

RESPONSIBLE INVESTMENT – FIVE YEAR RETROSPECTIVE PRESENTATION FOR CALPERS BOARD OFFSITE

JANUARY 19, 2016

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Partner

CALPERS RECOGNISED GLOBAL LEADER

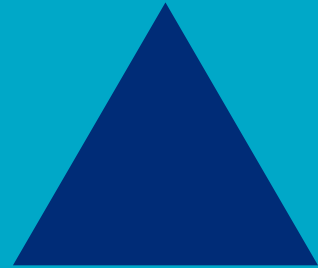
- **PRI: A+**
benchmarking
score
- **AODP: #3 of 500**
worldwide in asset
owner climate index

2015 Extel Survey

Which asset owner contributes most to the wider SRI debate?

1. **CalPERS**
2. PFZW (Stichting Pensioenfonds Zorg en Welzijn)
3. ERAFP
4. Government Pension Fund Global (Norway)
5. ABP
6. Environment Agency (Pension Fund)
7. AP4
8. CALSTRS
9. Fonds de réserve pour les retraites - FRR
10. Cometa Pension Fund

GLOBAL TRENDS



2015 WEF GLOBAL RISKS REPORT

RISKS OF HIGHEST CONCERN – BY TIME HORIZON

Rank	Next 18 months	Rank	10-year horizon
1	Inter-state conflict with regional consequences	1	Water crises
2	State collapse or crisis	2	Failure of climate change adaption
3	High structural un- or underemployment	3	Profound social instability
4	Failure of national governance	4	Food crises
5	Large-scale terrorist attacks	5	Extreme weather events
6	Large-scale cyber attacks	6	High structural un- or underemployment
7	Profound social instability	7	Large-scale cyber attacks
8	Rapid and massive spread of infectious diseases	8	State collapse or crisis
9	Extreme weather events	9	Major biodiversity loss and ecosystem collapse
10	Fiscal crises in key economies	10	Failure of national governance

Legend

■ Economic
 ■ Environmental
 ■ Geopolitical
 ■ Societal
 ■ Technological

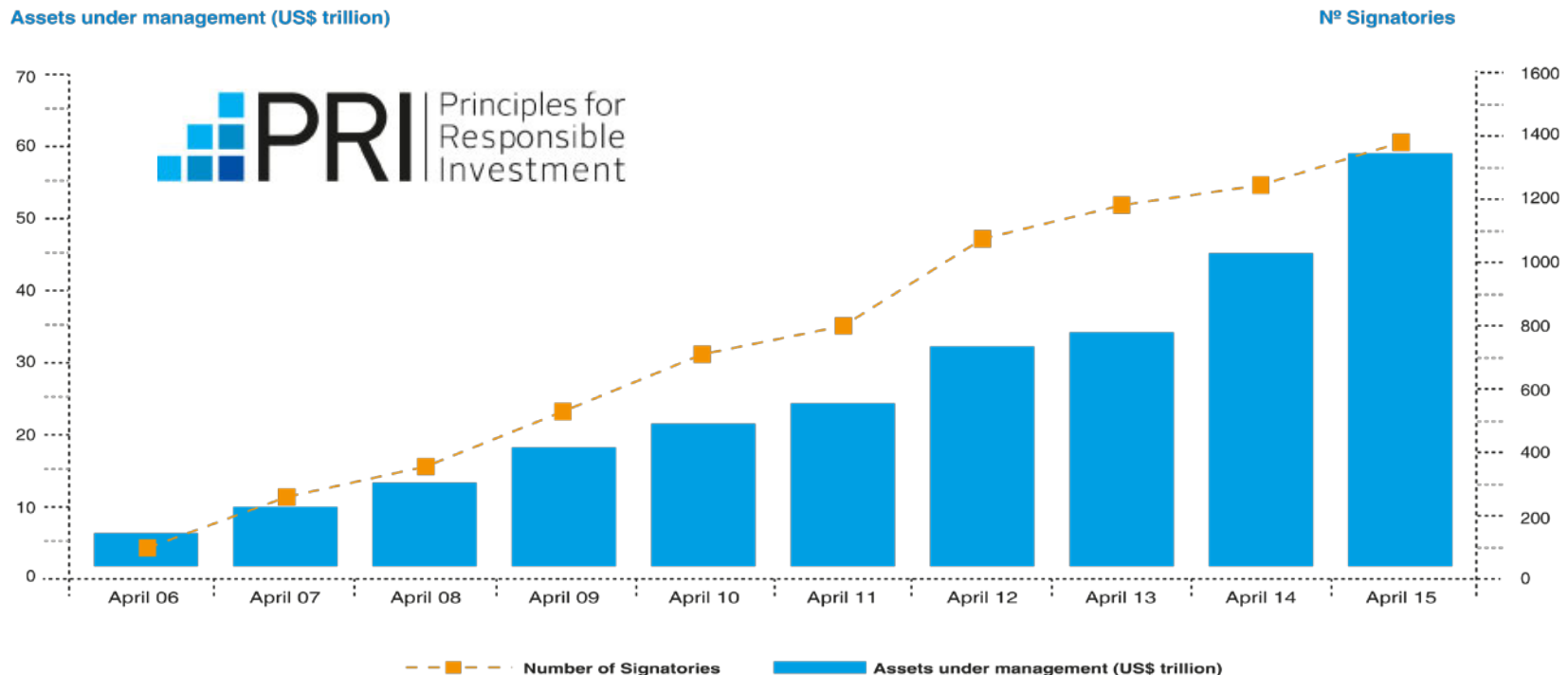
Source: World Economic Forum, *Global Risks 2015*

Note: Respondents were asked to provide the five risks of highest concern globally

GLOBAL GROWTH

PRI FOCUS IS NOW 'FROM AWARENESS TO IMPACT'

- What is driving this growth?
 - Recognition of these global risks – including COP21 outcome
 - Improving quality of analysis of ESG factors & related performance case¹⁾
 - Interest in RI is growing fast amongst individuals and institutions²⁾
 - Initiatives such as Montreal Pledge, Portfolio Decarbonization Initiative

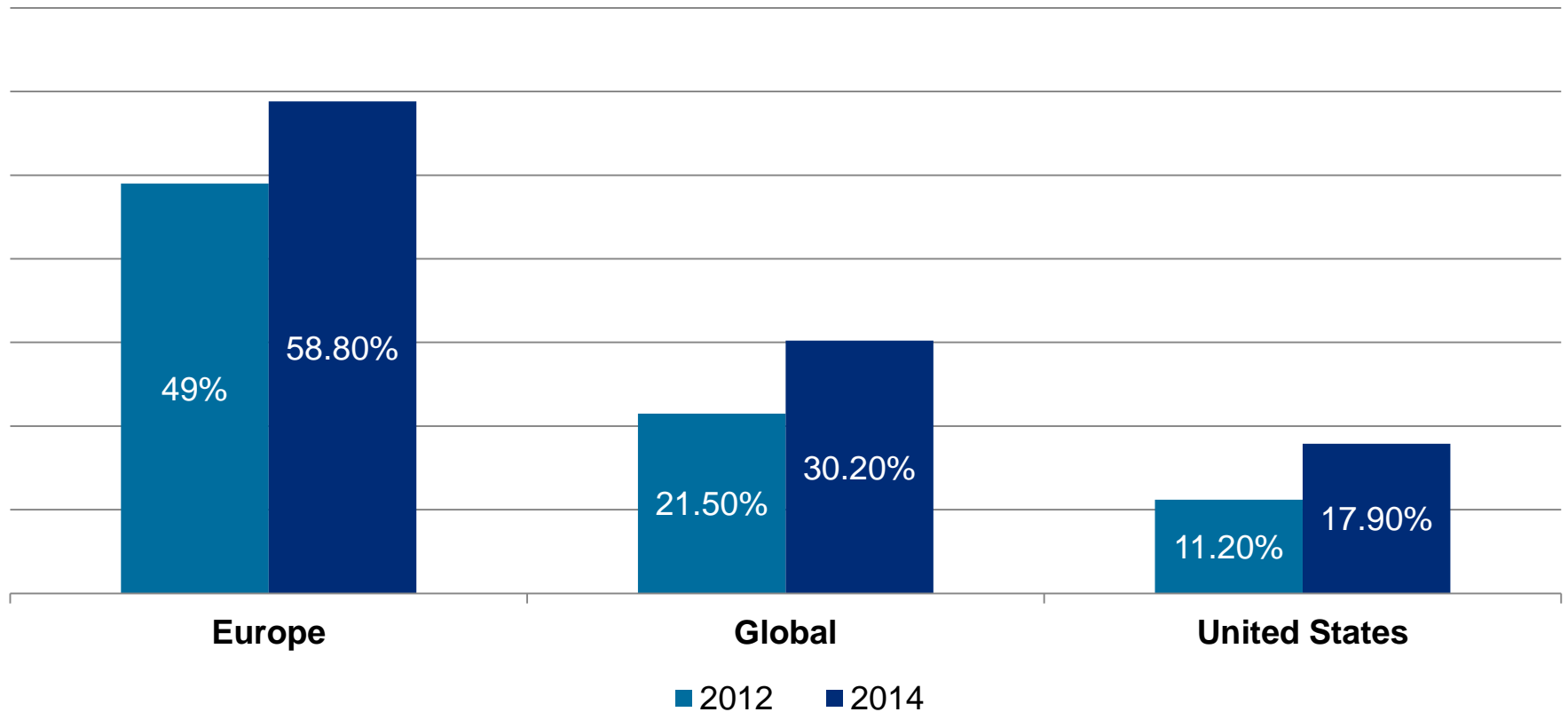


1) For instance see Morgan Stanley (2015): 'Sustainable' (US) equity funds had equal or higher median returns and equal or lower volatility for 64% of the period 2007-2014.
2) For instance see Morgan Stanley (2015): 71% of individual investors are interested in sustainable investing. Millennial investors are more focused on sustainability in their consumer behavior and demonstrate a greater commitment to sustainable investing than other generations. The story is similar for women versus men and overall two-thirds of investors expect sustainable investing to become more prevalent in the next five years (survey of 800 individual investors who actively trade + 200 oversample of Millennials (age 18-32)).

GLOBAL GROWTH OF 'RI' ASSETS

REGIONAL DIVERSITY

Proportion of RI Assets to Total Managed Assets



Source: GSIA; Global Sustainable Investment Review; 2014

ESG INTEGRATION: QUALITATIVE REVIEW STRATEGY LEVEL ASSESSMENTS

- Mercer has been assigning 'ESG' ratings as a core part of the manager research process since 2008
- Ratings are applied at the investment strategy level, across asset classes (e.g. one manager's US small cap core strategy may have a different rating than their Global Equity or Global Credit strategy)
- Ratings now exist for more than 5,500 different investment strategies
- Pension funds and other investors use our ESG research and ratings to:
 - **Influence manager selection** decisions (as a structured component and/or a tie-breaker)
 - **Review manager performance** – including rating trends over time
 - **Track total portfolio** ESG scores (often with targeted improvements)
 - **Report** ESG characteristics to plan members
 - **In conjunction** with carbon footprint and security-level ESG analysis (see slide 26)

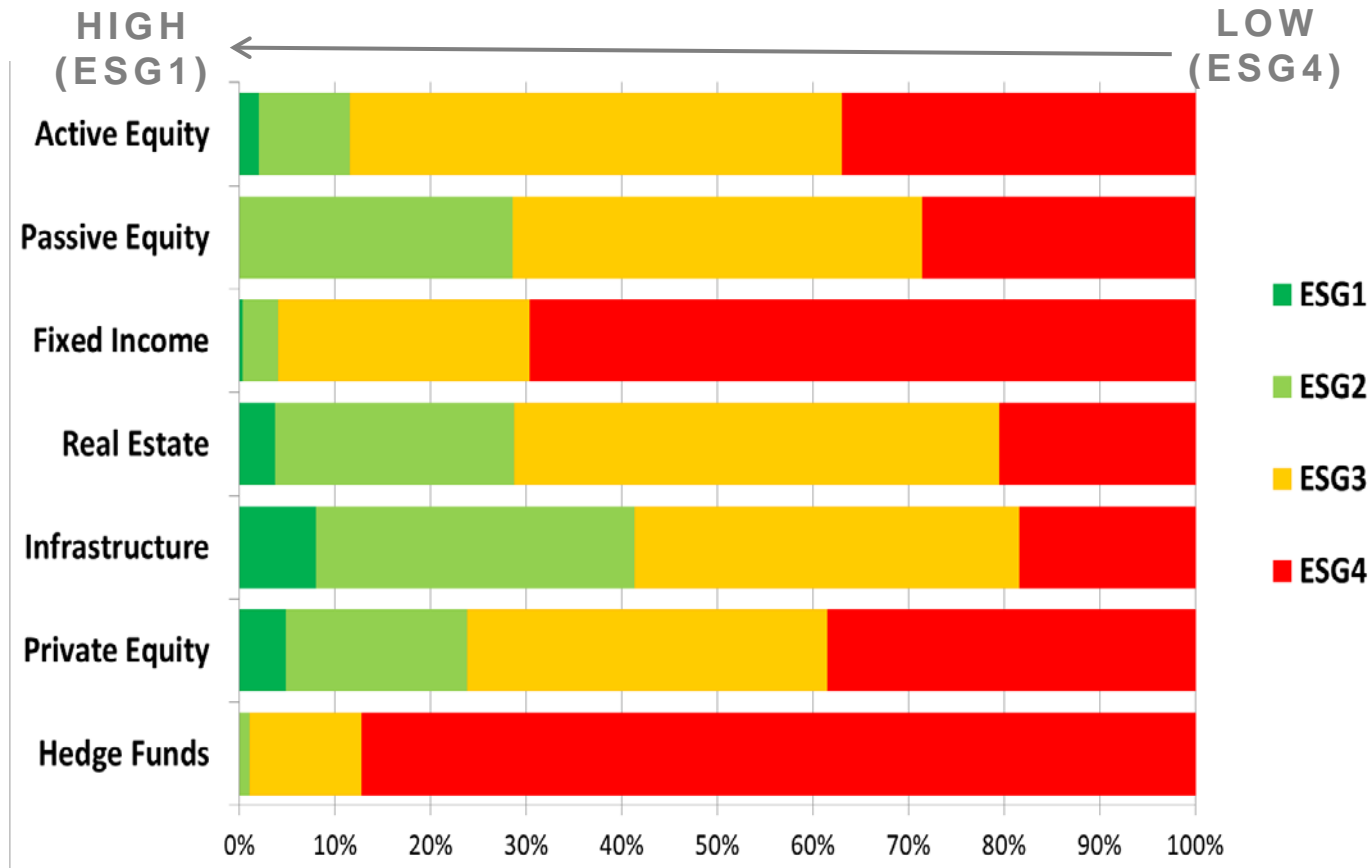
ESG INTEGRATION – A SLOW PROCESS

STRATEGY LEVEL ASSESSMENT

ONLY **12%** OF STRATEGIES HAVE A HIGH RATING (ESG1 OR ESG2), UP FROM 9% IN 2012

PROGRESS IS MOST ADVANCED IN **UNLISTED ASSETS AND PASSIVE EQUITY** (VIA ADVOCACY & ENGAGEMENT)

Distribution of 5,500+ Mercer ESG ratings



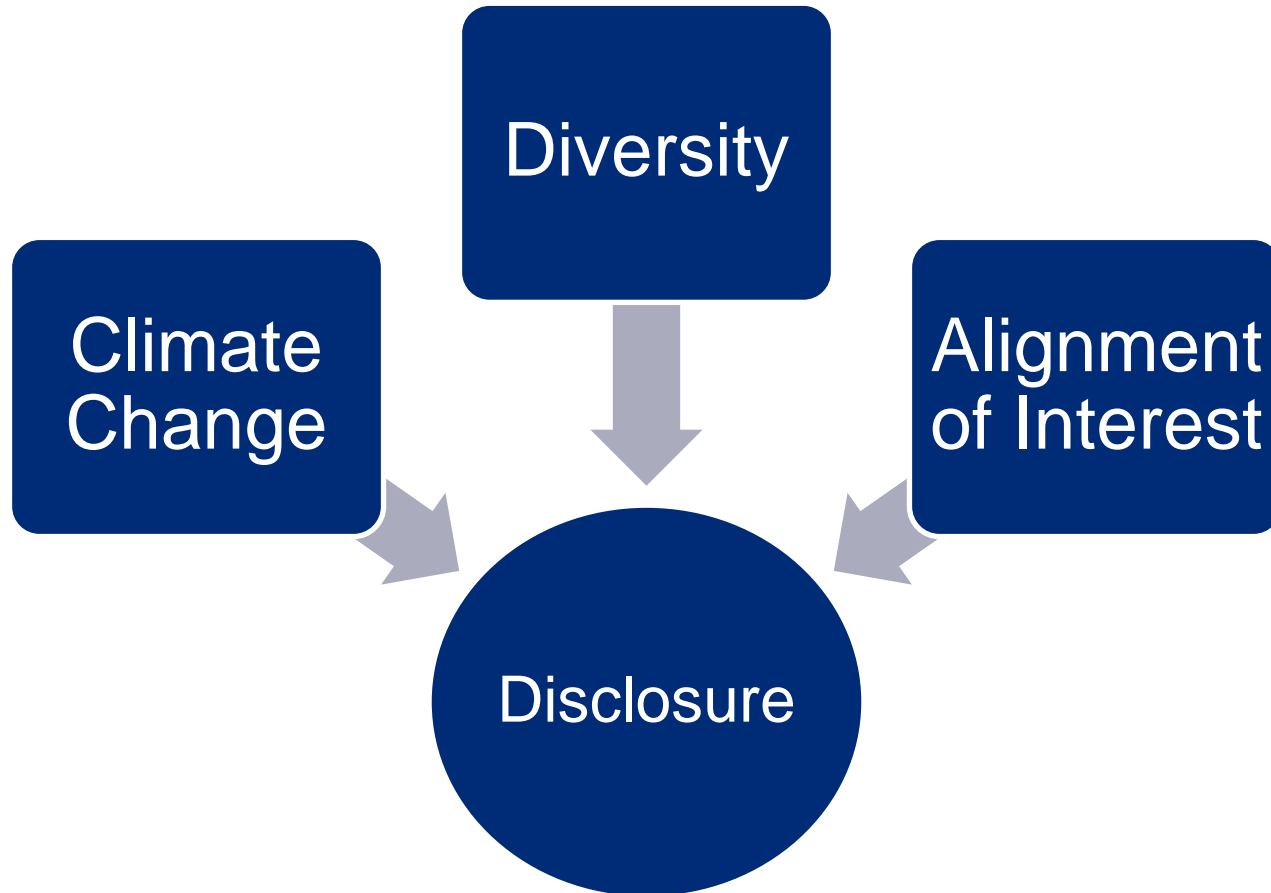
“Expectations are set as ESG3 or above... with identified improvement areas reviewed annually.”

Mercer Sustainable Investment Policy

Data as at November 2015; n=5,550 though not all asset classes shown

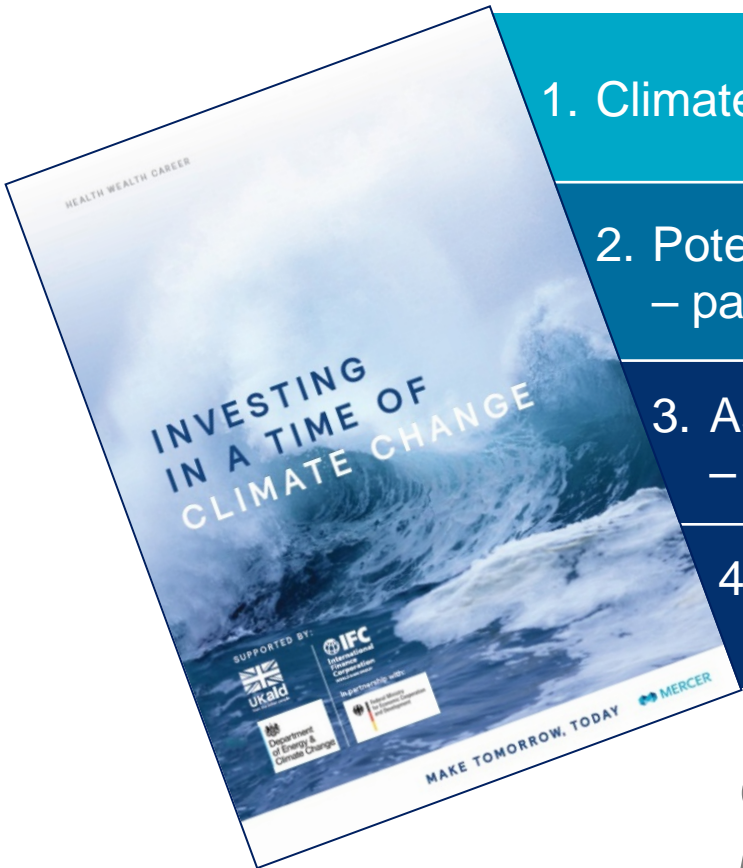
CALPERS KEY THEMES

WHAT ARE OTHERS DOING IN THESE AREAS?



MERCER'S 2015 CLIMATE CHANGE RESEARCH FOUR KEY FINDINGS

1. Climate change will have an impact regardless of scenario.
2. Potential sector impacts are most meaningful – particularly over the next 10 years to 2025.
3. Asset class impacts can also be material – and vary by climate scenario.
4. A 2oC (Transformation) scenario need not harm total diversified portfolio returns out to 2050.



***Commissioned by 16 investors
representing \$1.5 trillion AUM***

Available at: <http://www.mercer.com/insights/focus/invest-in-climate-change-study-2015.html>

SCENARIOS

A BROAD RANGE OF POTENTIAL OUTCOMES

- The future is uncertain, thus scenarios are a useful tool
 - Current policies have us on a pathway to Fragmentation (+4°C)
 - Combination of existing pledges still has Coordination (+3°C) as a high probability
 - Ambitious goals in Paris for a +2°C pathway (stretch goal of 1.5°C) suggests Transformation is increasingly possible
- Most funds focus on the impact of +2°C and +4°C for planning purposes

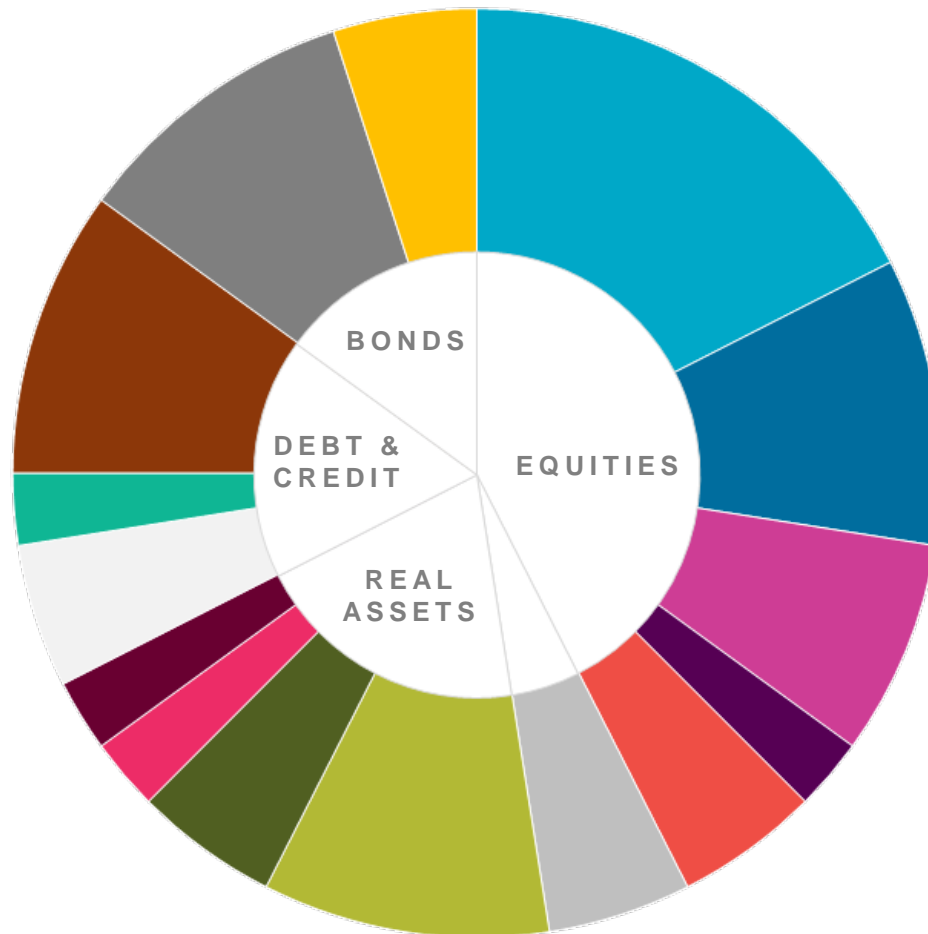
	MITIGATION	PERCENTAGE FOSSIL FUELS*	EMISSIONS PEAK	TEMPERATURE**
TRANSFORMATION	STRONG	64%	AFTER 2020	+2°C
COORDINATION	SUBSTANTIAL	46%	AFTER 2030	+3°C
FRAGMENTATION***	LIMITED	LIMITED	AFTER 2040	+4°C

* As % of energy mix by 2050; ** By 2100, since pre-Industrial era; *** The Study models two variants of this scenario

CLIMATE IMPACT ON RETURNS BY ASSET CLASS

SAMPLE PENSION PORTFOLIO: GROWTH-ORIENTED

- Developed Market Global Equity
- Emerging Market Global Equity
- Low Volatility Equity
- Small Cap Equity
- Private Equity
- Hedge Funds
- Real Estate
- Infrastructure
- Timber
- Agriculture
- Private Debt
- Emerging Market Debt
- Multi-Asset Credit
- Developed Government Bonds
- Corporate Bonds

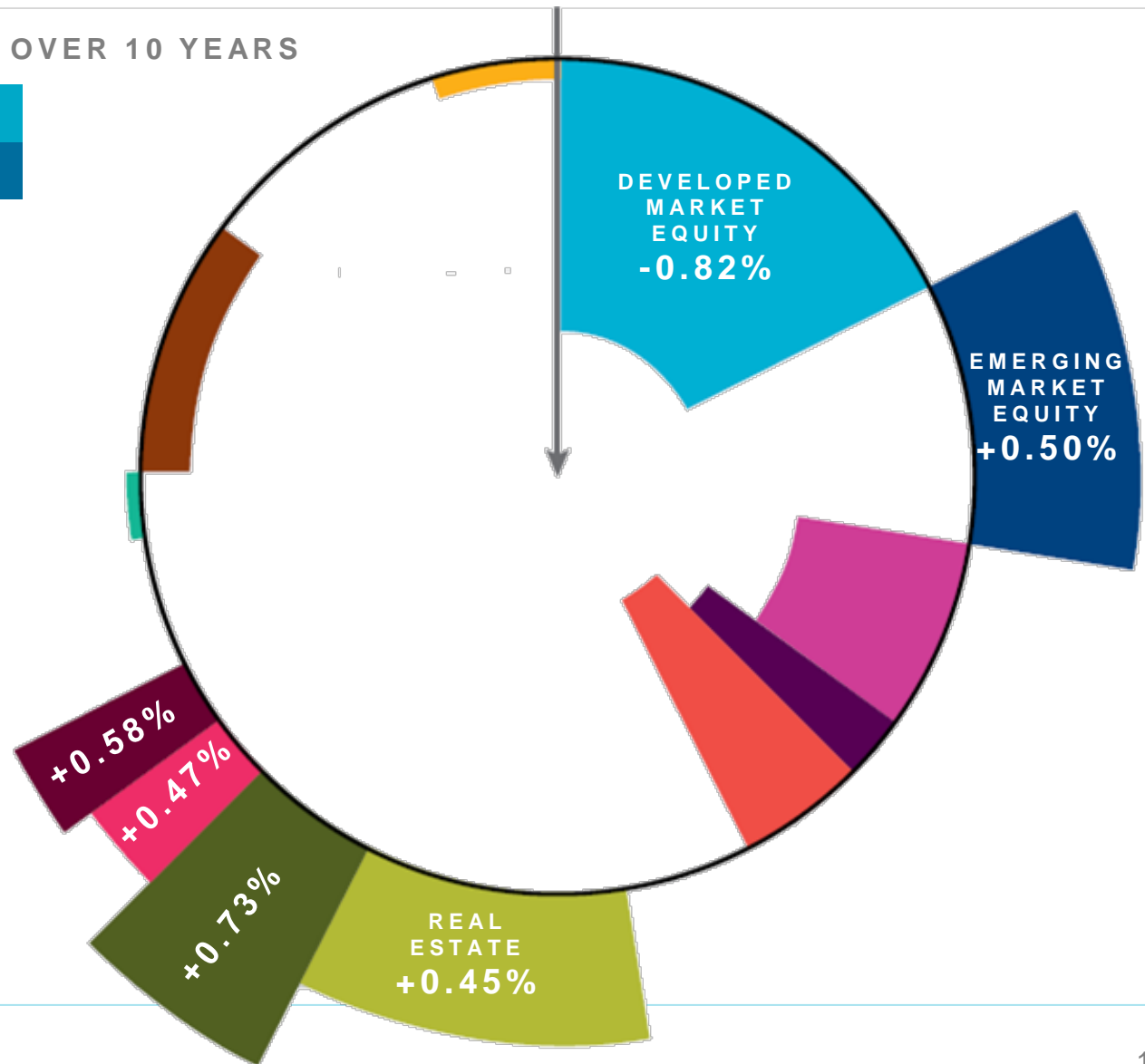


CLIMATE IMPACT ON RETURNS BY ASSET CLASS

IMPACT OF 2 SCENARIO = RISK AND OPPORTUNITY

MEDIAN ANNUAL RETURNS OVER 10 YEARS

- Developed Market Global Equity
- Emerging Market Global Equity
- Low Volatility Equity
- Small Cap Equity
- Private Equity
- Hedge Funds
- Real Estate
- Infrastructure
- Timber
- Agriculture
- Private Debt
- Emerging Market Debt
- Multi-Asset Credit
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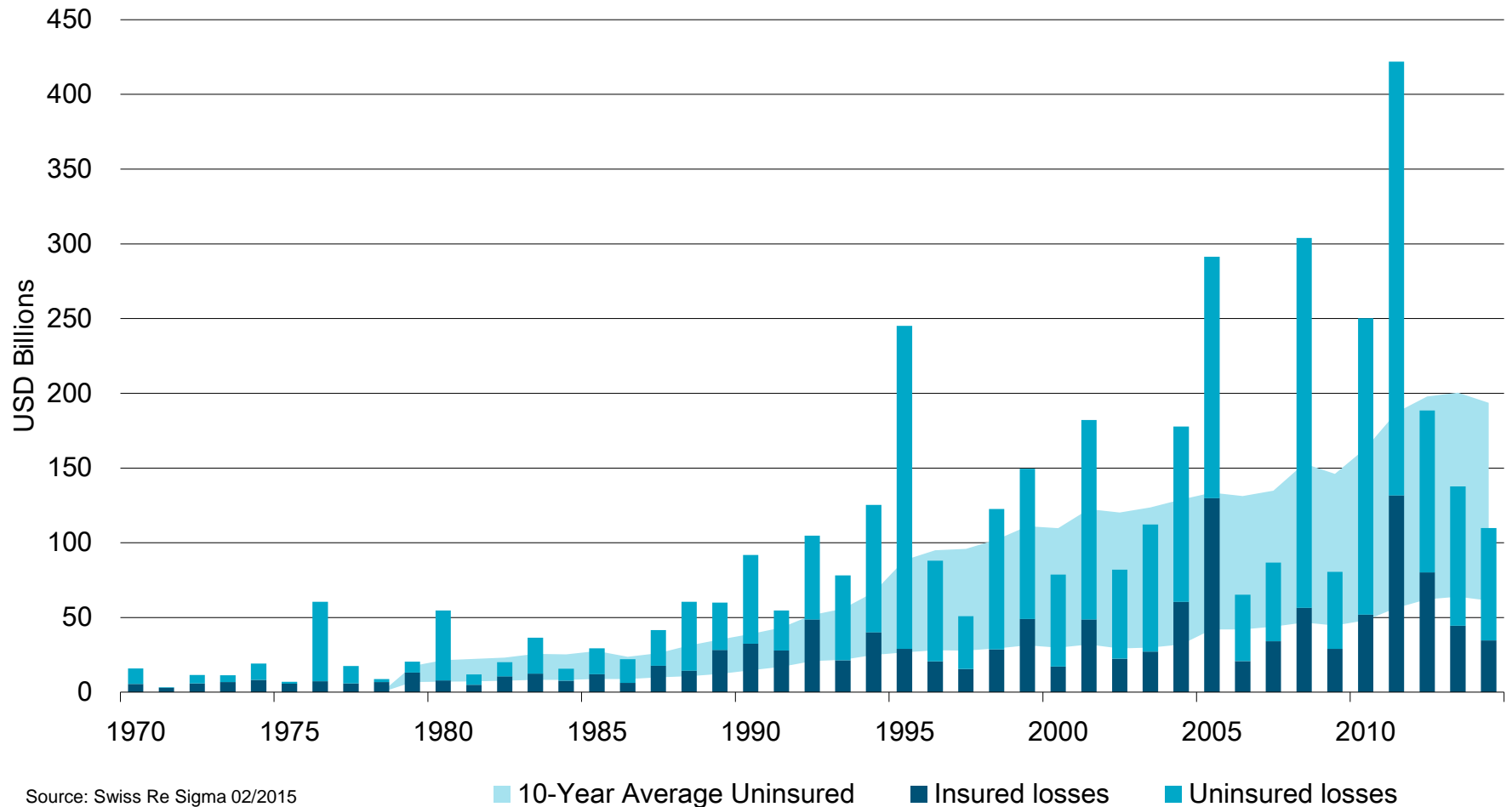
MANAGING CLIMATE RISK: OTHER APPROACHES

- **Passive Investment** approaches increasingly utilized as a ‘hedge’ against future carbon pricing
- **Current innovation abounds** in considering low-carbon alternatives in RAFI, Low-Volatility, Smart Beta strategies and across asset classes (e.g. green infrastructure)

Index Construction Method / Approach (MSCI ACWI Variants rows 1-4)	Carbon footprint reduction (intensity by rev.)	Expected tracking error	Who is invested?
Low Carbon Target Index	75%	0.39%	EAPF (UK); UNJSPF
Low Carbon Leaders Index	46%	0.54%	AP4 (SWEDEN) FRR (FRANCE)
ex Fossil Fuel	14%	1.04%	-
ex Coal	n/a	0.26%	-
Custom approaches	-	-	NYSCRF, PGGM APG

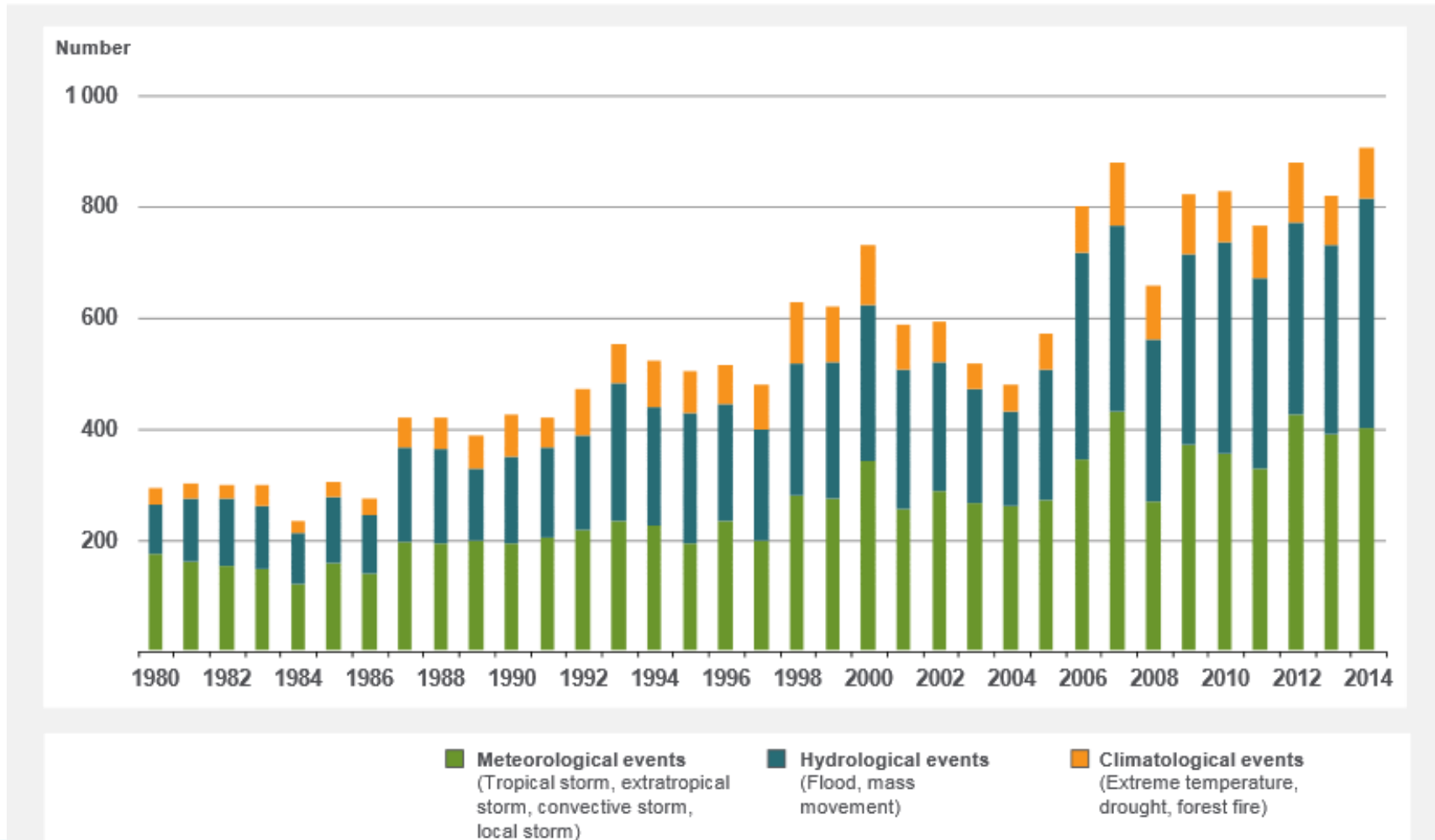
- **French Energy Transition Law** driving innovation in Europe (introduces investor reporting on: climate risk and carbon footprint exposure; investment in the low-carbon transition)

GLOBAL CATASTROPHE UN(DER)INSURANCE A GROWING ISSUE FOR INVESTORS WITH ACCESS TO REAL ASSETS



WEATHER RELATED CATASTROPHES EVENT FREQUENCY INCREASING

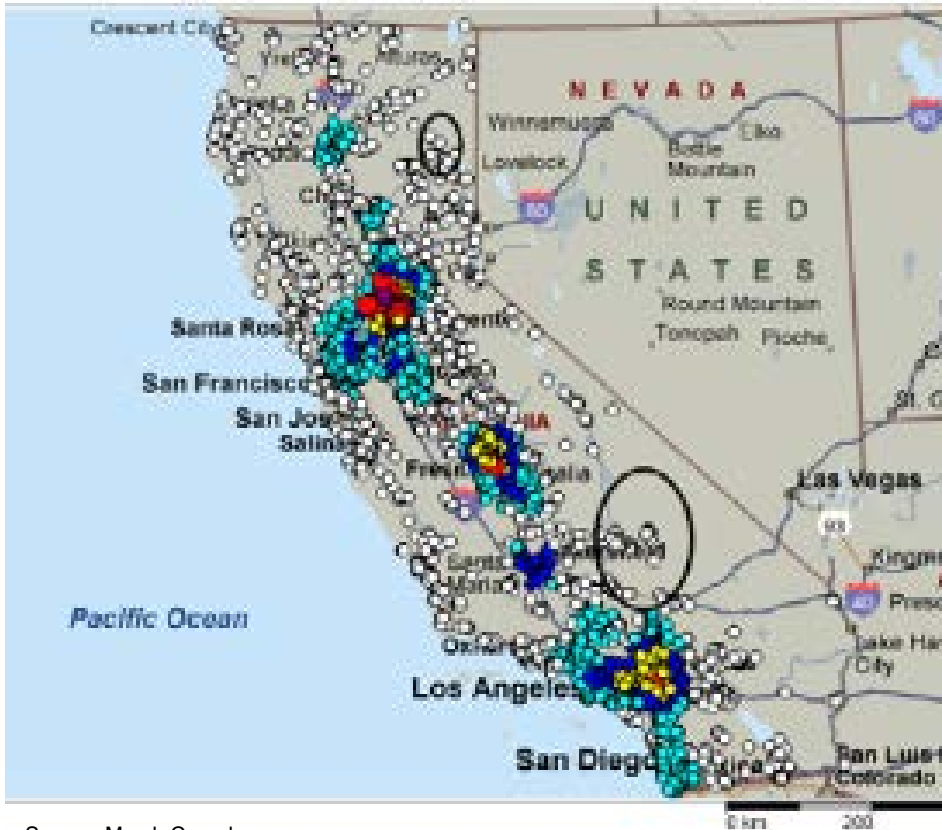
Number of events



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CLIMATE RISK INCLUDES PHYSICAL RISK

Geographic Portfolio Review



Source: Marsh Canada

Q : Where are *your* real assets located, and what is your aggregate weather/climate risk exposure?

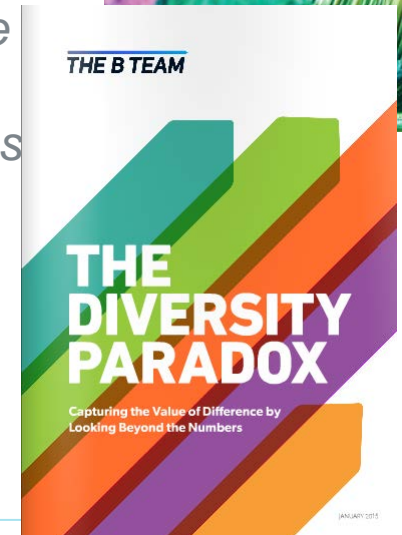
A: Most asset owners don't know

- The insurance sector uses a variety of tools to map holdings and assess aggregate natural catastrophe / environmental risk across a portfolio of assets
- Investors are growing their real asset exposures, yet such tools are un(der)utilized; risk management / due diligence is undertaken largely asset by asset
- Mercer and Marsh are providing a joint service to address this gap

DIVERSITY IN THE INVESTMENT VALUE CHAIN



- Small, but growing # of **investment strategies and indices** focused on diversity
- Industry reports and **performance reviews demonstrate value of diversity**
- **Investors starting to review**
 - Diversity practices within *professional service providers*
 - Diversity scores within *active equity strategies*
- Rare to see formal expectation setting outside of emerging manager programs, but this is likely to follow over coming 5 years



DISCLOSURE IS ON A ROLL

- In response to the G20 Finance Ministers and Central Bank Governors, the global **Financial Stability Board** recently launched a **Task Force on Climate-related Financial Disclosure**.
 - Develop recommendations to improve the consistency and effectiveness of climate risk disclosures for the capital markets
 - Chaired by Michael Bloomberg; 16 industry participants – one year timeline
- Continued progress at **SASB** and the world of accounting standards
- 2015 **'Aiming for A'** shareholder resolutions on climate resilience had virtually unanimous shareholder support at BP and Shell – with help from CalPERS proxy solicitation campaigns
 - Similar resolutions planned for 2016
- Continued **Stewardship Codes** (e.g. ICGN) and **ESG disclosure requirements** (e.g. Ontario in 2015)
- **Human Capital Management Coalition, Proxy Access, etc.**

LOOKING AHEAD – THE NEXT 5 YEARS

- A key challenge for many Boards and investors relates to developing a view of the future which isn't firmly grounded in the past
- Yet today's global risk landscape – particularly climate change – forces fiduciaries to
 - Shift focus from the past to the *future*
 - Consider conviction vs. *evidence*
 - Rely not only on data but *beliefs*
- Like many, CalPERS is experiencing these challenges. Your beliefs put you in good stead for continued progress and innovation
- Evolving investment practices (i.e. integration) is always the toughest part. To continue its leadership role, CalPERS could:
 - Support better disclosure to enable better decision making
 - Drive improved corporate management of *all types* of capital
 - Increase climate risk management practices (total fund review / real asset risks)
 - Allocate capital in line with your convictions



APPENDIX – CLIMATE RISK ASSESSMENT



MERCER'S 2015 CLIMATE RISK FRAMEWORK COMMISSIONED BY PEERS

Commissioned by 16 investors

– \$1.5 trillion AUM , including:

- New York State Common Retirement Fund
- CalSTRS
- Connecticut Pension Fund
- British Telecom Pension Scheme (BTPS)
- Environment Agency Pension Fund (EAPF)
- Första AP-fonden (AP1)
- New Zealand Superannuation Fund
- QIC Limited

13 Advisory group members

“The report ...is, to date, the most comprehensive from an asset-allocation perspective...”

– The New Yorker



MAKE TOMORROW, TODAY



RISK FACTORS: SECTOR AND ASSET CLASS SENSITIVITY (EXAMPLE – ENERGY SECTOR)



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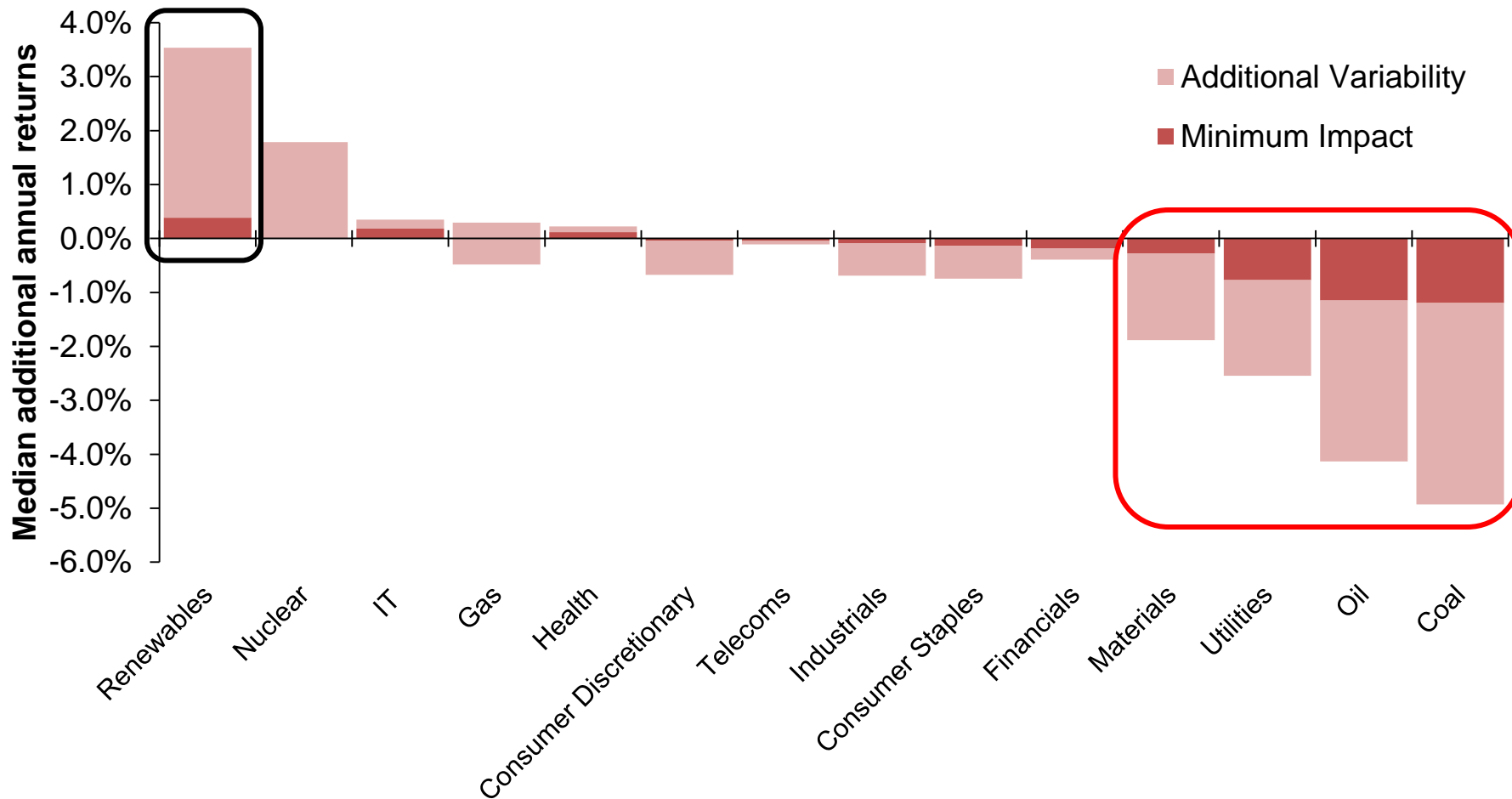
	TECHNOLOGY	RESOURCE AVAILABILITY	IMPACT	POLICY
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OIL	-0.50	-0.75	-0.75	-0.75
GAS	<0.25	-0.50	-0.75	<0.25
COAL	-0.50	-0.75	-0.75	-1.00
RENEWABLES	0.50	-0.25	-0.25	1.00

Values assigned between -1 and +1

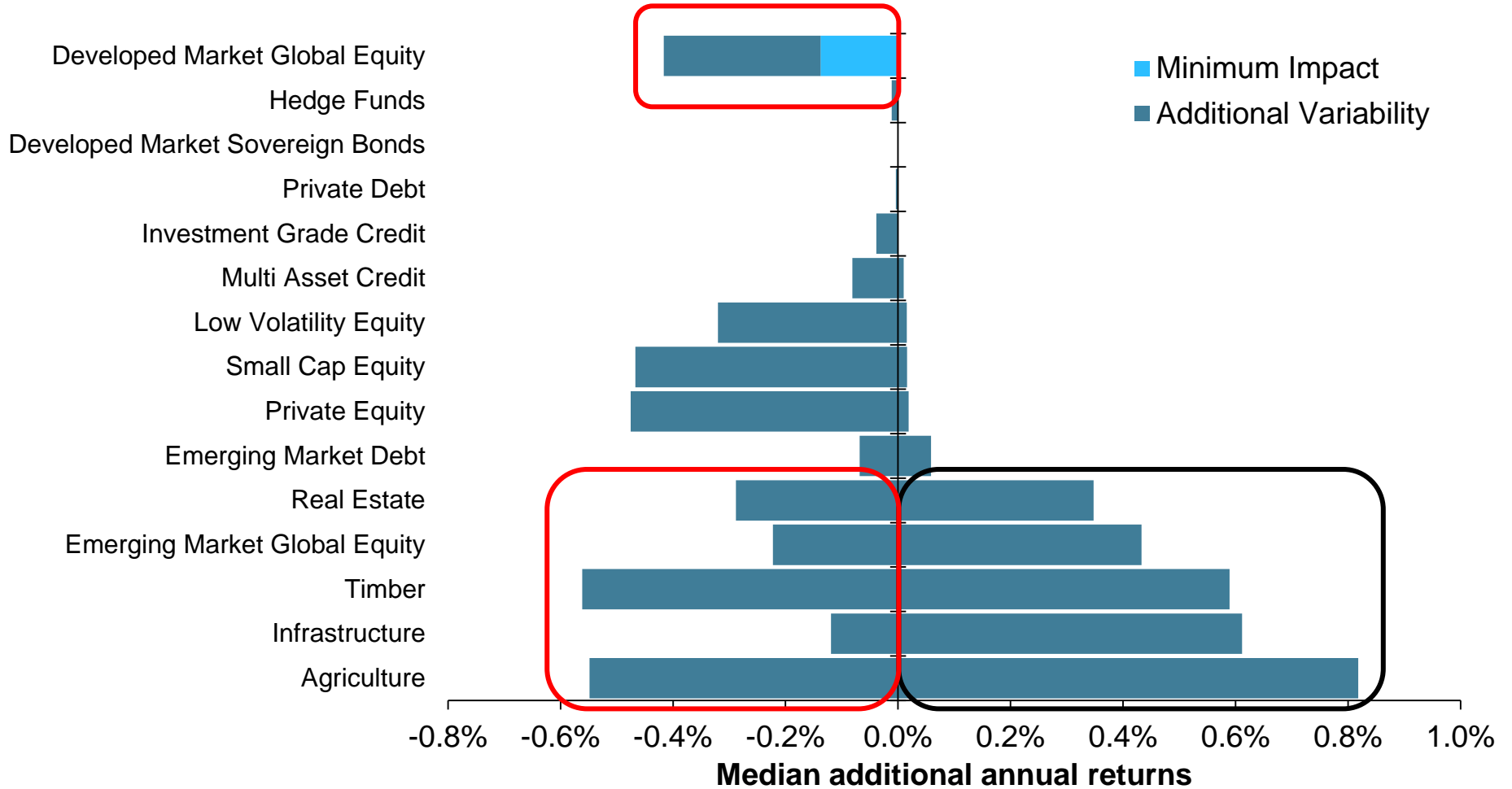
CLIMATE IMPACT ON FUTURE RETURNS

MEDIAN RETURN IMPACT BY INDUSTRY SECTOR (35 YEARS)

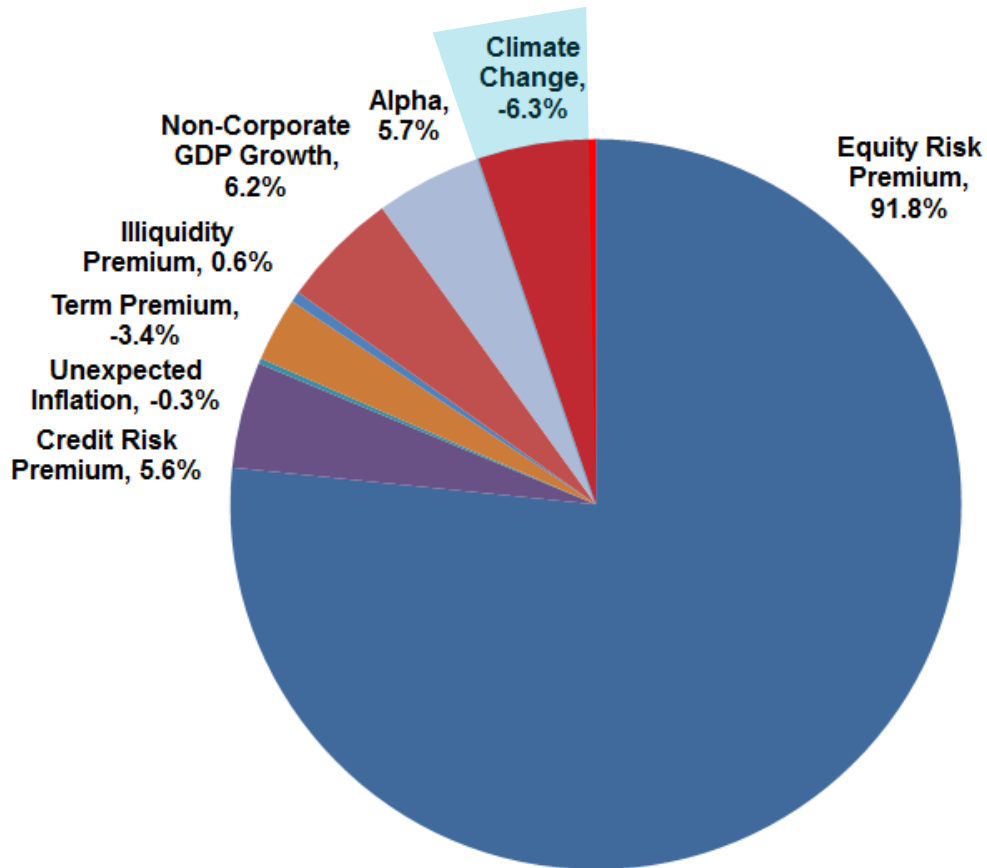


CLIMATE IMPACT ON FUTURE RETURNS

MEDIAN RETURN IMPACT BY ASSET CLASS (35 YEARS)



CLIMATE IMPACT ON RETURNS* BY RISK FACTOR – “TRANSFORMATION”



Risk factor	Impact on return
Equity Risk Premium	5.88%
Small Cap Premium	0.00%
Emerging Mkt Premium	0.00%
Credit Risk Premium	0.36%
Unexpected Inflation	-0.02%
Term Premium	-0.22%
Illiquidity Premium	0.04%
Non-Corporate GDP Growth	0.40%
Value	0.00%
Momentum	0.00%
Carry	0.00%
FoF Alpha	0.00%
Alpha	0.36%
Other	0.00%
Currency	0.00%
Climate change	-0.40%
Total portfolio return	6.40%

* Sample shown for AU client with following asset allocation: 30% Australian shares, 30% Overseas shares (50% hedged), 10% Australian Direct Property, 15% Australian Fixed Int, 15% Overseas Fixed Int.

CLIMATE IMPACT ON RISK

RISK DASHBOARD – “TRANSFORMATION”

Risk	Risk Measure	Target	Results, exc “TRIP” factors	Results, inc “TRIP” factors
Not meeting target return over required time horizon	Probability of meeting return objective (after fees, over timeframe/ rolling periods)	> 67% prob of generating CPI + 3% pa over 5 yrs	60% / 66%	53% / 61%
Downside risk	Expected Ave. Loss (%) (worst 5% of outcomes)	No less than -15%	-14%	-15%
Absolute risk	Standard Deviation	10-15%	9.2%	9.3%
Factor concentration	Factor Risk (max expo to a risk factor)	<90% in ERP	~90%	~90%
Liquidity	Primary – 7 days, Secondary – 90 days Tertiary – 1 yr	>33%, 67%, 75%	86%, 90%, 95%	86%, 90%, 95%

Note: Based on following asset allocation: 30% Australian shares, 30% Overseas shares (50% hedged), 10% Australian Direct Property, 15% Australian Fixed Int, 15% Overseas Fixed Int.

ESG DASHBOARD

MERCER & MSCI DATA

“What Gets Measured Gets Managed”

Client dashboard assessing 6 equity portfolios

US Large Cap Managers – Relative to Bench	S&P 500	1	2	3	4	5	6
Mercer ESG Rating	N/A	3	3	3	N	4	3
MSCI IVA Coverage	100.0%	94.4%	94.3%	89.0%	88.6%	78.3%	79.1%
Overall IVA Score	4.7 BBB	4.7 BBB	4.1 BB	4.7 BBB	4.3 BB	6 A	4.1 BB
Environment IVA Score	5.7 BBB	5.1 BBB	6.1 A	5.3 BBB	5.5 BBB	5.2 BBB	4 BB
Social IVA Score	3.9 BB	3.9 BB	3.7 BB	3.9 BB	3.7 BB	4.7 BBB	4.1 BB
Governance IVA Score	4.4 BBB	4.6 BBB	3.5 BB	4.9 BBB	4.5 BBB	5.4 BBB	4.7 BBB
% rated lowest quartile (B & CCC)	22.4%	18.5%	30.6%	16.7%	17.6%	13.2%	20.0%
% with negative momentum	20.5%	19.7%	18.7%	16.5%	31.1%	15.8%	0.00%
MSCI IM Coverage	100.0%	95.2%	93.1%	89.6%	87.3%	77.0%	79.1%
Red flagged for 'severe controversies'	3.5%	0.0%	5.6%	6.7%	3.8%	0.0%	0.0%

SCALE	RELATIVE PERFORMANCE
Dark Green	Less ESG risk exposure than benchmark index
Light Green	
Yellow	ESG risk in-line with benchmark index
Orange	
Red	Greater ESG risk exposure than benchmark index

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**TOMORROW,
TODAY**