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Lloyd's emerging risk report 2022

Shifting powers: Climate cooperation, chaos or competition?

Managing geopolitical risk from the climate transition

In association with

Centre for Risk Studies

UNIVERSITY OF CAMBRIDGE Judge Business School

Lloyd's Futureset

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1. Executive summary

There's significant overlap between geopolitical movements and climate change – yet few organisations or models would say they are actively monitoring, or aware of, this intersection in risk management.

Climate diplomacy – the strategic cooperation or competition of states towards climate-related goals – is anticipated to drive global political developments in the coming century, as it has for much of the last century. The nature of these volatile relationships will decide the scale, speed and final form of the transition to net zero – with far-reaching political, environmental and economic consequences along the way.

This report explores those risks, based on potential but plausible scenarios in global climate politics. The intention is to help insurers, risk managers and contingency planners build models and organisational strategies to mitigate this emerging and influential risk.

A mindset shift is required that sees the race to net zero not as an inevitable, linear drift to carbon neutrality – but an uncertain and pliable journey, influenced by human behaviour and promising twists and turns throughout the century.

The three scenarios used to analyse geopolitical climate risks are:

1. **'Green Globalisation' (Cooperation)** which sees world leaders collaborate towards a stable and global transition driven by a shared belief that decisive and focused action is needed to tackle climate change. Geopolitical frictions are reduced; short-term transition risks increase.
2. **'Climate Anarchy' (Chaos)** on the other hand, sees state interests prevail as actors struggle to mobilise on the scale and speed needed to shift the dial on climate change. A slow and uneven transition emerges, causing transition risks to stay low in the short-term but environmental and economic risks to skyrocket in the long-term.
3. **'Green Cold War' (Competition)** sees like-minded states coalesce around major powers to form 'climate blocs', with competition between blocs for energy, technology, and market dominance. The competition drives investment and innovation, but considerably raises the long-term environmental and geopolitical stakes.

This report identifies Green Cold War as the most likely scenario, based on current levels of cooperation – although the reality is likely to mirror two or more scenarios, and to fluctuate as states and societies shift throughout the 21st Century.

The analysis signals an opportunity for the insurance sector to take the initiative. COP26 revealed a shift in agency over climate change, from governments and NGOs (the traditional activists) to businesses and private individuals (the emerging activists).

Lloyd's has stepped into the space between geopolitics and environmental action by:

1. ***Convening the industry*** *– through its leadership of the Insurance Task Force of HRH The Prince of Wales's Sustainable Markets Initiative and other industry initiatives.*
2. ***Insuring the transition*** *– targeting a net zero investment strategy for Lloyd's £3 billion Central Fund and a net zero underwriting position for the Lloyd's market by 2050, through the Net Zero Insurance Alliance – at the same time as working with market participants to phase out cover for high-impact energy sources by 2022.*
3. **Building climate resilience** *– developing products and solutions to help countries of all sizes respond to natural disasters and climate-related threats.*

Lloyd's research community alongside Lloyd's Futureset is also pooling expertise from across the industry to provide cutting edge risk insight on systemic risks from climate change to cyber security. You can find more research on the impact of systemic risks on the Lloyd's website.

2. Introduction: the geopolitics of climate change

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The COP26 Summit, staged in Glasgow in November 2021, was the latest global initiative aimed at striking an international consensus on how to curb the warming of our planet. The underlying ambition – to reach net zero carbon emissions as early in the 21st Century as possible – was premised on the ability of states and civil society to define their collective environmental interests, before taking decisive action on the scale needed to address the challenge.

Progress against this goal hinges on some level of disruption. To shift the dial, changes in political, technological and consumer behaviour are required on a sschedule running counter to natural timelines or economic cycles.

Many believe the action taken by world leaders to date has not been disruptive enough to achieve genuine decarbonisation worldwide. While climate diplomacy since the mid-1980s has raised the profile of environmental issues, levels of human-emitted carbon dioxide in the atmosphere have more than doubled in that time. It is not surprising, therefore, that expectations for climate change have only risen through the years.

A brief summary of this diplomacy is listed below, but much of the discussion has centred around the flagpole set by the Paris Agreement in 2015: to limit warming to 1.5°C. Whether COP26 did enough to channel renewed political and societal will into concrete and decisive action in pursuit of this goal is still unclear; many say it failed to introduce the legally-binding change needed, while others point to progressive commitments around coal, deforestation and electric vehicles. Whatever the case, the clearer message is that climate change – and climate diplomacy – are here to stay; and will continue to be a defining feature of global geopolitics in the 21st Century.

A brief history of climate diplomacy

An understanding of the discussions to date is therefore essential for any individual or organisation seeking to assess – or respond to – the potential risks of climate geopolitics. Since the late 20th Century, intense and continuous international negotiations on climate change have performed the vital function, albeit incrementally, of laying the foundations of today's climate diplomacy.

– **Montreal Protocol, 1987.** Though not directly intended to address climate change, the Montreal Protocol was a landmark environmental accord that offered a model for future diplomacy on the issue. The treaty, which was eventually ratified by all countries in the world, required signatories to halt production of ozone-depleting substances and, through the years, has succeeded in eliminating nearly 99% of them.

– **Rio (UNFCCC), 1992.** Ratified by 197 countries, the historic accord was the first global treaty explicitly aimed at tackling climate change. As part of the agreement, the annual forum known as the Conference of the Parties (COP) for international discussions aimed at stabilizing the concentration of greenhouse gases in the atmosphere was established. These meetings produced the Kyoto Protocol, the Paris Agreement, and the recent COP26 Climate Summit in Glasgow.

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– **Kyoto, 1997.** The Kyoto Protocol, adopted in 1997 and entered into force in 2005, was the first legally binding global climate treaty. It required developed countries to reduce emissions by an average of 5% below 1990 levels and established a system to monitor their progress. The treaty excluded developing countries, including major carbon emitters, from such obligations.

– **Copenhagen, 2009.** Despite the huge expectations for COP15 in 2009, the Copenhagen conference was substantively a failure, marking the first serious blow to climate diplomacy. New quantitative commitments were expected to ensure an agreement moving seamlessly on from the Kyoto Protocol, but divisions between developing and developed countries crippled negotiations. The agreement recognized the scientific case for keeping temperature rises below 2°C but did not contain binding targets and a weak voluntary commitment approach was adopted. Only 122, subsequently rising to 139 countries, eventually agreed to the Accord.

– **Paris, 2015.** The most significant global climate agreement to date, the Paris Agreement required all countries to set emissions-reduction pledges. Governments set targets with the goals of preventing the global average temperature from rising 2°C above pre-industrial levels and pursuing efforts to keep it below 1.5°C. The Agreement also aims to reach global net zero emissions in the second half of the century. Equity and the principle of common but differentiated responsibilities and respective capabilities are also important defining features. However, countries set their own emissions targets, and there is presently no enforcement mechanism to ensure they meet them.

– **Glasgow, 2021.** 151 countries submitted new climate plans to cut emissions by 2030. Such plans, however, put the world on track for 2.5°C of warming by the end of the century – still far from the goal of limiting temperature rise to 1.5°C set in Paris, for which global emissions would need to be cut in half by the end of this decade. Significantly stronger commitments from governments are needed – and expected – from COP 27, which will take place at Sharm El-Sheikh, Egypt, in 2022.

Can political actors be predicted?

States – the primary drivers of international politics – have always alternated between cooperation and competition in shaping the norms, rules, and institutions of the international order. One school of political thought ('realist') says this cooperation is driven primarily by a state's interests and fears. 'Liberal' scholars might point to moral values that transcend state interests; 'constructivists' might emphasise inherent features in the state's national identity or mindset that dictate its behaviour. In all likelihood, climate diplomacy reflects elements of all three: interest-driven states and organisations, driven by their distinct psyches, in pursuit of a challenge that transcends national boundaries. This theoretical founding has been used to predict – to varying degrees of accuracy – the behaviour of states in global politics.

In light of the political wrangling seen at the COP26 Summit, and a watered-down resolution that most would say reflects the triumph of national interests over global considerations, this report assumes narrowly-defined interests are the primary driver of state behaviour in geopolitics, with loose cooperation on the premise of shared values and identities. However, climate change poses a unique conundrum in that it is not an isolated area of strategic concern; rather a pervasive condition with implications for most other areas of interstate competition and cooperation, from global trade to regulatory standards. In this sense, actors have climate-related incentives and imperatives to either cooperate or compete according to specific issue areas such as the economy or national security. Assessing how these considerations interact with each other to form a coherent climate strategy for every state is a complicated exercise, especially in an increasingly interdependent and multipolar world – but an essential one to assess and mitigate climate risk.

2. Introduction: the geopolitics of climate change

In a post-carbon economy, a new set of winners and losers may emerge depending on how different countries chose – or are forced – to approach the transition to net zero. Whether through cooperation or competition, the stakes are such that the transition has the potential to significantly redesign the geopolitical map over the rest of the 21st Century. Transformations as deep and far-reaching as the global energy transition have occurred only a handful of times in history; and never without friction. Rather, they are characterised by tensions, non-linear developments, and unintended consequences. The rapid industrialization of Europe and North America following the advent of steam power in the 18th Century as well as the sudden transition from a planned to a market economy of the post-Soviet space in the 1990s are just two examples. Such a transformation has never occurred on a global scale, and never as the result of a collective conscious willing of systemic change.

Report goals & methodology

The following report seeks to offer a guide on the global race to net zero for insurers and risk owners, focusing on the geopolitical scenarios that could surround and dictate the climate transition. Our approach is to offer a broad insight on how sectors are adapting to the energy transition already underway, and the short-term implications for insurance that will arise as a result of these trends. In order to analyse the short, medium, and long terms, however, three different geopolitical scenarios – based on three different main assumptions on actors' behaviour – are described and analysed: cooperation **(I. Green Globalisation)**, chaos **(II. Climate Anarchy)**, and competition **(III. Green Cold War)**.

In each section of the report, the possible resulting geopolitical consequences and related risks for society and the private sector over the next decade are described for the benefit of those seeking to mitigate those threats. Scenarios, while hypothetical, provide a useful tool to cope with managing uncertainty, especially regarding risks that are newly emerging or difficult to quantify. They provide a systematic method for exploring how a complex and diverse array of risks may impact an organisation, sector, or economy; and how resilient these systems are to potential disruptions. This understanding can be applied to support and rationalise decision making about the future, and facilitate reporting, management, and mitigation of risks. In simple terms, scenarios are valued for supporting creative thinking about plausible futures, rather than accurately forecasting specific outcomes.

For the insurance industry, these tools continue to evolve in response to advancing consideration and regulation of enterprise risk management, both within the industry and for those insured by it. Scenarios are increasingly being used by underwriters, analysts, risk managers, actuaries, and other stakeholders in the (re)insurance community to better understand the characteristics and consequences of unknown, uncertain, or unexpected future events.

2. Introduction: the geopolitics of climate change

Report goals & methodology (continued)

Different narratives of socio-political, economic, technological, and governance development explore plausible evolutions of the world in the absence of decisive technological breakthroughs (e.g., in geoengineering or carbon capture and storage technologies) that would limit global warming. Each scenario is associated with a trajectory of changes in energy and land use, carbon emissions, and geopolitical relations to assess the possible transition and geopolitical risks for each pathway. Not unlike previous studies that pioneered the use of scenario-building and foresight methodologies for the study of the socio-economic implications of energy transformations, this report offers different scenarios based on current geopolitical trends and imagines how these may evolve over the next decade and play out in the global transition to low-carbon economies[1]. What follows, however, is a unique exercise in risk analysis built on each of these scenarios – thereby drawing a clear link between geopolitics, global business, and insurance.

As a ten-year timeframe is too short to effectively capture variance in physical risk for each scenario, the analysis focuses on transition and geopolitical risks – with the former indicating the knock-on effects of states' policies aimed at curbing global emissions and the latter referring to the indirect, sometimes unintended, geopolitical consequences of such policies. The assumptions made for each scenario are the result of qualitative observations further substantiated by a series of interviews held with subject experts from academia, private sector, and public sector. This analysis is provided to help insurers understand how the demands of existing policies may change and what new products businesses will need as priorities change.

1 Bazilian, M., Bradshaw, M., Gabriel, J., Goldthau, A., & Westphal, K. (2020). Four scenarios of the energy transition: Drivers, consequences, and implications for geopolitics. WIREs Climate Change, 11(2), e625; International Renewable Energy Agency. (2019). A new world. The geopolitics of the energy transformation. Masdar City: IRENA; Hafner, M., & Tagliapietra, S. (2020). The geopolitics of the global energy transition (p. 381). Springer Nature.

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Scenario summary table

A summary of the three geopolitical transition scenarios is broken down below according to three main categories: **actors** (capturing the main behavioural assumptions behind each scenario), **structure** (describing what business environment companies may find themselves operating in), and **market** (defining some of the main characteristics of the future clean tech and energy markets). The descriptors listed below are the main features of what the world may look like at the end of the decade should the transition to net zero unfold in a coordinated, chaotic, or openly confrontational way.

Narrative elements	I. Green Globalisation	II. Climate Anarchy	III. Green Cold War
Actors			
Behavioural assumptions	Cooperation	Short-term self-interest	Polarized confrontation
Geopolitical architecture	Multilateralism	Unilateralism, anarchy	Bipolarity/Tripolarity
Assistance to developing nations	Thorough and coordinated	Minimal and exploitative	Inadequate, politically motivated
Structure			
Trade system	Rule-based, open international system	Protectionism/Mercantilism	Regional free trade agreements with external barriers
Regulatory landscape	Coordinated and consistent	Fragmented and contradictory	Unified within blocs, conflictual between blocs
Carbon pricing	Multilaterally negotiated global pricing regime	Unilateral taxes in flexible global pricing regime	Regional border adjustments mechanisms
Supply chains	Internationally regulated, globally stretched	Unregulated, fragile, globally stretched	Decoupled, intercontinental, intra-bloc supply chains
Power grid connectivity	Transcontinental, global power grids	Independent national/ sub-regional grids	Interconnected grids in regional systems
Market			
Fossil fuels demand	Fast, steady decline	Stagnant, but solid	Gradual steady decline
Commodity prices	Low fossil fuel prices, relatively high prices for transition metals	Stable fossil fuel prices, volatile prices for transition metals	Low fossil fuel prices, very high prices for transition metals
Cleantech development	Fast and cheap, driven by competition	Slow, priority given to short-term gains	Fast but expensive, driven by politics
Global cleantech market	Open, competitive	Underdeveloped	Decoupled, redundant

2. Introduction: the geopolitics of climate change

Risk table – variation in risk

The table below summarizes the observations made under each scenario's 'Impact and variations in risk' section. The upward or downward variation in risk is expressed through five possible values: **high increase, modest increase, stable, modest decrease, high decrease**. The ten year time horizon is broken down into **short-term, medium-term,** and **long-term** – each represented by one of the three consecutive arrows in this order. Variations in climate risk are only indicative of the impact each scenario may have on global warming well beyond the considered timeframe due to the latter being too narrow to effectively capture any significant impact on environmental degradation that is directly attributable to emission reduction efforts.

Risk categories	Variation in risk compared to present								
	I. Green Globalisation			II. Climate Anarchy			III. Green Cold War		
Transition	Short term	Mid term	Long term	Short term	Mid term	Long term	Short term	Mid term	Long term
Carbon pricing	↑	↑	↔	↓	↓	↔	↑	↑	↔
Change in assets value	↑	↑	↑	↓	↔	↑	↔	↑	↑
Liquidity	↑	↑	↔	↓	↔	↔	↑	↑	↔
Litigation liability	↑	↑	↔	↔	↑	↑	↔	↓	↓
Technology	↑	↔	↓	↔	↑	↑	↑	↑	↑
Market	↑	↔	↓	↓	↔	↑	↑	↑	↔
Reputational	↑	↔	↔	↔	↑	↑	↔	↓	↓
Carbon tariffs	↓	↓	↓	↔	↑	↑	↑	↑	↑
Geopolitical	Short term	Mid term	Long term	Short term	Mid term	Long term	Short term	Mid term	Long term
Regulatory	↑	↔	↓	↑	↑	↑	↑	↑	↔
Sovereign	↑	↑	↔	↔	↔	↑	↓	↔	↔
Protectionism	↓	↓	↓	↑	↑	↑	↑	↑	↑
Supply chain	↓	↓	↓	↑	↑	↑	↑	↔	↓
Political violence	↓	↓	↓	↑	↑	↑	↔	↓	↓
Humanitarian crises	↓	↓	↓	↑	↑	↑	↓	↔	↑
Resource-driven conflict	↑	↔	↓	↔	↑	↑	↔	↑	↑
Macroeconomic	↓	↓	↔	↑	↑	↔	↑	↔	↔
Trade dispute	↓	↓	↓	↑	↑	↔	↑	↑	↑
Sanctions	↓	↓	↓	↑	↑	↔	↑	↑	↑
Destabilization of petrostates	↑	↑	↔	↓	↓	↓	↑	↑	↑
Climate	Short term	Mid term	Long term	Short term	Mid term	Long term	Short term	Mid term	Long term
General environmental degradation beyond scenario time horizon	↓	↓	↓	↑	↑	↑	↓	↓	↓

Key:

↑ increase ↔ stable ↓ decrease

2. Introduction: the geopolitics of climate change

Risk summary table – variation in risk and likelihood

Variation in:	Green Globalisation	Climate Anarchy	Green Cold War
Climate Risk*	High decrease	High increase	Modest decrease
Transition Risk	High increase	Modest increase	Modest increase
Geopolitical Risk	High decrease	High increase	Modest increase
Likelihood	Unlikely	Very unlikely	Likely

* Beyond scenario time horizon

3. The role of the insurer: innovations for geopolitical transition

3. The role of the insurer: innovations for geopolitical transition

The geopolitical changes in the risk landscape arising from international attempts at energy transition present a myriad of risks and opportunities for the insurance sector.

While there is no guarantee of any of the scenarios detailed coming to fruition, all three – Green Globalisation, Climate Anarchy and Green Cold War – provide detailed analysis into expected changes in risks, geopolitical and otherwise, that may result from various outcomes of the global energy transition process. Insurers must monitor these changes in exposure and demand closely as the transition gains momentum.

Insurance opportunities associated with changes in geopolitical postures, affecting elections, popular movements, insurgency, and demographic shifts have been covered extensively in the report *Shifting powers: Meeting the challenges of the geopolitical risk landscape.* These include:

1. **Improving the understanding of policy clash events** associated with geopolitical conflicts, and to pursue novel methods for sharing 'uninsurable' risks of the future before disasters occur;
2. **Closing the "geopolitical protection gap"** in immature markets, providing much needed coverage to developing economic powerhouses where political institutions may be historically insecure;
3. **Exploring parametric solutions** to address periods of increased vulnerability, particularly for supply chains, while limiting capital exposure;
4. **Adapting the role of the insurer** to one of vital data stewardship for understanding supply chain exposure.

These recommendations remain entirely relevant in the face of the geopolitical response to the challenges of climate change and the energy revolution that will occur in the coming decades, though additional themes and opportunities for the industry should also be noted in this specific regard.

Multinational exposure to energy transition risks

The Task Force on Climate-related Financial Disclosures (TCFD) explicitly calls attention to four classes of energy transition risks to business: **market and technology risks, policy and legal risks, reputation risks,** and **physical risks**. TCFD estimates the value of these energy transition risks to be around $1.6 trillion over the period of 2018-2025[2]. Regulation and litigation measures across different regional markets will change the shape of demand for insurance protections across these four major classes. It can be expected, then, that different regions – the so-called "leaders" and "laggards" – will introduce penalties and incentives for transitions at different rates. Suitable frameworks for managing coverage demand dynamics across a variety of regulatory environment types are necessary for matching suitable products to businesses undergoing transition.

2 'Mind The Gap: The $1.6 Trillion Energy Transition Risk', Carbon Tracker Initiative, 6, accessed 1 November 2021, https://carbontracker.org/reports/mind-the-gap/.

3. The role of the insurer: innovations for geopolitical transition

In as much as these risks affect major multinationals – who often represent national interests overseas and stand in as proxies for foreign governments – they are also risks to geopolitical stability and continuity. These risks apply particularly to energy firms, food processing entities, and other major community employers whose continuity forms a critical element of national infrastructure and, thus, have the potential to become quasi-political actors on the international stage.

Safeguarding transition

Despite its mixed outputs, COP26 did signal a clear shift – even, a consensus – in the business community's approach to transition, in favour of climate action and sustainable business practices. Recent decisions by insurers to limit coverage of fossil fuels, has signalled a proactive change in the industry's approach to ushering in energy transition innovations, and may be seen as an inflection point in the international pursuit of a less carbon-intensive economy. For now, it may be argued, this change in commercial policy is simply good business; investments in renewable energy presents huge untapped growth potential for insurance bodies. The green economy as a whole is expected to grow at four times the rate of the underlying economy. However, beyond the commercial benefits, the industry also has an important role to play in de-risking the transition process to encourage economic and geopolitical stability. These benefits apply largely to the sphere of international collaboration on renewable energy technology and infrastructure projects.

A myriad of international projects associated with energy transition have been developed, with more ambitious projects announced. The United Kingdom's established and proposed turbine sites at Hornsea, Dogger Bank and East Anglia will generate a potential 18GW in renewable energy. In October 2021, the North Sea Link established a subsea cable between the UK and Norway, exporting hydropower from the Scandinavian state to mainland Britain's electricity grid. The Link is Norway's seventh such project, transporting green energy around Europe.

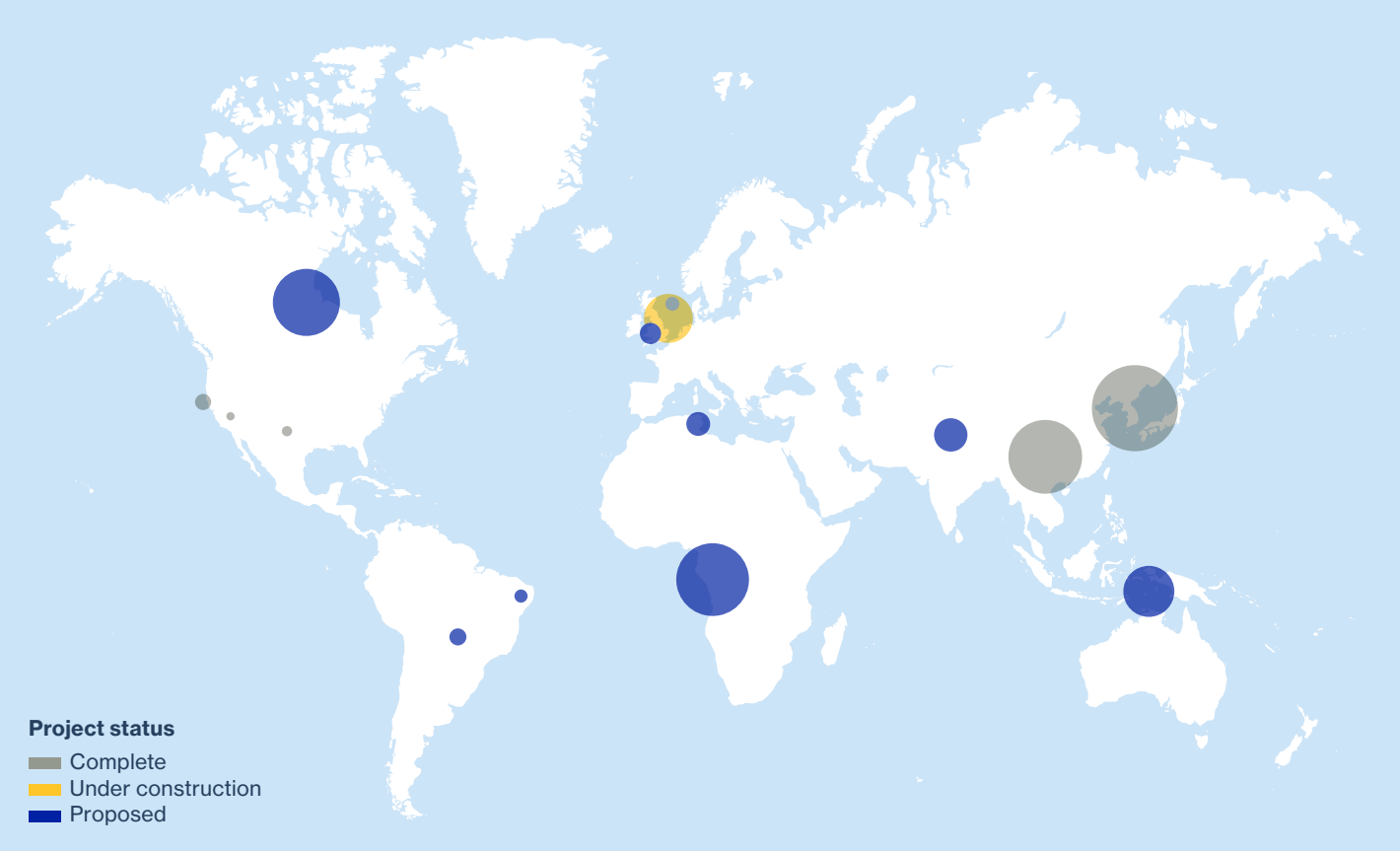
The Australia-Asia Power Link project recently announced by the governments of Australia and Singapore is a $22 billion USD infrastructure investment which will see solar energy captured in Australia transported to Singapore, and later Indonesia, via the world's longest high-voltage undersea 'Sun Cable' by 2027.[3] Similar clean-energy export projects are expected in the coming years, particularly in parts of the world where expensive infrastructure innovation is untenable at a national level. The 'One Sun, One World, One Grid' initiative floated by India's government, for example, sets an ambitious goal of uniting Middle East, South Asian, and South East Asian electricity grids – at the very least – in order to transfer solar power drawn from farms throughout the region.[4]

3 Reuters, 'Bechtel, Hatch among Firms to Work on Australia-Asia PowerLink', Reuters, 20 October 2021, sec. Asia Pacific, https://www.reuters.com/world/asia-pacific/bechtel-hatch-among-firms-work-australia-asia-powerlink-2021-10-20/.

4 Green Grids Initiative-One Sun One World One Grid Northwest Europe Cooperative Event', accessed 30 October 2021, https://pib.gov.in/pib.gov.in/Pressreleaseshare.aspx?PRID=1763712.

3. The role of the insurer: innovations for geopolitical transition

Figure 1: A selection of major international sustainable energy projects and statuses in 2021. The size of each bubble indicates the green megawattage (MW) generated per project.



Ambitious ideas are necessary to supercharge the energy transition process to meet with set climate goals, and investment in these ambitions can be better guaranteed with appropriate and inclusive insurance policies which provide protection for such variables as technology failures (Hornsea 1 Wind Farm has been taken offline by lightning strikes and software failure, contributing to significant power disruption on the mainland), political and security risks, third-party compensation, etc.[5] There is significant opportunity, therefore, for international and domestic insurers to continue to pursue expansion into policies which de-risk renewable engineering infrastructure in order to drive continuous protected investment.

Perhaps more importantly, these projects, if and once successful, will become vital nodes in global business as well as symbols of influential international partnerships. They will, therefore, be highly exposed to the disruption and damage posed by geophysical threats, industrial accidents, cyber threats, terrorism, and traditional military conflict, and require the protection of suitable long-term coverages in order to safeguard systemically important assets throughout and following global energy transition. In this regard, the insurance industry also has a vital role to play in underwriting the continued operations of such projects, which provide a not insignificant basis for future international friendship, collaboration, and regional peace.

5 'The Critical Role of Insurance in the Transition to Clean Energy', Development Asia, 15 June 2021, https://development.asia/insight/critical-role-insurance-transition-clean-energy.

4. Scenarios for geopolitical risk in the global climate transition

4. Scenarios for geopolitical risk in the global climate transition

The following sections detail three broadly separate scenarios – introduced in the executive summary – for global climate transition, each of which assumes a different direction for geopolitical developments.

For much of the 20th century, energy and productivity norms dictated by a reliance on fossil fuels have determined a significant portion of the international power structure. Transition to a green energy industry, therefore, will undoubtedly change both the script and the cast of geopolitical actors and methods of risk transference through the global trade network.

The three scenarios unearth the need for innovation in the insurance industry, providing qualitative blueprints for changes in geopolitical and transition risk landscapes which will challenge the current state of the policy market.

Scenario 1 – Coordinated transition: "Green Globalisation"

This scenario sees the global transition to clean energy resources driven by consensus among world leaders recognising the need for concerted action in tackling climate change. Characterized by cooperative dynamics and a united international policy drive, coordinated efforts lead to a deep and accelerated decarbonisation against the backdrop of increasingly ambitious global emission reduction targets, the formulation of compatible policy signals from major powers and the creation of a coherent global regulatory framework.

Actors

World leaders reiterate that climate talks can and must be separated from other issues of national concern, bypassing great power politics and fundamental divisions between major powers concerning other issues. Political leaders and influential figures at home set politics aside and hold to this line as pressure from public opinion and civil society groups compels them to maintain an internationally united front to face the global challenge of climate change. The ensuing wave of green globalisation allows all countries to share the benefits of decarbonisation. A comprehensive global green finance package assists developing countries in their transition efforts while incentivizing hydrocarbon-exporters to diversify their economy and move away from a societal model based on the redistribution of fossil-fuel rents, thereby transitioning smoothly to a post-carbon society – which, in turn, resists the temptation to flood the market with cheap oil and gas.

Market

While the COVID-19 pandemic represents a temporary setback for growth in energy transition projects, the crisis also serves as a powerful reminder of the urgency of adopting and implementing more effective transition policies as well as a unique opportunity to do so as part of the economic recovery effort. The idea of a "green recovery" drives post-pandemic recovery and stimulus policies, directly borrowing from Green New Deal initiatives, prompting a strong capitalization of cleantech start-ups in parallel with a quick divestment from carbon-intensive assets. Within a relatively short time, low-carbon tech companies supplant the largest oil and gas firms on the world's stock markets, with some of the early movers in the petroleum industry managing to ride the waves of disruption instead of being crushed under them and successfully reinventing their business models.

4. Scenarios for geopolitical risk in the global climate transition

On the commodities side, a new supercycle sees fossil fuels traded at lower prices and costs for key industrial metals needed to electrify society such as cobalt, lithium, copper, nickel, and aluminium pushed up by green investment. Winners and losers among oil and gas producers are largely determined by the cost-competitiveness of their fossil fuel resources, including the carbon intensity of both products and production as an ever-decreasing demand becomes increasingly sensitive to rising carbon prices.

Policy coordination across all parts of the global economy creates the conditions for a purpose-led, comprehensive increase in public investment. This, accompanied by redistribution measures, financial reform, and specific industrial policies, succeeds in lifting supply constraints and channelling private investment toward profitable green projects in rapidly urbanising developing countries that successfully manage to resume growth while leapfrogging carbon-intensive technologies. To facilitate this process, a multilateral mechanism for restructuring sovereign debt is created to help countries identify and finance low-carbon high-productivity activities and design appropriate industrial policies to scale up their resources in sustainable infrastructure. A globally negotiated minimum carbon tax which varies according to GDP is introduced as a fairer alternative to carbon tariffs.

Structure

With the fight against climate change being an outspoken shared goal that can only be pursued through cooperation between states, no major power seeks renewable-energy dominance. Instead, global coordination and countries' interdependency spark an era of positive competition among advanced economies in which the world's most important energy producers and consumers try to develop the best technologies, drive down their costs, and deploy them as far and wide and quickly as possible – giving new stamina to pro-globalisation arguments and policies. International cooperation between government and the private sector strengthens the resilience of global supply chains of critical technologies and raw materials.

Finally, improving grid connectivity and dispatching electricity over wide areas emerges as a key goal of international cooperation as the role of power grids as the main platform for energy allocation becomes increasingly essential with the development of green and electrified energy systems. Multilateral agreements for the improvement of energy interconnection regionally and globally lead to the realisation of optimal large-scale transnational, trans-regional, cross-continental, and global allocation of clean energy which improve mutual energy support between regions for security of supply.

Overall

The "Green Globalisation" scenario represents the ideal case from all perspectives. Here, mitigating climate change is seen by most as a shared goal that can only be achieved through joint action, so states initiate an era of positive, open competition in which the world's most important energy producers and consumers – in a regulated yet open trade environment – rival to develop the best technologies, drive down their costs, and deploy them as wide and fast as possible while reducing environmental and social impacts. This scenario is a win–win for climate and the global economy, and the only one that fully achieves current climate targets while keeping trade disruptions to a minimum. Geopolitical friction is low since energy security concerns decrease alongside reliance on fossil fuels.

4. Scenarios for geopolitical risk in the global climate transition

Impact and variations in risk

The globally coordinated transition produces a stable pattern of public expenditure that leads to a general expansion of economic activity and to a crowd-in of private investment while clear policy signals and a coherent global regulatory landscape support cross-border activities. The resulting new green globalisation wave supports employment creation, boosting wages and prompting technological advances. Income distribution also improves with many of the jobs created by green investment being inherently local and joblessness in “brown” sectors being partially offset by effective policy action.

A coordinated transition scenario thus entails little variation in geopolitical risks, but a modest increase in transition risks in the short term. These, however, decrease over time as decisive early action, while indeed producing rapid policy changes, does so in a gradual and orderly way. Both costs and opportunities of carbon are unevenly distributed, and competitive shifts are largely based on changes in technology and regulation. The distance between high carbon business and their low-carbon competitors widens, leading to an enormous reallocation of capital across industries and borders. On the upside, the clear and consistent policy signals at the international level coupled with increased government support reduce risks and their impact.

Geopolitical risk

Regulatory and compliance risk: Markets are global and open, yet more regulated. Regulatory and legal hurdles make investing in fossil-fuel projects as well as carbon-intensive industries too risky. Moreover, the ambitious multilateral project requires states to cede portions of their sovereignty to international bodies in order to establish international regulations and forge collective action, which implies a rolling back of free trade agreements and bilateral investment treaties that have so far regulated trade restricting policy space.

Sovereign risk: As financing needs keep rising to sustain ambitious efforts to transition while simultaneously mitigating the effects of climate change, higher debt stocks hit government budget constraint and larger flows cause demands on liquidity that markets cannot finance. Many countries’ sovereign debt may thus become unsustainable as transition risks are transmitted to public finance through fiscal expenditures, drags on economic growth, and repricing of sovereign assets. Contingent liabilities are likely to materialise on public balance sheets where private investment falls short of the targets while carbon-intensive assets in public ownership may become stranded assets that are no longer economically viable given rising carbon prices. This may cause sovereign wealth to be repriced, impacting credit quality and debt financing rates.

Transition risks

Carbon pricing: Risks associated with fast changing technologies, markets, policies, and social norms increase substantially and rapidly. National policy makers adopt stringent regulation and carbon pricing mechanisms to keep up with the ratcheting of climate targets and incentivise or force businesses to reduce their carbon footprint and positively contribute to cleaner growth. Given scale and timing of the policy changes assumed in this scenario, the associated risks and impact are very significant for the highest CO2-emitting sectors.

4. Scenarios for geopolitical risk in the global climate transition

Change in assets value: Physical assets are rendered redundant or stranded at a higher rate, sometimes leading to premature write-downs and bankruptcies. Human capital – as people need retraining and reskilling for the new economy – and intangible capital, which increasingly forms the bulk of company's wealth and that will need to become net zero consistent, are also affected. The value of investments held by banks and insurers in carbon-intensive companies experience a rapid and steep reduction.

Liquidity risk: In response, companies may keep increasing emissions and decide not to invest in greener technology – but have to sustain higher carbon taxes on their emissions. Alternatively, they may invest in greener technology, thus paying lower carbon taxes – but incur higher operating costs. Either way, aggressive climate mitigation policies affect both net profit margins and the required rate of capital expenditure, leading to higher liquidity risks.

Litigation liability: Legal risks are set to increase alongside the awareness around the impact of climate change. On the back of more stringent obligations for both private and public entities, failure of organisations to mitigate and/or adapt to climate change and the insufficiency in assessing and disclosing the associated material financial risks and their impacts on company performance may lead to greater legal liabilities, thus undermining business viability and compromising shareholder value on account of inadequate commitment to sustainability. Governments are also exposed to increased litigation and liability risks.

Technology risk: As another consequence to these policies, improving technologies and more efficient sustainable processes begin to outcompete old ones in terms of costs and productivity, dealing a significant impact on a number of organizations. Companies see their competitiveness, production and distribution costs, and ultimately the demand for their products and services decrease dependent on pace and scale of the uptake of new technologies such as battery storage, energy efficiency, and carbon capture and storage.

Market risk: Disruptive developments – which obviously have both winners and losers – are enormously amplified in this scenario as international cooperation accelerates the development of a fully competitive global market for green tech. Moreover, while globally stretched supply chains keep costs of technologies and raw materials comparatively lower than in other scenarios, the tightening of supply chain regulation needed to reduce vulnerability and geopolitical risks require more scrutiny, thus pushing prices up.

Reputational risk: Finally, an overall increase in climate ambition among governments and public opinions sees a potential source of reputational risk in the changing customer or community perceptions of an organistion's contribution in curbing global carbon emissions and fighting climate change. This becomes an increasingly important risk factor across sectors while entire industries will get increasingly stigmatized.

4. Scenarios for geopolitical risk in the global climate transition

Likelihood

This is not the most likely scenario. Climate change is an exemplary collective action problem, as the global goal to curb green-house gas emissions relies on the critical contributions of single nation-state actors. Collectively, all countries want to limit climate change. Individually, though, each country may be willing to contribute only as long as other countries do the same. Therefore, the mere possibility that a country may freeride on other countries' efforts may stall cooperation. In game theory, this situation is known as the prisoner's dilemma: while in the collective interest of parties, cooperation is difficult to achieve due to parties' mistrust that others will cooperate towards the mutually beneficial outcome.

The failure of past climate treaties has already illustrated the limits of international diplomacy in producing effective results in the fight against climate change, and even the Paris Agreement – which formalises today's framework for international cooperation on climate action – does not address this underlying tension. **While cooperation on climate is likely to continue in the coming years, this will hardly evolve into a policy area free from any form of competition between states.**

Scenario summary – Green Globalisation	
Actors	
Behavioural assumptions	Cooperation
Geopolitical architecture	Multilateralism
Assistance to developing nations	Thorough and coordinated
Structure	
Trade system	Rule-based, open international system
Regulatory landscape	Coordinated and consistent
Carbon pricing	Multilaterally negotiated global pricing regime
Supply chains	Internationally regulated, globally stretched
Power grid connectivity	Transcontinental, global power grids
Market	
Fossil fuels demand	Fast, steady decline
Commodity prices	Low fossil fuel prices, high prices for transition metals
Cleantech development	Fast and cheap, driven by competition
Global cleantech market	Open, competitive
Variation in risk	
Climate Risk*	High decrease
Transition Risk	High increase
Geopolitical Risk	High decrease
Likelihood	Unlikely

* Beyond scenario time horizon

4. Scenarios for geopolitical risk in the global climate transition

Scenario 2 – Chaotic/fragmented transition: "Climate Anarchy"

In this scenario, while many promise to 'build back better', states build back as fast as possible – doing whatever it takes to revive growth, including financing high-emitting infrastructure projects and subsidising carbon intensive industries. Change is slow and uneven, actors move on their own or through ad hoc opportunistic coalitions, and mitigation efforts are too narrow and too slow to meet climate targets. Responses are characterised by improvisation and compromise, prioritising short-term gains over long-due structural changes.

The primary drivers behind this scenario are states' self-interest and mistrust, both reinforced by the recent failure in finding a truly multilateral solution to the global health crisis and, most importantly, by the lack of a solid leadership behind global efforts in climate change mitigation. Compared to the Green Globalisation scenario, Climate Anarchy is closer to a 'business-as-usual' scenario; how the transition could look if global cooperation fails to materialise.

Actors

Most political leaders around the world do acknowledge the importance of fighting climate change, yet it proves impossible to reach a global consensus on how this should be done. Climate diplomacy falls short as national energy security goals and short-term political interests outweigh climate concerns and the Paris Agreement breaks apart in the absence of incentives and penalties forcing countries into doing their part. In this context, investment in renewable energy projects make slow progress, mostly driven by states' interest in increasing their energy self-sufficiency and reducing import dependence, while governments keep investing in existing energy reserves through renewed state subsidy for home-grown oil and gas companies and shielding carbon-intensive domestic industries through protectionist policies.

Market

Although investment in green technologies build up over time, with national governments going their own way on climate change, increasingly fragmented global markets prevent the scaling up of low-carbon technologies that would be needed to drive down costs, prompt innovation, and boost sustainable growth.

Green expenditure remains almost entirely concentrated in advanced economies, as wealthy countries either fail or refuse to meet their long-standing commitment to help poorer states in the transition, and the clean energy investment gap between developed and developing markets widens. This deprives the Global South of a concrete sustainable growth perspective, thus cementing inequality within and between countries and weakening resilience to climate change. International efforts to mitigate global warming are significantly hindered as developing countries – which had stressed how funding was key to their ability and willingness to commit to ambitious climate targets – continue to rely heavily on hydrocarbon to fuel growth. The resulting supply crises, water shortages, extreme weather conditions, and migratory pressure only exacerbate populist trends in a vicious circle.

4. Scenarios for geopolitical risk in the global climate transition

Structure

Countries increasingly rely on their own electricity grids for the sake of energy independence, avoiding reliance on neighbouring states and prioritising security over the benefits provided by a more interconnected grid in lack of sufficient political will, solidarity, and mutual trust. Multilateral governance enters a new crisis as energy markets become more heterogenous and fragmented. Sub-regional energy blocs emerge relying on ad-hoc coalitions focused on specific energy sources, carriers, and technologies. However, this scattered governance of energy on a regional level does not provide a steppingstone to more integrated regional governance – let alone a global one – which would result in competitive and well-functioning new markets. Instead, competitive regional governance intensifies rivalry and fragmentation, with single states increasingly controlling key technologies and value chains.

Hydrocarbon exporting countries have more time to diversify their economies away from a dependency on fossil fuel revenues. A handful of states enjoy a sufficient institutional stability and financial/technological resources to successfully leverage solid oil prices and demand to boost green investment and maintain their energy leadership. Most countries continue to export oil.

Overall

In the absence of multilateral coordination, attempts to introduce tighter regulation to ensure sustainable and fair supply chains and avoid an excessive number of bottlenecks along the value chain fall short, leaving states vulnerable to a series of supply risks including disruptions, conflict, export restrictions, labour unrest, transportation delays, and many others. Prices for key transition minerals are highly volatile.

Impact and variations in risk

As the bidding war for green credentials wears off in the aftermath of COP26 – with climate issues no longer dominating the media – and it finally comes to complying with targets through policy action, governments radically resize their commitment to climate change prioritising short-term self-interest. Global action against climate change thus becomes a chaotic collection of disharmonious, inward-looking, and sometimes conflicting policy measures taken at the national level, which results in only a modest increase in transition risks – as climate policies are not as ambitious as in other scenarios – but a significant increase in geopolitical risks – spanning from protectionism and regulatory uncertainty to widespread instability and social unrest.

The low-carbon transition eventually takes place in this scenario, whether states cooperate or not. The late response from national leaders only delays the inevitable, with governments rushing through regulations later on and leaving businesses and investors little time to adapt. Transition risks eventually rise in the long term, as delayed and disorderly climate policies come into effect, while the poorly managed transition on the international level increases geopolitical risks already in the short term.

4. Scenarios for geopolitical risk in the global climate transition

Geopolitical risk

Protectionism: States' self-interest leads to phenomena such as resource nationalism, whereby countries focus on creating and protecting domestic cleantech supply chains to build resilience or to use raw materials as a bargaining chip to renegotiate other geopolitical objectives, and green protectionism, for which environmental aims are used to enact damaging policies that curtail foreign investment by taxing imports. Both restrict access to key metals for clean technologies, pushing prices up while dramatically slowing down the transition process. Heavier trade policies, such as carbon tariffs, are neither harmonised nor consistent across jurisdictions thus, instead of contributing towards emissions reduction, only end up affecting trade.

Supply chain risk: Quotas, tariffs, and other trade restrictions on strategic minerals are used by source countries as political assets, not unlike from fossil fuels, while competition between green tech manufacturers from advanced markets makes it hard to enter long-term contracts with suppliers, preventing effective monitoring and regulation of supply chains. Moreover, excessive market concentration resting on globally stretched, yet unregulated supply chains represents a serious supply risk for companies that produce solar panels, wind turbines, and batteries using imported minerals. Trade restrictions, regulatory changes, or any number of bottlenecks that might arise among suppliers, such as shortages of power, equipment, or skilled workforce, labour unrest, and delays could very easily raise costs and exacerbate tightness of supplies.

Political violence: International divisions over the net zero transition impact national domestic politics, and climate change becomes a polarizing political issue once more. Political support for introducing new or expanding existing green tax policies varies across and within countries, causing a greater risk of protests from both those who want less and those who want more government action against climate change. While a rejection of climate science is no longer a mainstream position, populist parties make climate change a divisive issue across party lines, pushing the idea of climate policies – especially those adopted at the international level – as unfair for common citizens. On the other hand, climate activism also becomes more aggressive against what is substantially perceived as government inaction. Risk of social unrest increases on both sides of the ideological spectrum, possibly leading to a surge in both eco-fascism and eco-terrorism.

Humanitarian crises: In the absence of a multilateral strategy – which would provide effective assistance to emerging economies that are most exposed to the effects of climate change in the form of limited access to clean water, food scarcity, agricultural degradation, and violent conflict – climate change intensifies underlying issues acting as a significant push factor in humanitarian crises and migration patterns.

Resource-driven conflict: Wars for the control, transportation, regulation of hydrocarbon resources remain a lingering threat in oil-rich regions on the back of a plateauing, yet solid, demand for oil and gas. At the same time, advanced economies applying unilateral carbon pricing put severe financial pressure on the most fragile, least competitive oil-producer economies, some of which may experience domestic political turmoil as a result.

Other macroeconomic effects: The uncoordinated low-carbon transition at the global level leads to changes in inflation, trade balances, and exchange rates, which in turn generate dynamics to re-assess existing international economic agreements. These impacts are, as of now, still difficult to adequately quantify.

4. Scenarios for geopolitical risk in the global climate transition

Regulatory and compliance risk: Diverse growth models for green technologies between countries and limited global cooperation inevitably lead to an increasingly heterogeneous regulatory landscape. The resulting patchwork of inconsistent environmental policies complicates regulatory compliance creating accidental barriers for businesses and discouraging investment as it drives operating costs up and ultimately hurts business margins. Regulatory uncertainty and complexity also impede the ability of the financial sector to mobilize effectively to provide the necessary investment and insurance underwriting for the transition.

Transition risk

Market risk: Contrary to the coordinated transition scenario, green companies are not sufficiently supported throughout the transition. Markets do not grow fast enough to sustain technological advancements whereas a large local market would be needed to realise the necessary economy of scale and vertical integration opportunities to remain competitive. Overall, the chaotic transition creates mismatches between investment in renewables and divestment in fossil fuels.

Change in assets value: As pandemic relief programmes of most countries double down on fossil fuels, a rise in asset stranding once carbon restrictions will inevitably tighten emerges as a key risk over time, creating uncertainty for sovereign credit and governments' ability to raise finance for climate mitigation and adaptation measures.

Likelihood

This is perhaps the least likely among the proposed scenarios. The spread of COVID-19 and the failure in providing a truly global solution to the health crisis showed the fragility of international cooperation in facing common challenges, making countries ever more reluctant to rely on one another in the face of an existential crisis. In this sense, the pandemic experience will likely influence future developments in the global efforts to mitigate climate change. Nonetheless, a nearly total break-up of international cooperation regarding climate change – as assumed in this scenario – is far from being the likely outcome for the next decade.

Climate has now become a mainstay across countries as well as political parties – and both public opinions and political leaders in most countries understand meaningful results on such front cannot be attained unilaterally. While underlying, fundamental divisions between states are likely to persist in the foreseeable future and self-interest will hardly be replaced by solidarity as the basic motives behind states' action, **governments' climate change mitigation efforts will continue to be coordinated through some form of international cooperation for the years to come.**

4. Scenarios for geopolitical risk in the global climate transition

Scenario summary – Climate Anarchy	
Actors	
Behavioural assumptions	Short-term self-interest
Geopolitical architecture	Unilateralism, anarchy
Assistance to developing nations	Minimal, exploitative
Structure	
Trade system	Protectionism/Mercantilism
Regulatory landscape	Fragmented and contradictory
Carbon pricing	Unilateral taxes in flexible global pricing regime
Supply chains	Unregulated, fragile, globally stretched
Power grid connectivity	Independent national/sub-regional grids
Market	
Fossil fuels demand	Stagnant, but solid
Commodity prices	Stable fossil fuel prices, volatile prices for transition metals
Cleantech development	Slow, priority given to short-term gains
Global cleantech market	Underdeveloped
Variation in risk	
Climate Risk*	High increase
Transition Risk	Modest increase
Geopolitical Risk	High increase
Likelihood	Very unlikely

* Beyond scenario time horizon

4. Scenarios for geopolitical risk in the global climate transition

Scenario 3 – Confrontational transition: "Green Cold War"

In this scenario, also driven by an interest-centric approach to geopolitics, major powers compete in the development, production, and deployment of critical technologies for the low-carbon transition of the global economy. The competition goes beyond leadership in technology manufacturing and trade, and quickly extends to geopolitics. Major powers fail to compartmentalise climate cooperation, as political leaders refuse to separate an otherwise mutually beneficial collaboration to slow global warming from confrontational relations on other fronts. The energy transition becomes yet another arena for great power competition and the world fractures into regional blocs, with countries gravitating around technology leaders and regional alliances forming around their respective integrated energy systems. Within these blocs, access to critical raw materials such as rare-earth metals, cobalt, and lithium as well as clean energy technologies such as batteries, photovoltaics, wind turbines, and electric vehicles is facilitated through integrated supply chains and free-trade agreements. Access to these same goods is restricted for countries outside of the bloc.

Actors

The openly confrontational energy transition sees major powers seeking to reduce their reliance on fossil fuels without excessively disadvantaging their own economies. In this scenario, the main goal of these actors is to assert renewable energy dominance and gain a leadership position in a post-carbon global economy. Therefore, leading powers do not abandon the sentiments and ambitions of the UNFCCC process. Rather, they strive to take the leadership within multilateral fora and build a coalition of like-minded partners as a way to establishing the critical mass needed to pressure the other bloc while building around them a large enough market to sustain innovation, economies of scale, infrastructure development, and eventually obtain technological self-sufficiency. To compete against the rival bloc, the more industrialised side makes use of countries' domestic carbon taxes benchmarked to negotiated regional standards and border adjustment mechanisms for imported goods. On the other side – where manufacturing is cheaper, but significantly more carbon intensive and carbon tariffs deal a heavy blow to industrial players and exporters – countries respond with export restrictions on critical raw materials and cheap components for green technology.

Market

While decoupling from each other, the two blocs work to achieve a coupling market within their sphere of influence integrating electricity and carbon trading and to realise large-scale optimal allocation of renewable resources improving mutual energy support across and between regions. Improved grid connectivity infrastructure becomes the basic way to tie countries together in a post-carbon world, all the while reducing emissions and mitigation costs. Through the financing of super-grid projects and the dispatching of electricity over wide areas, leading powers in both blocs remap the energy landscape around them and reshape alliances within regions having centres and peripheries according to specific political arrangements, all resting on the commitment to provide for the energy security of the newly created energy communities.

With the quest for energy and technological dominance taking on a strategic dimension, major powers try to gain control of cleantech manufacturing and of the necessary critical mineral by ousting strategic rivals from their supply chains or simply creating new ones. The global cleantech 'arms race' thus sees states vying for dominance in global solar modules and wind turbine manufacturing capacity, electric vehicles production and of the lithium-ion battery supply chain. Above all, access to lithium-ion battery cell manufacturing facilities and the mineral supply chains to support them becomes a key element of modern industrial power, and investment to control intellectual property along this value chain acquires strategic priority. Systemic supply uncertainty for both blocs and ensuing price pressures encourage innovation and disruptive new technologies such as next generation electrofuels, polymeric energy storage, and cobalt free batteries.

4. Scenarios for geopolitical risk in the global climate transition

Structure

Winners and losers of this scenario are determined by the development of and access to green supply chains, which are partly predetermined by geology but also by the ability to harness intellectual and financial capital. This means that low-income countries are set to be left behind in the transition process. However, differently from the "chaotic transition scenario" – where states are entirely driven by self-interest and self-preservation – in a confrontational transition scenario actors value alliances and long-term strategic advantage above short-term gains. With winners having a clear stake in the overall success of the process, rival blocs will compete to get on board as many countries as possible among the losers – although, to a lesser extent than compared to the "coordinated transition scenario". This translates to a balancing of climate priorities that considers fairness and development needs. When measures such as carbon pricing, border adjustments or waivers for countries with ongoing hydrocarbon dependencies persist, green investment in emerging markets is not successful without proper global coordination.

Among the winners of this scenario are large oil and gas exporting countries, even if demand for fossil fuels gradually declines over time, as states reduce but do not abandon reliance on hydrocarbon – especially as prices decrease due to weaker demand. Low-cost, low-carbon producers maintain their profitability in a low-price environment and even grow their market share in a shrinking market driving out higher cost producers. With no multilateral support scheme for vulnerable oil and gas exporters, low-income petrostates get destabilised as the resulting austerity leads to a fracture in rentier states' legitimacy.

Overall

In such a cold war-like scenario, soft power competition also features alongside economic competition as one of the dimensions of the broader geopolitical confrontation. Which system can transition faster and better into a more competitive post-carbon economy is the ultimate goal. Here, similarly to the "chaotic transition scenario" the trigger for change lies in self-interest – just the stakes are much higher.

Economic partition and decoupling between blocs as they rival over access to critical materials needed to develop low carbon tech and the associated refining and manufacturing industries disrupts international trade and global supply chains. Yet, their competition over technological, political, and business leadership on climate also proves a powerful spur for green investment domestically and within their blocs, inspiring a "race to the top" that ultimately encourages bold climate action. This is neither the worst, nor the best scenario – change is fast, but uneven.

Impact and variations in risk

The progressive decoupling between the world's leading economic and technological powers and their respective geopolitical systems inevitably obstructs the spread of green innovations, significantly slowing down the decarbonisation process of the global economy. Yet, although less than in a globally coordinated transition scenario, change is fast and transition risks increase significantly. Moreover, as major powers remain part of the same multilateral fora but with conflicting agendas, such change is erratic – and winners and losers are determined more by political factors than market forces. In terms of geopolitical risks, a "Green Cold War" scenario finds itself in between the coordinated and the chaotic transition scenarios: while certainly riskier than a peaceful cooperation between nations, Cold War – as history shows – is the realm of predictability, which lowers risks and simplifies decision-making.

4. Scenarios for geopolitical risk in the global climate transition

Geopolitical risk

Trade war: Alongside decoupling for most materials and components, green tech producers will continue to face supply chain cost increases and disruptions for goods they are not able to secure from domestic or allied suppliers and that need to be sourced from the rival bloc. Trade and investment barriers mean that companies that continue to export inputs or products between the two blocs are subject to extraordinary tariffs. Firms seeking to invest in the rival bloc's green tech sector are likely to face greater regulatory scrutiny when they do not have their transactions simply rejected altogether.

Sanctions: Further complicating the situation are sanctions on specific green energy and tech companies from each market, which directly affect access to capital and valuations. With leading powers imposing financial sanctions on access to their capital markets, firms may have to raise capital in domestic financial markets, with systemic effects reverberating in the overall valuation of companies.

Destabilisation of petrostates: Like in the coordinated transition scenario, falling oil demand coupled with cheaper green energy slashes oil and gas prices. In both scenarios, the cartel of oil producers breaks up and low-cost, large-reserve, lower-carbon fossil fuel exporters increase their margins by maintaining and growing their market share in a shrinking market at a price level that drives out higher cost producers. Differently from the green globalisation scenario, however, a much weaker safety net is offered to high-cost, politically unstable oil producers in the absence of a multilaterally orchestrated assistance package to financially support them throughout the transition. Social unrest, regime change, and political violence may ensue.

Humanitarian crises: As lower-for-longer oil prices cut into hydrocarbon producers' social spending, rents-based political stability in fragile political systems falters leading to a break-up of traditional petrostate social contracts and ultimately to civil conflict, which could also escalate into wider regional crises.

Resource-driven conflict: The growing importance of transition minerals gives rise to new strategic rivalries and geopolitical vulnerabilities as competition over new resources intensifies. As critical raw materials for renewable technologies such as copper, graphite, lithium, and cobalt are often concentrated in countries lacking effective governance, new countries may be condemned to the 'resource curse' driving widespread political instability as rival parties seek access to resource rents, echoing today's petroleum-based conflicts.

4. Scenarios for geopolitical risk in the global climate transition

Transition risks

Market risk: As both blocs develop and produce clean energy within a highly integrated global market and with many of the advanced low-carbon technologies they produce consisting in large part of components that are cheaper to import than to purchase domestically, their progressive decoupling ends up hurting their own industries. In the chaotic transition scenario, complex supply chains that go into producing these technologies remain globally stretched, which makes them vulnerable to disruption but also keeps costs down. Here supply chains of key raw materials and components for green technologies are decoupled along geopolitical divides and only extend to allied nations outside of domestic borders. Green technology manufacturers may thus end up paying more for some of their parts and will be required to build up and maintain stockpiles of key minerals, which will drive operating costs up and hurt their margins.

Technological risk: Greentech competition may complicate long-term planning and investment. The efforts of leading technological powers to establish and impose competing product design and environmental standards around the world, risk making cross-border trade more difficult and long-term investment much riskier for green tech companies. Companies may face higher costs if they operate in both spheres, but also risk losing access to some very lucrative markets if they fail to adopt both sets of standards.

Carbon tariffs: Leading economic powers – which are at the same time the highest carbon emitters – release border tax proposals as part of their green initiatives with the primary goal of preventing carbon leakage. As emissions pricing systems and related border adjustment mechanisms differ between major markets due to the lack of a shared global emissions trading system, differently designed and openly confrontational carbon tariffs lead to severe disruptions in international trade while achieving little in terms of emissions reduction.

Likelihood

Despite the more cooperative ambitions displayed at COP 26, the world's major powers are already on course for unconstrained geostrategic competition. Given how an "unconstrained geostrategic competition" – by definition – negates the possibility of compartmentalising even those issues against which competing powers would have a mutual interest in joining efforts, there is no reason to believe that climate change will not end up caught in great power politics. Today's geopolitics are not driven by Cold War ideology, yet contemporary great powers' pursuit of strategic stability is indeed characterised by traditional Cold War dynamics, whereby everything is captured within the broader confrontation between rival powers. Issues concerning the supply chains for the upcoming post-carbon global economy have long been framed as a matter of national security on all sides and a partial decoupling between the world's major economies is already underway. Climate change is set to become the ultimate test of whether competition for political and economic dominance and cooperation for the pursuit of collective interest can coexist in the face of a common challenge. Nevertheless, **a "Green Cold War" scenario must be considered a concrete possibility.**

4. Scenarios for geopolitical risk in the global climate transition

Scenario summary – Green Cold War	
Actors	
Behavioural assumptions	Polarized confrontation
Geopolitical architecture	Bipolarity/Tripolarity
Assistance to developing nations	Inadequate and strategically motivated
Structure	
Trade system	Regional free trade agreements with external barriers
Regulatory landscape	Unified within blocs, conflictual between blocs
Carbon pricing	Regional border adjustments mechanisms
Supply chains	Decoupled, intercontinental, intra-bloc supply chains
Power grid connectivity	Interconnected grids in regional systems
Market	
Fossil fuels demand	Gradual steady decline
Commodity prices	Low fossil fuel prices, very high prices for transition metals
Cleantech development	Fast but expensive, driven by politics
Global cleantech market	Decoupled, redundant
Variation in risk	
Climate Risk*	Modest decrease
Transition Risk	Modest increase
Geopolitical Risk	Modest increase
Likelihood	Likely

* Beyond scenario time horizon

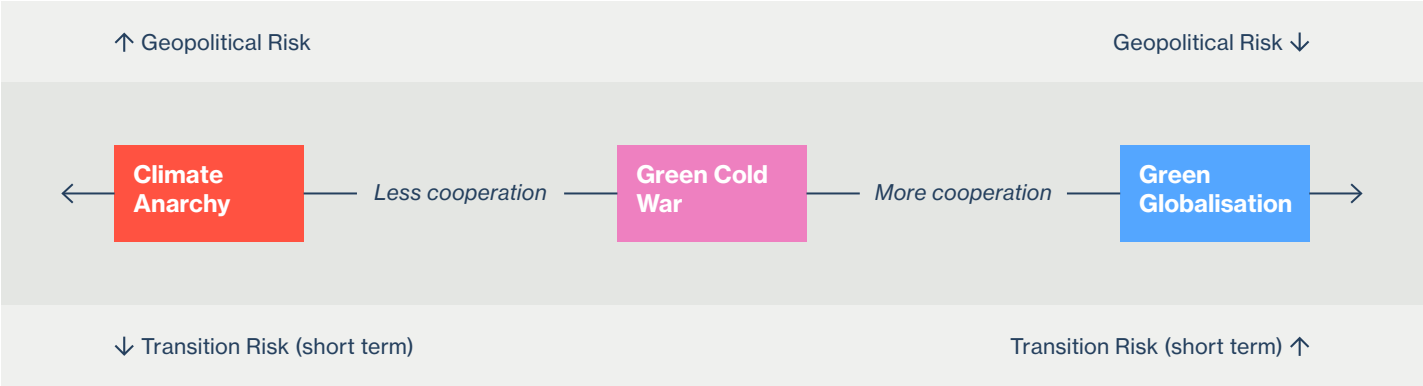
5. Conclusion

5. Conclusion

Building on the conclusions of the *Shifting Powers* research, as summarised in the introduction, this report reinforces the need to seek innovative solutions to mitigating geopolitical risks around climate challenge.

These should be carefully tailored depending on the transition scenario deemed most likely by the risk manager involved. This report thus aims to serve as a tool for business and insurance to develop strategies against several possible competing futures and to develop products covering the broader range of associated threats.

The three scenarios described in this report aim to provide a representation of what the world may look like at the end of the decade, depending on the pathways major powers take in pursuing net zero by 2050. They are summarised in [Fig X / the below graphic].



In a **Green Cold War** – the scenario most likely to resemble the real-world global transition – sustainability transformations are significant, though slow and unevenly applied as competition between leading economic, political, and technological powers spurs investment and innovation. The cost of this, however, is a considerable increase in current geopolitical and transition risks, as competition drives change while considerably raising the geopolitical stakes.

Climate anarchy – possibly the least likely scenario – would see a slow and uneven transition that creates greater volatility in the risk landscape. In the short term, transition risks would stay low as the climate efforts of this scenario are not nearly as ambitious as in the other hypothetical circumstances described, but delays to transition policy roll-outs mean that an increased risk environment will emerge in the medium to long term. Throughout this development, geopolitical risks would remain high with a likelihood of rapid escalation.

Finally, **Green Globalisation** – assessed as the most environmentally desirable, but not the most likely outcome if state self-interest continues to dominate climate negotiations – entails a fast and just transition which places emphasis on transition risks, at least in the short term due to the quick scale-up of increasingly stringent climate policies, while geopolitical risks remain low as geopolitical frictions are reduced to a minimum.

Geopolitical climate risk scenarios: **Green Globalisation** (Cooperation) **Climate Anarchy** (Chaos) **Green Cold War** (Competition)

5. Conclusion

The **likelihood** assessments proposed under each scenario help estimating the odds, but the reality will fall somewhere on the continuum stretching between the two extreme scenarios – most likely featuring a blend of more than one scenario's characteristics. The benefit of this report is therefore in aiding insurers and risk managers in their assessment of which scenario is closest to the feasible outcome, while providing useful guidance on all geopolitical eventualities.

An understanding of these three scenarios, outlining an extreme and simplified version of plausible events across the spectrum of cooperation, should underpin attempts by individuals and organisations to assess geopolitical risks around climate change and develop products and solutions to mitigate those impacts.

As outlined in Chapter 3 ('The role of the insurer'), the insurance industry has a key role to play. Not only in helping multinationals manage their increased exposure to political risk through the largest energy transition in history, but also in providing suitably available capital to underpin confidence in transition projects and ease construction woes which could strain geopolitical relations and interdependencies. The implications for insurers are therefore magnified: they must respond to the physical and transition risks surrounding climate change, the scale of which will be determined by the level of political cooperation or competition; while also considering how their actions in themselves can influence those geopolitical movements and the severity of climate change.

The role of geopolitics in the race to net zero can therefore not be ignored; and the intersection between the two forms of risk should not be overlooked by those seeking to effectively prepare for their political, environmental and economic impacts. Those risk owners and purchasers able to prepare for all or some eventualities – while recognising a non-linear, human behaviour-centric approach to climate change – will set themselves up for sustained success as the world transitions to a low carbon consensus.

6. About the authors

6. About the authors

Andrew Coburn is Chief Scientist at the Cambridge Centre for Risk Studies. Andrew is one of the leading contributors to the creation of the class of catastrophe models that over the past 20 years has come to be an accepted part both of business management in financial services and of public policy making for societal risk. He has extensive experience in developing models and using them for business decision support. Andrew has also provided research inputs into government policy, such as House of Congress legislation on terrorism risk management policy and urban planning for disaster mitigation in Mexico, Metro Manila, and Southern Italy.

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7. References

Bazilian, M., Bradshaw, M., Gabriel, J., Goldthau, A., & Westphal, K. (2020). Four scenarios of the energy transition: Drivers, consequences, and implications for geopolitics. *WIREs Climate Change,* **11**(2), e625.

International Renewable Energy Agency. (2019). A new world. The geopolitics of the energy transformation. Masdar City: IRENA.

Hafner, M., & Tagliapietra, S. (2020). The geopolitics of the global energy transition (p. 381). Springer Nature.

'Green Grids Initiative-One Sun One World One Grid Northwest Europe Cooperative Event'. Accessed 30 October 2021. https://pib.gov.in/pib.gov.in/Pressreleaseshare.aspx?PRID=1763712.

Carbon Tracker Initiative. 'Mind The Gap: The $1.6 Trillion Energy Transition Risk'. Accessed 1 November 2021. https://carbontracker.org/reports/mind-the-gap/.

Reuters. 'Bechtel, Hatch among Firms to Work on Australia-Asia PowerLink'. *Reuters,* 20 October 2021, sec. Asia Pacific. https://www.reuters.com/world/asia-pacific/bechtel-hatch-among-firms-work-australia-asia-powerlink-2021-10-20/.

Development Asia. 'The Critical Role of Insurance in the Transition to Clean Energy', 15 June 2021. https://development.asia/insight/critical-role-insurance-transition-clean-energy.

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About Cambridge Centre for Risk Studies

The Centre for Risk Studies is a research group at the University of Cambridge's Judge Business School. The Centre provides frameworks for recognising, assessing and managing the impacts of systemic threats. The research programme is concerned with catastrophes and how their impacts ripple across an increasingly connected world with consequent effects on the international economy, financial markets, firms in the financial sectors and global corporations. To test our research outputs and guide our research agenda, the Centre engages with the business community, government policy makers, regulators and industry bodies.

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