Climate Change Briefing

A Supplement to

Brunel's Climate Change Policy

BRUNEL
Pension Partnership

Climate Change Briefing

Purpose

This briefing has been written to support Brunel's Climate Change Policy by providing further detail on the science of climate change, the policy response at international and national levels, and on the relationship and impacts of climate change to investors. The briefing also outlines some of the key climate-related terms and investor relevant initiatives, though this is a rapidly evolving area and is not an exhaustive list.

Introduction: Climate Change, Climate Policy and Investors

The Science

Climate change is the defining issue for our world. It is global in scope, with impacts that will, and already are, affecting the natural and human systems of all aspects of our society, environment and economy. Scientific evidence[1] suggests that our climate is being altered faster than at almost any point in geological history with atmospheric concentrations of greenhouse gases higher than any time in the last 800,000 years. This has caused unprecedented warming of the climate system that can be observed through atmospheric warming, sea level rise and reducing ice levels. Along with more frequent and more extreme weather events. Continued increases in warming will amplify existing risks and create new risks with potential irreversible and catastrophic impacts on society and the environment.

Human activities are estimated to have already caused approximately 1.0°C of global warming, with warming likely to reach 1.5°C between 2030 and 2050 if emissions continue at the current rate. Warming is currently anticipated to reach 2.9-3.4°C[1] by 2100 with further warming in the next century if net-zero CO_2 emissions are not achieved. With no or limited overshoot of 1.5°C warming this century, global net CO_2 emissions are modelled to need to decline by about 45% from 2010 levels by 2030, reaching net zero around 2050. For limiting global warming to below 2°C, emissions will need to decline by about 25% by 2030 and reach net zero around 2070[2].

With the Intergovernmental Panel on Climate Change's (IPCC) fifth assessment report[2] categorically concluding human activity as the main cause of this climate change there has been increasing action to develop mitigation and adaptation strategies to tackle global warming, manage the risks of climate change and encourage a just transition to a sustainable low carbon economy.

[1] de Coninck, H., A. Revi, M. Babiker, P. Bertoldi, M. Buckeridge, A. Cartwright, W. Dong, J. Ford, S. Fuss, J.-C. Hourcade, D. Ley, R. Mechler, P. Newman, A. Revokatova, S. Schultz, L. Steg, and T. Sugiyama, 2018: Strengthening and Implementing the Global Response. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [MassonDelmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

[2] IPCC, 2014: *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland, 151 pp.

Policy Response

A key development in the global policy response to climate change was the 2015 Paris Agreement, a global consensus to combat the threat of climate change and to accelerate and intensify the actions and investments needed for a sustainable low carbon future. World governments committed to keep global temperature rise this century to well below 2°C compared to pre-industrial levels and aim to limit the increase even further to 1.5°C, through the implementation of Nationally Determined Contributions (NDCs) that set out the actions countries would take to reduce greenhouse gas emissions. The Paris Agreement is important as the establishment of globally agreed targets provided a consensus for global policymakers and other actors on the future we want to achieve. Whilst the declared NDCs provide transparency on what nations are doing and how they are progressing to meet the goals, and achieve the future, of the Paris Agreement.

The European Union (including the United Kingdom) published a joint NDC[3] to reduce greenhouse gas emissions by at least 40% by 2030 compared to 1990 levels. This is in line with the separate EU objective, developed in the context of IPCC reports calling for warming to be kept around 2°C, to reduce greenhouse gas emissions by 80-95% by 2050. The United Kingdom's target is to reduce greenhouse gas emissions by 80% by 2050.

We are already on a pathway to reducing global CO_2 emissions. The next set of NDCs due to be announced in 2020 are intended to be a strengthening of signatories' targets and ambitions, in line with the Paris Agreement ratcheting mechanism that envisions action on mitigation and adaptation intensifying as time progresses.

To assist policymakers and other actors in transitioning to a low carbon economy, illustrative emissions pathways have been developed that show what is required to limit global warming to the Paris Agreement goals. The IPCC 2018 Special Report[4] details four model emission pathways (P1, P2, P3 & P4) that limit global warming to 1.5°C. All will require swift and extensive transitions of systems and carbon dioxide removal at significant scale. The report identifies four key systems that will need wholesale transition as Energy, Land, Urban and Infrastructure, and Industrial Systems.

The substantial changes required for transition of our systems presents decisions in selecting one pathway over another. Which will result in compromises being made elsewhere and potential negative implications for people. Shifts to an alternate pathway could occur if a compromise is ultimately deemed too great or is seen to have unacceptable implications on sustainable development goals. The Just Transition has been proposed as a framework that can be used to acknowledge the compromises and assist in reconciling them, with a foundation on advancing sustainable development goals in conjunction with reducing emissions.

Assessing global progress towards the Paris Agreement goals will begin in 2023, and continue every 5 years thereafter, with a Global Stocktake (led by UN Climate Change) on climate adaptation and mitigation measures. The global stocktake will be an opportunity to refresh understanding with the best available science and developments made in mitigation and adaptation. It is expected the first global stocktake will signal that countries are well behind on climate mitigation and adaptation and will necessitate the next set of NDCs submitted in 2025 to be far more ambitious.

[3] https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/United%20Kingdom%20of%20Great%20Britain%20and%20Northern%20Ireland%20First/LV-03-06-EU%20INDC.pdf

[4] IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

Investors

Investors will be acutely impacted by the risks and opportunities presented by climate change adaptation and mitigation. They will also have a crucial role to play in enabling progress on NDCs and the viability of achieving the ultimate goals of the Paris Agreement. The various pathways that could be taken to achieve net-zero CO_2 emissions will have diverse implications on investment risks and opportunities in sectors and mitigation and adaptation financial needs. In addition to the pathway taken, the level of warming that occurs will affect impacts and requirements, for example whether warming is limited to 2°C versus 1.5°C.

Investors will be crucial in influencing and supporting policymakers and company practices, and in the provision and shifting of capital for mitigation and adaptation needed to ensure a smooth transition to a low carbon economy. Climate mitigation efforts will require capital to be withdrawn from certain sectors and allocated to others.

The energy sector, responsible for two thirds of greenhouse gas emissions, is a key system needing transition action now. The decisions investors make on allocation of capital can on the one hand avoid potential stranded assets and carbon lock-in that will limit the ability to mitigate and on the other can provide financing for low carbon energy production. The International Energy Agency's World Energy Outlook[5], through its use of policy driven scenarios, anticipates a US$67 trillion reallocation of capital is needed to transition the global energy supply.

Transition and capital reallocation is already occurring, and changes can be seen in the real economy. The Climate Policy Initiative reported climate finance flows of US$546 billion in 2018[6]. Moreover it is estimated the green economy currently represents 6% of the market capitalization of global listed companies, approximately US$4 trillion or about the same size as the fossil fuel sector[7]. However, the Climate Policy Initiative asserts the need for a radical increase in annual climate investment beyond climate finance as usual to meet the Paris Agreement goals.

In anticipation of the Paris Agreement global stocktake the UN Principles for Responsible Investment has suggested a scenario that the 2023 global stocktake will force an 'Inevitable Policy Response'[8] if governments are to act more decisively with ambitious 2025 NDCs to meet the Paris Agreement targets. This could leave investors' portfolios exposed to significant policy risk, with PRI supposing ambitious policy changes across 8 key areas; coal phase-outs, ICE sales ban, carbon pricing, CCS and industry decarbonisation, zero carbon power, energy efficiency, land use-based greenhouse gas removal and agriculture. This would lead to large scale changes in certain sectors, particularly the energy sector, and would likely leave investors and the companies they invest in needing to react to significant regulatory requirements with certain business models potentially no longer viable.

Climate change presents an immediate systemic and material risk to the ecological, societal and financial stability of every economy and country on the planet. It has direct implications for investors and needs to be a strategic priority for all. It is becoming increasingly clear that climate change needs to be considered as part of core fiduciary duty[9]. The investment community has begun to respond to the risks of climate change and policy developments. Investors are using tools to manage climate change such as the Transition Pathway Initiative (TPI), a global, asset-owner led initiative which assesses companies' preparedness for the transition to a low carbon economy.

[5] https://www.iea.org/Textbase/npsum/WEO2016SUM.pdf
[6] https://climatepolicyinitiative.org/publication/global-landscape-of-climate-finance-2019/
[7] https://www.ftserussell.com/research/investing-global-green-economy-busting-common-myths
[8] https://www.PRI.org/download?ac=7102
[9] https://www.PRI.org/fiduciary-duty

Climate Action 100+ has global investor support and is engaging with the world's largest corporate emitters. The Institutional Investors Group on Climate Change is, alongside investors, developing some of the new tools and resources needed to better integrate climate risk and opportunity into portfolios. Whilst the Taskforce on Climate-related Financial Disclosures, a voluntary initiative, is stimulating improvements in corporate provision of financially material climate-related data.

Key climate-related terms and definitions

Asset Classes – all asset classes will be affected by the physical and transition risks and investment opportunities presented by climate change but will be affected in diverse ways across regions and sectors. For example, investors in real estate could be highly exposed to the physical risks of climate change however there will also be opportunities through energy efficiency and mitigating energy use in construction.

Carbon Capture and Storage (CCS) – is the process of separating carbon dioxide from industrial and energy-related sources, with transportation to a location for long-term storage of it in isolation from the atmosphere. An associated process is bioenergy with carbon dioxide capture and storage (BECCS) which is CCS applied to bioenergy production. This process can be used to remove carbon dioxide from the atmosphere.

Carbon Dioxide Removal – is the process of removing carbon dioxide from the atmosphere. Most IPCC pathways require the use of Carbon Dioxide Removal, particularly if overshoot occurs, often at an untested scale. Carbon Dioxide Removal can come in the form of enhancing natural sinks for example afforestation. Or in more technological form such as bioenergy with carbon capture storage (BESCCS). Carbon Dioxide Removal technology at scale is mostly conceptual and is likely to require extensive investment. Some Carbon Dioxide Removal methods are likely to impact on other sustainable development goals which could affect uptake.

Carbon Footprint – a carbon footprint is a measure of the carbon emissions associated with companies within an investment portfolio. Using a portfolio carbon footprint enhances understanding of emissions in the portfolio, allowing comparison with global benchmarks, informing investment strategy and can be used to engage investment managers on climate change considerations.

Carbon Offsetting – is the reduction in emissions made in order to compensate for emissions made elsewhere. This can be achieved through carbon markets such as the European Union Emissions Trading System where institutions can trade emissions allowances. The development of a linked international carbon market is envisaged as playing a key role in reducing global emissions.

Carbon Pricing – is harnessing market forces by attributing a price for releasing carbon dioxide emissions. Pricing carbon to more accurately reflect carbon emission climate costs will help stimulate sectors to transition to low carbon alternatives. It is seen as a key mitigation policy. Carbon pricing currently covers 20% of global emissions, PRI forecasts first movers to implement carbon pricing of US$40-60/t$CO_2$ by 2030[10]. To achieve Paris Agreement goals IEA suggests carbon pricing increasing to US$140 by 2040 in advanced economies. Emissions intensive industries are beginning to apply internal carbon pricing in their investment decisions in anticipation of policy developments.

[10] https://www.PRI.org/climate-change/the-inevitable-policy-response-policy-forecasts/4849.article

Climate Adaptation – the process of adjusting to changes in climate and its impacts thereby building resilience in systems. Investing in adaptation can help manage the physical risks of climate change. There are challenges in calculating costs from the physical impacts of climate change and the amount of adaptation needed, though some estimates see adaptation needs in developing countries as US$140bn per year to US$300bn per year by 2030 under a 2°C warming scenario[11]. Adaptation needs will increase with warming and differentiate by region.

Climate Mitigation – the process of reducing sources of greenhouse gas emissions. Investors will be central to shifting capital flows to decarbonise the global economy and reduce greenhouse gas emissions. There are transition and physical risks to investors as, for example, material carbon pricing is implemented in high emitting sectors. However, there are also opportunities, for example through renewable energy generation.

Global Stocktake – the global stocktake is a formal aspect of the Paris Agreement requiring an assessment of the collective progress in achieving the goals of the Paris Agreement. The first will occur in 2023 and every five years thereafter. It is intended to inform countries in updating and enhancing their NDCs and climate action.

International Energy Agency's World Energy Outlook[12] **–** provides a set of future scenarios to 2040 based on current policy decisions and global goals, describing changes that would occur in the energy system, and with a focus on the provision of affordable energy for all.

- Current Policies Scenario – is a baseline scenario with the world continuing along the current path with no change in policy. With energy demand increasing by 1.3% each year it shows a continuous increase in energy emissions and strain on energy security.
- Stated Policies Scenario – provides a scenario for fully implemented announced policies and targets. It shows energy demand rise 1% each year, rise in emissions slow but do not peak by 2040 as energy transition actions by sectors and countries are counteracted by an expanding global economy and growing population.
- Sustainable Development Scenario – is a pathway to meeting global warming limits of the Paris Agreement and achieve the sustainable development goals related to universal energy access and clean air. It requires extensive emissions cuts and technological transformation across the energy system. In contrast to IPCC scenarios SDS does not use net-negative CO_2 emissions methods. If net-negative emissions are achievable at scale IEA predicts SDS has a 50% chance of limiting global warming to 1.5°C, and without to 1.65°C.

IPCC (P1-P4) Scenarios[13] – these are a set of mitigation scenarios that achieve net emissions reductions to limit global warming to 1.5°C with no or limited overshoot.

- P1 – Innovations result in lower energy demand up to 2050 while living standards rise, especially in the global South. A downsized energy system enables rapid decarbonization of energy supply.
- P2 – A broad focus on sustainability including energy intensity, human development, economic convergence and international cooperation, as well as shifts towards sustainable and healthy consumption patterns, low-carbon technology innovation, and well-managed land systems.
- P3 – Societal as well as technological development follows historical patterns. Emissions reductions are achieved through production changes over reduction in demand.

[11] https://igcc.org.au/wp-content/uploads/2017/03/Adaptation_FINAL.pdf
[12] https://www.iea.org/weo2019/
[13] https://report.ipcc.ch/sr15/pdf/sr15_spm_fig3b.pdf

- P4 – Economic growth and globalization lead to widespread adoption of greenhouse-gas-intensive lifestyles. Emissions reductions are mainly achieved through technological means, making strong use of CDR through the deployment of BECCS.

Just Transition – the concept of a just transition is a key element of climate strategy – acknowledging that the impacts of climate change and the transition to a low carbon economy will impact people disproportionality – and requiring that climate change policy and action is socially sustainability, taking account of workers' rights and community interests. A just transition will be more stable, reducing transition risk and will improve achievement of the sustainable development goals. Investors have a role to play through their capital allocation and engaging with companies and policymakers.

Nationally Determined Contributions (NDCs) – is where a country that has joined the Paris Agreement details its plans for emissions reduction. NDCs by country vary in detail. The first set of NDCs came after the Paris Agreement in 2015 with countries expected to update their NDCs every 5 years thereafter. NDCs highlight a country's intentions and are a signal to policymakers and other actors.

Physical Risk – risks related to the physical impacts of climate change. Physical risks can be described as acute (e.g. increases in extreme weather events) or chronic (e.g. rising sea levels) and can have a range of effects on investments. From direct damage to an asset value or through necessitating operational changes. Physical risk is anticipated to increase with warming and could increase exponentially.

Ratcheting mechanism – is a concept in the Paris Agreement, linked to the outcomes of the global stocktake, which will see countries setting more ambitious NDCs and taking greater action on climate mitigation and adaptation as time progresses. Policy developments will occur with differing levels of severity.

Temperature overshoot – this concept describes the situation in many scenarios and emissions pathways where temperature limits are temporarily exceeded with the intention of actively reducing levels later. It generally requires the use of CDR at scale with potential negative implications for other sustainable development goals.

Transition Risk – risks related to transitioning to a low carbon economy. TCFD categorises transition risks into policy & legal, technology, market and reputation. Delayed action from policy makers is likely to increase transition risk as transition becomes faster and disorderly.

Relevant Climate Change Initiatives

There are several initiatives that are already helping investors to integrate climate change into investment considerations and resources to advise investors on analysing portfolios[14]. The following section will provide an overview of some of the key climate initiatives, programmes and resources that will assist in managing climate change risk and opportunities and in aligning investment strategies with a well below 2°C scenario.

Climate Policy Initiative – whilst not an initiative or programme directly for investors the Climate Policy Initiative provides extensive research on climate finance, energy finance and land use.

[14] https://www.iigcc.org/download/addressing-climate-risks-and-opportunities-in-the-investment-process/?wpdmdl=623&refresh=5dcededdf0f121573838557

Corporate engagement – collective engagement initiatives are valuable tools to amplify the investor voice with companies, industries and policymakers. They will play a crucial role in the transition to low carbon economy. **Climate Action 100+** is an initiative targeting the world's largest corporate emitters which account for over two-thirds of annual global industrial emissions.

The EU Taxonomy[15] – the EU taxonomy is a framework of economic activities assessed and classified based on their contribution to EU sustainability related policy objectives including climate change mitigation and adaptation. Investors can use the taxonomy to identify investment opportunities that contribute to climate policy objectives and, also to evaluate the extent to which existing portfolios meet climate objectives.

GRESB[16] – provides environmental, social and governance data and benchmarks in real estate and infrastructure, two sectors critical to successfully achieving Paris Agreement goals and exposed to significant physical and transition risk. GRESB is developing 1.5 and 2-degree decarbonization pathways for real estate assets by applying global carbon budgets. Each pathway will extend to 2050 and be aligned with the global warming goals as set out in the Paris Agreement.

Institutional Investors Group on Climate Change Investor Practices programme[17] – the IIGCC programme is developing tools and resources to help the investment community better integrate climate risks and opportunities into their investment decision-making. One such initiative is the IIGCC Paris Aligned Investment Initiative[18] that is developing methodologies to assess alignment of different asset classes and portfolios to Paris Agreement goals. It will propose new metrics that allow asset owners and investment managers to explain, in a consistent and comparable manner, how their portfolios compare to the goals of a net zero carbon future and of keeping global temperature rise below 2°C.

Intergovernmental Panel on Climate Change (IPCC) – is the United Nations body for assessing the science related to climate change. IPCC reports are neutral, policy-relevant but not policy-prescriptive and are key knowledge resources for policymakers and international agreements on climate change.

Taskforce on Climate-related Financial Disclosures[19] – a resource supported by many investors, TCFD have developed a set of voluntary, consistent climate-related financial disclosures that can be used by companies. The recommendations are forward-looking information on the material financial impacts of climate-related risks and opportunities, including those related to the global transition to a lower-carbon economy. Investors can use the disclosures to evaluate companies and are also encouraged to provide their own disclosures, with particular value associated with scenario-based analysis.

[15] https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/190618-sustainable-finance-teg-report-taxonomy_en.pdf
[16] https://gresb.com/investors-initiative-assess-climate-change-transition-risk-global-real-estate-investment-portfolios/
[17] https://www.iigcc.org/our-work/investor-practices-programme/
[18] https://www.iigcc.org/download/iigcc-paris-aligned-investment-initiative/?wpdmdl=2292&refresh=5de5d33f47a8f1575342911
[19] https://www.fsb-tcfd.org/

Transition Pathway Initiative (TPI)[20] – is an asset owner led initiative that supports investors in assessing how companies in high-impact sectors, including oil & gas, mining and electricity generation, are preparing for the transition to a low carbon economy. TPI assesses companies' preparedness in two areas:

- Management quality: TPI evaluates and tracks the quality of companies' management of their greenhouse gas emissions and of risks and opportunities related to the low carbon transition.
- Carbon performance: TPI evaluates how companies' planned or expected future carbon performance compares to international targets and national pledges made as part of the Paris Agreement.

Investors are using the tool and its data in a range of ways, including informing their investment research, informing their engagement with companies and tracking managers' holdings.

United Nations Principles for Responsible Investment: climate change initiatives[21] – PRI has a programme of investor initiatives all committed to realising the goals of the Paris Agreement. Collaboration in initiatives such as these will be vital in stimulating large scale action on climate change.

- The Investor Agenda focusses on scaling up action critical to achieving the Paris Agreement.
- The Net-Zero Asset Owner Alliance is a commitment from asset owners to transition investment portfolios to net-zero GHG emissions by 2050.
- The Montreal Carbon Pledge mobilises investors to commit to measure, disclose and reduce their portfolio carbon footprints.
- iCinternational is a commitment by private equity players to reduce emissions and collaborate with peers to contribute to achieving the goals of the Paris Agreement.

United Nations Framework Convention on Climate Change[22] – is an international environmental treaty established in 1994 and ratified by 197 countries. The ultimate goal is to stabilise greenhouse gases at levels that would prevent dangerous anthropogenic interference with the climate system. The Convention formally meets yearly at Conference of the Parties (COP) events. The Paris Agreement was agreed by Parties of the UNFCCC to build upon the aims of the Convention. UN Climate Change is the secretariat to the UNFCCC.

[20] https://www.transitionpathwayinitiative.org/
[21] https://www.PRI.org/climate-change
[22] https://unfccc.int/

Getting in touch

If you have any questions or comments about this policy, please email Faith Ward, Chief Responsible Investment Officer, at RI.Brunel@brunelpp.org.

Fund managers with general enquiries, meeting requests and other materials (updates, newsletters, brochures and so on), should contact us at investments.brunel@brunelpp.org or pminvestments.brunel@brunelpp.org

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