IFT Macro | WG 3 – pre-reading

Tuesday 25th July 2023 (West Group) | Wednesday 26th July 2023 (East Group)

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Useful additional pre-reading

(no change from WG1)

Type	Resource	Details
Research report	Pay now or pay later	Provides evidence and analysis to support the climate beliefs required to drive increased action on climate. To demonstrate to the industry that we must pay now to address climate risks, or we will be required to pay more later.
Investment insight	Phase down or phase-out | is there a difference?	A thought piece considering the winding down of fossil fuels at a high level.
Investment insight	To explore, or not to explore	A thought piece considering whether it is now time to stop exploring for new fossil fuel sources.
Research report	Systemic risk paper	 A draft paper by the Thinking Ahead team on the theory of systemic risk. An application paper for institutional risk management will follow.
Book summary	*Post Growth, Life after Capitalism* by Tim Jackson	 A slide deck summarising the book chapter by chapter.
Articles	Best case scenario 2050 Worst case scenario 2050	Articles based on the book, *The Future We Choose*, by Christiana Figueres and Tom Rivett-Carnac which offers two contrasting visions for how the world might look in thirty years.

New WG3 additional pre-reading

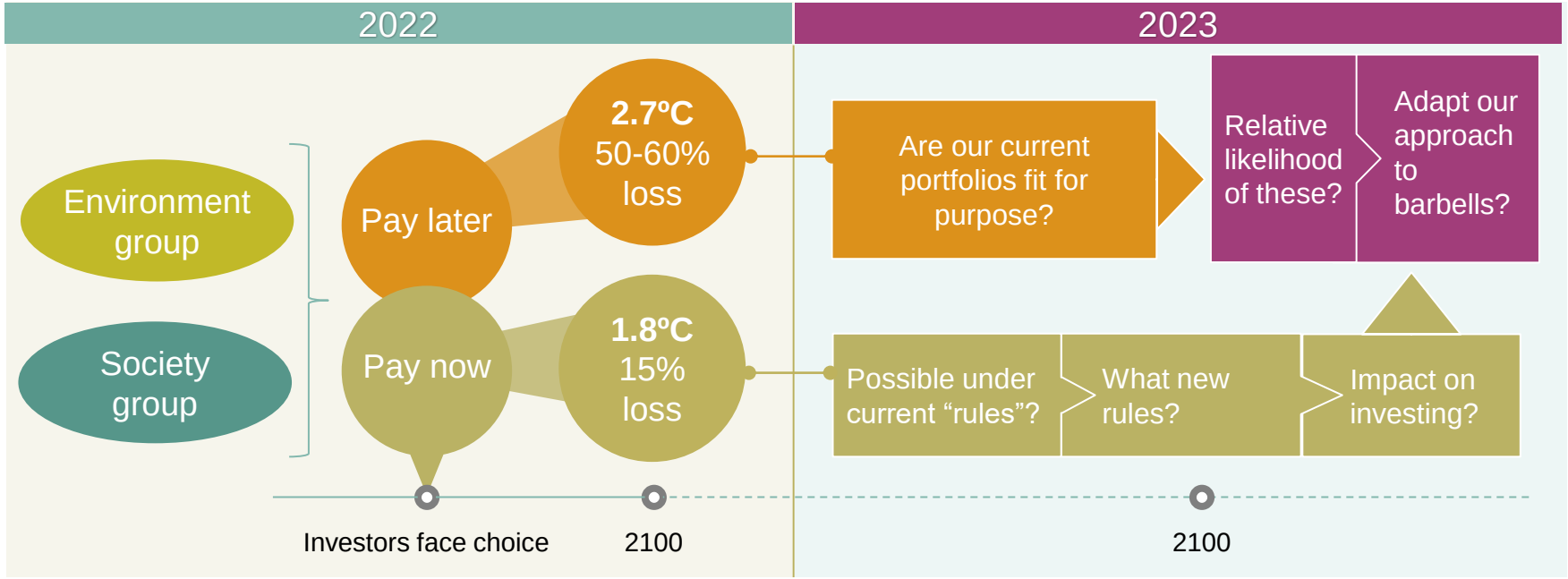
Type	Resource	Details
Research report	The Emperor's New Climate Scenarios	Limitations and assumptions of commonly used climate-change scenarios in financial services. A call for actuaries to focus on climate risk
Research report	This is the way…or is it?	The impact of climate scenario choice on stress-test outcomes across 5 climate scenarios
Research report	Robust management of climate risk damages	Parameter uncertainty in the DICE model affects economic outcomes. Optimal actions depend on uncertain model aspects. Gradual abatement is preferred, but steeper abatement becomes viable with uncertainty in the damage function
Research report	The impact of climate conditions on economic production	How weather shocks and climate changes impact economic output and growth rates using a stylized growth model and extensive subnational data
Research report	Warming the MATRIX: a Climate assessment under Uncertainty and Heterogeneity	Explores the potential impacts of climate change and mitigation policies on the Euro Area, considering the uncertainty and heterogeneity in both climate and economic systems

Agenda for WG3 | 25 July (West) and 26 July (East) 2023

West start 10:00 EDT / 15:00 BST on 25 July
East start 16:00 AEDT / 07:00 BST on 26 July

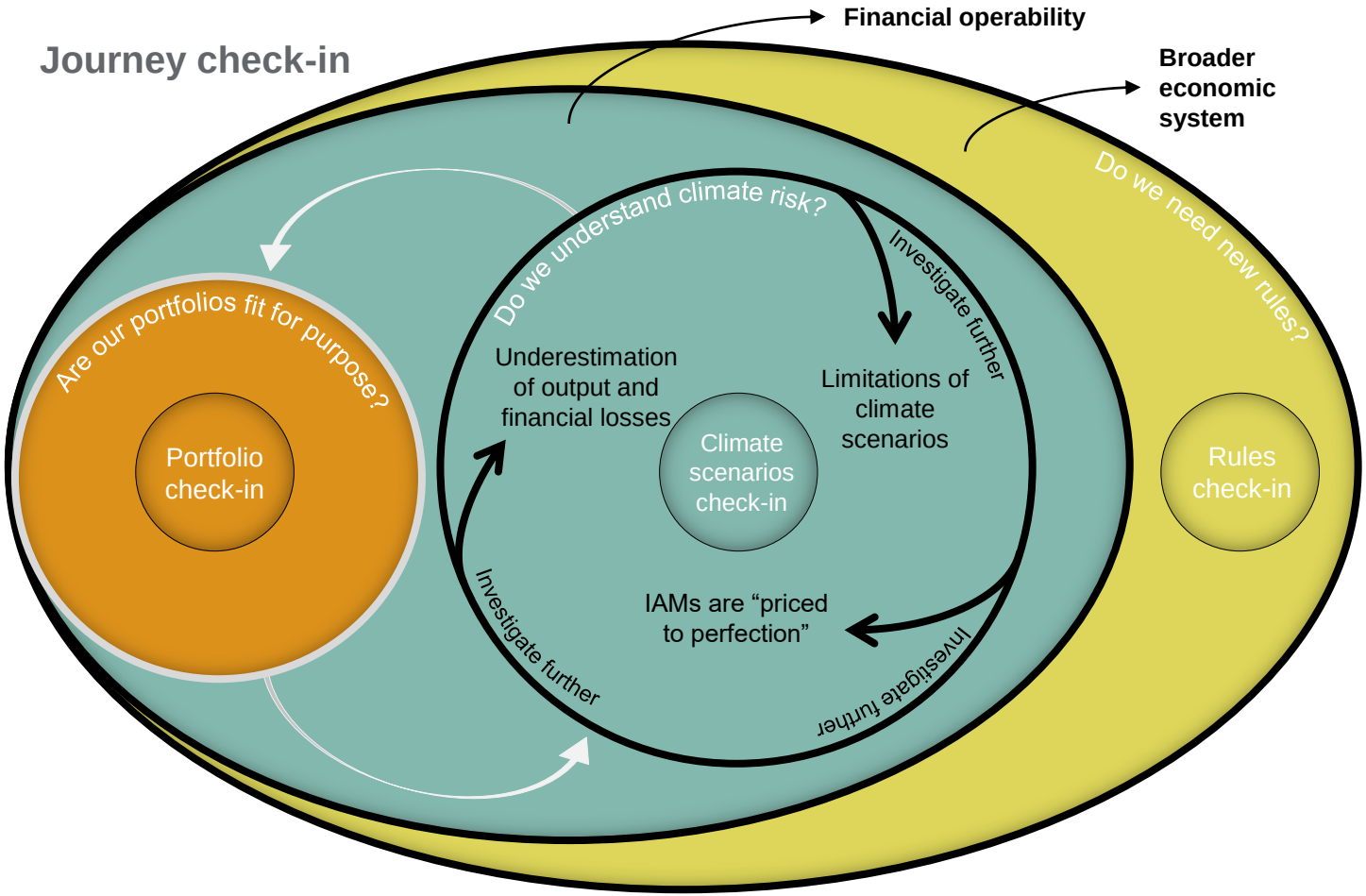
Time	Agenda Item	Description	
-10	Coffee prequel	▪ Please join for a pre-meeting catch-up if you are able	
10	Introduction Scene setting	▪ Andrea welcomes WG members and starts the call ▪ Tim introduces the 'action planning matrix' (s10)	AC TH
60	Discussion	▪ As executive to the WG, our thinking has moved on – in part due to the influence of new papers (s3). In essence, climate scenarios and models are not 'fit for financial purpose' (they are useful for policy). This is because they underestimate risk, and because they give wildly different financial results for similar scenarios. Consequently, we currently think investor action should be driven by a deeper understanding of the dynamics at play (climate change, and society's willingness to change). This will suggest a 'base scenario' and how much it should be adapted for physical risk, speed of transition, degree of adaptation etc ▪ Do you agree with this approach? ▪ As an investor/fiduciary, what is the most appropriate x-axis position? ▪ What is the most likely y-axis position	All
20	Next steps	▪ Tim summarises discussion, suggests possible next steps (eg slides 11-12) ▪ WG provide advice and guidance for next stage of work	TH All
	Close	▪ Thanks for your participation ▪ Next meeting scheduled for 26th (West) /27th (East) of September	

Investing for tomorrow – macro view



Time commitment:	5 x 1.5 hours MS Teams calls, plus pre-reading and reviewing
WG call dates:	Mar, May, July, Sep, Nov
Output:	Co-created paper. Possibly, scenarios

Journey check-in



- Our system is governed by rules
- We covered what we mean by rules in WG1
- Our portfolios are built to maximise risk-adjusted returns in line with the *current rules* of the system
- In the face of the climate crisis, we strive to develop climate models that can potentially generate useful and actionable *climate scenarios*
- Further investigation (WG2) has revealed fundamental *limitations in the underlying assumptions* of those scenarios and corresponding models. It's time to address:

1. Are our portfolios fit for purpose, given the assessment of the climate models?
2. Do the profound uncertainties at the climate level require us to reshape our portfolio?
3. Is the current approach sufficient, or do we need to rethink the architecture of our own system and its governing rules?

The metaphor

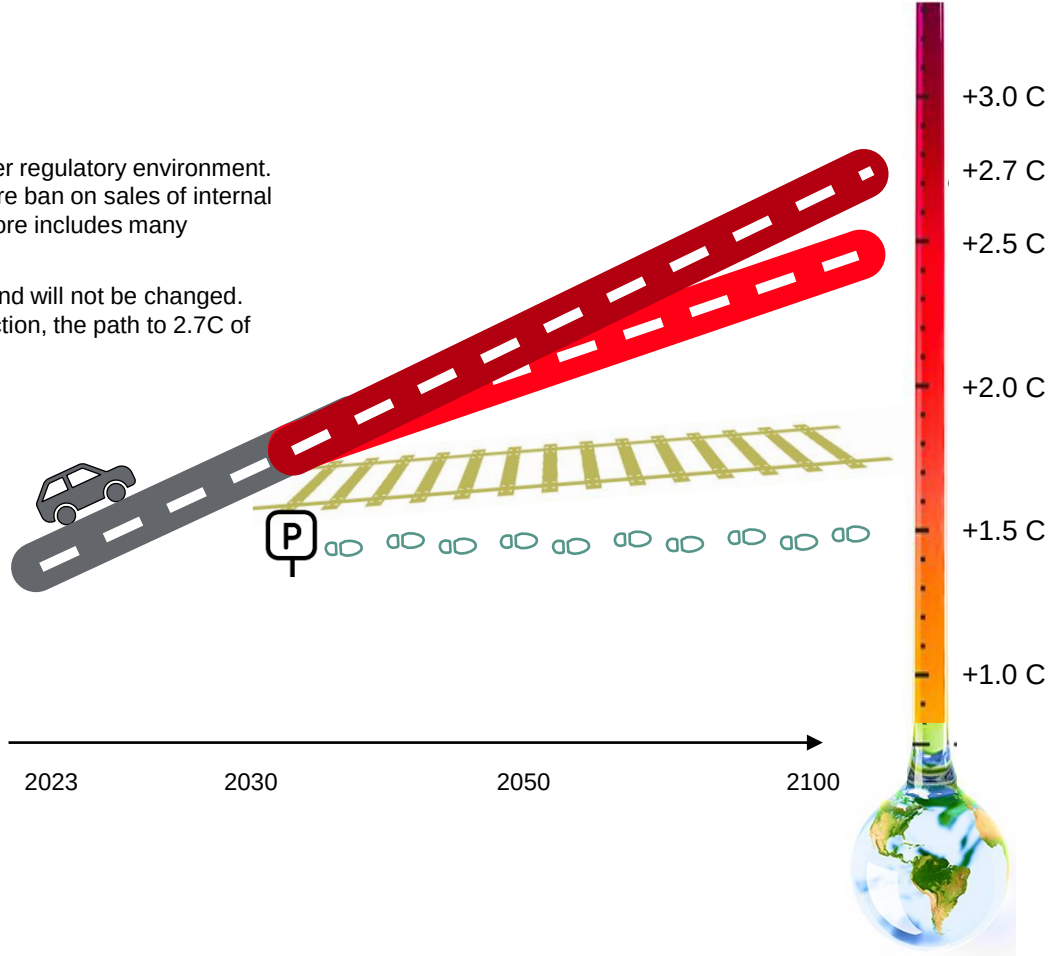
We are on road to 2.7C – this is business-as-usual within a stricter regulatory environment. It includes the enactment of announced policies, such as the future ban on sales of internal combustion engines, national net-zero laws and the like. It therefore includes many elements of transition

In the metaphor, a stretch of road ahead has already been built and will not be changed. [How long do you believe this stretch to be?] Beyond the built section, the path to 2.7C of warming has been mapped, but changes are possible

One such change is the strengthening of national decarbonisation commitments and putting these into law. The road would divert to a 2.4C outcome. [Beliefs about government action]

A more drastic change would be to abandon road building, and scrap all cars. The state would provide electrified public transport.

Or, to aim for a yet lower temperature, people agree to live locally, and walk.



The inconvenient recent research

In *Safe and just Earth system boundaries* (Rockstrom et al, 31 May 2023) suggest the warming limit for justice is +1C. The implication is that any amount of warming from our current level will exacerbate injustice

Investor action planning framework

Revisiting scenarios to help inform investor actions

- Two key (and related) questions that were raised in WG2 were:
  - Are the scenarios on which the majority of net zero pledges based feasible in practice, and if they are realised with they actually keep global average temperature increases well below 2C (WB2C)?
  - If the answer to the above is no, what should investors be doing in response while still acting in a financially rational way?
- A way of approaching the above is to think about the problem through two dimensions
  - X-axis: what should be the “allowable” carbon budget to support a transition to a WB2C world?
    - This will reflect the investor’s level of aversion to climate risk (or, the probability of success of remaining WB2C), as well as their views on the degree to which allowance needs to be made for the challenges to climate scenarios highlighted in WG2
  - Y-axis: what degree of change is possible/likely to be supported by system participants?
    - This will in part reflect the views of the broader market on the same issues above and in part the degree to which the system itself can/will be changed
- An interpretation of the above is that:
  - The position on the x-axis reflects the degree of transition that an investor believes “needs to happen” in order to achieve a WB2C outcome and limit the magnitude of physical climate risks
  - The position on the y-axis reflects the type of transition that is likely to happen (eg fast vs slow, orderly vs disorderly, current vs transformed “rules of the game”) which in turn will determine the magnitude of transition risks and the types of scenarios an investor should use in order to “follow the money”
  - The intersection between the x and y axis positions will then inform the likely degree of overshoot of the “allowable” WB2C carbon budget and therefore the physical climate risks that an investor should be planning for

Investor action planning framework

Revisiting scenarios to help inform investor actions (cont'd)

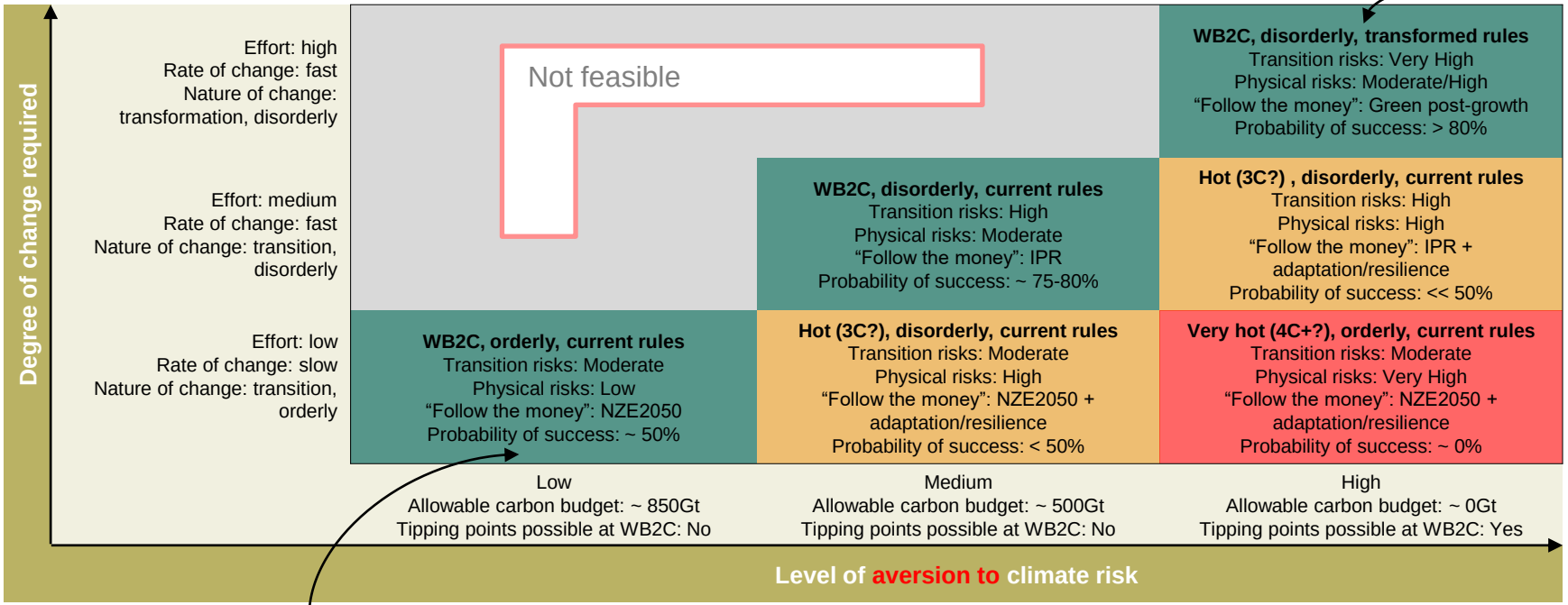
- The above can then be used to define scenarios that investors could use to determine the actions that are both in line with existing net zero pledges as well as fiduciary duty/acting in a financially rational way
- On the following slide we apply this framework and show a matrix that sets out potential positions that an investor could take on both the x and y-axes
- At each intersection point the category of scenario that would be appropriate for investor action planning is then defined as a combination of:
  - Expected temperature outcome – WB2C, hot, very hot
  - Nature of transition – orderly vs disorderly
  - Degree of system change – current rules vs transformed rules
- Further information is then provided about the characteristics of each category of scenario:
  - Magnitude of transition risks due to degree, speed and nature of change that occurs
  - Magnitude of physical risks due to overshoot of allowable WB2C carbon budget
  - Representative scenario for determining capital allocation activities ("follow the money") based on the above*
  - Probability of success – defined as keeping global temperature increases to WB2C
- One important implication of the scenario framework is that, in contrast to frameworks typically used in practice, there are a number of categories of scenarios that exhibit both high transition and physical risk

* at this stage we have deliberately avoided being too specific on which scenarios/pathways an investor should focus on at each intersection point in the matrix. This is in large part because even within a particular category of scenarios (e.g. WB2C, orderly, current rules) there are a number of potential pathways which can give rise to quite different "winners and losers". As an example, the analysis set out in This is the way…or is it? shows different versions of a WB2C, orderly, current rules scenario

Investor action planning framework

Scenario definitions

Question: does a scenario that will realistically keep temperatures at WB2C inevitably require transformation (ie new rules) rather than just transition?



Question: does adopting this scenario create too much exposure to climate risks/should allowable carbon budget be much smaller than is typically assumed?

Question: do current net zero frameworks place too little emphasis on adaptation/resilience?

Note: carbon budgets based on IPCC, but reduced by 150Gt representing 3.5 years of elapsed time and around 40Gt of emissions pa

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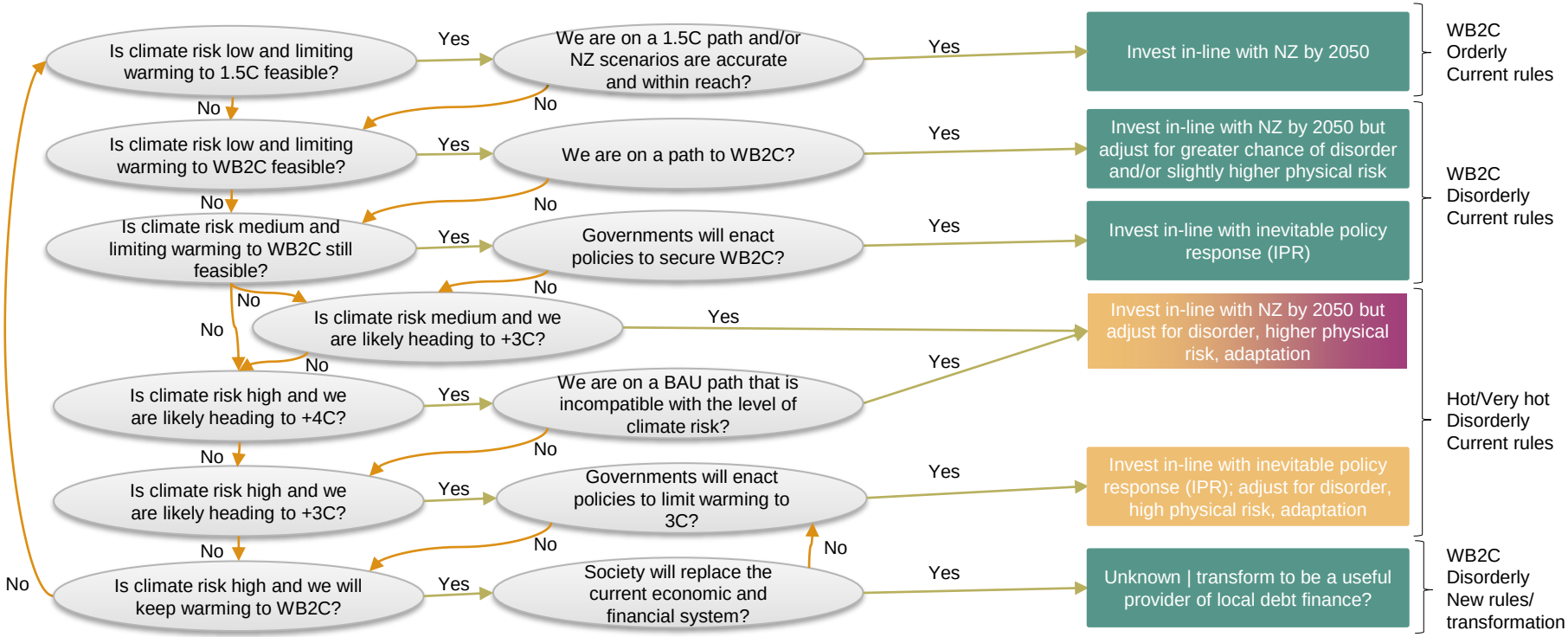
Investor action planning framework

Answer twice – for the market and for you



The next step would be to write down the crib sheet (beliefs) that helped people to answer each yes/no question

Investor action planning framework

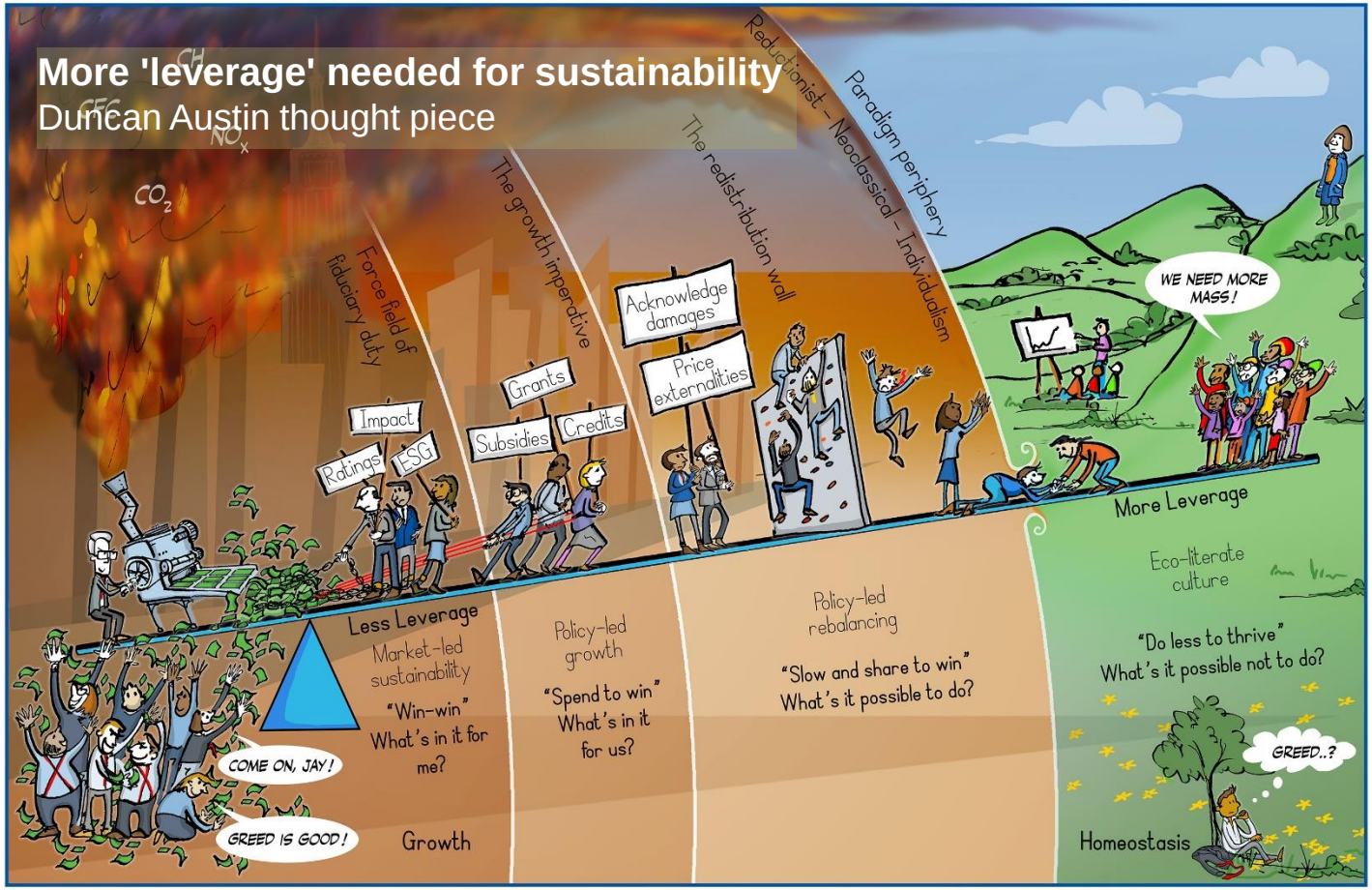
Prioritising actions

- The work carried out by the IFT Environment working group in 2021/2022 defined a series of actions that investors could take in order to implement a net zero pledge – these can be categorised using the following four dimensions:
  - Ambition level – incremental vs transformational
  - Focus area – mitigation (reduce likelihood of physical risks) vs adaptation (reduce magnitude of physical risks if they happen)
  - Portfolio actions – capital allocation (change what is in the portfolio) vs stewardship/engagement (improve what is in the portfolio)
  - External action – new primary investment (eg climate solutions) vs policy advocacy (change the system)
- A potential next step for this WG would be to use the framework described above to identify which categories of actions would be most appropriate for investors based on the planning scenario is most appropriate to their beliefs/priors – a high-level example of this is set out below:

	Ambition	Focus	Portfolio actions	External actions
WB2C, orderly, current rules	Incremental	Mitigation	Stewardship/ engagement	New primary investment
WB2C, disorderly, current rules	Incremental	Mitigation	Stewardship/ engagement	New primary investment
Hot, current rules	Incremental	Adaptation	Capital allocation	Policy advocacy
Very hot, current rules	Incremental	Adaptation	Capital allocation	Policy advocacy
WB2C, transformed rules	Transformational	Mitigation	Stewardship/ engagement	Policy advocacy

More 'leverage' needed for sustainability

Duncan Austin thought piece



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After Meadows

Dana Meadows famously identified 12 'leverage points' for changing human systems, from tweaking parameters to rewriting major rules. More effective interventions typically required greater effort. Number 12 on her list – with greatest potential leverage but most difficult – was to transcend the prevailing system to see it for what it was and reject it for something new.

The image is an adaptation of Meadows' idea for the current ecological crisis – which continues to be shaped predominantly by the attitudes of wealthier nations. It might be thought of as four 'leverage attitudes' for sustainability, depicting an uphill struggle against various forms of resistance to reach more effective stances.

More 'leverage' needed for sustainability... (cont)

Duncan Austin narrative for the ‘infotoon’

The embracing paradigm is the reductionist worldview that is the peculiar legacy of the scientific revolution. While a fruitful perspective for working out how atoms and cells work, when applied to social systems it has somehow resulted in externality-denying capitalism and expertise-debasing democracy. The shared premise of capitalism and democracy, informed by reductionism, is that you can ‘add back up’ expressions of self-interest – whether spending or voting – to arrive at the best possible outcome for society. But unless all expressions of self-interest fully reflect latest ecological understanding, the aggregation may fall well short of a sustainable outcome.

Most difficult of all is that global ecological challenges are fundamentally 'stop doing' problems, ie stop emitting GHGs, stop destroying the Amazon etc.

The hope has been that 'stop doing' problems could be solved by the 'more doing' strategy of technological substitution – renewables, greener products etc. The private sector is felt to have advantages in innovation and so market-led sustainability has been a major form of response.

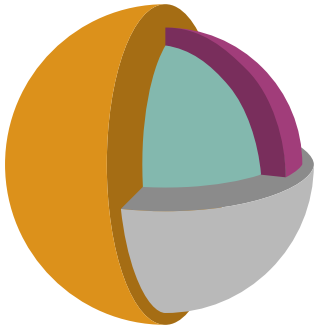
However, the evident fact of much historical technological substitution (cars replaced carts, computers replaced typewriters, etc) is no guarantee that technological substitution can always happen fast enough to solve every problem. Instead, the main learning from 25 years of CSR, SRI, ESG, etc, is that substitution is not happening anything like fast enough to prevent climate change. While technologies like wind and solar have grown strongly, their growth has not resulted in a reduction of fossil fuel use.

So, we continue to face innately ‘stop doing’ problems for which the first-choice ‘more doing’ mindset is not working well enough. Not only does that challenge the modern impulse to be ‘productive’ and do more, but the capacity to do less is very unevenly distributed. Some can, some cannot.

The broader point is that sustainability may now depend upon people and institutions asking the question one - or two or three - along from the question they are currently asking themselves.

Appendix

Summary of qualitative assessment of IEA NZE scenario

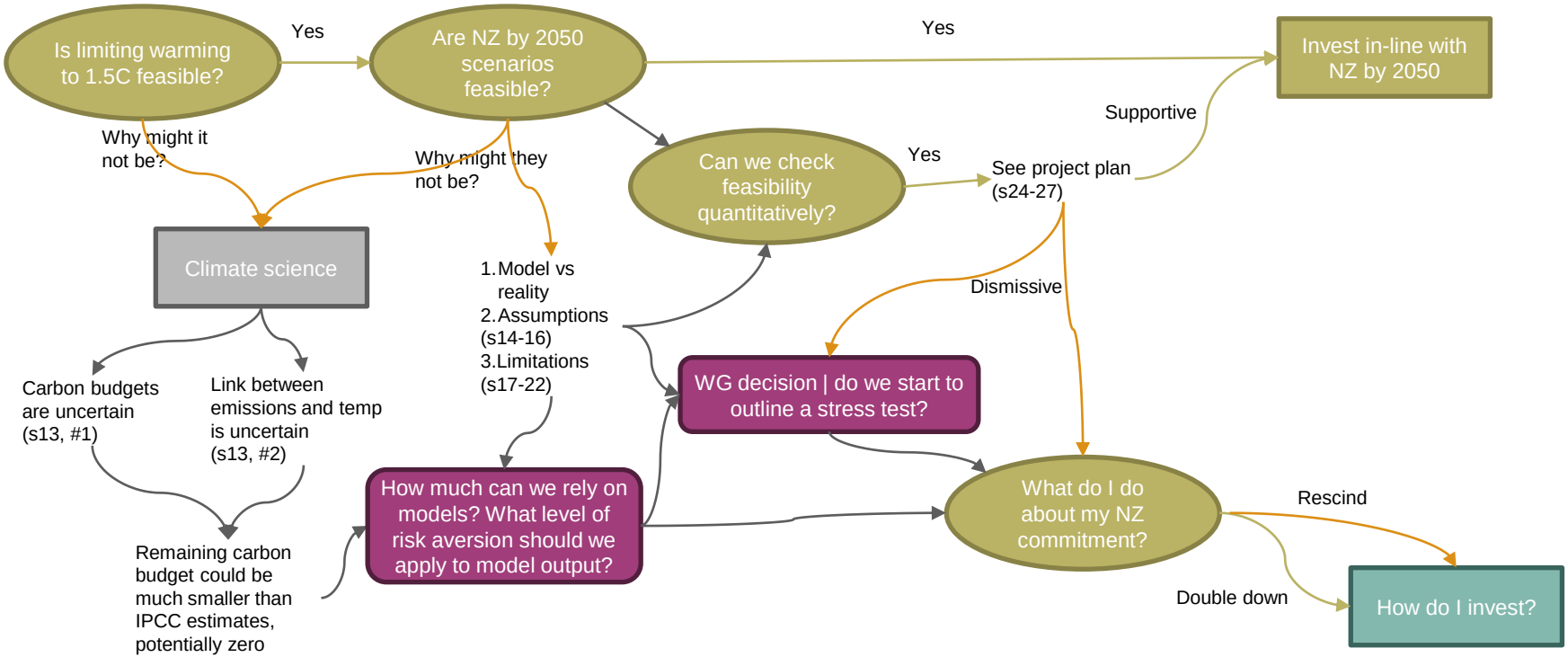


- An arguable carbon budget is fully spent
- Unnatural orderliness
- No risk buffer
- ‘Priced to perfection’

- NZE is a partial real-world scenario, not a financial scenario. It is built by the energy industry, for the energy industry. It is NOT a financial stress test

Context	Key item	Implicit assumption/ limitation
Climate science	Carbon budget	▪ Wide error ranges ▪ Based on subjective assumptions ▪ Not acceptable chance of failure (50%)
	GHG concentration and temperature rise	▪ Equilibrium climate sensitivity (ECS) is uncertain ▪ Earth system sensitivity (ESS) is greater, implying >3C warming at current GHG levels
General commentary on NZE scenario		▪ Role of government in scenario differences ▪ Differential pace of NZE by economies ▪ Orderly transition assumptions
Open questions on climate policies and strategies		▪ Fossil fuel prices, carbon price, biofuels, emissions removal
Model assumptions assessment	Basic assumptions (on some modules of the IEA GEC model)	▪ Perfect competition ▪ Perfect information, atomic agents ▪ Price signalling -> rational decision making ▪ Perfect foresight: complete market knowledge
	Variability	▪ Lack of transparency and comparability in model assumptions and outcomes, and difficulties in assessing likelihood and financial risks of scenarios
	Understanding of transition narrative	▪ Assumptions of frictionless transition and absence of feedback mechanisms ▪ No adequate capture of the complexity of the transition to a low-carbon economy ▪ Lack of understanding of the potential severity and timescales of climate-related risks
	Model oversimplifications	▪ Limited capacity to incorporate complexities (non-linearity, tipping points, uncertainty) ▪ Neglected climate events and links between climate, ecosystems and natural resources often excluded ▪ Insufficiently capture acute physical risk shocks ▪ Rational expectation assumptions don't reflect reality
	Information loss along the climate scenario modelling chain	▪ Scenario modelling may result in information loss ▪ Insufficient passthrough of extreme tail risks and variation ▪ IAMs lack sub-sectoral and country-specific breakdowns ▪ Lack of scenario and model granularity

The feasibility of net-zero investing



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