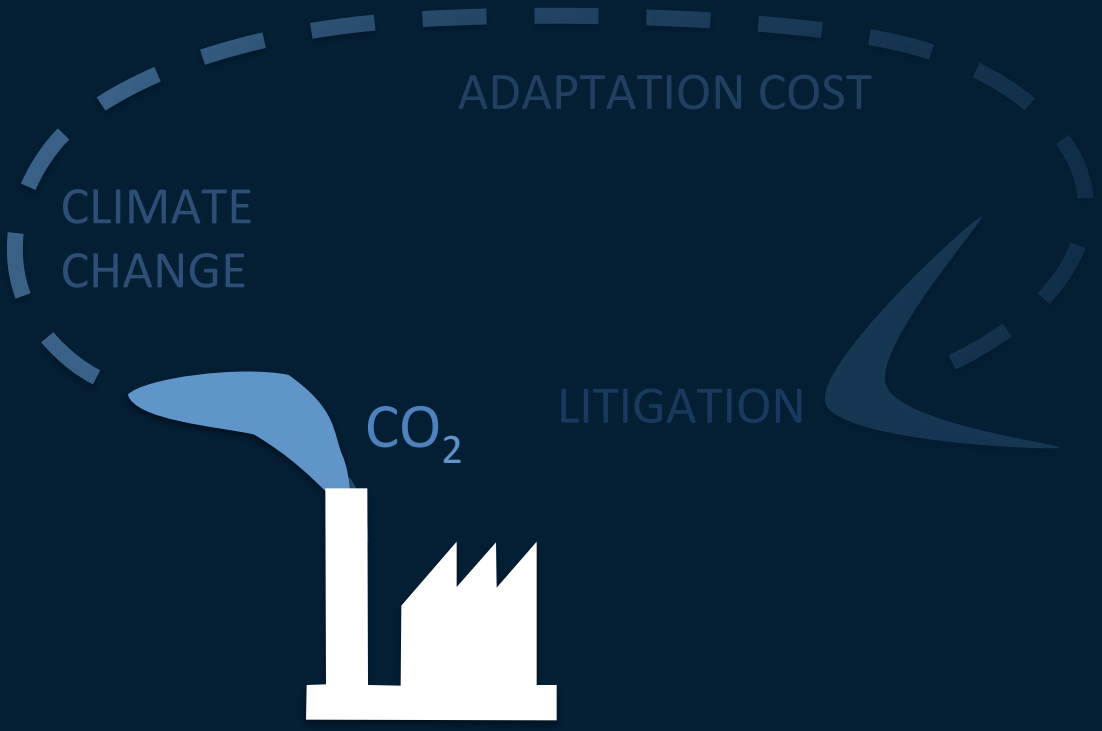
CARBON BOOMERANG

THE LANDSCAPE OF CLIMATE LITIGATION
RISKS FOR COMPANIES AND INVESTORS



CONCEPT NOTE
DECEMBER 2013

BACKGROUND INFORMATION ON CARBON RISKS

1. THE LANDSCAPE OF CARBON RISKS FOR COMPANIES

• **Climate-policies.** Defining climate risks as the family of risks related to climate change, we must distinguish 'physical risks' and 'carbon risks'. Physical risks result from the effects of climate change such as variations in temperature and precipitation, the increase of sea levels, etc. Carbon risks are linked with the mitigation of climate change, via the efforts to reduce the emissions of greenhouse gases (GHG). These risks are mostly driven by climate-policies (e.g. regulatory standards, tax schemes, market prices, and changes in consumption patterns).[1] Finally, it is important to stress that from a financial perspective, carbon risks also include the risk of going low-carbon when governments and policies remain 'high-carbon'.

• **Correlation with other risks**. Carbon emissions are correlated with other impacts such as resource depletion, local air-pollution, local environmental impact of extractive activities, water consumption, and pollution. Carbon intensity can therefore be used as a proxy for risk exposure to other environmental and energy efficiency policies (e.g. air quality standards for cars), contested operation licenses (e.g. for fracking), and increasing market prices (e.g. energy). Equally, it cannot alone cover the whole scope of risks (e.g. large hydro, biofuels).

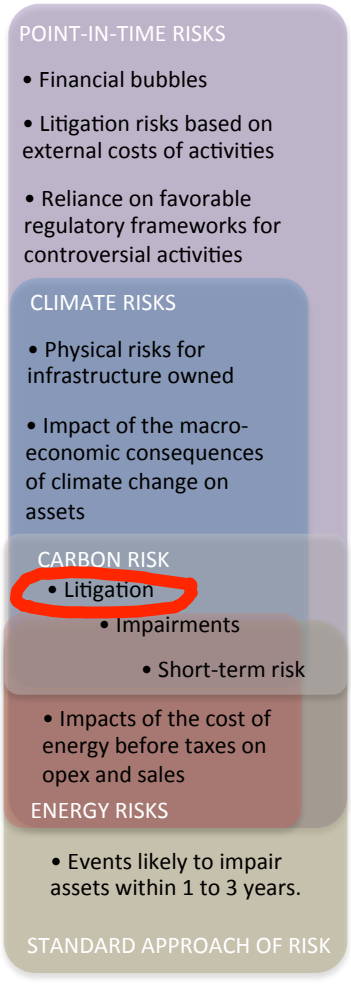
Carbon risks can materialize in three distinct but potentially mutually reinforcing ways:

• **Short-term risk.** This is the short (and medium-term) risk essentially associated with costs related to the evolution of the carbon price on regulated markets, the increase in energy prices, the introduction of new taxes and energy-efficiency standards (e.g. for cars, appliances, real estate, etc.). The exposure to short-term risk is primarily a function of year-to-year emission levels. While potentially material in the short term, this risk is expected to evolve and become stronger in the long run. The 2010 Global Investor Survey on Climate Change suggests this type of risk is the 'main worry' for investors.[2]

• **Impairment.** Some long-lifetime physical assets owned by the investee such as power plants and coal reserves may become 'stranded' at one point in time, due to the implementation of more stringent policies or changes in consumption patterns. The risk extends to long-term, capital-intensive R&D programs in carbon-intensive technologies. The automotive sector is a prominent example in this regard. Impairment is correlated with locked-in emissions and not limited to direct emissions.

• **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. It is not limited to direct emissions and likely to occur in countries where extra-territorial jurisdiction and class action lawsuits exist. The tort cost could include adaptation costs at local level for states and cities (invested by anticipation), thus shortening the time horizon of risk from the years 2050-2100 to today. This concept note focuses on this type of risk.

FIG.1 RISK FACTORS FOR INVESTORS (2°ii, 2013)



1. Climate change valuation in financial analysis, ADEME/OTC (2010) 2. Global Investor Survey on Climate Change, Mercer/IGCC (2010)

2. CARBON & FINANCIAL RISK ASSESSMENT

• **Point-in-time risks ignored.** To date, the integration of carbon risks in risk-assessment frameworks is limited to short-term factors. Impairments and litigation risks which could be assessed through stress-testing are not even mentioned as risk factors in the dedicated sections of the companies' annual financial reports.

This gap in reporting is not limited to carbon risks. Indeed some kinds of risks, while credible and possibly major, appear to be almost completely ignored by investors, arguably due to discrepant time horizons. The World Economic Forum calls these 'point-in-time-risks'.[3] Indeed, for various reasons including principal/agent concerns, the impact of capital requirements, the lack of assessment methodologies, and behavioral bias, the investment horizon of most institutional investors are shorter than what a rational client-oriented approach of risk-adjusted returns would require. As a consequence, most risk-management metrics and tools are based on a short-term view.

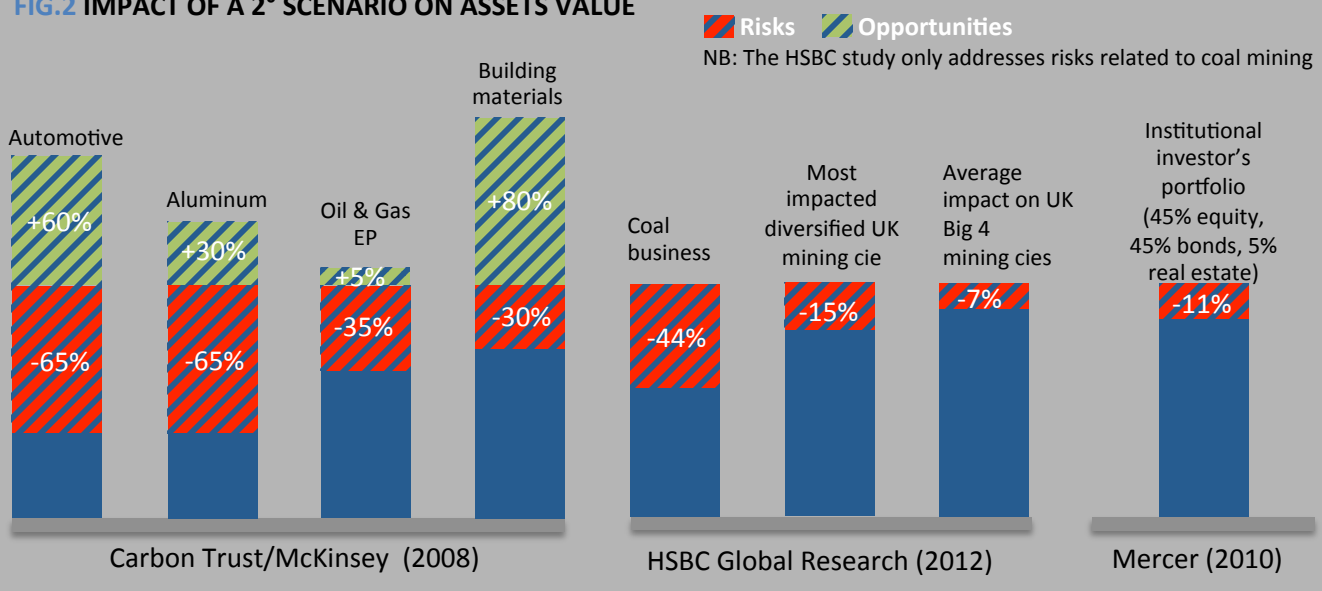
Changing the time horizon for investors in terms of responsibility could therefore result in considerable risk management mutations. This however does not settle the question of the ultimate materiality of climate risk exposure. To address these uncertainties, financial institutions and regulator can stress-test cash flows and portfolio returns based on extreme scenarios. The approach is applicable to both credit and market risks. To date it has been applied to policy, physical, and macro-economic risks, while climate liability risks have been largely ignored.

• **Equity research.** To date, assessing climate risks relies on an adjustment of discounted cash flows calculation (DCF) in order to take into account higher prices on direct or induced CO_2 emissions. These approaches have been pilot-tested by brokerage houses and researchers on climate-sensitive industries. According to several studies the impact of a 2°C scenario on companies' valuation reaches up to 35% for oil companies, 44% for pure players in coal mining and 65% for car manufacturers and aluminum producers (see table below).

• **Strategic asset allocation.** Following a first experiment of the French Pension Reserve Funds (2009), Mercer (2010) has translated climate scenarios into economic impacts (inflation, investments, etc.) to simulate the risk adjusted return of various asset classes. The result shows that climate risks represent about 11% of a balanced portfolio risk exposure.

3. Measurement, Governance and Long-term Investing, World Economic Forum (2012)

FIG.2 IMPACT OF A 2° SCENARIO ON ASSETS VALUE



3. CARBON ACCOUNTING & REPORTING

• **Organizational boundaries**. The GHG Protocol[4] classifies companies' annual emissions into 'scopes':
–Scope 1 for direct emissions of the company's facilities and vehicles,
–Scope 2 for the purchase of electricity, heat, cooling, and steam emissions;
–Scope 3 for all other indirect GHG emissions, classified into upstream (supply-chain) and downstream (sold products use phase, disposal, and investments – a.k.a. 'financed emissions').
The development of carbon accounting, especially regarding financed emissions might lead to new definitions of boundaries in the next five years.

• **Legal responsibility**. Under cap and trade schemes, a company is only accountable regarding scope 1 emissions. However, some other legal frameworks such as the agreement on fuel-efficiency with car manufacturers (EU level) recognize a producer responsibility over sold products' carbon emissions.

• **Carbon disclosure.** Several countries have implemented mandatory reporting requirements (Australia, Canada, Denmark, France, UK, Japan, South Africa, United States, etc.)[5]. They are currently limited to scope 1 and 2. Scope 3 reporting is still in its infancy (specific guidance was only released in 2011). However, the current pilot-testing phase might lead to an extension of mandatory reporting requirements. In the meantime, carbon data providers are able to precisely estimate sold product emissions in most industries exposed to litigation risks (energy, automotive, etc.).

FIG.3 ADDITIONAL ANNUAL INVESTMENT NEED & FINANCIAL FLOWS NEEDED BY 2030 TO COVER COST OF ADAPTATION ($BN/YEAR)

Source: UNFCC

Sector	Global cost	Developed countries	Developing countries
Agriculture	14	7	7
Water	11	2	9
Health	5	Not estimated	5
Coasts	11	7	4
Infrastructure	8-130	6-88	2-41
Total	49-171	22-105	27-66

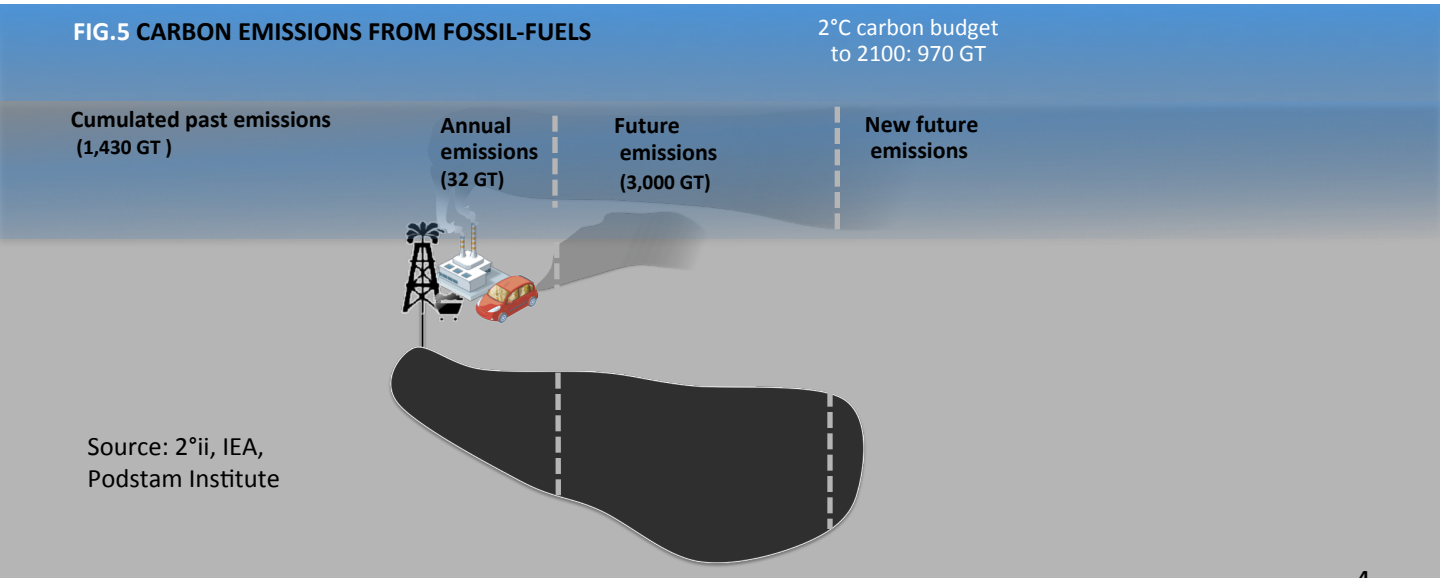
FIG.4 SOCIAL COST OF CO_2 (IN 2007 $/TON)

Source: US Government (2013)

Discount Rate Year	5.0% Avg	3.0% Avg	2.5% Avg	3.0% 95th
2010	11	33	52	90
2015	12	38	58	109
2020	12	43	65	129
2025	14	48	70	144
2030	16	52	76	159
2035	19	57	81	176
2040	21	62	87	192
2045	24	66	92	206
2050	27	71	98	221

4. GHG Protocol corporate standard. 5. Measuring and disclosing the carbon intensity of investments portfolios, UNEP-FI Investor Briefing (2013)

FIG.5 CARBON EMISSIONS FROM FOSSIL-FUELS



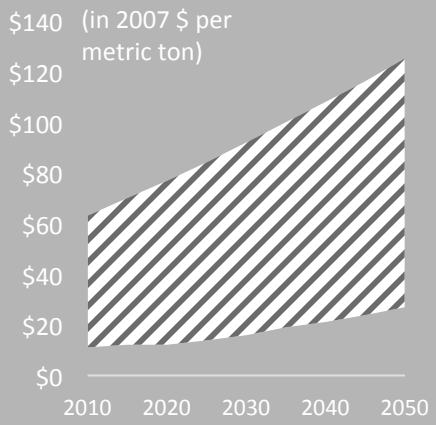
Source: 2°ii, IEA, Podstam Institute

FIG.6 US CLIMATE LITIGATION FILINGS 2001-2010

Source: Arnold & Porter LLP

FIG.7 RANGE OF SOCIAL COST OF CO_2 2010 – 2050

Source: US Government (2013)



OVERVIEW OF CLIMATE LITIGATION

1. CONTEXT OF CLIMATE LITIGATION

Current GHG emissions and energy investment trends lead us to a +6°C future involving massive changes in sea levels, local climate and water availability, as well as a sharp intensification of extreme weather events. As this future is becoming increasingly probable, cities and states are currently starting or planning massive adaptation investments and are therefore looking for deep-pocket organizations to foot the bill. Climate litigation targeting carbon-intensive companies for their cumulated emissions seems to be a new promising way to achieve this goal. Some lawyers see it as the 'new tobacco', while most investors only consider this risk as science fiction scenario. However, no in-depth comprehensive analysis of risk exposure has been conducted to date.

2. INTRODUCTION TO CLIMATE LIABILITY

• **The rise of climate litigation.** For about a decade, towns and states (e.g. Connecticut,[6] California[7]) impacted by climate change have started to sue oil companies, electric utilities, and automakers in US courts on the basis of their GHG emissions.[8] As of yet, all cases have been dismissed. However, a closer look shows that massive tort cost can occur after 40 years of dismissed claims[9] (e.g. tobacco litigation). Equally, not all options have been explored in the United States,[10] as well as in other countries with extraterritorial jurisdiction and class action systems.[11] In addition, under the no-harm rule, international law allows countries to sue each other for cross-border damages, even if the pollution comes from private companies.

Ultimately, climate change litigation is gaining ground. While it is unlikely to materialize in the short-term, a legal paradigm shift arising out of a particular case law judgment may fundamentally alter the legal environment. More active courts in developing countries (e.g. India) may also influence the agenda in developed countries. Moreover, the growing number of cases (see Figure 6) in the United States suggests environmental litigation is a growing topic on US courts' agendas. The results of the conference on 'financed emissions' calculation methods organized by 2° ii suggest that costs are less likely to materialize in the form of 'black swan' events (e.g. BP claims following Deepwater Horizon), but rather as growing number of singular and gradual compensation claims and tort costs.

6. AEP vs Connecticut 7. State of California vs GM, Toyota, Ford, Honda, Chrysler, Nissan (2006) 8. Climate Change Liability, Cambridge press (2011) 9. SustainAbility/Foaley Hoag LL (2007) 10. Chadbourne & Parke LLP (2012) 11. Interview with J.Spier, Advocate general, Dutch Supreme Court (2013)

• **The boomerang effect**. Recent academic research shows that progress in modeling will soon make it possible to attribute extreme weather costs to climate change[12]. But litigators will not necessarily have to wait for the accumulation of extreme weather events. The tort cost could include adaptation costs at local level for states and cities (invested by anticipation), thus shortening the time horizon of risk from the years 2050-2100 to 2013-2020.

• **The hidden cost of carbon emissions.** According to the *Stern Review*, climate changes could lead to a drop in global GDP of -5% to -20% by the end of the century. The cost of climate change will include adaptation investments, the direct cost of residual damages, and the indirect impacts on economic growth. Several economists, including US government officials, have calculated the present 'external' or 'social' cost of carbon emissions. Based on these calculations, cumulated and locked-in energy-related CO_2 emissions between the first IPCC report in 1990 and 2035 represent an estimated external cost of $21 to 88 trillion, with the wide range attributable to different core assumptions (discount rate, etc.).[13] This number increases to $90 tn when applying the Trucost/UNEP-Fi calculations.[14] For 2008, *Trucost* concluded that the top 3,000 companies' external cost amounts to $2.15 Tn or 1/3 of the global external cost of human activity. About 2/3 of the total cost comes from GHG emissions.

• **Attribution of the burden.** In the future, major technical obstacles will include determining the threshold between an 'acceptable' and 'harmful' emission level, and allocating emissions to liable companies.
In terms of the carbon threshold, recent research from the International Energy Agency and the Carbon Tracker Initiative helps to clarify the picture: The carbon content of existing oil and gas reserves already exceed the amount we can release in the atmosphere if we hope to limit global warming to +2°C. At the same time, if investment schedules don't adjust, the locked-in emissions of new energy-consuming infrastructure and equipment (power-plants, factories, buildings, cars, aircrafts, etc.) will exceed our 'carbon budget' within the next 5 to 7 years. As a result, every investment in a fossil-fuel related new capacity leads to costly emissions 'breaking the carbon bank'.
Regarding the attribution of emissions to companies, the picture is complex and no consensus prevails today (cf. 2°ii latest paper on 'financed emissions'). However, it seems relatively clear that the quick evolution of carbon accounting methods and standards can lead to an unexpected evolution of the way society and courts analyze legal responsibility in this field.

NEXT STEPS

• Cost analysis
The analysis would be based on a review of papers on the cost of climate change with a focus on adaptation cost. It would also review and build on the attempts to calculate the net present value by ton of CO_2 equivalent (annual or cumulated past GHG emissions).

• Allocation analysis
The report would analyse the various methods - and underlying assumption on responsibilities - used to allocate GHG emissions to governments, individuals, and companies, with a focus on the emerging accounting rules applied by/to carbon-intensive companies.

• Legal analysis
A legal analysis would include: a review of climate litigation trends; an analysis of legal grounds in various jurisdictions; a forward-looking analysis of litigation risks; as well as a risk exposure analysis by industry, building on the conclusion of the allocation analysis.

• Stress-testing
Financial analysts would model Discounted-Cash Flow (DCF) forecasts based on extreme litigation scenario. The approach would be applied to highly exposed companies short-listed with the help of the legal analysis. The analyst could then provide an outlook regarding the market and credit risks for investors.

12. A. Ananthaswamy, New Scientist (2010) 13. Potsdam Institute, US. Gov (see Fig 6 and 7 on previous page)
14. Universal ownership, UNEP-FI/PRI (2011)

2° Investing Initiative is a multi-stakeholder, non-profit think tank dedicated to promoting the integration of climate constraints and long term needs in financial institutions' investment strategies and the related regulatory frameworks.

www.2degrees-investing.org

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