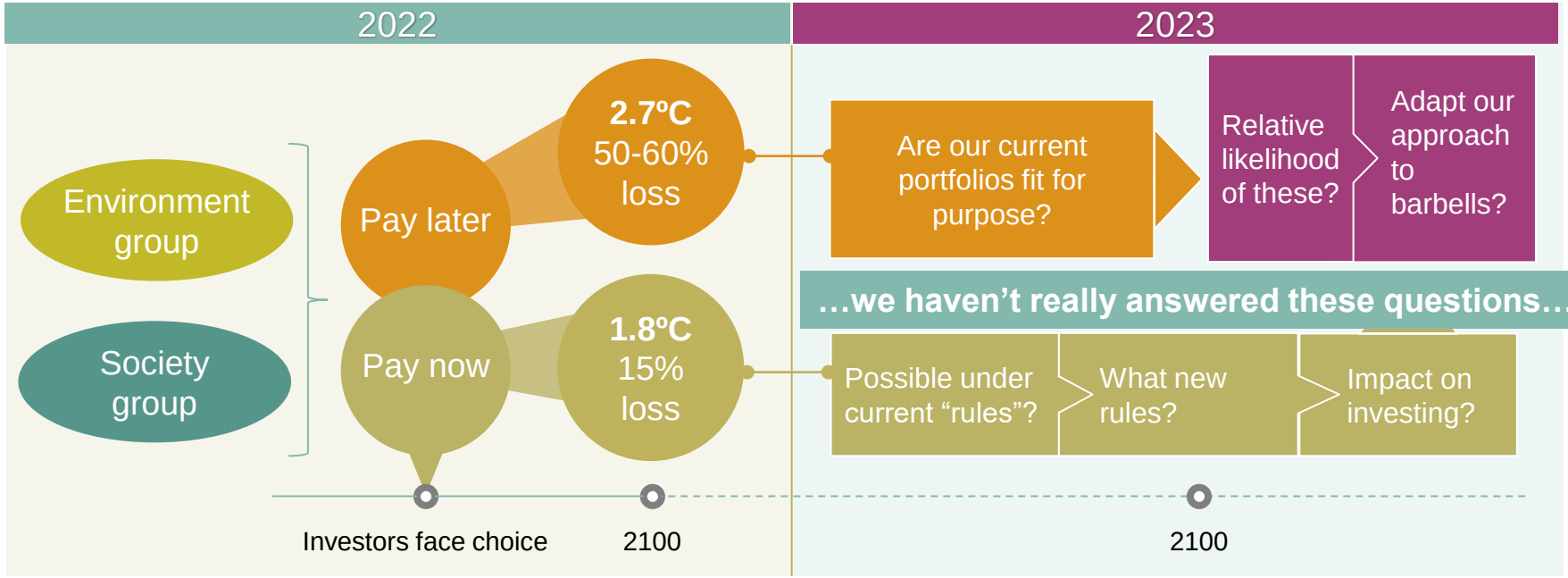
Summary of IFT Macro work on climate risk

IFT Macro working group

Thinking Ahead Institute
An innovation network founded by WTW

We started here…



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

Working group 1

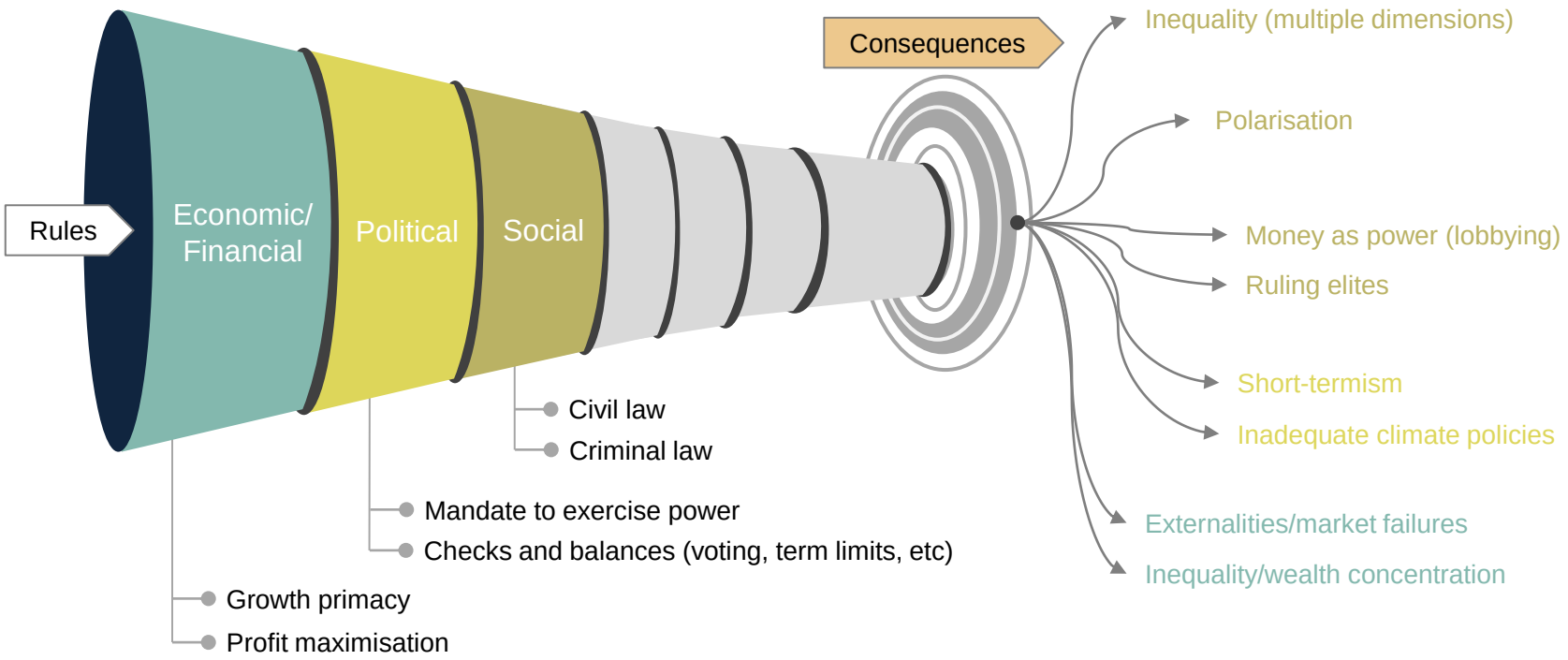
We started by exploring the rules of the game and by thinking right to left

- **The rules of the game:** These are the laws, policies, and regulations that govern how we interact with each other and the environment. We explored how the rules contribute to the crises the world faces, including the climate crisis, and how they limit our ability to take decisive [effective?] action to mitigate climate change. We asked whether limiting warming to 1.8C is possible under the current rules.

- **Thinking right to left:** We asked participants to imagine themselves in net-zero emissions world in 2050. What does this world look like? We highlighted some key factors that would determine how this world reached net-zero emissions:
  - The energy- and cost-efficiency of carbon capture and storage
  - The extent of remaining fossil fuel burning / the extent of shrinkage of fossil fuel financial value, and size of workforce
  - The extent to which the ideology of GDP growth has been challenged
  - The extent to which capitalism has been reformed
  - The extent to which insurance is still available for more frequent and more severe physical risks
  - The extent of climate migration
- We emphasized that the path from today to that future world ultimately depends on beliefs about the key factors above.

- We finished by asking participants if they believe that a future net-zero emissions world is compatible with the current rules of the game.

The rules of the game and their consequences



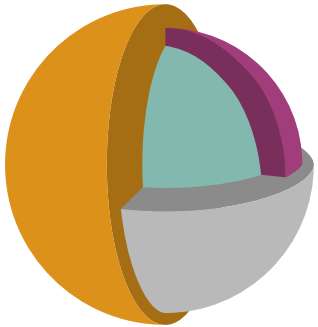
Working group 2

We examined the beliefs underlying standard climate scenarios and whether they bear scrutiny

- **The implicit and explicit beliefs in the main climate scenarios:** Continuing our focus on beliefs, we explored those that comprise the IEA and NGFS's scenarios that are widely used in finance and policymaking. We drew attention to the following explicit beliefs:
  - There is a carbon budget of 500 GtCO2e remaining.
  - We understand the relationship between atmospheric GHG concentration and temperature rise.
  - Advanced economies move first and fastest to achieve net-zero emissions.
  - There is an orderly transition, minimising volatility and stranded assets.
- We also drew attention to the implicit beliefs:
  - Some degree of perfect competition and perfect foresight.
- And highlighted concerns about how these scenarios are used:
  - A lack of understanding about the variability of the results
  - Insufficient understanding of the narratives and simplifications in the scenarios.
- Considering the points above, we provided our own opinion on these scenarios:
  - The carbon budget they rely on is arguably already spent.
  - They are unrealistically orderly.
  - The scenarios' probability of limiting warming is imprudently low.
- We put it to the Working Group that without a nuanced understanding of these scenarios, they are not appropriate for financial stress testing or investing.

The feasibility of net-zero investing

Summary of qualitative assessment of IEA NZE scenario

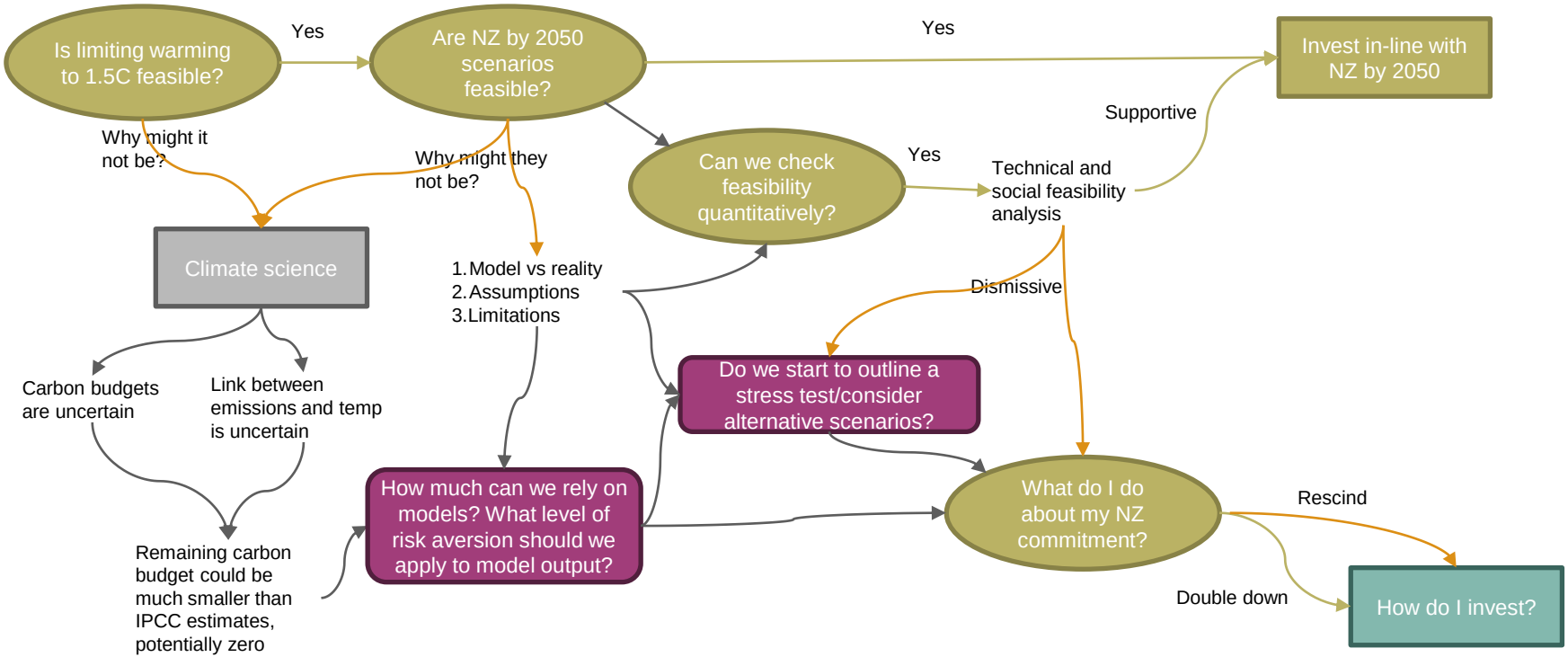


- An arguable carbon budget is fully spent
- Unnatural orderliness
- No risk buffer
- ‘Priced to perfection’

- 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



Working group 3

We proposed a framework for exploring a broader range of potential scenarios

- Two key (and related) questions are:
  - Are the scenarios on which the majority of net zero pledges based feasible in practice, and if they are realised will 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

Exploring a broader range of scenarios (cont)

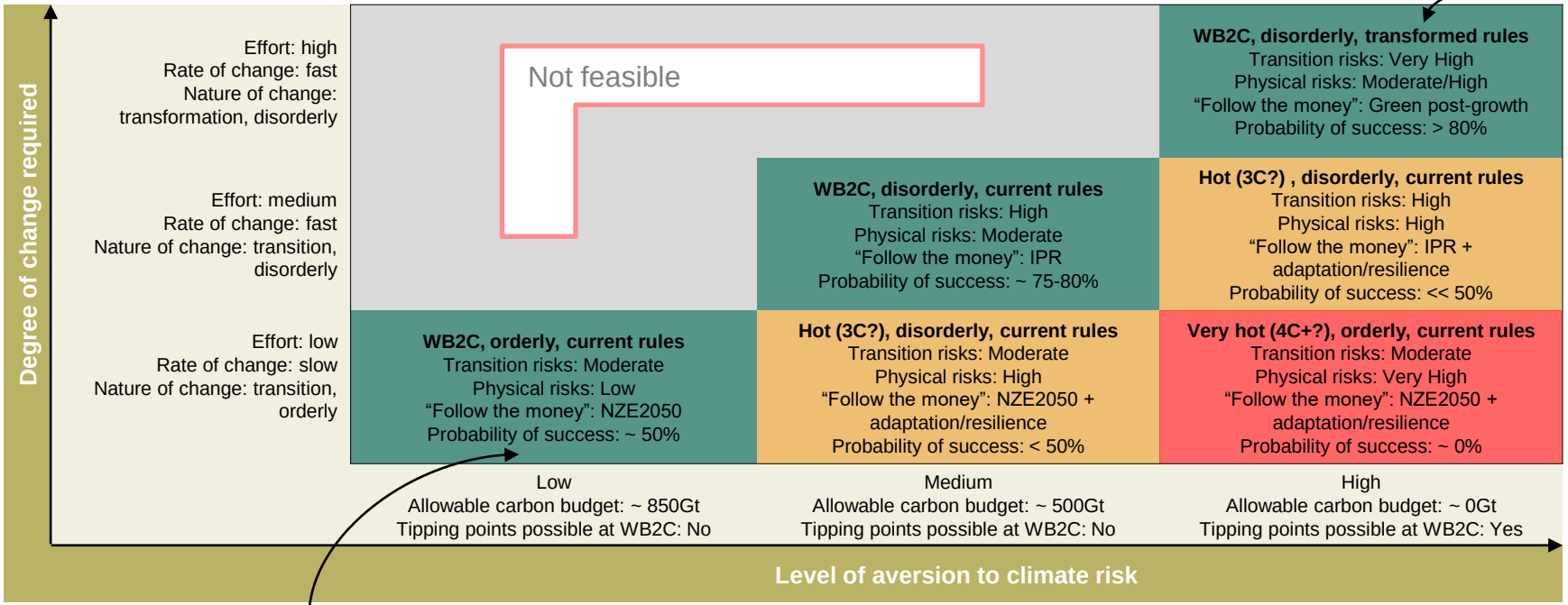
- The above can then be used to define scenarios that investors could use to determine the actions that are both in line with existing net zero pledges as well as fiduciary duty/acting in a financially rational way
- On the following slide we apply this framework and show a matrix that sets out potential 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

Working group 3

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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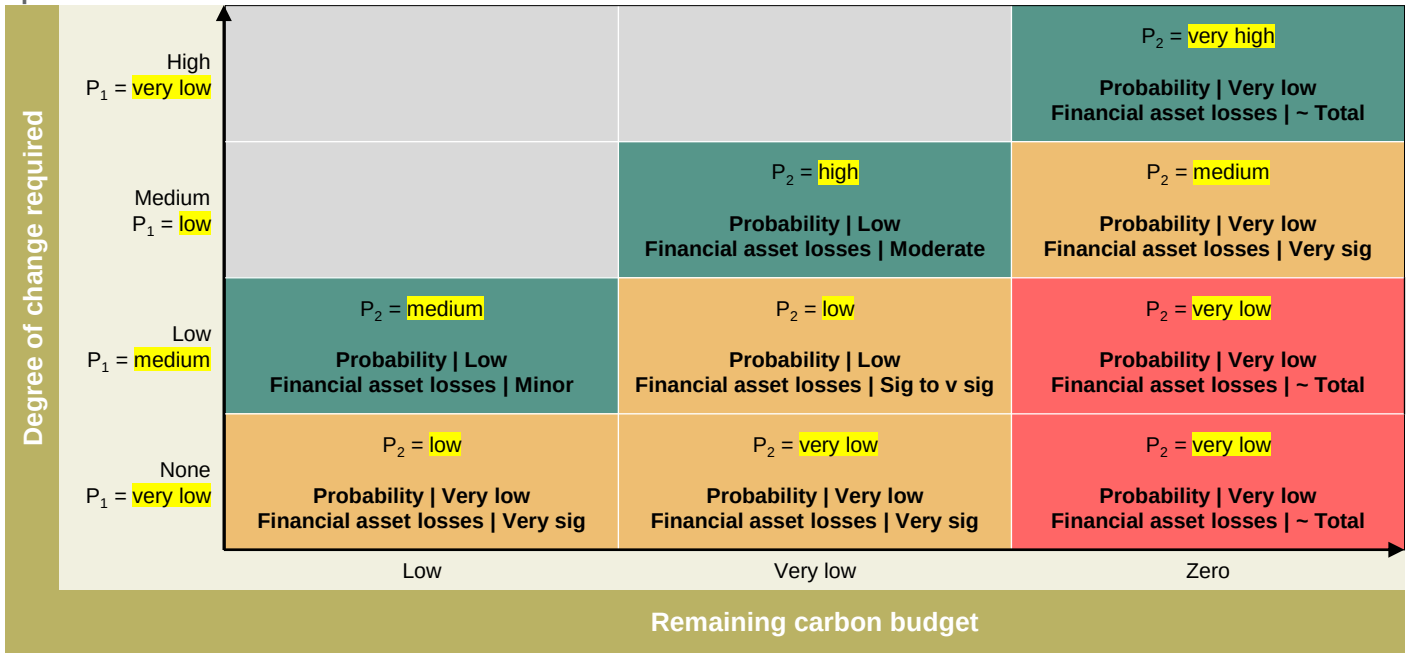
Working group 4

We developed a framework for using beliefs to derive probabilities for scenarios, and showed the probabilities that follow from our beliefs



Key

Probability	
Very low	0-20%
Low	20-40%
Medium	40-60%
High	60-80%
Very high	80-100%

Financial asset losses	
None	<10%
Minor	10-25%
Moderate	25-50%
Significant	50-75%
Very significant	75-90%
~ Total	>90%

Carbon budget	
Low	~ 850Gt
Very low	~ 350Gt
Zero	~ 0Gt

xyz = user input

P_1 = probability of level of change occurring

P_2 = probability of warming remaining <2C given economic change

Probability of scenario / cell (level of change and warming <2C) = $P_1 * P_2$

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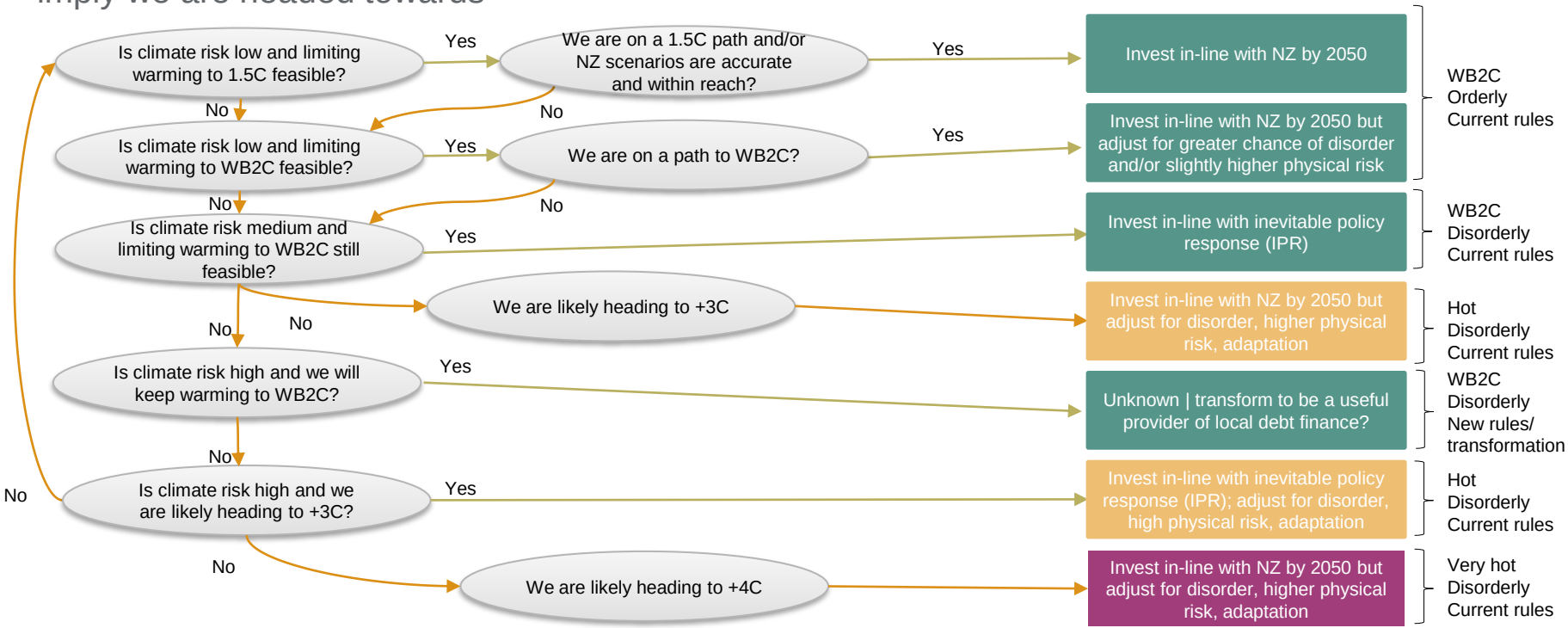
Working group 3 and 4

We made a map (decision tree) to show investors what scenario their or the markets' beliefs imply we are headed towards



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Working group 3 and 4

We produced a catalogue of solutions linking working group insights to actions for investors

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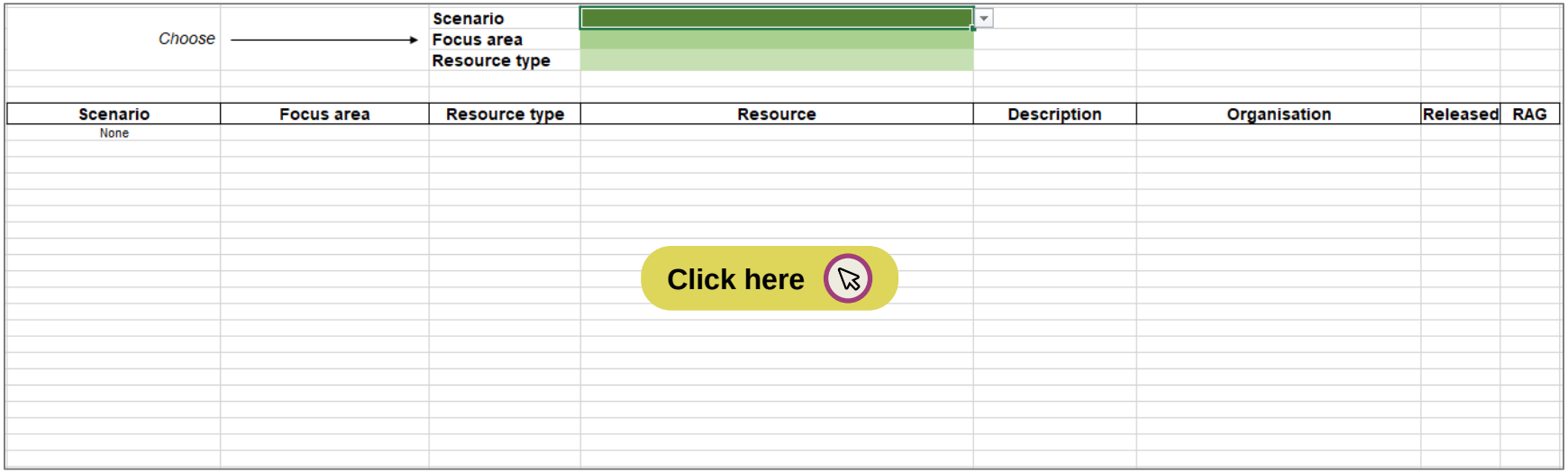

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Working group 5

We suggested how to think of the next 7 years in light of the long term

- An infinite number of potential futures fan out ahead of us. We will only travel through time down one of those potential futures
- We travel one step (from T_0 to T_1) and notice 2 things: (1) the potential paths disappear and are replaced with the single actual path, and (2) the fan of infinite potential futures shifts forward but, importantly, some of the potential futures available at T_0 are no longer available at T_1 because the actual path we took means they are no longer available; AND we now have some paths available to us at T_1 that weren't available previously [this is 'path dependency']
- In general in investment, individuals and organisations are measured and rewarded in the short term. However, our true purpose and value creation (societal wealth and well-being) occurs over the long term.
- We need to navigate a difficult truth: in the short term, the initial conditions (current context) will matter more to (short-term) outcomes than the path (which doesn't have time to deviate much), but in the long term, the path will matter more (to long-term outcomes) than the initial conditions. For the next 7 years we need to identify the initial conditions. This entails deciding which cell of the matrix best describes the present and/or the average conditions for the next 7 years. We suggest that one of the bottom-left cells best describes current conditions
- We can think of the remaining carbon budget as the bridge between the short and long terms. For as long as the level of change remains below that necessary to stabilise temperature rise, we will run down (or push negative) the remaining carbon budget. This pushes us to the right of the matrix as time passes. In other words, a greater proportion of the potential futures take us to a hot or very hot world – making ever more urgent the need to take and maintain a lower temperature path as early as possible
- Three thoughts follow
  1. We can also be pushed to the right through a change in our own, or society's, belief about climate risk / remaining budget
  2. There is such a thing as "too late". In a path dependency context this refers to a point in time where paths to a desirable state are no longer available
  3. The only decision-making window available to us to address climate change is now / the next 7 years. So, while the physical risk and investment returns for the next 7 years is largely determined by current conditions, it is decisions taken in the next 7 years that will determine long term physical risk, investment returns, etc

Working group 5

We suggested investment organisations should have a ‘hypothesis testing’ process

1. **Choose baseline path / scenario**
   - This is the working hypothesis regarding the long-term path we are on
2. **Develop check-in process**
   - Design dashboard – to include only decision-relevant data points
   - Design set of beliefs to be confirmed / rejected by dashboard
3. **Amend baseline if required**
   - The review of dashboard and beliefs should conclude with a decision to retain, or replace, the working hypothesis

Examples of dashboard construction

A sector progress tracker for the net-zero transition
Interactive tracker from McKinsey aiming to measure the progress and preparedness of ten key sectors (agriculture, forestry, O&G, transport, etc.) on the path to achieving global net-zero emissions by 2050

State of climate action 2023
Assessment of global progress toward 2030 targets across specific targets and indicators

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