***Law and Financial Markets Review***

**The Search for Sustainability in Financial Markets: Carbon Bubbles, Shifting Tectonic Paradigms, and Natural Capital Coalitions**

In his earlier review on *The Economics of Climate Change* Sir Nicholas Stern called climate change “*The greatest market failure the world has ever seen*.” He insisted the choice we faced was taking mitigation action now or very expensive adaptation in the future and concluded “There is still time to avoid the worst impacts of climate change, if we take strong action now.”[[1]](#footnote-1) Stern insisted: “The scientific evidence that climate change is a serious and urgent issue is now compelling. It warrants strong action to reduce greenhouse gas emissions around the world to reduce the risk of very damaging and potentially irreversible impacts on ecosystems, societies and economies. With good policies the costs of action need not be prohibitive and would be much smaller than the damage averted.”[[2]](#footnote-2) Stern highlights how the the effects of climate change are global, inter-temporal and highly inequitable. Climate change is a result of the externality associated with greenhouse-gas emissions entailing costs that are not paid for by those who create the emissions. Stern distinguishes a number of features of climate change that together distinguish it from other externalities:

• It is global in its causes and consequences;

• The impacts of climate change are long-term and persistent;

• Uncertainties and risks in the economic impacts are pervasive.

• There is a serious risk of major, irreversible change with non-marginal economic effects.[[3]](#footnote-3)

The great weight of scientific evidence accumulated by successive reports of the Intergovernmental Panel on Climate Change (IPCC), and a multitude of other scientific projects and policy reviews, brought recognition of the seriousness of the challenge facing humanity and the environment, and the need for deep cuts in global emissions.[[4]](#footnote-4) But a prolonged apparent incapacity to reach agreement on how this policy might be effectively and equitably implemented across the planet, as manifest in the limits of the 2009 Copenhagen Framework Convention on Climate Change.[[5]](#footnote-5) However in a heroic feat, following extensive rounds of international negotiations over four years in preparation for the 21st Session of the Conference of the Parties to the United Nations FCCC (COP 21) in Paris in November 2015, a total of 196 countries reached an historic moment in global diplomacy with a universal climate agreement more rigorous and ambitious than conceived possible earlier.[[6]](#footnote-6)

The agreement aims to substantially “strengthen the global response to the threat of climate change” while maintaining sustainable development and efforts to eradicate poverty.[[7]](#footnote-7) Critically the agreement commits to more demanding long term mitigation efforts in Article 2(a):Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change.[[8]](#footnote-8)

Reinforcing this commitment is the agreement to a robust transparency framework for emissions reductions with common accounting standards, national reporting, and independent expert review. The agreement establishes binding commitments of all parties to make “nationally determined contributions” (NDCs) and to pursue the necessary domestic emissions reductions measure to achieve these.[[9]](#footnote-9) In addition to annual reporting, every five years countries are expected to develop new NDCs that represent a significant progression on previous targets. While it is possible that some countries may breach the caps on emissions, over time there is the possibility of negotiating to renew and increase emissions reductions.

The momentous diplomatic breakthrough engineered by the French in the 2015 Paris Agreement, together with the substantial publications of the IPCC, Stern Review, and countless other international agencies, market intermediaries, business and civil society bodies, and national and legal authorities have helped the business world recognize the dramatic environmental consequences of unrestrained industrial activity and how little time there is to put this right. What this scenario suggests is not business as usual. The traditional conception of corporations maximizing profit and leaving others to worry about the externalities they create simply does not work in a context of the impending consequences of climate change. In this context, government, business, and the wider community have to engage in the immediate and urgent stewardship and recovery of the environment. Business corporations will respond—or shareholders, stakeholders, and governments will make them respond—to the demand that they act with greater responsibility in their use of resources and impact on the community and environment.

This is a tectonic paradigm shift, as dramatic as any that has been applied to Thomas Kuhn’s *Structure of Scientific Revolutions.* We have to “begin the extraordinary investigations that lead the profession at last to a new set of commitments, a new basis for the practice of science.” Kuhn explains “The extraordinary episodes in which that shift of professional commitments occurs are the ones known … as scientific revolutions. They are the tradition-shattering complements to the tradition-bound activity of normal science.”[[10]](#footnote-10) This paradigm shift impelled by the real and imminent danger of climate change includes a fundamental widening and deepening of the traditional conception of professional directors’ duties and the mission of finance and industry.

**NEW PARADIGMS OF FINANCE AND BUSINESS**

In a remarkable speech to Lloyds insurers of London on 29 September 2015, Mark Carney the Governor of the Bank of England and Chairman of the Financial Stability Board (established by the G20 to monitor and review global financial and economic stability) highlighted that while a classical problem of environmental economics is the *Tragedy of the Commons -* the despoliation of common property through over-use*,* climate change is also a *Tragedy of the Horizon –* that because the catastrophic impact of climate change is beyond the traditional horizon of most actors, it is imposed as a cost on future generations as the current generations has little direct incentive to fix this.[[11]](#footnote-11) That is the intervention to repair climate change is beyond the usual business cycle, political cycle, or horizon of regulators and other authorities.[[12]](#footnote-12) The tragic paradox is that by the time climate change is considered a defining issue within the normal business and political cycle it will be too late to repair except at enormous cost. Attempting to calculate the potential future costs involved, the G20 Finance Ministers asked the Financial Stability Board to consider how the financial sector could take account of the risks climate change posed for the financial system. In 2015 the FSB launched the task force on Climate Related Disclosure (TFDC) applying to financial and non-financial companies, chaired by Michael Bloomberg the former Mayor of New York.[[13]](#footnote-13) Carney identifies three channels through which climate change can impact on financial stability:

* *Physical risks:* the impact today on insurance liabilities and the value of financial assets arising from climate related events such as floods and storms that damage property and disrupt trade;
* *Liability risks:* the impacts that could arise if parties suffering loss or damage from the effects of climate change seek compensation from those they hold responsible. These claims could come decades into the future, but could potentially hit carbon resources companies and emitters hard, and if they have liability cover would hit their insurers the hardest.
* *Transition risks:* the financial risks resulting from the process of adjusting towards a low carbon economy as changes in policy, technology, and physical risks prompt a reassessment of the value of a large range of assets as costs and opportunities become apparent.[[14]](#footnote-14)

These risks can be minimised by an early and predictable path of transition to anticipating the consequences for a world two degrees warmer, or alternatively the risks can be maximised by waiting for the consequences to occur and allow *jump-to-distress* pricing to ruin businesses.[[15]](#footnote-15) Already since the 1980s the number of weather related loss events has tripled for the insurance industry and the inflation-adjusted insurance losses have increased from an annual average of around$10 billion in the 1980s, to around $50 billion over the past decade.[[16]](#footnote-16)

**Strategies for Combating Climate Change**

Financial institutions and corporations have a central role to play in the two main strategies for combating climate change by mitigation and adaptation. Diminishing the potentially catastrophic consequences of the increasing impact of climate change will require urgent efforts to reduce carbon emissions. Financial institutions and business corporations are required to make a major contribution to emissions mitigation, and if they refuse to do so will face reputational damage, higher energy costs, legal costs and fines from increasingly rigorous emissions regulation. More critically they may find it increasingly difficult to transfer the risk they encounter through insurance, and also discover they are being deserted by investors and credit providers concerned at the exposure to emissions intensive sectors, stranded assets, and declining industries.[[17]](#footnote-17)

Equally financial institutions and business corporations will be fully engaged in the efforts at adaptation to climate change involving actions to moderate the harm of climate change, or to pursue opportunities to ameliorate the harmful effects of climate change. While the primacy of the effort to mitigate climate change is indisputable, the fact that past emissions will determine a certain degree of climate change, make adaptation necessary. Corporations that prove incapable of adaption to the physical impact of climate change will be vulnerable to interruptions in their business operations and supply chain, potential damage to plant and infrastructure, and water and other raw materials scarcity. The two corporate strategies of mitigation and adaptation are connected, since significant emissions mitigation is necessary to achieve effective adaptation by minimising vulnerability to environmental shocks and enhancing resilience.[[18]](#footnote-18)

We have clearly passed the stage where the responsibility for mitigation and adaptation relating to climate change could largely be regarded as belonging solely to government. The hazards associated with climate change are both considerable and pervasive, and are characterised by their complexity and inter-connectedness. The dramatic climactic discontinuities caused by climate change “may give rise to cascading risks of potentially unforeseeable magnitude.”[[19]](#footnote-19) Therefore climate change cannot be framed as one of technical risk management for government and specialists, it is the responsibility of everyone, but particularly those in leadership positions in organisations that have a significant environmental impact: “...Although risk management is a responsibility of corporations and government agencies which carry out risk assessments as part of their legal and actuarial responsibilities, it now seems to be required of all actors − as risk is shifted from collective institutions and specialised systems to individuals. Faced with systemic and pervasive risk, the individual must plan and measure contingencies and adopt ‘actuarial rationality.’”[[20]](#footnote-20) As Godden et al argue:

“..Climate change adaptation measures require a more sophisticated model of legal, regulatory and governance structures in order to develop effective responses… Adaptation to climate change, therefore, must negotiate the need for heightened complexity in governance, but also seek to deconstruct conventional simplifying mechanisms such as clear boundaries between public and private spheres. Embracing such complexity is not always palatable, but re-invoking simplifying assumptions about appropriate legal and institutional forms may be detrimental if robust governance for climate risk adaptation is the overarching objective.” [[21]](#footnote-21)

**Climate Change: Directors Duties and Corporate Purpose**

How climate change impacts upon the interpretation of directors duties is now being examined. As Barker elucidates with reference to climate change international law has thus far concentrated upon the broad areas of taxing of emissions, protecting the environment with emissions standards and disclosures, and planning. Litigation has mainly occurred in planning and environmental protection regarding high-emitting projects or vulnerable environments, with the law recognising the impact of anthropogenic climate change and the risks of failure to mitigate emissions, and adapt to its consequences.[[22]](#footnote-22) Barker concludes that at this stage the question of liability for climate change has revolved around mitigation and its cost, while the issue of damage caused by climate change impacts remains at an embryonic stage: “Plaintiffs have found duty and causation (or, in a climate change context, ‘attribution’) to be near ‘insurmountable’ evidentiary hurdles. This is primarily due to the disconnect between the global nature of emissions and their collective, cumulative effect, versus the localised nature of their impacts.”[[23]](#footnote-23)

While international agencies remain silent on the question of the implications for directors’ duties of climate change, this reserve is unlikely to continue. The gathering scale of the international, market, national, and business and civil society campaign for corporate social and environmental responsibility presents an irresistible challenge to corporations and directors to rethink their mission in the direction of sustainability (Figure 2). As the American Bar Association contends: “Corporate sustainability efforts in particular have been growing in scope and intensity over the past few years. In translating the broad objectives of sustainability into specific practices, businesses are guided to a growing degree by private systems of governance. These include sustainability-related codes of organizational behavior, including the CERES (Coalition for Environmentally Responsible Economies) Principles, the UN Global Compact, the UN Guiding Principles on Business and Human Rights, the Global Reporting Initiative standards on sustainability reporting, and the International Chamber of Commerce’s Charter for Sustainable Development.”[[24]](#footnote-24)

There are indeed many hundreds of policy initiatives led by institutions across the world. Existing initiatives vary in their *status* from laws to voluntary guidance, from the UN to government, and through to civil society; in their *scope* from limiting greenhouse gas emissions to tackling broader environmental risks; and in their *ambition,* from demanding simple disclosure to full explanations of mitigation and divestment strategies. These institutional initiatives have increasing influence and authority as the science and policy base that supports them becomes more profound. In aggregate over 90% of FTSE 100 firms and 80% of Fortune Global 500 firms participate in these various initiatives.[[25]](#footnote-25)

In the past corporate objectives described as ‘wealth generating’ too frequently have resulted in the loss of well-being to communities and the ecology. But increasingly in the future the *licence to operate* will not be given so readily to corporations and other entities. A licence to operate will depend on maintaining the highest standards of integrity and practice in corporate behaviour. Corporate governance essentially will involve a sustained and responsible monitoring of not just the financial health of the company, but the social and environmental impact of the company. As ABA states “legal tools, the legal profession, and the rule of law can make important contributions and are an integral component of efforts to achieve sustainability, especially by promoting good governance.”[[26]](#footnote-26)

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**Figure 2:** *The Widening Scope of Director’s Duties: The Increasing Impact of Social and Environmental Responsibility*

Perhaps never in the history of human civilisation has the world faced a more consuming challenge than climate change, or more terrible consequences if a sustainable solution is not achieved. Yet the field of sustainability has assembled the most exceptional constellation of talents and ideals stretching from engineers and life scientists, through community activists and institutional entrepreneurs, to lawyers, company directors and politicians. Tackling the greatest problem of humanity, and some of the most deep-seated corporate interests in business as usual, are an array of individuals and institutions with a vision of a sustainable future. The contest will continue for many decades to come, and the outcome will determine the future of human civilisation as well as planetary sustainability.

**Transition to a Sustainable Economy**

However the goal of sustainable enterprise existing integrally with the natural environment is both possible and necessary: the strategies of business can be redirected to serve the natural environment rather than to destroy it. Table 1 projects a transition to a sustainable economy on which we have already embarked.[[27]](#footnote-27) For many decades industry has been subjected to environmental laws that have limited emissions and waste, which have enlightened enterprises have engaged in with a spirit of continuous improvement and the benefit of lowering costs (and those businesses that have transgressed the law have faced prosecution – often in the past with penalties that did not discourage further pollution, but with more adverse consequences today including being abandoned by investors afraid of the risks involved). In more recent times a sense of product stewardship has developed largely with the motivation of minimising the life-cycle cost of products but with significant residual environmental benefits).

Finally we are entering an era of sustainable enterprise where minimising and eliminating the environmental impact of the growth of firms is becoming established as a key objective, and integrated into firms’ operations. New business models forming in the circular and sharing economies are enabling transitions to sustainable business practices, addressing resource depletion , waste management, and resource stewardship models that go beyond the traditional life-cycle requiring collaborative governance structures, new partnership arrangements, and networks between and across sectors. New technologies may transform the management of the traditional linear economy towards a circular economy, in which waste is effectively eliminated, and the economy is restorative rather than depletive of eco-systems.[[28]](#footnote-28) The European Commission has been developing a Circular Economy Strategy for some time, “The circular economy requires action at all stages of the life cycle of products: from the extraction of raw materials, through material and product design, production, distribution and consumption of goods, repair, remanufacturing and re-use schemes, to waste management and recycling.”[[29]](#footnote-29)

**Table 1 A Natural Resource-Based View of Firm**

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**Strategic Environmental Key Business Capability Driver Resource Advantage**

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**Pollution** Minimise emissions, ContinuousLower **Prevention** effluents and waste improvement costs **(1900s-1980s)**

**Product** Minimise life-cycle Stakeholder Pre-empt **Stewardship** cost ofproducts integration competitors  **(1980s-2000s)**

**Sustainable** Minimiseand eliminateShared vision, Future Position **Development** environmentalburden of Circular economy **(2000s-2060s)** firm growth

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Source: Adapted from Hart (1995)

It is clear though that the pace of change towards a sustainable economy will only continue to accelerate if there is significant, insistent and sustained pressure upon finance and business to contribute to this goal from all stakeholders. Coalitions of institutions have sponsored initiatives for corporate responsibility which have driven collaborative business action for responsible business practices.[[30]](#footnote-30)The remainder of this paper surveys the vast institutional development internationally around the theme of corporate social and environmental responsibility and sustainability, identifying a selection of the leading institutional initiatives, the objectives of the institutions, the business response to the initiative, the recognisable impact of the initiative upon business, and any revealed weaknesses in the nature of the initiative or the business response.[[31]](#footnote-31)

**Towards Zero Emissions**

The traction which these initiatives are having with companies internationally is illustrated by the companies that report their greenhouse gas emissions, water management and climate change strategies to the Carbon Disclosure Project which has increase from 253 unique company reports in 2003, to 5003 companies disclosing in 2014.[[32]](#footnote-32) CDP and the Climate Group have compiled the companies with a list of companies with 100% greenhouse gas emissions reductions targets achieved by 2014 (Table 2), a number of which have pursued zero emissions into their value chain.[[33]](#footnote-33) Even if most of these companies are in industries where there are not very large emissions to eliminate, this is a remarkable feat, and a beacon for other companies in more emissions-intensive industries to follow. As Eric Schmidt, Executive Chairman of Google comments, “We’re serious about environmental sustainability not because it’s trendy, but because it’s core to our values and makes good business sense. After all, the cheapest energy is the energy you don’t use in the first place. And in many places clean power is cost-competitive with conventional power.”[[34]](#footnote-34)

**Table 2 Companies With 100% GHG Emissions Reduction Targets**

|  |  |  |  |
| --- | --- | --- | --- |
| **Organization** | **Country** | **Per Cent Reduction** | **Target Year** |
| Aimia  Bank of Montreal\*\*  Biogen  Google  Insurance Australia  Intuit  Kohl's\*\*  Marks and Spencer \*\*  Microsoft\*\*  TD Bank Group\*\*  Royal KPN  Infosys  Goldman Sachs  Interface  Kingspan Group  Mars  GlaxoSmithKline\*  Tesco\*\*  Verbund | Canada  Canada  US  US  Australia  US  US  UK  US  Canada  Netherlands  India  US  US  Ireland  US  UK  UK  Austria | 100  100  100  100  100  100  100  100  100  100  100  100  100  100  100  100  100  100  100 | 2014  2014  2014  2014  2014  2014  2014  2014  2014  2014  2015  2018  2020  2020  2020  2040  2050  2050  2050 |
|  |  | | |

Bold text indicates achieved target \*Near term targets likely include use of renewable energy certificates (RECs) and/or carbon offsets. \*\*Target includes emissions beyond direct operations into the value chain (Scope 3)

Source: CDP/The Climate Group, Unlocking Ambition 2015 p3 <https://www.cdp.net/Documents/policy/CDP-targets-briefing-2014.pdf>

**The Value of Natural Capital: The Depletion of Ecosystems and Biodiversity**

Further widespread adoption of zero emissions policies by business and plans for green growth will be inseparable from the commitments to delivering major emissions reductions in successive international climate change negotiations, with national governments accelerating the transition of corporations towards total decarbonisation. Assisting corporations to think strategically in this direction is the work of agencies which highlight to investors the real cost of carbon, and how this must be incorporated into estimates of the market valuation of corporations such as Trucost. Trucost is a dedicated consultancy established by a number of large financial institutions in London to examine natural capital dependency across companies, products, supply chains and investments, with a view to managing risks from volatile commodity prices and increasing environmental costs, and ultimately building more sustainable business models. “It isn't "all about carbon"; it's about water; land use; waste and pollutants. It's about which raw materials are used and where they are sourced, from energy and water to metals, minerals and agricultural products. And it's about how those materials are extracted, processed and distributed.”[[35]](#footnote-35) Natural capital is defined by Trucost as “The finite stock of natural assets (air, water and land) from which goods and services flow to benefit society and the economy. It is made up of ecosystems (providing renewable resources and services), and non-renewable deposits of fossil fuels and minerals.”[[36]](#footnote-36)

In estimating the world’s largest natural capital risks which business, investors and governments face, Trucost suggests these risks are costing the global economy of the order of $4.7 trillion dollars per year. Resource intensive industries and supply chains around the planet are incurring these natural capital cost, and internalisation of the costs by companies and industries has only occurred at the margins. However confronted by the prospect of another 3 billion middle class consumers by 2030, demand for natural resources will grow rapidly as supply continues to shrink. “The consequences in the form of health impacts and water scarcity will create tipping points for action by governments and societies. The cost to companies and investors will be significant.”[[37]](#footnote-37) Trucost is engaged in informing companies and investors how to measure and manage natural capital impacts, to focus on high risk areas, and to develop mitigation.[[38]](#footnote-38)

Together with examining the impact and costs of climate change, what also has to be estimated is the cost of the ongoing depletion of ecosystems and biodiversity. Trucost is a member of The Economics of Ecosystems and Biodiversity in Business and Enterprise (TEEB) which is supported by the G8 and UN Environment Programme and the European Commission, together with the German, UK, Norwegian and Netherlands governments. The key messages of TEEB on business, biodiversity and the ecosystem are:

* The world is changing in ways that affect the value of biodiversity and ecosystem services (BES) to business. The value of biodiversity and ecosystem services is a function of population growth, urbanisation, economic growth and eco-system decline.
* Biodiversity loss and ecosystem decline cannot be considered in isolation from other trends which are growing and shifting markets, resource exploitation and climate change.
* Business risks and opportunities associated with biodiversity and ecosystem services are growing and with the interaction between biodiversity loss, decline in eco-system services and other major trends business can expect increased risks and opportunities over time.
* There will be increasing pressure on and more restricted access to natural resources with growing market demand for natural resources and increasing public concerns about the environment.
* Consumers increasingly consider biodiversity and ecosystems in their purchasing decisions which companies and their suppliers will need to re-examine.
* Business is beginning to notice the threat posed by biodiversity loss and surveys of CEOs indicate a growing concern about the impact of biodiversity loss on their business growth.[[39]](#footnote-39)

TEEB draws attention to the invisibility of nature in the economic choices we make, and how this is a key driver of the ongoing depletion of ecosystems and biodiversity. Valuation as an institutional development in diverse social contexts and many forms has a role to play in stemming the tide of degradation of ecosystems and the loss of biodiversity. There are concerns about valuation in conditions of economic and environmental uncertainty, and TEEB recognises that values are a product of different worldviews and treats them in their respective socio-cultural contexts. However TEEB argues in the absence of valuation essential ecosystem services are presently being traded as commodities often with an implicit value of zero. Policy responses are required to resolve the public goods problem s underlying biodiversity loss and ecosystem degradation, such as land use planning, regulation, and payments for environmental services. Corporate impacts and dependencies on biodiversity and ecosystem services should be measured and valued as an integral part of statutory reporting and disclosure in the interests of the conservation of the natural commons and intra-generational equity.[[40]](#footnote-40)

A Natural Capital Coalition has now formed to provide a global platform of business, accounting, consultancy, academia and government members working on natural capital with a common vision.[[41]](#footnote-41) The purpose is building the business case for integrating natural capital into decision-making; developing and testing natural capital protocols and sectoral guidelines; shifting corporate behaviour towards enhancing rather than depleting natural capital; and supporting the evolution of an enabling policy environment and access to reliable data.[[42]](#footnote-42)

Collectively this huge and multi-faceted effort by both business and civil society, by all the agencies and initiatives discussed above, represents a great advance in the campaign for corporate environmental, social and governance responsibility. The ideals manifested are often exemplary, and whatever weaknesses and limitations revealed in the complex challenges these initiatives face, in aggregate the initiatives do represent a significant institutional development in the cause of corporate responsibility. The question remains to be addressed of whether corporate law has in any way responded to this enhanced sense of the widening scope of company directors’ duties, and the increasing impact of corporate social and environmental responsibility?

**THE CHANGING LANDSCAPE OF FIDUCIARY DUTY IN THE 21st CENTURY**

Given the enormity of the environmental and social threat to their existence that humanity has encountered in recent decades, and the range and extent of the civil, professional, business, and governmental response to the impending crisis of climate change, it is curious that internationally while there have been substantial reforms in environmental and related law, there has been comparatively little change in corporate law or in the duties of directors. One explanation of this paradox is the view that directors in pursuing the success of the company already are able and willing to take into account the impact of environmental and social changes, and to develop strategies to mitigate or adapt to these threats. That is directors are becoming increasing aware of the elephant in the boardroom, and are interpreting their duties in this context:

“It is estimated that the top 100 environmental externalities cost the global economy around US$4.7 trillion a year, according to a 2013 report commissioned by The Economics of Ecosystems and Biodiversity (TEEB) for Business Coalition, now known as the Natural Capital Coalition. The report observes that half of all existing corporate profits are at risk if the costs associated with natural capital were to be internalised through market mechanisms, regulation or taxation. A water shortage, for example, would have a ‘severe’ or ‘catastrophic’ impact on 40% of Fortune 100 companies.”[[43]](#footnote-43)

Company directors are nearer to the coal face than the courts, and, as Barker insists, material and insistent evidence “posits climate change as a squarely financial concern: not only consistent with, but prerequisite to, the maximisation of wealth, and therefore imperative to directors’ oversight of risk and strategy.”[[44]](#footnote-44) That is directors will incorporate environmental and social responsibility into their decision making as part of a balanced assessment of the risks and opportunities facing the company. Barker continues: “As the impacts of climate change continue to intensify, so too does the likelihood that corporations who are not strategically positioned to manage them will be placed at a significant competitive disadvantage. This undermines the maximisation of corporate wealth or value and, in some cases, may raise the prospect of insolvency. In such circumstances …the regulator charged with maintaining the integrity of the market, may hold directors to account for any breach of the corporate governance laws. And shareholders and creditors may look to recover their losses from directors and their deep-pocketed insurers.”[[45]](#footnote-45)

While much attention has been focused on the effort to reform the interpretation of directors duties in the US with corporate constituency statutes, and with the development of B-corporations with more inclusive objectives; and in the UK with Section 172 (1) of the Companies Act 2006, which states directors should have regard to the impact of the company’s operations on the community and environment, imperceptibly wider changes may have been occurring in the interpretation of directors duties in practice (which were always more carefully balanced than the naked tenets of shareholder primacy urged). In fact the narrow strictures of shareholder value routinely neglected the ethical foundation of business as a University of Cambridge study argues “...the separation of ethics from fiduciary duty assumes that the overriding interest of savers is to make the most money possible, regardless of the social and environmental consequences – a view that has never been verified through robust empirical research but, rather, imputed without consent.” [[46]](#footnote-46) The landscape of directors’ fiduciary duty is changing dramatically in the 21st century, and both company directors and investors need to respond. As a UNEP international survey of asset owners, investment managers, lawyers and regulators concludes, “Failing to consider long-term investment value drivers, which include environmental, social and governance issues, in investment practice is a failure of fiduciary duty.”[[47]](#footnote-47)

The re-evaluation of fiduciary duty is presently taking place, and will prove to be profound, as Watchman states, “The concept of fiduciary duty is organic, not static. It will continue to evolve as society changes, not least in response to the urgent need for us to move towards an environmentally, economically and socially sustainable financial system.”[[48]](#footnote-48) What is occurring is the widespread and insistent development of soft law to deal with the wicked complexities the overwhelming emergency of climate change has exposed. While soft law has its limitations, it also may be applied intelligently and promptly to deal with changing circumstances, and can be translated into hard law when required and possible. “The term ‘soft law’ entered the international lexicon in the 1970s as a descriptive and differentiating phrase: soft law was anything that was not in fact, hard law promulgated by a government body authorised to enact it, but that nonetheless was designed to affect, or actually behaviour and that might in time solidify into hard law or otherwise affect the development of hard law.”[[49]](#footnote-49) Soft law does possess authority, the UN *Declaration of Human Rights* is the most translated document in the world (in 370 languages), and yet has no legal status.[[50]](#footnote-50)

There are many current issues which will sharpen company directors’ sense of fiduciary duty regarding the materiality of environmental and social concerns. The issue of ‘Loss and Damage’ from climate change (the impact of climate change not mitigated by reductions in emissions) is now on the agenda of the United Nations Framework Convention on Climate Change, with discussion of the case for compensation.[[51]](#footnote-51) Addressing the insurance industry Mark Carney stated, “Participants in the Lloyd’s market know all too well that what appear to be low probability risks can evolve into large and unforeseen costs over a longer timescale. Claims on third-party liability insurance – in classes like public liability, directors’ and officers’ and professional indemnity - could be brought if those who have suffered losses show that insured parties have failed to mitigate risks to the climate; failed to account for the damage they cause to the environment; or failed to comply with regulations… Cases like Arch Coal and Peabody Energy – where it is alleged that the directors of corporate pension schemes failed in their fiduciary duties by not considering financial risks driven at least in part by climate change[[52]](#footnote-52) – illustrate the potential for long-tail risks to be significant, uncertain and non-linear.”[[53]](#footnote-53)

The terrifying thought is that we have created a trillions of dollars carbon bubble in financial markets as large and threatening as the toxic securities that delivered the global financial crisis. CarbonTracker calculates the bubble of unusable carbon assets using research by the Potsdam Institute which indicates that to reduce the chance of exceeding 2°C warming to 20%, the global carbon budget for 2000-2050 is 886 GtCO2. When the emissions that have already occurred this leaves a carbon budget until 2050 of 565 GtCO2 for the remaining 40 years to 2050. However the total carbon potential of the Earth’s known fossil fuel reserves of 2795 GtCO2 far exceeds the carbon budget by 5 times (65% from coal, 22% from oil, and 13% from gas. “This means that governments and global financial markets are currently treating as assets, reserves equivalent to nearly 5 times the carbon budget for the next 40 years. The investment consequences of using only 20% of these reserves have not yet been assessed.” [[54]](#footnote-54) International oil, gas and coal companies remain prominent in the leading stock exchanges, as the first impact of the fossil fuel divestment movement occurs, with the *jump to distress* option the most likely to be exercised.

The impending corporate disasters by companies formerly regarded as leaders in their sector are a salutary warning to other corporations to be alert to the very real hazards they will face with the onset of climate change if they neglect their social and environmental duties, as Sarah Barker convincingly argues in an Australian legal context, that has similar implications for other jurisdictions, there will be in the future no safe harbour for the irresponsible director:

“…Even where directors’ subjective bona fides are not in question, passivity, reactivity or inactivity on climate change governance is increasingly likely to contravene the duty of care and diligence under section 180(1) of the Corporations Act, and increasingly unlikely to satisfy the ‘business judgment rule’ defence under section 180(2). This includes governance strategies that emanate from climate change denial, a failure to consider its impacts due to ignorance or unreflective assumption, paralysis caused by the inherent uncertainty of its magnitude and timing, or a default to a base set by regulators or industry peers. In addition, even considered decisions to prevail with ‘business as usual’ are increasingly unlikely to satisfy the duty (or the business judgment rule defence) - particularly if they are the product of a conventional methodology that fails to recognise the unprecedented challenges presented by an erratically changing climate. In addition, whilst unorthodox, it is reasonably arguable that a failure to actively consider the impacts of climate change may also breach the duty to act in good faith in the best interests of the corporation under section 181. Accordingly, directors who do not proactively respond to the commercial risks and opportunities of climate change, now, may be held to account under the Corporations Act if corporate value becomes impaired into the future.”[[55]](#footnote-55)

Mark Carney from a Bank of England and Financial Stability Board perspective set out starkly the implications for the resources industries of the IPCC’s estimate of a carbon budget necessary to limit global temperature rises to 2 degrees above pre-industrial levels: a carbon budget that amounts to between 1/5th and 1/3rd world’s proven reserves of oil, gas and coal.

“If that estimate is even approximately correct it would render the vast majority of reserves “stranded” – oil, gas and coal that will be literally unburnable without expensive carbon capture technology, which itself alters fossil fuel economics. The exposure of UK investors, including insurance companies, to these shifts is potentially huge. 19% of FTSE 100 companies are in natural resource and extraction sectors; and a further 11% by value are in power utilities, chemicals, construction and industrial goods sectors. Globally, these two tiers of companies between them account for around one third of equity and fixed income assets.”[[56]](#footnote-56)

Yet there is the other side of the ledger if corporations are astute enough to realise it. “On the other hand, financing the de-carbonisation of our economy is a major opportunity for insurers as long-term investors. It implies a sweeping reallocation of resources and a technological revolution, with investment in long-term infrastructure assets at roughly quadruple the present rate.”[[57]](#footnote-57) The reality is that if all business does not face up to the enveloping threats and opportunities of climate change, carbon intensity will continue to increase towards the worst case projected scenario of the IPCC at 4 per cent of global warming that will undoubtedly precipitate the non-linear compounding of climactic catastrophes that will endanger civilisation let alone business survival. (Figure 3). A rate of decarbonisation is required to keep global warming below 2 per cent that will demand virtually zero-carbon emissions by the end of the century, a goal that will require comprehensive commitment from corporations and directors.



**Source: Adapted from PWC (2014)**

**Figure 3**: *Reducing Carbon to Zero Emissions by the End of the Century[[58]](#footnote-58)*

**CONCLUSIONS**

We all have to face the inordinate economic and social risks of climate change including the dangers of increased flooding and storm damage, altered crop yields, lost productivity, increased crime, damaged public health, strained energy systems to begin with. [[59]](#footnote-59) Henry M. Paulson as US Treasurer had to negotiate the risk of the global financial crisis, is now co-Chair with Michael R. Bloomberg of the Risky Business Project an environmental consultancy, and is helping others to get the message, “I know a lot about financial risks—in fact, I spent nearly my whole career managing risks and dealing with financial crisis. Today I see another type of crisis looming: A climate crisis. And while not financial in nature, it threatens our economy just the same.”[[60]](#footnote-60) The architect of the vast U.S. rescue package during the global financial crisis, called upon fellow Republicans to face up to their environmental responsibilities:

“I was Secretary of the US Treasury when the credit bubble burst, so I think it is fair to say that I know a little bit about risk, assessing outcomes and problem-solving. Looking back at the dark days of the financial crisis in 2008, it is easy to see the similarities between the financial crisis and the climate challenge we now face. We are building up excesses (debt in 2008, greenhouse gas emissions that are trapping heat now). Our government policies are flawed (incentives for us to borrow too to finance homes then and encouraging the overuse of carbon-based fuels now) . . . . And the outsize risks have the potential to be tremendously damaging (to a globalized economy then and the global climate now). Back then we narrowly avoided an economic catastrophe at the last minute by rescuing a collapsing financial system through government action. But climate change is a more intractable problem. The carbon dioxide we’re sending into the atmosphere remains there for centuries heating the planet.”[[61]](#footnote-61)

In response to conservative critics who highlight the high price of intervention, Paulson argues:

“Our failure to act on the underlying problem is deeply misguided, financially and logically. In a future with more severe storms, longer fire seasons, and rising seas that imperil coastal cities, public funding to pay for adaptations or disaster relief will add significantly to our fiscal deficit and threaten our long-term economic security.. . . A tax on carbon emissions will unleash a wave of innovation to develop technologies, lower the costs of clean energy and createjobs as we and other nations develop new energy products and infrastructure.”[[62]](#footnote-62)

There are alternatives to waiting for disaster to happen, and building a circular economy now is one of them. Presently we have a linear economy in which we extract resources at an ever-increasing pace, and having made them into products then dispose of them wastefully. A circular economy is designed to be waste free at every stage and resilient by design, innovative, and restorative of eco-systems. This creativity is technically feasible but what is required are the supporting institutions and values. Businesses can succeed while exercising ethical values, respecting people and communities, and sustaining the natural environment. This requires comprehensive responsible policies, practices and programs fully integrated into business operations, incentive systems and decision making. The UN Global Compact defines corporate sustainability as “a company’s delivery of long-term value in financial, social, environmental and ethical terms.”[[63]](#footnote-63) This is a good working definition for future endeavours.

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