now:pensions

Case Study: Incorporating Climate Scenario Analysis into Pension Fund investment decision making

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Context

now:pensions is a UK Defined Contribution Master Trust with c£7bn AUM

In 2021 TCFD reporting was introduced for UK Pension Schemes

- Mandatory climate scenario analysis
- Several options were reviewed, and a “Climate Value at Risk” data provider selected
- The results were difficult to communicate to members and not investment decision useful

In 2024 we adopted a qualitative approach to climate scenario integration

- This led to a clearer set of conclusions that linked strategic objectives with the strategy, manager selection and portfolio decisions
- And has allowed us to navigate the changing political landscape and shifting regulation over the last few years
- Updated quantitative climate scenario analysis as of 2026 now provides quantitative support for the conclusions adopted

This presentation is a case study of that experience.

(Note: the difference in formatting of slides reflects the branding applicable at each moment of the case study. NOW:Pensions in 2024, now:pensions in 2025 and Marsh in 2026)

2022 Climate Scenarios for Scenario Analysis

2022 Case Study: Initial quantitative modelling

The regulatory guidance requires a minimum of two scenarios, with one being a global average temperature rise of 1.5-2°C.

We recommend three scenarios to the Trustees, 1.5°C, 2°C and 3°C be used for Scenario analysis

Paris-aligned transition 1.5°C **– this is our goal**
We hope through action by policy makers, consumer activity and investment to accelerate the transition to achieve this outcome.

Late transition 2.0°C **- This is what we think is most likely**
Given the current pace of policy change that we observe.

Slow transition 3.0°C **– this is our "hothouse" scenario**
Which could happen if policy action stalls or if climate tipping points accelerate climate change despite mitigating efforts.

2022 Climate Scenario Analysis Results:

The CVaR model projected expected losses vs baseline over 15 years by aggregating the bottom-up impact of scenarios across portfolio positions

Portfolio Value at Risk in Scenario	1.5°C Scenario	2.0°C Scenario	3.0°C Scenario
Transition Risk	-5%	-3%	-0.30%
Physical Risk	-6%	-6%	-9%
Total Risk (estimated financial loss)	-11%	-9%	-9%

Challenges

- Communicating to Members that a 3.0°C scenario was better for portfolio outcomes than a 1.5°C scenario!
- At odds with the sense of urgency from the scientific community.

WHAT WERE THE MODELS MISSING?

What was missing in climate models in 2022?

- Systemic risk – a realistic impact of climate change on the whole economy and broad markets was missing or severely underestimated
- Loss severities for the whole economy from the physical impacts of climate change in the long term were under-estimated

The Industry recognised– “these results are nonsense”

- Higher Physical Loss Functions for Climate Risk
- The challenge of financial discounting – lots of value in terminal assumptions.

More recently updates to stochastic models take a more top down approach

- New models have “more acceptable/realistic” outcomes across different future climate scenarios: they show a cumulative underperformance of c50% in a 2.8 degree Limited transition and a c70% loss in a 3.8 degree scenario over 40 years.

Is more sophisticated long-term quantitative modelling the answer?

Climate Modelling Uncertainty (Cloud effects, Tipping points)

Government climate policy response uncertainty (Mitigation, Adaptation, Geopolotics)

Real world impact uncertainty (Food production, Energy demand, Asset & Insurability impacts, Productivity)

Climate/Energy Technological progress uncertainty (Renewables, Battery Tech, Fusion, Carbon Capture)

Other Government policy interaction (Taxation, Interest Rates, Energy security, Defence etc)

Economic interaction uncertainty (Growth, Inflation, Capex, Deficits, Debt cycles)

Other technology interaction (AI, Electric Vehicles, Industrial processes, Farming)

Market reaction uncertainty Yield Curves, Equities, Credit, Commodities, Correlations, Regions

Compounding uncertainties lead to a very wide range of potential outcomes

Many of which may be very negative for economies and markets – It is prudent to act to mitigate these systemic risks

But does your quantitative modelling lead to different portfolio decisions today?

Scenario Analysis is not about predicting the future, its about preparing for a range of potential outcomes

First be clear on your beliefs, objectives and investment tools

Beliefs Fiduciary duty, Systems Approach to investing, Priority themes	Objectives: Financial Objectives Intended Outcomes (real world)	Time Frame Systemic Risks – 30yrs+, Absolute returns Financial Risk Mgt – 3-5 yrs, Relative returns
Capital Allocation Influence Secondary Market vs Primary Credit/Equity/Private Markets	Strategic Asset Allocation Total Portfolio Approach Solutions/Impact Targets?	
Stewardship Influence Engagement for disclosure/ transition? Escalation	Systemic Influence Policy Engagement, Stakeholder engagement	

Be clear on your Financial and Intended Outcome Objectives e.g. to achieve financial risk return objectives over the medium term while also seeking to reduce systemic risks in the real economy to protect members long term financial outcomes

Be clear on your "model of influence" – how do investment actions influence real world outcomes in order to achieve risk mitigation

This should lead to clear portfolio decision/actions supporting different timeframes

Our Climate Scenarios

2024 Case Study: A shift to qualitative scenario analysis

The guidance requires a minimum of two scenarios. We suggest three scenarios, of 1.5°C, 2°C and 3°C

We recommend not sharing the quantitative assessment of scenario outcomes, as they are inadequate and misleading in quantifying climate change risks to members

Instead, the Trustees **should conduct a qualitative assessment** of various narrative climate risk scenarios and this **should lead to clear investment decisions for the portfolio**

Paris-aligned transition 1.5°C **– this is our goal**
We hope through action by policy makers, consumer activity and investment to accelerate the transition to achieve this outcome.

Late transition 2.0°C **- This is what we think is most likely**
Given the current pace of policy change that we observe.

Slow transition 3.0°C **– this is our "hothouse" scenario**
Which could happen if policy action stalls or if climate tipping points accelerate climate change despite mitigating efforts.

We have developed our own internal narratives around future potential climate and socioeconomic scenarios.
We recommend the USS/Exeter paper that applies this narrative approach in more detail
No Time To Lose – New Scenario Narratives for Action on Climate Change (greenfuturessolutions.com)

(Our modified) climate risk terminology

Impact on investments	Definition
Transition Risk (bottom up)	The impact of implementing climate policies on individual companies, modelled by focussing on the "bottom-up" effect on each asset
Physical Risk (bottom up)	The impact of weather and climate on physical assets. This is a "bottom-up" risk assessed for each specific asset and dependent on its location its nature and mitigation
Systemic Risk (the whole economy top down)	The impact of climate change on broad economic activity and financial markets. Financial market returns are a function of economic growth, inflation, interest rates and the risk appetite of investors

How will the economy be affected over the next 6 years?

Impact:
On Inflation

On Productivity

On Investment and capital expenditure

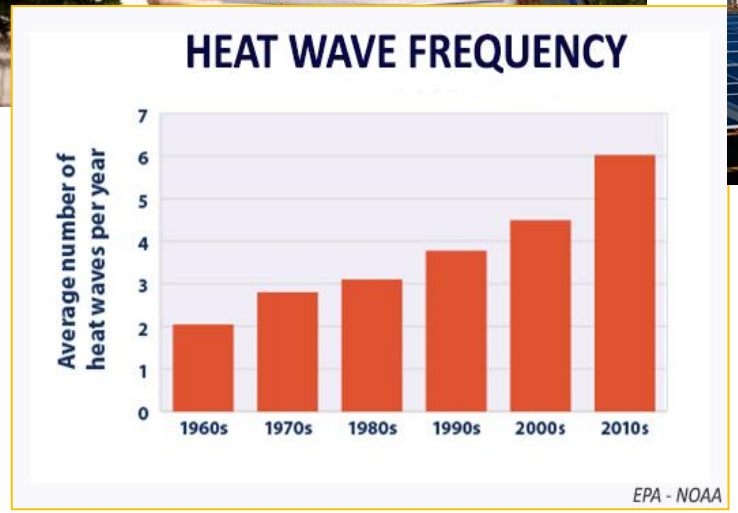
On Economic Growth

On Broad Equity Markets

On Specific sectors and geographies

in our 3°C scenario?





in our 1.5°C scenario?





Building decision useful narrative scenarios

We will look at 3 key drivers of systemic sustainability risks (such as climate) that

- may affect market and portfolio outcomes **over the medium term** (out to 2030)
- and may determine the longer-term trajectory: are we on a 1.5°C or 3°C pathway?

1. Geopolitics

2. Climate Misfortune & Adaptation

3. Government policies

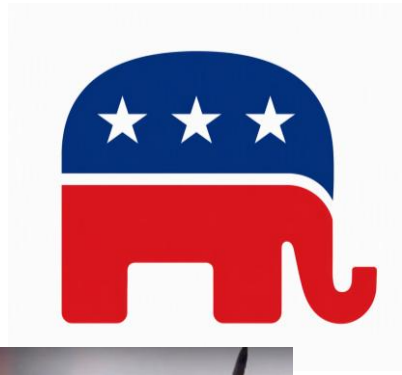
In our scenarios we will imagine "the newspaper headlines" for these factors if we are on 1.5°C or 3°C aligned trajectory.

We consider what this may mean for the real world outcomes and what it means for the investment strategy.

Come on a climate journey with me into the future! (2024)

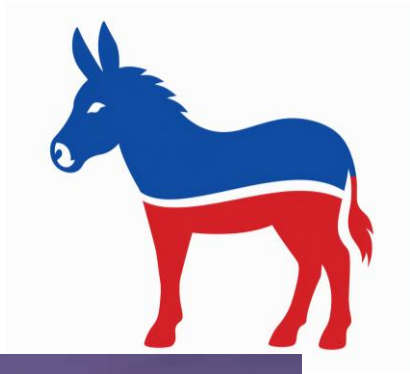
Imagine the newspaper headlines: Geopolitical outcomes that could lead to

a **3ºC** world





a **1.5ºC** world

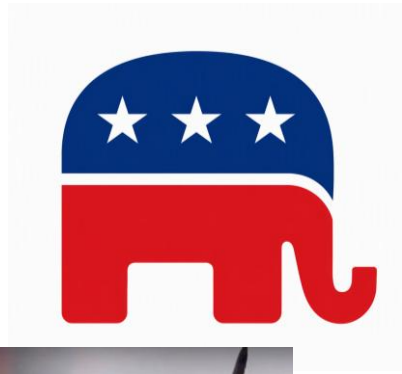




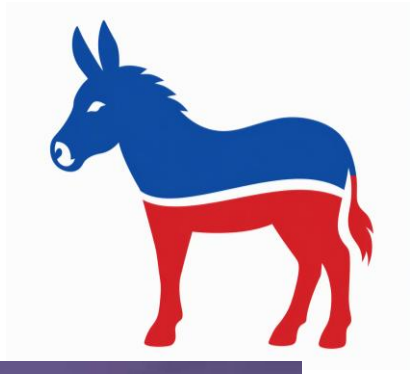
The 2024 insights: 1. US Election Outcome was likely to be the biggest driver of whether we were on a 1.5 or 3 degree pathway. 2. The Russia Ukraine war had the potential to impact inflation and disrupt energy markets, a key driver of transition

Our 2024 Scenario Analysis:
The outcomes of US elections and global geopolitics could lead to:

a **3ºC** world



a **1.5ºC** world







2025 UPDATE: The new US Administration and an increasingly fragmented world order makes a 1.5ºC outcome less likely. Net Zero remains the inevitable destination but it will be delayed. By how much?

Systemic Risks beyond Climate are highly interconnected

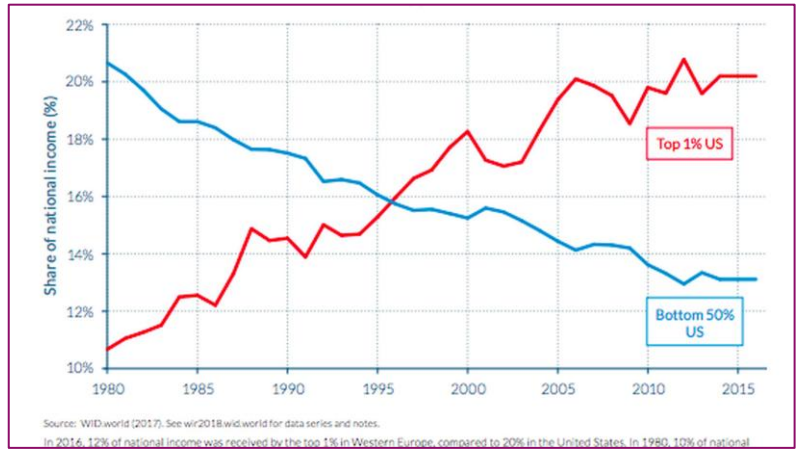
Water use



Biodiversity



Inequality



The 2024 insight: Climate is highlight interconnected with other systemic risks. A systemic approach requires strategies that contribute to mitigation of all of these risks in the long term

2024 Case Study: A shift to qualitative scenario analysis

What are the Investment Impacts on the portfolio?

Our assessments over the medium term to 2030

Impact on investments	1.5°C	3°C
Transition Risk Impact	Negative	Initially limited but accelerating in time
Physical Risk Impact	Moderately negative	Initially moderate but accelerating in time
Systemic Risk (the whole economy impact)	Positive (particularly due to investment growth impulse)	Negative
Total Portfolio Outcome	Positive	Negative

2024 Case Study: A shift to qualitative scenario analysis

What are the Investment Impacts on the portfolio?

Our assessments over the long term to 2050

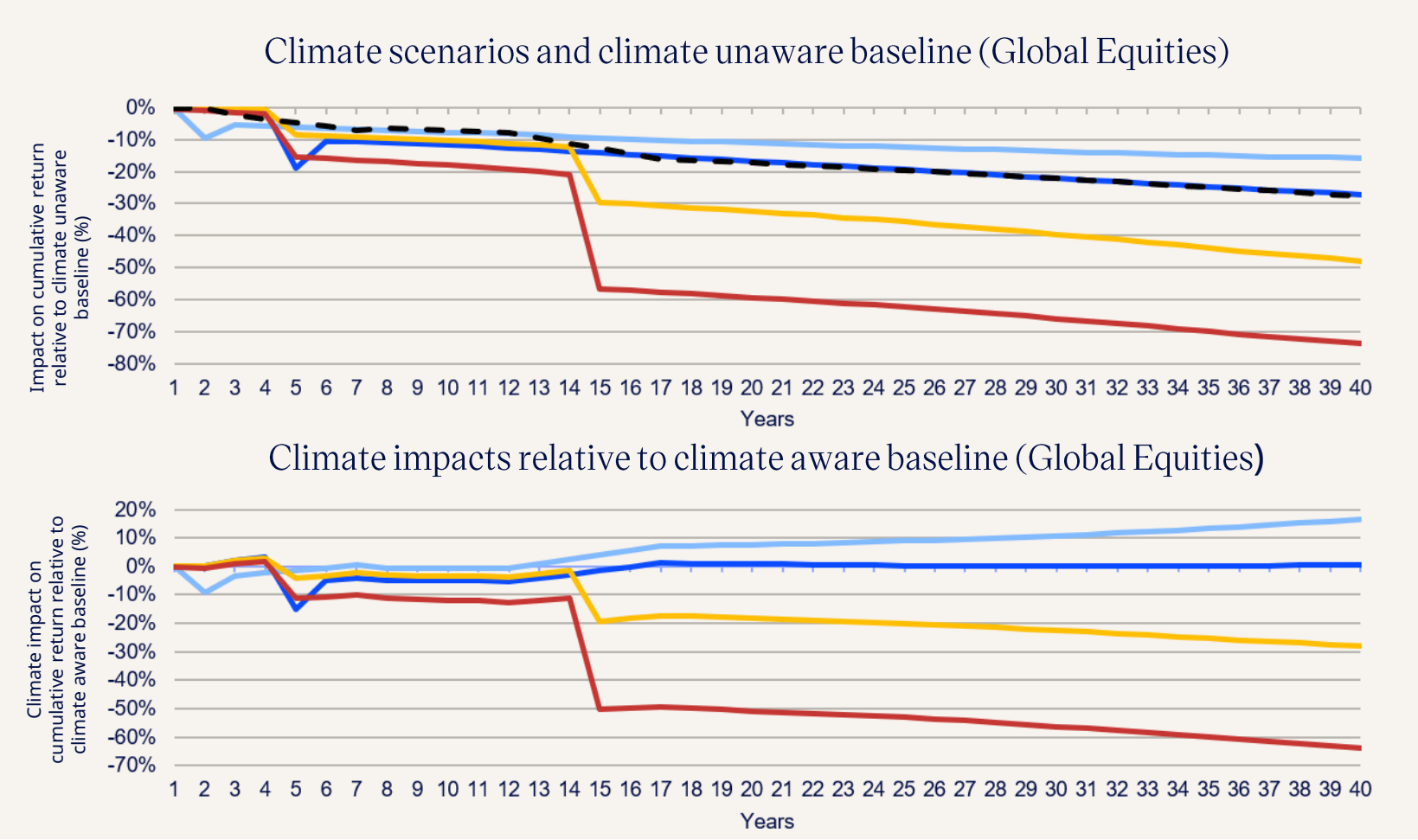
This is "alpha " vs market returns

This is the dominant long term return driver

Impact on investments	1.5°C	3°C
Transition Risk (bottom up)	**Negative**	**Very negative (policy change is forced)**
Physical Risk (bottom up)	**Moderately negative**	**Very negative**
Systemic Risk (the whole economy impact)	**Positive**	**Very negative (adaptation costs+impacts)**
Total Portfolio Impact	**Positive**	**Very Negative**

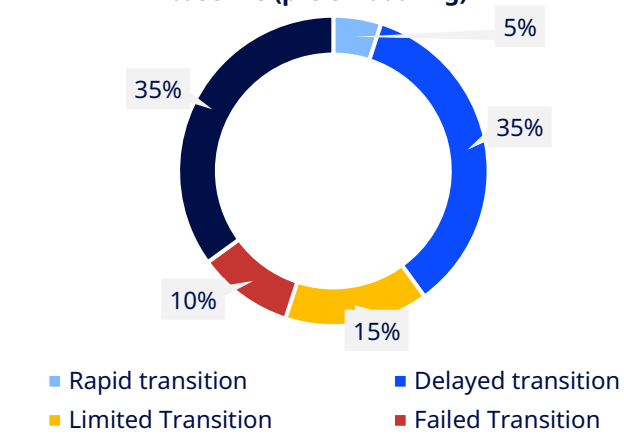
New quantitative modelling from Marsh (2026), in partnership with Ortec Finance supports the conclusions

Marsh's view on a climate aware baseline – global equities



- Marsh's view is that markets are currently partially pricing in climate-related risks and opportunities
- Our modelled climate impact calculates the additional pricing shock under a given climate scenario relative to what is assumed to be priced in today
- The climate impact is calculated as the absolute scenario effect minus the baseline. The baseline shows a persistent drag from climate change
- The analysis shows substantia long term negative performance in hotter scenarios and transition impacts in all scenarios at different times.

Composition of factor weights for the climate aware baseline (pre-smoothing)



The baseline represents what we are assuming the market is currently pricing in. The climate impact is the climate scenario outcome relative to the climate aware baseline.

MARSH

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What can you do to manage the risks and opportunities?

Conclusions from the Scenario Analysis

Uncertainties are large, but the next 6 years will be crucial

Politics will determine outcomes

We don't know which scenario will come true - build a portfolio that is robust

You don’t need fancy models to apply common sense

Traditional asset-class diversification won’t diversify long-term risk away

1.5°C

We can aim to play our part in influencing the scenario outcomes – reducing systemic risk is aligned with trustee fiduciary duty

Make sure your strategy incorporates all of the risks and all of the risk management tools

- Climate, biodiversity, water, inequality - are highly interlinked
- **Systemic Risks** – Top-Down Risk
  - SAA: Build in more inflation protection
  - Stewardship: Influence companies and policy makers to transition inline with 1.5°C
  - Invest in Solutions: accelerate the transition
- **Transition & Physical Risks** - Bottom-up
  - 1.5°C = avoid stranded asset risk,
  - 3°C = climate adaptation, geospatial data, stewardship

What if 1.5 becomes unrealistic?

- Net Zero 2050, -50% by 2030, +1.5 degrees would be the best financial and real world outcome for members
  - In this scenario stranded asset risk would be very high – manage these with stock selection
- If the world transitions more slowly, that may mean Net Zero by 2060 or 2080 and a 2 degree or warmer world is more likely
  - At some point the IPCC may indicate +1.5 degrees is increasingly improbable. 2030 interim objective (-50%) will be the first come under pressure

In this scenario financial risk of asset stranding is likely delayed but

Policy change risk is still inevitable*, climate will only become a bigger issue (politically and economically)*

- Portfolio: **Potentially stay invested in <u>some</u> assets for longer and continue to engage?**

We could choose to stick to the decarbonisation pathway or to revise the target timing e.g. 2030 becomes 2033

- Net Zero is still the objective, timing might shift.
- Engagement objective does not change: Align with Net Zero: getting companies to set science based transition plans and engaging with policy makers to get to Net Zero as fast as possible, if possible 1.5 degree aligned

Net Zero stays. Keep timing under review for realism

2024 conclusions to 2025 updates

2025 Case Study: Update to qualitative scenarios post US election

Uncertainties are large
Politics will determine outcomes ->
1.5ºC degrees now less likely

We don't know which scenario will come true - build a portfolio that is robust
You don’t need fancy models to apply common sense

Traditional asset-class diversification won’t diversify long-term risk away

We can aim to play our part in influencing the scenario outcomes – reducing systemic risk is aligned with trustee fiduciary duty

Make sure your strategy incorporates all of the risks and all of the risk management tools

- Climate, biodiversity, water, inequality - are highly interlinked

Actions on systemic risk remain largely the same

- **Systemic Risks** – Top-Down Risk
  - SAA: Build in more inflation protection
  - Stewardship: Influence companies and policy makers to transition ~~inline with 1.5ºC~~ **towards Net Zero**
  - Invest in Solutions: accelerate the transition

- **Transition & Physical Risks** - Bottom-up
  - ~~1.5ºC~~ = avoid **realistic** stranded asset risk,
  - **3ºC** = **climate adaptation**, geospatial data, stewardship

Conclusion: Incorporating Climate Scenario Analysis into investment decision making

- Set clear financial and real-world objectives and be explicit on timeframes. For example:
  - To manage financial risks over the medium term (3-5 years) while
  - Contributing to the reduction of Systemic Risks over the long term (5-30 years).
- Quantitative Climate Scenario Analysis can be useful – but the key question is what investment decisions does it drive.
  - Bottom up – it can help identify assets that are more or less susceptible to Physical or Transition Risk. BUT those are dynamic risks whose likelihood will evolve over time, driven by shorter term policy and long-term climate trends.
  - Top Down – it can help identify the potential scale of the problem and the urgency of doing something. This can lead to some strategic asset allocation decisions e.g. more inflation protection, BUT largely cannot be diversified away. Therefore contributing to real-world risk mitigation and transition becomes a systemic imperative (Transition and Impact investing)
- Qualitative Scenario analysis can be a powerful mechanism to link climate scenarios to real portfolio decision making and actions that can be dynamically updated
- It helps if investors are very clear on 1. Their influence mechanisms – Capital allocation, Stewardship, Engagement,
  2. are ambitious but also realistic about the influence investors can actually have.

Q&A

NOW: Pensions

The future is now

What can you, an investor, do about it?

Risk category	What could you do in the portfolio to influence or impact the outcome?
Systemic Risks	Inflation Risks? - Strategic Asset Allocation Stewardship? Encourage the transition Invest in Solutions? Accelerate the transition
Transition Risks	Exclusions? Underweights? - How quickly to adapt the strategy in the light of shifting transition pressure? Opportunities, Solutions? What strategy within each asset class Equity, Credit, Sustainable bonds, Commodities? Differences in different regions/countries? Monitoring government policy becomes very important. Stewardship? Focus on transition plans Manager selection? Alignment around stewardship
Physical Risk	Data: Exposure x severity x vulnerability? Identifying risk? Underwriting risk? Integration within each asset class Private market real assets, Public markets? Geographies, Local exposures, Adaptation information? Stewardship? – Is management preparedness the simplest starting point Manager selection? Opportunities, Solutions? Who pays for adaptation? Insurability?

Thank you.

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The future is now

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