

How does climate change and the low-carbon transition affect financial institutions?

TOP-DOWN PERSPECTIVE

Gaining a holistic view of climate risk - macro implications



BOTTOM-UP PERSPECTIVE

Scenario modelling and Analysis at asset level

Systemic climate risk

versus

holding-specific climate risk

- Climate-related risks are **systemic** and therefore **unhedgeable**.
- Climate change will fundamentally impact how the economy performs as a whole.
- 'Stock-picking' is **insufficient** to manage systemic risk.
- Therefore, taking **climate change** into account as a risk driver in your **strategic investment decision-making** is crucial.
- Over a longer time horizon (10+ years), more than **80%** of returns and risk are the result of **Strategic Asset Allocation**.

Approach Climate MAPS

Input Data & Assumptions

MACRO-Economic Model

Climate impacts are mapped to macro-economic interactions to generate GDP shocks per global warming pathway per country/sector, per year.

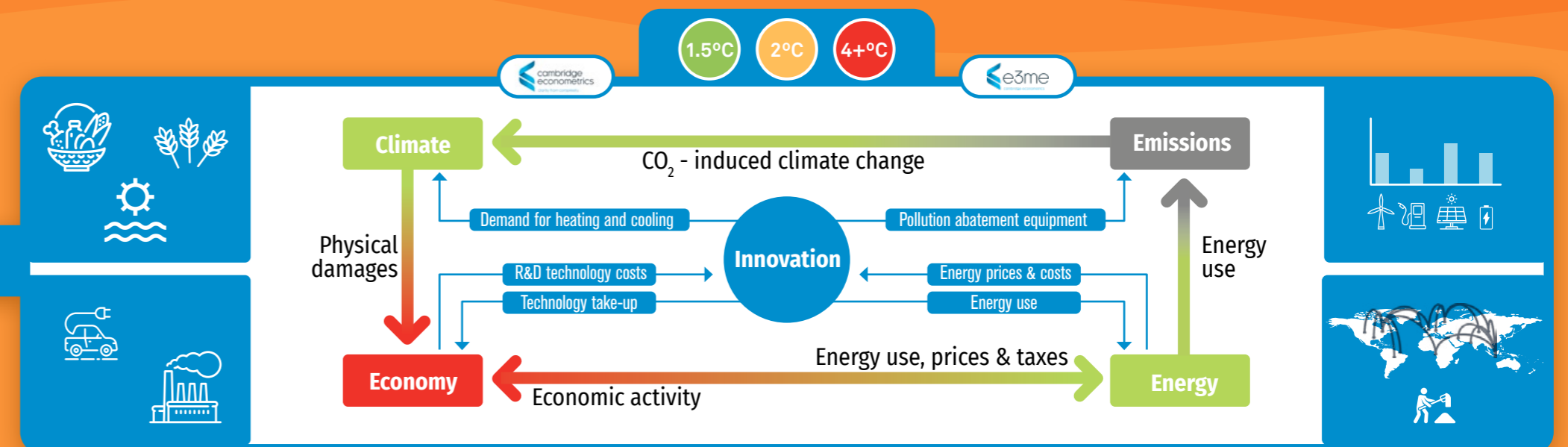
STOCHASTIC Financial Model

Climate GDP shocks are translated over time to 600+ economic & financial variables via stylized facts based on historic relations, per country/sector, per year.

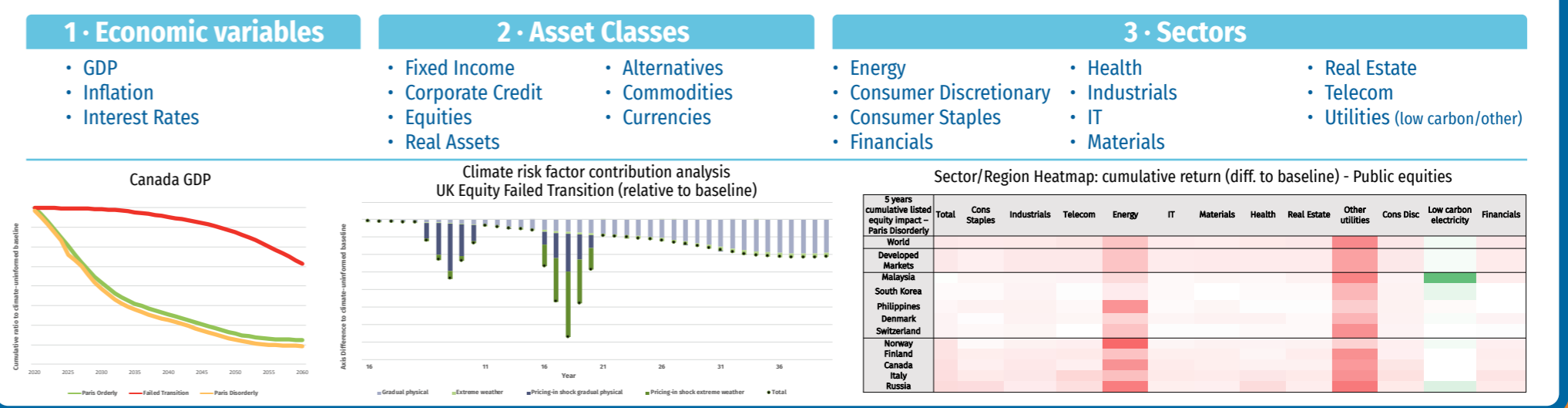
Systemic Climate Risk - Aware Scenarios Sets

Paris Orderly Transition Paris Disorderly Transition Failed Transition

Result: systemic climate risk-aware economic and financial outlooks up to 2060, per country/sector, per year.



Model OUTPUT = climate-adjusted growth expectations & pricing-in dynamics up to 2060 (annual timesteps) for...



Comparison with NGFS

Scenarios are in line with the Network for Greening the Financial System's scenario requirements

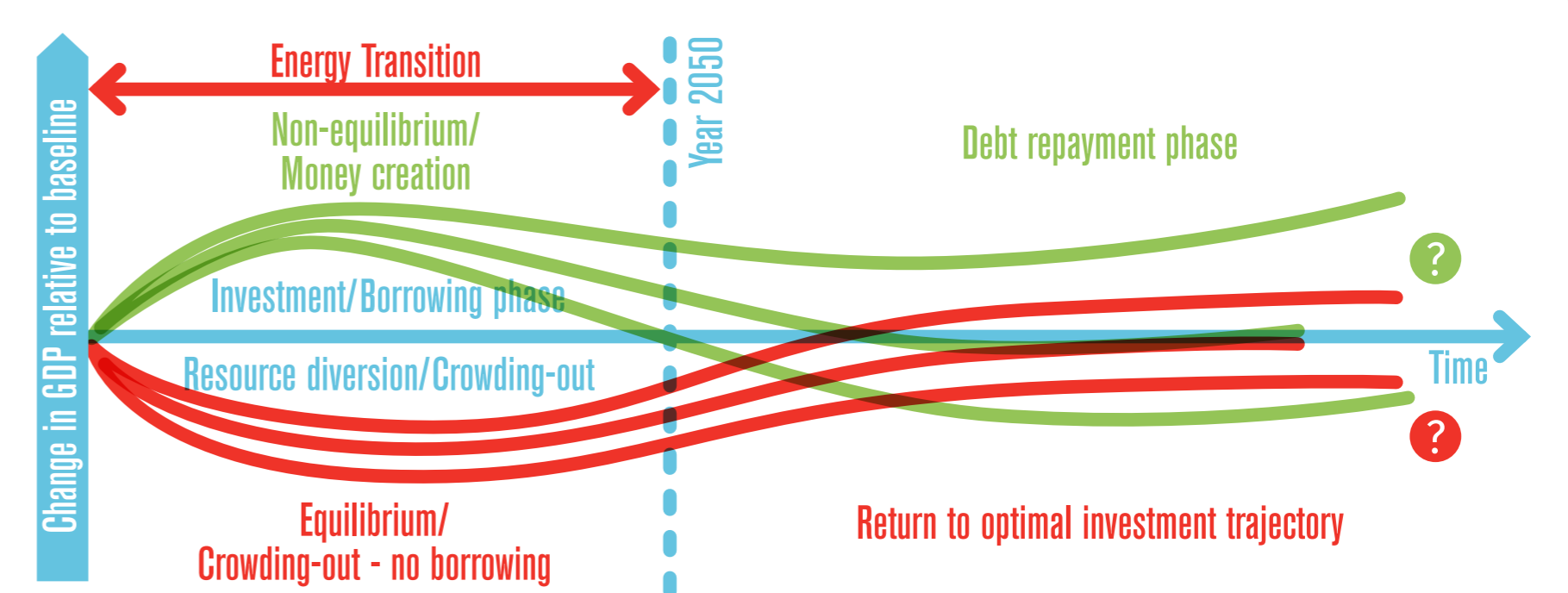


- Assessing both the physical and transition risks.
- Different actions taken to reduce GHG emission - strength of response.
- Different transition pathway - orderly and disorderly.
- Using a consistent set of transition scenarios for the comparability of different analyses.

Source: https://www.ngfs.net/sites/default/files/medias/documents/ngfs_first_comprehensive_report_-_17042019_0.pdf

Main difference between NGFS and Climate MAPS is in using (partial) equilibrium models versus the non-equilibrium model E3ME:

- Equilibrium models assume markets are efficient and in equilibrium. Policy intervention (e.g. carbon tax) results in sub-optimal economic outcome/loss of welfare. In E3ME (used in Climate MAPS), policy can stimulate investment that improves economic outcome (see illustration).
- In equilibrium models, investments are typically constrained by level of savings. In E3ME, investment is determined by entrepreneurs' expectations of future demand and is funded by new bank loans. Endogenous money is created as bank loans are created.
- In equilibrium models, the interest rate equilibrates supply and demand for savings. In E3ME, interest rates are influenced by central bank policy rate, which is assumed to target macro stability.



Economic impacts comparison NGFS - Climate MAPS

Comparison only possible on global cumulative level (due to limited scope of current version of NGFS scenarios)

	NGFS	Climate MAPS (June20)
Orderly Transition impact by 2100 (global cumulative GDP)	-4%	+0.4%
Disorderly Transition impact by 2100 (global cumulative GDP)	-9.5%	-0.5%
Hothouse Earth/Failed Transition impact by 2100 (global cumulative GDP)	Between -1% and -25%	-55%

