

BACKGROUND PAPER

GEOPOLITICS OF DECARBONISATION: TOWARDS AN ANALYTICAL FRAMEWORK

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ABSTRACT

An increasing number of scholars and political analysts draw our attention to the fact that the necessary decarbonisation of the global economy, changing the world as we know it, will impact international affairs and geopolitics. But do we agree on what geopolitics of decarbonisation is (not)? How can we look at this area of inquiry more systematically? What developments and causalities does it encompass? This paper draws on the literature on both geopolitics and decarbonisation in an attempt to help structure the discussion and identify pertinent questions about future trends.

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1. Decarbonisation is geopolitical, geopolitics is decarbonising

Geopolitics and decarbonisation are broad topics which have inspired much academic and policy thinking, but less attention has been paid to how exactly they interrelate. For one, decarbonisation processes are embedded in geopolitics. Most measures to reduce emissions depend on nation states and their governments. These are influenced by international context and relations – and these relations are geopolitical, to the extent that they are formed by geographies and natural resources. At the same time, resource geographies and their impact on international relations change in a decarbonising world. So, decarbonisation, in turn, has implications for geopolitics.

In this paper we suggest a way to structure the links between the two concepts, drawing on existing literature, in order to help define geopolitics of decarbonisation as a field of inquiry. The goal of the paper is not to create an entirely new framework. It is rather to **clarify which questions constitute this emerging research agenda**.¹ This is done partly by asking where decarbonisation research already includes geopolitical thinking and which tools scholars of geopolitics give us to analyse the trends of decarbonisation.

First, we give a brief overview of the concepts of geopolitics and decarbonisation separately in sections 2 and 3. This will help us highlight linkages in section 4 and understand 1) how the dynamics of decarbonisation are embedded in, and influenced by geopolitical relations; 2) how geopolitical patterns are or could be changed by a low-carbon transformation of societies and on the global scale. We provide potential research questions to illustrate these connections. In section 5, we present a set of parameters that can be used to research the geopolitics of decarbonisation, drawing attention to possible approaches and focal points within the field. Finally, we suggest selected avenues for policy action in section 6.

2. What is “geopolitics”?

i. What’s in a word? The diverse uses of “geopolitics”

Geopolitics is a term frequently used in public discourse, often as a catch-all for issues relating to international affairs. Since the concept emerged, geopolitics has been subject to scientific and applied political interest which, however, implies different understandings of the term, as we learn below (Jones and Sage 2010: 320). Thus, a strict definition that does justice to all possible meanings is hard to come by: geopolitics is probably best described as **a field of interest or a specific lens to**

“DECARBONISATION PROCESSES ARE EMBEDDED IN GEOPOLITICS; AND RESOURCE GEOGRAPHIES CHANGE IN A DECARBONISING WORLD.”

¹ Specifically, this paper was written to help structure and guide the work stream on geopolitics of decarbonisation in the Mistra Geopolitics Programme (MGP) and draws strongly on the discussions in the research consortium. The authors would like to thank all MGP researchers who provided their insights during various conversations on the topic.

look at the world that has been evolving and changing over time

(Steinmetz 2012: 3-10).

Active use of the term “geopolitics” started at the end of the 19th century to reflect upon how relations of power and vulnerability between nation states depend on their territories and natural resources. It was observed, this often connected to warfare and security strategies, dovetailing especially well with the view of the world as an international competition for land and power (Ó Tuathail 1998: 15, Flint 2017: 8, Mamadouh 1998: 238).

Interest in geopolitics rose and faded throughout the years, also varying between regions. For instance, in the 1970s Henry Kissinger popularised the term, but in the decades that followed it received less attention, especially in academia. Some authors point out that there is a renewed demand for geopolitical explanations recently (Flint 2017: 11-15, Mamadouh 1998: 237-238, Steinmetz 2012: 3-10). Geopolitics was also a domain for both geographers and political scientists (Steinmetz 2012: 7), which meant a more varied set of theories and methodologies were applied to the topic.

Bearing in mind that geopolitical ideas were used by practitioners in a specific historical context and in pursuit of political goals, a critical view is necessary (Flint 2017: 12-15, Steinmetz 2012: 2). Flint notes that so-called “classical” geopolitics was mostly maintained by white male elites, from a privileged “all-knowing position” and encouraged a high degree of simplification while claiming an “objective” view of the world which helped justify and gain support for policies – a usage that still carries weight in some public and academic discourses (Flint 2017: 5, 14). He also notes that this implied the “reassuring promises of understanding and control [...] reinforced by another promise [...], prediction” (Flint 2017: 1). Another word of caution on the use of the concept goes:

In practical geopolitics, there is an urge for frames of thinking to guide short term behaviour. Simplistic theories able to reduce the complexity of reality to one clear conflict [...] are welcome. They serve to define the interests of a state, to identify (possible) threats and to formulate appropriate policies dedicated to the state’s interests and to the contention of the perceived threats; in short: geopolitical codes (Mamadouh 1998: 242.)

The paper by Virginie Mamadouh (1998) gives a good idea of how diverse the use of “geopolitics” is, based on two helpful distinctions: **whether only states are considered important actors and whether a practical or an academic standpoint is taken**. With this, the paper establishes a matrix of four approaches in existing studies:

- neoclassical geopolitics;
- critical geopolitics;
- non-geopolitics;
- subversive geopolitics.

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NECESSARY.”**

The applied approach that takes states as the main actors is called **neo-classical geopolitics** – it is a modern, somewhat reformed descendent of classical geopolitics; some representatives of this approach also use the term “geo-strategy”. It includes political analyses of how resources and geographic locations of states affect their foreign affairs. This also encompasses geo-economics that puts economic rather than territorial power to the centre and emerged more recently (Mamadouh 1998: 238-239).

In the opposite corner of the matrix is **critical geopolitics** – an academic approach that includes non-state actors. Coming from discourse analysis of foreign policy, critical geopolitics makes the geopolitical perspective on international relations its research object and seeks to deconstruct its concepts, among other, recurring to historical context (Mamadouh 1998: 244-246).

The other two approaches seem to be somewhat further detached from more commonly used meanings. **Non-geopolitics** (state-centred and academic) mainly includes political geographers and peace scholars who seek to “denounce the use of geographical knowledge by the state and especially by its military machine” (Mamadouh 1998: 242).

	Practical/applied	Academic
States	<p>Neo-classical geopolitics</p> <p>Geopolitics, géostratégie, geoeconomics</p>	<p>Non-geopolitics</p> <p>Political geography</p>
Other actors	<p>Subversive geopolitics</p> <p>Géopolitique interne et externe</p>	<p>Post-structuralist geopolitics</p> <p>Critical geopolitics</p>

Figure 1. Four approaches to geopolitics. Source: Mamadouh 1998.

Subversive geopolitics is an applied approach that challenges the monopoly of states, claiming that all territorial conflict, including within a state, and conflicting views of the national interest can be analysed in geopolitical terms (Mamadouh 1998: 240-241).

ii. Is everything geopolitical? Towards cornerstones of the concept

Citing the distinctions made by Mamadouh (1998) helps illustrate how heterogeneous the field of geopolitics is. It does not imply that this particular grouping of approaches can accommodate every perspective, especially as this classification is inductively derived from a set of geopolitics studies primarily in the 1990s (Mamadouh 1998: 237).

This paper seeks to distil some of **key components** common to most views on order to be able to delineate geopolitics of decarbonisation as

a field of research. Thereby, we hope to avoid ex-ante excluding any specific view of geopolitics, as both applied and academic as well as both state and not state-centred geopolitical analyses may look at decarbonisation as a geopolitical phenomenon.

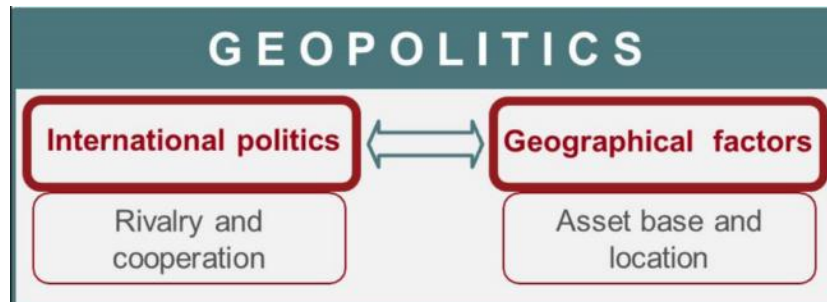


Figure 2. Constituting elements of geopolitics. Source: own elaboration.

This purpose is best served by a “modal definition” of geopolitics: „the study of relations between the conduct of a politics of power oriented toward the international level and the geographic frame in which it is carried out” (Steinmetz 2012: 2). While it states that geopolitics is about international politics, power and geographies, it refrains from defining the relationship between or role of these components. In this regard, approaches differ. In the following, we would like to highlight the components that unite the different conceptualisations of geopolitics². In order to avoid straining the concept, we also underline what is *not* a primary concern of geopolitical perspectives.

Importance of geographies: Geopolitics is hardly conceivable without assuming an impact of geographical factors on actors’ behaviour towards each other. This influence might be seen through actual space and resource endowments or in the realm of ideas and discourse. Some mentions of geopolitics, including by Kissinger, minimised the role of geographies – which rendered the term “almost identical to ‘realist’ models of international relations” (Steinmetz 2012: 2). Even though geographical aspects can, of course, always be found in international politics, we suggest **not equating geopolitics with international relations**, because otherwise the added value of the concept of geopolitics remains unclear. We recognise that there is no strict criterion to establish when the role of geographies is considered salient enough, but a student of geopolitics should be able to make an intelligible case for it.

Importance of international politics: Geopolitics is linked to international affairs, in terms of conflict and cooperation between actors (Flint 2017: 2, 15). Geopolitics does not have to adopt a realist view on international relations because it is not always state-centred and may highlight the importance of institutions, ideas and international cooperation.³ Yet, international rivalry, balancing power and dependencies are

“GEOPOLITICS DOES NOT HAVE TO ADOPT A REALIST VIEW ON INTERNATIONAL RELATIONS. BUT INTERNATIONAL RIVALRY, BALANCING POWER AND DEPENDENCIES ARE AN IMPORTANT ASPECT OF THIS THINKING.”

² See approaches cited by e.g. Steinmetz 2012 or van Efferink 2009.

³ In her classification of geopolitics research, Mamadouh 1998 does not seem to pinpoint the place of neoliberal and non-state centred accounts of international relations (e.g. Keohane and Nye 1989), as there seems to be a dichotomy of neo-classical state-centred and

often an important aspect of this thinking. Again, this can also mean examining international power discourses critically instead of accepting them as appropriate descriptions of reality. Looking at geographies and resource-related issues from a domestic and/or a non-political perspective, e.g. plainly economic or cultural, perspective is not geopolitical. Mamadouh mentions the possibility to speak of domestic power struggle as geopolitical under the term subversive geopolitics (1998: 240). In a world of increasingly permeable and overlapping governance levels this could be a fruitful line of inquiry, but is arguably not in the core of the concept.

Strategic significance of natural resources: Wielding power or seeing one's position constrained through geographical factors is another common trait of geopolitical thinking. It emphasises that geographical endowments are not "just there"; they are used in actors' international strategies and receive part of their value through the role they play in these.

After stating that geopolitical perspectives are diverse and all can engage with decarbonisation processes, we would like to highlight some **assumptions that the authors of this paper do not subscribe to:**

- While recognising the strategic importance of geographies and environment, we discard the possibility of predicting actor behaviour or the future of international community based on geographies, and thus do not subscribe to geo-determinism⁴. However, we recognise the importance of detecting and accounting for geo-deterministic perceptions of actors (e.g. Lacoste 1993).
- We are also cautious of objectivistic claims about geographical set-ups in international relations and recognise the importance of perceptions in the construction of geographies.
- Though geopolitics obviously includes the political, geopolitical inquiry does not imply the assumption that the struggle for power is always the dominant motive for international actors.
- In our view, states are neither the only important nor unitary actors with a clear "national interest".

“WIELDING POWER OR SEEING ONE’S POSITION CONSTRAINED THROUGH GEOGRAPHICAL FACTORS IS A COMMON TRAIT OF GEOPOLITICAL THINKING.”

critical discourse-oriented approaches. This might come with the specific sample of studies she analyses and also reflect the fact that the field is shared by different disciplines, whose theories can hardly match perfectly, and applied analyses, that probably that often do not have a specific theoretic background altogether. However, we see no reason why any IR theory should not make for a meaningful approach to analysing geopolitics.

⁴See Flint 2017, p. 11 and Steinmetz 2012, p. 2 for more detail on geo-determinism in geopolitics.

One could argue that “classical” geopolitics disregards **climate and environmental change** while decarbonisation trends, as they unfold, create novel geopolitical conditions and pose new questions – perhaps, similar to how technological progress of the last century changed geopolitical thinking (Steinmetz 2012: 3). These trends bring about new geopolitics of a decarbonising world and draw attention to actor characteristics that relate to climate issues, e.g. endowment with fossil resources or carbon sinks (Mamadouh 1998: 239). As geopolitical approaches, to a certain extent, oppose the assumption of a globalised world in which geographies are irrelevant (Steinmetz 2012: 14), the merit of analysing a geopolitics of decarbonisation might be that it would bring back the focus to environmental constraints and conditions of international politics, supporting the view that planetary boundaries matter for achieving development and cooperation. To acquire a better understanding of what aspects are of interest in this regard, in the next chapter we summarise some insights on factors that play a role in decarbonisation processes.



3. How is decarbonisation conceptualised? How does it unfold?

Decarbonisation refers to reducing greenhouse gas emissions⁵ caused by activities of societies in order to avoid dangerous climate change. Since the Paris Agreement, the agreed goal regarding global decarbonisation is to keep the increase of the world mean temperature below 2°C or even below 1.5°C. This requires major cuts in greenhouse gas emissions and a **radical change in societal and economic patterns** (UNEP 2017, 2018, IPCC 2018: 17). Therefore, decarbonisation is a process of transition from a global status quo to a very different, low-emission future. As this chapter shows, much of the scientific insight focusses on how institutions and technologies can be transformed on a broad scale over time to enable this. Our goal in this section is – far from covering all the aspects of the topic – to outline some features of decarbonisation which help us understand how this transition is connected to geopolitics, based on relevant literature.

“DECARBONISATION IMPLIES A FUNDAMENTAL CHANGE OF THE WAYS SOCIETIES WORK ACROSS VARIOUS SECTORS.”

Decarbonisation implies a fundamental change of the ways societies work within in a complex set of interacting processes (e.g. Geels and Schot 2010; Kemp 1994). This goes through many sectors such as energy, mobility, industry and agriculture, involves many actors, and unfolds over longer time periods (Markard et al. 2012; Geels et al. 2017a). Such a deep shift naturally implies “negotiations and trade-offs between multiple objectives and constraints” and requires political action, leading to “political struggle and public debate” (Geels et al. 2017b: 463-4). Decarbonisation may be seen as two concurrent processes:

- **leaving the status-quo high-carbon model behind** (e.g. reducing coal-based power capacities or abandoning fossil private vehicles) and
- **bringing about a new low-carbon model** (e.g. creating low-carbon mobility systems) (Markard et al. 2012: 957; Geels 2014: 37).

Furthermore, these processes are not linear but rather change pace, experiencing breakthroughs and backlashes (Geels et al. 2017b: 463-4). Here, the influence of geopolitical trends can play a role among many other factors.

i. Three perspectives on decarbonisation

As decarbonisation involves changes in technology and social and political institutions, researching it needs interdisciplinary perspectives.

⁵ The term “decarbonisation” obviously highlights reducing and avoiding carbon dioxide emissions, but we suggest using it in reference to mitigation all greenhouse gas emissions, as there seems to be no comparably elegant and popular alternative for this. In the same vein, the terms low-carbon and low-emission are used interchangeably.

Based on an analysis of explanatory frameworks in energy transition literature, Cherp et al. 2018 find analyses focussing on **three co-evolving systems**:

- the techno-economic,
- the socio-technical and
- the political systems.

They underline that real entities, such as a coal power station, can be seen as part of all these systems and analysed from different perspectives. Each one of these frameworks has a set of assumptions, theories and parameters it looks at as well as its blind spots. Therefore, differentiating between the three while recognising that they interact and co-evolve helps explain best the ways in which energy transitions happen and take different pathways in different countries (Cherp et al. 2018: 178-179, 185-186).

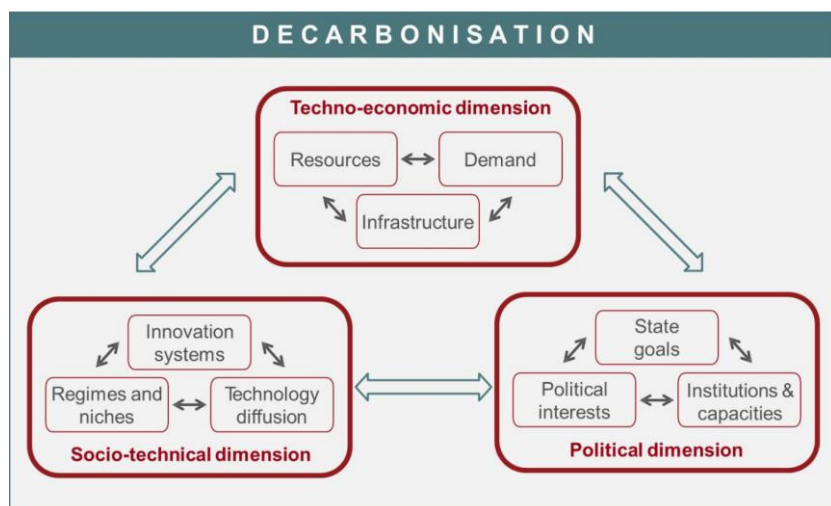


Figure 3. Three perspectives on decarbonisation. Source: Cherp et al. 2018.

While this approach concentrates on energy transition literature which is a large part of decarbonisation, it can be adapted to capture other sectors of a low-emission transition. Summarising briefly the insights of Cherp et al. 2018:

- **Techno-economic perspectives** are primarily concerned with how resource availability, demand and resulting resource flows as well as market dynamics shape transitions. It relies on geophysical and (neo-classical) economic perspectives. It does not explain policy action, seeing it as exogenous, and underrepresents factors of political economy (Cherp et al. 2018: 179-180).
- **Socio-technical perspective** looks at how new technologies evolve and diffuse in socio-technological systems and change them (see below more detail on one such approach), relying on

Science, Technology and Society studies and evolutionary economics. It overemphasises new technologies and merges social and technological developments to a great extent (Cherp et al. 2018: 180-181).

- **Political perspective** zooms into policies, institutional capacities, interests and ideas behind a transition, relying on various areas of political science and international relations. It tends towards downplaying material and technological factors (Cherp et al. 2018: 181-183).

The prominent **Multi-Level Perspective (MLP)** on decarbonisation (Geels et al. 2017a) represents a socio-technical approach, emphasising that socio-technical systems are “the interlinked mix of technologies, infrastructures, organizations, markets, regulations, and user practices that together deliver societal functions such as personal mobility” (Geels et al. 2017a: 1242). MLP distinguishes three analytical levels that need to come to an alignment to accelerate transition, creating a window of opportunity for change: the present socio-technical system, niche innovations that lead to changes, and broader “landscape” developments external to the system. According to MLP, progress on several complementary innovations and linking systems, such as transport and urban planning, ratchet up the transition speed. Furthermore, support across public, private and civil society sectors are needed for success. Therefore, a “whole system” perspective is a more appropriate way to analyse transitions and ways to foster them (Geels et al. 2017a: 1242-3).

“DECARBONISATION HAS A PRONOUNCED SOCIAL, POLITICAL AND INSTITUTIONAL DIMENSION AND IS ROOTED IN THE PHYSICAL ENVIRONMENT.”

ii. Where does geopolitics come in?

Summing up, two points are important to highlight in order to understand connections with geopolitics:

- Decarbonisation has **pronounced social, political and institutional dimensions**. It is deeply embedded in the established political economies in which it unfolds. It is influenced by vested interests, path dependencies and power coalitions in the respective society or context. These national political economies are connected to international developments (e.g. trade patterns) and themselves influence behaviour of international actors.
- Decarbonisation processes (both moving away from the old and approaching the new socio-economic model) are profoundly **rooted in the physical environment and resource base**. This also has an international dimension, among others, due to cross-border nature of many environmental changes and of supply chains.

How decarbonisation is embedded in international relations is at least as complex as the transition process itself. The systems and processes of decarbonisation as well as their interactions do not only play out in

nation states. A geopolitical analysis of decarbonisation looks specifically at international dynamics connected to geographical factors. This interaction of geopolitics and decarbonisation is the subject of the next chapter.

4. Where are the links between geopolitics and decarbonisation?

In order to structure the research area of geopolitics of decarbonisation, we need to disentangle the links between the two concepts. For this, we will take two steps, focussing first on how geopolitics influences decarbonisation and then, second, on how decarbonisation changes geopolitics. This distinction is made for the sake of clarity and does not imply that these interactions cannot take place simultaneously, influence each other or both be part of a systemic approach.

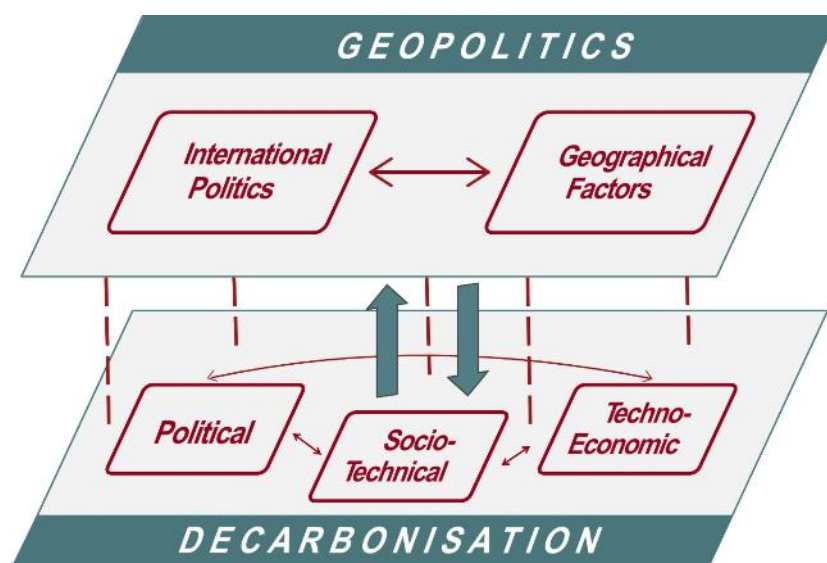


Figure 4. Interactions between geopolitics and decarbonisation. Source: own elaboration based on the three-perspective approach to decarbonisation by Geels et al. 2018.

Furthermore, in this section we will look at some matters which are not predominantly geopolitical according to the concept understanding in this paper. Still, a geopolitical angle may be appropriate under certain circumstances and for certain actors. It is fair to say that **it is not necessarily about defining what is geopolitical in nature, but more about the benefits of a geopolitical framing and expected explanatory power** of a geopolitical perspective on a given research subject.

i. How does geopolitics influence decarbonisation?

Possible overarching research questions

- How do geopolitical dynamics influence the course of decarbonisation and interact with transitions systems in a given country?
- How does use of geographic factors to wield international power influence national political economies of decarbonisation?
- How do geopolitical factors alter low-carbon transition processes?

As established in chapter 2, geopolitics is a field that encompasses the interaction of geographical factors and international politics. So, how does this shape decarbonisation processes? This may be answered by focussing on how geopolitics affects the elements of the three systems that offer different perspectives on decarbonisation, as described by Cherp et al. 2018 (see above).

The **techno-economic system** with its elements resources, demand and infrastructure (see figure 3) is mainly concerned with resource flows and markets. It becomes geopolitical when these dynamics are seen as a part of international power struggle, and examples are not scarce. Especially international fossil fuel markets are notorious for being intertwined with geopolitical competition.

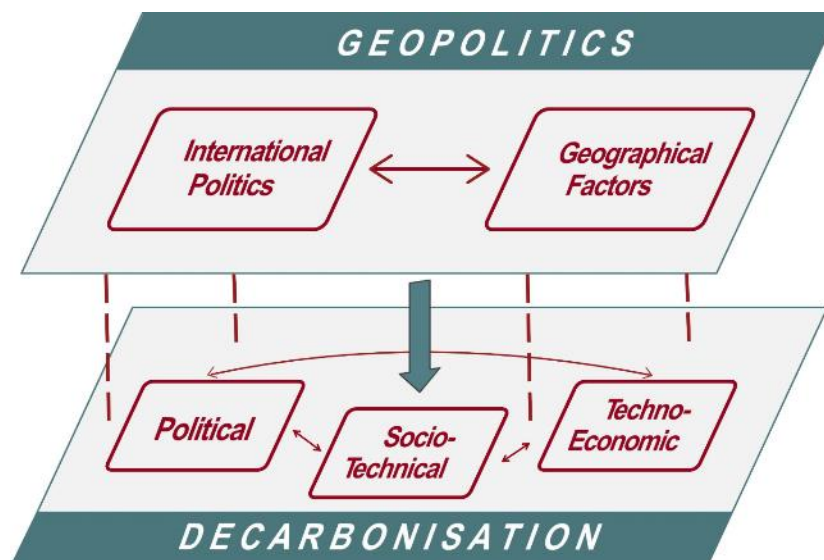


Figure 5. Geopolitics affecting decarbonisation processes.

Source: own elaboration based on the three-perspective approach to decarbonisation by Geels et al. 2018.

An example with regard to **resource demand and availability** is the impact of the 1970 oil crisis – which was geopolitical in nature to a great extent [Baumeister and Kilian 2016: 142-143] – on demand-side energy policies and consumer preference in oil-importing countries (Hancock and Vivoda 2014). Any other effects of oil price fluctuations on decarbonisation pathways in consumer and producer countries (e.g. Baumeister and Kilian 2016: 145ff, Evans 2016, McCollum et al. 2015) could be an appropriate subject for research if these can plausible seen in light of geopolitical motives of states.

Infrastructure development is influenced by geopolitics. The Chinese Belt and Road Initiative is, among others, a geopolitical effort to strengthen the position of China in the Asian region and beyond (Cai 2017: 3ff, Godehardt 2016: 33-34, Blanchard and Flint 2017). But this effort is likely to have a major impact on the decarbonisation pathways of the countries where infrastructure projects are financed by China. Construction of new coal power capacities, oil pipelines or roads has the potential to lock-in high-carbon economies (Jin and Gallagher 2018).

International politics is an important dimension affecting the **political system** – state goals, political interest, and institutions (Cherp et al. 2018: 181-183; see figure 3). This paper is especially interested in highlighting that political system is influenced by international relations revolving around geographies.

For one, geopolitics impacts the formulation of **state goals** and relative power of **proponents and opponents of decarbonisation**. Consider the logic of the two concurrent movements (away from status quo, towards a new system) presented in chapter 3. Geopolitical dynamics can make it harder (or easier) to **move away** from certain high-carbon practices by reiterating path dependencies and supporting vested high-carbon interests. For instance, in Poland, caution regarding the dependence on energy exports, among others from Russia, can be seen against a historical background of territorial integrity concerns (Hedrich 2014: 43). Thus history contributes to the continued perseverance of coal in the energy mix, as the country also reiterates narratives of “[...] coal’s solidity and indigenous abundance positioned it as a guarantor of Poland’s energy security, and the national sovereignty which had so often been abused in the past.” (Kuchler and Bridge 2018: 144) Thus, geopolitics has an influence on the political system not only in terms of material factors such as the energy supply, but also with regards to how resources are bound up with perceptions, values and cultural relations.

Geopolitical dynamics can make it easier (or harder) to **move towards** certain low-emission practices. The **push towards for energy security and affordability can have a positive effect on decarbonisation** if renewables are seen as its pillar, as, for instance, in fossil-fuel-poor Chile which had painful experiences with natural gas supply disruption from Argentina and resultant very high energy prices (Olivares 2017; Ministerio de Energía 2015). The wish to reduce energy dependence on fossil fuel suppliers that present international risks for a country could be favourable to deploying low-carbon indigenous energy sources. This

“RESOURCE DEMAND AND AVAILABILITY AS WELL AS INFRASTRUCTURE DEVELOPMENT CAN BE INFLUENCED BY GEOPOLITICS.”

“GEOPOLITICAL DYNAMICS CAN EITHER MAKE IT HARDER OR EASIER TO MOVE AWAY FROM CERTAIN HIGH-CARBON PRACTICES.”

could, in turn, strengthen domestic actor coalitions that support these energies.

Geopolitical issues may also simply **push decarbonisation issues further down on the priority list** of state goals, especially if there are trade-offs among these goals. For example, if expansion of hydropower is considered a major contributing factor to decarbonisation, new or increased rivalries between upper and lower riparian states could, in principal, lead to further political reluctance to follow a decarbonisation path based on hydropower. Instead a stronger focus on using fossil fuels may be considered as a, politically more stable strategy.

Finally, with a look at the **socio-technical system**, geopolitics is among the contextual factors or “sociotechnical landscape” of MLP (see p. 12) that can contribute to a window of opportunity for a decarbonisation, either encouraging or hindering it. For example, the socio-technical regime based on the increased use of nuclear power in Japan was shaped by the geopolitical tensions over energy resources in Asia while in Germany it was encumbered by the prospect for energy security in Europe in 1990s brought by the end of the cold war (Cherp et al. 2018: 185).

As evident from these reflections, the **three perspectives on decarbonisation already accommodate international and specifically geopolitical factors**. This section highlighted where these factors might sit in decarbonisation processes (rather than adding new factors to the mix). Moreover, **geopolitics is often encountered where the three systems interact** (e.g. “techno-economic” energy markets meeting “political” state goals). Drawing the border between them is an analytical exercise and reflects disciplinary delineations in previous research trends, as shown by Cherp et al. 2018. So, we primarily seek to show the wide variety of decarbonisation factors interacting with geopolitics and that different analytical perspectives can be combined with a geopolitical angle.

“THE DIFFERENT PERSPECTIVES ON DECARBONISATION IN THE LITERATURE ALREADY ACCOMMODATE INTERNATIONAL AND SPECIFICALLY GEOPOLITICAL FACTORS.”

ii. How does decarbonisation influence geopolitics?

Possible overarching research questions

- How are inter-state relations changing due to new resource-use patterns in the context of global decarbonisation?
- How is the importance of borders and geographical locations for international relations changed by decarbonisation?
- Are new dependencies and vulnerabilities emerging? How are international actors using changes to their strategic advantage?

As decarbonisation progresses, **it is bound to change the ways in which geographies matter for international relations**: changing the value of natural assets as well as forming international resource flows and markets. It furthermore changes the relative power and significance of actor groups, including states, international institutions, forums and partnerships as well as civil society networks and international corporations whose work is connected to natural assets and geographies.

“A DECREASE IN FOSSIL FUEL DEMAND CAN FURTHER ENDANGER THE SOCIO-POLITICAL STABILITY OF SOME OF THE EXPORTING COUNTRIES.”

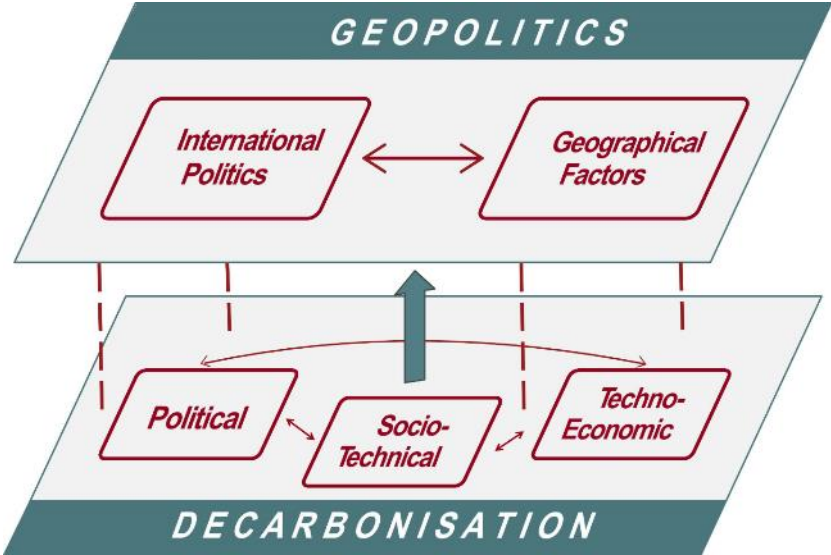


Figure 6: Decarbonisation processes affecting geopolitics. Source: own elaboration based on the three-perspective approach to decarbonisation by Cherp et al. 2018.

Stating that decarbonisation trends change geopolitical conditions and strategies includes its **successes and drawbacks**. It is salient to research how geopolitics can change while economies decarbonise. It may also be worthwhile to investigate how it can change if a set of actors continue to encourage fossil fuel production or cannot stop the destruction of carbon sinks. In fact, geopolitics is likely to be influenced by a mixture of low-carbon and high-carbon trajectories of different actors, i.e. if some countries decarbonise and others resist.

Geopolitics altered through changes in the value of natural assets

Again, consider energy markets. In order to reach the two-degree target, most of the available **fossil fuel reserves** need to stay in the ground (IRENA 2017: 19). If global fossil energy demand decreases in the wake of decarbonisation, exporting economies will lose a high portion of income, reducing economic activity, government revenue and rapidly devaluing (“stranding”) a high percentage of physical and natural assets for the economy. These effects will prove direr, the more sudden the transition and the lower the institutional capacities to steer it.

As many reserves are located in developing countries some of which exhibit high fragility levels, this can further endanger their socio-political stability by increasing pressure on societies through economic

downturn while decreasing their coping capacities through government revenue loss (de Jong et al. 2017: 11-12, Ivleva et al. 2017: 18, IRENA 2019: 33). Increased **fragility of fossil-exporting countries** can have strong knock-on effects in and beyond the respective regions, impacting geopolitics. However, if managed with foresight and care, reducing dependencies of developing countries on fossil fuel exports may help tackle what is known as “resource curse” and therefore advance socio-economic development (Ivleva et al. 2017: 32-37).

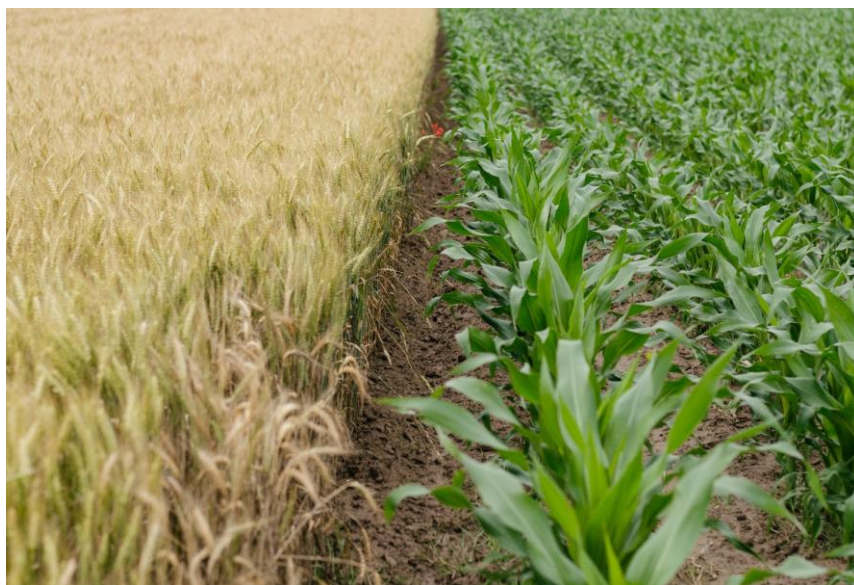
Geopolitical effects can also emerge if more stable countries that rely on fossil revenues face a plunging demand. In some regions the status quo is constituted by powerful actors such as Saudi-Arabia, Iran, Nigeria or Russia whose domestic development and international influence greatly depend on fossil-fuel exports (Hutt 2016). A strain on the capacities of these **regional powers** can lead to geopolitical shifts that are difficult to predict. For instance, it is conceivable that a government might adopt more conflictive international strategies in order to secure domestic public support, in an attempt to distract from economic grievances, or that other countries challenge these regional powers. At the same time, if decarbonisation **reduces political dependencies** due to the need to secure energy supply, this can increase room for manoeuvre of fossil-fuel importing countries and potentially open new spaces to resolve long-standing geopolitical controversies. This is sometimes mentioned as a “peace dividend” of renewable energies (Beck and Bertram 2015).

In parallel, while the world might reduce its dependence on fossil fuels, low-carbon development is by no means resource-neutral. Scaling-up low-carbon technologies – be it renewable energy or e-mobility – brings about a **growing demand for certain metals** (Manberger and Stenqvist 2018: 238-239). This can have similar geopolitical caveats as fossil energy markets. For instance, demand for resources that are concentrated in a few countries, many of which are fragile, may produce new dependencies and rivalries. It can also lead to “resource curse” dynamics, and socio-political and environmental grievances (Church and Crawford 2018: 15-16, Carius et al. 2018: 13-15). Such scenarios are by no means inevitable but securing cooperation and better governance would require respective action (Overland 2019: 37-38).

It is not only the value of the traded resources that is likely to change with decarbonisation. Countries may need to **reassess the value of domestic natural wealth** more generally. International food systems might change considerably, if preserving forests and healthy soils is effectively ascribed an economic or strategic value due to its significance for the world climate. Increasing strategic value of land has already grown palpable in recent decades through food price spikes and other commodity markets factors, resulting in big-scale international land acquisition (“land grabs”) (Lee 2015: 260-261).

“COUNTRIES MAY NEED TO REASSESS THE VALUE OF DOMESTIC WEALTH MORE GENERALLY, GOING BEYOND THE VALUE ON COMMODITY MARKETS.”

This competition might be influenced not only by a growing food demand but also due to increasing **recognition of the importance of carbon sinks** (Rautner 2016: 1). This may fuel international tensions, lead to increased agricultural product price volatility, shift production sites and trading patterns (due to changing exporting and national food security policies). Food insecurity episodes had contributed to instability in the past, as the role of bread prices spikes in the Arab Spring shows (Rüttinger et al. 2015). Furthermore, agricultural and land assets can be devaluated both due to successes and failures of decarbonisation with, as of yet, poorly understood geopolitical consequences (Rautner 2016: 1).



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Geopolitics changed through cross-border relations

Decarbonisation may bring changes to geopolitics that go beyond resource issues and concern **geographical positions** of countries. An example for this is the possible growth of connectivity in decarbonising energy systems. In order to optimise energy sustainability, cross-border approaches are often mentioned, e.g. transboundary hydropower, electricity grids or trade (Overland 2019: 37, Fischhendler et al. 2016). This can create new interdependencies and, in the case of transboundary water governance, have a positive effect on relations between riparian states (Pohl et al. 2017; Detges and Ide 2018: 79). However, increasingly interconnected and smart energy systems can create new vulnerabilities, e.g. for cyber warfare (SNV 2017: 6, Overland 2019: 38).

Decarbonisation trends influence geopolitics – whichever way they go

Failing decarbonisation will also have an influence on geopolitics. **Climate change is a threat multiplier** increasing international security risks and vulnerability of populations (Rüttinger et al. 2015). Furthermore, it changes geographies quite literally, e.g. when coastlines and

maritime borders shift due to sea-level rise or when entire island nations threaten to disappear or are forced to relocate (Dalby 2017: 14; Maas and Carius 2011; Paskal 2010). Another example is the changing Arctic, with new available resources, potential trade routes and international rivalries among Arctic states (e.g. Kraska 2011; Wolters et al. 2013).

One might object to eligibility of these cases as pertaining to geopolitics of decarbonisation as a field of analysis because global climate change cannot be attributed to a specific turn of events or failing of decarbonisation in a given country. For instance, drawing a meaningful link between lagging decarbonisation in Europe and security threats exacerbated by climate change in Sub-Saharan Africa probably does not constitute a useful basis for an analysis (yet some ethical or legal perspectives are imaginable).

Fragmented decarbonisation with countries pursuing more or less ambitious decarbonisation efforts in certain sectors seem a more promising subject. For instance, the international power of the European Union can be challenged in the field of low-carbon innovation such as e-mobility or smart energy systems (Oberthür 2016: 9-10). Innovation competition can develop geopolitical dimension whenever it takes an influence on geographical issues of foreign policy, e.g. if it affects regional power balance and alliance politics, critical infrastructure or warfare (EPRS 2018: 63ff).

iii. What is international, yet not (predominantly) geopolitical about decarbonisation?

Possible overarching research questions

- How do existing and emerging institutional arrangements shape decarbonisation processes, partnerships and trajectories?
- How are international institutions shaped by evolving low-carbon technologies?

The international dimension of decarbonisation cannot be denied. Climate change is a global phenomenon. The economic and technological dynamics of decarbonisation is highly internationalised. International politics and discourses within UNFCCC negotiations and the work of the IPCC were certainly among the main push factors to start national decarbonisation processes.

Yet, of course, **not all these processes are geopolitical**, as many international aspects of decarbonisation are not about the role of geographies or politics (consider, for instance, cultural, scientific or financial

“GEOPOLITICS IS LIKELY TO BE INFLUENCED BY A MIXTURE OF LOW-CARBON AND HIGH-CARBON TRAJECTORIES OF DIFFERENT ACTORS.”

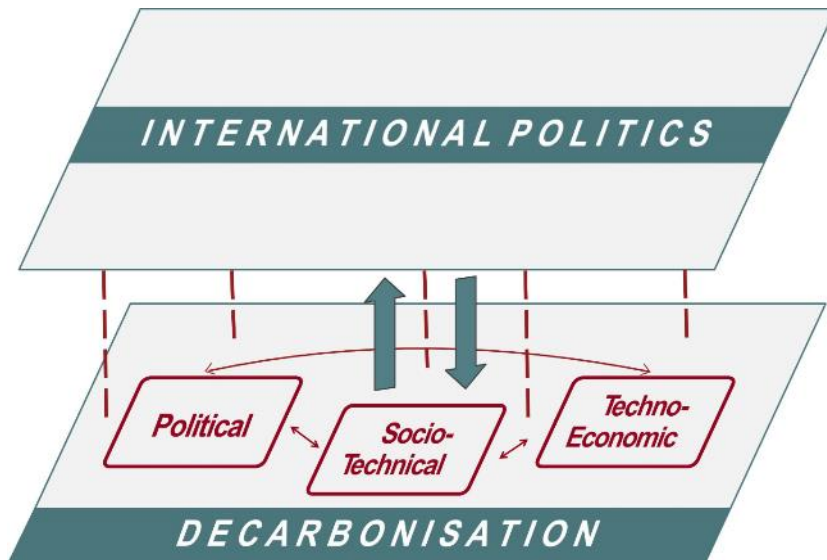


Figure 7. International relations interacting with decarbonisation processes without an explicit geographical dimension. Source: own elaboration based on the three-perspective approach to decarbonisation by Cherp et al. 2018.

interactions). Even in the domain of international politics, not all issues of international power, conflict and cooperation are best understood by looking at geographical realities. For instance, a competition between states for soft power gains due to low-carbon innovation leadership does not have to be connected to natural resources or geographical positions. Possible exposure of the EU to Chinese e-mobility competition may have a variety of implications for international relations without necessarily concerning geographical factors.

iv. What is geographical, yet not (predominantly) geopolitical about decarbonisation?

Possible overarching research questions

- How do a country's assets and its specific geography affect its decarbonisation path?
- How will global decarbonisation change the economic value of a country's natural resources?

“GEOGRAPHIES SHAPE DECARBONISATION PATHS OF COUNTRIES BUT DO NOT ALWAYS PRESENT A CONNECTION TO INTERNATIONAL POWER STRUGGLES.”

Geographies shape decarbonisation paths of countries but do not always present a pronounced connection to international power struggles and alliances. First of all, **decarbonisation challenges and opportunities depend on the natural resource base of a country**, that is, on high-carbon or carbon-sink resources it possesses or can access, or more precisely, on how these resources are converted to socio-economic value. Such resources are fossil fuels, minerals needed for low-carbon

technologies, agricultural land or forests. The degree of their availability is an important factor for the cost of different mitigation measures and for decarbonisation choices a given country makes.

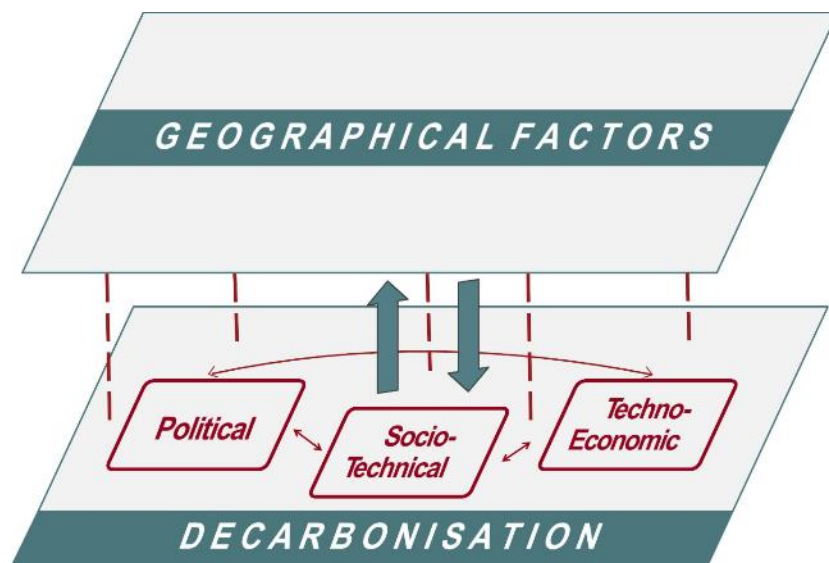


Figure 8. Geographical factors interacting with decarbonisation processes without an explicit international dimension. Source: own elaboration based on the three-perspective approach to decarbonisation by Cherp et al. 2018.

Geographical characteristics such as potential for specific renewable energy production or being able to share hydropower capacities with neighbouring countries may also shape decarbonisation decisions **without being primarily motivated by a struggle for international influence** – rather by domestic socio-economic factors.

In many cases, the **interaction of geography with factors of domestic political economy or innovation** will provide a better explanation of developments and decisions than a geopolitical approach. However, as mentioned in section two, there is no strict criterion for applying a geopolitical perspective, rather being a matter of being able to justify it. For instance, a geopolitical angle might be salient for specific actors. Of course, there might also be competing perspectives on the same subject. Take the example of innovation progress from above: it can but does not necessarily have to have a geopolitical dimension.

5. What are the different parameters for the geopolitics of decarbonisation research?

In this section, we briefly list the different parameters that could define thinking about the geopolitics of decarbonisation. This overview **emerged from the conversations on mapping the field with the researchers of the Mistra Geopolitics Programme** and, among others, aims to help structure existing research of the Programme. The conversations brought forward many aspects and topics under the umbrella of geopolitics of decarbonisation, which were mapped in an initial exercise. Here we suggested a clustering of these aspects as “parameter sets”. The idea is that one or several values in each parameter category are used in a given study, and the respective specific combination of these values helps locate it in the field of geopolitics of decarbonisation. Suggested parameter categories are: structure of the hypothesis or of the subject of research; empirical focus on geographies, actors and sectors; discipline, method, and data basis.

i. Structure of the hypothesis or subject of research

The suggestion to approach the topic by discerning the two directions of impact – of decarbonisation on geopolitics and of geopolitics on decarbonisation – is meant to help structure descriptions and explanations of complex realities under the broad umbrella of geopolitics of decarbonisation. It might help answer the questions: What part of diverse interactions in the field of geopolitics of decarbonisation is of primary interest? Which impacts are in focus – and on what area? What are the assumptions about causal relations? What is relevant to the process being described and what is not? What is an appropriate starting point to disentangle the dynamics of interrelations in the field? As the analytic interest varies strongly among disciplines or theory schools and depends on the information needs of the observer (policy maker, journalist, scientist etc.), the suggested framework can be used differently.

“GEOPOLITICS OF DECARBONISATION IS A POTENTIALLY INTERESTING FIELD FOR MANY DISCIPLINES, BE IT LAW, SOCIAL, CULTURAL OR BEHAVIOURAL SCIENCES.”

ii. Disciplines, methods and data

Geopolitics of decarbonisation is of course a potentially interesting field for many disciplines, be it law, social, cultural or behavioural sciences. The multitude of systems involved in transitions and the complexity of their interaction with geopolitics underline the importance of insights from various fields of study as well as of interdisciplinary research. Furthermore, practice-oriented thinking that often seeks to define action strategies for politics or civil society is also likely to be interested in geopolitics of decarbonisation. A certain convergence towards humanities and, specifically, social sciences is, however, to be expected due to socio-political processes under scrutiny. Accordingly, the methods of the study of geopolitics of decarbonisation can vary and encompass both quantitative and qualitative approaches. With each method and empirical focus comes a specific data basis – from statistical data to interviews to primary documents. This is another substantial parameter to define a study.

iii. Empirical focus

Actors and geographies

Clearly, geopolitics of decarbonisation is bound to be concerned with different geographies. These might be **states or regions** – and there role for the field can also differ. Some are interesting because they represent a major actor with regard to power and/or emissions such as China or the US. Others share some relevant characteristics such as the Gulf States or joint areas of geopolitical interest such as the Arctic states. At the same time, a **“geography” is by no means synonymous to a “state”** – a particular transboundary water basin such as the Nile or sub-national areas such as Yasuni reserve in Ecuador can be the focus. Furthermore, **non-state actors** are of utmost importance – albeit, international organisations, multinational corporations, municipalities or trade unions.

How actors are conceived of and to which groups they pertain, depends on the approach. For instance, advocacy coalitions or veto actors are parts of specific theoretical approaches. Actor groups in the context of transitioning systems are often seen as “winners” and “losers”, “front-runners” and “laggards”, “incumbents” and “challengers”⁶ – depending on the explanatory merit seen by the researcher in such terminology and the underlying theories. In the field of geopolitics of decarbonisation, these classifications are likely to be structured around international rivalries and relevant resources held by actors which can be loosely divided in high- and low-carbon assets.

Sectors

Decarbonisation is a cross-sectoral matter. In the context of decarbonisation, sectors often refer to different **emission sources**, as in the UN-FCCC reporting format defining energy (including fuel combustion in energy industries, in manufacturing and in construction and transport as well as fugitive emissions from fuels), industrial processes and product use, agriculture, land use, land use change and forestry (LULUCF) and waste. Energy is a particularly relevant source of emissions, accounting for over 70 % of the global total, followed by agriculture with over 10 %. LULUCF and industrial processes share the third rank with over 6 % (based on 2014 emissions; CAIT).

An understanding of sectors as **economic branches** is also viable in our field of study. It often overlaps with the perspective of emission sources, but puts an emphasis on the actor and governance structure, being more applicable to a specific country where, for instance, the coal industry, chemical industry or e-cars manufacturers may be the relevant empirical focus. This also points to the fact that “sectors” may signify **actors**, e.g. within governments they may refer a ministry of energy or

⁶ According to Fligstein et al., “incumbents” benefit from the high-carbon status quo which “challengers” seek to change competing for more support and control in “strategic action fields” defined by constraints and resources (Fligstein et al. 2011).

“ACTORS IN THE CONTEXT OF TRANSITIONING SYSTEMS ARE OFTEN SEEN AS ‘WINNERS’ AND ‘LOSERS’, ‘FRONT-RUNNERS’ AND ‘LAGGARDS’, ‘INCUMBENTS’ AND ‘CHALLENGERS’.”

>70%

OF GLOBAL EMISSIONS COME FROM ENERGY

mining while in the private sector they could mean chemical or industry associations. Furthermore, “cross-sectoral” often refers to bringing together governmental, business and civil society actors.

All these perspectives are legitimate and potentially relevant to geopolitics of decarbonisation research. As the distinction between geographies, sectors and actors is not always clear-cut and study-specific, these aspects are gathered under the category of empirical focus. Combining them is meant to clarify what a given study is focussing on, e.g. the coal mining companies in Indonesia or BRICS’ trade in agricultural commodities.

iv. Initial assumptions about the process of change

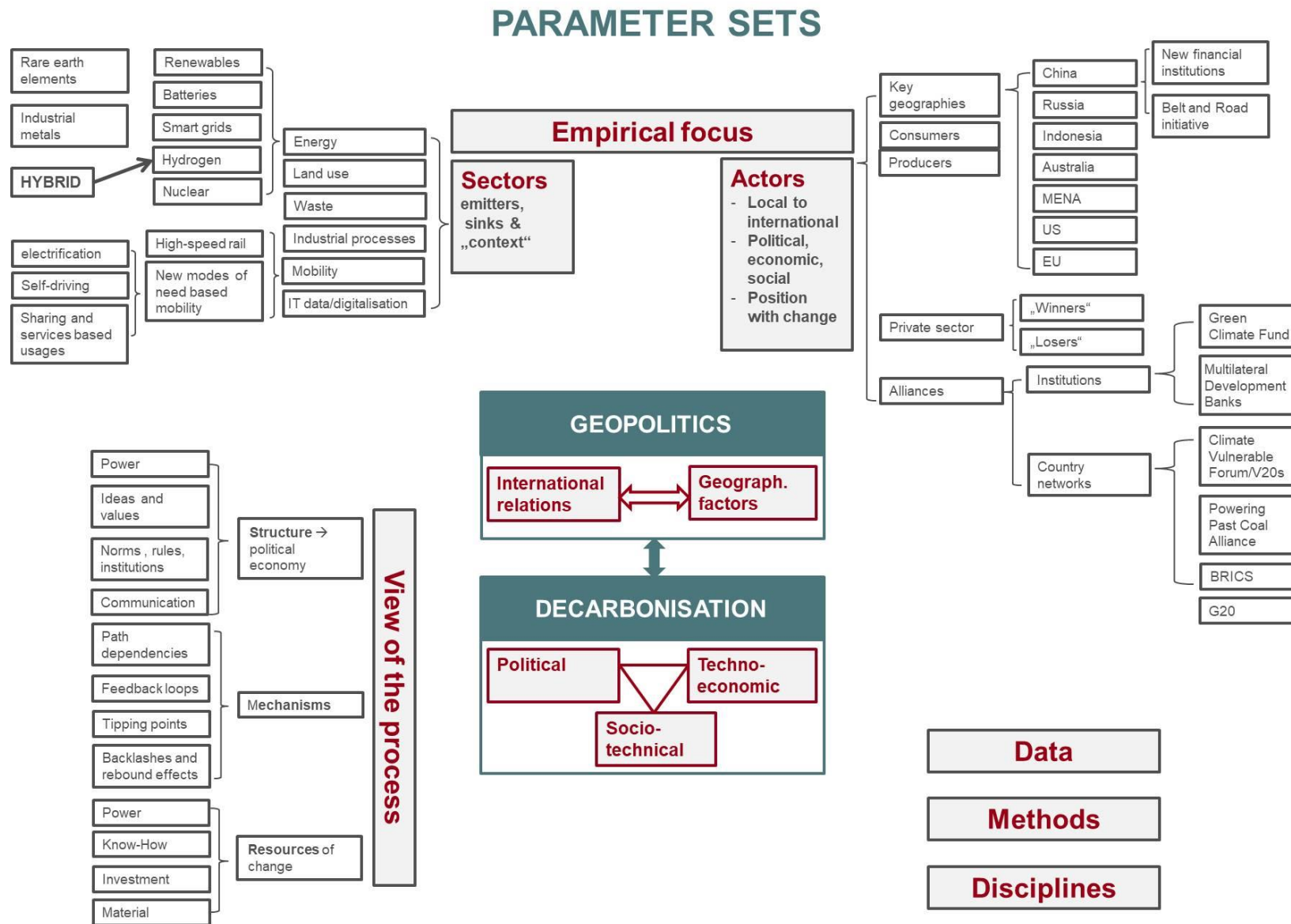
From the brief description of some approaches to understanding how transition processes unfold it becomes quite clear that these can be conceptualised very differently. This means that, when thinking about geopolitics of decarbonisation, one might look at

- the **structure** of the socio-technological and international systems. This can accommodate different assumptions about units of analysis and their relative importance, e.g. institutions, actors, ideas, individual values, power;
- systemic **mechanisms** such as feedback loops, windows of opportunity and tipping points, backlashes and rebounds, confluence of processes;
- **resources** and **catalysts of change** such as know-how, investment or new technologies.

This parameter set mostly seeks to point out that, depending on the theory or model applied, studies will conceptualise processes differently, highlighting different mechanisms and units of analyses to explain the (lack of) change deemed most relevant.

“LOOKING AT THE STRUCTURE OF (SOCIO-TECHNOLOGICAL) SYSTEMS AS WELL AS DIFFERENT SYSTEMIC MECHANISMS AND RESOURCES OF CHANGE CAN BE PART OF ANALYSING GEOPOLITICS OF DECARBONISATION.”

Figure 9. Topics and approaches in the research field of geopolitics of decarbonisation clustered into parameters sets. Source: own elaboration based on a mind-mapping process of the Mistra Geopolitics in Stockholm.



6. Selected messages for decision-makers

The world is going to change very profoundly both due to climate change and climate policies in ways that are yet difficult to predict. We need to improve our understanding of how this might affect international constellations of actors and our ability to create resilient solutions to global challenges. In this final section, we make allusions to the relevance of geopolitics of decarbonisation to different areas of policy making.

i. Foreign policy

A failure to decarbonise and a global temperature increase above 2°C will likely have a negative impact on peace and security (Nett and Rüttinger 2017; Rüttinger et al. 2015) of which the international research and policy communities are increasingly aware (e.g. [Planetary Security Initiative](#); Pohl 2018). At the same time, as described above, changes in resource flows and in the power dynamics between countries in wake of decarbonisation are also likely to affect geopolitics. Foreign policy needs to account for the potential effects of global low-carbon transformation on international relations.

Foreign policy should provide international leadership for a resilient, just and mindful transition. This implies searching for alliances to promote international cooperation for decarbonisation, involving actors from different sectors and engaging at various governance levels – in global and regional institutions as well as in bilateral government dialogue and track-two diplomacy with non-governmental actors. Foreign affairs ministries should thus seek to devise integrated strategies to support a planned low-carbon transition and avoid geopolitical disruptions. This includes a better understanding and monitoring these trends as well as active support for the transition.

Understanding and monitoring change

Foreign policy should **include possible shifts of international positions of power due to decarbonisation in their analyses**, monitoring the progress of countries and regions along the sustainability goals as part and parcel of long-term peace and stability. This could help shed light on blind spots regarding major transformation trends. Strategic foresight, early warning, assessments, planning and conflict prevention efforts should be mindful of the different capacities of countries and regions to cope with decarbonisation shifts. In the same vein, an altered structure of regional or transboundary relations in the wake of changing energy supply or trade flows brought by decarbonisation should also be included in these processes.

To gather insights and be able to better assess future developments, foreign policy should capitalise on the capacities of its international missions and on wide networks of actors in which it is involved. These could be both within the respective host regions as well as in international

“FOREIGN POLICY SHOULD INCLUDE POSSIBLE POWER SHIFTS DUE TO DE-CARBONISATION IN THEIR ANALYSES, MONITORING PROGRESS ON SUSTAINABILITY.”

fora. For instance, the **EU external action** could further integrate monitoring geopolitical change in its climate and energy diplomacy as well as in country programmes that frame its bilateral relations, further connecting this to its efforts to mainstream resilience in external action and using the capacities of the Green Diplomacy Network.

Actively supporting transition

Decarbonisation is a major economic and social shift with a pronounced international dimension that certainly goes beyond environmental policy and needs to be actively shaped: the risks of disruptions will be the lower, the earlier political action prepares and accompanies the transition. In fact, decarbonisation – along with other environmental change topics – needs to be seen as an **important international task and part of conflict prevention**. Therefore, bilateral and multilateral relations as well as national foreign policy strategies should be account already today for global decarbonisation needs as established by the Paris Agreement and the changes that come with them.

Consider countries that rely on fossil fuel exports and show significant levels of fragility. As discussed above, these countries may experience pronounced socio-political, development and stability challenges, if the demand for fossil fuels decreases rapidly. As maintaining the present consumption of fossil fuels will challenge international peace and security even more direly, foreign policy needs to support these countries in mastering a transition away from fossil export dependence. The **relations with these countries should be rewired** accordingly: dialogue, experience sharing and partnerships should focus on low-carbon technologies and pathways for structural change of economies that help avert socio-political risks.

ii. Development cooperation

Development cooperation is concerned with socio-economic progress and sustainable development in target countries that can be affected by geopolitics of decarbonisation. In order to support gradual and resilient transitions, it should first of all insure **consistent support to economies and institutions fit for a low-carbon world**. In this, development aid should avoid perpetuating high-carbon path dependencies e.g. through investing in carbon-intensive infrastructure and fossil fuel extraction.

The World Bank, for instance, has already made progress in this regard e.g. by announcing to stop oil and gas upstream financing in 2019, advancing shadow carbon pricing and making its energy, land-use and urban finance increasingly fit for climate challenges (World Bank Group 2017, 2018). Climate-compatible development finance is an enormous leverage for a decarbonisation that starts early and progresses without compromising other development goals, including international cooperation (OECD et al. 2018: 40-43).

“BILATERAL AND MULTILATERAL RELATIONS AS WELL AS NATIONAL FOREIGN POLICY STRATEGIES SHOULD ACCOUNT ALREADY TODAY FOR GLOBAL DECARBONISATION NEEDS AS ESTABLISHED BY THE PARIS AGREEMENT.”

This potential should be fully harnessed, especially with new actors such as China and new development banks supported by the countries or regions enter into development cooperation. Development aid should not turn a blind eye to interactions between decarbonisation and geopolitics. As we have seen, geopolitical realities can have an important influence on how decarbonisation unfolds in a given country, shaping the opportunity space for development policies.

There is a need for **strategies that bring decarbonisation trends in line with the pursuit of equality, economic development and peace**. Interaction – both synergies and trade-offs – of decarbonisation and other sustainable development priorities is of high interest to development policies in this context. For instance, while geopolitics of decarbonisation might push towards new “resource curses” along the material demand for a low-carbon transition, development cooperation can help poorer countries counteract these dangers by strengthening governance in the extractive sector.

iii. Climate policies

Climate politics should keep in mind that geopolitical factors may hinder decarbonisation but they can also help broaden windows of opportunity. The knowledge on transition processes as well as on success and failure factors of environmental policies is quite substantial. It is reasonably well understood how interest group dynamics, feedback loops or rebound effects, power and ideas affect climate policies. The perspective of geopolitics of decarbonisation highlights geopolitical factors in this mix in an attempt to make the picture more comprehensive, especially as **many processes relevant to decarbonisation are highly internationalised** – from resource supply to innovation dynamics.

For instance, the influence of the Belt and Road Initiative by China cannot be overlooked given the huge importance of new infrastructure for the emission footprints of future economies (OECD et al. 2018: 8-12). On the other hand, factors such as energy security, international competitiveness or shifting power concerns can be a strong motivation for the promotion of low-carbon technologies.

Bearing this in mind, climate politics should seek to **understand and communicate geopolitical co-benefits of a low-carbon transition to different actors**. Furthermore, cautionary tales of ill-managed transitions e.g. away from mining and heavy industry in European countries or studies of the consequences of the oil crisis may help underline the scope of the needed transformation. They may also address the urgency to act as early as possible in conversations with a wide array of actors. This can help build international alliances and create transnational innovative coalitions, importantly, including non-state and non-governmental actors.

“DEVELOPMENT STRATEGIES NEED TO BRING DECARBONISATION TRENDS IN LINE WITH THE PURSUIT OF EQUALITY, ECONOMIC DEVELOPMENT AND PEACE.”

“CLIMATE POLITICS SHOULD KEEP IN MIND THAT GEOPOLITICAL FACTORS MAY HINDER DECARBONISATION BUT THEY CAN ALSO HELP BROADEN WINDOWS OF OPPORTUNITY.”

iv. Economic policies

Maintaining or achieving a competitive economy and high level of public well-being goes along with securing an advantageous position internationally. It may allow countries to shape international relations in accordance with their own values and priorities. Though decarbonisation as well as sustainable development policies are often portrayed as barriers to socio-economic progress and competitiveness, the opposite – **ignoring environmental change trends in economic policies – might actually prove debilitating geo-economically and -politically.**

Therefore, public and private sector decision makers should consider the effects of decarbonisation on resource flows and supply chains and work towards more resilient economic models. Sustainability of supply in high-carbon and low-carbon assets to industries may change. Decarbonisation will have implications for trade both in terms of primary resources and manufactured goods. Furthermore, some economic branches may face significant vulnerabilities in a decarbonising world, e.g. through changing availability in agricultural products such as soy or a decreasing demand for high-carbon technologies.

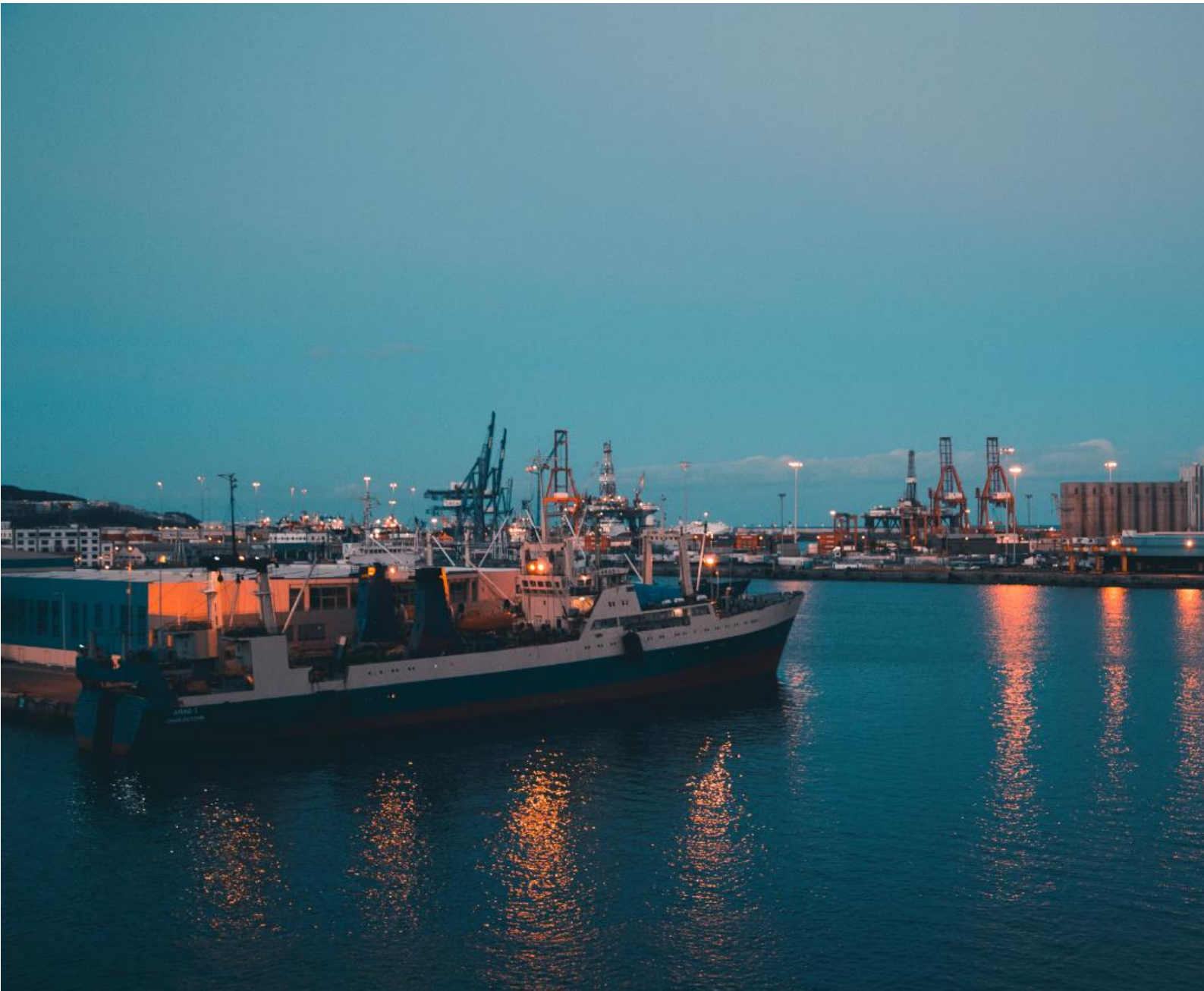
As mentioned, this may weaken the competitiveness of national economies and affect international standing of states but also change mutual international dependencies. Arguably, the actors who manage to understand and navigate the change can better adapt to shifting geopolitical conditions. Economic policies are an important leverage in this regard. Successful transition management cannot be brought about through policies which fall exclusively within the category of “environmental” policy.

One of such cases is asset stranding. Financial and other assets such as infrastructure or natural resources valuable in a high-carbon economy (e.g. shares in oil companies, coal power plants, roads or pipelines and other high-carbon infrastructure) may lose value sooner than expected, causing economic losses. This can affect both public and private actors who hold these assets. But losses by institutional investors – such as pension or sovereign funds and, quite obviously, by governments – may also affect large parts of the population even if they do not hold high-carbon assets. These assets are so **deeply rooted in both financial markets and the real economy** that their abrupt devaluation can lead to significant disruptions to national economies, yet predicting the exact (knock-on) effects is quite difficult.

Reasonably certain is that **governments should make sure to invest in the development of economic branches and in infrastructure compatible with decarbonising economies.** This includes strong support to the development of knowledge and skills needed in such economies through fostering research and education. Moreover, they need to align public support for policies such as subsidies or tax breaks with decarbonisation trends in order to avoid obstacles to sustainable innovation

“THE ACTORS WHO CAN UNDERSTAND AND NAVIGATE THE ONGOING CHANGE CAN BETTER ADAPT TO SHIFTING GEOPOLITICAL CONDITIONS. ECONOMIC POLICIES ARE AN IMPORTANT LEVER.”

and deployment of economically efficient low-carbon technologies. Finally, clear political signals that decarbonisation is indeed the plan of governments over specific timelines are highly important to motivate businesses and investors to use their resources to support and prepare for a transition.



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