

LANDSCAPING CARBON RISK FOR FINANCIAL INTERMEDIARIES

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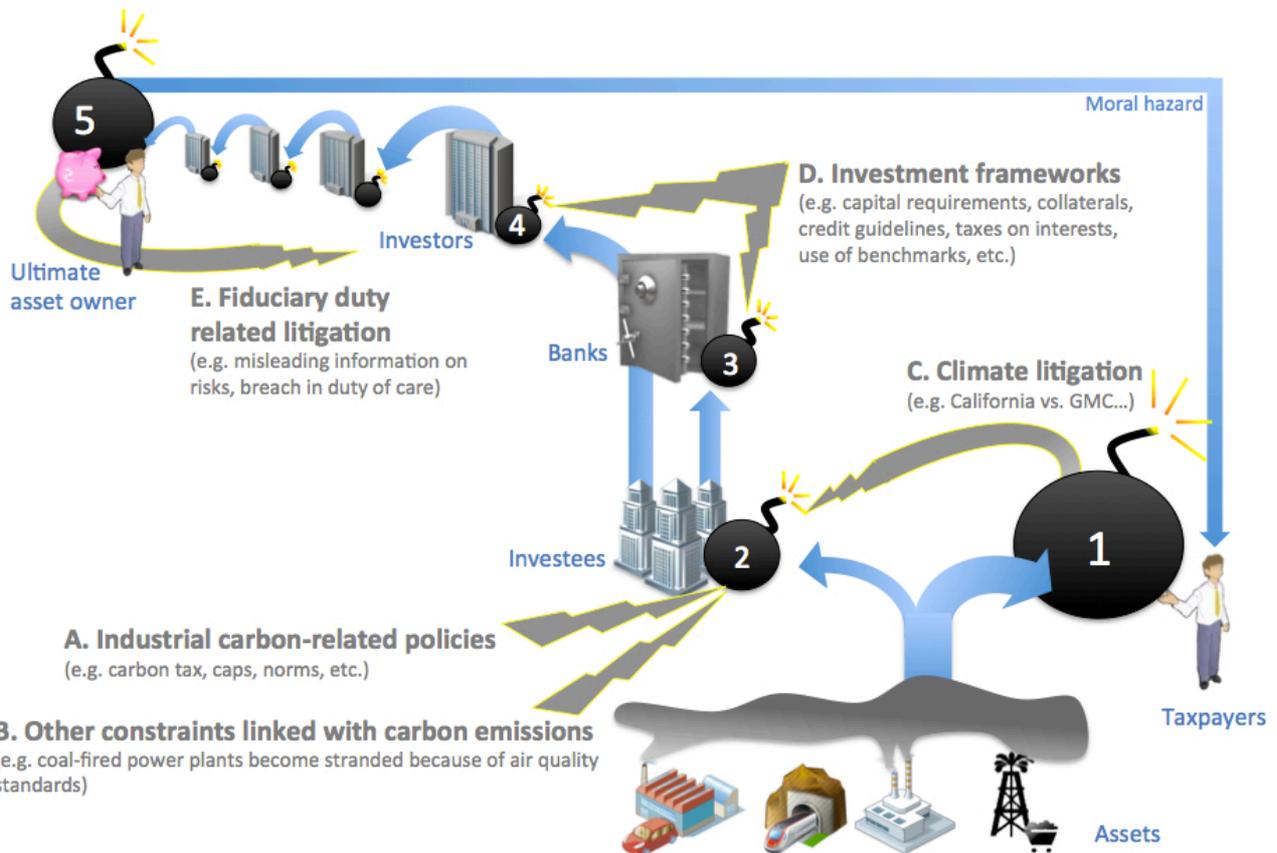
I. DEFINITION AND CONCEPTUAL FRAMEWORK

 **Carbon risks** can be defined as the family of risks correlated with the GHG-emissions associated with an asset.¹ Generally, these risks exclude climate change-related physical and macroeconomic consequences, such as variation in temperature, the rise of the sea level, and their impacts on national economies.

 **Risk factors.** The financial risk can be conceptualized as the probability of changes in risk-adjusted return profile of the asset. This could be due to changes in the demand / price / competition for the various entities that derive profits from activities releasing GHG-emissions (including companies, banks, asset-owners). In some cases this may be due to directly assuming at least a part of the related *social cost*.² Or it may be due to other factors such as air quality standards which act as a proxy for carbon measures. Most risk factors that have materialized to date concern emitters, their clients, and their suppliers (A,B, C on the chart). However, a forward looking analysis suggests that financiers and owners might also directly face risk factors related to their ‘financed emissions’ via an evolution (real or perceived) of investment regulatory frameworks (E on the chart).

 **Risk transfer.** The risks faced by the investees (A, B, C on the chart) are partly transferred to those who finance and own these entities, since a drop in asset value or creditworthiness translate into losses accounted in their books, or a reduction in asset levels of a certain quality.

 **Boomerang effect.** Some types of risk result from ‘boomerang effects’, through litigation for instance (C and E on the chart). In this case, the risk exposure is correlated with the tort cost and therefore the success of the entity in externalizing or transferring the cost of ‘its’ GHG-emissions in the first place.



1 Working paper for the forthcoming 2^oii/CDP study on the future of carbon metrics for investors

II. RISKS FOR WHOM?

In order to understand and assess a carbon risk, the first step is to define who is concerned and how the risk faced by the investees are transferred across the investment chain.

- 1. Society/taxpayers.** The first and most prominent 'risk' correlated with GHG-emissions relate to their external cost. Based on IPCC report, the existence of a cost is almost certain. The main uncertainties relate to magnitude and burden sharing.
- 2. Investees.** For carbon-intensive companies the risks will materialize in the form of increased costs, reduced revenues, and impairments related to 'stranded assets'. These risks can be calculated through an adjustment of valuation (Discounted Cash Flow, market value) based on an alternative scenario (e.g. reduced demand and prices aligned with +2° C goal).
- 3. Banks.** The risks faced by the investees are partly transferred to lenders via losses at default in an adverse scenario or a rise in the cost of capital if the credit rating of the asset is downgraded. In turn, these risks are transferred to the bank's shareholders and financiers, or investors in case the loan is securitized.
- 4. Investors.** Institutional investors hold securities (equities, bonds, ABS) and therefore face credit and market risks in case future cash flows and credit worthiness of the investees are significantly altered by the introduction of new constraints during the holding period. These risks are transferred to other investors when the security is traded.
- 5. Ultimate asset owners.** The ultimate asset-owners are those at the end of the investment chain, who hold the security or have their benefits hit "when the music stops" (i.e. the carbon risks materialize). Depending on the magnitude of the impact, they might (or might not) be able to transfer the cost to tax payers if "too big too fail" institutions are in the front line (a.k.a. moral hazard).

OPTIONS TO DEFINE THE CARBON RISKS RELATED TO FINANCIAL ASSETS

Depending of the perspective adopted (society at large, financial intermediaries or ultimate asset-owners), the carbon risk can be defined in three ways:

- **In a narrow definition**, it is the financial risks faced by the lenders and investors (2 & 3): credit and market risks linked with the asset held (transfer of A,B,C) during the holding period, as well as the regulatory and litigation risks related to the investment framework (D & E).
- **A broader definition** includes the risk for the ultimate asset owner (5), assuming that the financial intermediaries have a duty to assess these risks and inform the next investor in the 'hot potato' game, or the regulator when considering moral hazard.
- **An extended definition** includes the social cost of emissions (1) assuming that someone will pay this 'off-balance sheet' liability at the end of the day and that governments might sooner or later try to shift the burden to asset-owners by all possible means.

III. SOURCES OF RISK

The following section tracks the different type of risk factors and their materiality for financial intermediaries.

A. Industrial carbon-related policy risks. The most prominent and original source at least in the short- and medium-term for carbon risks are industrial carbon-related policy risks. They include for instance caps on

GHG emissions, carbon taxes, and norms regarding vehicles emissions. For financial intermediaries, the risk relates to a sharp and unanticipated change (real or perceived) in public policies at global level or in multiple countries during the holding period. The failure to believe measures will come into force until it is too late can also contribute to risk. Whilst measures labelled as carbon are the most obvious risk, fossil fuels are already facing increasing uncertainty, which leads to consideration of other market factors under B. in the next paragraph.

B. Market constraints linked with carbon emissions. An energy transition will see changes in the demand and prices for different energy options. This could be linked to a range of factors including falling prices for alternatives, economic slowdowns, technological advances, efficiency measures, etc. Carbon emissions are highly correlated with other impacts such as resources depletion, local air-pollution, local environmental impact of extractive activities, water consumption, etc. Carbon intensity can therefore be used as a proxy for risk exposure to other environmental and energy efficiency policies (e.g. air quality and mpg standards for cars), contested operation licenses (e.g. for fracking), and increasing market prices (e.g. energy). For financial intermediaries, the risk relates to a sharp and unanticipated change in public policies in several countries or changes in global market prices (e.g. oil) during the holding period.

C. Climate litigation. This is the long-term risk that lawsuits targeting companies with high cumulated past emissions create liabilities, based on the company's 'share of responsibility in the cost of global warming'.³ It is not limited to direct emissions and likely to occur in countries where extra-territorial jurisdiction and class action lawsuits exist. To date all cases are pending or have been dismissed. For financial intermediaries, the risk relates to a first wave of prejudices or settlements occurring during the holding period and turning the cumulated emissions of their investees into liabilities (*Cf. forthcoming study of 2°ii and Kepler-Cheuvreux*).⁴ In an alternative scenario, financial intermediaries can directly face claims based on their 'financed emissions'. To a certain extent, reputational risks faced by banks today can be seen as a first step towards these new types of claims.

D. Investment regulatory frameworks. Investment regulatory frameworks include all 'top-down' mechanisms that directly or indirectly impact the cost and availability of capital for financial intermediaries, including: capital requirements, eligibility of collateral, taxes on capital, interest and transactions, credit guidelines, etc. (*Cf. forthcoming study of 2°ii*).⁵ To date, these investment frameworks only include climate goals in a positive way (i.e. incentives for investments in green mortgages) and at a very limited scale. No disincentive for fossil fuel and carbon-intensive investment has been implemented yet. But recent developments, including the regulatory debate on long-term financing at European level,⁶ and the introduction of mandatory reporting of loans environmental risks to CBRC in China suggest a mentality change among regulators.⁷ For financial intermediaries, the risks relate to incentives and/or disincentives potentially directly linked with a 'climate-friendliness' indicator (e.g. "Is my lending and investment in line with a 2°C investment roadmap?").

E. Fiduciary duty related litigation. Scanning the investment process of many institutional investors, one comes up with a series of questionable practices that seem fundamentally inconsistent with the pursuit of the best financial interest of beneficiaries (for pension funds, life insurance) and ultimate asset-owners (for mutual funds) over the long-term. They include: the 'artificial shortening' of investment horizons,⁸ the lack of long-term risks assessment to inform strategic asset allocation,⁹ the alignment of sectorial exposure on benchmarks without questioning the impact on diversification,¹⁰ etc. These practices seem to partly result from principal-agent concerns and a narrow short-term focused interpretation of trustees' duty of care.¹¹ As a result, if the 'carbon bubble' bursts (i.e. massive write-offs and/or provisions at investee level related to the materialization of risks A, B or C), institutional investors might face claims for negligence. While this litigation may primarily affect institutional investors, they can in turn file suits against banks and investees, based on their lack of disclosure of tail risks (e.g. Rico lawsuits in the US).

IV. DETERMINING THE MATERIALITY OF CARBON RISKS FOR FINANCIAL INTERMEDIARIES

There are a number of key issues to be considered when determining the materiality of carbon risks.

Forward-looking vs. backward-looking analysis. To date, only risks A and B have materialized, albeit still insufficiently to lead mainstream equity and credit analysts to integrate carbon risk into their models (with the exception of specific industries in certain countries such as electric utilities and airlines in Europe). Market risk is starting to feature as a theme for things like the structural decline of the coal market and reviews of oil price assumptions underpinning capital expenditure strategies. Looking backward, most debates and assessment frameworks¹² on carbon risks rely on the assumption that future risks for financial intermediaries will primarily relate to the strengthening of A and B (i.e. introduction of more stringent industrial policies and tensions on the energy markets). However the basic rules of prospective analysis call for the consideration of potential disruptive changes on topics that are off the radar screens today. In this respect, any serious forward-looking risk analysis will also address C, D and E, even if they might sound like 'science fiction' in today's environment.

Long-term risks vs. short-term investment horizons. Given the state of international climate negotiations, the 'non science-fictional' risks (A & B) are not likely to materialise soon enough to hit bottom lines and credit ratings in the next 2 to 5 years.¹³ On the other hand, the turnover of equity portfolios and the average maturity of bonds and banks' loan books largely put these risks 'off the radar' of most financial intermediaries. In other words, in the next 2 to 5 years, "*value at risk x likelihood of materialization = no risk*". So at the end of the day, a comprehensive forward-looking analysis suggests that the materiality of 'science-fictional' risks (C, D, E) for financial intermediaries might be relatively higher, or at least equally eligible for consideration.

Exposure to carbon assets vs. lack of diversification. At asset line-level (e.g. loan, equity, bond), one can distinguish carbon risks (e.g. faced by a coal mining company) and carbon opportunities (e.g. for a solar panel manufacturer). Carbon risks A, B and C are exclusively linked with the exposure to 'carbon assets' (i.e. assets associated with 'too much' cumulated, annual, or past emissions). In this respect, the exposure to 'low-carbon assets' can be considered as a distinct issue that can be addressed separately (e.g. in order to hedge carbon assets risks). However, this distinction is not relevant anymore at portfolio-level for an investor, especially when considering carbon risks D and E. The reasons are twofold:

- According to the modern portfolio theory, the investors are supposed to diversify their portfolio exposure, but they are not obliged to reduce the exposure of each individual line to a given risk. In this respect, if one assumes that carbon risks are or will become material, the duty of investors is to consider this as a parameter in their diversification strategy, not necessarily to phase out carbon assets. Therefore the carbon risk E is linked to diversification (right mix of green and brown investments).
- If investment regulatory frameworks (risk D) are to include carbon constraints and climate goals, any incentive/disincentive mechanism is likely to be based on the 'climate-friendliness' of investments (right mix of green and brown investments) rather than only their exposure to carbon asset.¹⁴

OPTIONS TO PRIORITIZE RISKS AND DEFINE INDICATORS

Based on this analysis, practitioners have several options (not mutually exclusive) when considering the development of "carbon risk indicators". If narrow definitions are used, the materiality for financial intermediaries might be limited for the next few years. Furthermore, if the indicators are developed for reporting purpose, stakeholders might expect indicators based on a broader definition of risk, covering the exposure of ultimate asset-owner (cf. previous box) or society at large. NB: If a broader definition is used, the carbon risk exposure would include the underexposure to low-carbon assets.

SUMMARY TABLE

	<i>Tax payers (external cost)</i>	<i>Investees (Impairments and costs)</i>	<i>Bank (credit risk)</i>	<i>Investors (Value-at-risk risk)</i>	<i>Ultimate asset owner (tail risk)</i>
<i>Nature of risk</i>	Cost of climate change (damages, adaptation costs)	Impact of future policies (A), constraints (B), and litigation (C)	Impact of future policies (A), constraints (B) and litigation (C) on investees, as well as investment frameworks (D).	Impact of future policies (A), constraints (B) and litigation (C) on investees, as well as investment frameworks (D) and fiduciary duty related litigation (D)	Impact of future policies (A), constraints (B) and litigation (C) on investees, as well as investment frameworks (D).
<i>Assessment</i>	Social cost of emissions	Impact of a scenario (to be developed) on DCF	Integration of the alternative DCF calculation in credit risk assessment.	Alternative assessment for each asset line or assumption by asset-class and industry (e.g. Mercer’s model)	Same for each investment product
<i>Carbon data requirements</i>	Cumulated past, annual, and locked-in emissions	Locked-in emissions by type and country	Not relevant, carbon-stressed DCF required for each investee	Not relevant, requires alternative credit ratings	Not relevant, carbon-stressed DCF required for each company

SOURCES AND ENDNOTES

¹ All issues and stakes related to the definition of the allocation rules are discussed in the study *from financed emissions to long-term investing metrics* (2°ii 2013).

² The social cost of carbon emissions is defined as the present net cost of adaptation and damages related to global warming. According to the US government, the social cost per metric ton of CO₂ ranges from \$20 to \$60.

³ Liability for climate change ? Experts' views on a potential emerging risk, Munich Ré (2009)

⁴ Carbon Boomerang, the landscape of climate litigation risks for companies and investors, 2°ii/Kepler-Cheuvreux (forthcoming 2014)

⁵ Shifting private capital towards climate-friendly investments: the role of financial regulatory regimes, 2°ii (forthcoming 2014).

⁶ In 2013, the DG Markt released a green paper on long-term financing of the EU economy, connecting the dots between regulatory issues (e.g. financial markets regulation, banking regulation, tax incentives on savings, etc.) and long-term investment needs and climate goals. Following the consultation, the DG Clima commissioned a study dealing with « the mobilisation of private capital towards climate-friendly investments ». Regulation on these topics is on the agenda of the Commission for 2014 and 2015.

⁷ Chinese banks are now obliged to report to CBRC (the regulator) on various indicators related to their lending activities, including CO₂ savings and regulatory risks. Source : Forthcoming 2° ii country-report China (2014).

⁸ *Measurement, governance and long-term investing*, WEF (2012); *The future of long-term investing*, WEF (2011); *Investment Horizons. Do managers do what they say ?* Mercer (2010)

⁹ *Climate change scenarios: implications for strategic asset allocation*, Mercer (2010)

¹⁰ *Winning the long game: implications of using benchmarks for long-term & climate financing*, 2°ii (forthcoming 2014).

¹¹ *Is the exposure of institutional investors to fossil-fuels assets a breach of their fiduciary duty?* 2°ii (exploratory paper, 2013)

¹² E.g. AODP's Climate Risk Management Best Practice Methodology, Mercer's TIPP assessment framework, papers from HSBC, Kepler Cheuvreux, etc.

¹³ *The integration of climate risks into financial analysis*, OTC/ADEME (2010).

¹⁴ Cf. forthcoming study on the *Integration of climate and long-term financing goals in tax incentives on savings interests in France*, 2°ii / Prime Minister's office/ ADEME (2014).

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