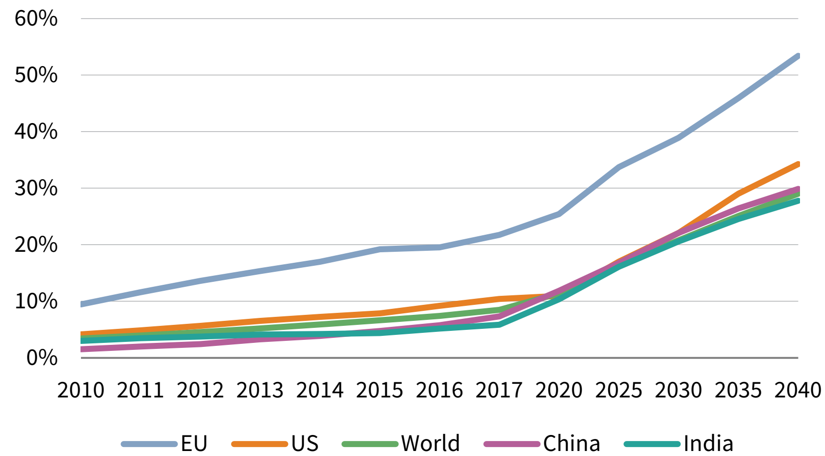
UTILITY & ENERGY
2006 – 2023 (EV/EBITDA)



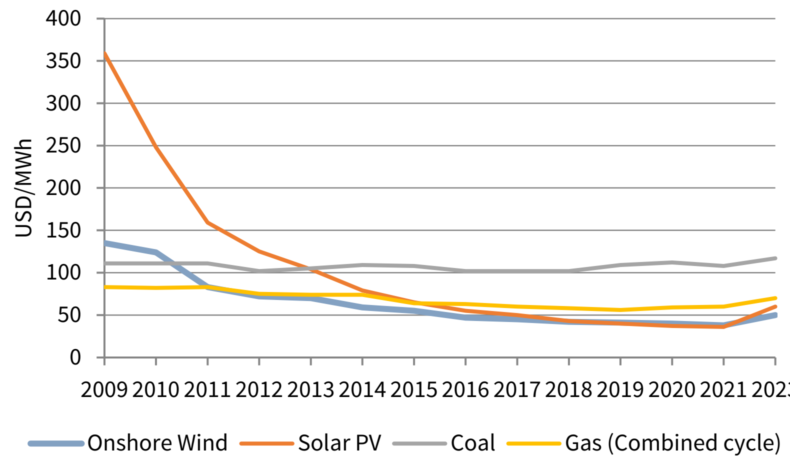
Source(s): Dealogic. Data as of 12/31/2023.

Valuation Trends Drive Investors towards Development / Greenfield.

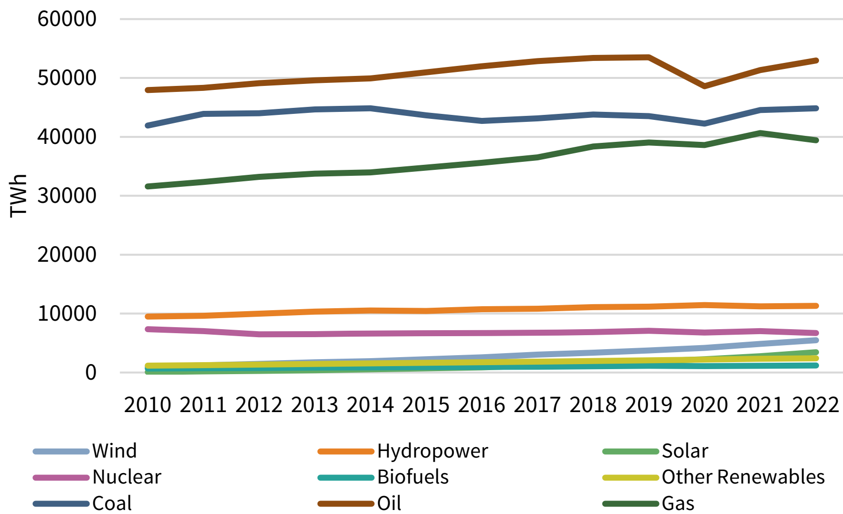
RENEWABLES SHARE OF POWER GENERATION BY REGION
2010-2040



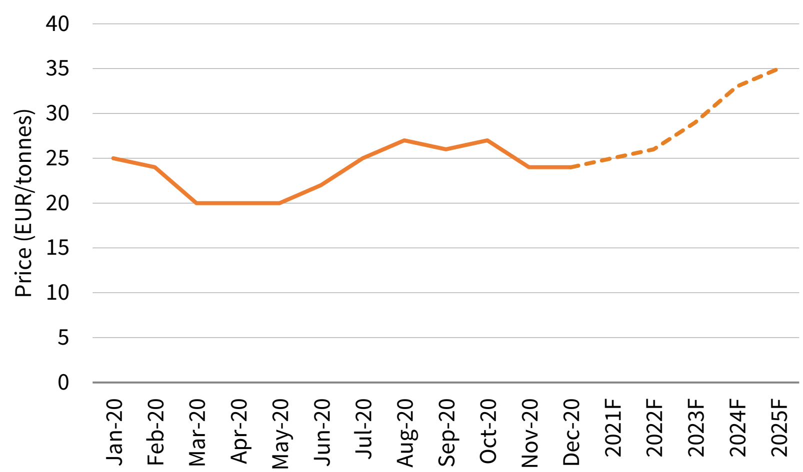
MEAN UNSUBSIDIZED LEVELIZED COST OF ENERGY BY SOURCE
2010-2023



PRIMARY GLOBAL ENERGY CONSUMPTION BY SOURCE
2010-2022



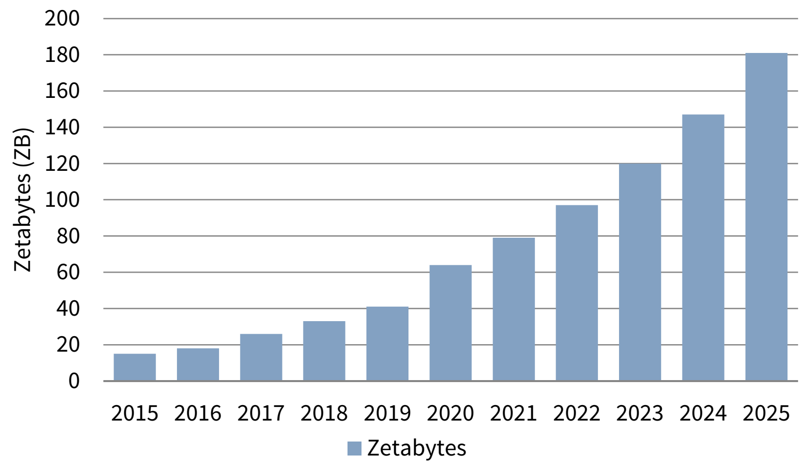
CARBON EMISSION FRAMEWORK PRICE
CO2, EUR/tonne, Average



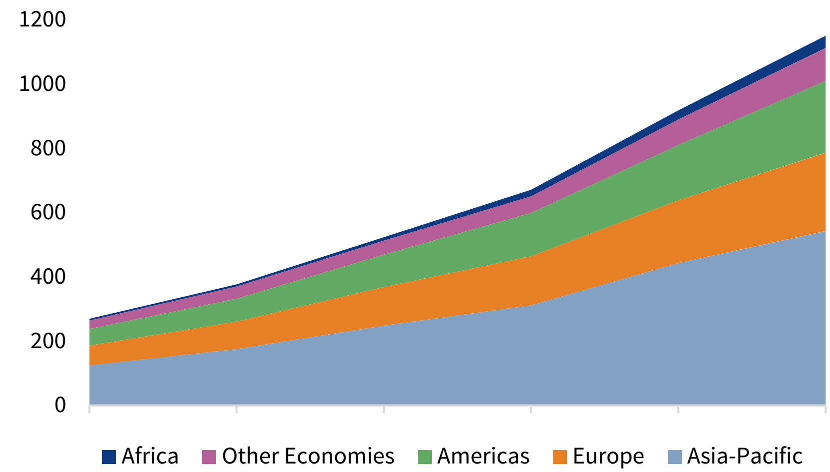
Source(s): Lazard Levelized Cost of Energy Analysis 2023, International Energy Agency, International Renewable Energy Agency (IRENA), Cambridge Associates.

Rising demand for data, data storage, bandwidth, hardware, and software continue to create pressing need for digital infrastructure upgrades globally.

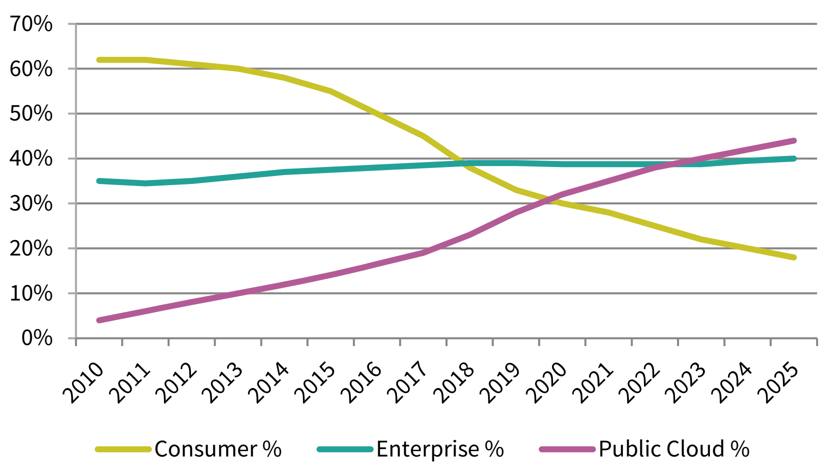
DATA CONSUMPTION FORECASTED TO GROW BY 300% BY 2025
2015-2025



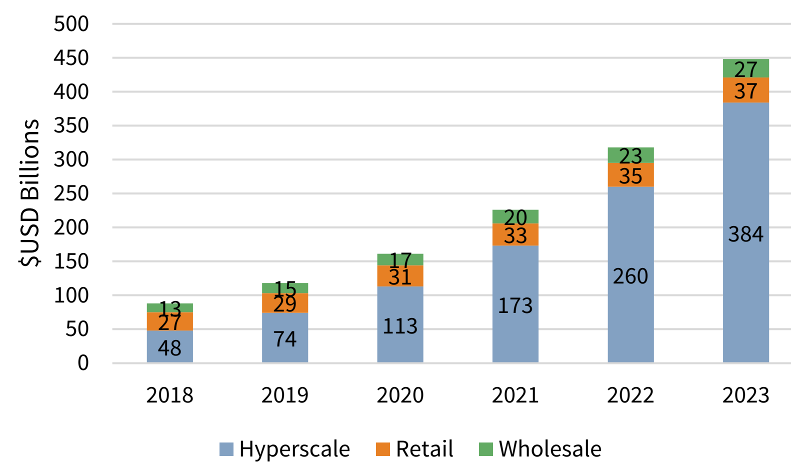
INTERNATIONAL BANDWIDTH USAGE BY REGION, TBIT/S
2017-2022



DATA STORAGE DESTINATIONS OVER TIME
2010-2025



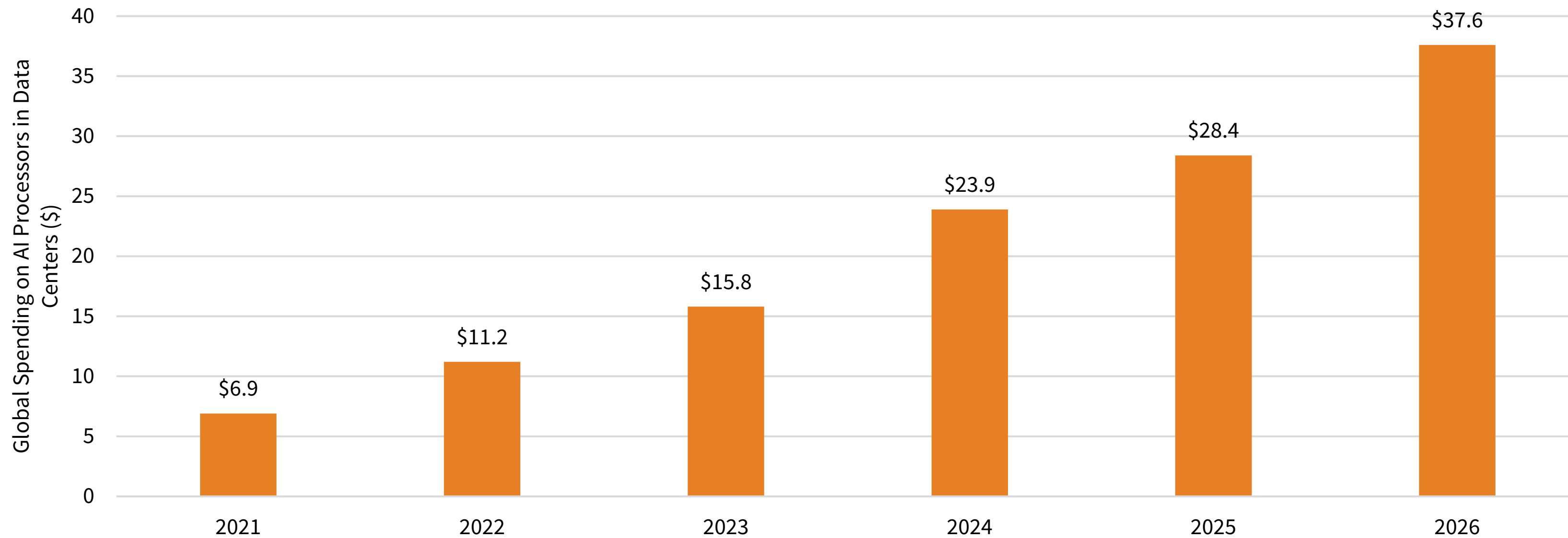
DATA CENTER MARKET SIZE
2018-2023



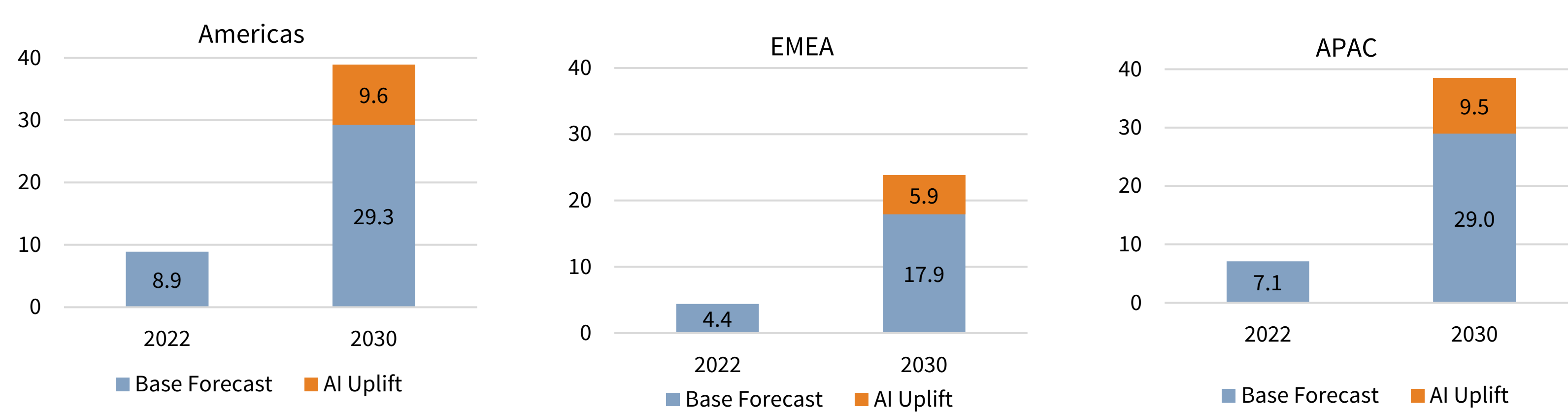
Source(s): Cisco VNI Study, 2021; International Telecommunication Union Facts and Figures, 2022; Cambridge Associates.

Generative AI will be an additional driver of data center demand.

GLOBAL SPENDING ON AI PROCESSORS IN DATA CENTERS
2021-2026



2022 VS 2030 HYPERSCALE DATA CENTER DEMAND BY REGION (GW)



Source: Silver Lake, Stonepeak, Altman Solon Research & Analysis

Natural Resources Outlook

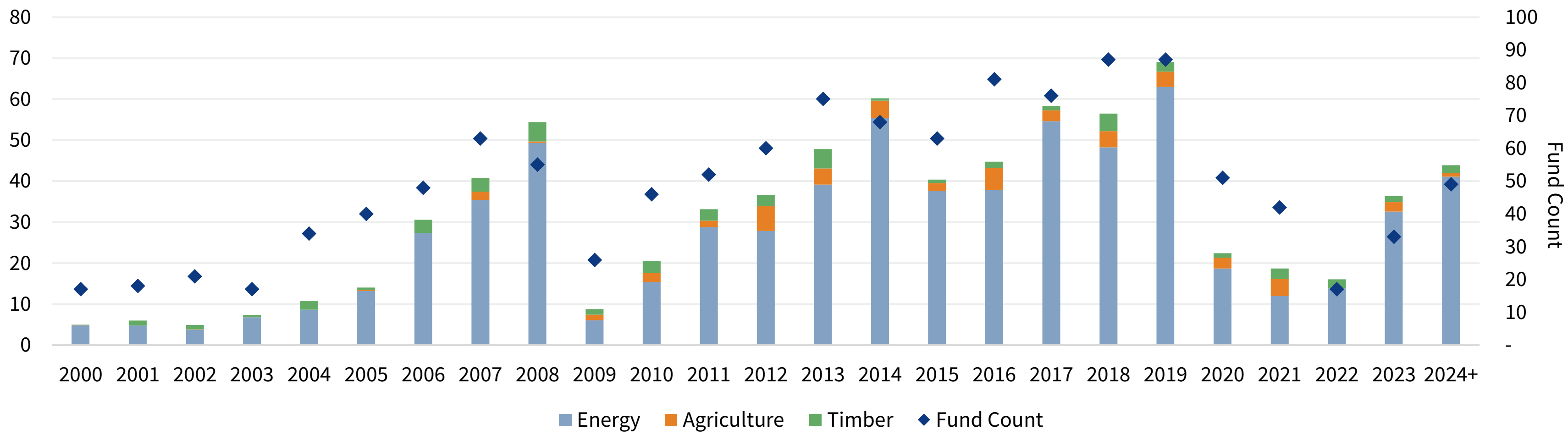
- The oil & gas sector continues to experience extreme volatility as geopolitical conflict abroad adds to a growing list of considerations surrounding the space.
- Now three years after COVID decimated fundamentals, the oil and gas market is reasonably tight as ever as sanctions against Russia and potential export embargos have an impact.
- Accounting for industry wide underinvestment in production, only reinforced by a growing societal resistance to traditional energy and institutional divestment from the space, there are few signs of prices abating.
- Mining continues to benefit from the significant uptick in demand for metals and materials needed for the energy transition, such as copper, lithium, nickel, and cobalt. The industry should also continue to benefit from longer-term supply constraints across as capex for new mines continues to wane.
- Agriculture continues to exhibit attractive growth characteristics, particularly in agribusiness.
- Timber is a low-return asset class that is less compelling today. Housing starts remain sluggish driven by rising input costs and higher mortgage rates. However, the ability of timberland assets to generate carbon credits is a notable development and could create opportunities for investors comfortable with lower returns in an illiquid asset class.

Natural Resources Fundraising & Dry Powder

NR fundraising dipped in 2023 but the level of “dry powder” held by closed end funds remains near all time highs

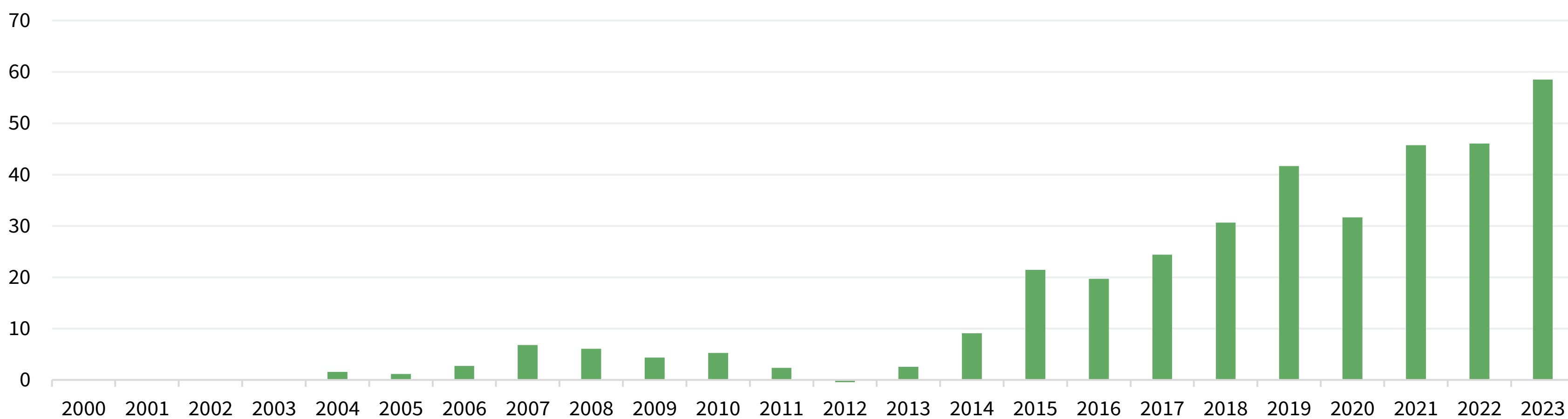
CLOSED-END NATURAL RESOURCE HISTORICAL FUNDRAISING BY STRATEGY

As of December 31, 2023• Billions ($)



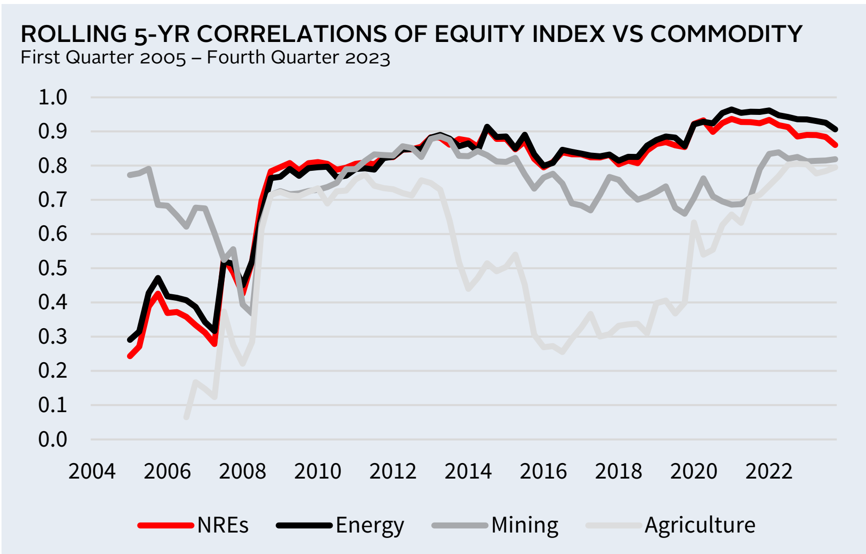
NATURAL RESOURCES DRY POWDER

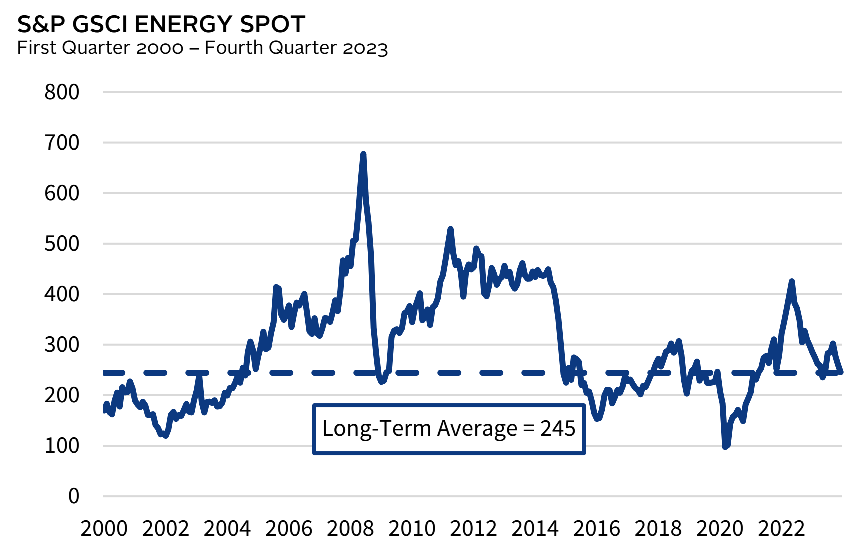
As of December 31, 2023• Billions ($)

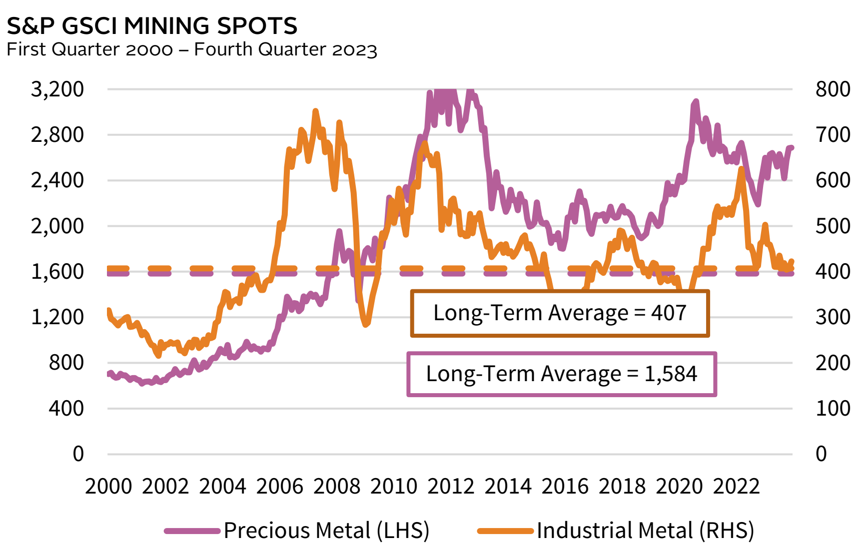


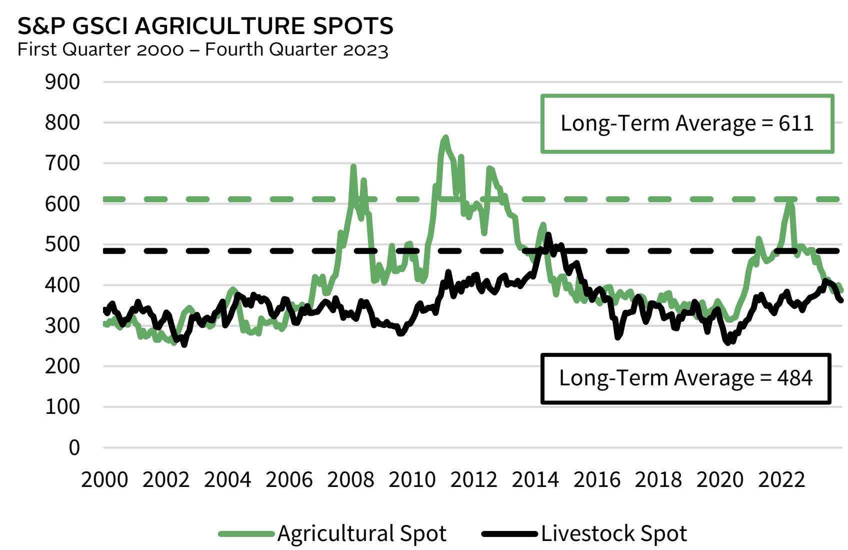
Source(s): Cambridge Associates LLC.
Notes: Data is as of December 31, 2023. Data includes close-ended funds tracked by Cambridge Associates. Open-ended funds are not included. Fundraising represents total target fund size by fund vintage year. The period of 2024 and Beyond includes the total number of real asset funds and fundraising amounts, as in our database, that are set to launch over the next two years. Dry powder for each vintage year reflects the sum of estimated dry powder remaining in funds for that year and the five prior years. For example, 2023 dry powder includes capital raised but uninvested in 2023 along with estimated uninvested capital raised between 2000 and 2022.

Commodities generally trading at long term averages, with gold an exception.







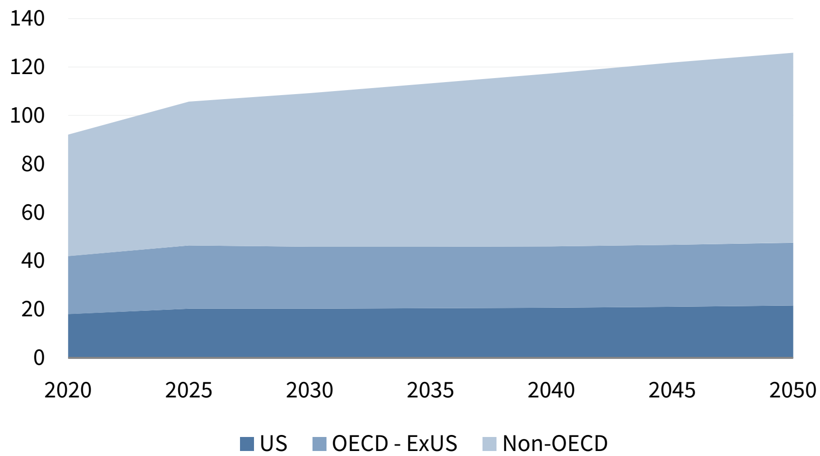


Sources: Standard & Poor's, Thomson Reuters Datastream, and US Department of Labor - Bureau of Labor Statistics.
Note: Charts constructed using monthly price index levels adjusted to June 30, 2023. Correlations are measured as follow: Energy (Datastream Energy Index vs S&P GSCI Energy Index); Mining (Datastream World General Mining Index vs 50% S&P GSCI Industrials Metals Index + 50% S&P GSCI Precious Metals Index); Agriculture (MSCI All Country World Select Agriculture Producers IMI Index (Gross) vs 50% S&P GSCI Agriculture Index + 50% S&P GSCI Livestock Index); NREs (MSCI World Natural Resources Index (Net) vs S&P GSCI).

While demand growth will slow, oil and gas will remain key to meeting global energy needs, particularly in emerging markets.

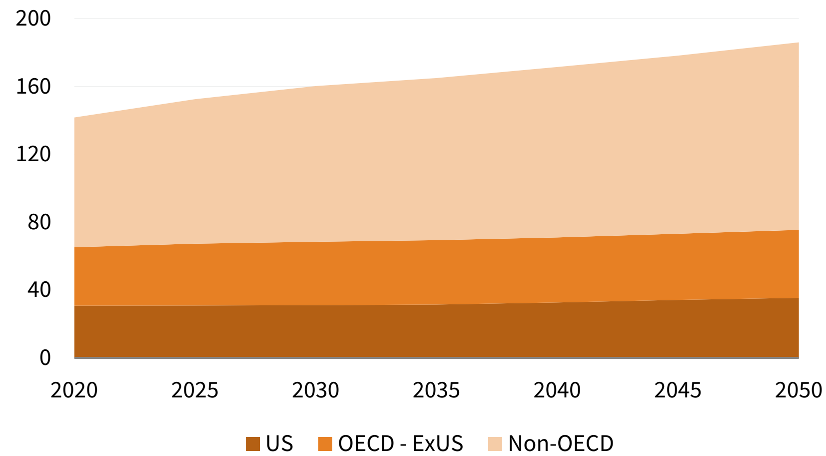
FORECASTED GLOBAL LIQUID FUELS CONSUMPTION

2020 – 2050E • Million bbl/d



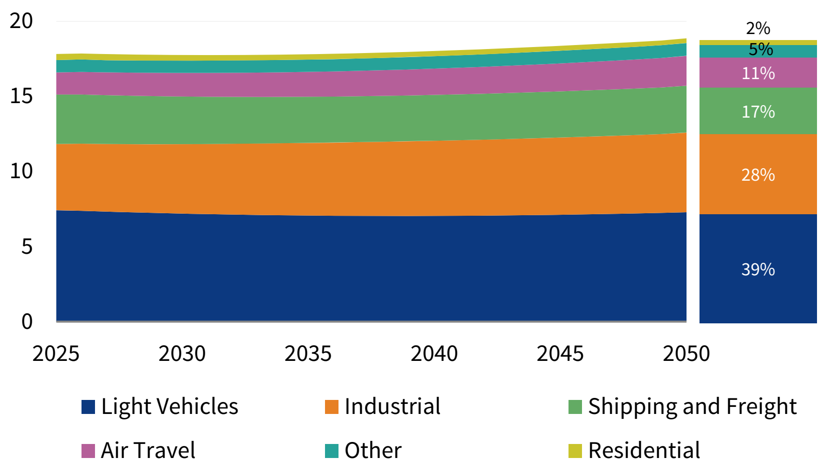
FORECASTED GLOBAL NATURAL GAS CONSUMPTION

2020 – 2050E • Trillion cubic feet



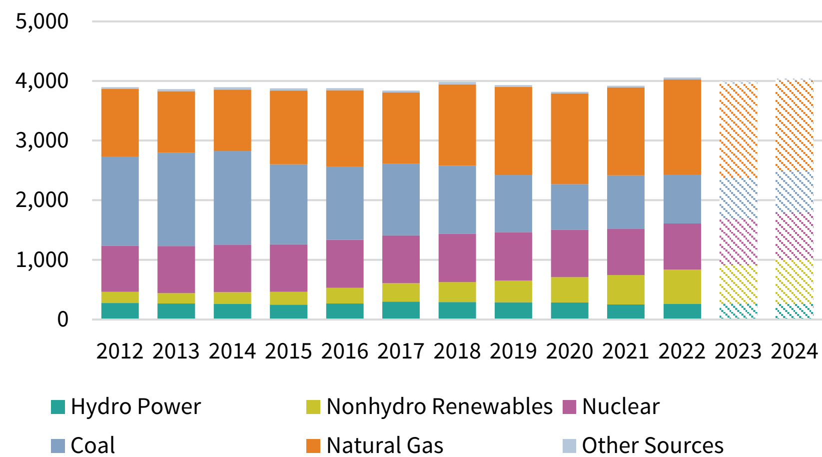
US LIQUID FUELS CONSUMPTION

2025E – 2050E • Million bbl/d



ELECTRICITY GENERATION: FUEL SOURCE

2012 – 2024E • Billions of kilowatt hours (kwh)

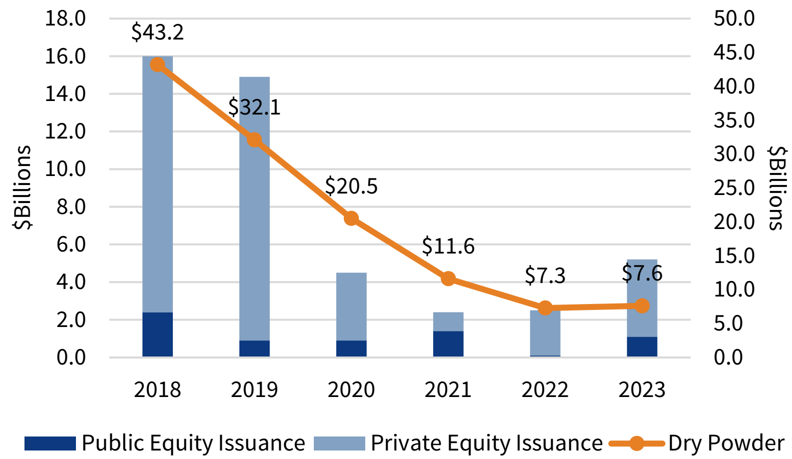


Source: US Energy Information Administration

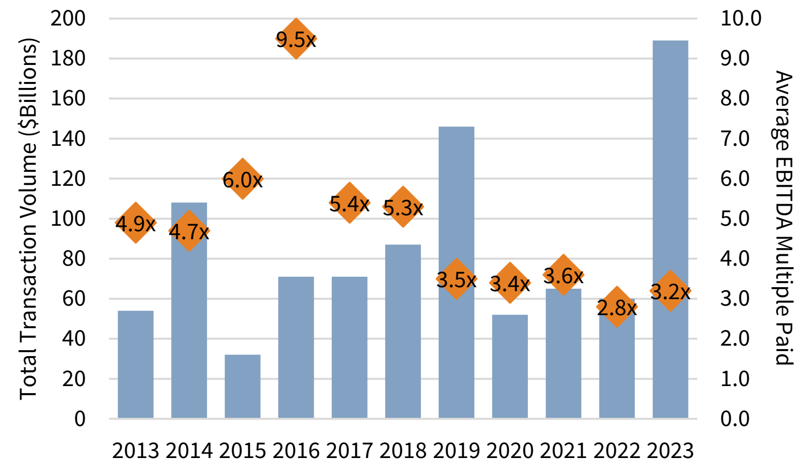
Notes: Data sourced from EIA's Annual Energy Outlook (2022), International Energy Outlook (2021); Dashed bars represent projections.

As E&Ps have focused on growing cash flows for existing assets, reserves and valuations relative to earnings have declined, which has driven consolidation and demand for high quality producing assets.

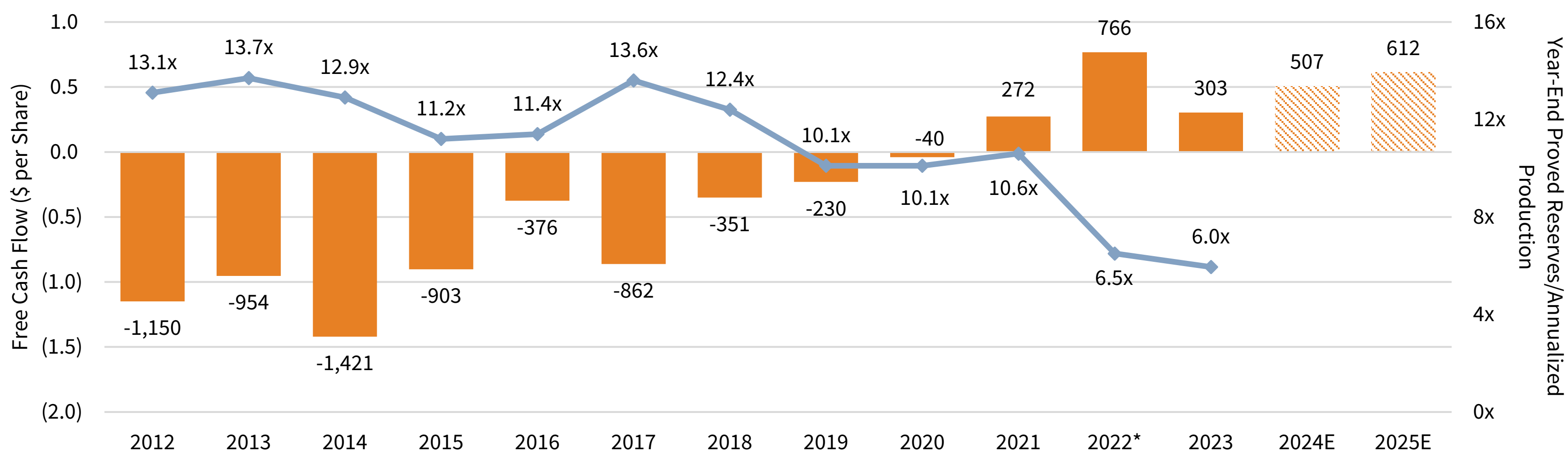
E&PS MUST INCREASINGLY RELY ON OPERATIONS FOR FUNDING
2018 – 2023



LOW MULTIPLES DROVE AN INCREASE IN PUBLIC M&A ACTIVITY IN 2023
2013 – 2023



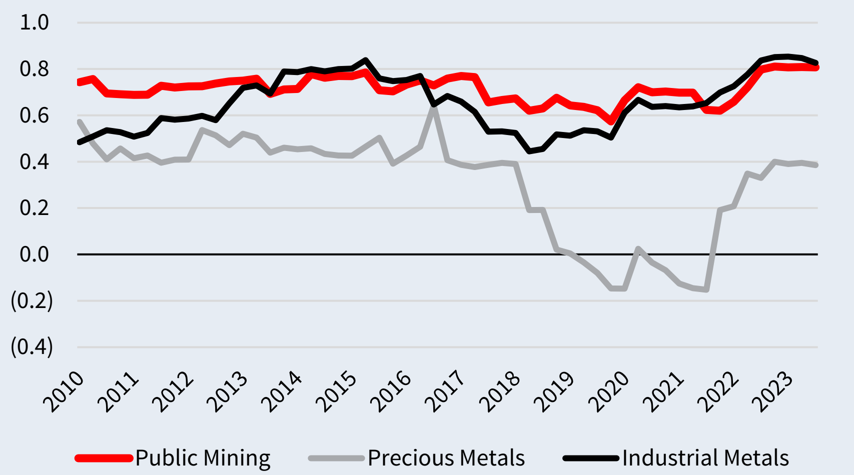
GROWING FREE CASH FLOWS AND A HISTORICALLY DECLINING RESERVE LEVELS SUPPORTS CONSOLIDATION
2013 – 2024E



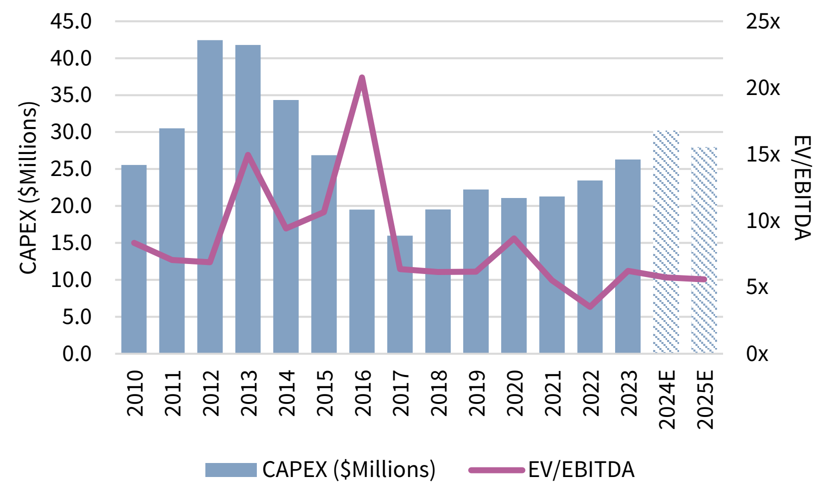
Sources: Bloomberg, Juniper Capital Partners, TPH & Co.
Note(s): *2022 onwards uses the average of a modified peer set to calculate PD R/P. Prior to 2022, an aggregate calculation is used.

Well positioned mining managers that focus on late-stage investments may be well positioned to take advantage of low valuations and a protentional commodity boom in industrial metals and minerals.

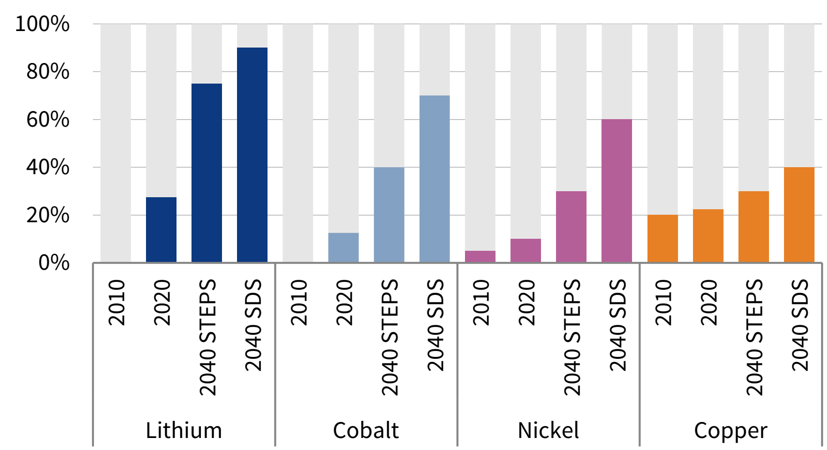
ROLLING 5-YR CORRELATIONS TO PRIVATE MINING STRATEGIES
First Quarter 2010 – Third Quarter 2023



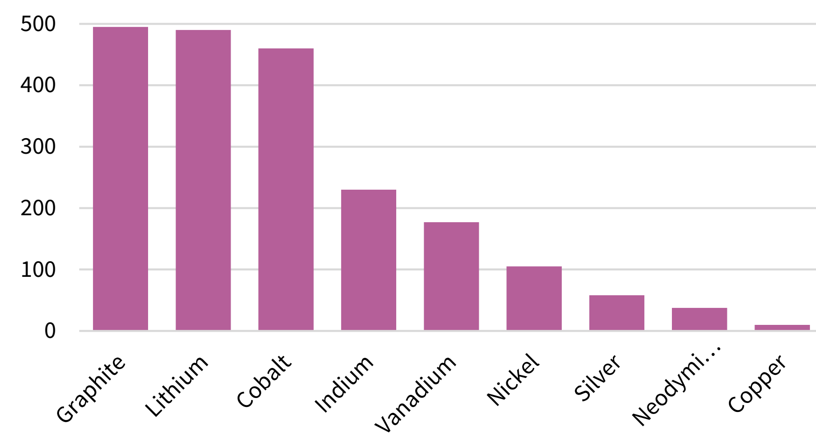
CAPEX UNDERSPEND MAY DRIVE METAL PRICES, TRADING VALUATIONS
2010 – 2025E



SHARE OF CLEAN ENERGY TECH IN TOTAL DEMAND FOR MINERALS
As of May 2021 • Percent (%)



2050 DEMAND FROM ENERGY TECHNOLOGY VS 2018 PRODUCTION
As of December 2020 • Percent (%)



Sources: Cambridge Associates LLC, Thomas Reuters Datastream, IEA

Notes: Correlations represent the relationship between private mining funds within the CA PE Energy Mining subgroup and various public indices using the mPME methodology, wherein cash is invested and redeemed from the index at the equal pace of cash inflows to (and outflows from) private funds within the CA PE Energy Mining subgroup; public indices used are as follows: S&P GSCI Precious Metals Index ("Precious Metals"), S&P GSCI Industrial Metals Index ("Industrial Metals"), and Datastream World General Mining Index ("Public Mining"). CAPEX data represents total annual CAPEX spend by 38 large and mid cap stocks across 23 developed markets. Valuations represent this same pool of 38 large and mid cap stocks in the MSCI World Metals and Mining Index. STEPS = Stated Policies Scenario, an indication of where the energy system is heading based on sector-by-sector analysis of today's policies and policy announcements; SDS = Sustainable Development Scenario, indicating what would be required in a trajectory consistent with meeting the Paris agreement.

Six Foundations for Real Assets Themes in 2024

Decarbonization

- Energy transition 2.0 along with increasing focus on energy security has created a broad spectrum of opportunities including nuclear, green metals, and improved efficiencies of traditional energy.
- Increased financing/construction costs, interconnection challenges, and oversupply in certain markets will create opportunities to fill a capital need to acquire or develop assets. The drive to net zero is ongoing but with increased nuance on the varying solutions needed.

Demographics

- Population shift to more affordable markets and corresponding oversupply of multifamily product created short-term dislocation but also opportunity. Affordability challenges and fragmented ownership in niche sectors such as manufactured housing, SFR, and affordable housing create opportunities.
- Aging population continues to support demand for senior housing.

Digital

- Strong continued demand and AI growth support digital infrastructure assets (data centers, fiber, towers), as well as increasing demand for electricity and grid reliability.
- Higher rates have slowed M&A activity and decreased multiples, especially in markets such as fiber, which could create opportunities but also pressure returns on existing investments.

Six Foundations for Real Assets Themes in 2024

Distress

- High interest rates, challenging refinancing environment, maturity wall, and general slow down in rent growth continue to pressure borrowers.
- Degree of dislocation in RE varies: office is in distress due to fundamental oversupply and utilization; multifamily experiences short-term oversupply in certain markets, but affordability issues support long term tailwinds of rental residential; senior housing continues to recover from post-COVID operational challenges that create attractive opportunities in current market. Overall level of distress to come in this cycle still unclear.
- Infrastructure generally not seeing distress although sectors such as offshore wind, fiber, distributed solar have struggled with higher financing/development costs, leading to potential distressed opportunities.

Distribution/Deployment

- Transaction volumes for many sectors remain pre pandemic levels, reducing exit activity. In addition, refinancing is difficult in the current credit environment. These dynamics should create an attractive environment for secondaries buyers, while the challenging fundraising environment should create more opportunities for co-investments, co-GP funds.

Diversification

- The less correlated nature of Private Real Assets compared to other private asset classes can provide diversification benefits and is especially distinct for Natural Resources and Infrastructure (listed and private) that help diversify risk in investors' portfolios. Real Estate offers some diversification but to a lesser degree.

Real Estate Themes 2024: Better Values in Attractive Property Types

The rise in interest rates has put downward pressure on valuations and reduced the availability of credit, creating a need for liquidity for some property owners. Transaction volume remains limited despite ample dry powder available to be deployed. The level of dislocation varies by property type, and many distressed assets will not necessarily represent attractive opportunities. Our focus in 2024 will be on strategies targeting resilient property types trading at more attractive values given dislocation in capital markets and opportunistic groups that will benefit from distress.

Favorable Sectors

Industrial – demonstrates resilience, driven by on-shoring, "just-in-case" inventory strategies, e-commerce penetration and consumer preferences.

Retail 2.0 – recovery and resilience in necessity and grocery-anchored sector

Residential – demographic trends favorable for multifamily and senior housing. Should see distressed opportunities

Niche real estate – remains attractive due to low capex requirements and fragmented, non–institutional ownership (student housing in Europe; self storage; manufactured housing)

Additional / Dislocation Opportunities

A challenging environment to sell assets and to fundraise create opportunities for liquidity solutions providers – secondaries, co-GP capital

Many assets with broken capital structures will require capital infusions, creating opportunities for funds that can position themselves as a "solution providers".

Potential Opportunities

Office is distressed – despite that, many lower quality assets remain uninteresting. Office-to-residential conversions are difficult. Unclear if the office properties in the "winner" category will trade at attractive pricing.

Infrastructure Themes 2024: Resilient Cashflows, Inflation Linkage and Well Positioned to Benefit from Two Mega Trends

Infrastructure has been amongst the fastest growing private asset classes driven by the reliability of cash flows and positive correlation to inflation. There were challenges in some markets, such as US offshore wind and fiber-to-the-home, but this was very project specific and highlighted the need for good manager / partner selection to be able to mitigate a more complex environment (i.e., rising prices, rates).

Strong performance has been driven by the drive for energy security and decarbonization, supported by government policies particularly in the US and EU. Renewables has been the key beneficiary here, but opportunities remain within traditional gas and LNG as global supply and demand imbalances persist following the Russian invasion of Ukraine. Other growing opportunities include in electrification (e.g. EV charging). Digital assets remain a key growth area, though some more cyclical assets (e.g. fiber to the home) highlighted the need to be focused in robust and growing areas. Cloud has remained more resistant, particularly within hyperscale data centers which has been a focus recent growth given market opportunities in AI.

Key Secular Trends

- Decarbonization, Energy Security
- Digitization

Key Sub-Sectors

- Renewable Energy, LNG
- Transportation Infrastructure
- Data Centers, Towers

Natural Resources Themes 2024: Energy Transition–related Opportunities; Diversifiers

A higher rate environment, a complicated energy transition process and geopolitical risks create an interesting but uncertain backdrop for the Natural Resources sector, favoring a patient opportunistic approach to find attractive sources of diversification and growth.

While capital markets struggle to continue financing niche strategies, the energy sector has seen an increase in capital activity as large players race to consolidate attractive assets. The mining sector continues to see a capital shortage, which could create opportunities to take advantage of structural inefficiency. While valuations are generally reasonable, the market environment promises to be persistently volatile as uncertainty reigns. Onshoring, updating, and maintenance of critical energy sources and supply lines could provide opportunities across energy-related service sectors, but selectivity is key in this narrow sector.

Secular Trends

- Increasing Energy Demand
- Engagement Strategies
- Energy Transition 2.0

Dislocation Opportunities

- Energy Secondaries

Sectors of Interest

- Specialty Agriculture/Agribusiness
- Mining Finance
- Natural Capital
- Energy Transition-Related PE Services

APPENDIX: REAL ASSETS MODELING

CAMBRIDGE
ASSOCIATES

Real Assets Modeling Assumptions Overview

- Real Assets
  - Total pool value of $34.6 billion (as of 12/31/2023)
  - Target Real Assets allocation of 10%
  - Allocation mix: 70% Real Estate; 20% Infrastructure; 10% Natural Resources
  - Return assumptions: 10% net IRR for Real Estate, 10% net IRR for Infrastructure, 9% net IRR for Natural Resources
  - Fund life assumptions: 14 years for Real Estate, 14 years for Infrastructure, 13 years for Natural Resources

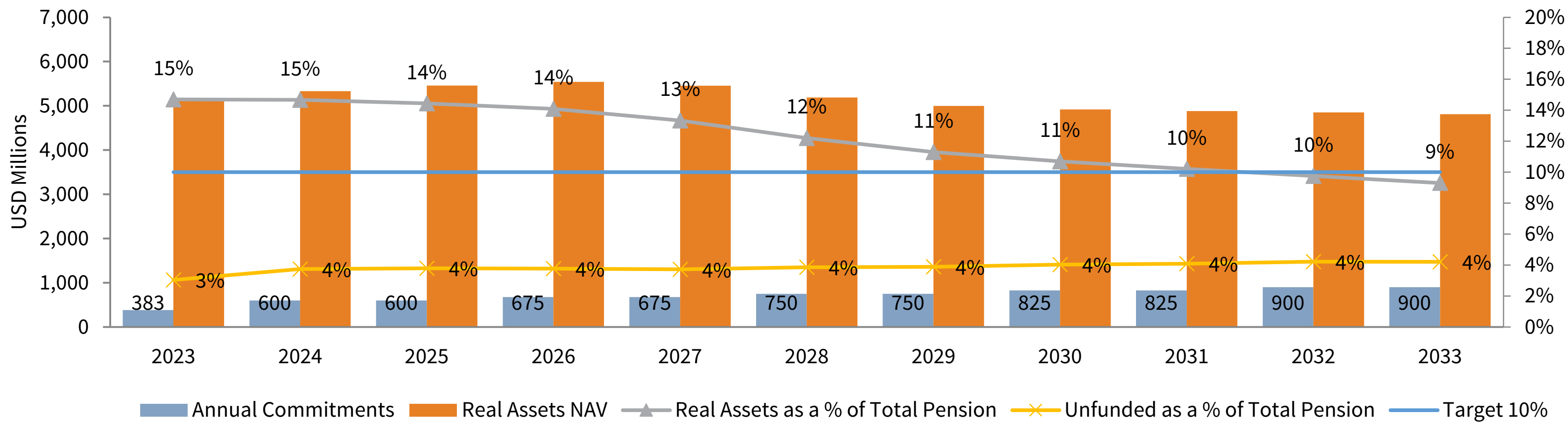
Base Case	No Growth Stress Case	GFC Stress Case
▪ Assumes (nominal) pool growth of 4% ▪ Assumes "normal" market environment assumptions for contributions, distributions, and NAV growth	▪ Assumes (nominal) pool growth of 0% from 2024-2026, and 4% thereafter ▪ NAV experiences no growth from 2024-2026 and then returns to normal growth in 2025+ ▪ Distributions are cut by 50% in 2024-2026, before returning to normal in 2027+ ▪ Contributions are cut by 25% in 2024-2026, before returning to normal in 2027+	▪ Applies GFC-like changes to pool value for 2024-2026 (~28% drop in 2024, followed by two years of ~10% gains) ▪ NAV declines 28% in 2024, before returning to normal growth in 2025+ ▪ Distributions are cut by 75% in 2024-2026, before returning to normal in 2027+ ▪ Contributions are cut by 25% in 2024-2026, before returning to normal in 2027+

Note: Model populated with historical portfolio data as of September 30, 2023. Projected cash flows and allocations are based on CA modeling and proprietary assumptions. Modeling is intended to be used as a guideline; actual capital calls, distributions, and exposure may differ materially from projections, depending on macroeconomic and fund-specific variables.

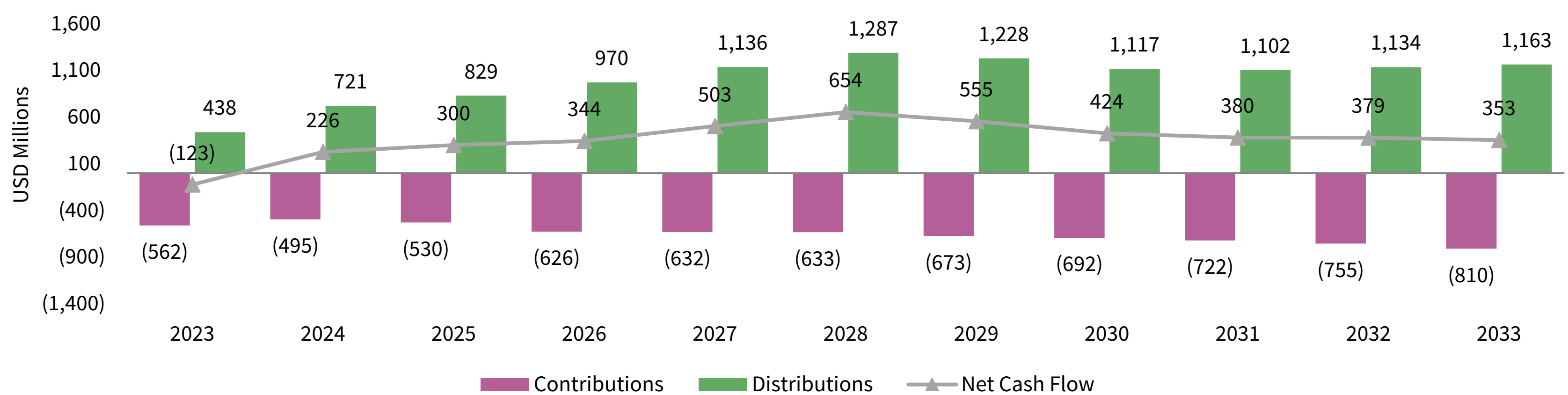
Real Assets
Base Case (4% Pool Growth)

Starting Pool Value: $34.6 billion (as of 12/31/2023)

COMMITMENT PACE
As of September 30, 2023



ESTIMATED ANNUAL CASH FLOWS
As of September 30, 2023



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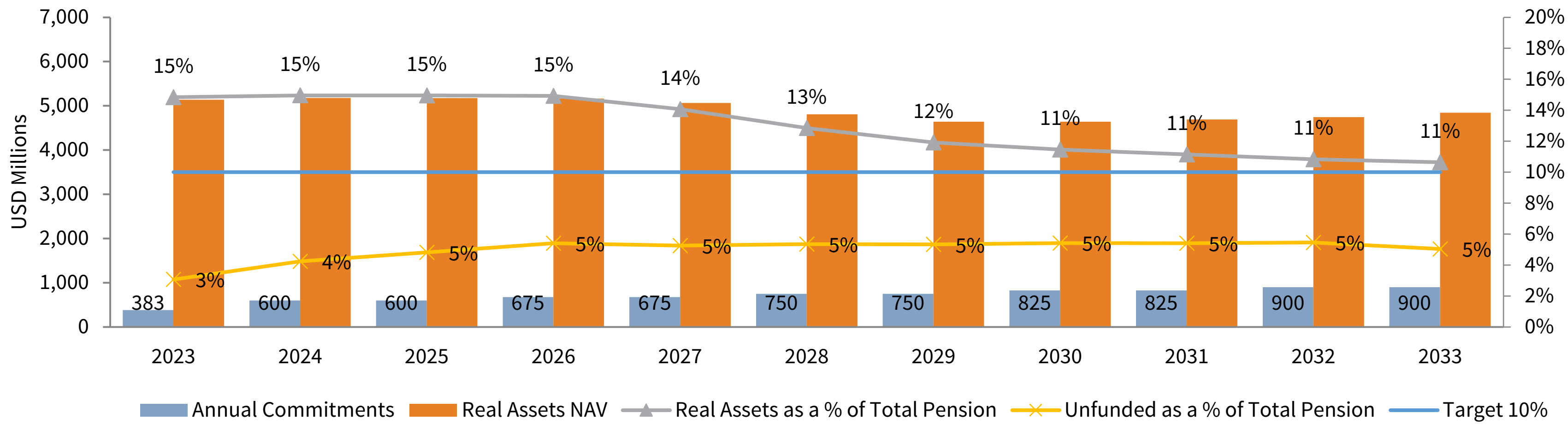
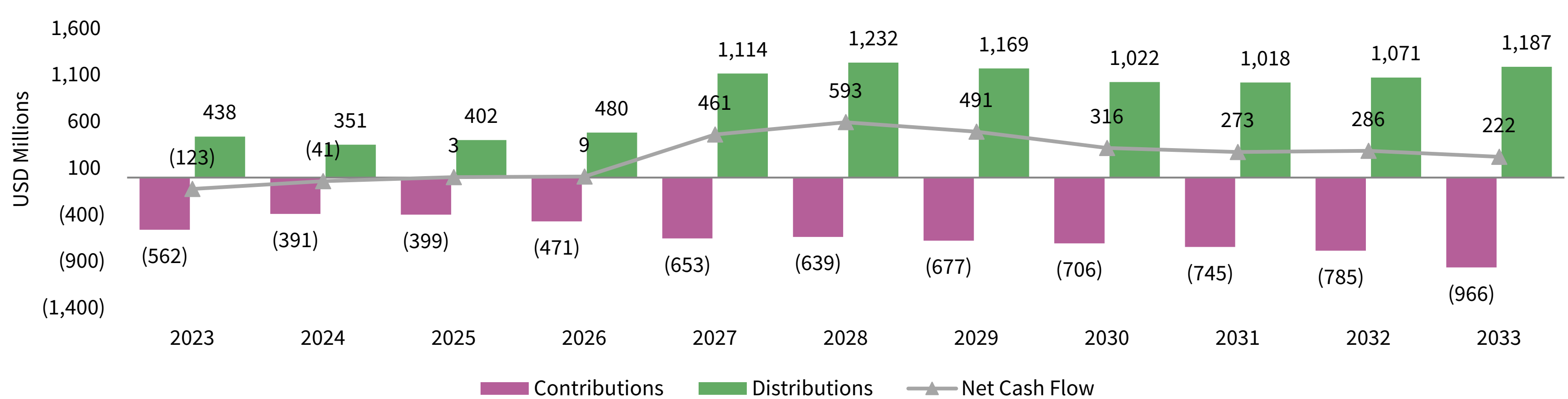
Real Assets
No Growth Stress Case (0% Pool Growth, 2024-2026)

Starting Pool Value: $34.6 billion (as of 12/31/2023)

COMMITMENT PACE
As of September 30, 2023



ESTIMATED ANNUAL CASH FLOWS
As of September 30, 2023



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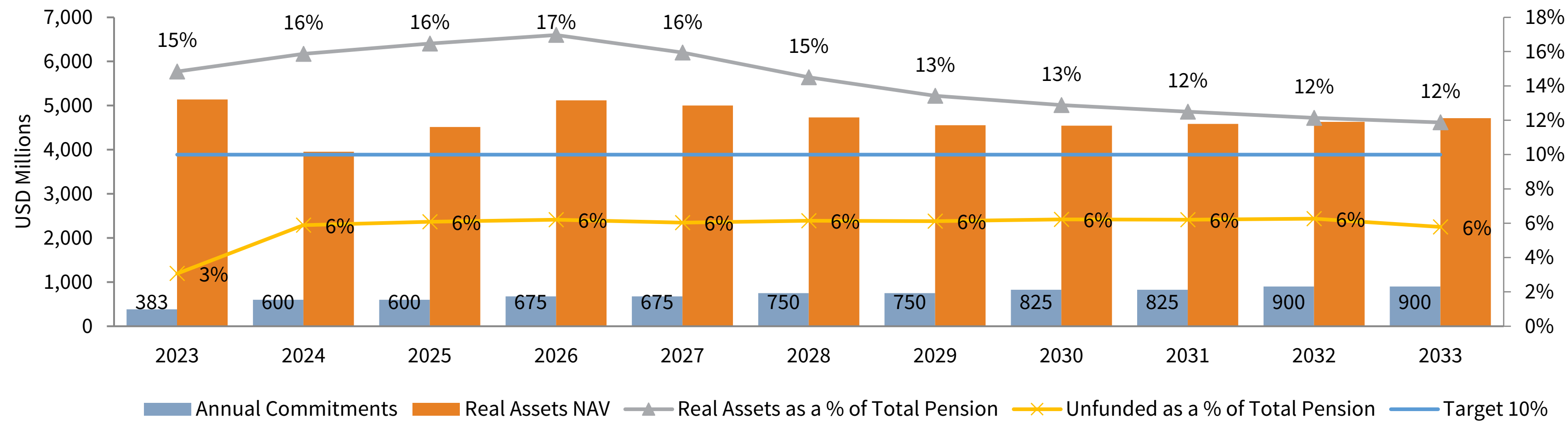
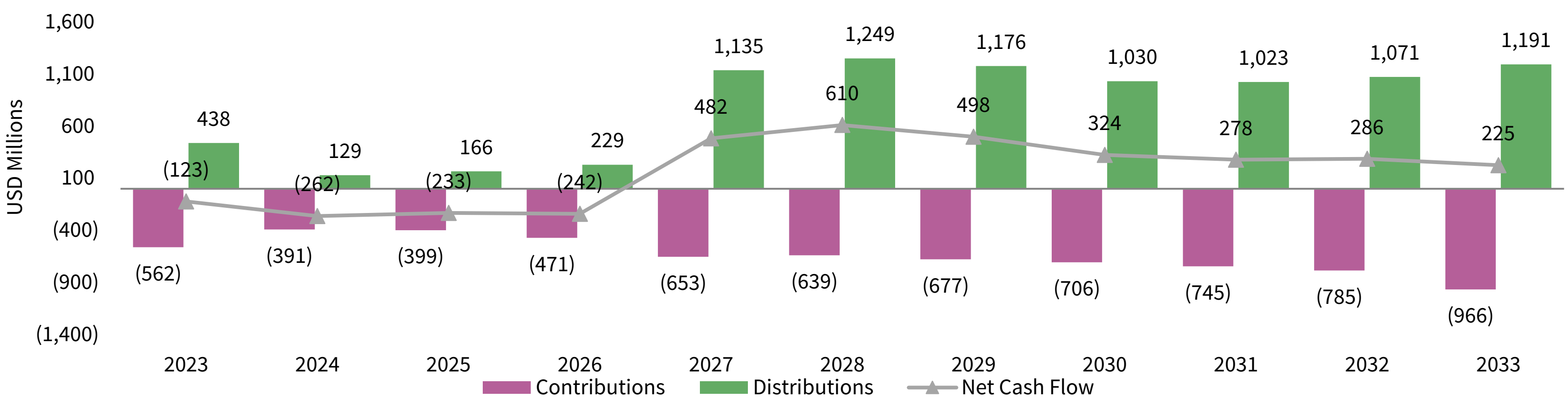
Real Assets
GFC Stress Case using Base Case Pacing

Starting Pool Value: $34.6 billion (as of 12/31/2023)

COMMITMENT PACE
As of September 30, 2023



ESTIMATED ANNUAL CASH FLOWS
As of September 30, 2023



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