The Inevitable Policy Response Forecast Policy Scenario 2023 (IPR FPS 2023)

Investment Strategy Implications

October 2023

INEVITABLE POLICY RESPONSE

IPR was commissioned by the PRI[1] and is supported by world class research partners and leading philanthropies, financial institutions, & NGOs

1. Principles for Responsible Investment
2. The conclusions of the report are solely those of Energy Transition Advisers and Theia Finance Labs

Commissioned by PRI

In 2018, the Inevitable Policy Response was commissioned by PRI to advance the finance industry's knowledge of climate transition risk & support investor efforts to incorporate climate risk & opportunities in portfolio assessment

PRI Principles for Responsible Investment

A Climate Research Consortium

This report was produced by Energy Transition Advisers and Theia Finance Labs[2]

NGO partners include Carbon Tracker, Climate Bonds & Planet Tracker

Energy Transition Advisors ETA

THEIA FINANCE LABS

Strategic Partners

In 2021, leading financial institutions joined the IPR as Strategic Partners to provide more in-depth industry input, and to further strengthen its relevance to the financial industry

FitchRatings

BNP PARIBAS ASSET MANAGEMENT

quinbrook infrastructure PARTNERS

TEMASEK

apg

Core philanthropic support

The IPR is funded in part by the Gordon and Betty Moore Foundation through The Finance Hub, which was created to advance sustainable finance, and the ClimateWorks Foundation striving to innovate and accelerate climate solutions at scale

THE FINANCE HUB

GORDON AND BETTY MOORE FOUNDATION

climateworks FOUNDATION

IPR has developed global, policy-based forecasts of forceful policy responses to climate change and implications for energy, agriculture and land use

Please see the IPR Home Page for further details

Scenario	Policy Forecast Details	Open Access Database
 **IPR 2023 Forecast Policy Scenario (FPS)** • Models impact of forecasted policies on the real economy	IPR FPS 2023 Summary Report IPR 2023 Policy Forecast IPR FPS 2023 Detailed Energy Results IPR FPS 2023 Detailed Land Use and Nature Results IPR 2023 Bioenergy Report	IPR FPS 2023 Value Drivers IPR Scenario Explorer
 **IPR 1.5°C Required Policy Scenario (RPS)** • Required policies to align to a **1.5°C objective** building on the IEA's Net Zero scenario and deepening analysis on policy, land use, emerging economies and value drivers	IPR 1.5°C RPS Energy and Land Use System Results including Policy Details	IPR RPS 2021 Value Drivers
 **IPR Forecast Policy Scenario + Nature (FPS + Nature)** • First integrated climate and nature scenario for use by investors	IPR 2022 FPS + Nature detailed results	IPR FPS + Nature Value Drivers

IPR has published a set of publicly available outputs from the FPS and 1.5°C RPS that offer significant granularity at the sector/country level, allowing investors to assess their own climate risk across 4,000+ variables

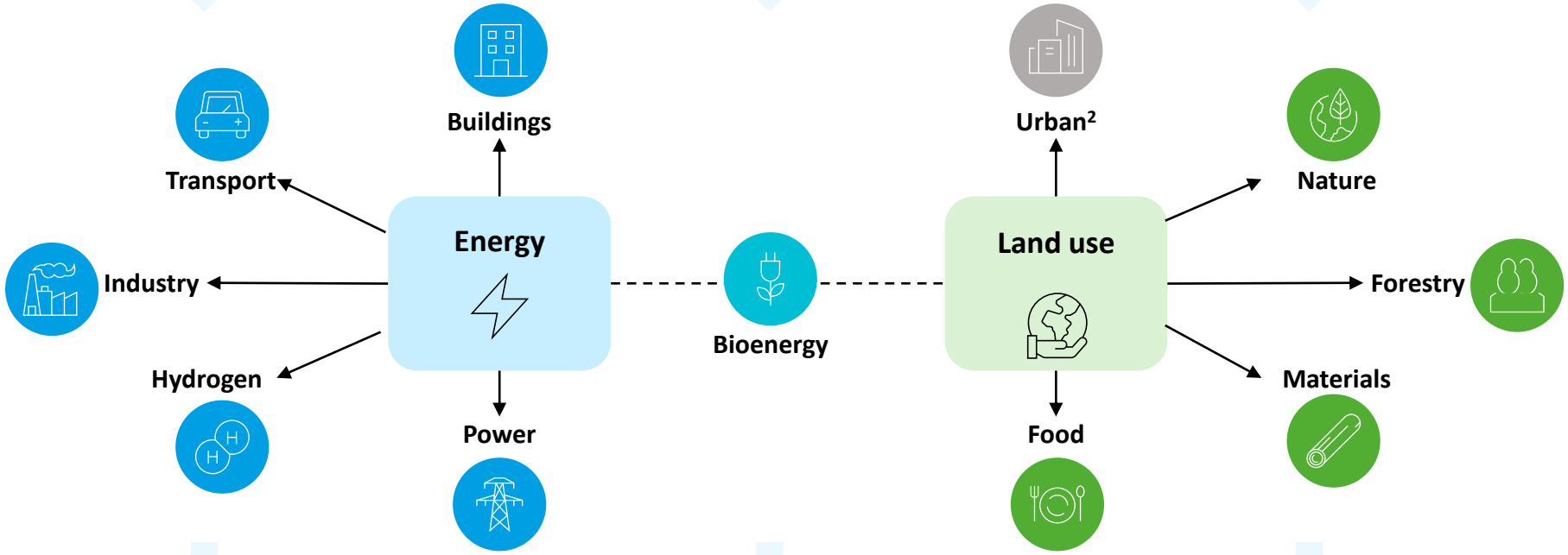
IPR offers a range of applications to help financial institutions navigate the climate transition

Policy Forecast

IPR produces **>300 high-conviction policy forecasts** covering 21 countries and 10 policy areas across energy and land use

Policy forecasts feed into a fully **integrated climate and nature scenario model** that elicits the impact of the forecasted policies on the energy, land use, and nature systems up to 2050, tracing detailed effects on all emitting sectors[1]

Modeling



Value drivers

IPR's integrated scenario model outputs detail value drivers across energy and land use. See Value Driver Visualizer

Applications

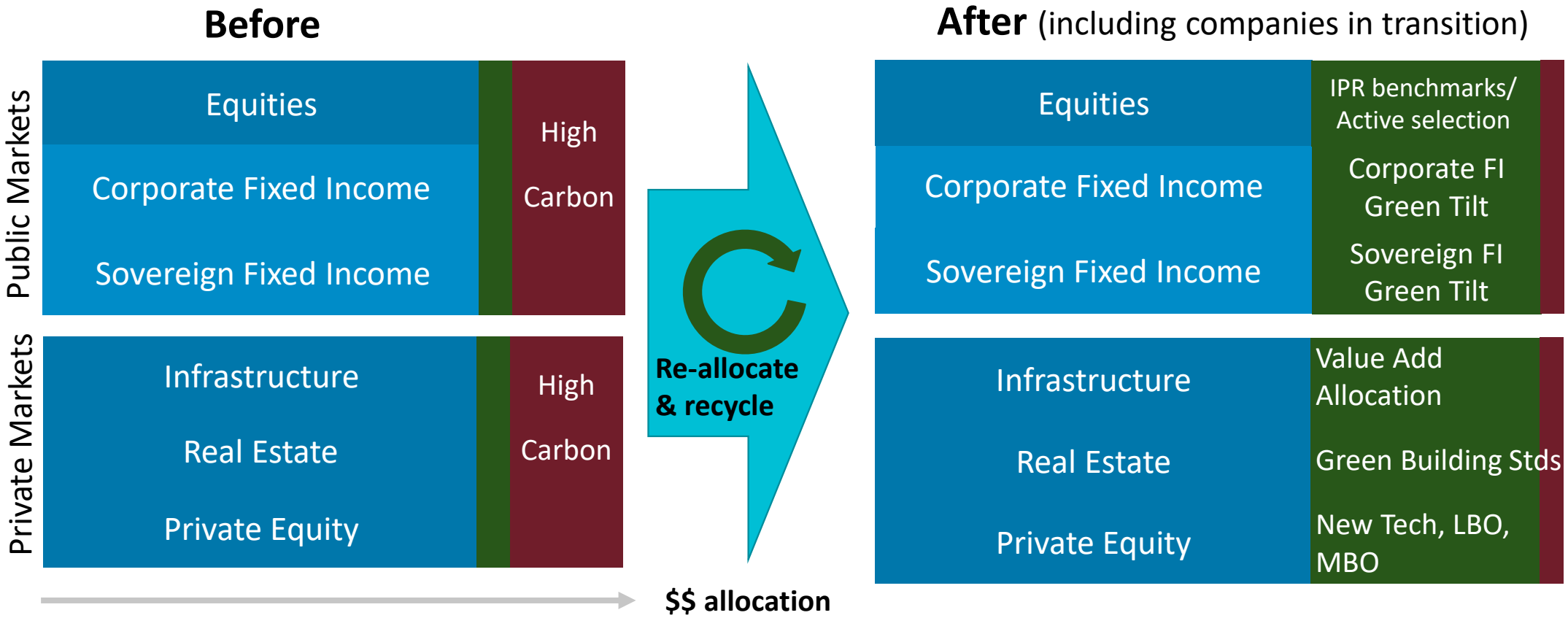
Fitch Ratings, Morningstar Sustainalytics, Paris Agreement Capital Transition Assessment (PACTA), Planetrics, *tilt* (Climate data for SMEs)

1. IPR also develops a '1.5°C Required Policy Scenario'(1.5°C RPS) building on the IEA NZE by deepening analysis on policy, land use, emerging economies, NETs and value drivers. The RPS scenario is also run through the model and can be used by those looking to align to 1.5°C. 2. Urban areas are not modelled in detail in IPR

Why use a high conviction base case like IPR?

- Investing has always been about reading the future
- Thematic investing is a good lens through which to approach transition investing.
- IPR's forecast has been the most realistic in the market since its launch in 2018.
- Key insights for investors in the short to medium term
- Key insights for investors with net zero portfolio alignment targets
- Massive open source database to assist base portfolio construction or product development
- Unique land-use component now market relevant due to forecast overshoot

Asset Universe for Capital Recycling



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Implications for Asset Owners

- **Detailed Actions for Asset Owners**
  - Reduce reliance on divestment strategies other than for value reasons – policy and substitutes will restrain fossil fuels.
  - Prepare to adjust your strategic asset allocation e.g. from equities to real assets / infrastructure to realise climate benefits which have real world impacts
  - Huge refocus on policy lobbying barriers at policymaker and company level
  - Work to de-risk allocations to Emerging Markets and Developing Economies to capture climate benefit
- **Your Asset Managers**
  - Select managers with a climate transition focus and capacity. In particular, focus on specialist investment managers around forestry and clean energy infrastructure for real world impact
  - Drive existing managers to escalate climate company engagement
  - Engage and incentivise companies to transition and ensure managers do the same

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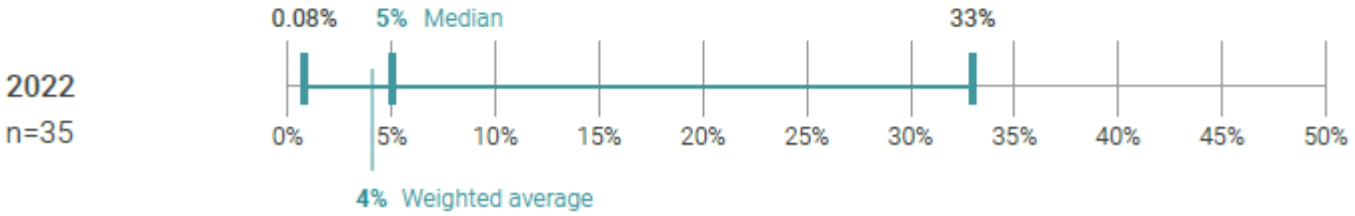
NZAOA aligning investors putting 5% of their portfolio towards solution capital?

Figure 13: Share of climate solution investments

(US$ billion)	2021	2022
Total absolute value of investments in climate solutions	87	253
Total AUM of AOs setting financial targets	2,120	6,155

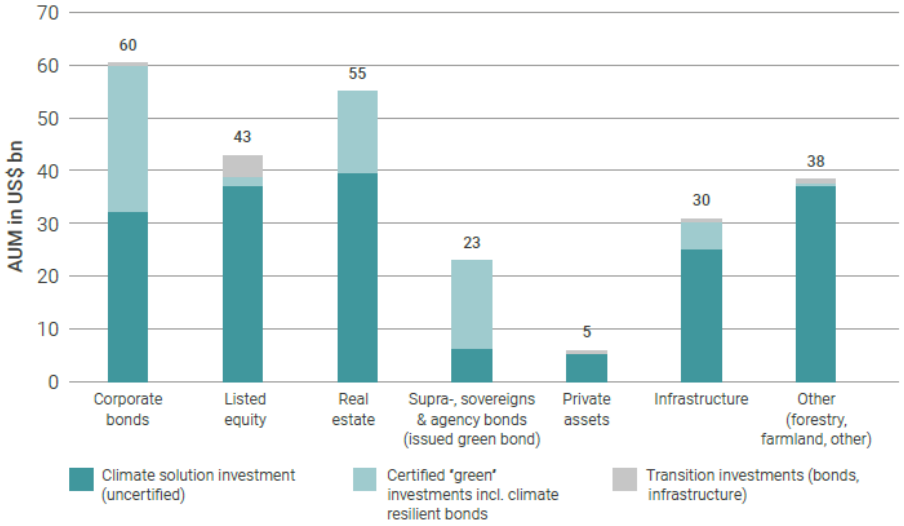
Source: The Alliance's members' data collected by the Alliance's MRV Track

Figure 14: Range in the share of climate solution investments (as percentage of total AUM)



In absolute terms, these investments now total US$253 billion. The following figure shows how this amount is allocated per asset class.

Figure 15: Climate solution investments per asset class (US$bn)



Source: Data from Alliance members collected by the Alliance's MRV Track

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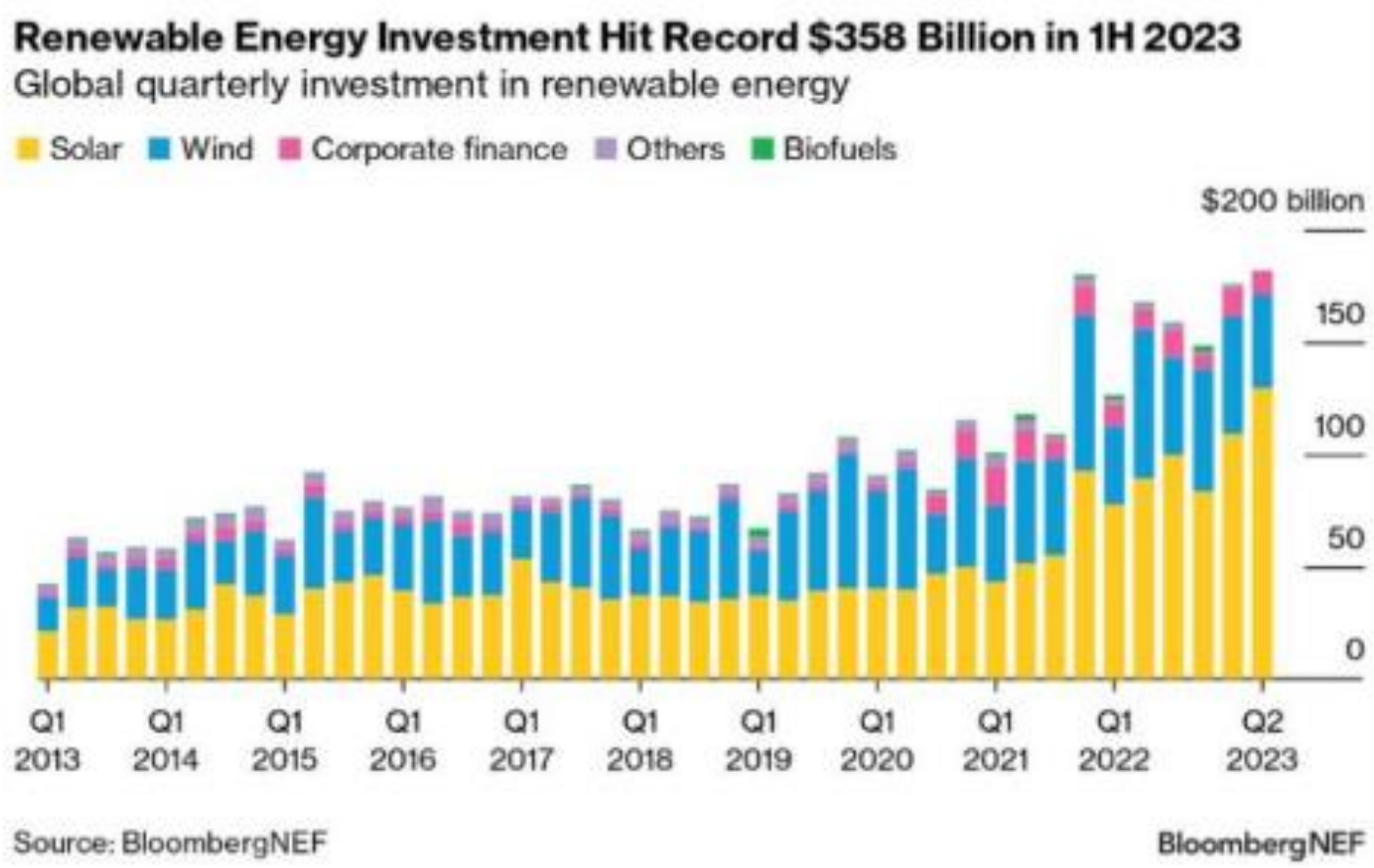
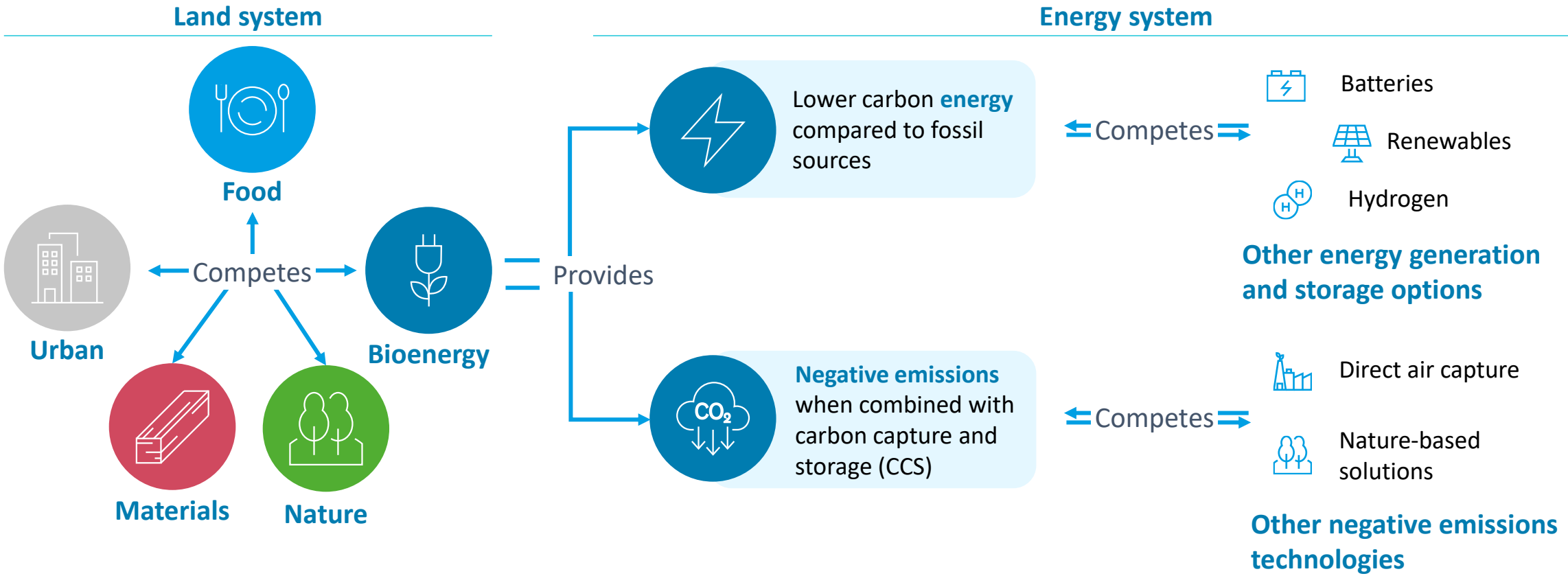
2)Infrastructure allocation trends: Clean Energy still dominant



Land: Competition for a fixed amount of land forces difficult trade offs between competing uses

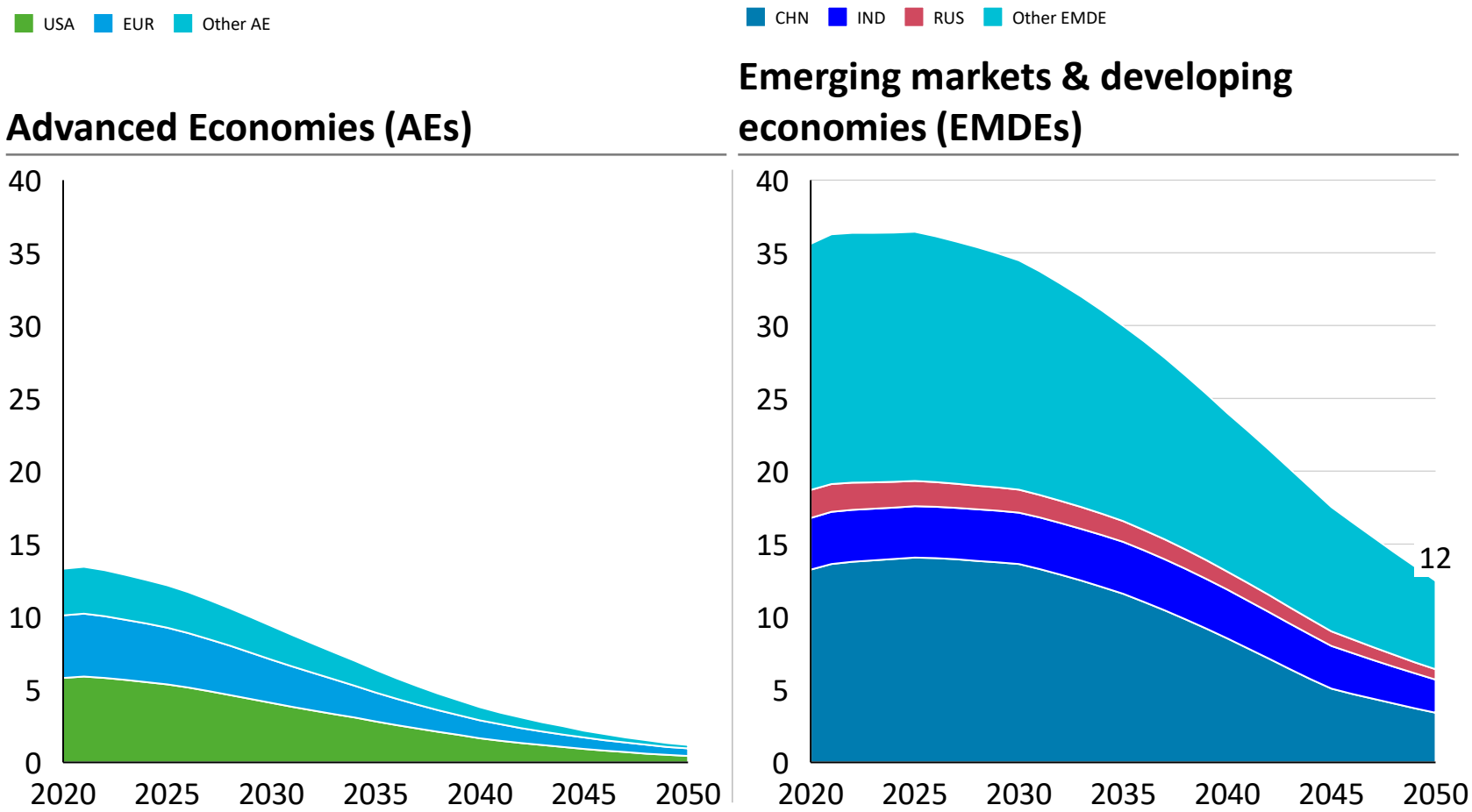
Climate, nature, and **affordability** outcomes represent **constraints on the outputs** we consume from the land system. Maintaining and restoring forested area, for example, is necessary for emissions and biodiversity targets to be realized.



Improving yields, changing consumption habits, and **reducing waste** can all **ease competition** and improve tradeoffs

Advanced Economies reach near-zero GHG emissions by 2050, with substantial emissions in Emerging and Developing Economies

Energy and Land GHG emissions[1] by region, $GtCO_2e$/year



- Except for the uptick in emissions following the recovery in activity post-COVID, **AEs see GHG emissions fall rapidly** to near-zero by 2050. **AEs could reach net-zero energy** emissions with CO_2 removals from DACCS (not shown)
- In EMDEs, **emissions continue to grow throughout the 2020s** due to growing population and incomes. **They still emit 12 $GtCO_2e$ in 2050** mainly from industry. Even easier-to-decarbonize sectors like power and transport do not do so fully
- Emissions reductions in both AE and EDME land systems are driven by NBS

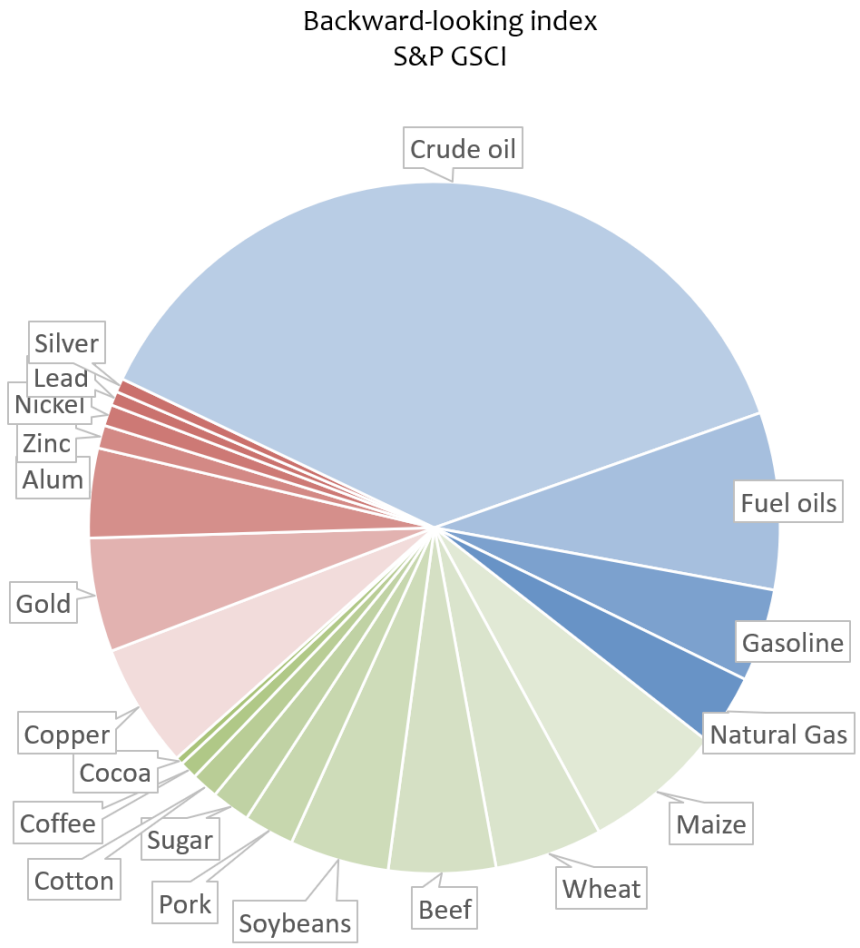
1. Emissions on a production basis. Includes carbon removals from BECCS but not DACCS

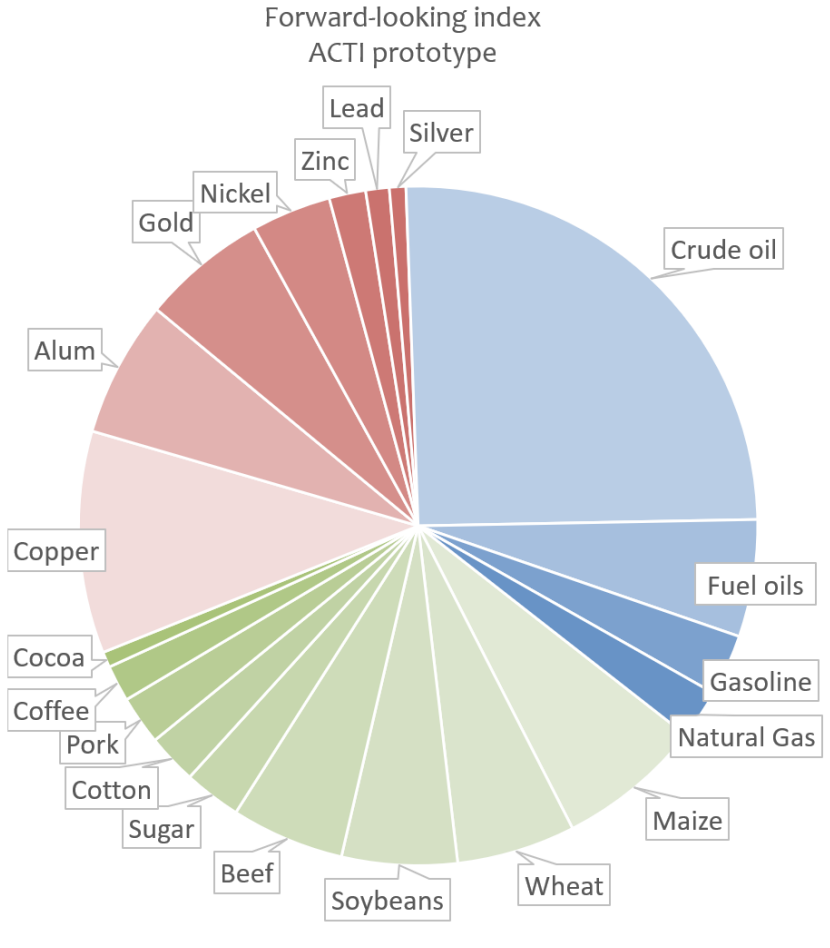
Investment Implications: the Opportunity Side of Transition

Electrification of everything	Decarbonization of land-use	Decarbonization of food	Removal of emissions
• Energy production: Solar, heat pumps, geothermal, hydrogen, biodiesel (if using organics waste) • Infrastructure / last mile to user: grids, batteries, materials	• Ag tech to reduce land use per unit • Nature-tech / carbon tech for land planning & policy enforcement	• Food tech to increase nutrients per unit / reduce methane per unit (cow) • Incumbents demonstrating first mover advantage in decarbonizing own Scope 3	• Only Nature can remove carbon reliably and profitably: NBS • New tech is emerging - CCS, DACCs, BECCs

Why are commodities such an opportunity?

- Current Commodities Indices fossil fuel dominant
- Future Commodities dominated by metals





Risks: What macro, market and system issues might impact returns?

- Energy forward shortfall predicted by some to 2030– how will it be filled, especially in EDME's?
- Macro cycles not helpful :Energy prices rise=inflation=High rates=higher cost of capital=government budget pressure=government inability to subside transition
- Macro impacts from Climate change are negative. (see FPS 2021Macro results)
- Global clean energy competition – can be disruptive if trade wars occur
- Grid, storage issues massively underestimated – e.g. US FERC improved but still in flux
- Gas v Battery storage a key equation
- Materials prices key to volatility

Risks : Sectors

- Real Assets – Clean Energy Infrastructure and Forestry growing rapidly but returns unclear and hard to track

- Volatility in clean assets also likely as high growth exposes poor strategies

- Energy switch in power and transport offer active equity managers opportunities. Oil demand in FPS 16% lower by 2035 so proven reserves of 47 years mean growth models under pressure.

Which jurisdictions hold risk and opportunities?

Opportunities:

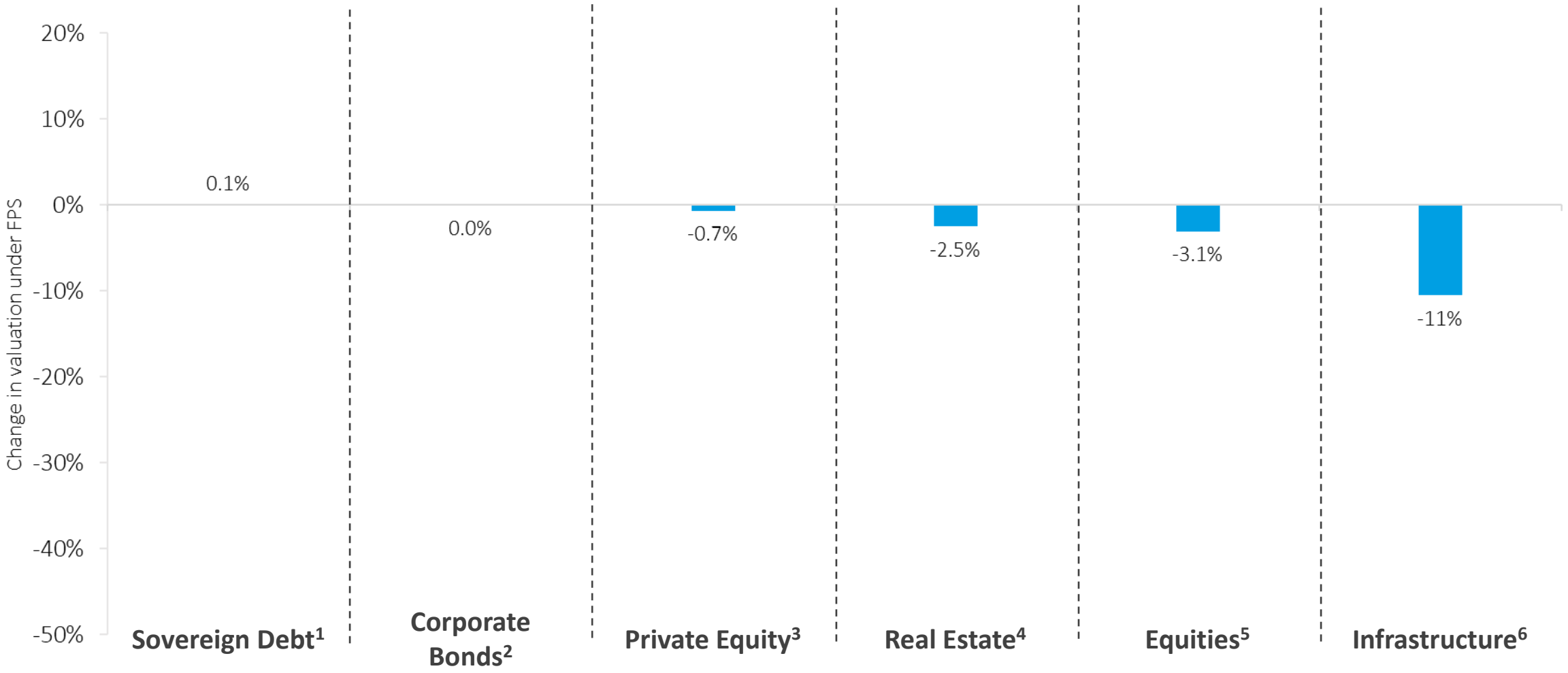
- USA powered by IRA seems set with bilateral support – race with China perceived
- EU responding to USA and is already in mature stage
- Emerging markets and developing economies clearly set for huge clean growth
- The new commodity economies – China (especially rare earths), Chile, Australia, Argentina, Peru, DRC, Indonesia (esp. Nickel), Brazil, Mozambique, Madagascar, Turkey, Philippines

Risks:

- Fossil Fuel Dependent Countries with high cost of extraction but not before 2035
- Trump election in US
- Emerging markets still seen as inherently risky

How did Asset Class variance look in the IPR 2019 analysis?

While not updated since 2019 the overall implications are still valid

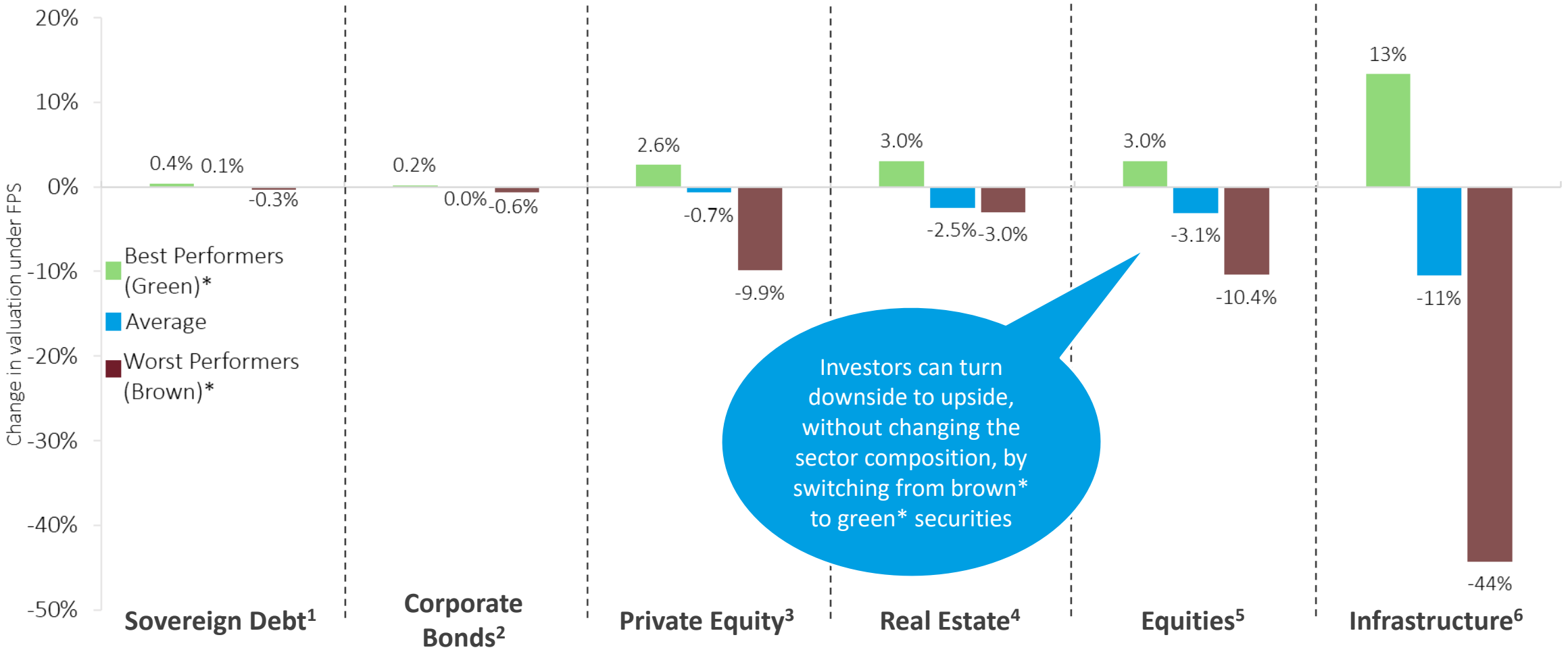


1 Sovereign Debt: USD 6-year (average tenor for USD debt), 2) Corporate Bonds based on bonds issued by companies within the iShares MSCI ACWI ETF,

3) Private Equity details on portfolio in PE slide, 4) Real Estate details on portfolio in Real estate section, 5) Equities is based on the MSCI ACWI ETF , 6) Infrastructure is based on iShares MSCI Infrastructure index

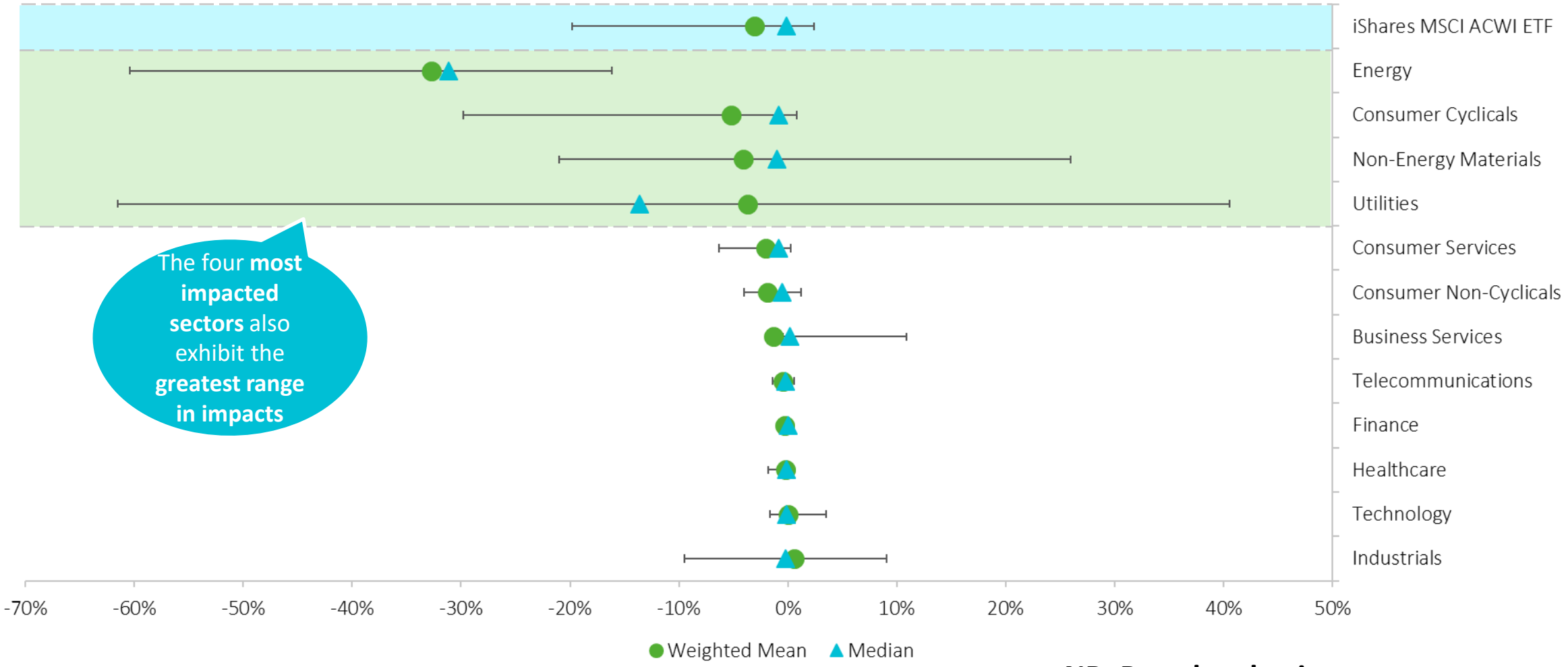
Source: Vivid Economics (Net-Zero Toolkit)

Illustrative Split based on IPR 2019; high and low carbon by Asset Class



Green* and Brown* indices for Corporate Bonds, Private equity, Read Estate, Equities, and Infrastructure are constructed by applying sector weights to the 90th and 10th percentile of companies (in terms of valuation change in FPS). Sovereign debt Green / Brown impacts are from 10Y debt from Canada and the Netherlands. Real Estate Green assumes carbon neutral building with no carbon costs, whereas brown is average buildings with no abatement.

Illustrative from IPR 2019: Returns Variation by sector



NB: Based on business models as at today

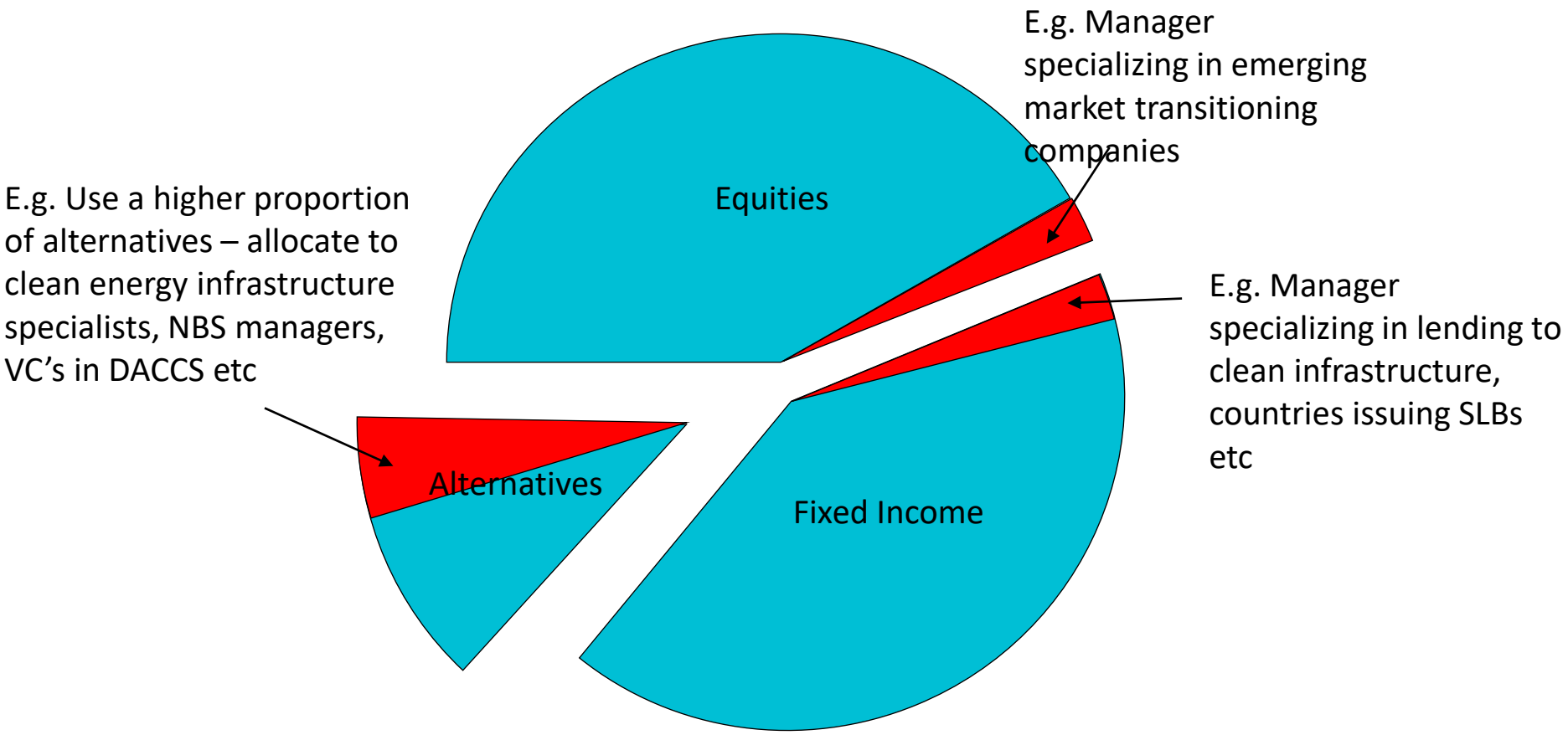
Notes: Error bars indicate the 10th and 90th percentiles of impact within each sector. Sectors: RBICS level 1.
Source: Vivid Economics Net Zero Toolkit

Asset Owners: Using your risk appetite to make impact

Asset Owners can only do so much BUT……

- There is a degree of risk appetite, risk tolerance or risk budget for all Asset Owners- If an AO wants to make climate impact it should use its risk budget for assisting areas of climate financing that most desperately need proving and drive peers to collaborate / follow the leadership example.
- This risk appetite needs to go beyond volatility and Standard Deviation at the SAA level.
- Climate Themed investors can use forward looking opportunities to help define their risk budget.
- Its time Investors' Responsible Investment Policy was used to temper reliance on Sharpe ratios, VAR etc.
- With tail end risks high in many parts of the climate theme, increased hedging also appropriate.

Translating risk appetite into themed SAA?



Disclaimer

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