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The importance of looking forward to manage risks: submission to the Task Force on Climate-Related Financial Disclosures

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This policy paper is intended to inform decision-makers in the public, private and third sectors. It has been reviewed by at least two internal referees before publication. The views expressed in this paper represent those of the author(s) and do not necessarily represent those of the host institutions or funders.

The Importance of Looking Forward to Manage Risks

Task Force on Climate-Related Financial Disclosures, Phase I. Submission by the ESRC Centre for Climate Change Economics and Policy and Grantham Research Institute on Climate Change and the Environment at the London School of Economics and Political Science

Dimitri Zenghelis and Nicholas Stern¹

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Summary

Shifts in our climate and in associated climate policies provide potentially profound implications for the economy. Climate risks threaten to transform how and where humanity lives, reversing recent gains in development and mass poverty reductions and increasing the likelihood and scale of migration and conflict. The next 20 years will be critical in bringing about immense transformations of the global economy and the ways in which goods and services are produced, distributed and consumed. The global economy is still overwhelmingly dependent on oil, gas and coal, which make up almost 80% of primary energy use². Fossil carbon emissions have to be reduced to zero if global temperature is to be stabilised, leaving open the potential for the mass scrapping and stranding of productive assets if the transition is not well managed.

Under the Paris Agreement, reached at the 21st session of the Conference of the Parties to the United Nations Framework Convention on Climate Change in December 2015, almost every country in the world has committed to cutting annual emissions of greenhouse gases over the coming 10-15 years, and accepted a long-term path towards complete decarbonisation. The scale of investment in low-carbon energy such a transition will require is already shifting investor expectations, leading to predictions of further cost reductions as global markets expand and as technological innovation is induced. The value of high-carbon assets, such as the stocks of coal mining companies, is in decline and investors are increasingly analysing the risks to such assets which further climate policy may bring³. At the same time, huge opportunities are emerging for innovators in renewable energy and energy efficiency technologies offering the potential to significantly boost the global economy's long run productive potential.

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² World Energy Outlook Special Report 2015: Energy and Climate Change, International Energy Agency

³ See Unburnable Carbon 2013: Wasted capital and stranded assets, Carbon Tracker and Grantham Research Institute on Climate and the Environment, London School of Economics. See also Atif Ansar, Ben Caldecott and James Tilbury: 'Stranded assets and the fossil fuel divestment campaign: what does divestment mean for the valuation of fossil fuel assets?' 2013 October. Stranded Assets Programme, Smith School of Enterprise and the Environment, University of Oxford

Policy-makers increasingly understand this and recognise the short-term benefits from effectively managing a low-carbon transition in terms of energy efficiency, energy security, urban pollution, congestion and generating innovation. This makes ambitious decarbonisation policy more likely and underlies growing business sector support for the Paris agreement.⁴ By contrast, business models reliant on the assumption that governments were not serious in Paris are looking increasingly vulnerable.

The importance of effective disclosure is immediate. Actual or expected changes in policy, technology and physical risks as well as the threat of litigation could prompt a rapid reassessment of the value of a large range of assets as changing costs and opportunities become apparent. Our focus is not the detailed methodology associated with streamlining the process of disclosure, crucially important though this is. Our aim is to make sure that the top-down macroeconomic motivation for this exercise—the need to limit systemic risk through an orderly adjustment in asset valuation, prevent avoidable financial loss and avoid locking in to stranded assets—is clearly integrated into the framing of the programme, in order to ensure the most effective provision of relevant information to investors. To achieve this requires careful assessment of forward-looking business risks and stress-testing against possible scenarios, acknowledging that many risks are mutually reinforcing and could unfold rapidly.

Specifically, we recommend the Task Force:

1. provides a clearer up-front articulation and unbundling of material risks, matched to the need for corresponding data and statements on forward strategy;
2. tackles the marginalisation of non-physical risk in the report, and therefore the issue of exposure on account of carbon-intensity of business activities;
3. most importantly, tackles the absence of a forward-look assessment of business vulnerability and ensures businesses provide an answer to the question "what strategy is in place to transition business models to ones that remain valuable if ambitious climate policies are imposed, or if disruptive climate impacts apply?"

Public consultation

As part of its stakeholder outreach and engagement strategy, the Task Force on Climate-related Financial Disclosures (TCFD) launched a public consultation on its Phase I report which set out the scope and high-level Objectives of the Task Force. This is in advance of the Phase II report, which is due to be delivered to the FSB by December 2016 and is tasked with addressing points arising from Phase I and setting out specific recommendations and guidelines for voluntary disclosure. A finalised report to be published around February 2017. This is a submission by the ESRC Centre for Climate Change Economics and Policy and Grantham Research Institute on

⁴ Global Commission on the Economy and Climate, Better Growth, Better Climate, New Climate Economy, 2014

Climate Change and the Environment at the London School of Economics and Political Science [in consultation] with the Carbon Disclosure Project.

The Phase I report is a scoping exercise and therefore not intended as a preliminary assessment or even a synthesis of substantive issues. Its primary aim is to develop recommendations for issuers of public securities, listed companies, and key financial-sector participants with a target audience of investors, creditors and insurance underwriters. It outlines requirements in terms of governance and metrics, to develop a common and baseline set of recommendations for the voluntary adoption of leading practices for company disclosure.

The Task Force's primary objective is to design a set of recommendations to:

- promote alignment across regimes and address inconsistencies in disclosure practices;
- address a lack of context for information;
- ensure consistent and comparable reporting throughout the G20;
- focus on material "climate-related" risks;
- improve the ease of both using and producing financial disclosure.

In response to the Phase I consultation we recommend the following.

Recommendations

1. Articulate and unbundle material risks

This initiative is driven by the expectation that climate-related disclosures should help users determine whether companies or investors have established and implemented an effective risk management process, including key risk indicators and key performance indicators, and are committed to continuous improvement. This will:

- enable more consistent and appropriate pricing and distribution of risks throughout markets;
- reduce the potential for financial instability by reducing the likelihood of large, unexpected changes in value (due to abrupt changes in asset prices or expected future cash flows).

The Phase I report acknowledges that "Climate impacts" may pose risks to economic and financial activity through multiple channels, a wide range of information can be included under the heading of "climate," which, in turn, affects information to be disclosed under various regimes.

The report further acknowledges varied impacts over time, geography, and industry—and even among individual companies. Different companies may require different disclosures that reflect the nature of their business and the specific risks they face. This requires judgment when determining what information is most suitable and appropriate for disclosure.

Changes in our climate and in associated climate policies provide potentially profound implications for individual business and the economy as a whole. In order to facilitate the stated aim of providing materially relevant, coherent and verifiable metrics and information, we recommend the Task Force more clearly identifies a taxonomy of key risk at the start. Terms such as “*climate-related risks*”; “*climate-related issues*”; “*climate impacts*” need to be defined, for example in the case of sentences such as “to enable a variety of financial market participants to better understand the *concentrations of carbon-related assets*”. A taxonomy of terms is necessary to arm the reader with the information they need.

We recommend that the material specified in table 3B on page 24 of the report as used to guide the principles for financial disclosure. This will enable the report to match risks with corresponding corporate and financial activities and metrics. The table delineates:

- **Physical risks:** these can be event-driven and occasional (acute) or relate to longer-term changes in precipitation, temperature, and weather patterns (chronic).
- **Nonphysical Risks:** these can be grouped into four categories:
 - policy/legal/litigation;
 - technological changes;
 - market and economic responses (e.g., consumer preferences);
 - and reputational considerations.
- **Opportunities** including commercial benefits.

The full array of risks cannot be comprehensively described with precision, but we recommend some assessment of likely risks. For example, the landscape of key physical risks such as vulnerability of plant, equipment and infrastructure, upstream supply lines and availability of resources as well as depleted markets whose purchasing power is eroded by climate impacts needs to be mapped. This is a prerequisite for determining what data and information is pertinent to the assessment of risks. We also recommend that the Task Force seek information on vulnerability to risks without a known distribution: so-called ‘Knightian’ or deep uncertainty or ‘unknown unknowns’. This is more challenging, but backward looking historical examples (such as the history of Eastman Kodak or Nokia) may provide insights on risks associated with rapid change and assist investors in adopting of formal techniques such as robust decision making.

2. Tackles the marginalisation of nonphysical risk

We recommend the Task Force place greater emphasis on nonphysical risks, a clear description of which does not emerge explicitly until p.21. Non-physical or ‘carbon’ risks associated with policies, technologies and litigation are more likely to impact the day-to-day activities of financial markets and lead to more rapid changes in valuation. The recent signing of the Paris Agreement on climate change can be seen as evidence of nonphysical risks materialising as policy-makers agree to national decarbonisation plans (many of these driven by an enhanced perception of national self-interest, for example from managing economic transitions, benefiting from associated gains in

efficiency and reductions in air pollution and opportunities in developing low-cost renewable technologies).

Pfeiffer et al (2016) analyse concentrations of greenhouse gases in the atmosphere and conclude that in order to meet the two degree target (with 50% probability) no new emitting electricity infrastructure can be built after 2017, unless other electricity infrastructure is retired early or retrofitted with carbon capture technologies. This highlights the gap between what politicians have signed up to in Paris and what markets and fossil fuel companies are assuming. This gap should alarm policy-makers and central bankers: it suggests either asymmetric information or a lack of credibility in policies. This underlies the creation of a Task Force to focus on information and disclosure to allow proper pricing.

The speed at which such re-pricing occurs is uncertain and could be decisive for financial stability. If the transition is orderly then financial markets will likely cope. But as Mark Carney recently noted “there have already been a few high profile examples of jump-to-distress pricing because of shifts in environmental policy or performance⁵”. Moreover, it is clear that the subcategories of nonphysical risk listed in table 3B are not independent but co-vary and indeed are mutually reinforcing. Most obviously, a focused policy effort can lead to enhanced deployment of new technologies whose costs would be expected to come down as a result. Lower technology costs in turn make the application of decarbonisation policies more politically and economically palatable. This can generate positive feedback mechanisms which can lead to rapid step-changes.

Conceptually, a variety of studies have identified that innovation and deployment of new technologies at times of structural change is ‘path-dependent’ (Romer, 1990; Aghion and Howitt, 1992; Solow 1994, 1998; Krugman 1991; Shleifer, 1986; Krugman, 1991; Matsuyama, 1991, Redding 1996 and more). This means that at first, innovation and research tends to focus on further improving technologies and networks that are already established. However, if change is pushed, say, by technological breakthroughs (the shift from horses to combustion engines, canals to railways, kerosene to electricity) or credible and deliberate mission-orientated policy, feedback loops in the innovation process interact across the economy, prompting institutional and behavioural change and the possible emergence of new scale economies (Aghion et al. 2014).

A current example of the difficulty in overcoming such lock-in is the challenge of developing electric vehicle infrastructure (Eberle and von Helmont, 2010). If electric vehicle infrastructure becomes established, the incentives to conduct research and development on electric cars will increase substantially relative to fuel cell or combustion engine vehicles. Since the Industrial Revolution firms have been routinely exploiting this path dependence in technology adoption and network effects in order to diffuse their innovations and create new markets (Bessen, 2014). For example, realising that fossil-driven networks are hard to dislodge, in June 2014 Tesla Motors

⁵ ‘Breaking the tragedy of the horizon - climate change and financial stability’. Speech by Mark Carney, 29 September 2015 at Lloyds of London. Available at: <http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx>

announced they would effectively make their electric vehicle patents public. Toyota followed suit.

The emergence of a tipping point from one status quo to another may be facilitated by, but not reliant on, falling technology costs. Declines in technology costs can feed the cycle and make it self-reinforcing as new path-dependencies and expectations are created. The potential for unit costs to fall as new technologies are developed and benefit from learning and experience, and as engineers learn how to cheaply install, connect and repair technology, is higher for many new technologies than for long established incumbents. This has already allowed solar photovoltaic and onshore wind technologies to become competitive with gas and coal in a number of global locations, even without a strong carbon price. The cost of solar PV modules fell by a factor of five in the five years post-2008. As, planning institutions are updated and new networks are built or transfigured, then it is possible that the costs of new energy systems will fall further, and close (or exceed) the gaps with conventional energy sources (Bloomberg NEF, 2011; EPIA, 2011).

Tipping dynamics further result from the fact that the perceived payoff to action to decarbonise by any single agent will be a function of what others are expected to do. Once enough players shift, for example in markets such as China, the US and the EU, the rest will quickly follow. Technology and finance costs are expected to fall while markets are expected to grow. This is why such risks are often termed ‘transition risks’, which is intended to portray a sense of the dynamic process in which paths become reinforcing.

The point here is not that such tipping dynamics are about to happen, they might or might not. But if they do, change could be rapid. Investors will rightly demand that firms have made appropriate contingency plans for such potential rapid changes, even if such changes remain one scenario among many. Put another way, it is becoming increasingly risky for companies to pin all business strategies on the assumption that extensive decarbonisation will not happen, for example, on the basis because of (mostly backward-looking) lack of political will.

It is also worth noting that the column labelled ‘opportunities’ in table 3B constitutes a subset of nonphysical risk. Political risk will apply with greater force to the losses of incumbents than to the equally valuable opportunities of new entrants. This is because in a representative political system such as the UK the losers will be more effective at lobbying politicians than potential winners. From the perspective of overall economic and financial risks, winners and losers should be treated equally, with the valuation of new sectors exploiting opportunities offsetting the decline in value of less productive and slow growing sectors.

Finally, we note that physical and non-physical risks can co-vary. Sudden catastrophes may be followed by acceleration in policy effort to decarbonise. Consider the impact of a powerful hurricane in Florida. This is likely to spawn extensive litigation and powerful lobbying which might prompt a swathe of policies to rein in emissions and build climate resilience. Such co-variance has important implications for the rapidity and distribution of potential risks, given the possibility of positive feedback.

3. Tackles the absence of a forward-look assessment of business vulnerability

“Climate risks”, broadly defined, are expected to increase with time. Consequently, the vulnerability of companies will depend on their forward strategies rather than their backward performance. In such circumstances, all companies will benefit from building resilience and planning for decarbonisation, through access to new technologies and markets and compliance with new policies, but the degree to which they expect to benefit will depend on the costs of taking action and the distribution of risks. Some will be more exposed than others, but even in heavily carbon entangled sectors, competitive losses can be limited or avoided through proactive attempts to transform production processes and business models.

The report acknowledges that mandatory and regulatory frameworks generally do not require dynamic or forward-looking disclosures or a framing in terms of risk assessment and strategic decisions to cope with risks. But in order to assess material risks, the Task Force needs to start tackling the absence of a forward-look assessment of business vulnerability. It is likely that all businesses will need to have an answer to the key question "what strategy is in place to transition business models to ones that remain valuable once ambitious climate policies are in place?" Similar questions relating to exposure to physical risks and future-proofing business models will have to be formulated, these varying according to different sectors' exposure.

Financial corporations and larger fossil fuel companies should be encouraged to undertake explicit sensitivity analyses and stress-tests, bearing in mind that many risks may be systemic and co-vary. Testing a company's future viability against different carbon prices and regulations would be one way of teasing out the implicit assumptions in their forward planning.

We feel that it would be a wasted opportunity if the Task Force were to merely 'rubber stamp' existing disclosure, such as that collected by the Carbon Disclosure Project (CDP). There is no shortage of available financial data. The danger is that too much data that is not salient is collected. The metrics needed to quantify a forward assessment are less straightforward than, say, data on emissions, but a simple yet credible forward-looking statement of strategy may be more valuable in informing investors than reams of backward-looking data. Resilience requires the presence of forward risk management and hedging strategies. In addition to answering the question "what is your most likely scenario?" investors will seek to ask "what will you do in alternative scenarios such as a net zero emissions world?" The answer to this puts market players in a better position to assess market capitalisation.

For example, if an oil company does not believe global policy makers will adopt the measures necessary to attain the decarbonisation outlined in the Paris Agreement, then they need to be explicit about this. From an investor point of view, it is one thing for a business to assume that governments were not serious in Paris, but it is quite another to pin their entire strategy on this being so. They need to address the overarching "what if" question outlined above. A resilient strategy needs to account for a number of possibilities.

By way of example, it is not outlandish to conceive a breakthrough in battery storage technologies over the next two decades which might resolve problems with intermittent generation of electricity and induce a ‘breakthrough’ in the roll out of electric vehicles. Elon Musk, CEO of Tesla Motors, among others has sunk significant investment on just such a transition. A dynamic evolution of this type might be policy-led or policy-inducing (both being mutually reinforcing) but the point is that company business models would be vulnerable to such a risk. Such rapid change scenarios need to be on companies’ radars. In addition to what risks are considered, we recommend that companies explicitly disclose how such risks are considered, for example whether they are considered at board level or through an a separate compliance unit?

We recommend that the Task Force ask CEOs and CFOs to articulate their positions on such questions in order for investors to take an informed view on risks. If oil company X has no response to the "what do you do in a net zero emissions world", then better to know that now so that their market capitalisation can fall in a gradual way. If coal company Y’s response is "carbon capture and storage will save us", then investors can ask what it is doing to promote that solution, and whether they believe governments are backing them? If oil and gas company Z’s response is "diversification and eventual transition to renewable energy will keep us ahead of the game”, then the market will assess their portfolio of investments in renewables to see if it goes far enough?

These are hypothetical examples, but they offer an indication of the kind of forward-looking frameworks that could be applied. Such questions would ideally be framed in a format such that answers are comparable across companies and sectors and usable by regulators. The Task Force can build on the Carbon Tracker Fossil Fuel Transition Blueprint, which provides a roadmap for individual companies to adapt their business practices and models consistent with an energy transition that delivers a climate secure global energy system⁶. In the longer term, a further set of questions might be aimed at national governments to help ensure they have economic strategies sufficiently diversified to limit sovereign exposure to climate risks. Such frameworks might be established in collaboration with the International Monetary Fund and the Multilateral and Regional Development Banks.

Conclusion

Climate risks and climate policies are likely to have a profound impact on firms in the global economy in the years to come. The commitments expressed by almost every country in the world in the recent Paris Agreement cannot be safely dismissed. “Climate risks” (whether physical or nonphysical) must be clearly identified and business resilience assessed against them. Many of these risks are not independent but will co-vary, making a possible transition and price adjustment in the valuation of assets very rapid. What matters for “climate risk” is that companies have a strategy in place to transition their business models to ones that are valuable once serious climate policies are in place, or once climate damages have accrued. This needs to be formulated into specific forward-looking strategies and scenarios, broken down by components regarding policies, technologies, weather and other salient risks.

⁶ www.carbontracker.org/report/companyblueprint/

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