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Overlooked Political Risks for 2022: The Politicization of "Everything"

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Pressing or emerging political and geopolitical risks that have flown under the radar

Written by Samuel Jardine (Head of Research), Billy Buddell and Connor Bryant (Research Directors), Manon Leprince (Senior Analyst), Ivory Chang, Sahil Sagar, Vikram Sairam, Issy Ronald, Matt Elliot, Lucy Bather, Keita Vasiljeva, Frank Stengs, Arshdip Singh, and Olivia Minor (Research Analysts)

Edited by Samuel Jardine, Billy Buddell, Connor Bryant, Manon Leprince, and Frederico Fróes (Research Analyst)

Executive Summary

By Samuel Jardine

As 2022 begins, the three "C's" of Covid (and its impact), climate change, and China's rise continue to dominate the theme of many flagship political and global risk reports. However, beyond these indeed important factors, there are a series of overlooked risks that have flown largely under the radar, or- given their potential global impact, not received due attention. These can be risks related to the aforementioned three C's but have been overshadowed by other aspects of them, or those that are completely unrelated.

This report seeks to comprehensively unearth and detail three of these "overlooked" risks:

1. **Competing Perspectives of Climate Mitigation**- Climate change and its impact ranks highly in current political and social rhetoric and action, but behind this- competing conceptions of what climate mitigation should look like risk destabilizing domestic political stability in key states, aided by the increasing use of climate mitigation for geopolitical purposes. If this trend is not brought to light and tackled soon it threatens to unravel humanities collective approach to meet the Paris Agreement targets- an already fraught task.

2. **The Politicization of Critical Resources**- The building blocks of modern society- critical minerals, and the source of human life- water, are just two of the many commodities that are increasingly becoming subject to politicization- becoming tools for international competition. This trend is a fundamental, but overlooked, risk emerging in the 2020s. If not addressed it could spark increasing political instability, negatively impact living standards for a plethora of states and blocs and compromise the pursuit of net-zero and Paris Agreement targets.

3. **The Growth of a State-Sponsored-Crime Complex-** As states turn-back to the "grey zone" of competition in a multipolar world, the lines between civilian and military/security spheres blur, as does the ability to attribute actions. More than this though, certain states have greater opportunity and/or the necessity to engage in criminal activity to sustain or provide themselves with a hoped-for competitive advantage. This will have a global impact on policing, stability, and crime as we expect an upturn of state-sponsored crime into the 2020s, particularly in both illegal opioid distribution and cyber-attacks.

These three risks share a common thread, that being the increasing politicization of "everything". Specifically in these cases the politicization of things that are a significant factor in polity, and indeed human, survival, livelihoods, living standards, and stability. A multipolar world where large powers are increasingly competitive and smaller ones seek to "diversify" their dependence are the perfect conditions to create increasing state-created artificial barriers such as these that are tools of competition, but which threaten to cause increased disruption for states, markets, businesses, and citizens.

Risk 1) Contested Perspectives of Climate Mitigation

Climate change has ranked highly on most institutions, governments, and people's agendas in terms of its impact and the risks it presents for human, geographic, environmental, and economic security. Even formally reticent states like Russia and the US, have made new commitments over the last year, at least in their rhetoric to better tackle this risk. This has been informed in the context of an increasing urgency as it has become clear that most states are not on track to meet the Paris Agreement targets of limiting global warming to a 1.5C or at worst 2C rise. This has seen calls for more radical or accelerated action emerge from many quarters.

However, a risk that has been overlooked, particularly in the context of more radical climate action demands is the increasing policy, political, and social tensions emerging from proposed, expanded, or currently implemented climate mitigation measures. How to balance climate justice has been far lower down the agenda when mitigation has been discussed; For instance, the renewable energy revolution which many developed states are relying on to aid their mitigation policies, requires an increase in the polluting and environmentally damaging extraction of critical minerals, mostly in developing states. Likewise, climate mitigation policy has the risk of becoming politicized in domestic policy- where for example, public support for such measures could be broad, but not deep if they result in an impact on traditionally enjoyed living standards. In foreign policy too climate mitigation approaches can and have been utilized as the justification, or indeed fig-leaf, for actions which also have significant geopolitical, and state-competition aims.

If the risks that these contested perspectives of climate mitigation and their politicization remain low on the agenda and ignored as merely a troublesome tertiary problem to the main goal of tackling climate change, the socio-political consequences could be significant; impacting the stability of states across the world, alongside that of the international order. This would see main efforts to mitigate climate change derailed significantly.

Climate Justice: A Growing Need to Balance Climate Mitigations Impact

By Manon Leprince, Ivory Chang, and Sahil Sagar

What is the risk?

As the global community grapples with increasingly damaging climate disasters, climate mitigation has become one of the top agendas in the fight against climate change. Given the energy supply sector being the largest contributor to greenhouse gas emissions, it is manifest that a fundamental transformation of the energy system from coal, oil, and gas to clean power is essential and at the core of actions to mitigate climate risks.

Green technologies in place to facilitate this shift toward a low-carbon energy system, including wind turbines, solar panels and energy storage batteries, are developing at an unprecedented rate. Without technological advances, metal substitution or recycling, the progress in clean power technologies entail significant raw material inputs that largely come from the mining sector, and are expected to drive the demand for key minerals such as gold, copper, lithium, and nickel in the coming decades.

This places the mining sector and resource-based countries with significant mineral reserves at a strategic position in the transition to a green economy. According to studies, a substantial percentage of these minerals are located in regions historically fragile and corrupt, making them more vulnerable to mining-induced conflict. As green technologies advance, the energy supply chain is projected to become more reliant on these resource-based economies, despite their current fragility surrounding mining activities.

As such, the green transition presents a double-edged sword that the service economies benefit from the fruits of advanced low-carbon technologies, while resource-based economies disproportionately suffer from the environmental and socioeconomic consequences of excessive mining. Notably, upstream countries in the green energy supply chain that are home to substantial mineral reserves are most likely to be profoundly stricken with localised impacts including conflicts, violence, forced labour and displacement, human rights abuse, and environmental damages such as losses of natural habitats and biodiversity due to heavy mining activities. This poses a grave risk of conflict minerals and climate injustice to the global society in the shift to a low-carbon economy.

Viewing the transformation of the energy system as a task for the global community, it is worth noting that, without responsible mineral sourcing, progress made in the climate-related Sustainable Development Goals (SDGs) will contradict or even jeopardise the improvements on other SDGs. That is, while innovative low-carbon energy technologies symbolise advancement in SDGs 7 (affordable and clean energy) and 13 (climate action), negligence of responsible supply chain conducts accompanying development may be detrimental to SDGs 8 (decent work and economic growth) and 16 (peace, justice and strong institutions).

The Potential Impacts: Global and Localised

Under mismanagement and weak governance, the development of green technologies may indirectly contribute to a series of socioeconomic and environmental repercussions by putting additional strain on the soaring demand for raw materials.

In 2021, South America became the region in the world with the highest level of human rights violations related to cobalt, copper, lithium, manganese, nickel or zinc mining. Africa came second, followed by Asia and the Pacific. The water-intensive nature of mining for lithium, mainly found in Argentina, Bolivia, and Chile, poses a threat to water rights in South America. The significant amount of water needed to extract lithium (about 500,000 gallons per tonne) is leading to water shortages and is having an impact on farming as local farmers struggle to grow crops and maintain livestock. Copper and/or cobalt operations in Africa are often tied to allegations of corruption and human rights abuse, including forced relocations and attacks on civil society organisations.

Looking at more localised impacts, the extraction of nickel in Guatemala has been linked to murder, sexual violence, and forced displacement, mostly at the expense of the Maya community. Indigenous communities in Guatemala are the most affected by the destruction of surface land resources as they represent their primary source of livelihood. It results in increasing land ownership disputes between the government, private companies, and local communities.

In the Democratic Republic of the Congo, a country supplying more than 60 per cent of the world's cobalt, the mineral has been dubbed the "blood diamond" of the decade due to the violence that accompanies it. Similarly to tin, tungsten, tantalum, and gold mining, cobalt mining has been connected to child labour, hazardous working conditions, extortion, and human rights violations. The extraction of bauxite on Rennell Island, in the Solomon Islands, was the cause of spills of oil and bauxite in 2019 in Kangava Bay. It contaminated freshwater resources and fishing grounds and caused the direct loss of 10,000 square metres of reef and 4,000 square metres of lagoon habitat as well as economic losses up to US$35 million. The site is expected to take up to 130 years to recover from these environmental disasters. The Philippines, a developing country that has performed well in moving forward with SDG 13, has, to the dismay of many climate change activists, lifted a four-year-old ban on open-pit mining of copper, gold, silver, and complex ores to encourage investments and stimulate the economy. The president also overturned a ban on new mining deals imposed by his predecessor. The government plans to increase its revenue by up to US$2 billion in the next 5-6 years as new projects start operating. The country is the world's largest producer of nickel and is also rich in minerals like copper, but it is estimated that 95 per cent of its mineral resources remain untapped. Provided that appropriate steps and regulations are not followed in the quest for profit, this will lead to long-term ecological and health complications, reiterating the importance of a consensus on the trade-off between environmental protection and economic development needs for resource-based economies.

Aside from the localised socioeconomic impacts, intensified mining activities induced by the green transition may have global environmental consequences that in turn offset the efforts toward decarbonisation. It was estimated that nearly 10 per cent of deforestation in the Brazilian Amazon between 2005 and 2015, an area of roughly 4,500 square miles, was

attributed to mining activities. With a gold rush followed by spikes in international gold prices, deforestation rates of the Brazilian Amazon have soared to the highest level since 2006 in 2021, despite the country's pledge to end deforestation by 2030. Uprooting the tropical rainforest has two-folded, global climate effects as it is not only a vital carbon sink that stores carbon dioxide but the lungs of Earth that absorb greenhouse gases from the atmosphere. In 2018, tree cover loss in tropical forests accounted for some 8 per cent of global emissions, and the same forests were estimated to provide 23 per cent of the climate mitigation needed by 2030 to limit global warming to 2°C. This should ring the alarm to the global society that unheeded pursuit of low-carbon transition could bear irreversible damages that the intended innovations could not remedy for.

Conclusion: Opening a Discussion for All Parties Involved

From its localised impacts to global effects, climate injustice emerges as a by-product of the adoption of green energy technologies due to institutional failure, lack of responsible sourcing, and imbalance between demand and supply of raw materials along the green energy supply chain. To minimise negative spill over effects and ensure a just green transition, open dialogue, and mutual concession among all stakeholders along the green energy supply chain are paramount. Specifically, while it appears that more states are joining the pledge to fight climate change, many still face domestic pressure of divergent discourses and have succumbed to the trade-off for economic development over environmental protection.

While effective regulatory enforcements, supply chain due diligence, and material substitution are all obvious mitigation pathways toward a more responsible and resilient green energy supply chain, no action would be made possible until active engagement and mutual concession are reached. Thus, an important first step toward a just green transition will be for the downstream service economies and upstream resource-based economies to join forces in the combat against climate change. After all, it is an imminent risk faced by humanity, and the global community is in this together.

Case Issue Spotlight: Climate Reparations

By Vikram Sairam

An interesting theory of International Relations is the demarcation of the global north and global south. While this was a theory that predominantly arose from the cold war with terminologies such as “First world countries” and “Second World Countries”, that proved to be inaccurate, hence the demarcation of countries as global north and south.
The Global North predominantly consists of countries which are more industrialised and developed in terms of their economy, in terms of access to basic necessities. The Global South consists of countries which are much more impoverished and poorer with a lack of access to the basic necessities.

This theory has been at the cornerstone of this debate regarding climate change. An interesting item to emerge from the COP 21 summit that happened in November. The European Union and The United States continued to reject proposals from developing countries in terms of mitigating consequences of climate change. These proposals emanating from the bloc of developing countries including China vary from a dedicated climate fund to debt cancellation from the Global North.

These climate mitigating proposals or as it is referred to in the Paris agreement as ‘climate finance’ are a growing conversation in addressing the inequality that exists in dealing with consequences of climate change. These consequences have been a mixture of factors including colonialism, rapid industrialization which had unintended consequences such as pollution of water bodies, and reduction in air quality. This debate in a microcosm has shown the divide in what should be prioritised in response to the growing climate crisis. While Climate Justice activists and developing countries emphasise on the need for immediate and drastic changes to current emissions plans and focusing on indigenous communities and the global south countries to facilitate their recovery, as in contrast to the Global North who’d rather would like to focus on the incremental nature of the recovery without a drastic change to standard of living of their own citizens.

The Paris agreement had stipulated a goal to mobilise and earmark at least $100 Billion by the year of 2020 for the sole purpose of mitigating circumstances faced by developing countries in the fight against climate change. Especially Small Island Developing States (SIDS) and Least Developed Countries. However, this target by estimates missed at least $20 Billion. There was a pro-forma condemnation from the developing countries during the summit in October, but it did not lead to anything substantial apart from additional pledges.

If we contextualise the $100 Billion that was earmarked to these developing countries, only $20 Billion was kept aside from “adaptation”, and only 7% of this 20 billion went to the poorest countries to deal with the catastrophic consequences of climate change. Finally, the figure of 100 billion pales in comparison to the $3.3 Trillion the G20 spent on subsidising the fossil fuel industries in the countries. The developing countries have used their resources instead of trying to shield themselves from the effects they helped propagate. The United States, United Kingdom, Canada all spent multiple times on shielding their borders from climate migrants and refugees from Third world countries.

Therefore, the proposals that have been circulating in the mainstream and in major institutions such as the United Nations. So, what are the alternative proposals from third parties such as climate activists & developing countries, would they work in the mainstream and be implementable?

One of the proposals from climate justice activists is debt cancellation. The climate finance proposals so far that have been accumulated from different sources are predominantly based on loans to developing countries. 71% of climate finances in 2019 were extended as loans. Research also shows that these developing countries spend 5 times more on paying interest on these loans than on climate mitigation initiatives. Debt is a stop gap solution, as this does not involve any sizable sacrifice made by the developed countries while collecting interest on their loans.

Amongst these proposals, along with the cancellation of debt, is the issue of direct transfer of climate funds to these countries instead of extending them as loans. These direct transfers can come in the form of grants from organisations. Another interesting proposal is the possibility of an international mechanism for carbon taxes on private enterprises, especially Big Oil, Coal companies etc. The taxes collected can then be distributed via a slush fund to developing countries to mitigate the climate problems in their own countries.

Proposals from climate justice activists have not only been restricted to governments and international organisations, but for private enterprises as well. There has been some movement on this proposal from the Glasgow summit in 2021 with the creation of the "Glasgow Financial Alliance for Net zero" or 'GFANZ' led by the UN. 450 financial institutions have pledged at least $130 trillion to set science-based targets to reach carbon net zero. However, the problem with this initiative is that private companies get to decide the targets rather than the government.

While the proposals have several merits, the timing could not be worse- which is in the aftermath of a global pandemic. Private enterprises and governments for at least the next 2-3 years, would focus on ramping up on government expenditures into industries which create jobs. The impending side effect is less money available for ambitious climate change proposals that climate justice activists hope for.

The Politicization of Climate Policy

By Billy Buddell, Issy Ronald, and Matt Elliot

Climate change policy has a growing "darker" side that has remained largely second fiddle to efforts to slow down global warming and mitigate its consequences. This being its growing utilization as a justification for actions that also have a significant geopolitical dimension regarding competitor states. Likewise, domestically climate mitigation measures that impact the living standards, prospects, or opportunities of citizens are highly vulnerable to becoming areas of socio-political contention. This increasing politicization of climate policy, inadvertent or not, is if left largely unaddressed has the significant potential to slow-down or derail the main thrust to prevent climate change from having too much an adverse impact. Certainly, in the context of Paris Agreement targets need more decisive action to meet, the potential for push-back due to climate policies domestic and foreign policy politicization is highly problematic for the stability of many states, as well as that of the international order.

Climate Policy as a Foreign Policy Tool

Combating climate change requires deep levels of international cooperation, arguably on a hitherto unseen level. International agreements such as the Paris Climate Accords have sought to align disparate national governments in pursuit of a common goal - to mitigate the potentially catastrophic effects of climate change. Yet, as states begin to engage with these policies, measures to combat climate change often appear to conveniently transform into tools with which their own foreign policy ends can be advanced. This pattern is likely to continue in 2022.

For China, as it seeks to extend its influence over other parts of the world, the intersection between environmental action and international development provides the base for an effective foreign policy. In perhaps the most ambitious expression of this policy, China's National People's Congress announced, in March 2021, plans for the construction of the world's biggest hydroelectric dam on the Yarlung Tsangpo river. As well as providing 60-gigawatts of electricity, the dam would reinforce Chinese control over Tibet, the proposed location of the dam. It would also create a political tool for the CCP to use vis-à-vis India, situated just 30km from the Indian border.

Fearing that China could weaponize water supply by cutting off or diverting the Yarlung Tsangpo, India has already retaliated with its own plans for a 10-gigawatt project on another tributary of the river. Given the scale of the project, it will be many years before the Yarlung Tsangpo Dam is built; but the mere existence of these plans is likely to increase tensions between China and India in 2022.

Plans for hydroelectric dams abroad also form part of China's foreign policy. Under the Belt and Road Initiative, China has helped finance dams in countries such as Cambodia, Uganda, Tajikistan, Pakistan, Georgia and Indonesia. These initiatives allow China to project its power globally, while still upholding the principles of combating climate change, and so is a device that is likely to continue.

As well as water, other commodities are becoming more valuable as the global economy seeks cleaner energy. Minerals including cobalt, copper, lithium, nickel, and rare earths are crucial to clean energy technology such as solar panels, batteries and wind turbines. These resources are concentrated in a handful of countries. The Democratic Republic of Congo contains more than half the global supply of cobalt, China half the supply of rare earths, and Australia half the lithium supply. While smaller countries such as the DRC could be reluctant to leverage this power, it seems likely that more powerful countries will weaponize these resources, controlling their supply on a global scale.

In an effort to harvest more of these resources, attention has turned to the deep sea and the mineral deposits that lie on the ocean floor in polymetallic nodules containing nickel, cobalt, manganese, and other rare earth metals. Provoked by an ultimatum from Nauru, the International Seabed Authority (ISA) is now proposing to finalize a mining code by July 2023, potentially allowing deep-sea mining to go ahead commercially. During 2022, then, heated debates are likely to emerge between blocs such as the European Parliament who oppose deep-sea mining, and the mining companies who would stand to benefit from it.

The EU, meanwhile, appears to be aiming to accumulate soft power in its climate foreign policy. Its flagship initiative, the European Green Deal, aims to create a carbon-neutral EU by 2050, representing the most comprehensive effort by a major economy to counter climate change. By pursuing these types of policies, the EU can challenge powers such as China and the USA for the mantle of global leadership, if only in this specific policy area, and so this pattern is likely to continue in 2022. For the Biden administration too, redefining the USA as a global leader on climate change again, will continue to form an important part of their attempt to portray the US as a beacon of global leadership.

The knock-on effects of the European Green Deal will require mitigation and reinforce the already anti-migration policies of the EU. As Europe weans itself off fossil fuels, countries such as Algeria whose economy depends on exporting fossil fuel products may face a slow-motion collapse, potentially leading to mass migration. In anticipation of this, the EU has pledged to help these countries diversify their economies by promoting solar energy and developing hydrogen markets. In this way, the foreign policy element of European climate policy throughout 2022 will serve their own political ends. Moreover, the geopolitical incentives for the EU to accelerate its move away from fossil fuels have been highlighted by the current build-up of Russian troops on the Ukrainian border. Europe relies on Russia for 35% of its natural gas and so is more vulnerable to Putin's threats.

As climate change morphs into the climate crisis, and its effects intensify globally in 2022, geopolitical incentives are increasingly likely to be reframed as environmental ones as individual states seek to advance their own national interest, while still appearing to combat climate change.

Climate Policy as a Domestic Policy Issue

Around the world, people are increasingly regarding climate change as a pressing global issue and calling on their governments to commit to ambitious climate change mitigation policies, according to a GlobeScan poll of 31 countries. However, this general rise in public

awareness and concern is countered by persistently vocal minorities which, although rarely denying outright the existence of climate change, are strongly opposed to the position that they or their countries are responsible for mitigating it. Many Europeans, even those who expect their government to take action against climate change, are against measures which will impact their lifestyle and livelihoods. The lofty rhetoric of urgency at COP26 is therefore likely to fade away in 2022 as the domestic politics of climate change take priority.

In the UK, through the end of 2021 and start of 2022, major protests by environmentalist groups Insulate Britain and Extinction Rebellion disrupted traffic around London and featured heavily in the national news. Alongside this also came heated reactions against them, showing the cultural, generational, and sometimes vitriolic inflections of public climate change debate. Though few deny outright the scale of climate change, many see it as a problem requiring industry regulation and not as an issue for which they are prepared to make lifestyle changes, especially during the developing cost-of-living crisis. Overall, as public calls for the government to tackle the increasingly salient threats of climate change grow, so too does vocal opposition to those calls. This polarization means that, despite occasional overtures, the major political parties are unlikely to risk their popularity by making a significant climate change commitment central to their campaigning in 2022.

In the USA, 2022 seeing the passing of any more significant climate change mitigation measures is also in question. Despite Biden's relatively strong record in working towards his climate pledges so far, his popularity has tumbled and the Democratic Party's position in Congress is tenuous, with many expecting it to lose its majority in this year's midterm elections. Even more pressingly, the Democratic Party itself is divided on climate change policy. In January, West Virginia senator Joe Manchin achieved infamy and revilement around the world, but popularity among Republican voters and the West Virginia coal industry, for blocking the Build Back Better Act, which included provisions for limiting CO_2 emissions. With US politics remaining highly polarized, the Democratic Party divided on climate policy, and the Republican Party threatening to reclaim its majority in the midterm elections, Biden's early drive towards climate leadership will most likely be stymied in 2022.

The European Union, in contrast, has the potential to be stronger in pushing through climate change mitigation policies in 2022. The particular and international nature of EU decision-making has meant that climate change frequently features much higher on the policy agenda than in individual nation-states. The European Commission has spent the start of 2022 negotiating changes to its green finance and sustainable investment rules. However, its determination to divest from coal could lead to sub-par outcomes, as it offers trade-offs in order to co-opt potential opponent states and investors. The European Commission's recent decision to declare nuclear and gas sustainable investments caused shock and anger among environmentalists and green parties. This kind of pragmatism has ensured that the EU has been able to achieve the required support from states in its goal of divesting from carbon, and the sustainability taxonomy is very likely to be passed in 2022. However, it also means that the EU's energy transformation may be distorted beyond the recognition of environmentalist concerns.

In addition to the difficulties posed to climate targets by the domestic politics of Western states, there are several key countries where the increase in public awareness of climate change issues does not correlate with the idea that they are morally responsible for tackling

them. China and India negotiated a watering-down of the COP26 pledge to 'phase out' coal, as both are heavily dependent on coal and see it as vital for their development in catching up with Western countries, which have enjoyed a head start. Prime Minister Modi, in particular, was applauded in India for standing up to what was seen as Western 'bullying' at COP26. There is, nevertheless, widespread public concern in India about the dangers of climate change and support for measures to mitigate it in 2022. The risk remains, however, given the influence of the coal industry and the political economy of development, that these measures will not receive the required funding in the 2022 budget.

China, on the other hand, was less intransigent on the international stage about climate change, as there are real incentives for it to aspire to global leadership on this issue, particularly in regarding ESG (Environmental, Social, and Governance) risks on its Belt and Road Initiative investments. It has also already made some substantial headway in developing its renewable energy sources. However, with the Communist Party acutely aware that its legitimacy rests on its ability to deliver economic growth, and as this may continue to slow down in 2022, President Xi has already pledged to focus on jobs, not the environment, in the near future.

The domestic politics of climate change in these global powers also have huge ramifications for smaller countries on the frontlines of the climate emergency. The continuing drought in East Africa represents an imminent humanitarian catastrophe, according to the International Rescue Committee. Kenya, where the second-highest proportion of people in the world want their government to be a global leader in urgent climate change action, has declared a state of national disaster. Like many countries across Africa, which have seen a marked increase in political stability in the past year, Kenya faces a farmer-herder conflict which itself exacerbates climate change as smallholders are forced to turn to slash-and-burn methods. As central governments are not often powerful enough to effectively control their peripheries, the urgency of climate politics in Kenya and many other African countries in 2022 will be centred on supporting grassroots conservation efforts and affecting climate-smart methods to help smallholders mitigate the climate crisis.

The disconnect between international and domestic politics is rarely clearer than on the issue of climate change. The lofty rhetoric made at international summits where it is the norm to claim to be tackling climate change seriously, however sincere it truly is, has often floundered on the rocks of domestic political risk. Climate change activists are campaigning with increasing urgency around the world, and there may come a time when politicians need to placate them more than they need to placate their vocal opponents. However, 2022 will most likely not see that time.

Risk 2) The Politicization of Critical Resources

The building blocks of human society are under increasing strain. A rapid increase in demand for critical resources, such as rare earths, wider minerals, and even water by the 2030s is set to see increased problems in terms of supply meeting demand, particularly in specific geographies. This is fuelled by global rapid demographic growth, increasing demand for technology and materials to support these shifts among young and old, and climate change; both in terms of its effects and mitigation technology and policy.

This is further confounded however, by the geopolitical context of increasing great power competition. States both large and small seek to stabilize their supply in the face of these problems, build their reserves, aim for increased self-sufficiency, or even seek to use their share of regional or global resources as a political tool to support their foreign policies and national interests at the international level.

This will be highlighted by an exploration of two key resources fundamental to human civilization whose supplies are increasingly precarious, particularly due to state-led politicization, but which currently despite their potential to have a significant and large-scale impact are not yet part of popular discussion: Critical minerals and their supply chains, and water. The weaponization of both should be a growing concern. The current key risk of a global semiconductor shortage will also be utilized to showcase why the politicization of resources is both a problem, and what it could mean.

Critical Mineral Supply Chains

by Samuel Jardine, Lucy Bather, Keita Vasiljeva, and Frederico Fróes

The Risk?

China, the United States, United Kingdom, European Union, and others are striving to secure stable supplies of critical minerals required to meet a rising global demand for industrialized and technological goods. The strategic competition this has created (and the use of certain mineral supply monopolies to pursue political aims) is leading to a pseudo-de-globalization of supply chains along political bloc lines that is exacerbating a looming demand crisis in international markets.

Countries' specific concerns depend on their resource profiles and industrial configurations. Whilst the US is wary of the geopolitical vulnerabilities stemming from import dependence, the European Union is primarily concerned with the effects of supply disruptions on their industrial competitiveness as the de-globalization of supply chains worsens.

The US once led production of rare-earth minerals; however, by 2000, the country was nearly entirely dependent on overseas imports of separated rare-earth oxides, particularly from China. China's decision to impose a rare-earth embargo on the US in 2010, which shocked supply chains and led prices to skyrocket, can be seen as an example of the challenges that may materialize more frequently in the future if critical resources continue to be politicized.

Several EU economies are mineral producers and suppliers. France, for example, accounts for 49 per cent of the global production of hafnium (used in super-alloys for space applications). However, the EU is absent from the upstream portion of supply chains as a result of a limited understanding of resource availability within Europe, as well as economic and societal hurdles for states within the EU.

At the same time- increasing nationalist sentiment around the world has seen a growing number of states key to the critical mineral supply chain (as producers or consumers) adopt a protectionist approach.

This foreign and domestic political pressure among large and small states is set to significantly increase the demand and supply squeeze of critical minerals just at a time when they are most needed both for climate mitigation (and particularly to pursue technological-based climate mitigation which governments have favored over trying to impose politically controversial societal changes) and to maintain living standards as demographics increase and the demand for higher living standards and technological solutions to many of the worlds problems grows.

To add to this growing demand, supply-side issues are further complicated by a gradual decline in resource quality. A fall in ore quality across a large range of commodities has increased the amount of energy required to extract minerals. This, in turn, can have a detrimental impact on the environment and cause production costs to surge.

Furthermore, the International Energy Association reports that on average it takes over sixteen years to move mining projects from discovery to production. Long lead times therefore also exacerbate supply-side issues.

Critical Minerals Overview

Definition:

The US Energy Act of 2020 defines critical minerals as minerals 'which are essential to the economic or national security […]; have a supply chain that is vulnerable to disruption; and serve an essential function in the manufacturing of a product, the absence of which would have significant consequences for economic or national security'. Whilst they encompass minerals such as lithium, cobalt, gallium, and rare earth materials, according to the US Energy Act of 2020 they do not include fuel minerals.

Rare earth materials are a key subsection of critical minerals. There are 17 rare earth elements, 15 from the periodic table's "lanthanides" alongside scandium and yttrium. They are dubbed "rare" due to their low concentration, despite an even distribution around the world. These elements have unique metallurgical, nuclear, electrical, magnetic and luminescent properties that make them critical for modern technology. Because of this their annual demand has doubled to 125,000 tonnes in 15 years and is projected to reach 315,000 tonnes in 2030.

The criticality profiles of all these minerals are determined by the available supply and level of demand.

Uses of critical minerals:

Critical minerals are used in the clean energy, defence, automotive, aerospace, machinery, robotics, and transport sectors. They are also set to play a key role in the automation of economies, a necessary development to increase productivity and fill-in workforce gaps for many states with aging populations.

- *Clean Energy Technology* -Critical minerals have a wide range of uses within the clean energy sector and are essential in bringing about the clean energy transition. This means, however, that their demand is driven principally by the green revolution.

  The minerals required for the manufacture of energy technology components varies for each component. Cobalt and lithium are crucial ingredients for manufacturing lithium-ion batteries used in electric vehicles, whilst the production of solar photovoltaics requires silicon and copper (see figure 1 below).

  The energy sector will be the principal force in driving demand growth for critical minerals in the future, specifically; Aluminium, Antimony, Arsenic (batteries), Barite (grounding), Beryllium (electronics), Bismuth (piping), Caesium (energy conversion), Chromium, Cobalt, Fluorspar, Gallium (solar and circuitry), Germanium (solar cells and energy), Indium (conduction and solar), Lithium (batteries), Rubidium,

Scandium, Tantalum, Tellurium, and Uranium. To politically commit to climate neutrality and to attain industrial competitiveness in the clean energy sector, countries require large quantities of these critical minerals.

Demand could rise by more than 450 per cent by 2050 if clean energy is deployed at levels consistent with achieving the Paris Climate Agreement's goal of limiting the increase in the earth's temperature to less than two degrees Celsius.

- *Defence*- Critical minerals are also used for defence purposes. Critical minerals are crucial ingredients in the production of missile guidance systems, jet engines, and satellite and communication systems. Specifically, Aluminium, Arsenic, Beryllium, Cobalt, Germanium, Hafnium, Rare Earths, Rhenium, Titanium Concentrate, Uranium and Vanadium.

  The UK and US are concerned that restrictions on foreign supplies of critical minerals would have grave consequences for their defence and national security.

Global Distribution:

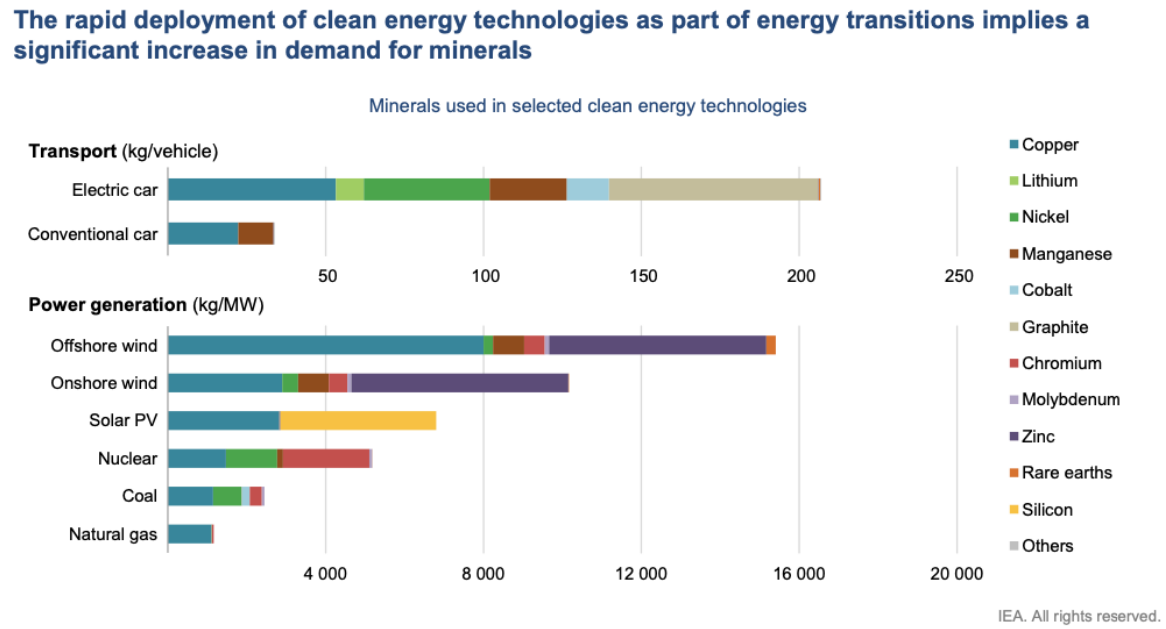
The production of critical minerals is more geographically concentrated than oil or natural gas. The world's top three producers of lithium, cobalt and rare earth materials control over three-quarters of global output. In 2019, the top producer of cobalt, the Democratic Republic of Congo, was responsible for 70 percent of the mineral's global production. In the same year, China was responsible for 97 percent of the global production of gallium and for 60 percent of the global production of rare earth elements.

With geographical concentration being so heavily skewed, countries with limited resources of critical minerals have to import them if they wish to supply their industries.

In 2019, the top importers of lithium (Lithium hydroxide and lithium oxide) were Japan, whose imports amounted to nearly USD 486 million, and South Korea, whose imports totalled over USD 385 million. The largest importer of cobalt in 2019 was China, importing over USD 182 million worth of the mineral.

In addition to resource supplies being unevenly distributed, so is processing capacity. Where midstream infrastructure is limited, critical minerals must also undergo necessary chemical processes— such as concentrating, refining, and smelting—outside of national borders. For example, China processes around 90 percent of the world's rare earth elements.

Figure 1:



What's Happening?

Risks to Critical mineral supply chains for states and industry are arising and being exacerbated by both domestic and geopolitical factors.
In particular, issues such as increased demand for resources, geopolitical tensions, the emergence of strategic reserves, and the effects of suppliers' domestic politics may all cause problems and disrupt critical mineral availability, as explored below:

Expanding Demands:

Critical minerals have seen their demand expand ever since the consensus grew on the need for increased sustainable policies around the world, especially as encouraged by the current United Nations Sustainable Development Goals, set for 2030. A move towards sustainability has also meant that there is an ever-increasing number of renewable energy sources in place of those relying on fossil fuels. Similarly, the same pattern can be noticed in new technological developments and even in defence.

Geopolitical Factors:

The expansion of demand is being leveraged, exacerbated, or utilized by international actors intentionally or inadvertently for their own gain. The fragmentation of global supply chains through politicization of critical minerals while arguably for the best national or regional intentions is increasing the likelihood of supply and stability problems down the track.

- *Chinese Control over Supply Chains*- Many countries have resorted to importing these resources in order to meet demand, but this, in turn, has presented an issue of

dependence on a foreign supplier, as well as vulnerability to geopolitical issues stemming from their choice of exporter, as is most prominently demonstrated in the example of China.

At the present, China has significant control over the global critical mineral and rare earth supply chain. In addition, significant quantities of other minerals utilize Chinese-operated infrastructure making their hold on the entire supply much tighter. Actors like the US, UK, and EU have been highly outspoken on their wishes to minimize their dependence on critical minerals that are supplied by China, even if it does control a large part of the supply chain.

This issue spans further in that China has also limited their exports since 2010, which has, in turn, resulted in conflicts between trading partners including not only the US and EU, but also Japan, who all filed disputes in 2012 in the World Trade Organization claiming that China's "government policies were unfairly benefiting its industry at the expense of other countries".

- *Strategic Reserves and Potential Problems*- Expanding demands and wishes for autonomy over critical mineral supplies have both been triggers for forming strategic reserves. These usually come in the form of blocs or agreements between country groupings to ensure stable supply of resources. The US alongside the governments of Australia, Botswana, Canada, and Peru has set up the Energy Resource Governance Initiative (ERGI) with the aim of ensuring the best practices for mining and sourcing critical minerals. Similarly, the European Raw Materials Alliance (ERMA) was set up to secure supply of critical minerals for EU states. These blocs are only two of many set up to ensure countries have strategic reserves of critical minerals such as ASEAN, and the African Union.

  However, striving for ensuring strategic reserves or cooperating on increasing regulatory barriers or costs presents potential problems of causing artificial shortages and limiting the freedom of supply chains to efficiently expand and deliver, especially for reaching buyers who don't find themselves lucky enough to be part of such blocs. Furthermore, strategic reserves pose the risk of critical resources being viewed solely in a political lens, thus potentially hindering efforts at attaining sustainable development efforts.

Domestic Politics:

It is not only global politics that are at play when it comes to the supply of critical mineral resources. Domestic politics also has a large role to play in the dynamic. A clear example of this could be seen throughout Latin America during the Pink Tide political phenomenon – a political wave that saw a general turn towards left-leaning governments in states including Argentina, Brazil and Venezuela. This movement triggered a number of political reforms, which, in the context of critical minerals, were striving towards resource nationalism aiming to increase self-sufficiency. This is highlighted by key producer states like Chile, who provides 28% of the world's copper supply annually, or Peru, who hopes to become a key part of the "Lithium triangle", implementing mining royalties for copper and lithium

respectively. This while a potential economic boon for these states will have a ripple effect on global markets, increasing costs. A renewed move towards resource nationalism of critical minerals, particularly in Latin America where a significant amount of critical minerals are mined, as well as being home to the strategically vital "lithium triangle", key for renewable energy plans, would leave international markets vulnerable to the effects of domestic politics at all levels of the supply chain, exacerbating supply issues.

Furthermore, whilst there is currently an abundance of critical mineral supplies globally, there is concern that in the future reserves might face the same fate as that of fossil fuels in the present day, with concerns aired, for instance by some at the Royal Society of Chemistry, that within the next hundred years reserves will start to diminish or certain critical minerals will "peak". Given the importance that critical minerals continue to play in technological advancements, a diminishing supply would have detrimental effects such as far higher prices, or bottlenecking technology, research and production. In the case of ores like copper, which is one of the most widely used critical minerals, this can be a reality in the nearest future as reports have already been made of diminishing quality of the ore in Chile, not only making it harder to refine but also more expensive.

Alongside potential future supply shortages driving up costs there is also the issue of artificial shortages of critical minerals. Unlike physical shortages, this is largely rooted in politics. With ever-growing demands and the creation, or expectation, of new strategic stockpiles being established to use as a nation state or blocs reserves, this has opened up a window of uneven distribution of critical mineral resources with those who are not directly involved in the monopoly over these resources being on the losing side. Both the potential natural shortages and artificial shortages would leave a devastating effect on progress towards net-zero and SDG targets.

To combat potential supply problems, as well as wishes to be less reliant on certain suppliers, new sources of critical minerals must be prospected in new areas around the globe. Despite the potential to meet demand for the critical minerals by finding new areas to source these from, several problems arise. Firstly, setting up infrastructure to extract these minerals is not only extremely expensive, but also slow, on average taking 16 years to complete. Furthermore, it opens up opportunities for exploitation of countries that do carry these resources but do not have the finances to build the necessary infrastructure thus having to rely on outside sponsors, as well as potentially subjecting extracting nations to the resource curse– whereby funds are funnelled into authoritarian regimes with no incentive to invest in development and citizen wellbeing–if not properly implemented.

However, given the exponential rise in demand for critical minerals there will be little choice left on whether to build new infrastructure, rather it will become a new question of where the infrastructure is built and who gets access to the resources. In recent discussions, the US, UK, and EU have all expressed their wishes to set up alternative supply chains as a means of favouring these over Chinese-controlled and/or influence supply chains over critical minerals. Although this can be a certain move towards greater self-sufficiency for these regions, it can also open room for further de-globalisation of the critical minerals supply and make it harder for various states to access these resources without being a part of either the countries striving for alternative supply chains or those already in place and dominated by China.

The Need to Address Sooner Rather than Later

Without states at best re-energizing the globalization of efficient supply chains or at worst setting a pragmatic equilibrium for resource sharing and investment starting in 2022 (given the length of time alternate supply chains take to establish and their need for stability as opposed to a quick-moving market shifts) several key areas will be hit that could risk wider political and environmental consequences. These include:

1. Artificially scarce critical minerals would increase the cost of attaining higher living standards by raising the price of technology and consumption goods. This would come at a time when complex technology usage is increasingly fundamental for sustainable development and individual wellbeing, and as developing states rightly yearn to attain higher standards.

2. The path towards addressing humanity's myriad global social issues, such as poverty, inequality, and hunger, relies on economic growth and increased value generation. To this end, technology is paramount for attaining higher economic development. Critical minerals are fundamental to ensuring this continued trend and building the infrastructure required to drive it. Increased expenses stemming from artificial barriers are unhelpful when looking at aspects such as the automation of sections of the workforce and the qualification of human capital to increase productivity or meet demand gaps.

3. A big area of this is climate change. The international community is already set to miss the Paris Agreement targets and green technology has been chosen by key states as the best policy approach for mitigating climate change over the more politically dangerous route of directly impacting living standards and changing social norms which might meet significant public pushback. Anything that impacts the rollout of renewables (particularly at a time when energy is under pressure and energy use set to rise) is a serious danger. In the short term, this could see political support drop for such a climate mitigation approach, while, over the long term, it may imperil our ability to reach climate targets further by bottlenecking development of needed infrastructure to transition to cleaner energy, industry, and living. The recognition and acceptance of critical minerals as paramount to the fight against climate change is not yet explicit or global. Nevertheless, due to the importance of critical minerals for decarbonisation efforts, a reduction in supply could have a particularly damaging impact on the rollout of renewables.

As the demand for critical minerals expands, countries seeking to secure their supplies will increasingly turn their attention toward intensifying domestic efforts. Both the US and the EU are researching and developing separation and processing methods so that they can reduce their dependence on foreign countries. In addition, the US is conducting surveys into its domestic resource capacity in an attempt to expand domestic supply. Nevertheless, both the implementation of a 'mosaic approach', combining domestic and international strategies, and the promotion of international cooperation are essential for satisfying the growing demand. The establishment of a more robust global regime for governing critical minerals extractions

and standardizing practices, particularly with regards to transparency and anti-corruption measures, is a core aspect of this ‘mosaic approach’.

The issues posed by the politicization of critical materials and questions about producing and consuming critical minerals in a more sustainable manner must be addressed simultaneously. Minerals are different to oil in the sense that they can be reused and recycled when the correct infrastructure and technologies exist. More money must be invested in R&D so that the implementation of such infrastructure and technology becomes more widespread. At the same time, a re-globalized approach to global critical mineral supply chains would be desirable to ensure the international community is equally on track to meet so-far missed Paris Agreement goals. Failing that, states and industries need to begin to prepare to ensure they have access to stable and sustainable critical mineral supplies for their future needs. Such planning, while already started in several regions, needs to be upscaled and expanded in the near future. Alternate supply chains can take a decade or so to establish, so the sooner the better.

The Geopolitics of Water

by Billy Buddell and Frank Stengs

As the combined effects of climate, infrastructural development, and geopolitical contexts take their toll, water becomes an increasingly contested commodity. As one of humanity's most critical resources, shortages present a number of significant risks. In particular, increasing risks of potential international conflict, and beyond this, the potential to become a weaponized resource in pursuit of state aims.

Nile Conflict

Water shortages, in areas along the Mekong and Nile Rivers for instance, are significant drivers of current and potential future conflict. The Grand Ethiopian Renaissance Dam (GERD) has been a major cause of tension between upstream Ethiopia and downstream Sudan and Egypt, for the past decade. Since 2020 the GERD project has entered its second phase, from development of the dam to filling up the dam reservoir. This dam presents serious risks of conflict in future, while some even claim is has already begun covertly.

Egypt considers the GERD a major security issue and sees the time-line of filling up the dam reservoir as a particular area for concern. 10 years of filling would mean a 14% reduction in water for Egypt. 5 years, however, would mean a 25% reduction and 3 years a staggering 50%. With the country being 90% dependent on the Nile as a water source (with 57% coming from the blue Nile in Ethiopia) for its freshwater resources, the implications of this project, and its timeline in particular, are huge.

According to UN estimates, the country already experiences relative water scarcity. With current population growth at a rate of 2% per year, the country is predicted to have absolute water scarcity by 2025. Water scarcity not only impacts the Egyptian people, but also the relations with upstream countries. The GERD has the potential to massively impact water availability, creating security implications for Egypt.

A large part of these implications relates to the Egyptian agricultural sector and food prices. The agricultural sector employs about a quarter of the population and supports the livelihoods of nearly a quarter more. It also is responsible for about 85% percent of total water usage. Limited water supply, therefore, directly impacting agriculture, would result in rural populations losing their livelihoods. Additionally, water scarcity could subsequently lead to rising food prices. Both unemployment and rising food prices were factors that led to anti-government protests and eventually a revolution in 2011. The impact of these implications therefore is already evident, if the effects of the GERD are to further affect water scarcity, the consequences would likely be exacerbated.

Meanwhile, Ethiopian considers the dam as the project of the century, set to modernize their country. With energy demand growing at 32% per year and 60% of Ethiopians having no access to electricity, Ethiopia is unlikely to compromise on the dam project. The US has already tried to encourage Ethiopia into making concessions by cutting down the aid budget. Ethiopia, however, considered this as a continuation of colonial legacy.

Ethiopia denies Egyptian claims to water, but Egypt argues Ethiopia is defying international law. Ethiopian foreign policy reveals that the defiance of international norms runs deeper than just the GERD case. Both in Kenya and Somalia cases appear where Ethiopia has acted similarly, when it comes to river and water diplomacy. A 2013 report, conducted by an international panel of experts convened by Ethiopia following an Egyptian protest, found Ethiopian studies in preparation for the dam appeared to be very basic. This could prove to exacerbate the impact of the dam via improper planning.

Risk Outlook:

The GERD presents major implications for both Egyptian and Sudanese security, and the potential for water conflict in the future. The eventual outcome of serious conflict depends heavily on Ethiopia's choice to operate unilaterally or multilaterally. A diplomatic solution is likely to ease tensions between the countries. However, if Ethiopia chooses to act unilaterally, that risk is likely to increase significantly, depending in particular on the chosen time-line for filling up the GERD reservoir.

In July 2021 both Ethiopia and Egypt & Sudan submitted a resolution to the UNSC, without success. It led the Egyptian minister of foreign affairs to call confrontation inevitable if Ethiopia would not change it's position. On 20th January 2022, however, Ethiopian Prime Minister Abiy Ahmed called for cooperation over the GERD. However, this still raised subsequent questions about the extent of the Ethiopian administration's seriousness in re-engaging in negotiations that would achieve regional cooperation with Egypt and Sudan.

Coupled into this risk is Egypt's desire to be a regional hegemon again, which makes it more likely that tensions will escalate. Egyptian foreign policy showcases this. Currently Egypt supplies weapons to Ethiopian enemy Somalia, contributing further to worsening relations between the two states. As for Sudan, it is also involved in a running border dispute with Ethiopia, in the Fashaqa triangle. With increasing tensions arising as a result of the dam project, that border dispute is made more likely to develop into a more serious conflict. Both sides already have amassed troops on the borders, increasing the chances for miscalculation and escalation.

Beyond just Ethiopian responsibilities however, the risk of conflict also depends on Egypt's management of the water sector and public funds. Better irrigation techniques, wastewater treatment facilities, and establishing a public fund are all actions that could be taken by Egypt to address domestic water scarcity, and thus help in easing tensions. If Egypt fails to address its own water problems, there is a real probability for conflict in the long-term as a result of the GERD reservoir.

Currently however, conflict has been averted thus far. Although the GERD reservoir has already begun filling up, an above-normal rainfall reduced the impact of the GERD in downstream countries. Moreover, Ethiopia is already facing an internal conflict with the Tigrayan Liberation Front, so additional international conflict poses a great threat to the nation's interests. Similarly, Egypt however has an interest in preventing conflict in Ethiopia, since promoting instability in the region is not in its interest. While the situation remains relatively peaceful however, if the impact of the GERD is as significant as many fear, the

resulting water scarcity will likely make some form of international conflict over the issue unavoidable.

Mekong Conflict

Dam construction in the Mekong River and the crucial role it plays as a water source across the Southeast Asian region is another serious driver of potential conflict. The lower Mekong basin is home to 66 million people. Farmers in the region produce enough rice to feed 300 million people. 25% of global freshwater fish catch comes from the basin. In Vietnam specifically, the Mekong region contributes fifty percent to agricultural GDP and 90% of Vietnam's rice production. Hydropower dams built along the river, while contributing to the region's sustainable energy, pose a significant threat to water scarcity, impacting Thailand, Vietnam, Laos, and Cambodia in particular.

Both China & Laos have built, and are building, hydropower dams upstream on the Mekong River. For Laos, these are built for mostly economic reasons. It aims to become the "battery" of Southeast Asia through exporting hydropower and electricity is its current top export. China has almost maxed out its hydropower resources and is looking to import from abroad, therefore is involved in financing many of these Mekong dams for downstream countries.

For China there are a number of national interests that can be met through the construction of these dams. These projects, falling under China's Belt and Road Initiative, could be seen as both a source of renewable energy and political leverage over downstream states. As electricity demands rise in both China and Southeast Asia, there is a need for renewable cheap energy. The need for local sustainable energy is also increased by volatile prices in international energy markets.

Damming of the Mekong is also about securing nations own water. Water security poses an existential threat to China, with a former Minister of water resources stating: 'To fight for every drop of water or die: that is the challenge facing China.' By some estimates 80-90% of China's groundwater and 50% of river water is too dirty to drink. Additionally, 50% of ground water and 25% of river water cannot even be used for farming. Furthermore, geographically 80% of the water is in the South of the country, 50% of the population live in the North. Water scarcity therefore becomes an incredibly expensive problem, as China is forced to divert water from wet regions to the dry North; with estimates of $100 billion is lost annually as a result of water scarcity.

The hydropower dams hold sediment containing critical nutrients that are spread on agricultural land during flood seasons. The dams are also responsible for lower water levels in the river. This causes salination, which is detrimental to agricultural production in the delta region. The dams also disrupt annual flooding cycles, which subsequently causes the destruction of crops and disruption of fish as a consequence of ensuing floods.

In 2019, droughts were exacerbated by retainment of water in China, harming agriculture and aquaculture production. Meanwhile there was above-average rainfall and snowmelt in China. During dry seasons less rainfall in the lower reaches of the Mekong means that water originating in China can account for roughly half of the river's volume. That number can rise

to as much as 70 percent during droughts. Therefore, when water from China is retained via dams, the effects of drought downstream are greatly exacerbated.

While experts view the South China Sea as the most probable area of conflict in Southeast Asia, their attention has now also turned to the Mekong River, where the economic and environmental stakes are arguably much higher. The dam projects foster distrust & political friction between China and downstream countries, but also between downstream countries themselves. The dams cause China to have leverage over downriver countries, which means countries depend on Chinese goodwill. This dynamic creates a situation where China's power over the region's water could potentially be weaponized to exert political and economic pressures downstream. Downstream countries however are also heavily reliant on investment from China. From 2010 to 2019, China provided more than $75 billion worth of investments and construction projects to the five lower Mekong countries. This provides a precarious position from which to challenge China, as several Southeast Asian countries benefit from Chinese investments to build the same hydropower dams downriver.

The current mechanisms in place to govern the Mekong are not working properly. This is compounded by the fact that China is not a part of the Mekong River Commission. Additionally, the Commission has no control over China's dams, or indeed those under construction in Laos. China's Lancang Mekong Cooperation framework so far seems divorced from the immediate problems of the dams. In these circumstances, there seems every reason to hold a cautious view of the Mekong's future with regard to the potential impacts of water scarcity and politicization.

Risk Outlook:

If the impact of increasing development of hydropower dams continues as planned to 2040, there will likely be significant impacts on domestic livelihoods and geopolitics as a result of increased water scarcity. Fish stocks along the river are predicted to decline by 40-80%, significantly affecting the aquaculture industry across the region. 2050 will also mark the tipping point when the delta will no longer be able to cope with salt water intrusion.

If left unchecked, the effects of climate change on Asia's water security could drive China's neighbours to align more closely with the country that controls the 'tap'. During the East Asia Summit foreign ministers' meeting in august 20201, US Secretary of State Antony Blinken already called for "a free and open Mekong.", however whether this aspiration can be met remains unlikely if China continues to control the Mekong's water flow from upstream. While it is in China's strategic interests to stay on friendly terms with its neighbours, and thus avoid restricting the flow of water downstream, the livelihoods of its own citizens will always come first amid water scarcity. As a consequence, if water is withheld from upstream by China, commodity prices in industries tied to water will be hit, and the people of Southeast Asia will likely face a subsequent water crisis.

Case Issue Spotlight: The Geostrategic Issues Stemming from the Semiconductor Shortage

By Arshdip Singh

A further example of resource politicization, and specifically what can happen in the context of a scarcity/bottlenecking of supply in terms of geopolitics can be highlighted by the current Semiconductor shortage.

Overview

Semiconductors are increasing in importance. Their application ranges from consumer (Computers, Phones etc) to national security (Weapons system). The current shortage of semiconductors poses serious geostrategic issues for states and blocs, United States, China and the European Union. Furthermore, caught in the crossfire of this technological cold war are manufacturing states, Taiwan and South Korea. This race will be won by the State that possesses the capacity to produce the finest process node in vast amounts.

Industry leaders

Due to the high costs associated with producing semiconductors, the market is concentrated. Taiwan Semiconductor Manufacturing Company (TSMC) and South Korea's Samsung pave the way with both manufacturers capable of producing large volumes of semiconductors at the 7 nanometer process node. To put this into context, US company Intel operates at the 10 nanometer process node, failing and delaying its production at 7nm until 2023. To further compound the failure, it will be making use of TSMC's technology to be able to produce semiconductors at a 7 nanometer process node. Similarly, China's Semiconductor Manufacturing International Corporation (SMIC) lags further behind at 14 nanometer process nodes.

The future roadmap for Samsung and TSMC is to develop semiconductors at 5nm and 3nm. Intel holds similar ambitions, however they are currently focused on producing 7nm semiconductors, and the production at finer levels is likely to face obstacles and delays. Although Samsung and TSMC lead the way, the most advanced semiconductor is produced by TSMC for Huawei, the Kirin 900. However, the US ban that prevents the shipping of semiconductors where American technology is utilised to the Chinese manufacturer, has limited delivery of the Kirin 900.

Whilst Asia is at the centre of semiconductor manufacturing, producing 83% of global chips, US firms account for half of global billings. The nature of the industry has seen the rise of geostrategic issues.

Cause of shortage

The ongoing pandemic, and the subsequent COVID breakouts in Taiwan compounded the shortage of semiconductors. King Yuan Electronics, test and package chips for TSMC expected a reduction in its June output and revenue by 35%. All the while, the demand for semiconductors has increased, with "total sales equaling 167% of Korea's Jan-Sep current account surplus and 146% of Taiwans".

Secondly, the ongoing US-China Tech Cold War has placed extra load on non-Chinese manufacturers to meet the shortfall. Furthermore, the high cost of researching and manufacturing semiconductors means that it is difficult to establish new companies to produce semiconductors of the same quality. For example, UAE's Globalfoundries stopped their development of 7nm semiconductors.

Thirdly, there has been a lack of access to EUV lithography equipment, which is integral to the production of 7nm and finer semiconductors. Netherland's ASML produces EUV equipment which can cost in excess of $140 million. Furthermore, there is no other producer of this equipment to drive the costs down. However, as ASML makes use of US technology, the US has control over exports, specifically blocking exports to Chinese manufacturers.

Mitigation

The US approach to mitigating the shortage is to produce semiconductors closer to home. For example, potentially introducing incentives and massive investments under the American Chips Act to support business production at home. Furthermore, there has been a push for collaboration between Intel, Samsung and TSMC, allowing for effective cost sharing and steady growth. The US has also managed to convince TSMC to invest up to $12 billion to build a 5nm manufacturing facility in Arizona. Similarly, Intel will be opening a fabrication plant in 2024 and creating 3,000 jobs. This would see a return to fabrication by Intel, with the previous operation closing in 2018. The steps taken above would consolidate the supply chain, whilst also ensuring TSMC maintains its market share in the US.

China has recapitalised the National Integrated Circuit Industry Investment Fund, and other regional and local funds. They have funded in excess of 200 billion. However, they continue to lag behind the US by approximately 3-5 years.

The European Union aims to claim 20% of the global market by 2030. This has been outlined in the European Chips Act and resulted in Alliances such as the European Alliance for Processors and Semiconductors. There is also likely to be collaboration between the US and EU in this area in a bid to rebalance the global supply chain. (Pittsburgh EU-US Trade and Technology Council Agenda September 2021).

Geo-strategy

Taiwanese leadership has acknowledged the advantages of leading the semiconductor industry. It provides them with the so-called 'silicon shield', whereby they can leverage to ensure security from the US, whilst also pursuing growth with China.

The importance of excelling in this area has resulted in protection measures as seen in the US defence bill, which included the provision for subsidising US chip manufacturing and research. This effort to ensure the production occurs at home can be seen behind the construction of TSMC plant in Arizona.

Furthermore, the direct product rule has been used to cut ties between Huawei and TSMC, crippling China's supply of high quality chips. Media reports suggest that the US placed pressure on ASML in the Netherlands to cut supply of equipment to China's SMIC. Consequently, China has pursued a policy of De-Americanisation of their technology supply chains, which increased their reliance on Taiwan and South Korea.

Finally, the ongoing shortage and lack of access to the industry is likely to maintain TSMC's control over the industry for the foreseeable future. Consequently, the costs are likely to remain high and unchallenged.

Conclusion

The protectionist approach in the coming years is likely to create semiconductors with a strong national identity, made possible through supply chains that align with national values and alliances. Along the way, there is likely to be political turmoil with the end being determined by the nation that is able to produce the finest process node at volume.

Risk 3) The Growth of a State-Sponsored-Crime Complex

As competition between large states intensifies along multipolar lines, and smaller states seek to "diversify their dependency" within this competition, there has been an increasing shift to the "grey zone" as a means of facilitating "below the threshold" of war competition between rivals. The aims of such engagement can be legion, from weakening a specific element or commercial enterprise, to disrupting growth, testing security, or in some cases keeping their own state afloat.

A key issue with states increasingly engaging in grey zone activity is the lines becoming blurred between civilian and state/security worlds and the attendant blurring of criminal/state-backed activity. This is especially true because attribution of grey zone attacks is extremely difficult. In this context the growth of state-sponsored and state-advocated criminal activity is one to watch as definitions blur.

Criminality: Threats from State-Sponsored Cyber Actors

By Connor Bryant

There is a higher level of geopolitics that occurs every day that goes largely unnoticed by the public. While many imagine geopolitical competition in terms of geography and weapons, much of current geopolitical competition is digitised. Cyber-attacks – once associated with minor fraud committed by young men sitting in a dark room – have become a common tool of statecraft. This trend has been increasing in recent years, and we expect it to become more pronounced this year as geopolitical tensions rise across the globe. Unlike traditional geopolitical manoeuvring, those who believe they are safe far away from the frontlines are mistaken; no one is completely safe, and one's nationality or industry may attract aggression from adversarial governments.

A common feature of 21st century geopolitics is the incorporation of international business and trade into strategic competition. Technology and communications manufactures; mining aimed at advancing the green economy; and media and entertainment are among the many industries employed in strategic competition. For many governments, the promotion of these industries is as much strategic as it is economic. This paints a target on the back of many companies.

Corporate executives should prepare their firms to be targeted in cyberspace. International or strategic firms should expect it. The question is whether these attacks will be state-sponsored or state-tolerated. While cyberattacks are often unpredictable, executives should enhance awareness during times of heightened geopolitical tension, especially if that firm is affiliated with any of the parties involved. Corporate executives and government officials should also expect a continuance of long-standing cyber threats. These include Chinese government-sponsored theft of intellectual property. There are two primary types of cyberthreats executives and officials should be alert to: advanced persistent threats and hacktivists.

Advanced persistent threats (APTs) are hacking groups that commit cyberespionage or cyberattacks against government or specialised sectors. APTs operate with state-sponsorship or tacit approval and often have geopolitical motives. While many countries employ APTs, China and Russia appear to be the most prominent sponsors. APTs often remain in a victim's systems for extended periods of time and develop methods to reinfiltrate should they desire.

There are too many APTs and too many attacks to list. One example of an active APT is North Korea's Lazarus Group. The Lazarus Group targeted the Anglo-Swedish pharmaceutical company AstraZeneca in 2020. The attack was believed to be part of a larger campaign by the North Korean government to target pharmaceutical companies during the Covid-19 pandemic. The Lazarus Group first came to global prominence in 2014 when they hacked Sony in retaliation for the company's production of The Interview, a comedy that depicts the assassination of Kim Jong-un.

Between the AstraZeneca and Sony hacks, the Lazarus Group is believed to be behind the 2016 Bangladesh Bank cyber-heist and the far-reaching 2017 WannaCry ransomware attack that, among other implications, inhibited parts of Britain's National Health Service from fully functioning. In 2018, the strategically-vital Taiwan Semiconductor Manufacturing Company

(TSMC) was infected with WannaCry, which resulted in TSMC temporarily shutting down some semiconductor production facilities.

There are other APTs that should concern executives and officials, many of which specialise in specific sectors. Executives and officials should research which APTs target their respective industries in preparation for a potential attack. For example, if tensions between the US and China rise, and there is an active APT which targets auto manufacturing, executives in that industry should exercise increased vigilance for a potential attack.

But state-sponsored APTs are not the only political risk that executives and officials should be vigilant of. 2022 may see an increase in hacktivists.

Another example is the purported recent attack on North Korea from an American civilian who was dissatisfied with Washington's response to North Korean cyberattacks. This attack downed the already-limited internet service in the country.

One may applaud the two listed examples, but they may inspire hacktivist actions that are not directed against countries like Russia and North Korea. Politically-inspired hacktivist attacks may target any company or government for any reason. A company that operates in Saudi Arabia may be attacked because of Riyadh's ongoing war in Yemen. The hypotheticals are endless. Corporate executives and government officials should be vigilant of the cyber sphere of political risk.

Some attacks may originate from unidentified attacks but will have clear geopolitical connections. During tensions with Russia, Canada's foreign ministry was breached by unidentified hackers. Dozens of Ukrainian government computers were destroyed when a cyberattack occurred against 90 Ukrainian websites.

Criminality: Afghanistan's Ephedra-fuelled Methamphetamines Boom

By Olivia Minor and Connor Bryant

Afghanistan's heroin market is the largest worldwide. Some 85% of global opium production occurs in the country, according to the UN Office on Drugs and Crime (UNODC), long fuelled by its sprawling crops of opium poppies.

Yet, the discovery in recent years that wild ephedra plants—widespread across the country—provide the key ingredient in the production of methamphetamines has marked the emergence of a unique and dynamic threat that is likely to proliferate in 2022.

The scope for expansion for the burgeoning industry is considerable. Since the first reported emergence of ephedra-based methamphetamine manufacture in the rural province of Herat, it has expanded to at least eight provinces, spanning from Afghanistan's mountainous central region to the former deserts of the south-west. A 2020 European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) report estimated that there exists 192 000 km^2 of land that ephedra could potentially be grown in Afghanistan—over a quarter of the country's land area. For context, the area under opium poppy cultivation in Afghanistan was just 177,000 hectares (1770 km^2) in 2021.

The extraction of revenue from the heroin trade, largely by taxing opium producers, has been a primary source of funding for the Taliban. While the regime is involved in regional and international political processes, experts warn that—with billions in assets still frozen abroad, and facing crippling sanctions and constraints on its access to financial support—Kabul may attempt to further scale up the production of methamphetamines in Afghanistan, diversifying the Islamic Emirate's share in the global illicit drug market and bolstering the critical lifeline for the Taliban that it provides.

Granted, vital economic opportunities exist in an expanding methamphetamines industry for many Afghans, in the grip of an ongoing economic and humanitarian crisis, who have come to rely on ephedra cultivation and distribution for their livelihoods and the promotion of their human security.

However, as with the heroin trade, synthetic drug markets threaten political stability, facilitate corruption and drive conflict, lining the pockets of warlords, insurgent groups, and criminal organisations. A rise in the volume of illicit drug flows across Afghanistan generated by methamphetamine production risks undermining development and stabilisation efforts, exacerbating insecurity at a time when the country is already 'hanging by a thread' according to UN Secretary-General Antonio Guterres.

Relatively low margins available on methamphetamine locally are pushing the supply of Afghan methamphetamines further afield, with prices surging relative to the distance the commodity can be smuggled. Evidence of penetration by Afghan-origin methamphetamines is appearing increasingly in international markets via traditional heroin trafficking routes through neighbouring Pakistan and Iran, into the Asia-Pacific, across Africa, and beyond.

Given the regular heroin traffic between south-west Asia and Europe, the EMCDDA has forewarned of the potential permeation by comparatively cheap and pure methamphetamine of Afghan origin into the European market currently dominated by synthetic drugs produced within Europe. Popular heroin smuggling pathways—most notably the Balkan route via Iran and Turkey, through South-Eastern Europe and into Central and Western Europe—have long resisted intervention efforts by European states and are thus likely to provide a viable avenue for the flow of methamphetamines from Afghanistan into Europe. The growth of Afghanistan's methamphetamines industry thus risks exacerbating the challenge to drug enforcement and the public health crisis precipitated by the flow of illicit drugs into Europe.

The Americas may also be affected by this trend. The United States is suffering from a drug crisis that might be worsened by an increase in methamphetamines into the country. This may also increase crime in many of the most vulnerable parts of the country. An increase in opioids may also threaten health care systems in areas that are most affected from drug use. With hospitals already strained from combatting Covid-19, the possibility of increased opioid production due to Taliban rule in Afghanistan may have a deadly impact in American communities.

There are other factors in the Americas to consider. Many governments in North America – particularly those in Mexico and Central America – are struggling to combat organised crime. Increased methamphetamine production may weaken these governments' ability to fight organised crime, which may lead to greater population movements and migration. Both of which could result in weaker economies in Mexico and Central America.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