PRI Principles for Responsible Investment

INEVITABLE POLICY RESPONSE

UNEP FINANCE INITIATIVE | United Nations Global Compact

An investor initiative in partnership with UNEP Finance Initiative and UN Global Compact

The Inevitable Policy Response 2022

Balancing Forecasting and Aligning – For Asset Owners

Julian Poulter,
Head of Investor Relations, IPR
Partner, Energy Transition Advisers
https://www.linkedin.com/company/inevitable-policy-response

PRI Principles for Responsible Investment

PRI commissioned the Inevitable Policy Response in 2018 to advance the industry's knowledge of climate transition risk, and to support investors' efforts to incorporate climate risk into their portfolio assessments.

vivideconomics putting economics to good use

Energy Transition Advisors ETA

A research partnership led by Energy Transition Advisers and Vivid Economics conducts the initiative's policy research and scenario modelling and includes 2Dii, Carbon Tracker Initiative, Climate Bonds Initiative, Planet Tracker and Quinbrook Infrastructure Partners.

The consortium was given the mandate to bring leading analytic tools and an independent perspective to assess the drivers of likely policy action, and the implications on the market.

Planet Tracker

quinbrook infrastructure PARTNERS

2° Investing Initiative

Carbon Tracker Initiative

Climate Bonds Initiative

Who supports the Inevitable Policy Response ?

Strategic partners consisting of leading financial institutions have joined the IPR in 2021 to provide more in-depth industry input, to further strengthen its relevance to the financial industry.

BLACKROCK

FitchRatings

nuveen
A TIAA Company

BNP PARIBAS

Goldman Sachs Asset Management

Core philanthropic support since IPR began in 2018. 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.

GORDON AND BETTY MOORE FOUNDATION

THE FINANCE HUB

climateworks FOUNDATION

How we support Asset Owners

- Provide clarity around “climate scenario” choices
- Highlight the application and integration challenges of the inevitable transition
  - To help implement climate strategy including engagement
- Offer insight into 1.5 degree alignment vs. maximising returns
- Discuss insights into Asset Manager selection, incentivisation, and alignment

All IPR resources are publicly available on the PRI website at:
https://www.unpri.org/sustainability-issues/climate-change/inevitable-policy-response

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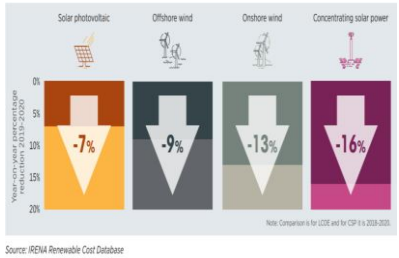
The pressure on institutional investors is at an all time high

Drivers of momentum makes an accelerated forceful policy response more likely

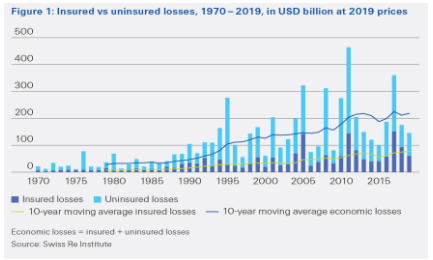
Extreme weather events

Impacts on security

Cheaper renewable energy



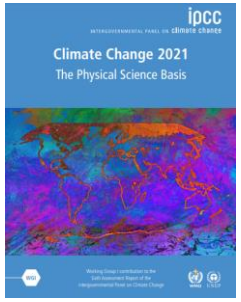
Uninsurable world



Civil society action

Financial regulator warnings on stability

New climate research



Influence shifting

Climate Action 100+
Global Investors Driving Business Transition

New geopolitics of energy

INEVITABLE POLICY RESPONSE

IPR Policy Forecast Drivers Process

Extreme weather events

Impacts on security

Civil society action

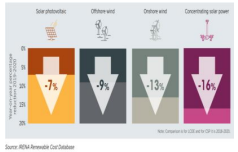
New climate research

ipcc
INTERGOVERNMENTAL PANEL ON climate change

Drives pro-active climate policy supplemented by:

Core Drivers

Cheaper renewable energy



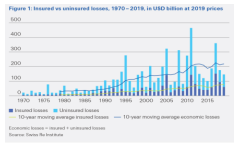
Influence shifting

General geopolitics of energy

Financial regulator actions

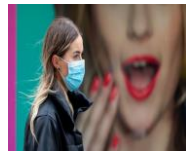
Climate Action 100+
Global Investors Driving Business Transition

Uninsurable world



Disruptive unpredictable risks

Covid 19



Ukraine

INEVITABLE POLICY RESPONSE

The structure of the IPR framework

Drivers of policy

- Extreme weather events
- Uninsurable world
- New climate research
- Impacts on security
- Civil society action
- Influence shifting
- Cheaper renewable energy
- Financial regulator warnings on stability
- New geopolitics of energy

IPR Policy Forecast

A **high-conviction policy-based forecast** of forceful policy response to climate change and implications for energy, agriculture and land use

IPR Scenarios

IPR 1.8°C Forecast Policy Scenario (FPS)

A **fully integrated climate scenario** modelling the impact of the forecasted policies on the real economy up to 2050, tracing detailed effects on all emitting sectors

IPR 1.5°C RPS Scenario

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. This can be used by those looking to align to 1.5°C

Note: IPR analyses transition risk only, not physical risk

IPR value drivers

A set of publicly available **outputs from the FPS and 1.5°C RPS** that offer significant granularity at the sector and country level allowing investors to assess their own climate risk

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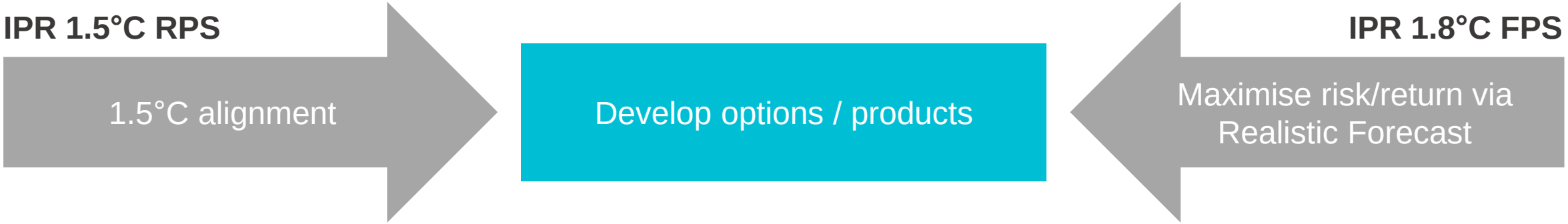
Climate transition presents challenges and investment opportunities for Asset Managers



Likely outcomes:

- Reduce emissions at the portfolio level
- Questionable impact in real world without re-allocation of capital to low carbon assets
- Return loss if RPS 1.5 policies do not materialise
- Possible unintended consequences of divestment

Desired and likely outcome:

- Reduce emissions at the portfolio level but less than RPS
- Maximisation of risk and return
- Real world emission reduction aligning with policy materialisation

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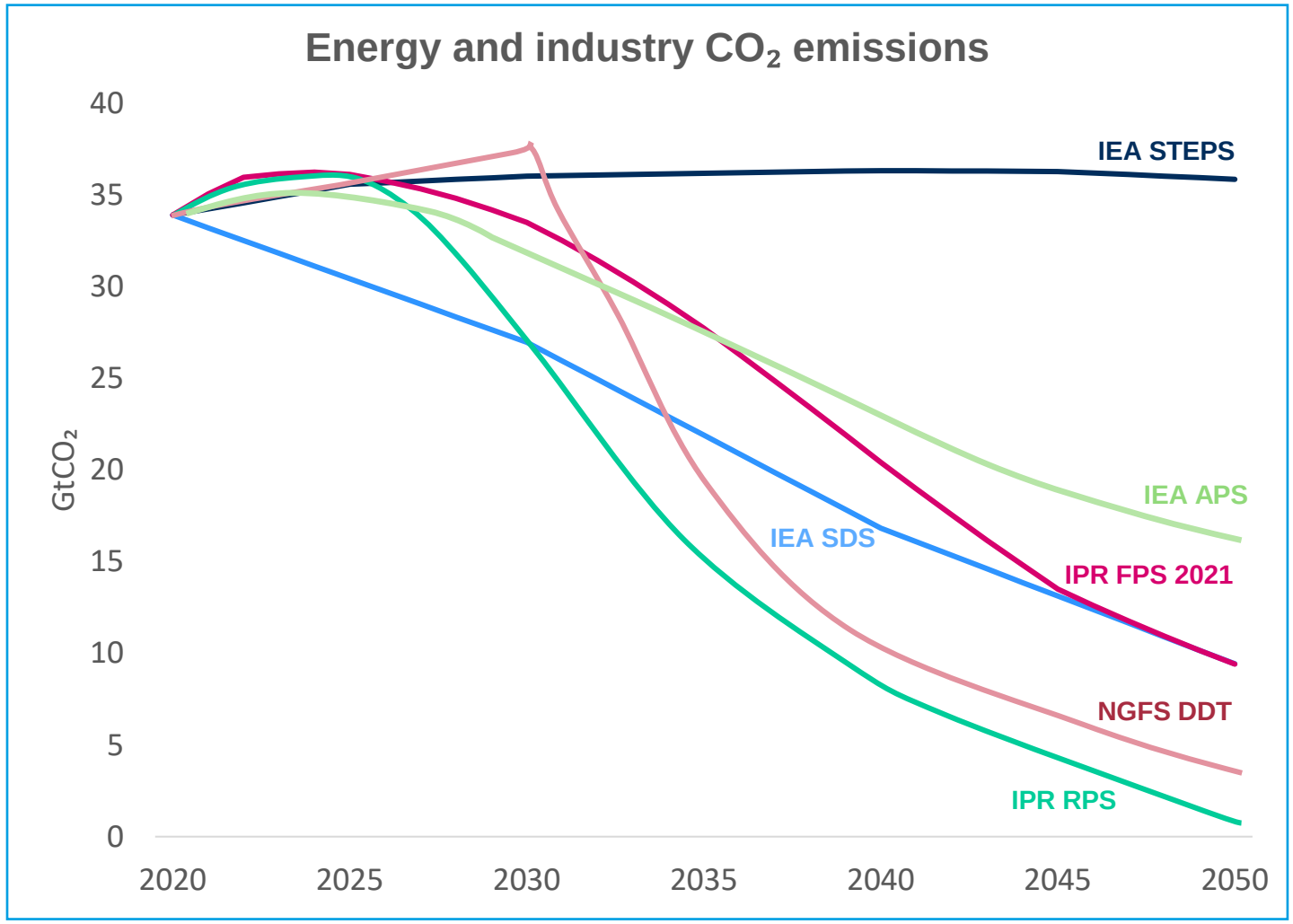
Key role of service providers

- **Investment Consultants / OCIOs:**
  - Asset Owners should assess their investment consultants' climate capacity
  - Investment consultants are critical to developing strategies for climate transition
  - Barriers: perception of "risky advice" and going against traditional SAA approaches
- **Ratings Agencies** – Can integrate IPR into ratings analysis (Fitch already doing so)
- **Data providers** – Can build new offerings integrating IPR public data
- **Index Providers** – Can create new benchmarks and semi-passive product
- **Proxy advisers** – Can make voting recommendation based on IPR realism

Scenario market in terms of emissions outcomes in energy related sectors



- Note strong COVID bounce backs for both IPR FPS and IPR RPS
- Delay on NGFS DDT (Disorderly Delayed Transition) is beyond IPR inflection point
- Neither IEA nor NGFS include full land use emissions or sequestration potential

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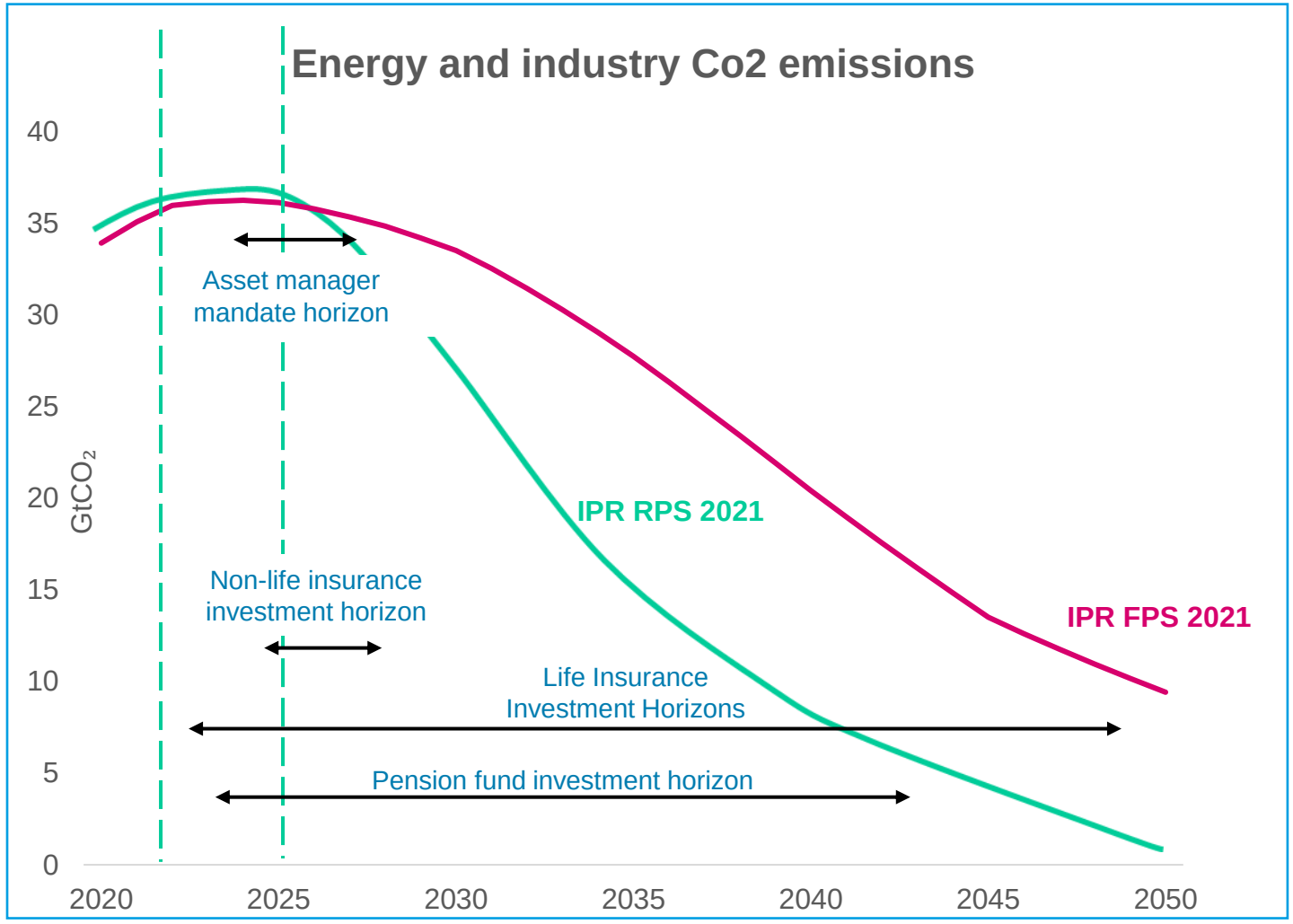
* Data on IEA CO2 pathways are published in 5-year intervals ** IPR FPS 2019 was modelled in 5-year increments
Note: IEA scenario data based on May 2021 Net Zero Emissions report; in WEO2021, IEA APC is renamed Announced Pledges Scenario (APS), with a slightly modified emissions pathway

IPR scenarios in terms of key investor time horizons



- Time horizons relevant in scenario analysis for determining likely behaviour and analysis

INEVITABLE POLICY RESPONSE

* Data on IEA CO2 pathways are published in 5-year intervals ** IPR FPS 2019 was modelled in 5-year increments
Note: IEA scenario data based on May 2021 Net Zero Emissions report; in WEO2021, IEA APC is renamed Announced Pledges Scenario (APS), with a slightly modified emissions pathway

Russia Ukraine War - Implications for IPR

For IPR Forecasts we see four overarching themes at this stage:

1) Reinforcement of medium (3-5 Years?) and long-term term IPR renewable energy and Green Hydrogen policies and sector forecasts
2) Short term (1-2 years) energy supply crisis for EU with many uncertainties and sourcing of Fossil Fuel supplies outside of Russia
3) For the IPR 1.8°C Forecast Policy Scenario this means that the fossil fuel sector supply dynamics will need reassessing eg split between piped natural gas and LNG, geography of origin etc
4) But we do not see any divergence from trend in demand side sectors, if anything an eventual acceleration towards more green outcomes

Note that one potential outcome is an “all of the above” where fossil fuels remain longer in the system as security back up (low-capacity utilisation) and the cost id borne in effect as an energy security cost.

Ukraine-Investor implications for the new geo-politics

- Strong reinforcement of IPR medium term renewables forecasts with good upside – implications for renewable infrastructure and transitioning companies
- Russian exposed debt, sovereign and corporate, requires urgent analysis whilst ratings agencies calculate impact
- Net Zero aligners will miss out on fossil fuel short term boom
- Net Zero alignment even lower probability
- No divergence from trend in demand side sectors, if anything an acceleration towards more green outcomes.
- Non aligners need to beware Capex expansion will be justified in the short term but will increase stranded asset risk
- Engagement - will O&G companies use windfall for transition?

Policy developments are scored using a 10-point scale to indicate magnitude and direction of impact on IPR scenario forecasts

A 10-point scale applied to policy developments to indicate impact on IPR 1.8°C FPS policy forecasts (implications for the 1.5°C RPS policy forecasts can also be drawn)

- 0-1 indicates **increasing evidence for deceleration** in policy forecast
- 2-4 indicates **evidence for deceleration** in policy forecast
- 5 indicates **no change** in policy forecast
- 6-8 indicates **evidence for acceleration** policy forecast
- 9-10 indicates **increasing evidence for acceleration** in policy forecast

A similar 10-point scale is applied to energy/land technology developments

Scale	Details	Impact on policy forecast
0	Evidence for significant deceleration in policy forecast	Potential for 10+ year downgrade
1	Evidence for large deceleration in policy forecast	Potential for 10-year downgrade
2	Evidence for moderate deceleration policy forecast	Potential for 5-year downgrade
3	Evidence for small deceleration in policy forecast	Potential for <5-year downgrade
4	Some evidence for marginal deceleration in policy forecast	Monitor developments
5	Confirmatory (reinforces and increases probability of 1.8°C FPS)	Does not change forecast
6	Some evidence for marginal acceleration in policy forecast	Monitor developments
7	Evidence for small acceleration in policy forecast	Potential for <5-year upgrade
8	Evidence for moderate acceleration in policy forecast	Potential for 5-year upgrade
9	Evidence for large acceleration in policy forecast	Potential for 10-year upgrade
10	Evidence for significant acceleration in policy forecast	Potential for 10+ year upgrade

Greater likelihood of 2.3°C IEA STEPS[1] scenario

1.8°C IPR FPS

Greater likelihood of 1.5°C IPR RPS scenario

* The IEA's 'Stated Policy Scenario' or STEPS reflects current policy settings based on a sector-by-sector assessment of the specific policies that are in place, as well as those that have been announced by governments around the world

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Q2 2022

Between COP 26 and June 2022, majority of energy/land policy & technology developments mostly show confirmation of IPR Forecasts

Greater likelihood of 2.3°C IEA STEPS* scenario ← **1.8°C IPR FPS** → **Greater likelihood of 1.5°C IPR RPS scenario**

	Significant deceleration	Large deceleration	Moderate deceleration	Small deceleration	Marginal deceleration	Confirmatory (increased probability of 1.8°C FPS)	Marginal acceleration	Small acceleration	Moderate acceleration	Large acceleration	Significant acceleration	
Score	0	1	2	3	4	5	6	7	8	9	10	Total
Global					1	11	3					15
US				1	2	12						15
China						7	3					10
EU						7						7
Germany						4	2					6
France							1					1
UK						5		1				6
Brazil					2	5	1					8
India						3						3
Indonesia						3						3
Canada						1						1
Nigeria						2						2
South Africa						1						1
Saudi Arabia						2						2
South Korea						1						1
Japan						2						2
Australia						2						2
Total				1	5	68	10	1				85

Q1 & Q2 2022

i. This assessment covers the period from COP 26 to mid-June 2022

ii. The IEA's 'Stated Policy Scenario' or STEPS reflects current policy settings based on a sector-by-sector assessment of the specific policies that are in place, as well as those that have been announced by governments around the world

IPR Value Add

Characteristics of Scenarios	IPR	Most "aligned" Scenarios
A high conviction policy-based forecast with realistic constraints	☑	
Transparent	☑	
Applicable to TCFD reporting	☑	☑
Complete forecast includes macroeconomic, energy and land use models	☑	
Covers all regions of the world	☑	☑
Fully integrating land-use	☑	
Built for investors with investor input	☑	
Usable for stress testing	☑	☑

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Example of differences between 1.8°C FPS and 1.5°C RPS in key sector – Unabated Coal

Phase out of existing unabated coal

	Timeline								annual reduction*	
	2020	2025	2030	2035	2040	2045	2050	2055	2060	RPS	FPS
AU			RPS		FPS					10%	5%
BRA				RPS		FPS				7%	4%
CAN		RPS	FPS							20%	10%
CHI				RPS		FPS				7%	4%
CSA				RPS		FPS				7%	4%
EEU			RPS		FPS					10%	5%
EURA						RPS			FPS	4%	3%
GCC						RPS			FPS	4%	3%
IND						RPS			FPS	4%	3%
INDO						RPS			FPS	4%	3%
JAP				RPS		FPS				7%	4%
MENA						RPS			FPS	4%	3%
RU						RPS			FPS	4%	3%
SA						RPS			FPS	4%	3%
SAF				RPS	FPS					7%	5%
SEAO						RPS			FPS	4%	3%
SK				RPS		FPS				7%	4%
SSA						RPS			FPS	4%	3%
UK		Both								20%	20%
USA			RPS	FPS						10%	7%
WEU			RPS		FPS					10%	5%

** reduction in coal generation as a share of 2020 levels*

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Example of differences between 1.8°C FPS & 1.5°C RPS in key issue – Deforestation

Deforestation of natural forest halted through strong and effective command and control policy

Countries/regions like CAN, GCC, JAP, SA, SK, UK have virtually zero net deforestation

End of deforestation				Change in forest cover 2020-2050 (m ha)	
	2020	2025	2030	IPR FPS 2021	IPR 1.5C RPS
AU		FPSRPS		3	3
BRA		RPS	FPS	12	16
CAN	FPSRPS			1	1
CHI		RPS	FPS	92	92
CSA		RPS	FPS	10	14
EEU		FPSRPS		4	4
EURA		RPS	FPS	1	2
GCC	FPSRPS			0	0
IND		RPS	FPS	13	13
INDO		RPS	FPS	2	6
JAP	FPSRPS			0	0
MENA		RPS	FPS	-1	1
RU		RPS	FPS	1	2
SA	FPSRPS			0	0
SAF		RPS	FPS	0	1
SEAO		RPS	FPS	3	11
SK	FPSRPS			0	0
SSA		RPS	FPS	0	15
UK	FPSRPS			1	1
USA		FPSRPS		17	17
WEU		RPS	FPS	11	12

Carbon pricing and NDC commitments combine to stop net deforestation by 2030. Biggest changes need to occur in BRZ, CSA, INDO, SEAO, SSA

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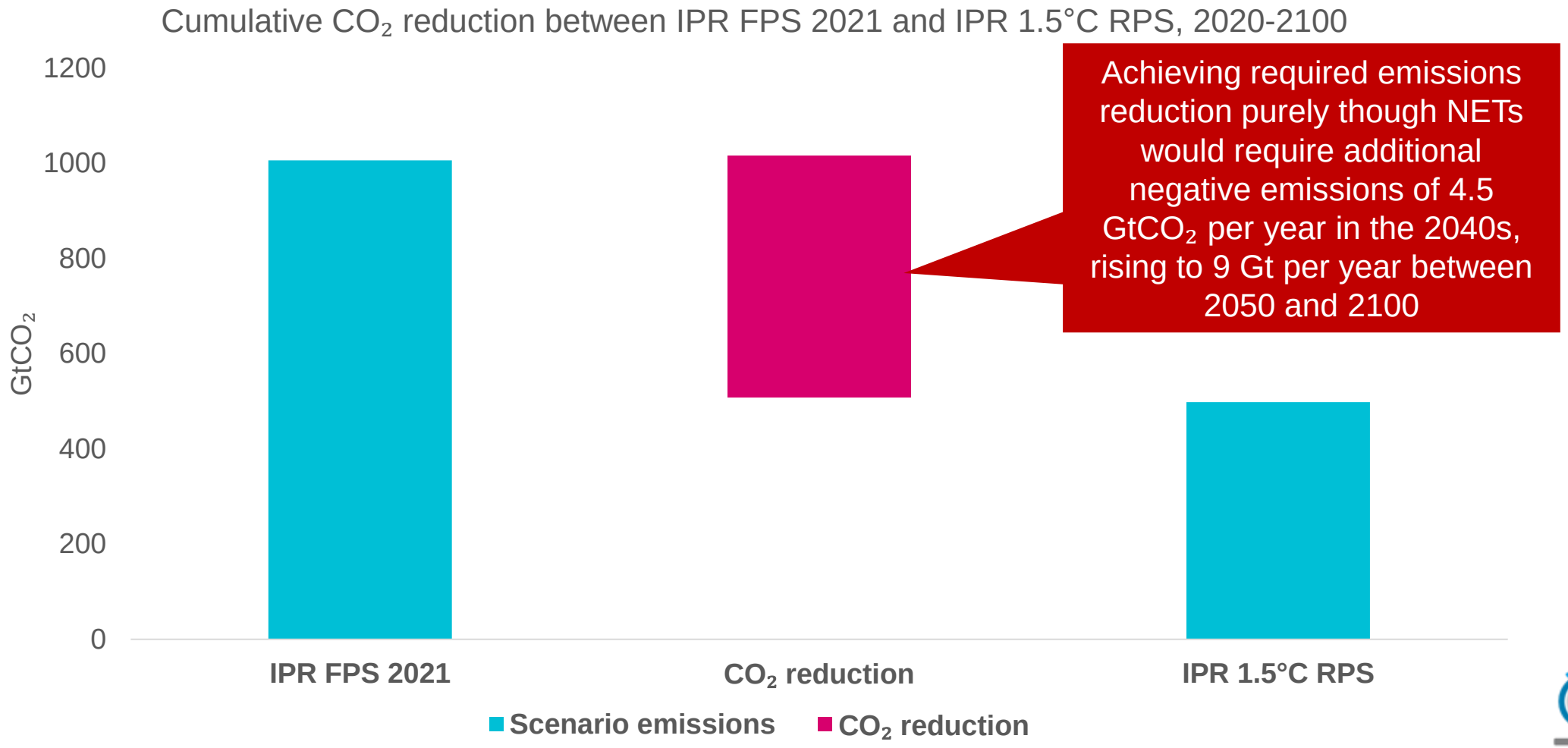
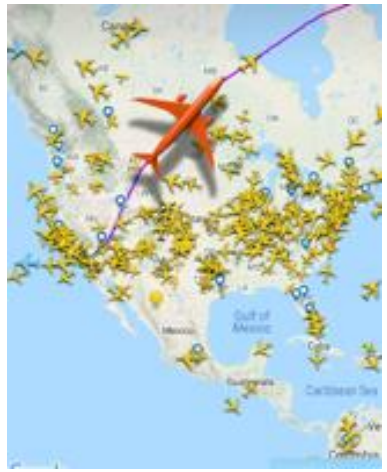
Achieving 1.5°C with less aggressive action on fossil CO_2 emissions would require substantially more negative emissions technologies (NETs)



The Value Drivers Database Explained

The IPR Value Drivers database is the largest and most comprehensive in the world enabling direct input into investor valuation models

- Data summary:
  - All major jurisdictions covered
  - Annualised data
  - Emissions by GHG type
  - Investment by technology type by jurisdiction by sector
  - Power Demand by fuel type by jurisdiction
  - All major sectors covered
  - Huge Land Use component
  - Price data derived
  - Macro-economic assumptions
- Designed in collaboration with IPR Strategic Partners and Research Consortium Partners
- Will facilitate opportunity to build new wave of product
- Hundreds of thousands of data points



- **Jurisdiction:** 21 world regions including 12 G20 countries
- **Countries:** Australia, Brazil, Canada, China, India, Indonesia, Japan, Russia, South Africa, South Korea, United Kingdom, United States
- **Composite regions:** Central and South America, Eastern Europe, Eurasia, Gulf co-operation Council; Middle East and North Africa, South Asia, South East Asia and Oceania, Sub-Saharan Africa, Western Europe

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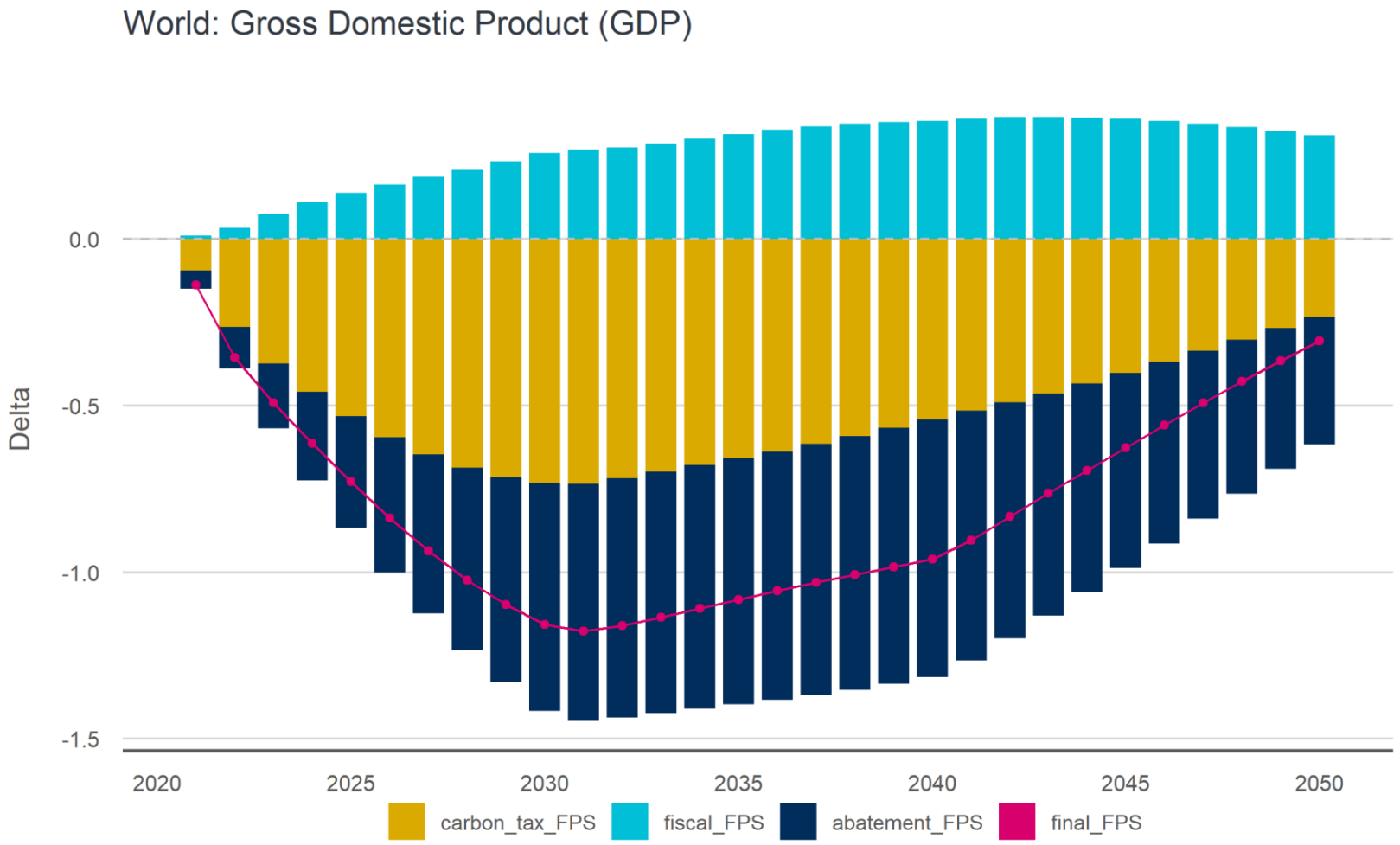
GDP impact: Global

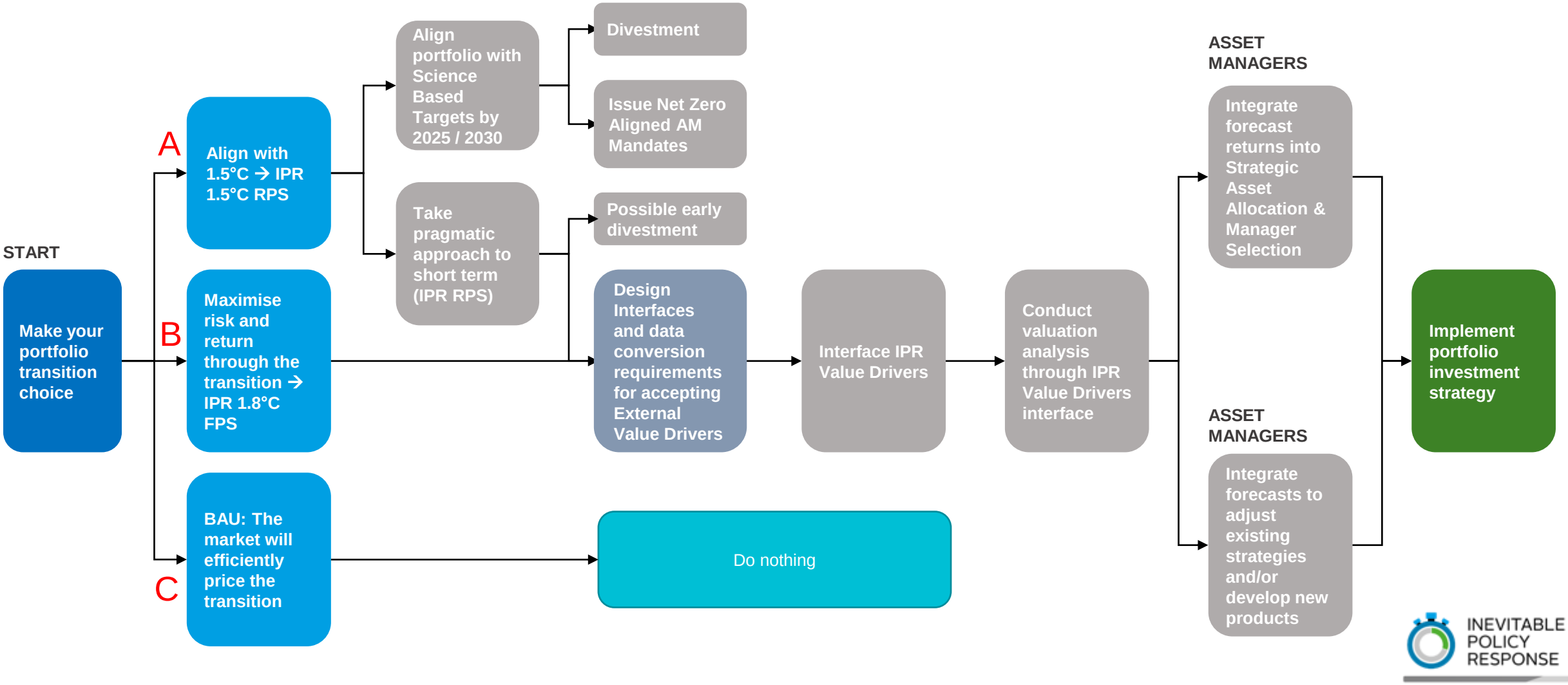


- The majority of negative final impacts are significantly mitigated by 2050 (see the pink line)
- The next 10 years appear to be crucial to cut emissions but also for economic cost to erupt
- FPS's carbon tax and abatement shocks could have a mild impact in the global economy by 2030 (less than 1.5%)
- This is partly offset by carbon revenue recycling back into the economy (through a combination of debt repayment, transfers, or government investments)

INEVITABLE POLICY RESPONSE

Source: NIGEM based on IPR inputs
Note: Delta is calculated as the relative % difference compared to the baseline scenario; no physical impacts are included in this analysis.

IPR Climate transition Integration



Asset Owners - key issues around Net Zero

- **Your Strategy**
  - IPR FPS is focused on real world impact, not portfolio impact. Net Zero portfolio targets can be challenging for portfolio teams to implement
  - Some fiduciary investors struggle with implications of large scale divestment - a blunt instrument that ignores company transition planning
  - Are you prepared to adjust your strategic asset allocation eg from equities to real assets / infrastructure for financial and climate returns?
- **Your Asset Managers**
  - Does giving your asset managers your short term portfolio intensity targets create unintended consequences?
  - Are you incentivising asset managers to go early or wait for clear policy and market signals?
  - What do you do with an asset manager who underperforms their benchmark for several years because they reduced exposure to carbon assets early and before policies and markets adjusted?
- **Your Climate Impact**
  - Divestment is driving assets off market where they can't be influenced

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Asset Owners – How the IPR thinks Net Zero could turn out

- Policies will not arrive in time to drive towards non NETS 1.5°C
- Without the policy progress, non NETS 1.5°C will lose credibility
- Non-divesting Net Zero aligners with 2025 targets will either start to divest or miss their targets
- Some aligners will lose return because of some strong performance by transitioning fossil fuel companies and concentration risk
- Discussion of some Net Zero realities will surely increase:
  - Divestment at scale will accelerate the selling of assets off market where they cannot be influenced
  - Without capital re-allocation to solutions in equal levels to divestment, real climate impact will be minimal - focus will turn to how investors are investing in solutions
  - It will become obvious that NZ aligners will achieve a clean portfolio will be clean but the world climate will be unaffected
  - Aligners will realise their so-called NZ portfolios are actually underpinned and supplied by non-OECD countries with high emissions
- NZ aligning Investment Managers will blame clients and policies
- Focus will turn to how to help non-OECD countries
- Focus will turn to NETS

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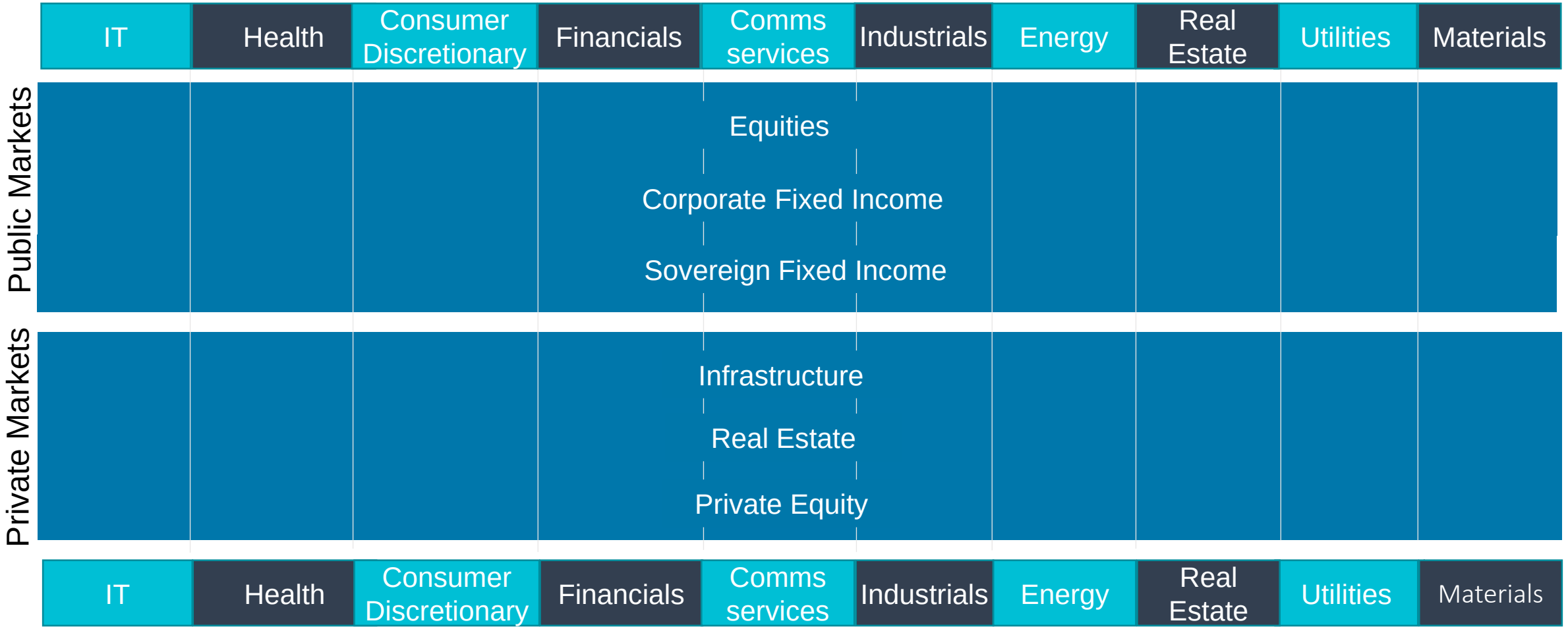
Conclusion on Net Zero

Logical follow on:

- Engage policymakers on RPS 1.5
- Invest in NETs ASAP
- Invest in value-add infrastructure
- Re-incentivise managers towards medium term

Climate transition theme demands sector and asset class matrix analysis



***Note**: Not market cap weighted and not all sectors have presence in each asset class*

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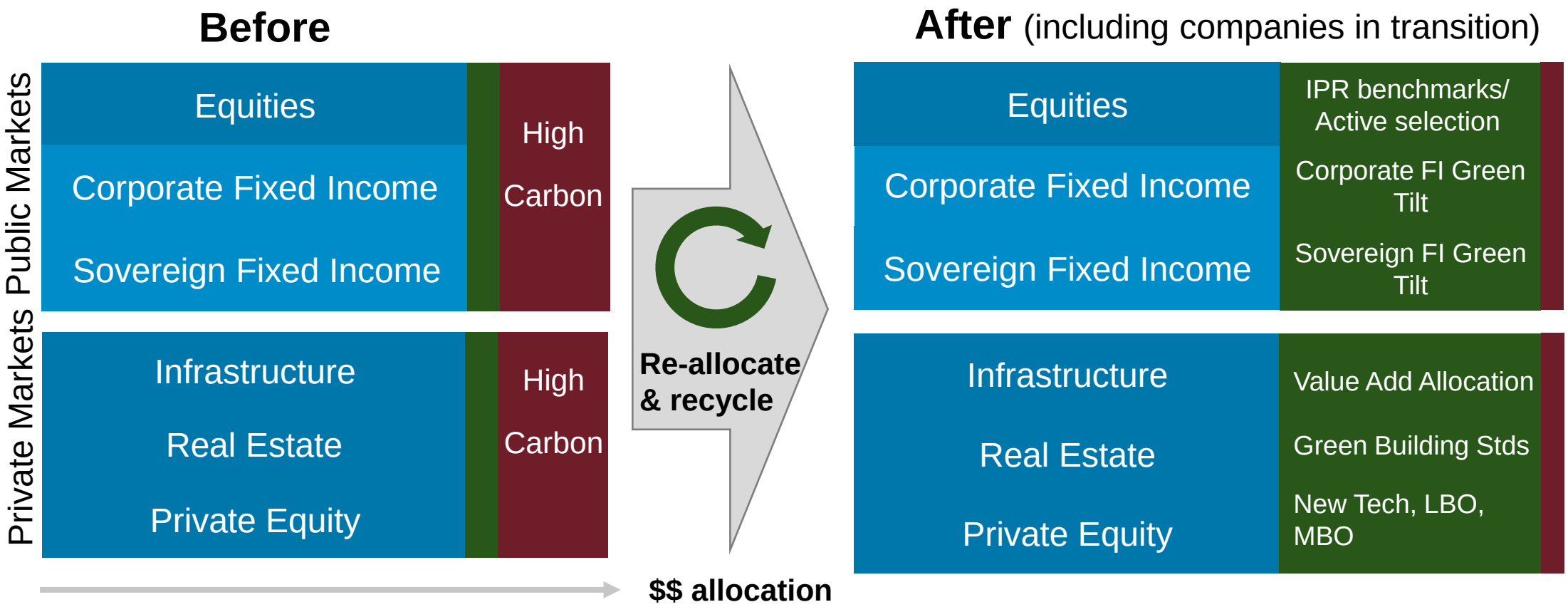
The portfolio carbon switch by asset class



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Key philosophies challenged by the climate transition

- **Fiduciary duty**
  - Restriction on ignoring risk adjusted return maximisation?
  - Licence to act proactively on climate strategy
- **Agency responsibility**
  - Who is responsible for establishing a climate strategy?

Some may consider others such as EMH (Efficient Market Hypothesis) or MPT(Markowitz)

Human issues for asset managers to manage and consider

- Culture
- Behaviours
- Incentives
- Career Risk

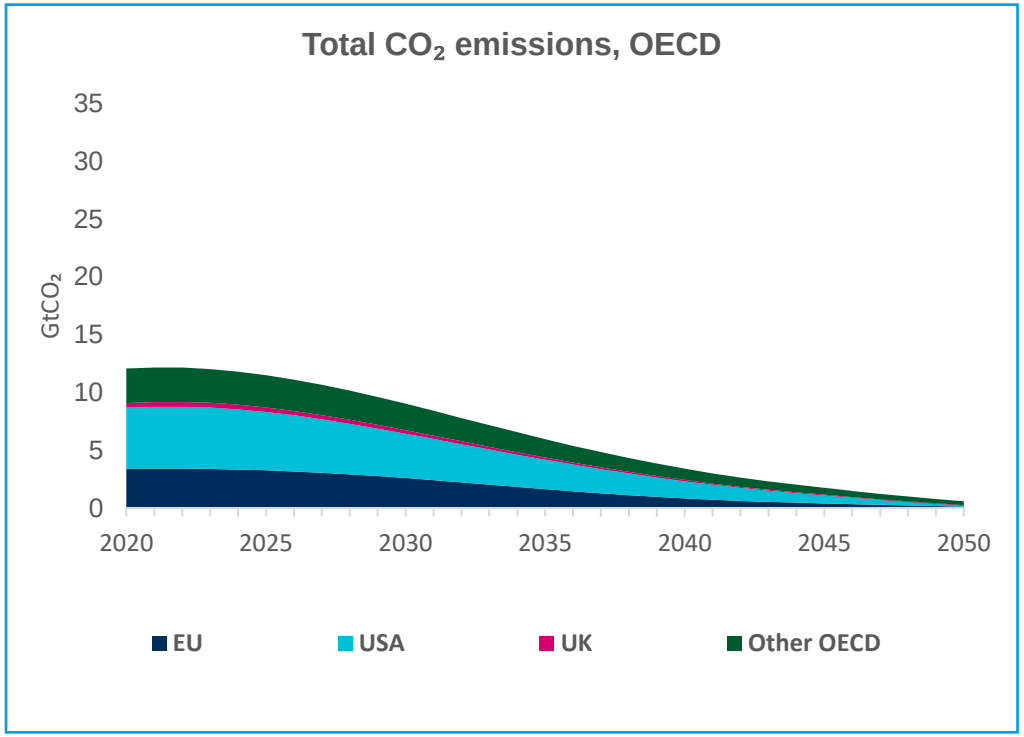
Informational barriers to taking action on climate change:

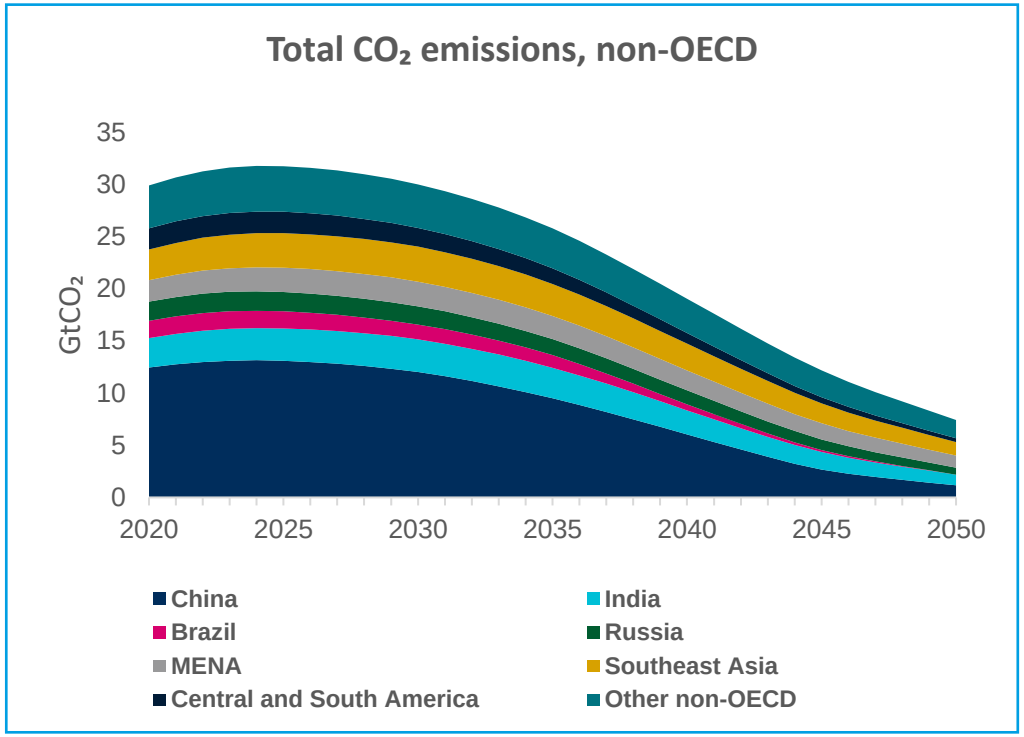
- Data, tools, metrics, scientific evidence, knowledge

Behavioural barriers to taking action on climate change:

- Cognitive biases, psychological underpinnings

Asset Allocation – do we have barriers to investing in emerging markets where the decarbonization opportunities are?





- Note this is only in terms of scope 1 &2 emissions as OECD "export" emissions to emerging markets through supply chains

- Non-OECD needs substantial investment from OECD to transition
- Potential Sovereign Debt Implications

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Key 6 issues for an Asset Owner board

1) If we align with 1.5°C, and start to underperform, what happens?
2) Where is our house view relative to IPR?
3) What degree of climate transition is priced into the market?
4) Do we have the skills and ability to implement this mitigation plan?
5) What are the structural barriers?
6) What human, cultural, behavioural and incentive barriers exist to implementing this mitigation plan?

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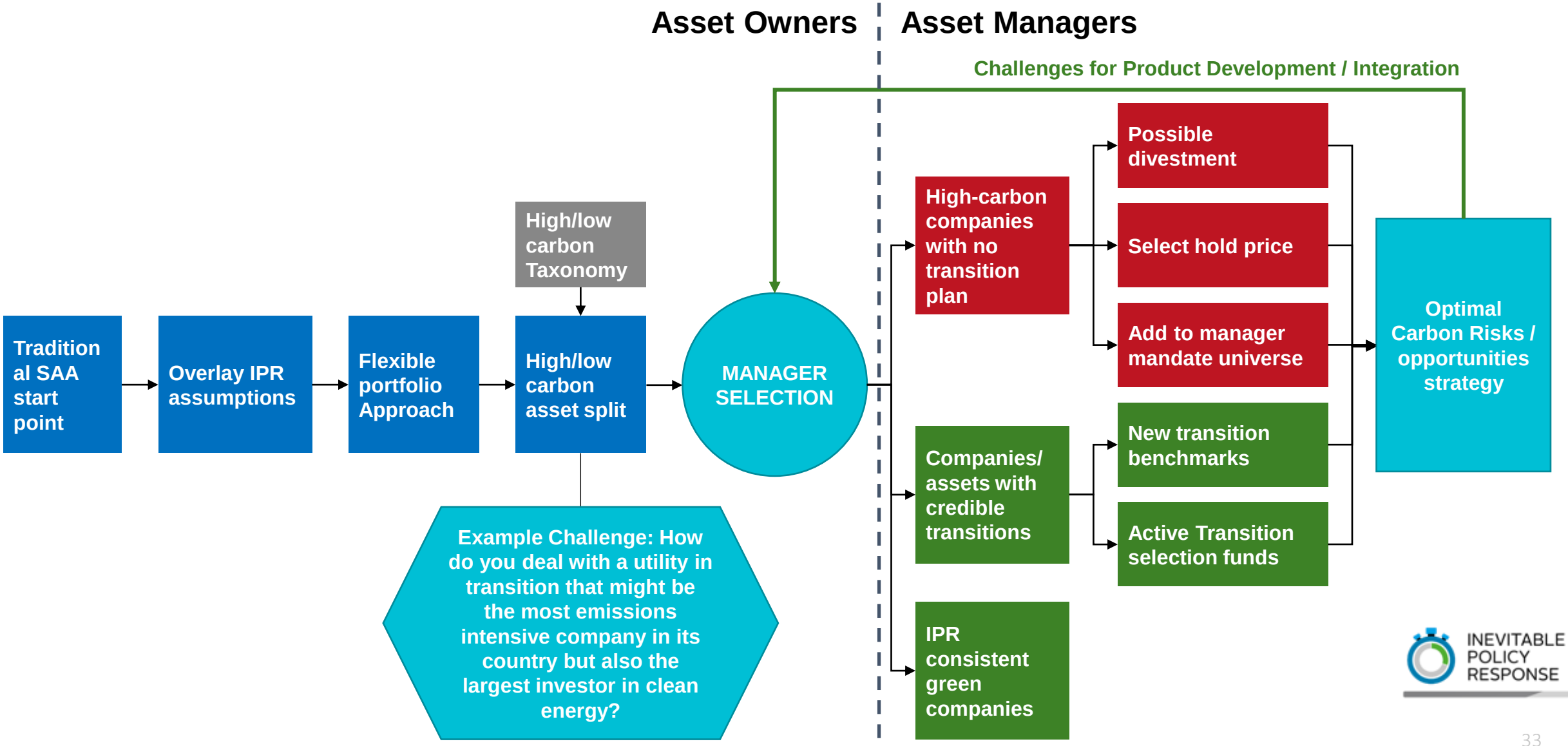
Whole system view - from asset allocation to company analysis and stock selection



Issues in manager selection for Asset Owners

- All managers scrambling for solutions and expertise
- How do you and/or your investment consultant assess managers on this issue?
- You want innovative new product from your managers, but you also want:
  - 3 year track record
  - Limited tracking error on equities?
- You want to invest in solutions but:
  - You have limited experience in specialist infrastructure or PE managers
  - You have limits on emerging market allocations (where the emissions are!)
- With so much going in the space, isn't it easier to ride the status quo?

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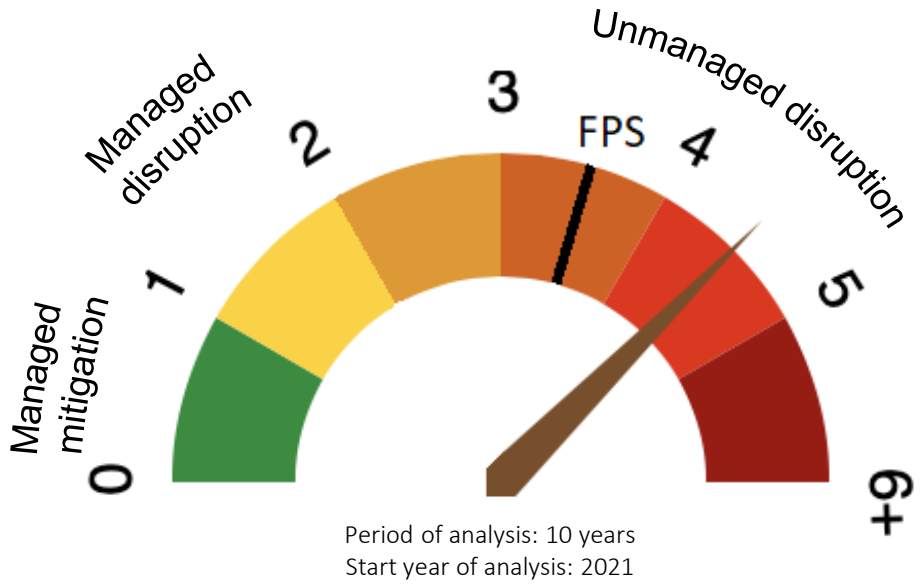
Using IPR 1.8°C FPS 2021

PACTA Transition Disruption Metric

Visual representation of the TDM*

- If we align with 1.5 deg and we underperform, what happens?

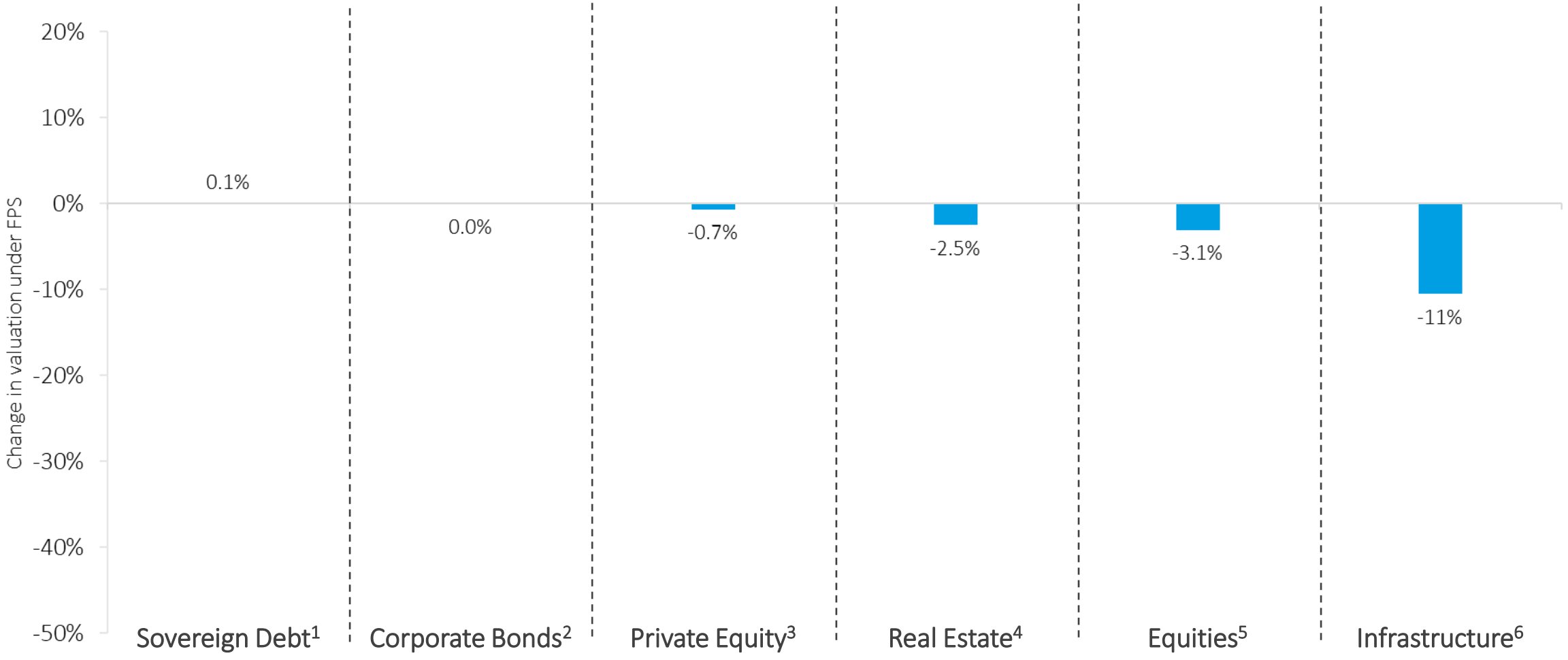


- **Full mitigation (0):** The portfolio is ahead of the FPS scenario pathway.
- **Managed mitigation (from 0 to 1):** Residual disruption consistent with the effort in years 1 to 5. Over 1, suggests that the portfolio needs to accelerate the transition relative to its current capital stock evolution projections, but this acceleration is in line with historical growth rates of the sector.
- **Managed disruption (1 to 2):** is in line with the FPS acceleration which involves some disruption that is still manageable.
- **Unmanaged or high disruption (over 2):** An unmanaged or high disruption suggests the portfolio is already lagging the FPS scenario benchmark and will involve significant unmanaged disruption over the next decade if / when the FPS scenario materializes.

See: https://2degrees-investing.org/resource/pacta/

* This visual representation should be considered as an example given that the metric is under construction and may have slight variations.

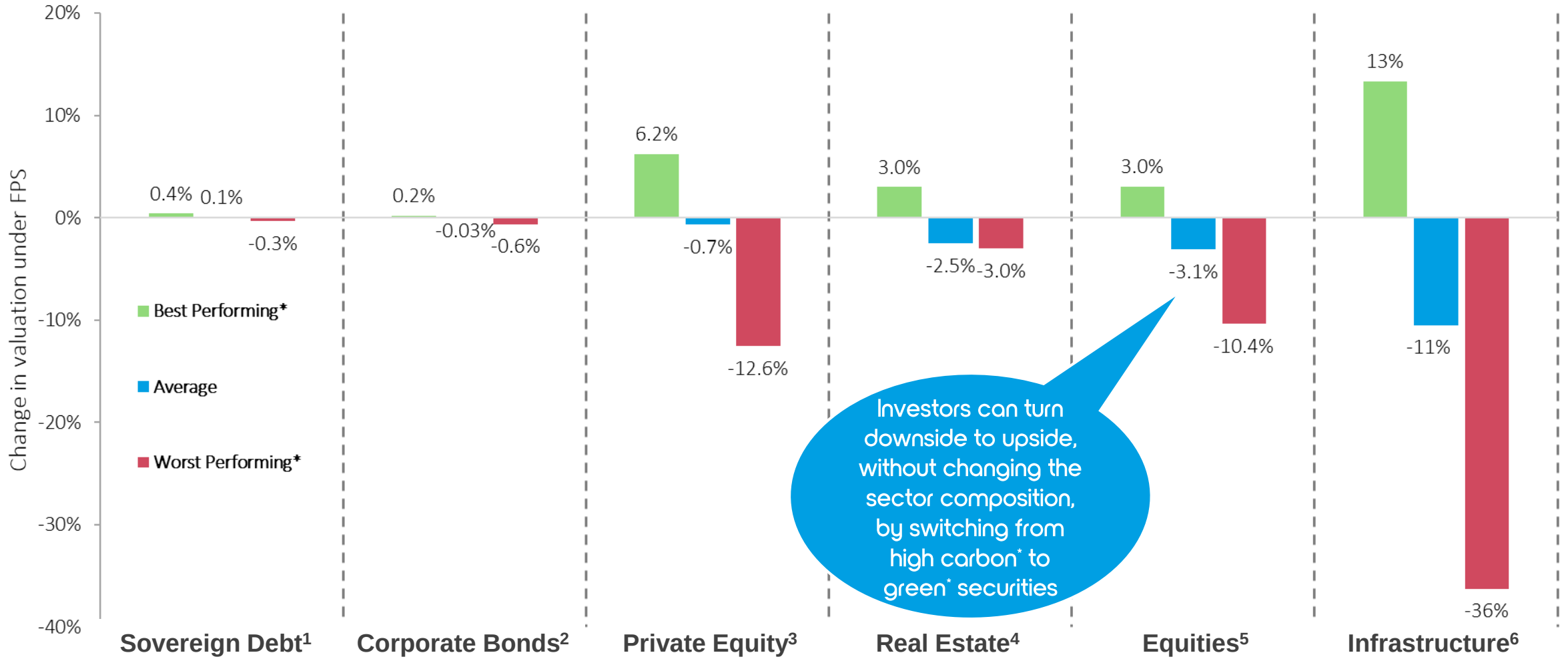
Example analysis from service providers on Strategic Asset Allocation – 2019 basis



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)

Examples from 2019 Strategic Asset Allocation analysis



Green* and high carbon* 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 / high carbon impacts are from 10Y debt from Canada and the Netherlands. Real Estate Green assumes carbon neutral building with no carbon costs, whereas high carbon is average buildings with no abatement.

Thank you!

Please see PRI website for further details:

https://www.unpri.org/climate-change/what-is-the-inevitable-policy-response/4787.article

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INEVITABLE POLICY RESPONSE

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APPENDICES

Policies with the greatest 2020-2050 Gt reduction between IPR 1.5°C RPS and IPR FPS 2021

Rank	Policy	Country	IPR 1.5°C RPS vs IPR 1.8°C FPS (2021 Gt reduction)
1	Coal phase out	China	40.0
2	End deforestation and NBS	Sub-Saharan Africa, South East Asia and Latin America	19.0
3	100% clean industry	China	19.0
4	Coal phase out	India	14.1
5	100% clean industry	India	8.3
6	100% clean industry	MENA	7.2
7	100% clean power	MENA	6.7
8	Fossil vehicle phase out	China	6.3
9	Coal phase out	Indonesia	5.4
10	100% clean industry	South East Asia	5.2

Note: Emissions reduction are approximate and include come additional sector-specific CO_2 reduction such as energy efficiency

Reduction is also substantial for OECD countries e.g. for the United States accelerated 1.5°C RPS policies deliver:

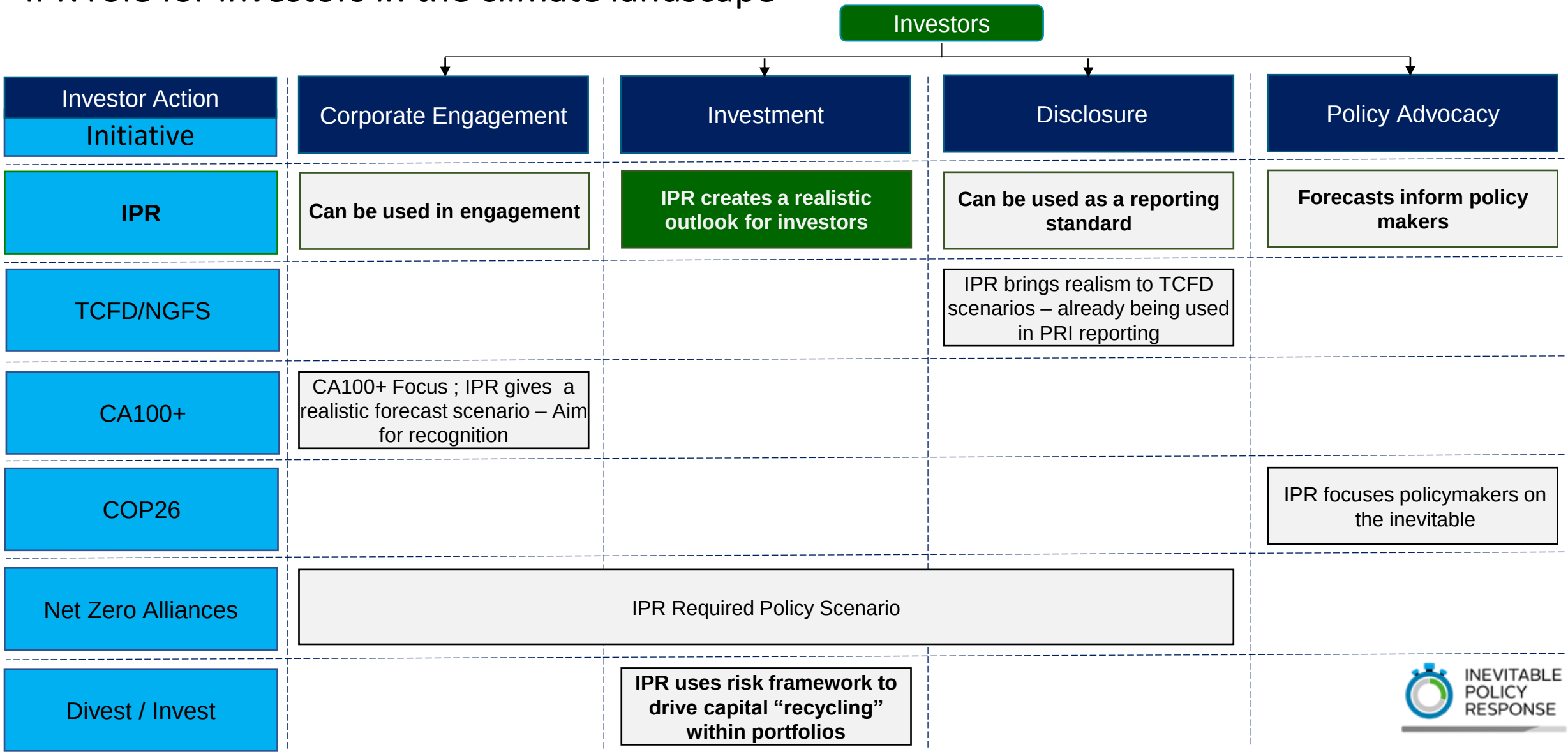
- 20 $GtCO_2$ reduction beyond FPS across all policies
- 4.9 $GtCO_2$ reduction beyond FPS for 100% clean industry policy

Reduction is also substantial for methane and nitrous oxide emissions that result from accelerated 1.5°C RPS policies related to animal protein demand:

- 24 $GtCO_2eq$ reduction beyond FPS across all countries
- 4.3 $GtCO_2eq$ reduction beyond FPS in India alone

INEVITABLE POLICY RESPONSE

IPR role for investors in the climate landscape



The IPR Forecast Policy Scenario (FPS) forecasts higher policy ambition across eight policy levers

In March 2021, the IPR FPS update was informed by a rigorous evidence review and large-scale survey of country climate policy experts

Carbon pricing

- Carbon taxes
- Emissions trading systems
- Border carbon adjustments

Coal phase-out

- Prohibiting regulations
- Emissions performance standards
- Electricity market reforms

100% clean power

- 100% clean power targets
- Renewables capacity auctions and other support policies

Zero emission vehicles

- 100% zero emission vehicle (ZEV) sales legislation
- Manufacturer ZEV obligations
- ZEV consumer subsidies

Low-carbon buildings

- Prohibiting regulations for fossil fuel heating systems
- Purchase subsidies for low-carbon heating systems
- Thermal efficiency regulations for new build and retrofit
- Minimum energy performance standards for new appliances

Clean industry

- Emissions performance standards for industrial plant
- Subsidy for new or retrofit clean industrial processes

Low-emissions agriculture

- Methane or nitrous oxide emissions tax or cap-and-trade system
- Subsidy for low-emissions agricultural practices and technologies
- Farmer education and technical assistance programmes

Forestry

- Strong policy action against deforestation, such as monitoring and penalties, supported by consumer pressure
- Incentives for reforestation and afforestation via domestic action and carbon markets

Source: IPR (2021)

The implications of company transition challenge