BANK OF ENGLAND

EMF Snowmass Workshop

Scenario analysis for climate-related financial risks

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Climate change presents a range of risks to the financial system

	Credit	Market	Operational
Physical	Increased risk of flooding Declining agricultural output	Re-pricing of sovereign bonds Re-pricing of catastrophe bonds	Business continuity planning for severe events
Transition	Tightening energy performance standards Stranded assets from fossil fuels Tightening standards for ICE vehicles	Re-pricing of equities Re-pricing of energy and commodity derivatives	Climate-related litigation claims

Source: Transition in Thinking (BoE 2018)

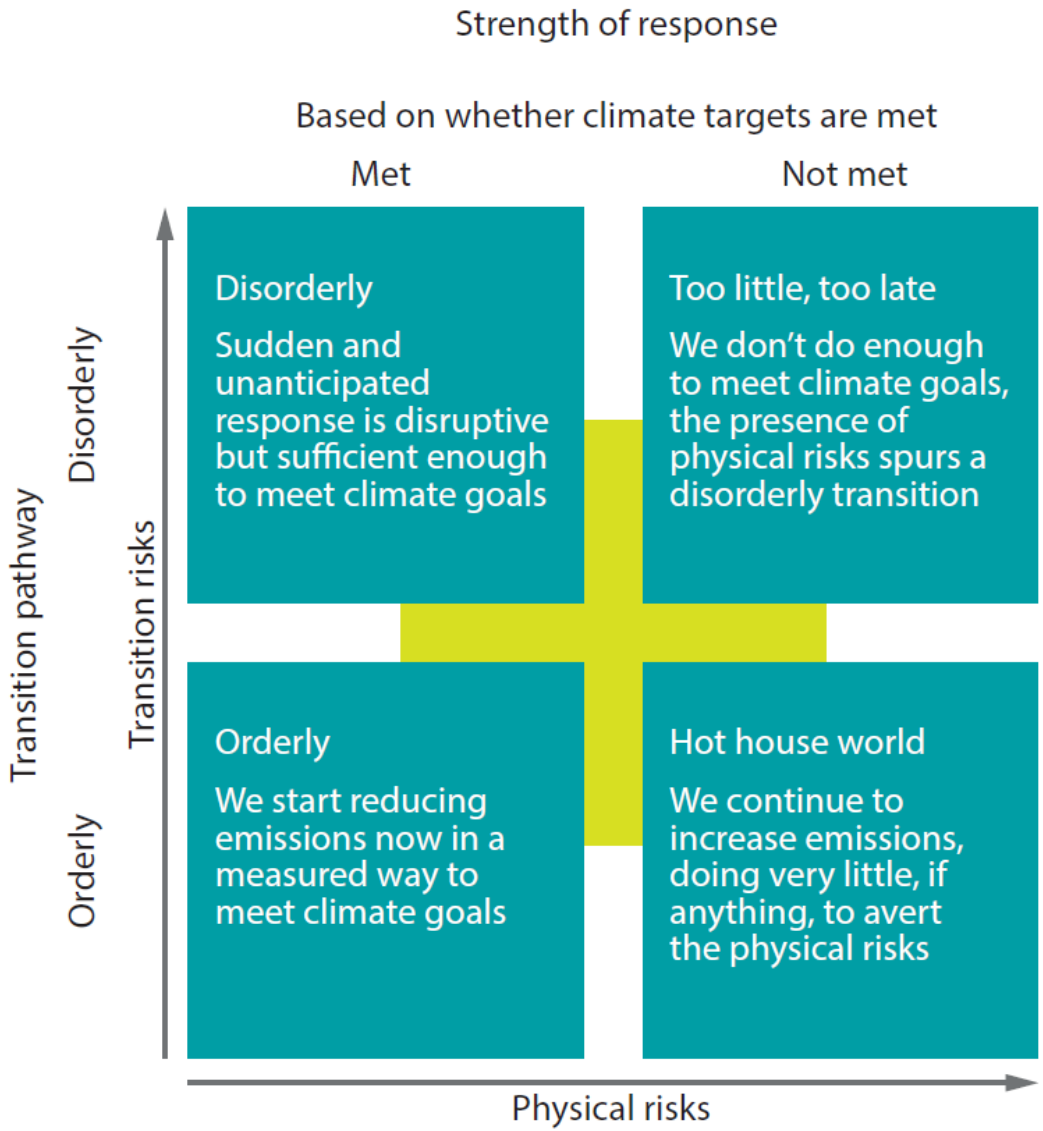
Fundamental barriers to assessing climate-related financial risks

- Uncertainty – climate risks are unprecedented, timing and size of policy action is unclear
- Past data not a good predictor of the future – so usual risk models less relevant
- Difficult to model far-reaching structural changes
- Time horizon of climate risks beyond usual decision-making horizons

Climate analysis at the Bank of England

Objectives	Policy actions
Soundness of banks and insurers Financial stability	Supervision to ensure firms manage climate risks *(Supervisory statement, 2018)* Disclosure of climate risks by firms (*TCFD recommendations*) Stress testing of the financial system *(Insurance stress test 2019, bank stress test 2021)*
Price stability	Monetary policy and market operations

Typical scenario narratives



Source: NGFS

Integrating scenarios into financial risk assessment

Scenario from IAM

- Temperature path
- Carbon price
- High-level macro and sectoral data

Granularity for financial analysis

- Impacts by region / sub-sector
- Additional macro variables
- Assumptions about incidence and adaptation

Model losses

- Probability of, and loss given, default
- Fit climate shock into existing risk models or develop new models

Financial system resilience

- Add up losses across the system
- Add up firm actions

Some challenges for scenarios for financial analysis

Uncertainty	- Regulators focus on the tail (e.g. bank capital calibrated to 99.5% of losses) - Volatility key for asset pricing
Granularity for financial analysis	- Map onto relevant variables (e.g. profitability, unemployment, house prices) - Detailed sectoral and geographic data
Policy drivers	- Can we distil the myriad of price / quantity measures into a carbon price?
Financial system interlinkages	- Model feedback loops between climate, economy and financial system