

# The macroprudential challenge of climate change

Authors: ECB/ESRB Project Team on climate risk monitoring

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- The report documents progress in the measurement and modelling of climate risks to EU financial stability, and discusses potential policy response
- Main take home messages:
  - A disorderly transition (carbon price) can trigger systemic financial risk
  - Interdependent hazards (water stress, heat stress and wildfires) can amplify physical climate risk -> multiform and compound risks
  - **Default cascades across firms** (not only to fossil but high carbon activities whose business is connected to fossil fuel firms) and banks
  - Financial market dynamics can amplify losses: abrupt repricing of assets could trigger corporate defaults and credit losses for bank
  - Role for prudential policies to mitigate such risks



## Getting granular and forward-looking on transition risk exposures: CPRS Granular

- How to identify firms and investors' transition risk exposure dynamically across NGFS climate scenarios, going beyond GHG emissions?
  - NACE CPRS IAM mapping: A tool to support climate risk analysis of financial portfolio using NGFS scenarios.
  - Climate Policy Relevant Sectors (CPRS) Granular that enable also to map NACE codes into IAM variables used in NGFS scenarios.
  - CPRS Granular: 100+ categories enabling to discriminate low and high carbon beyond the granularity of NACE codes.

### Mapping economic activities into IAM variables via Climate Policy Relevant Sectors **NACE** sectors IAM classification of variables economic activities (1000+)**Grouping in few Climate Policy** (1000+ 4-digits **Identify IAM Climate Transition risk Relevant Sectors** codes) variables relevant to dimensions (CPRS) transition risk: (Non-) energy value chain Primary, secondary Other classifications GHG emissions value chain energy, selected CPRS Main of economic activities (e.g. production levels of Climate policy relevance manufacturing and NAICS • CPRS2 affected sectors) Fossil fuel substitutability transport etc. GICS CPRS Granular ICB Climate financial risk assessment Financial portfolio data The mapping via CPRS into IAM variables enables the Financial securities issued by firms come with a classification based on their economic activities use of NGFS Scenarios for climate stress test

Fig: Rational for mapping the NACE codes into IAM variables through CPRS, from left to right. Source: <u>Battiston ea 2022</u>



- Strong message to EU policy makers in the current geopolitical context of high energy commodity prices and supply-driven inflation:
  - Early and credible introduction of climate fiscal policies (..what about a EUwide carbon tax/) crucial to prevent systemic financial risk
  - High fossil fuels prices: good or bad for the low-carbon transition?
    - Good create major incentives to foster economic decarbonization and build resilience to stranded assets
    - Bad: energy policy incoherence builds up new risk for stranded assets in banks' balance sheets (support to new fossil fuels investments in EU 27 eg regassification)



- Strong message to financial regulators and supervisors in the transition:
  - Role of macro and microprudential policy complementarity to smooth adjustments in agents' balance sheets
- How to macroprudential policy design? Some examples
  - Lending limits to high risk activities, either via the introduction of upper/lower ceiling floors and large exposure limits:
    - metrics and measurement challenges (e.g. ESG, Scope3 concerns and scandals)
  - Revision of minimum capital requirements to allow banks to withstand scenarios
  - Introduction of policies that increase the cost of capital for high climate-risk firms (e.g. a dirty penalizing factor)
  - Use of systemic risk buffers to address climate systemic risks i.e., supervisors can apply a buffer on assets from sectors most exposed to climate risks or to
- Side question: what about risk transfer from regulated to unregulated markets?



- Insights from the new World Bank report <u>"The Role of Green Financial Sector Initiatives in the Low-Carbon Transition: A Theory of Change"</u>
- Under which conditions and to what extent Green financial policies, regulations, and instruments (GFSI), could enable green investments and decarbonization, while avoiding unintended effects on econ and financial stability?
- Focus on green macropru, green monetary policies, green public co-funding:
  - Analysis of transmission channels through which they affect availability and cost of capital for high- and low-carbon goods, investments, output, and GHG emissions
  - For each GFSI: identification of entry point in the economy, direct, indirect impacts
- We identify criteria for applicability and conditions to maximize impact.

## Theory of change (ToC): building blocks

Building blocks of the ToC from bottom to top, structured into challenges, opportunities, enabling conditions, outcomes, and expected impact

		GLOBAL CLIMA	ATE MITIGATIO	N	
GHG emissions reduction Economic competi		mic competitiveness	tiveness Financial stability		Social cohesion
IMPACTS					
Higher cost of capital (high-carbon Investments)	Lower cost of capit (low-carbon Investments)	al Higher liqi low-ca Investr	arbon	De-risking (low-carbon Investments)	Larger capital flows (low-carbon investments)
OUTCOMES					
Climate fin	ancial risk disclosure		Climate financial risk assessment		
Green Taxonomy	Climate Policy Releva (transition risk strand		Risk adjustment (high/low-carbon activities)		Balance sheet Climate stress test
ENABLING CONDITIONS					
Green Financial Sector Interventions					
Brown Penalizing Factor	Green Supporting Gr Factor		een Collateral mework	Green Quantitative Easing	Public funding and cofunding
OPPORTUNITIES					
Carbon intensive economies	Carbon intensive Low attractiveness of low-carbon investment (cost of capital)		Low liquidity		Limited development of capital markets
CHALLENGES					
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Source: Monasterolo ea 2022

## Example: macropru - dirty penalizing factor (DPF)

The figure shows the transmission channels through which the DPF affects the banking sector and the real economy, via higher risk weights assigned to high-carbon activities.

Fig. Macro-financial transmission channels of the 'Dirty Penalizing Factor'. The **purple box** indicates the policy. Up-facing arrows: positive trend. Downfacing arrows: negative trend.

**Brown arrows**: policy impacts on high-carbon firms.

Pink area: direct impacts.

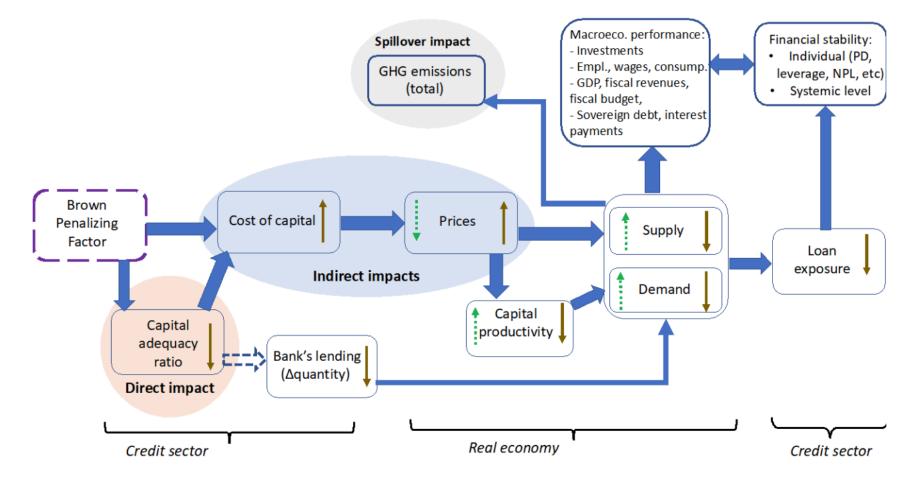
Blue area: indirect impacts.

Grey area: spillover impacts.

Dotted arrows: potential effects on

the low-carbon sector.

Source: Monasterolo ea 2022





- Battiston, S., Monasterolo, I., van Ruijven, B. and K., Volker (2022). The NACE – CPRS – IAM mapping: A tool to support climate risk analysis of financial portfolio using NGFS scenarios. Available at https://www.finexus.uzh.ch/en/projects/CPRS.html
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