Risk, Reward and Resilience Framework

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In research funded by the US intelligence agencies, Professor Philip Tetlock found that experts in specific disciplines and domains often exhibit limited predictive accuracy because they tend to over-emphasize a single lens of analysis. What distinguished the best forecasters in the world was their ability to see complex problems through “dragonfly eyes.” Tetlock used this metaphor because dragonflies have compound eyes made up of thousands of lenses, which they integrate to give themselves almost 360-degree vision.

Dragonfly Thinking™ – a start-up coming out of the Australian National University (ANU) – has developed a series of tools and techniques to allows us to navigate complexity better. By integrating many perspectives into a coherent picture, Dragonfly Thinking enables individuals and organizations to think more holistically and act more strategically. At the centre of Dragonfly Thinking’s approach lies the Risk, Reward and Resilience (RRR) framework, which was developed at the ANU by Professor Anthea Roberts, one of the Founders of Dragonfly Thinking.

Risk, Reward and Resilience™ Framework

Drawing on frameworks from across a variety of disciplines and domains, RRR provides a simple yet powerful and flexible mental model for decision making that can be applied across various policy, business and organizational domains. Leveraging generative artificial intelligence (AI), Dragonfly Thinking has created an interactive software application called RRR.ai that allows this framework to be applied to any issue. RRR.ai is available as a SaaS application with a portal user interface that is accessible via a browser.

At Dragonfly Thinking, we believe that the best results occur when humans co-create with RRR.ai. We typically begin the process of generating reports by having discussions with decision makers about how best to frame the relevant issue for analysis. We then run an initial RRR.ai analysis of the issue, sometimes with input from experts on potential drivers, before returning to the decision makers or experts for edits and suggestions. Once these modifications are incorporated, we run the revised version through the RRR.ai tool again to get more detail on each driver, including relevant examples.

RRR.ai Reports

We are including three reports that show RRR.ai in action with different levels of co-creation.

1. "How to bring together economists and security specialists in policy making in an era of increasing geopolitical competition?" was run purely using RRR.ai to produce a first-round draft.
2. "The implications of US-China Geoeconomic Competition for the Global Energy Transition in a Warming World" was co-created by RRR.ai, Anthea Roberts and Jia Yan, who is a Masters student at the ANU. It was lightly co-created.
3. "Australia's relationship with China, including the effects of rising US-China strategic rivalry" was co-created by RRR.ai, Anthea Roberts and Dr Benjamin Herscovitch, who is an expert in Australia-China relations and who writes the Substack Beijing to Canberra and Back. It was extensively co-created.

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UNDERSTANDING THE FRAMEWORK

GOALS	PERSPECTIVE
List of goals	Identify perspectives

	RISK	REWARD
	Risk is the potential harm an actor or system may suffer, such as financial, physical or environmental harms. It depends on a combination of threats/hazards, exposure and vulnerability.	Reward is the potential benefit an actor or system may gain, such as financial, physical or environmental harms. It depends on a combination of opportunity, access and capability.
EXTERNAL FACTORS	**Threats and Hazards** The degree of potential danger from an external threat (i.e., intentional harms, such as coercion or cyberattacks) or hazard (i.e., non-intentional harms, such as pandemics and extreme weather events).	**Opportunities** The degree of potential benefit from an external option or set of circumstances an actor or system could pursue (e.g., the potential to access global markets and develop economies of scale).
INTERNAL FACTORS	**Vulnerability** -The internal characteristics of an actor or system that can exacerbate the harm that is suffered (e.g., older buildings are more likely to collapse in earthquakes).	**Capability** The internal abilities of an actor or system to effectively leverage an opportunity (e.g., through skills and expertise) to realize the potential benefit.
CONNECTING FACTORS	**Exposure** The channels through which an actor or system encounter a threat or hazard (e.g., through being connected to the internet, through coming into contact with someone infected with a virus, or through a building being located in an earthquake-prone region).	**Access** The circumstances, channels, rules, or institutions through which an actor or system is able to take advantage of those opportunities (e.g., through trade agreements that open global markets and critical infrastructure that enable connectivity).

RESILIENCE

Resilience is the ability of an actor or system to withstand and recover from shocks and stressors, adapt to changing circumstances, and transform in response to challenges or new opportunities.

DYNAMIC CAPABILITIES		
Absorptive Capacity The ability to absorb a shock or stressor without suffering significant negative consequences (e.g., via stockpiles or redundancies) or absorb positive developments (e.g., being able to absorb new technologies).	**Adaptive Capacity** The ability to respond to changes by making adjustments that allow the actor or system to continue functioning, although in slightly different way (e.g., via small scale adaptations or modifications).	**Transformative Capacity** The ability to transform the structures and incentives of the actor or system not only to recover from shocks but to capture future rewards (e.g., via strategic planning or organizational change).

Example

Economic Security Policy Making – RRR.ai Analysis

How to bring together economists and security specialists in policy making in an era of increasing geopolitical competition?

How to bring together economists and security specialists in policy making in an era of increasing geopolitical competition

GOALS	PERSPECTIVE
Prosperity and security	United Kingdom

	RISK	REWARD
EXTERNAL FACTORS	**Threats and Hazards** Divergence of Economic and Security Goals Divergent Analytical Methodologies and Tools Siloed Policy Making Structures	**Opportunities** Shared Strategic Vision for Integration Integration of Economics and Security in Policymaking Valuation of Distinct Disciplinary Contributions
INTERNAL FACTORS	**Vulnerability** Inadequate Collaborative Frameworks Misalignment of Risk Perception Low or Absent Interdisciplinary Trust and Communication	**Capability** Interdisciplinary Policy Analysis and Development Skills Cognitive Diversity and Integrative Complexity Strategic Cross-Domain Education Initiatives
CONNECTING FACTORS	**Exposure** Insufficient Interdisciplinary Engagement Lack of Shared Knowledge Bases Regulatory Alignment for Interdisciplinary Engagement	**Access** Institutional Support and Resource Allocation Interdisciplinary Recognition and Career Advancement Opportunities Facilitated Access to Cross-Domain Data Repositories

RESILIENCE		
DYNAMIC CAPABILITIES	**Absorptive Capacity** Development of a United Interdisciplinary Language Interdisciplinary Crisis Simulation Exercises Integration of interdisciplinary Insights in Policymaking Processes	**Adaptive Capacity** Cultivating Shared Vision and Goals Establishment of an Interdisciplinary Geopolitical Strategy Hub Developing Better Communication with Businesses	**Transformative Capacity** Synthesized Analytic Frameworks for Integrated Policy Development Advanced Communication Platforms for Interdisciplinary Collaboration Interdisciplinary Strategic Foresight Units

Issue

How to bring together economists and security specialists in policy making in an era of increasing geopolitical competition

Goal

Prosperity and security

Perspective

United Kingdom

Risk

Threats and Hazards

EXTERNAL FACTORS

Divergence of Economic and Security Goals

Economists typically prioritize market efficiency, trade optimization, and economic growth, often advocating for openness and integration. Security specialists, on the other hand, may emphasize national security, sovereignty, and the mitigation of external threats, potentially supporting more protectionist and self-reliant strategies. As economists and security specialists aim to bring their expertise together, there may be instances where economic goals such as market expansion, trade liberalization, and fiscal incentives may not align with security objectives like safeguarding critical infrastructure, regulating foreign investments for national security concerns, and implementing trade controls. This divergence can create friction and pose a significant threat to achieving a cohesive policy that adequately balances economic growth with security imperatives. The assessment of this driver would include examining cases where economic policies have inadvertently weakened security postures, or security mandates have stifled economic potential, hence providing a nuanced understanding of how alignment or misalignment of these goals impacts overall policy effectiveness.

Divergent Analytical Methodologies and Tools

Economists and security specialists often rely on different sets of analytical methodologies and tools that are tailored to their respective fields. Economists may use statistical models, econometrics, and cost-benefit analyses to forecast economic trends and evaluate policy implications, while security specialists might utilize intelligence gathering, scenario planning, and risk assessment frameworks to understand security threats and devise protective measures. The divergence in methodologies can create barriers to synthesizing information and result in conflicting policy recommendations. The incompatibility of tools used by each discipline can also lead to difficulties in jointly analyzing complex situations that have both economic and security dimensions. Assessing this vulnerability involves exploring the extent to which the existing methodologies and tools can be integrated or adapted to facilitate interdisciplinary understanding and decision-making in the policy realm.

Siloed Policy Making Structures

Siloed policy making structures could pose a significant threat in the context of bringing together economists and security specialists in policy making. The traditional separation of economic and security issues into distinct departments or units can lead to fragmented perspectives and undermine the creation of integrated policies. These silos may limit the exchange of ideas and insights between economists and security specialists, hindering the ability to perceive and respond to issues holistically. This can be particularly problematic in an era of increasing geopolitical competition, where economic and security issues are deeply intertwined. The existence of such silos can also discourage interdisciplinary collaboration, as individuals may be incentivized to focus solely on their specific fields rather than exploring intersections and overlaps with other areas.

Vulnerability

INTERNAL FACTORS

Inadequate Collaborative Frameworks

Amid increasing geopolitical competition, a key vulnerability could be the 'Inadequate Collaborative Frameworks' for integrating economists and security specialists in policy making. Economists and security specialists often operate within distinct institutional frameworks that lack the mechanisms for effective interdisciplinary collaboration. This vulnerability can manifest in the absence of joint task forces, interdisciplinary working groups, or shared platforms for dialogue and decision-making. Consequently, the lack of structured collaborative environments can impede the flow of information and insights between disciplines, leading to disjointed policy approaches. Addressing this vulnerability requires an assessment of current institutional arrangements and the identification of gaps in collaborative infrastructure that hinder the productive convergence of economic and security expertise.

Misalignment of Risk Perception

Misalignment of risk perception arises when there is a discrepancy in how economists and security specialists perceive and prioritize risks. Economists may focus on risks to economic growth and stability, such as inflation, trade imbalances, or currency fluctuations. Security specialists, however, may prioritize risks related to national security, such as terrorism, espionage, or military conflicts. This divergence in risk perception can lead to a lack of cohesion in policymaking, where economic policies may inadvertently undermine security measures, and vice versa. It can also result in missed opportunities to address multifaceted risks that require a coordinated approach. Evaluating this driver involves examining the processes and communication channels that contribute to how risks are assessed and prioritized within policy discussions.

Low or Absent Interdisciplinary Trust and Communication

Trust and effective communication are foundational for interdisciplinary collaboration. However, the fields of economics and security operate with different terminologies, priorities, and methodologies, which can create barriers to trust and understanding. Without trust, information sharing and joint strategy formulation can be severely hampered. The lack of established communication channels that facilitate clear and regular interactions between these disciplines exacerbates this issue. This vulnerability driver recognizes that without addressing the internal barriers of communication and trust, efforts to bring these specialties together are likely to face significant challenges, reducing the effectiveness of policy outcomes in this competitive era.

Exposure

CONNECTING FACTORS

Insufficient Interdisciplinary Engagement

Economists and security specialists may have limited interaction due to the siloed nature of their professional environments, which can result in missed opportunities for exposure to each other's methodologies, insights, and strategic thinking. This limited engagement hampers the ability to construct unified policy frameworks that take into account the multifaceted nature of geopolitical issues, as economic considerations often cannot be divorced from security implications and vice versa. The lack of routine interdisciplinary exposure may lead to a decreased familiarity with the priorities and constraints of the other field, ultimately affecting the quality of policy integration. Assessing this exposure involves examining the frequency, depth, and structure of interdisciplinary interactions within policy-making institutions, and considering how these interactions facilitate or hinder the synthesis of economic and security considerations.

Lack of Shared Knowledge Bases

The absence of a common foundational knowledge between economists and security specialists creates the risk of a lack of shared knowledge bases. Each field possesses a complex set of theories, terminologies, and knowledge bases that are not necessarily accessible or understandable to professionals from the other discipline. This lack of shared knowledge can lead to difficulties in communication, misunderstandings, and the inability to effectively incorporate insights from one field into the other. The absence of a shared lexicon and understanding of foundational

Lack of Shared Knowledge Bases (cont.)

concepts may cause crucial details to be lost in translation, reducing the effectiveness of interdisciplinary policy formulation. By assessing the depth and accessibility of shared knowledge bases within policymaking institutions, we can gauge this exposure and its potential impact on interdisciplinary collaboration.

Regulatory Alignment for Interdisciplinary Engagement

In this era, the development of policies often involves navigating complex regulatory frameworks that can either facilitate or impede the effective collaboration between economists and security experts. Regulatory constraints or misalignments can significantly impact the exposure of these professionals to each other's work, insights, and perspectives. For instance, if regulations around information sharing are restrictive or not harmonized between the economic and security domains, it may limit the interaction between experts, thereby impacting policy outcomes. Conversely, regulations that promote transparency and cross-disciplinary participation can increase exposure, leading to more informed and effective policy-making. This driver highlights the importance of regulatory frameworks that are conducive to interdisciplinary exposure, which can shape the degree to which economists and security specialists can collaborate and contribute to policy decisions in the face of geopolitical challenges.

Reward

Opportunities

EXTERNAL FACTORS

Shared Strategic Vision for Integration

The opportunity for cross-disciplinary collaboration between economists and security specialists in policymaking can be enhanced by establishing shared goals and frameworks that align economic and security objectives. By creating a common conceptual ground, such as a national strategy that incorporates both economic growth and security imperatives, these professionals can find a unified direction for their joint efforts. This could involve the development of tools and models that integrate economic and security analytics, enabling more informed decision-making that considers the complexities of geopolitical competition. A shared strategic vision would not only guide policy formulation but also streamline the implementation of integrated policies, leading to a more cohesive and effective approach to national challenges.

Integration of Economics and Security in Policymaking

The identification of an opportunity for economists and security specialists to collaborate in policy making could involve the recognition of an emerging geopolitical context where economic strategies are increasingly intertwined with national security concerns. As geopolitical competition intensifies, there could be a growing need for economic policies that account for security implications and vice versa. For instance, the development of new technologies such as artificial intelligence and cybersecurity tools could be seen as dual-use, serving both economic and security functions. Therefore, an opportunity exists to create integrated policies that address these overlapping areas, potentially leading to more comprehensive and robust national strategies.

Valuation of Distinct Disciplinary Contributions

The opportunity for cross-disciplinary collaboration between economists and security specialists in policymaking can be furthered by recognizing the unique contributions each discipline brings to the table. Economists can provide insights into the financial implications and economic efficiencies of policy decisions, while security specialists offer expertise in threat assessment and risk management. This duality enriches the policy-making process by ensuring that both economic viability and security robustness are taken into account. Developing opportunities for each group to present distinct perspectives in a structured environment, such as interdepartmental committees or cross-functional teams, can lead to policies that are both economically sound and secure against potential threats. Encouraging the valuation of these distinct contributions can create a culture of mutual respect and lead to a more integrated and synergistic approach to complex policy issues.

★ Capability

INTERNAL FACTORS

Interdisciplinary Policy Analysis and Development Skills

This driver would emphasize the internal strengths and attributes that policymakers possess, which determine their ability to capitalize on the opportunity to integrate these two disciplines for more robust policy outcomes. Individuals and teams with strong interdisciplinary skills can effectively synthesize diverse perspectives, blending economic and security considerations into cohesive strategies. The development of such skills, including cross-cultural communication, systems thinking, and collaborative problem-solving, is crucial for overcoming the disciplinary silos that hinder effective policy integration. By assessing the current level of interdisciplinary policy analysis and development skills within policy-making institutions, we can gauge the capability component of the reward equation and its potential to enhance policy-making in a geopolitically competitive environment.

Cognitive Diversity and Integrative Complexity

This driver would reflect on the mental models and cognitive strategies employed by individuals and groups within policymaking institutions, highlighting how cognitive diversity and integrative complexity can act as an internal strength. The presence of cognitive diversity means that policymakers come equipped with varied problem-solving approaches, ideological perspectives, and heuristic techniques, enriching the dialogue between disciplines such as economics and security. Integrative complexity, on the other hand, refers to the ability to understand and synthesize conflicting viewpoints and information into a nuanced understanding. This capability is key in an environment where simplistic or one-dimensional policies are insufficient to address the multifaceted nature of geopolitical issues. By evaluating the degree of cognitive diversity and integrative complexity within policy-making teams, we can assess how well-equipped they are to leverage the interdisciplinary nature of economic and security concerns, thus enhancing the capability component of the reward equation.

Strategic Cross-Domain Education Initiatives

Given the challenge of integrating economists and security specialists in policy-making within an era of increasing geopolitical competition, a capability driver to consider could be 'Strategic Cross-Domain Education Initiatives'. Policymaking requires a fusion of diverse knowledge areas, and in this era, it is vital that professionals possess the educational background that spans both economics and security disciplines. Such initiatives might include joint degree programs, specialized courses, or continuous professional development modules that are explicitly designed to bridge the gap between economics and security studies. This educational foundation can enhance the ability of professionals to understand and analyze policies from a multidisciplinary perspective, thus contributing to more comprehensive and strategic policy development. By cultivating a cohort of professionals who are adept in both fields, this capability driver would strengthen the intellectual underpinning required for effective collaboration between economists and security specialists, directly impacting the quality and efficacy of policies crafted to navigate geopolitical complexities.

★ Access

CONNECTING FACTORS

Institutional Support and Resource Allocation

Institutional support and resource allocation focuses on the degree to which institutions provide support and allocate resources conducive to interdisciplinary collaboration between economists and security specialists. Access to institutional support could involve dedicated teams, funding, and mandates that directly encourage and facilitate joint efforts between these disciplines. Resource allocation could be in the form of budgets, time, and space designated for collaborative projects. These factors are pivotal as they establish the groundwork for sustained interdisciplinary interaction, thereby fostering an environment where integrated policy development can thrive. Assessing this driver involves evaluating the commitment of institutions to interdisciplinary work, based on the prominence of supportive policies, the scale of resources dedicated to such initiatives, and the presence of leadership advocating for integrated approaches to policy challenges in a geopolitical context.

Interdisciplinary Recognition and Career Advancement Opportunities

This driver contemplates the institutional and societal acknowledgement of the value that interdisciplinary work contributes to policy making. It emphasizes how recognition of joint efforts between economists and security specialists, such as through awards, publications, or career progression, can serve as a powerful incentive for collaboration. The promise of career advancement tied to successful interdisciplinary projects could motivate professionals to seek out and value such opportunities. This driver assesses the extent to which interdisciplinary achievements are celebrated and rewarded within professional communities and by the broader society, thereby influencing the degree of access to career-enhancing opportunities for those involved in cross-disciplinary policy development.

Facilitated Access to Cross-Domain Data Repositories

To inform robust policy decisions, both economists and security specialists greatly depend on access to comprehensive, accurate data. Cross-domain data repositories would be large-scale, integrated databases containing key economic indicators, security assessments, and geopolitical analyses, accessible to professionals in both disciplines. Access to such repositories enables experts to draw on a wealth of information that informs their collaborative efforts, effectively bridging the knowledge gap between the fields. This driver focuses on the availability and accessibility of shared data resources as a crucial factor that underpins successful interdisciplinary policy-making. By ensuring that data is not siloed within separate domains, but rather made readily available across disciplinary boundaries, policy formulation can be more informed, timely, and relevant, ultimately leading to more effective governance in the face of geopolitical challenges.

Resilience

Absorptive capacity

DYNAMIC CAPACITIES

Development of a Unified Interdisciplinary Language

This driver would assess the extent to which economists and security specialists are equipped with a common set of terms and conceptual frameworks that enable clear, precise communication and mutual understanding. It is paramount in interdisciplinary collaboration that participants speak a 'common language' to prevent misinterpretation and ensure that complex ideas are conveyed accurately. A unified interdisciplinary language would facilitate the seamless integration of diverse disciplinary insights, allow for more effective crisis response, and enhance the overall absorb capacity of the policymaking system by ensuring that vital information is not lost or misunderstood due to disciplinary jargon barriers. This driver is critical for evaluating the coherence of interdisciplinary teams and their ability to function effectively under the pressures of geopolitical competition.

Interdisciplinary Crisis Simulation Exercises

Considering the complexity of integrating economists and security specialists in policymaking within an era of increasing geopolitical competition, it would be important for policy-making institutions to conduct regular, realistic simulations that bring together economists and security experts to navigate hypothetical crisis scenarios. These exercises would not only test and improve the institutions' preparedness and response mechanisms but also foster a culture of collaboration and shared understanding between the two disciplines. Through repeated exposure to crisis simulations, participants can better identify and understand the interconnectedness of economic and security issues. By evaluating this driver, we can measure the practical readiness of the institutions to address real-world crises and the effectiveness of interdisciplinary teams in managing complex, fast-changing situations that require integrated solutions.

Integration of Interdisciplinary Insights in Policymaking Processes

This driver would evaluate the extent to which the policy-making process is structured to be inclusive of, and responsive to, interdisciplinary insights that blend economic and security perspectives. Such integration is crucial to formulate policies that are well-rounded and acknowledge the interconnectedness of economic and security issues. The driver would look at how policy frameworks are developed to ensure that they are flexible enough to incorporate diverse insights, and to what degree the processes facilitate the ongoing contribution of interdisciplinary knowledge throughout the policy cycle. By examining this driver, we can measure the readiness and responsiveness of policy-making institutions to adapt their strategies and decisions in real-time, based on a comprehensive understanding of the geopolitical landscape.

Adaptive capacity

DYNAMIC CAPACITIES

Cultivating Shared Vision and Goals

Policymakers often operate with discipline-specific objectives, but the complexity of geopolitics demands a unified approach. By developing shared goals that transcend disciplinary boundaries, economists and security specialists can align their strategies and analyses towards common outcomes. This driver focuses on the creation of an overarching framework that guides cross-disciplinary collaboration. It should aim to merge the distinct priorities of economic stability and security into coalescing policy directives that cater to both domains. The unifying vision would act as an anchor, ensuring that policy recommendations are not merely a collection of disparate parts but a cohesive strategy capable of addressing the multifaceted challenges of geopolitical competition. This driver emphasizes the importance of strategic coherence and shared purpose as pivotal factors in transforming the policy-making process to be more resilient against the fractures and misalignments that can arise from siloed thinking.

Establishment of an Interdisciplinary Geopolitical Strategy Hub

In the context of increasing geopolitical competition, an adaptive response could be the establishment of an 'Interdisciplinary Geopolitical Strategy Hub' (IGSH). This hub would serve as a nerve center where experts from both fields continuously interact, analyze global trends, and develop joint strategies. Unlike periodic symposia or task forces, the IGSH would be a permanent institution dedicated to fostering ongoing collaboration. The hub would not only facilitate the exchange of ideas but also actively involve experts in shaping policy by providing real-time inputs to decision-makers. It would ensure that economic and security viewpoints are not just shared but are also synthesized into cohesive strategies, keeping pace with the rapidly evolving geopolitical landscape. Institutions like the IGSH would be instrumental in moving beyond dialogue to actionable, integrated policy-making that addresses complex global challenges holistically.

Developing Better Communication with Businesses

The divergent language and frames of reference between economists and security specialists can be bridged through enhanced public-private dialogues to allow both sides to absorb divergent perspectives and synthesize them into a shared understanding. This could involve regular consultations or thematic discussions that actively involve representatives from both government and business. It's about creating spaces where policy makers and business people can directly communicate, exchange ideas and knowledge, and understand each other's perspectives. The success of this driver would rely on the willingness of participants to engage in open and constructive dialogue, the facilitation of these interactions, and the institutional support for such initiatives.

Transformative capacity

DYNAMIC CAPACITIES

Example

Geoeconomic Competition for the Global Energy Transition – RRR.ai Systems Map

The implications of US-China Geoeconomic Competition for the Global Energy Transition in a Warming World

The implication of US-China Geoeconomic Competition for the Global Energy Transition in a Warming World

GOALS	PERSPECTIVE

	RISK	REWARD
EXTERNAL FACTORS	**Threats and Hazards** Economic Coercion and Weaponized Interdependence Geopolitical Leverage over Energy Resource Escalation of Trade and Technology Disputes	**Opportunities** Cross-border Renewable Energy Infrastructure Initiatives Advancements in Green Technology Diversification of Energy and Critical Minerals Sources
INTERNAL FACTORS	**Vulnerability** Single-source Energy and Critical Mineral Dependence Lack of Technology Adaptability Economic Dependencies and Debt-leverage	**Capability** Human Capital Development in Renewable Energy Sectors Cybersecurity Strength Innovation Ecosystems Renewable Energy and Critical Minerals Knowhow
CONNECTING FACTORS	**Exposure** Investment Flow Disruptions Supply Chain Entanglement Energy and Critical Mineral Market Volatility Intellectual Property Conflicts	**Access** Strategic Partnerships for Energy and Critical Minerals Resource Development Geopolitical Influence Arising from Control over Key Commodities Support for IP Licensing or Technology Transfers Financial Market Responsiveness

RESILIENCE		
DYNAMIC CAPABILITIES	**Absorptive Capacity** - Flexible Energy Pricing Mechanisms - Energy and Critical Minerals Market Diversification - Buffer Stock Strategies/Recycling	**Adaptive Capacity** - Membership of International Energy and Minerals Agreements - Trade Agreements (including new forms such as IPEF) - Agile Energy Policy Frameworks - Diverse Energy Systems	**Transformative Capacity** - Reskilling for Energy Sector Employment - Decentralized Energy Systems - Investment in Alternative Technologies and Inputs

Issue

The implications of US-China Geoeconomic Competition for the Global Energy Transition in a Warming World

Goal

Perspective

Risk

Threats and Hazards

EXTERNAL FACTORS

Economic coercion and weaponized interdependence

As global energy systems and critical mineral supply chains become more interconnected, major powers, particularly the US and China, could leverage these interdependencies as strategic tools. The weaponization of such interdependencies may be reflected in actions like trade embargoes, tariffs, or sanctions that directly impact another nation's energy security or economic stability. These actions might be motivated by broader geopolitical aims, such as gaining an advantage in technological leadership, securing strategic resources, or influencing the behavior of other countries in global governance.

Example 1: China's ban on rare earth exports to Japan – In 2010, during a territorial dispute, China reduced its export quotas of rare earth metals, which are critical for high-tech products including in the renewable energy sector, affecting Japanese industries and prompting a global response to diversify supply sources.

Example 2: US sanctions on Chinese tech firms – The US government has placed several Chinese technology companies on a trade blacklist, citing national security concerns. These sanctions restrict the companies' access to vital US-origin technology, impeding their ability to operate and compete internationally.

Geopolitical leverage over energy resources

The US-China geoeconomic competition could intensify as the two powers vie for control over strategic energy resources and critical minerals. This competition might manifest as a threat if one side seeks to assert dominance over key energy and mineral supply chains, potentially leading to a geopolitical tug-of-war. Such a scenario could result in energy supply disruptions or the manipulation of energy and critical minerals prices, adversely affecting global markets and energy security.

Example 1: Chinese dominance of solar panel markets - China's dominance in the solar panel industry, partly due to their control over polysilicon, used for making solar cells, is a case in point. By controlling this supply chain, China can influence global solar energy markets and production capabilities. Market dominance can have many implications, including being used to affect prices or for enabling weaponization.

Example 2: US diversification attempts with allies - US's strategic partnerships to diversify critical minerals imports with trusted partners including Australia, Japan and the EU. These partnerships are aimed at reducing reliance on any single source and ensuring secure supply of minerals, which is crucial for maintaining energy independence and security as the US transitions to renewables.

Escalation of trade and technology disputes

Trade and technology disputes between the US and China represent a growing geoeconomic threat, particularly as they impact the global energy transition. The imposition of tariffs, sanctions, or restrictions can significantly disrupt the collaborative technological development necessary for advancing renewable energy infrastructure. The slowdown in technological exchange and innovation due to these disputes may hinder the global capacity to achieve climate goals and shift toward cleaner energy sources.

Example 1: US embargo on semiconductor exports to China - Semiconductors are vital for modern energy grids, including those that support renewable energy sources. The US embargo restricts China's access to these crucial components, potentially delaying advancements in energy grid optimization through AI and hindering the progress of global energy transition efforts.

Example 2: China's export controls on graphite, germanium, and gallium - These materials are essential for various technologies, including those used in the renewable energy sector. China's export controls can create significant supply bottlenecks, driving up costs and delaying the deployment of technologies such as solar panels and wind turbines, which rely on these materials for efficient energy capture and storage.

▲ Vulnerability

INTERNAL FACTORS

Single-source energy and critical mineral dependence

A significant vulnerability arises when nations overly rely on a single source for their energy imports. In the face of US-China geoeconomic competition, if either of these powers dominates the supply of a crucial energy resource, nations dependent on this source could find themselves vulnerable to geopolitical maneuvering. This vulnerability is heightened if alternative sources are not readily available or viable in the short term, leaving countries susceptible to energy supply disruptions and economic instability.

Countries may also become increasingly reliant on rare earth elements for the production of high-tech green energy solutions, such as wind turbines and electric vehicle batteries. This dependence can lead to vulnerability if these key resources are controlled by one of the geopolitical rivals, potentially leading to monopolization or strategic limitations on their availability. The scarcity of these elements, combined with geopolitical competition, can therefore significantly hinder the progress of the global energy transition.

Example 1: US' heavy reliance on Chinese rare earth minerals - The United States relies on China for a substantial portion of its rare earth elements, which are essential in various sectors, including defense, technology, and renewable energy. This reliance exposes the US to supply risks, particularly in the event of geopolitical tensions with China, which could lead to export restrictions or increased prices.

Example 2: Japan's diversification after China's export restrictions - Japan, once heavily reliant on Chinese REEs, faced a critical vulnerability when China restricted exports during a territorial dispute. Japan's response was to invest in alternative sources and technologies to reduce this dependency, demonstrating how such vulnerabilities can drive innovation and diversification in critical mineral supply chains.

Lack of technological adaptability

A key vulnerability in the geoeconomic contest between the US and China could be the lack of technological adaptability among other nations. If countries are heavily invested in specific technologies that become the focus of US-China tensions, their energy transition efforts or technological development goals might suffer. This vulnerability is particularly concerning for nations that do not possess the resources or infrastructure to quickly pivot to alternative technologies.

Example 1: Dependency on Foreign Critical Minerals - Electric vehicle batteries produced in third countries with Chinese critical minerals could become ensnared in the US' efforts to disentangle its supply chains from China. This could render the batteries ineligible for incentives like the IRA tax credits, as seen with the US Inflation Reduction Act, which prioritizes materials that are sourced either domestically or from trusted supply chains for clean energy technologies.

Example 2: Compliance with Multiple Standards - Divergent standards for EVs or hydrogen electrolyzers set by the US and China may compel third countries seeking market access to both nations to develop 'dual systems.' This duplication of efforts adds to the cost and complexity of production, potentially stalling the adoption of clean energy

Lack of technological adaptability (cont.)

technologies and delaying the energy transition.

Economic dependencies and debt-leverage

Global energy transition strategies may create financial vulnerabilities where countries accrue significant debt or economic dependencies in the pursuit of green infrastructure. If such debt is held or economic ties are strongly influenced by one of the geoeconomic competitors, this could be leveraged to exert undue political or economic influence. This form of vulnerability could impede a country's ability to make autonomous energy choices and could be exploited during periods of heightened geoeconomic tension.

Example 1: China's role in the Belt and Road Initiative (BRI) - China's financing of energy projects through the BRI, including investments in renewable energy infrastructure in participant countries, can provide it with substantial leverage. This influence becomes particularly pronounced if these projects are part of a country's core strategy for energy transition and if repayment terms or political conditions are used as tools for geopolitical influence.

Example 2: The Australia-United States Climate, Critical Minerals, and Clean Energy Partnership - This initiative, designed to strengthen ties between Australian and US green energy sectors, may inadvertently increase US influence over Australian domestic policies. This influence could extend to shaping Australia's approach to cooperation with China, potentially restricting Australia's foreign policy autonomy in balancing its relationships between two major world powers.

▲ Exposure

CONNECTING FACTORS

Investment flow disruptions

Global energy transition efforts are exposed to potential disruptions in investment flows, which could stem from the geopolitical tension between the US and China. Sudden shifts in investment strategies or the withdrawal of funds from certain projects due to changes in geopolitical priorities can have a significant impact. Exposure to this risk is particularly acute for projects that are capital-intensive and have long time horizons, such as the greening of industrial infrastructure and the development of large-scale renewables, which rely on stable and predictable investment climates.

Example 1: Increased investment scrutiny - The Foreign Investment Risk Review Modernization Act (FIRRMA) 2018 in the United States has increased the scrutiny of foreign investments, particularly those from China. This legislative move has led to a noticeable decline in Chinese investments in the energy sector within the US, as it broadens the powers of the Committee on Foreign Investment in the United States (CFIUS) to review and, if necessary, to block transactions that previously might have gone unscrutinized.

Example 2: Divided venture capital flows - Diminishing US venture capital investments in China could lead to fewer investments in emerging green technologies. As venture capital from the US dries up due to regulatory challenges, trade tensions, or governmental discouragement, Chinese firms that are at the forefront of developing new green technologies may face capital shortages. This, in turn, may slow down the innovation and deployment of these technologies, which are essential for the global energy transition.

Supply chain entanglement

The complexity and interlinkages of global supply chains for green energy technologies and critical minerals mean that countries could be exposed to risks of disruption from US-China geoeconomic competition. If key components or minerals are sourced from or pass through regions at the heart of the rivalry, the potential for delays, sanctions, or other disruptions increases. This exposure to supply chain vulnerabilities can have cascading effects, impacting the availability and affordability of sustainable energy technologies worldwide.

Example 1: US tariffs on re-exported Chinese solar panels - The US has contemplated imposing high tariffs on Chinese solar panels that are shipped to Southeast Asia for assembly before being re-exported to the US. This measure is aimed at curbing China's dominance in the solar panel market but can also lead to increased costs for US importers and potentially slow down the adoption of solar energy due to higher prices.

Example 2: US Inflation Reduction Act (IRA) and 'foreign entities of concern' - The IRA includes provisions that restrict

Supply chain entanglement (cont.)

tax credit eligibility for projects involving 'foreign entities of concern', which could exclude many critical minerals projects in third countries that involve Chinese investment or technology. This could deter investment in these projects and slow the development of green energy technologies that rely on these critical minerals.

Energy and critical mineral market volatility

As the US and China navigate their geoeconomic competition, their actions could induce volatility in global energy and critical minerals markets. Countries and companies engaged in the energy transition may consequently face increased exposure to unpredictable changes in energy and minerals costs and availability. This could disrupt long-term planning and investment decisions critical to the success of energy transition initiatives.

Example 1: Chinese control over supply chains - China's dominance in the production and processing of rare earth elements and other critical minerals gives it the ability to influence global pricing and availability. For example, if China were to restrict exports or increase prices, this could raise costs not only for the direct targets of such actions but also globally, as these materials are essential for manufacturing high-tech products, including those used in renewable energy.

Example 2: US tariffs on Chinese goods - The imposition of US tariffs on Chinese-manufactured goods, such as solar panels and electric vehicles (EVs), can have broader implications beyond the bilateral relationship. These tariffs can lead to trade diversion, where Chinese manufacturers may seek to dump their products in third-party markets like the EU at reduced prices, potentially undermining local industries and creating market distortions. Such actions could also prompt retaliatory measures, further complicating the global trade landscape for green technologies.

Intellectual property conflicts

The global energy transition relies heavily on the development and dissemination of new technologies, especially advanced batteries, carbon capture and storage and hydrogen, which can lead to increased exposure to intellectual property disputes. In the midst of US-China competition, such disputes could escalate and hinder collaboration or result in additional barriers to technology transfer. This risk exposure is particularly acute for smaller nations and companies that may lack the legal resources to navigate complex international intellectual property regimes.

Example 1: The Ford-CATL Partnership - Ford's partnership with China's CATL involves licensing CATL's battery technology for use in Ford's electric vehicles. This collaboration is under close scrutiny, as it raises concerns about technology transfer, IP rights, and the strategic implications of relying on critical technology from a potential geopolitical rival. Scrutiny from both Chinese and US policymakers reflects broader concerns about the control of and access to technology that is vital for the energy transition.

Example 2: Joint ventures in emerging technologies - Collaborations between Western companies and Chinese firms in developing next-generation renewables can lead to IP conflicts. For instance, if a Western company partners with a Chinese firm to develop advanced wind turbine technology, there could be disputes over IP ownership, patent rights, and technology sharing. The United States has also long expressed concern about China's IP practices, including with respect to industrial espionage and forced technology transfers in joint venture agreements.

Reward

Opportunities

EXTERNAL FACTORS

Cross-border Renewable Energy Infrastructure Initiatives

Joint cross-border initiatives for developing renewable energy infrastructure present a significant opportunity. Such projects can lead to economies of scale, shared technological advancement, and increased regional energy independence. By collaborating on large-scale renewable energy projects, countries can leverage mutual strengths to take advantage of the broader shift toward sustainable energy solutions. US-China rivalry could spur a ‘race to the top' in investing in green energy projects across the Global South.

Cross-border Renewable Energy Infrastructure Initiatives (cont.)

Example 1: China's Belt and Road Initiative (BRI) and Green Projects - The BRI has begun channeling investments into renewable energy projects, thereby boosting China's influence in the renewable sector of partner countries. This aligns with China's ambition to lead in the global energy transition and increase its geopolitical reach. Some of these projects have received criticism for not ensuring adequate standards with respect to environmental and social governance (ESG). This issue is dynamic, however, as China has also been responding to some of these criticisms by improving some of the standards used in BRI projects.

Example 2: G7 Partnership for Global Infrastructure and Investment (PGII) - This initiative seeks to fund sustainable infrastructure, countering China's BRI influence. It prioritizes green energy projects in developing regions, aiming to ensure the G7's stake in the global energy shift with a focus on governance and sustainability. PGII and related initiatives typically have higher ESG requirements than their BRI counterparts and also emphasize that private sector financing should be built on “good governance” frameworks. This approach may have long term advantages for these countries but it may also limit capital availability in the short term and extend project timelines given added due diligence requirements.

Advancements in green technology

The rivalry between the US and China could spur innovation as each aims to outdo the other in developing advanced green technologies. This competitive drive has the potential to accelerate technological breakthroughs, reduce costs, and improve the efficacy of renewable energy solutions. Consequently, this could lead to a more rapid and widespread adoption of green energy, as well as new business models and markets associated with it.

Example 1: US Inflation Reduction Act and Emerging Technologies - The US Inflation Reduction Act includes provisions to provide subsidies for technologies not yet commercially viable at scale, like carbon capture, utilization, and storage (CCUS), and Direct Air Capture (DAC). This support aims to accelerate the development and deployment of these technologies, promoting innovation and reducing costs through government-backed financial incentives.

Example 2: China's response to US' Efforts to de-risk Green Investments - In response to the US's initiatives to 'de-risk' its green technology sector, China is increasing its state support for domestic green manufacturing industries. This bolstering of support is intended to maintain competitiveness and drive down costs through enhanced process efficiencies and innovations, thereby advancing the technological frontier of its green industries.

Diversification of energy and critical minerals sources

In response to geoeconomic competition, nations may seek to diversify their energy sources to reduce dependence on adversaries. This could open up new opportunities for alternative energy and critical minerals suppliers and technologies, creating a more resilient and flexible global energy infrastructure and critical minerals supply chains. Such diversification could enhance energy and minerals security, reduce geopolitical risks, and support the transition to a lower-carbon economy.

Example 1: US Supply Chain Diversification - The US is taking steps to diversify its supply chains for critical minerals, aiming to boost domestic production and collaborate with allied nations. Efforts include investing in onshore mining and processing capabilities and forming strategic partnerships with countries rich in these resources to ensure a reliable and secure supply of minerals essential for green technologies.

Example 2: EU's Critical Minerals Strategy - The EU's push to secure critical minerals, including those necessary for renewable energy technologies, has been a driving factor in its trade negotiations, including notably in the pursuit of a Free Trade Agreement (FTA) with Australia. This strategy aims to secure a stable and diversified supply chain for essential minerals, reducing reliance on any single source and promoting economic cooperation with resource-rich countries aligned with EU standards and values.

★ Capability

INTERNAL FACTORS

Human Capital Development in Renewable Energy Sectors

Investing in the education and training of the workforce for the renewable energy sector increases a nation's capability to support the global energy transition. Human capital specialized in areas like solar, wind, and other renewable technologies will be crucial for innovation and maintenance of a sustainable energy infrastructure. This capability becomes even more valuable in the face of US-China geoeconomic competition, as it provides the internal strength to advance despite external geopolitical pressures.

Example 1: US Inflation Reduction Act (IRA) and Workforce Training - The IRA includes measures to support the development of skills and apprenticeships in the clean energy sector. This includes incentives for educational programs and workforce training specifically designed to equip workers with the necessary skills for emerging clean energy technologies, from solar and wind to advanced battery manufacturing.

Example 2: Australia's Energy Transition and Workforce Development - As part of its vision to become a renewable energy superpower, Australia is focusing on a just transition for communities dependent on the coal industry. This involves the establishment of the Net Zero Authority, which is responsible for managing the transition and investing in the development of new skills and job opportunities in the renewable energy sector, ensuring that the workforce is ready to support a sustainable energy future.

Cybersecurity strength

In an era where the energy transition is heavily reliant on digital technologies, cybersecurity strength becomes a critical capability. As tensions between the US and China grow, the risk of cyberattacks on critical energy infrastructure also increases. Nations and companies with advanced cybersecurity measures will be more capable of protecting their data and operations, ensuring the uninterrupted progress of their energy transition efforts.

Example 1: Australia's SOCI Act Enhancements - Australia has reformed its Security of Critical Infrastructure Act (SOCI) to include a broader range of sectors, notably the energy sector, enhancing obligations for cybersecurity protection. This includes renewable energy operators, ensuring they are equipped to defend against cyberattacks and contribute reliably to the energy transition.

Example 2: US Cybersecurity Initiatives in the Energy Sector - The US is implementing a suite of measures to bolster cybersecurity in the energy sector. These include establishing partnerships between the government and private companies to share intelligence, developing cybersecurity standards, and issuing Executive Orders to fortify the nation's cyber infrastructure. There are also targeted R&D efforts for advancing cybersecurity technologies, coupled with specialized training and workforce development programs.

Innovation ecosystems

The creation and nurturing of robust innovation ecosystems can be a powerful capability for countries during the US-China competition. These ecosystems, fostering collaboration between academia, industry, and government, can drive the development of new energy technologies and solutions. With this capability, nations can stay at the forefront of energy innovation, adapting quickly to changes in the geopolitical landscape and maintaining momentum in their transition to renewable energy.

Example 1: Chinese Government-Industry Partnerships in Green Tech - China's strategic partnerships between government and industry have significantly advanced its green technology sectors, such as battery technology, solar photovoltaic (PV) energy, and electric vehicles (EVs). These partnerships often involve state support for research and development (R&D), subsidies, and creating favorable market conditions for domestic companies, which have enabled China to become a leader in these fields.

Example 2: US Public-Private Collaborations for Innovation - In the US, similar ecosystems are formed through public-private collaborations, where the government supports R&D through grants and tax incentives, while private firms contribute through innovation and commercialization efforts. An example is the Advanced Research Projects Agency-Energy (ARPA-E), which funds high-potential, high-impact energy technologies that are too early for private-sector investment.

Renewable energy and critical minerals knowhow

Collaborations, including joint ventures and collaborative R&D programs, can expedite the diffusion of technology and knowledge in the renewable energy and critical minerals sectors, enhancing the pace of energy transition.

Example 1: Australian Solar PV Research and Commercialization - Research in solar photovoltaic (PV) technology at

Renewable energy and critical minerals knowhow (cont.)

the University of New South Wales (UNSW) in Australia was successfully commercialized for mass production in China. The collaboration allowed Australian scientific advancements in solar technology to be translated into large-scale manufacturing capabilities in China, making solar PV technology more accessible and affordable on a global scale.

Example 2: Chinese Investment in Lithium Refining in Australia - Chinese investments in Australian lithium refining can assist in Australia's strategy to develop its capabilities in downstream, value-added mineral industries. Such investments not only contribute to Australia's aspirations to transition from raw material exports to higher-value production but also support the global supply chain for critical components in renewable energy technologies, such as batteries for electric vehicles.

★ Access

CONNECTING FACTORS

Strategic Partnerships for Energy and Critical Minerals Resource Development

The formation of strategic partnerships can enhance a nation's access to critical energy and minerals resources amid US-China geoeconomic competition. These alliances, particularly with nations possessing abundant renewable and critical minerals resources, can secure long-term energy and minerals supplies. This access is crucial as it seeks to mitigate risks associated with access to resources amid US-China competitive dynamics by forming trusted supply chain ‘clubs' to procure necessary resources for the energy transition.

Example 1: Minerals Security Partnership (MSP) - The MSP, led by the US, is an initiative designed to secure the supply chains of minerals that are critical for modern technology. It aims to bring together like-minded countries to collaborate on ensuring the supply of minerals essential for economic security and the transition to renewable energy.

Example 2: Singapore's Green Economy Agreements - Singapore has been proactive in negotiating bilateral Green Economy Agreements with various partners. These agreements focus on securing a reliable supply of clean energy and entail collaborative efforts in R&D, commercialization of new technologies, and the building of green infrastructure.

Geopolitical Influence arising from control over key commodities

As the geoeconomic competition between the US and China unfolds, both countries will be in a position to exert geopolitical influence through controlling access to key sources of financing and supply of critical materials. Nations that can navigate this changing terrain can potentially secure more favorable terms for their access, which is crucial for the energy transition.

Example 1: China's Dominance of Critical Minerals - This dominance gives China significant leverage over countries that depend on these imports to sustain their industries. For instance, China produces about 80% of the world's rare earth elements, and disruptions in supply can have global repercussions, leading to price volatility and scarcity of supplyl. Nations may thus seek to maintain stable diplomatic relations with China to ensure continued access to these resources.

Example 2: US IRA Tax Incentives and Friendshoring - The U.S. government, through initiatives like the Inflation Reduction Act (IRA), has introduced tax incentives designed to bolster domestic production and foster "friendshoring" to reduce reliance on countries deemed as strategic competitors, such as China. Countries like Indonesia, rich in nickel reserves critical for electric vehicle batteries, may find these incentives attractive and hence strive to meet the governance and supply standards set by the U.S.

Support for IP licensing or technology transfers

The competition between the US and China could lead to one or both countries to support IP licensing on favourable terms or technology transfers for certain clean energy technologies in an attempt to gain strategic allies or influence other nations. This could improve access to cutting-edge technologies for countries looking to transition to greener energy sources. As a result, nations closely monitoring these geopolitical shifts may benefit from sudden openings in technology availability.

Example 1: Australia and the Australia-US Climate Compact - The Australia-US Climate Compact is an example of

Support for IP licensing or technology transfers (cont.)

how geopolitical alliances can facilitate the transfer of technology and intellectual property (IP) in the clean energy sector. Under this agreement, Australia would be in a prime position to benefit from US technological advancements spurred on by the IR Act, including in CCUS, emerging battery technology and hydrogen, through bilateral investment and technology collaborations.

Example 2: Developing Nations and Technology Transfers - Developing Nations may benefit from technology transfers as part of international climate change mitigation efforts. For instance, countries in Africa could receive solar energy technologies from China under the Belt and Road Initiative, which includes a green development component. Such transfers enable these countries to leapfrog to newer technologies, improving their resilience to climate change and energy scarcity.

Financial market responsiveness

The global energy transition in the context of US-China competition may influence financial markets, affecting access to capital for green energy projects. The geopolitical rivalry might lead to fluctuations in investment trends, with investors seeking to back projects that align with the strategic interests of either power. Entities that can adeptly understand and predict these financial shifts will have better access to the capital needed for transitioning to sustainable energy sources.

Example 1: Leveraging Green Incentives for Investment Diversification - Both US and Chinese government incentives for green projects (IRA in the US and state subsidies in China) make them more attractive destinations for green financing and investment, providing opportunities for private investors to hedge and invest in both to secure high returns.

Example 2: European Investment in Green Technology - Not wanting to fall behind, the European Union is a third major power in the race to boost its green economy through the Green Deal Investment Plan. This initiative aims to catalyze €1 trillion in sustainable investments over a decade, creating an attractive destination for capital seeking stability and growth in the green sector.

Resilience

Absorptive capacity

DYNAMIC CAPACITIES

Flexible Energy Pricing Mechanisms

The development of flexible energy pricing mechanisms that can adjust to global market fluctuations is an indication of absorptive resilience. By implementing pricing strategies that can buffer against sudden changes in energy costs due to geopolitical dynamics, nations and companies can maintain economic stability. This financial adaptability is especially important in a context where energy prices may be volatile as a result of the US-China geoeconomic competition.

Example 1: Australia's Flexible Energy Pricing - Australia has implemented a series of flexible energy pricing mechanisms, such as dynamic pricing, demand response programs, and financial hedging strategies, to cushion the economy against energy supply shocks. Dynamic pricing allows electricity prices to fluctuate based on supply and demand. Demand response programs reward businesses and consumers for reducing their energy usage during peak periods. Financial hedging strategies are used by energy companies to lock in prices for future delivery.

Example 2: Germany's Renewable Energy Act - Germany's Renewable Energy Act (EEG) promotes the development of renewable energy sources through a feed-in tariff system. This system guarantees fixed prices for energy produced from renewable sources, offering long-term contracts that provide stable and predictable returns for investors. This mechanism is designed to absorb market shocks by insulating the renewable energy sector from the volatility of fossil fuel prices, thus contributing to the country's energy resilience in the face of global geopolitical tensions.

Energy and critical minerals market diversification

Diversification of energy and critical minerals markets can enhance a nation's absorptive capacity, allowing it to withstand shocks to any single energy source or supplier. By engaging with a variety of energy and minerals producers and investing in multiple forms of energy, countries can absorb fluctuations in availability and pricing caused by the US-China geoeconomic competition.

Example 1: US-led Minerals Security Partnership - The United States has initiated the Minerals Security Partnership (MSP) as a collaborative effort with allied nations to ensure a stable and secure supply chain for critical minerals, which are essential for modern technology and defense industries. The MSP seeks to promote responsible and sustainable mining and processing practices globally, which is crucial given the concentrated supply from countries like China.

Example 2: EU's Floating LNG Terminals - In response to energy security concerns, particularly regarding natural gas supplies from Russia, the European Union has increased its investment in floating liquefied natural gas (LNG) terminals. This infrastructure allows the EU to tap into the global LNG market, reducing dependency on pipeline gas, which has traditionally come from Russia.

Example 3: Japan's Rare Earth Strategy - Japan has invested in companies like Lynas Corporation, an Australian firm that is one of the largest producers of rare earth minerals outside China. Japan's strategy aims to reduce its dependency on Chinese rare earth exports, which are critical for its high-tech and automotive industries.

Buffer stock strategies/recycling

Implementing buffer stock strategies and recycling for critical energy materials and technologies can increase a nation's absorptive capacity. This tactic involves maintaining a reserve supply of key materials to buffer against supply chain disruptions and market volatility that may result from geoeconomic competition.

Example 1: Japan's Rare Earth Stockpiling - After China's export ban in 2010 highlighted vulnerabilities in rare earth supplies, Japan began stockpiling these materials to ensure a continuous supply for its technology and manufacturing sectors. The strategy enhances Japan's resilience against potential geopolitical disruptions in the supply of these critical components.

Example 2: IEA's Oil Stockholding Requirement - The International Energy Agency (IEA) mandates its member countries to maintain minimum oil stockholdings, which acts as a buffer in case of global supply disruptions. In such events, these strategic reserves can be released to stabilize markets and mitigate the impact on energy prices and availability.

Example 3: Recycling of Critical Minerals - Investment in the recycling of critical minerals is an emerging strategy to bolster supply chains. This not only contributes to a circular economy but also increases a nation's absorptive capacity, ensuring that a steady supply of critical materials is available even when new mining is disrupted.

Adaptive capacity

DYNAMIC CAPACITIES

Membership of International Energy and Minerals agreements

Membership in international energy agreements like the International Energy Charter or forums like the IEA can enhance a nation's adaptive resilience. Such agreements and forums provide frameworks for cooperation and conflict resolution, which can be swiftly enacted in response to changes in the geopolitical landscape. By aligning with these agreements and forums, countries can secure a more predictable environment for their energy strategies, even amid the uncertainties of US-China competition.

Example 1: IEA's Coordination on Critical Minerals - IEA member countries actively engage in dialogue and strategic planning to manage the supply and security of critical minerals necessary for the energy transition. This international cooperation helps to identify and mitigate risks by sharing information and coordinating policy responses to potential supply disruptions.

Example 2: The Cobalt Action Partnership - An example of such international cooperation is the Cobalt Action Partnership (CAP), which aims to address the challenges of sustainable cobalt supply chains. Cobalt is essential for batteries in electric vehicles and energy storage solutions. The CAP brings together various stakeholders, including producing countries, companies, and NGOs, to ensure responsible sourcing and address the impacts of cobalt mining.

Trade agreements (including new forms such as IPEF)

Negotiating trade agreements that allow for flexible adjustments and coordinated action in response to geopolitical changes enhances a country's adaptive capacity. Bilateral and multilateral preferential trade agreements can enable flexible redirection of trade flows in the event of blockages or economic coercion by one trading partner, while multilateral agreements such as IPEF's Supply Chains Agreement enable countries to coordinate their responses to disruptions.

Example 1: New forms of trade agreement - Supply Chain Agreement under the Indo Pacific Economic Framework will enable 14 economies in the region to have ‘early warning' systems for supply chain disruptions and coordinate collective action to address supply shortages.

Example 2: Free trade agreements in general - Bilateral and multilateral free trade agreements encourage business-to-business linkages enabling quick pivoting of trade to other partners in the event of disruption with primary trade partner.

Agile energy policy frameworks

Developing agile energy policy frameworks that can be quickly adjusted in response to new developments in the US-China competition demonstrates adaptive resilience. Policies that can evolve with the geopolitical landscape ensure that a nation's energy sector remains competitive and aligned with both domestic goals and international dynamics. These policies could coordinate demand response (including by reducing demand), and enable greater supply of domestically produced resources.

Example 1: Australia's Domestic Gas Security Mechanism - Australia's Domestic Gas Security Mechanism (DGSM) is designed to ensure that the domestic market has sufficient natural gas supply before it is exported. This policy allows for government intervention in the event of a forecasted supply shortfall, prioritizing local needs and maintaining energy security within the country.

Example 2: The European Union's Energy Union Framework Strategy - The European Union's Energy Union Framework Strategy is a comprehensive plan to ensure energy security, sustainability, and competitiveness. The strategy includes measures to diversify energy sources and routes, improve energy efficiency, and enhance the EU's ability to respond to energy crises, making the energy system more resilient to external pressures, including those arising from geopolitical tensions.

Diverse energy systems

Investing in multiple different forms of energy technologies and inputs (e.g. gas, renewables (wind, solar, hydro), coal, diesel, nuclear) equips a nation with the adaptive capacity to respond to shifts in the energy landscape driven by US-China competition. A diverse energy system that relies on multiple different forms of energy technologies and inputs enables a country to adapt when supply of one particular technology or input is cut off.

Example 1: Diversity of the U.S. Energy System - The United States' energy system showcases high diversity with a mix of gas, coal, nuclear, and a growing proportion of renewables like wind, solar, and hydroelectric power. This multifaceted energy portfolio allows the U.S. to pivot between energy sources as needed, providing a buffer against international supply chain disruptions and enabling a more stable transition towards sustainable energy sources.

Example 2: India's Energy Mix - India presents another example of energy system diversity. It has been expanding its renewable energy capabilities rapidly, while also relying on traditional sources like coal and pursuing nuclear energy. This diverse mix not only supports energy security but also positions India to meet its energy demands sustainably, despite global geopolitical shifts affecting energy supply and trade.

Transformative capacity

DYNAMIC CAPACITIES

Reskilling for Energy Sector Employment

The retraining and reskilling of the workforce to meet the demands of emerging energy sectors can signify transformative resilience. This shift would not only prepare the workforce for current energy transition needs but also enable a country to pivot its labor market towards future-proof industries. The ability of a nation to transform its workforce skills profile will likely determine its long-term success in the global energy market, especially in a world where the types of energy generation and consumption are evolving.

Example 1: United States' Workforce Reskilling - In the United States, initiatives such as the Department of Energy's workforce development programs are aimed at reskilling workers for the green economy. This includes investments in STEM education, job training for renewable energy sectors, and partnerships with community colleges to develop curricula that reflect the skill needs of a low-carbon future.

Example 2: European Union's Green Skills Agenda - The European Union, through its European Skills Agenda and the Pact for Skills, has prioritized the development of a skilled workforce to support the European Green Deal. It involves a sectoral approach, identifying skill needs and gaps in the green economy, and providing targeted training programs.

Decentralized energy systems

Investing in decentralized energy systems such as microgrids and distributed generation technologies is a form of transformative resilience. This approach fundamentally alters the structure of a nation's energy network, making it less susceptible to disruptions from geopolitical tensions and aiding the shift towards a diverse, lower-carbon energy portfolio.

Example 1: Distributed Energy Systems - As countries move from fossil fuel to distributed renewables-based energy systems, reliance on distributed generation (e.g. Australia's rooftop solar panels) or microgrids in remote areas (e.g. Indonesian's islands) will reduce single points of failure from large, centralised generators and reduce reliance on imported fossil fuels.

Example 2: African Rural Electrification - In Africa, decentralized energy systems have played a transformative role in rural electrification. Solar home systems and community microgrids are increasingly used to provide electricity to remote villages that are not connected to the national grid. This not only reduces the continent's dependence on fossil fuels but also empowers local economies.

Investment in alternative technologies and inputs

One way to reduce reliance on chokepoint critical minerals is investment in alternative inputs, including synthetic materials or new technologies that reduce reliance on certain critical minerals with concentrated supply chains.

Example 1: Alternative Chemicals-Based Batteries - Research and development efforts are increasingly focused on creating batteries that use alternative chemicals to lithium. These include sodium-ion batteries, which use abundant materials and have a similar energy density to lithium-ion batteries. Such technologies could diversify the battery supply chain and reduce the risks associated with lithium's geopolitical and market volatility.

Example 2: Development of Solid-State Batteries - Solid-state batteries represent a significant advancement in battery technology, with the potential to use less or no cobalt, which is often mined under difficult conditions in the Democratic Republic of Congo. These batteries use solid electrolytes rather than liquid ones, potentially offering higher energy density, improved safety, and longer lifespans, while also mitigating ethical and supply chain concerns related to cobalt.

Example

Australia's Relationship with China – RRR.ai Systems Map

Australia's relationship with China, including the effects of rising US-China strategic rivalry

Australia's relationship with China, including the effects of rising US-China strategic rivalry

GOALS	PERSPECTIVE
Prosperity, security and social cohesion	Australia

	RISK	REWARD
EXTERNAL FACTORS	**Threats and Hazards** China's Growing Power in the Indo-Pacific China's Foreign Interference and Espionage US-China Economic and Technological Competition Economic Coercion and Diplomatic Denial China's Structural Economic Changes and Slowdown	**Opportunities** China's Market Size and Growth Strong Economic Complementarities Technological Innovation and Collaboration Potential to Collaborate on Global Issues
INTERNAL FACTORS	**Vulnerability** Trade Dependence on China Security Dependence on the US	**Capability** Australian Business' Competitiveness Rule of Law in Australia Multicultural Competencies Diplomatic Capabilities
CONNECTING FACTORS	**Exposure** Location in the Indo-Pacific Bilateral Flows of Trade, Investment, and People Engagement in Multilateral Institutions	**Access** Investment Access and Flows Trade Access and Flows Immigration and People Flows Time Zone and Proximity

RESILIENCE

DYNAMIC CAPABILITIES

Absorptive Capacity	Adaptive Capacity	Transformative Capacity
Political and Social Cohesion	Selective Market Adaptability	Greater Economic Complexity and Self-reliance
Relational Capital	Open Democratic Debate	Significantly Closer Cooperation with the US
Strong Domestic Institutions	Policy Adaptability	Significantly Deeper Engagement with China
Economic Health and Financial Reserves		

Issue

Australia's relationship with China, including the effects of rising US-China strategic rivalry

Goal

Prosperity, security and social cohesion

Perspective

Australia

Risk

Threats and Hazards

EXTERNAL FACTORS

China’s growing power in the Indo-Pacific

China's increasing power in the Indo-Pacific amplifies potential threats to Australia's national interests. As China's military rapidly modernises and emerges as the most powerful regional force, Beijing is increasingly using its armed forces to advance its efforts to coerce, and eventually, annex Taiwan and to intimidate regional countries, including over territorial and maritime disputes. These developments could destabilise the region and heighten the chances of military conflict, which would harm Australia's economic and security interests. China is also leveraging its growing diplomatic and economic clout to influence international organisations and shape international agreements, at times in ways inimical to Australian interests. Meanwhile, China continues its effort to shape and interfere in the domestic politics and policy of other countries in the region, often resulting in outcomes that are less favourable for Australia.

Example 1: China's installation of missile and surveillance systems on artificial islands in the South China Sea could threaten Australian naval and air force transits and reconnaissance missions.

Example 2: China's Belt and Road Initiative, an expansive network of infrastructure projects in the Indo-Pacific and beyond, might pull countries in Australia's region closer to Beijing economically and strategically, thereby reducing Canberra's influence and leverage.

China’s foreign interference and espionage

As China's power and ambition have grown, it has actively sought to exert influence on politics and policy both within Australia and around the world As part of these efforts, there is credible evidence that the Chinese government has targeted Australian politicians, academics, and businesspeople, and the Australian media in a bid to encourage the Australian government to take positions more amenable to China's interests. As well as transparent and largely acceptable forms of persuasion, China has used covert and corrupting means of shaping politics and policy. Meanwhile, China is among the most serious espionage threats to Australia. Beijing uses both traditional methods and a growing array of electronic tools to pursue sustained and widespread intelligence gathering and interference. The Chinese government has also sought to use Chinese-Australians in its foreign interference efforts, while Australia's security responses to Chinese government interference have disproportionately impacted Chinese-Australians, including by inadvertently fuelling suspicions of Chinese-Australians in some parts of the community.

Example 1: As public concern about Chinese government interference has grown, Chinese-Australians have at times had their loyalty publicly questioned by Australian politicians and media commentators.

Example 2: The Chinese government's interference efforts have reportedly sought to use Chinese-Australian businesspeople and community groups as avenues for shaping politics and policy.

US-China economic and technological competition

As well as an ongoing trade war in the form of enduring Trump-era tariffs, the US and China are engaged in intensifying technology competition. Adversarial technology and economic policies in both countries are likely to escalate as the US seeks to shut off China's access to leading-edge semiconductors and related technologies while Beijing doubles down on industrial policy. The US is likely to request Australia's deepening involvement in its efforts to compete with China in critical technology and economic domains, while any Australian support for US moves to hinder China's technological development would likely seriously strain Australia-China relations.

Example 1: US efforts to enlist Australia in moves to starve select Chinese technology companies of access to foreign capital could force Australia to choose sides between Beijing and Washington, potentially either jeopardising Australia's trade and diplomatic ties with China or its military relationship with the US.

Example 2: Australian businesses might face higher costs and lost opportunities if forced to decouple from the Chinese technology ecosystem and divest from Chinese companies. Similarly, they face potential financial losses and missed opportunities if they lose access to the US market.

Economic coercion and diplomatic denial

There is an ongoing risk that China will use economic coercion or denial of diplomatic access to pressure and punish Australia to achieve Beijing's policy objectives. This risk could be triggered by a variety of factors, such as disagreements over investment access, human rights disputes, or geopolitical tensions. China could curtail leader-level or ministerial contact and impose prohibitions or restrictions on the export or import of key goods to or from Australia. Given the importance of access to the Chinese market and high-level diplomatic contact in Beijing for Australia's economic and diplomatic interests, economic coercion or loss of diplomatic access would have negative consequences for Australia's national interest.

Example 1: Australia's call for an inquiry into the origins of the COVID-19 pandemic combined with other bilateral disputes led to tensions with China, resulting in Beijing imposing trade restrictions on nine Australian exports.

Example 2: Australia's criticisms of China's human rights abuses and efforts to hold Chinese officials accountable with targeted sanctions could lead to another freeze in diplomatic relations and the imposition of trade restrictions.

China's structural economic changes and slowdown

Decelerating economic growth rates in China are likely for a range of structural reasons. As well as shrinking demographics and President Xi Jinping's cautious approach to liberal reforms, China's growth rate is likely to slow because of an economic rebalancing towards the services sector and diminishing returns on fixed assets, such as property and infrastructure. Whether as a result these and other structural shifts or external economic shocks, a tapering down of China's economic growth would have cascading effects, especially for countries heavily linked to China's economic engine, including Australia. A recession in China or even a moderate slowdown of China's economic growth rate would affect its consumption patterns, thereby altering its import needs, likely leading to associated drops in demand for some Australian energy resources and minerals. For Australia, which exports a range of commodities and services to China, these changes would have significant negative impacts on both private sector and government revenues.

Example 1: A reduced growth rate in China might curb its infrastructure projects, thereby diminishing its demand for Australian iron ore and coking coal.

Example 2: Economic strains in China can adversely impact the middleclass' spending capacity, possibly reducing the number of Chinese tourists or students visiting Australia.

▲ Vulnerability

INTERNAL FACTORS

Trade dependence on China

Australia's trade dependence on China, coupled with its exposure to changes in China's political and policy landscape more generally, create a significant vulnerability for Australia. Australia's heavy export and import concentration or dependence on China, including for especially lucrative exports like iron ore, liquefied natural gas (LNG), coal, tourism, and education, make Australia vulnerable to shifting Chinese economic policies and market fluctuations. A sudden change in China's demand for Australian commodities or services, or a move to diversify its import sources away from Australia, could adversely impact Australian industries, companies, employees, and government revenue. Meanwhile, China is the largest source of Australian imports, including numerous critical goods and services, so Chinese outbound export restrictions or moves to prioritise the domestic market could lead to shortages of essential imports in Australia.

Example 1: If China decides to source iron ore, LNG or lithium from other countries due to rising costs or for geopolitical reasons, Australian exporters would lose a major market.

Example 2: Shifting education preferences or a state-directed boycott of Australian universities could see international student revenues plummet, with significant negative flow-on effects for the Australian tertiary education sector and the broader economy.

Security dependence on the US

Australia's security dependence on the US, coupled with its exposure to shifts in US politics and policies, increase Australia's vulnerability in its relationship with China. As Australia deepens its alliance with the US through expanded military collaboration, including the AUKUS partnership, and welcomes increased US military presence, it is likely to strengthen its strategic alignment with Washington. This deepening military interdependence will heighten China's suspicion that Australia is part of a US-led containment effort and would support the US in potential regional conflicts, including in the Taiwan Strait. Concurrently, the close nature of the US-Australia relationship makes Australia especially susceptible to shifts in US domestic politics and its China policy. As the US adopts a more assertive economic and technological posture against China, Australia finds itself in a precarious position, having to navigate between aligning with US-led economic and technological competition and preserving its significant trade and investment ties with China.

Example 1: Australia's acquisition of nuclear-powered submarines in partnership with the US and UK will prompt sustained objections from China and confirm perceptions in Beijing that the Australian military will act at the behest of Washington, including in the event of military contingencies in the Taiwan Strait and elsewhere in the region.

Example 2: Australia's deepening dependence on US military technology is likely to heighten expectations in Washington that Canberra will align with US efforts to hold back China's technological rise, which will strain diplomatic relations with China and might prompt Beijing to impose additional trade restrictions on Australia.

▲ Exposure

CONNECTING FACTORS

Location in the Indo-Pacific

Australia's location in the Indo-Pacific creates additional economic opportunities but also exposes the country to the volatility of regional security dynamics, especially those influenced by US-China relations. Australia is relatively geographically close to potential military flashpoints in the region, including the Taiwan Strait and the South China Sea. On top of the risk of being drawn into a regional conflict, Australia faces potential harm to its economic interests given its dependence on shipping lanes that traverse contested waters. Australia's exposure is heightened because of the depth and breadth of the US-Australia military relationship, which would likely make Australia more militarily exposed in the event of US-China conflict. Australia's exposure would be further amplified by the intensity of the country's trade interdependence with China.

Example 1: Potential US-China conflict zones like the Taiwan Strait and the South China Sea increase the risk to Australia's maritime trade routes, which pass through these waters and are vital for its access to export markets.

Example 2: The ongoing expansion of US military presence in Australia will likely increase Australia's role in any regional military conflict involving the US, which could consequently make Australia more of a military target for China.

Bilateral flows of trade, investment, and people

A central driver of exposure in the Australia-China relationship stems from the complex interdependence characterised by the flow of trade, investment, and people. This interdependence produces massive economic and social benefits for Australia. For instance, Chinese investment in Australia has been a boon for the mining industry and contributed to the local economy, enhancing government revenues and creating jobs. Similarly, the expansive Chinese market offers unparalleled export opportunities to many Australian businesses in sectors ranging from natural resources to agricultural products, thereby contributing to Australia's economic growth. However, these flows also serve as conduits for risk, especially given China's proven track record of weaponising interdependence to pressure and punish other countries, including Australia. Rules, such as those governing foreign investment reviews, represent a mechanism for responding to different levels of risk.

Example 1: Dependence on the Chinese market for Australian exports can expose the Australian economy to risks of economic coercion.

Example 2: Given Beijing's efforts to maintain its dominant role in the international rare-earth elements (REE) market, Chinese or China-linked investors in Australian REE mines could seek to shape commercial outcomes to serve the Chinese government's national objectives.

Engagement in multilateral institutions

Australia is deeply engaged in, and benefits from, the international system and its participation in multilateral institutions. As China's diplomatic and economic influence grows, it is poised to shape international organisations and political alignments in ways that could make them less likely to reflect Australian values and interests. As a long-term beneficiary of the US-led global order, such developments could adversely impact Australia. Such shifts could expose Australia to changes in: (1) processes, meaning that Australia and its allies would likely wield less influence over institutional processes; and (2) outcomes, meaning that the decisions and actions of these institutions would likely be less aligned with Australia's international interests.

Example 1: As China strengthens its role in international organisations, it is likely to push for the reinterpretation of human rights in terms of development and economic rights at the expense of the political rights often championed by Australia.

Example 2: As China's economic influence continues to expand, Chinese companies are increasingly involved in setting international standards, including through international standard setting bodies. Increased participation of Chinese actors in these forums is changing how these forums function, which may sometimes impact the standards they produce in ways unfavourable to Australian interests.

Reward

★ Opportunities

EXTERNAL FACTORS

China’s market size and growth

China's rapid ascent to economic superpower status has created a vast and dynamic market, providing lucrative opportunities for Australian commodity exporters and service providers. The scale of China's consumer base, coupled with significant industrial and technological advancements, has made it the prime export destination for a range of Australian industries. Despite ongoing bilateral tensions and security concerns, China remains a valuable source of foreign direct investment for Australia. China's massive market size continues to offer growing trade and investment opportunities for Australia even as its economic growth rate moderates. Australia's ability to leverage this potential is crucial, especially for sectors like natural resources, education, and tourism, which have already established strong customer bases in the Chinese market.

Example 1: Australian universities have historically capitalised on China's market size and value, with a significant influx of Chinese students contributing to the growth of Australia's international education sector.

Example 2: The Australian tourism industry has flourished by catering to the increasing number of Chinese tourists, who have been amongst the highest spenders in Australia, bolstering local economies.

Strong economic complementarities

The economies of Australia and China are interlinked through strong complementarities, which have underpinned the bilateral trade relationship. Australia's rich endowment of natural resources aligns with China's robust demand for raw materials and energy to support its manufacturing sector and infrastructure development. Moreover, Australia's advanced agricultural, services, and innovation sectors complement China's economic diversification and its push towards consumption-led growth by its burgeoning middle class, which enjoys increased disposable income. As China's demand for critical minerals increases to feed its manufacturing and renewable energy industries, and as Australia transitions towards Net Zero, green economy complementarities will also grow. This symbiotic relationship underlines the significance of each economy to the other, with Australia supplying both the raw materials and services required by China's economic development.

Example 1: Prior to the introduction of anti-dumping duties in late 2020, Australian wineries saw a sustained increase in exports to China, with premium brands gaining in popularity.

Example 2: As China continues its rapid industrialisation and urbanisation, the demand for raw materials and energy from Australia will continue.

Technological innovation and collaboration

China's and Australia's technological and research capabilities present opportunities for mutual benefit. Australian research and industry advancements in sectors like renewable energy, agriculture technology, and digital services can pave the way for joint ventures and investments. Meanwhile, technological innovation could be further spurred via research collaboration between Australian and Chinese universities in Science, Technology, Engineering and Mathematics (STEM). This technological innovation and collaboration can lead to the development of solutions to global challenges, including climate change and food security. Despite these potential benefits, research and technology collaboration between Australia and China is declining, driven in part by security concerns. For the first time in the history of the Australian Research Council Discovery Projects, no China-focused grants were awarded in 2023. China was also no longer one of Australia's top-ten international collaborators.

Example 1: China's market scale and Australia's innovation ecosystem could jointly foster the development and rollout of new technologies, including in agricultural sciences and green technology, offering a dual benefit of environmental sustainability and enhanced food production.

Example 2: Australia's renewable energy innovations can aid China in transitioning towards a greener economy, further serving both countries' goals of reducing carbon emissions.

Potential to collaborate on global issues

Australia could pursue opportunities with China to address regional and global challenges, including climate change and public health. Both nations have shared interests in addressing these challenges, and cooperation in these domains can create a buffer against volatility in bilateral ties and regional security. Such collaboration not only benefits both countries but also contributes positively to regional and global stability and progress. Engaging in joint research projects, sharing best practices, and contributing to multilateral initiatives can strengthen ties and build a foundation for broader dialogue on contentious issues.

Example 1: Australia and China jointly funding a research institute focused on studying and combatting emerging infectious diseases could benefit the global community.

Example 2: Collaborative efforts in renewable energy projects could aid the transition towards a low-carbon economy, potentially setting a precedent for other nations to follow.

★ Capability

INTERNAL FACTORS

Australian business' competitiveness

Spurred by the liberal economic reforms of the 1980s, many Australian businesses have become and remain globally competitive. Australia's competitiveness has made Australian exports appealing for Chinese consumers and businesses alike. Due in large part to this competitiveness, Australia is now a leading supplier to China of minerals, energy, education, agricultural products, and tourism, amongst other exports. This competitive advantage stems from various factors, such as advanced technology, high-quality standards, and a focus on innovation and customer service. This advantageous position is bolstered by Australia's ability to consistently meet the demands of the Chinese market, ensuring a steady flow of goods and services critical to consumers and businesses.

Example 1: Competitive price point and reliability of supply, amongst other factors, have made Australia by far the largest supplier of iron ore to China.

Example 2: Despite geopolitical tensions, Australia's internationally competitive and reliable agricultural exports are an integral input into China's food security.

Rule of law in Australia

The rule of law in Australia and its commitment to international trade law anchor its global economic engagements, offering a stable and predictable legal environment that is conducive to international trade and investment. Despite China's political and diplomatic suspicions of Australia, the reliable Australian legal system has contributed to a robust bilateral investment relationship. Australia's rule of law fosters confidence among international partners and investors, who can rely on transparent and fair legal processes and intellectual property protection, which are vital for encouraging innovation and foreign investment. The rule of law also helps create a competitive business environment that can attract talent and capital from around the world. Meanwhile, Australia's legal system upholds contracts and trade agreements, reinforcing Australia's position as a trustworthy trading partner. This is further underscored by Australia's commitment to the rules-based international trading system, which ensures that China can be confident Australian governments will honour their bilateral and multilateral trade commitments.

Example 1: Clear regulations and protections for foreign investors have encouraged China to continue to seek investment opportunities in Australia despite deep and enduring bilateral tensions.

Example 2: The integrity and impartiality of Australia's legal system mean that China can afford to depend on Australian agricultural exports for its food security.

Multicultural competencies

Australia's multicultural society with its Chinese diasporas plays a role in strengthening relations with China via cultural linkages, language skills, and cross-cultural understanding. Often bilingual and bicultural, these communities can help manage bilateral relations, enhancing Australia's capability in cross-cultural communication. Furthermore, Chinese-Australian diasporas' understanding of linguistic and cultural subtleties can help Australian businesses navigate and adapt to the shifting Chinese market landscape, while bolstering the government's adeptness in handling China-related affairs. By capitalising on its multicultural strengths, soft power, and interpersonal connections with China, Australia can more effectively shape perceptions, foster goodwill, and cultivate a conducive atmosphere for dialogue on challenging topics. Operationalising these multicultural competencies will, however, be hampered by enduring barriers to hiring and promoting Australians of Chinese backgrounds in the Australian government and private sector.

Example 1: Many of the approximately 1.4 million Chinese-Australians possess language skills and cultural understanding that can help build ties between Australia and China, as well as assisting Australian businesses develop and maintain opportunities in the Chinese market. Their skills can also assist with increasing China literacy in the Australian government.

Example 2: Many Australian journalists of Chinese backgrounds use their language and cultural understanding to improve the quality of reporting and public understanding of China.

Diplomatic capabilities

Australian diplomatic capabilities are crucial for managing Australia's relationship with China. Australia's active participation in multilateral forums and international organisations can help resolve disputes and secure new opportunities in its relationship with China. Australia's successful participation in these platforms allows for dialogue, negotiation, and cooperation on global issues and can aid the resolution of bilateral disputes. Australia's bilateral diplomatic engagement with China also provides many opportunities to advocate and seek to persuade. This bilateral

Diplomatic capabilities (cont.)

diplomatic capability is used to negotiate trade deals, resolve disputes, and foster cooperation in areas such as climate change, global health, regional security, and global governance. However, Australian diplomatic capability would be even stronger if the Australian government recruited more staff with deep knowledge of Chinese history, culture, and politics, as well as strong Chinese language abilities. There have also been times when Australian diplomatic capabilities contributed to a diplomatic incident or were not sufficient to arrest a decline in relations between the two countries.

Example 1: Australia's skilful use of bilateral diplomacy helped secure the release of the long-detained Australian journalist Cheng Lei in October 2023. However, Australian diplomatic skills have not led to the release of Yang Hengjun and other Australians detained in China.

Example 2: Australian diplomatic capabilities were not sufficient to prevent a significant rupture in relations with China in 2020 after the Australian government called for an international inquiry into the origins of the COVID-19 pandemic. Combined with a wide range of other factors that contributed to the repair of the Australia-China relationship from 2022 onwards, Canberra's bilateral and multilateral diplomacy likely helped Australia advocate its trade priorities, including the resolution of several trade disputes with China over the course of 2023.

★ Access

CONNECTING FACTORS

Investment access and flows

The rules and enabling environment for foreign investments are key examples of access. Investing in China, and especially in areas such as technology start-ups, green energy projects, and advanced agriculture, allows Australia to tap into China's dynamic innovation ecosystem and massive market. Such investments not only provide financial returns, but the scope for such investments is increasing as China seeks to attract more foreign capital. At the same time, Chinese investments into Australia support and stimulate local industries, transfer technology and knowhow, enhance infrastructure development, and contribute to economic diversification. As China continues to encourage its firms to invest abroad, Australia stands to benefit from increased capital inflows, which can spur innovation and job creation. In recent years, however, there has been a discernible shift in the investment landscape, with the Australian government introducing new restrictions on foreign investments.

Example 1: Chinese investments in Australian mining and real estate projects have contributed significantly to the development of these sectors, providing employment and economic growth opportunities. This access has been enabled/regulated by Australian foreign investment laws.

Example 2: Australian financial services firms have expanded their operations in China, leveraging the burgeoning wealth and the shift towards more sophisticated financial products, enhancing bilateral economic ties. This access has been enabled/regulated by Chinese financial services laws.

Trade access and flows

The rules and enabling environment for foreign trade are key examples of access. Australia's two-way trade access to the Chinese market is facilitated by bilateral and regional trade agreements, diplomatic relations, and the international rules-based trading system. With one of the world's largest economies and consumer markets, gaining greater access to China offers Australian businesses significant and sustained opportunities. Meanwhile, access to Chinese exports provides Australian consumers and businesses with a vast array of consumer items and essential manufactured goods. Maintaining two-way trade access to China is necessary for both Australia's ongoing economic growth and its ability to fund its security policy objectives.

Example 1: The bilateral China-Australia Free Trade Agreement (ChAFTA) provided additional market access and economic opportunities for Australian exporters and the economy overall.

Example 2: Both Australia and China are World Trade Organization (WTO) members, which provides greater economic opportunities for both countries, in addition to dispute resolution procedures to resolve trade disagreements.

Immigration and people flows

The rules and enabling environment for immigration and people flows are key examples of access. High levels of immigration and people flows between Australia and China have provided massive economic and social benefits for Australia. Chinese students in Australian universities contribute significantly to the education sector's revenue and create a vibrant multicultural campus environment. Skilled Chinese workers in Australia contribute to the technology, research, and business sectors. The large and growing population of Australians of Chinese background has shaped Australia's social fabric and created deep and enduring familial and cultural linkages with China. Conversely, changes in immigration policy or public sentiment due to geopolitical tensions can lead to a decline in people flows, adversely affecting university finances, labour market dynamics, and the social integration of Chinese communities in Australia.

Example 1: China is the largest source country for international students and tourists, thereby underwriting Australia's two largest services exports.

Example 2: Australia's non-discriminatory immigration policies have seen the population of Australians of Chinese background grow to approximately 1.4 million, which has enriched Australian society and benefitted the country economically.

Time zone and proximity

Australia's time zone and geographic proximity contribute to Australia's ability to access economic opportunities in China. The overlap between China Standard Time and Australian time zones facilitates business and makes Australia a more appealing destination for travel and study. Meanwhile, compared to many other major commodity exporters, Australia enjoys shorter and easier shipping options to China. Australia's location and time zones also make it well placed to become deeply embedded in business and supply chains throughout the Indo-Pacific region, including ones that begin, transit through, or end in China.

Example 1: Australia is an attractive destination for Chinese parents and families to send their children for education, in part because of the similar time zones and the direct flights.

Example 2: Australia's major iron ore deposits in north-western Western Australia are far closer to Chinese ports than many other internationally significant deposits in countries such as Brazil and Guinea.

Resilience

Absorptive capacity

DYNAMIC CAPACITIES

Political and social cohesion

Australia's ability to absorb and mitigate the impacts of international tensions, particularly with China, is significantly bolstered by its political and social cohesion. Political cohesion is a core component of Australia's resilience, allowing it to weather economic, political, and social storms while maintaining a stable foreign policy stance. During periods of heightened tension, such as trade disputes or diplomatic disagreements with China, Australia's political solidarity ensures that internal divisions do not weaken its international negotiating position. Despite some challenges, Australia maintains a largely peaceful and cohesive society with limited populist backlashes against economic and social openness compared to other liberal democracies. Australia's commitment to multiculturalism and inclusive values has supported national cohesiveness even during periods of acute geopolitical tensions. However, recent tensions with China have seen a rise of anti-Chinese and anti-Asian racism and complaints remain ongoing about problems of bias, such as employment-based discrimination against Asian Australians.

Example 1: Australia's social cohesion has been evident in its ability to integrate a diverse population, which has helped maintain domestic harmony and a united front in international relations, even as it faces complex diplomatic challenges with China.

Example 2: Although Australia has seen a rise of racism towards Chinese-Australians, particularly in the wake of the COVID-19 pandemic, this was met with widespread community and government condemnation and active policy measures to reinforce societal bonds.

Relational capital

The nature of Australia's relationship with China has historically been one of mutual goodwill and collaboration, which has helped the relationship navigate geopolitical tensions. This relational capital—spanning both individual and institutional ties between Australia and China—has been instrumental in the two nations' capacity to manage differences amicably and maintain a robust bilateral relationship. However, this relational capital has been eroding over recent years due to escalating frictions and growing distrust, reducing the effectiveness of social reserves as a buffer in diplomatic engagements. This decline in relational capital makes it increasingly difficult for the two countries to navigate conflicts and manage differences amicably.

Example 1: Previously strong relational capital between Australia and China allowed both countries to maintain positive diplomatic, political, trade, and investment ties despite strong disagreements over contentious consular cases and China's human rights abuses.

Example 2: Despite the recent stabilisation of the bilateral ties, the decline in relational capital means that it is harder for Australia to leverage relations with China to facilitate dialogue and understanding during conflicts, which could slow the resolution of bilateral disputes.

Diversified trade and investment

Despite China's importance as an export destination and source of imports, Australia has been deepening its economic interdependence with other key economies in the Indo-Pacific and beyond. By trading more with a diverse array of partners, Australia can better absorb political and economic shocks in its relationship with China without significantly impacting its overall economic health. Notwithstanding a growing stock of investments from China, Australia also relies on a diverse range of countries for foreign capital, including the US. This approach promotes resilience and adaptability in the face of global economic shifts. However, this strategy requires careful management to ensure that trade diversification does not compromise Australia's economic competitiveness or national interests.

Example 1: Despite China's trade restrictions against Australian exporters in recent years, Australia's trade ties with a diverse range of other countries remained robust and, in many cases, has expanded.

Example 2: Australia is a member of a growing range of regional and bilateral free trade agreements, which further enhance trade and investment diversification.

Strong domestic institutions

Australia's strong domestic institutions, including its democratic governance, rule of law, and independent institutions and judiciary, provide a bulwark against foreign pressure. These institutions ensure that domestic policies are usually based on rigorous processes and the national interest rather than being swayed by external influences. They can help absorb the impacts of various economic, security, social, and political shocks that arise in Australia's relationship with China, ensuring a predictable and fair process for resolving disputes, enforcing agreements, and protecting rights. However, these institutions need to be continually strengthened and updated to maintain their effectiveness in the face of evolving domestic and international challenges. Moreover, some Australian institutions, including the Foreign Investment Review Board (FIRB), are liable to have their advice ignored on occasion due to the ultimate authority of federal ministerial and Cabinet prerogatives.

Example 1: Democratic processes give expression to a diversity of opinions on Australia-China relations, leading to rigorous and open scrutiny of policy and protecting against vulnerabilities that might stem from groupthink.

Example 2: The independence of many Australian institutions, like the Anti-Dumping Commission, ensures that they deliver findings largely free from internal and external pressure and aligned with the national interest.

Economic health and financial reserves

Australia's economic health and financial reserves, bolstered by long-standing trade with China, constitute another form of absorptive capacity. Underpinned by Australia's broad macroeconomic settings of an open and liberalised economy, these reserves provide a fiscal buffer that allows Australia to withstand and recover from economic disruptions. However, as geopolitical tensions rise and the relationship with China becomes strained, and as Australia's financial reserves are affected by other economic headwinds, the capacity of Australia's economic reserves to buffer against shocks is likely to be tested in the coming years.

Example 1: Australia's economic prosperity has allowed the country to absorb shocks, such as those from economic coercion, without immediate severe repercussions for its economy as a

Economic health and financial reserves (cont.)

whole.

Example 2: As trade relations with China face strains and economic interdependence is questioned, the resilience provided by these economic reserves is likely to be tested, potentially leading to a need for greater fiscal prudence and diversification of trading partners, which may lessen future economic rewards and thus lower absorptive capacity over time.

Adaptive capacity

DYNAMIC CAPACITIES

Selective market adaptability

Australia's adaptive capacity in global trade is particularly evident in its export of basic commodities, which typically enjoy broad global demand. This allows Australian exporters of such goods to demonstrate remarkable flexibility in redirecting their products to alternative markets in the event of trade disputes. The country's internal capacities, such as cost-efficiency and production scalability, combined with the generally homogeneous nature of these commodities, facilitate this ease of market transition. However, this adaptability has its limitations, particularly with high-value, bespoke products like premium wines and lobster, which were tailored to the Chinese market's specific tastes and preferences. These products faced greater challenges in finding alternative markets due to their specialised nature and the established consumer base in China.

Example 1: Most of the Australian commodities that were impacted by China's trade restrictions, including coal, copper, cotton, beef, timber, and barley, were able to redirect to alternative markets relatively quickly and with manageable additional costs.

Example 2: Although Australian commodities could find new buyers due to widespread demand and less specific market requirements, wine and lobster exporters faced steeper challenges in replacing the Chinese market.

Open democratic debate

As well as elite and expert views in political parties, the business community, and bureaucracy, Australia's China policy is shaped by a diverse range of civil society, media, and community voices. Given the ability of these different groups to contribute to and shape public debate, political leaders are often pushed to adapt Australia's China policy to reflect a broad range of objectives. This open democratic debate also assists Australia in managing pressure from China. Media debate and interest group advocacy on issues like human rights can reinforce and add extra weight to official Australian government messages. Meanwhile, public discussion and scrutiny of China policy will at times make the Australian government look moderate and restrained by comparison, which can help Canberra manage tensions with Beijing.

Example 1: Media, activist, and public advocacy about long-detained Australian journalist Cheng Lei is thought to have contributed to her eventual release.

Example 2: Public opinion polls, think-tank research, and community advocacy on human rights issues in Xinjiang and elsewhere in China is thought to have helped encourage the Australian government to take stronger public positions.

Policy adaptability

Australia has shown that it has the capacity to modify its security, foreign, and economic policies in response to its evolving relationship with China. The ability to recognise when a current policy is not yielding the desired results and modify it is a hallmark of effective policymaking. Australian institutions have many feedback mechanisms that enable them to draw insights from the private sector and broader society, and then update their policies and processes accordingly. Australia has amended its foreign investment policies to ensure a balance between economic gains and national security concerns, while Australia pivoted towards export promotion in alternative markets in the wake of China's economic coercion. However, in some cases, policy adaptability can come at the expense of the certainty and consistency that might promote trade and investment flows.

Example 1: The Albanese government balanced its security objectives and desire to stabilise bilateral ties with China by placing Confucius Institutes under ongoing scrutiny rather than vetoing them and risking blowback from

Policy adaptability (cont.)

Beijing.

Example 2: Australia's flexible one-China policy allows Australia to pursue mutually beneficial trade, investment, and cultural ties with Taiwan while calibrating such engagement to reduce the risk of provoking Beijing's ire.

Transformative capacity

DYNAMIC CAPACITIES

Greater economic complexity and self-reliance

Australia might seek to transform its economic strategy towards greater economic complexity and self-reliance by broadening its industrial and technological base to mitigate the risks of over-reliance on certain markets, including the Chinese and US markets. By fostering a diverse array of sectors and reducing dependence on raw commodity and services exports, Australia can build a more robust economy capable of withstanding global market and geopolitical shifts. Investments in local manufacturing, technological development, and innovation would be pivotal to this by generating domestic growth, diminishing import dependency, and increasing the complexity of the Australian economy. However, greater self-reliance also presents challenges, such as managing the potentially significant economic inefficiencies and costs and the new vulnerabilities created by increasing domestic dependencies.

Example 1: Developing and expanding Australia's renewable energy sector not only diversifies the economy away from the traditional carbon-intensive resources sectors, but also positions the country as a leader in sustainable technology.

Example 2: Encouraging the growth of value-added industries, such as advanced materials and biotechnology, can reduce reliance on resources exports and create high-skilled jobs, fostering a more resilient and diversified economic landscape.

Significantly closer cooperation with the US

To manage the geopolitical upheaval of scenarios like conflict with China sparked by a Taiwan Strait contingency, Australia might pursue alliance-driven transformative resilience. This might entail Australia further deepening its alignment with the US and/or other allies and partners to prepare for the economic and military repercussions of a US-led military standoff or conflict with China. Simultaneously, Australia might aim to bolster its national defence industry, invest in critical technologies, and secure its supply chains from excessive reliance on potentially hostile actors. By pre-emptively developing contingency plans, Australia could mitigate the impact of sanctions and trade disruptions while contributing to an allies- and/or partners-centric defence posture. This transformation would underscore the importance of international cooperation and collective security in safeguarding the national interest against the backdrop of a more bifurcated global order. Such a transformation would, however, create intense vulnerabilities in the form of deeper dependence on the US, as well as heightened exposure to US politics and policy, and likely costly trade-offs between security and economic efficiency.

Example 1: Expanding Australian defence production capabilities, including in partnership with the US, to secure its military supply chains amidst global uncertainties and potential sanctions or a conflict with China.

Example 2: Australia forging closer ties with like-minded nations to develop alternative trade blocs and technology partnerships that circumvent reliance on Chinese goods and infrastructure.

Significantly deeper engagement with China

In anticipation of a potential thaw in US-China relations, Australia could recalibrate its approach towards increased engagement with China. This shift could focus on leveraging improved geopolitical conditions with China to enhance trade, investment, and collaborative efforts on global challenges like climate change. Embracing this positive turn, Australia could seek out synergistic opportunities with China in areas of mutual interest, such as research and development in green technologies and sustainability. This strategy would enable Australia to diversify its international technological collaboration, moving beyond traditional alliances and partnerships to foster more economic efficiency and growth, and developing a more interconnected and cooperative regional approach.

Example 1: Australia increasing its participation in international forums focused on clean energy and climate technologies, working closely with both China and likeminded partners to drive global

Significantly deeper engagement with China (cont.)

action.

Example 2: Revising investment strategies to tap into new markets and sectors emerging from reduced US-China tensions, while also fostering cross-border innovation and digital economy collaborations with China.

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