4

A Conceptual–Analytical Approach to Examining Security in Sustainability Transitions and Policy Interplay

This chapter outlines the main analytical contribution of this book, drawing from the literatures described in Chapters 2 and 3, as well as the literature on policy coherence and integration explained here. It combines elements of conceptual–analytical frameworks published in scientific articles as part of the research I undertook for this book. However, it also goes beyond these to create a broader framework to address the security inferences of sustainability transitions and the coherence between energy transition and security policies.

The conceptual–analytical framework adopted in this book looks at security in relation to sociotechnical systems and transitions. The key conceptualization behind how transitions are depicted here is the multilevel perspective (MLP) introduced in Chapter 2 (Geels, 2002, 2005b, 2011). The MLP has been criticized due, for example, to its focus on change in technological artifacts and its lack of agency (Genus and Coles, 2008) and ontological assumptions (Shove and Walker, 2010). However, I see it as valuable in depicting how security can be divided into multiple levels: the landscape as the broader context where security affects, in part, the stability or instability of the sociotechnical energy regime; security as a sociotechnical regime itself that engages in multiregime interaction (including policy coherence) with the energy regime; and the range of positive and negative security implications that ensue from regime destabilization or the expansion of niches and niche innovations. I approach changes in niches and regimes via selected processes that may lead to security effects.

Figure 4.1 shows the overall analytical dimensions used in country case studies (Chapters 5–8; also called here "the country chapters"), which will be further explained and elaborated later in this chapter, highlighting the specific focus areas of the book. The framework merges different viewpoints and perspectives to examine sustainability transitions from a security perspective. It is centered around the x-curve of transitions (Hebinck et al., 2022), where the old regime will gradually destabilize and decline and make space for the new one built with the help

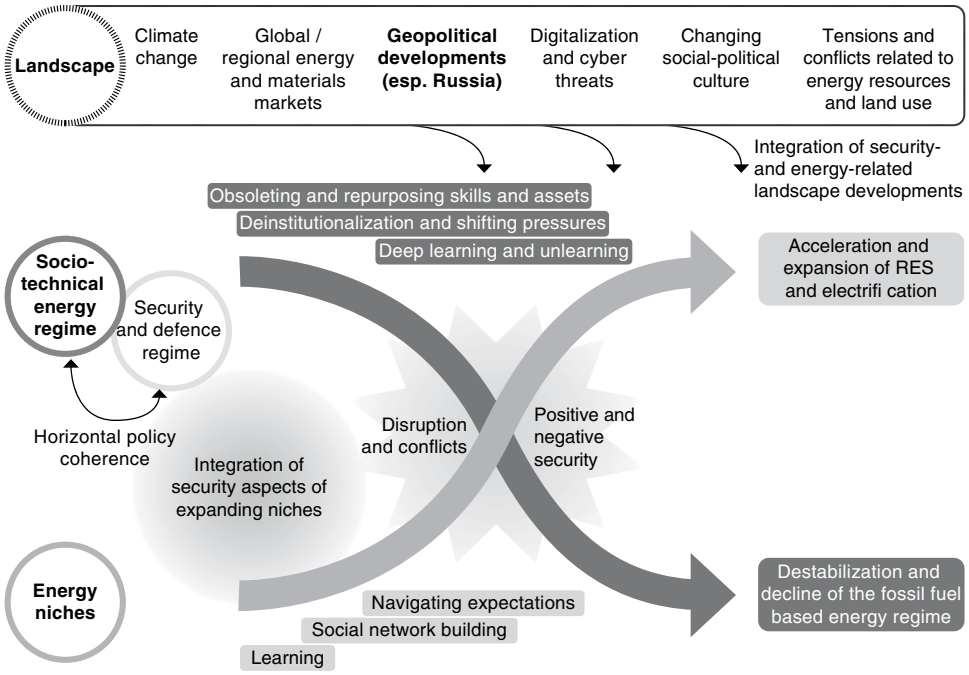

Figure 4.1 Analytical framework for Chapters 4–8.
Sources: Based on adaptations from Geels (2002); Loorbach et al. (2017); Kivimaa and Sivonen (2021); Hebinck et al. (2022); Lazarevic et al. (2022).

of expanding niches. The transition period, where the curves meet, can experience disruption and conflicts.

The framework also draws on the MLP by identifying the three levels of change and how they interlink to security. More specifically, the levels are used to explore: (1) *landscape-level security factors* and how they have been perceived by energy and security experts prior to and post 2022, what potential policy actions may have been taken in the regime level, and whether these actions amount to securitization (see Chapter 2; Heinrich and Szulecki, 2018); (2) *policy coherence between energy (transition) and security and defence policies* at the level of sociotechnical regimes; and (3) the *expected positive and negative security implications of the transition* via the expansion of the renewables niches (and the decline of the fossil fuel-based regime). Nonpolicy-related developments in the regimes are outside the scope of analysis. However, I aim to provide sufficient context in the country chapters in terms of the structure of the energy sectors and the resources available.

In the following, I provide some more detailed explanation on the three focus areas of the conceptual–analytical framework.

4.1 Security as Part of the Sociotechnical Landscape for an Energy Regime

The landscape level is the broad context that influences sociotechnical regimes and sustainability transitions. Berkhout et al. (2009) talk about the landscape as the selection environment that contains political, economic, and institutional contexts and conditions for both niches and regimes. It cannot be directly influenced by specific niche actors and regime actors the same way as niches or regimes.

The problem with the landscape concept is that several different types of issues or elements have been described as falling under this conceptualization. These include, for instance, values and worldviews (Rock et al., 2009), scientific paradigms, social movements (Smith et al., 2010), environmental problems, the phenomenon of globalization, transnational actors (Grin et al., 2010), political ideologies, macroeconomic patterns, demographical trends (Geels, 2011), culture (Geels and Verhees, 2011), overarching institutional frameworks (Upham et al., 2014), and natural hazards, wars, and pandemics (Huttunen et al., 2021).

The landscape is not fixed, and it experiences both slowly moving long-term developments and more short-term, or even abrupt, changes. For example, climate change can be depicted as a long-term landscape development, whereas the initial phases of the Fukushima nuclear disaster, the Russian attack on Ukraine, and the COVID-19 pandemic can be depicted as more sudden changes or landscape "shocks."

From the security perspective, the landscape is an extremely relevant transition studies' concept. Pressures threatening geopolitical, environmental, human, or cyber security are quite evident at the landscape level. Regarding the geopolitical dimension, sociotechnical energy regimes have seen landscape changes in the positioning of major states in terms of global alliances or military actions, which have influenced cross-country energy flows and security of supply. The war in Ukraine instigated by Russia in 2022 is an example of how war efforts have led to the energy supply from Russia to Europe being cut off, and changes are envisaged in both energy alliances between countries and physical infrastructure development.

Other security-related landscape factors include, first, the increased risk of cyberattacks, which is heightened as societies become increasingly digitalized. Second, planetary environmental problems that threaten both climate and environmental security and to which energy regimes need to respond. Third, changes related to the increase of extremist right-wing movements and populism, which both connect to human security and influence the degree of landscape-level support for zero-carbon energy transitions. Fourth, globally increasing energy demand

and scarcity of resources as landscape developments also influence security of supply in local, regional, and national energy regimes. When landscape developments or pressures are depicted as threats, based on security studies we should ask what is the perceived "referent object" (see Chapter 2) that is to be secured against such a threat? Is it the energy regime, the unfolding energy transition, the state more broadly, humans, society at large, or the planet?

The landscape can be seen from a global and a more local perspective. I argue that the landscape is effectively formed by both physical developments, such as natural disasters, but also social constructs. Consequently, the ways in which relevant actors *perceive* developments in the wider environment forms the landscape. Antadze and McGowan (2017) argued that landscape developments are interpreted by actors (with agency) for the use of niches and regimes. The country cases of this book show, for instance, that while Russian military and energy developments are a part of a broad landscape context for other countries' energy regimes, they have been – at least prior to 2022 – differently interpreted as landscape pressures by actors in different countries and in different regimes.

The sustainability transitions literature has paid less attention to the landscape than to niches and regimes and, hence, conceptual specifications are limited. Some insights have nevertheless been provided. For example, three different temporal elements for the landscape have been suggested by Van Driel and Schot (2005): (1) factors that do not change or change very slowly, such as the climate; (2) rapid external shocks, such as wars or oil price variations; and (3) long-term changes in specific directions, such as demographical trends. In the 2020s, we have seen a remarkably high number of rapid external shocks influencing energy regimes. These include the COVID-19 pandemic, an increased number and scale of extreme weather events from climate change, and the war conducted by Russia in Ukraine and the resulting implications of this on wider European developments.

The key importance of the landscape concept is its influence on niches and regimes. Frank Geels (2011) makes a distinction between stabilizing and destabilizing landscape influences. Relatively stable landscapes can reinforce existing regimes (Smith et al., 2010). This is visible, for example, in the relatively slow changes in sociotechnical energy regimes in the past. Destabilizing landscape influence can, in turn, be associated with the disruption of sociotechnical systems and their technological, market, policy, or behavioral dimensions (Kivimaa et al., 2021).

The boundaries between landscape and regime are somewhat blurry. For example, while technologies are typically addressed as part of regimes, Rip and Kemp (1998) argued that some technologies are also elements in the landscape, providing an example of motorcars because they have had such a profound

influence on broader societal rules and cultures (e.g., perceptions of freedom and cultural necessity). The same could be said for many digital technologies, such as computers and cell phones. In effect, landscape is determined based on what regime is in focus and how it is defined. For example, it may be that renewable energy technologies will have as great an influence on the landscape in the future as motorcars had in the past across the society.

Whereas, generally, regimes are not seen as being able to change landscape factors, Smith et al. (2010) argue that over long periods the creation of new regimes can affect broader landscape developments – describing the examples of the developments of aeromobility and communications technologies affecting globalization. In the context of energy and security connecting to the literature on geopolitics (Chapter 3), zero-carbon energy transition can also shape the broader landscape, such as international relations between states and global stability, affecting different sociotechnical regimes.

The landscape differs according to the perspective of different sociotechnical systems or geographical locations The natural environment, culture, economies, and populations mold the landscape in specific places, regions, or internationally (Rock et al., 2009). Therefore, the landscape for the sociotechnical energy regime and its transitions differs from the viewpoints of different countries or regions. The boundary between the regime and the landscape can be analytically set based on the focus of each study and its scale (e.g., a local, regional, national, or international sociotechnical regime).

Rock et al. (2009) proposed that the sociopolitical part of the landscape is composed of institutions and values that guide the economy. Actors' values are regarded as fairly permanent and, thus, as part of the landscape (Bögel and Upham, 2018), while moves toward more altruistic, biospheric, or postmaterial values would benefit sustainability transitions (Huttunen et al., 2021). Practices conducted by actors link to more general social norms and values of the landscape (Bögel and Upham, 2018; Laakso et al., 2020). Hence, gradual shifts in values and the prioritization of values are important determinants in how the landscape also affects transitions. For example, the energy transition requires environmental values to be prevalent, while longer-term economic values are often employed to convince actors of the benefits of energy transitions. In contrast, short-term economic values can and have often slowed down sustainability transitions. Geopolitical or "realist" values that focus on security of supply, strategic alliances, and military power are also present, but to differing degrees in different countries (Kuzemko et al., 2016).

Landscape pressures can be distinguished as either unintentional or intentional (Morone et al., 2016). Unintentional pressures are, for example, the advancement of climate change or changing demographics. Intentional pressure can be created via

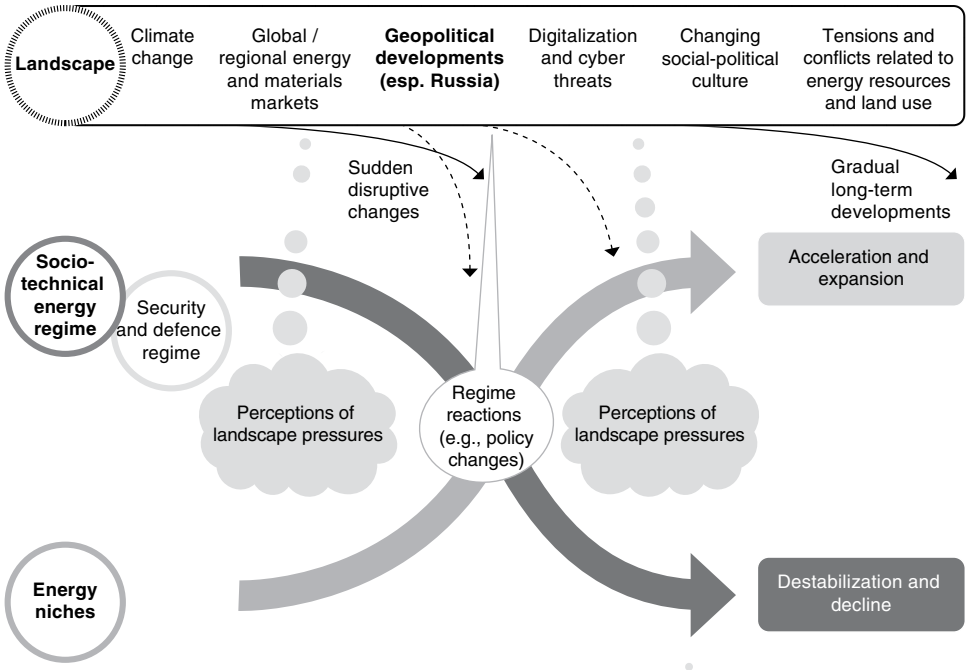

Figure 4.2 Landscape in focus.
Sources: Based on adaptations from Geels (2002); Loorbach et al. (2017); Kivimaa and Sivonen (2021); Hebinck et al. (2022); Lazarevic et al. (2022).

large-scale institutional changes and political mechanisms, such as oil embargoes or climate change conventions. Both intentional and unintentional pressures and developments are subject to actors' interpretations and perceptions. For instance, the risks posed by geopolitical developments instigated by Russia were seen as more or less significant by different actors before 2022 (Kivimaa and Sivonen, 2023). The same goes for climate change. Despite the widespread scientific consensus on the realization of climate change and the threats it poses, some states, politicians, or economic actors have interpreted, for example, related extreme weather events or Arctic ice retreat as less concerning than others. Therefore, the perceived scale and urgency caused by landscape-level developments on sociotechnical transitions varies.

Figure 4.2 depicts the part of the analytical framework of this book that is focused on the landscape and, in particular, interpretations of that landscape. Developments can be depicted as gradual or more sudden. In the country cases (Chapters 5–8) focus is placed on how these countries and their energy and security experts have perceived developments pertaining to Russia as a landscape pressure for the energy transition, alongside some other key concerns for energy policy. Empirical insights on the perceptions of expert actors before and after 2022 are delivered.

4.2 Policy Coherence at the Regime Level: Interplay of Energy Transition Policies with National Security and Defence Policies

Public governance plays an important role in sustainability transitions. Government interventions in the form of public policy can facilitate transitions by setting goals, targets, and specific policy interventions or policy mixes to support changes. The EU Green Deal is a good example of such policy interventions. However, public policy may also frequently hinder transitions, for example by preventing the diffusion of niche innovations and subsidizing or otherwise supporting an unsustainable sociotechnical regime, contributing to its lock-in and path dependence. Policy contradictions or conflicts may undermine the positive influence of transition-oriented policies, which make the concepts of policy coherence and policy integration areas of interest here.

Public governance has traditionally been defined in terms of a unitary state with vertically integrated policymaking and implementation, that is, the policy cycle, while the theory of new public governance posits that state is actually disaggregated and policymaking and implementation at least partly disconnected (Osborne, 2006). National-level public governance in Western countries is typically organized so that a single or multiparty government, formed of elected parliamentary politicians, designate ministers to lead ministries. The composition and number of ministries varies among countries. For instance, climate and/or energy policy can be allocated under their own ministry or be part of a broader ministry, often the Ministry of Economic Affairs. Administrative sectors are formed of ministries and agencies that typically implement the policies set in ministries.

Ministries are often established long-term institutions. Thus, they have long traditions and, frequently, adopt specific worldviews that influence their policymaking practices and objective setting. For instance, ministries of defence have usually adopted a realist and geopolitical worldview. This means focus on state security by military means and, with respect to energy, on aspects such as security of supply and strategic alliances (Kuzemko et al., 2016). Ministries of economic affairs tend to orient toward political liberalism and free market-based worldviews. This implies, for instance, free market trading and limited government intervention in market operations (Kuzemko et al., 2016). Therefore, energy policy subsumed under a ministry in charge of economic affairs is less prepared for geopolitical threats. Ministries in charge of the environment are typically oriented toward environmental perspectives. The worldviews of energy or environmental ministries may also at times connect to socialist perspectives, which, according to Kuzemko et al. (2016, p. 14), relate to "greater equity in the distribution of wealth," affordable electricity prices, and societal well-being as primary objectives over economic

profits. Another potentially crosscutting perspective influencing worldviews is a technological one, which may be combined with a technocratic approach toward, for instance, energy or environmental policymaking and implementation. The diversity of worldviews in different administrative sectors make coherent policymaking difficult, while dominant party political views also influence the degree of policy coherence.

Public policy can be described in terms of policy objectives and instruments, as well as processes for setting up and implementing these. The sets of objectives, instruments, and processes influencing a given policy issue, for example building energy efficiency, or a given domain, for example energy policy, can be called policy mixes. Policy mixes have been described as complex arrangements that have gradually formed over the years (Kern and Howlett, 2009) and that exist in a messy multilevel and multiactor reality (Flanagan et al., 2011). This means that "ideal" policy mixes vary from place to place and sector to sector. Rogge and Reichardt (2016) have argued that policy processes are an important part of policy mixes, because policy preparation processes influence how policies are designed and redesigned and implementation processes may, for instance, suffer from political resistance or poor implementation. Indeed, such implementation deficits have been observed in relation to energy efficiency policies (Kivimaa et al., 2017). The process dimension of the policy mix is connected to policy coherence and integration because, for example, policy coordination structures in place between different ministries and agencies influence how broader policy mixes in the interface of energy (transitions) and security are designed and implemented. Broader conceptualizations of policy mixes also include governing organizations and their institutional developments (Kivimaa and Rogge, 2022). Changing institutions and organizations are longer-term processes with potentially crucial impacts on the advancement of energy transitions and on achieving more coherent energy transition and security policy mixes.

Policy contradictions and conflicts may occur both within specific policy mixes (e.g., those designed to govern the national energy production and supply) and between different policy domains across various sets of policy mixes. Alternatively, policies within and across domains can be complementary (i.e., no contradictions) or even seek policy synergies to bring policy objectives and instruments more into alignment. Policy conflict can be defined as a situation where two policies together achieve less than they would separately (Howlett et al., 2015). This occurs when policies give contradictory signals to policy recipients in terms of actions. An example from the energy domain is when renewable energy subsidies aim to advance the diffusion of renewable energy technologies by making them more competitive with fossil fuels, while at the same time fossil fuel subsidies undermine the effect of renewable energy subsidies. This kind of situation

can also be described as policy incoherence (Huttunen et al., 2014). Synergies go beyond complementarity, that is, aligned coexistence of policies, in that two policies are synergetic if they together have a greater effect than the sum of both policies' singular effects.

Policy coherence is a concept used to explore policy synergies and complementarities on the one hand and policy conflicts or contradictions on the other. It originates from policy studies (May et al., 2006; Tosun and Lang, 2017) but it is also much applied in practice by organizations such as the OECD and the European Commission. Several types of policy coherence have been described, drawing on different levels and domains of public governance. Carbone (2008) created a typology with four dimensions: horizontal coherence between policy domains, vertical coherence between the EU and its member states, internal coherence as the consistency of objectives and instruments within a policy domain, and multilateral coherence referring to interaction between international organizations. Other conceptualizations of policy coherence also exist and it has been described as an elusive concept, difficult to detect and measure (Righettini and Lizzi, 2022). Nevertheless, in this book, I will try to analyze policy coherence in the case countries.

The analytical framework here focuses on horizontal coherence. Drawing from previous studies, it utilizes the idea of *synergies* and *conflicts* to describe the status of horizontal coherence between objectives, instruments, and the implementation of energy transition policies and of national security and defence policies in the case countries.

The exploration of horizontal coherence is focused on interaction and coordination between two or more administrative bodies or organizations. Such coherence is required to address policy issues, such as climate change, which cut across many administrative sectors (Candel and Biesbroek, 2016). In addition, when a policy issue can create substantial side-effects for another policy domain – for example, energy and security – some coherence is beneficial or even required. Research on policy coherence also emphasizes its processual nature, where policy coherence may weaken or improve over time – it may first get better and then worse again (Candel and Biesbroek, 2016).

Policy integration as a concept is connected to policy coherence. It means the integration of a policy objective, such as climate change mitigation or expansion of renewable energy, to another policy domain, such as security policy. Whereas policy integration does not require coherence or two-way coordination between policy domains, this can benefit the pursuit of policy coherence. When security policy is more attuned to energy questions or the mitigation of climate change it is easier to achieve synergies or complementarities between energy transition policy and security policy. Yet policy integration may also be limited to an isolated

functional exercise in a policy domain and not spur interaction between actors from different domains (Kivimaa and Sivonen, 2021).

Policy integration has a history of several decades in the development of European environmental policy. It was developed at the start of the millennium, with different perspectives of integration presented. For example, Lafferty and Hovden (2003) proposed a definition of environmental policy integration including a principled priority of environmental issues over other policy objectives. Nilsson and Persson (2003), in turn, took a learning-based approach in defining and analyzing environmental policy integration, arguing that such integration occurs when (policy) actors meet together and discuss issues. Such learning could, in these instances, occur across political frames or worldviews and their interpretations. Russel and Jordan (2009) distinguished between the approaches of policy integration as normative, organizational, procedural, output-based assessments and reframing. More recent literature has begun to question the feasibility of policy integration in each possible context. For instance, Candel (2021) has argued that policy integration can be costly and deliberation is required regarding when integration is a good use of public resources. He, however, also remarked that not considering policy integration can be dangerous too and can result in disruptive effects in cases of crises. Therefore, policy integration as an idea should not be disregarded without proper consideration.

Certain elements or mechanisms benefit from advancing policy coherence and integration and can also function as analytical evidence of the presence or absence of coherence and integration (see Kivimaa, 2022a, for details). While many of these mechanisms, such as shared visions or specific plans to improve coherence, operate at the level of administration, the political level is important too – albeit rather sparsely addressed. Tosun and Lang (2017, p. 559) argue that political leadership and parliamentary committees are important for policy integration, noting that "political dynamics have not been systematically explored within the literature on horizontal governance." Also, Runhaar et al. (2018) emphasize political commitment as an important explanatory factor. Jordan and Lenschow (2010) note that lack of political will is associated with mere symbolic actions on policy coherence and integration, particularly by right-wing governments. In effect, improving policy coherence or integration may require a shift in some dominant political frames (Candel and Biesbroek, 2016). The 2022 security and energy crisis in Europe may have created such a shift in the dominant frames for many countries and the EU more broadly.

Specific elements or mechanisms for policy coherence, proposed in the literature, include visions (May et al., 2006) and comprehensive frameworks (e.g., common strategic objectives and instrument mixes) shared across policy domains (Furness and Gänzle, 2017). These can be implemented as new policy strategies. Within and

across public organizations, coherence and integration can be advanced by setting up new executive agencies (Tosun and Lang, 2017), creating means of coordinating between sectoral administrations, promoting specific plans for coherence, allocating staff and financing (Runhaar et al., 2018), and evaluating and reporting on coherence and integration. Independent working groups or science panels may also be used (Mickwitz et al., 2009). While they may not guarantee the presence of synergies or the absence of conflicts these elements can be interpreted as signs of attempted coherence. From a transition perspective, they may nevertheless be useful, as transitions have been argued to benefit from constructive and open tensions among actors. Thus, more explicitly recognizing policy conflicts is a start to exploring connections among diverging worldviews, interests, and perceptions. However, policy incoherence or lack of sufficient policy coherence or integration are common. Conflicting interests or lack of access to knowledge and advice results in poor integration and incoherence, visible, for example, as conflicting policy statements and objectives (Runhaar et al., 2020). Cultural and cognitive frames of policymaking influence how and whether policy coherence and integration happens (Jordan and Lenschow, 2010).

In the context of policy coherence for energy and security, an important additional feature is the dynamics of securitization (see Chapter 2). In essence, securitizing energy policy could mean, at least in some cases, a principled priority of security over other policy objectives. This could be translated as extraordinary energy-policy measures for security reasons that are not part of established political or policy practices, allocating more power from the ministries to the agency level in decision-making related to energy and security and/or hiding information from the public eye (Heinrich and Szulecki, 2018). Securitization of energy policy could lead to improved coherence between energy and security policymaking, but the viewpoint taken would determine the effects on zero-carbon transition in terms of contradiction or synergy. For energy transition policies to be aligned with security policies would require acknowledging environmental and climate security as central parts of security policy and the pursuit of securitization.

Figure 4.3 shows the part of the analytical framework oriented toward exploring horizontal policy coherence between energy policies and security and defence policies from a transitions perspective. The policy domains are in interplay, not in a static world, but in a world where the energy transition is advancing and where landscape-level developments are taking place, creating new pressures for national security and the energy sector. The analysis focuses on synergies and conflicts/contradictions, administrative coordination between the domains, and the existence of potential coordinating elements. In addition, it aims to identify how security aspects of expanding energy niches as well as new landscape developments have been integrated into the nexus of energy and security policymaking.

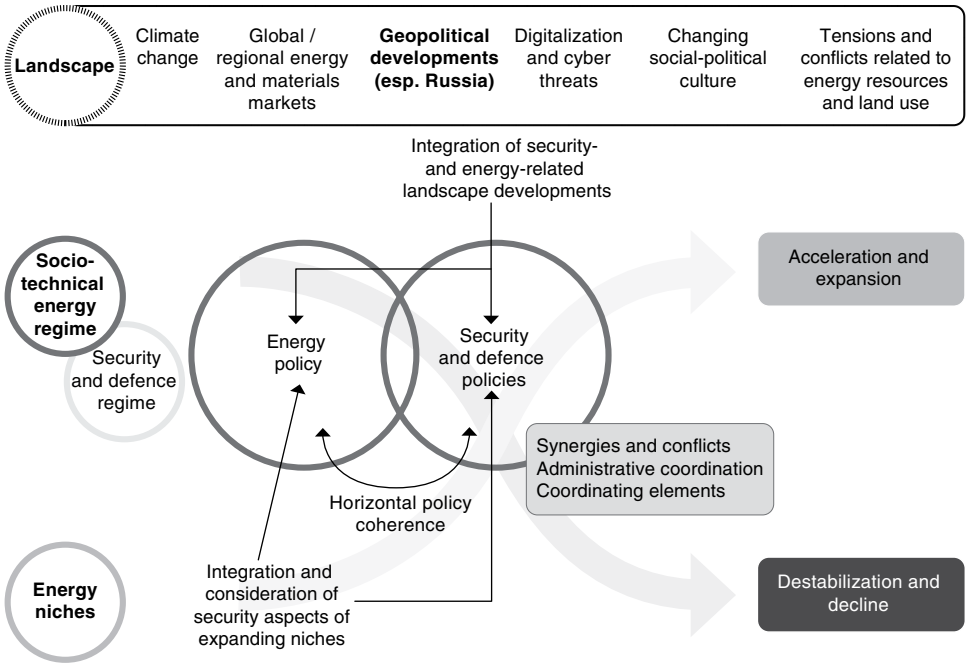

Figure 4.3 Coherence between energy transition and security and defence policies at the sociotechnical regime level.
Sources: Based on adaptations from Geels (2002); Loorbach et al. (2017); Kivimaa and Sivonen (2021); Hebinck et al. (2022); Lazarevic et al. (2022).

4.3 Security in Change Processes: Niche Expansion and Regime Decline

The final part of the analytical framework is focused on the positive and negative security implications of the unfolding energy transitions (Figure 4.4). It draws on the concepts of positive and negative security, introduced in Chapter 2, and on processes of niche-building from sustainability transitions literature. It also proposes new processes for regime decline (Kivimaa and Sivonen, 2023), drawing from literature on regime destabilization and decline. The aim is to note how the different case countries have explored the security implications of these processes in public policy development (strategies, policy actions) and why the countries may have differing perspectives on this. In country chapters, this topic is mainly addressed via specific cases where security connects to a certain energy technology or development.

I now briefly describe the key analytical components used, drawing from a scientific paper in which they were first used (Kivimaa and Sivonen, 2023). Table 2.1 in Chapter 2 described the established processes of navigating expectations, social

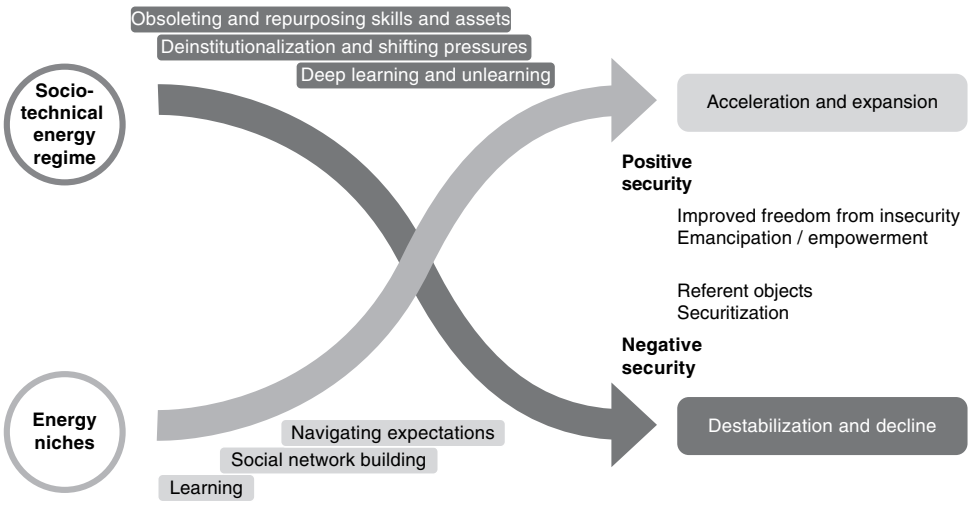

Figure 4.4 Framework for analyzing the positive and negative security of transition processes.
Source: Elaborated from Kivimaa and Sivonen (2023).

network-building, and learning, which have been used to delineate the development of new niches but can also be applied in the context of assessing their security implications. Because similar established processes for regime decline do not exist, new processes that could be used to describe regime decline and explore the security implications of fossil fuel phaseout are proposed (Table 4.1).

It has long been argued that disruptive innovation leading to regime destabilization may initiate processes that reduce the value of existing skills, knowledge, competences, and resources (Abernathy and Clark, 1985; Kivimaa and Kern, 2016) and weaken the flow of resources to previous core technologies (Turnheim and Geels, 2013). New research, however, shows that incumbent actors in the energy sector are increasingly seeking to repurpose their resources to new technological and market contexts (Mäkitie, 2020). This process is described as *disruption to and repurposing* of skills and assets (Kivimaa and Sivonen, 2023, p. 1).

In the energy security context, I regard the second process of regime decline to be *unlearning and deep learning*. Unlearning has been used to refer to processes that question and reject taken-for-granted values, norms, and beliefs (Feola et al., 2021) linked to incumbent power structures (Stirling, 2019), as well as discarding ineffective habits and practices alongside established mental models (Van Mierlo and Beers, 2020; Van Oers et al., 2023). Deep learning, in turn, indicates experiential social learning about the pressures for change for established regimes and creating new in-depth knowledge about change to come (Ghosh et al., 2021).

Table 4.1 *Processes of disruption to and repurposing skills and assets, unlearning and deep learning, and deinstitutionalization and shifting pressures in regime decline*

Regime decline process	Grounding in literature
Disruption to and repurposing skills and assets	Disruptive innovation and resulting regime destabilization processes create changes, whereby existing skills, competences, knowledge, and resources may become reduced in value and, in extreme cases, obsolete (Kivimaa and Kern, 2016). In an industrial context, this means that the value of incumbents' expertise and other factors of production reduces significantly (Abernathy and Clark, 1985). Destabilization is argued to weaken the flow of resources into the reproduction of regime elements such as core technologies (Turnheim and Geels, 2013) and financial resources (Rosenbloom and Rinscheid, 2020). However, recent research, for example, in the COVID-19 pandemic context, also shows that actors can quite rapidly repurpose their skills to new types of commercial operations (Nemes et al., 2021). For instance, Norwegian oil and gas industry companies have sought new corporate ventures in offshore wind, mainly because they are able to repurpose their existing resources (e.g., technological and market expertise) to this new form of power (Mäkitie, 2020).
Unlearning and deep learning	Unlearning and deep learning are connected to processes that destabilize existing sociotechnical regimes. Unlearning is a process that results in discarding old obsolete practices and ineffective habits (Van Mierlo and Beers, 2020), established routines, and mental models (Van Oers et al., 2023) via consciously not thinking or acting in old ways (Stenvall et al., 2018). It has been described as a continual and reflexive process of identifying how our conceptualizations of the world are unself-consciously bounded (Lawhon et al., 2016). It is about rejecting and questioning taken-for-granted values, norms, and beliefs (Feola et al., 2021) that are often associated with incumbency and the structuring of power (Stirling, 2019). Unlearning means accepting a certain risk and uncertainty about the future regime and, hence, connects to deep learning, that is, "experiential social learning" about challenges facing the extant regime and constructing new in-depth knowledge about the changing system dynamics (Ghosh et al., 2021).
Deinstitutionalization and shifting pressures	Deinstitutionalization is a process where legitimacy is eroded in the context of shifting social, political, and functional pressures, implying changes in underlying interests and power relations and in structures of leadership and authority, and reducing cultural consensus (Novalia et al., 2022). Key actors in (de) institutionalized structures may be replaced organically or in response to deliberate attempts (Kivimaa and Kern, 2016; Turnheim and Geels, 2012). Dominant actors may lose influence and legitimacy when markets decline, and when value chains and networks break up with weakening expectations connected to changing landscape pressures (Markard et al., 2020), while actors also resist this process by seeking renewed roles in the new system that relegitimize their position (Mäkitie, 2020).

Source: Kivimaa and Sivonen (2023).

Further, regime decline can be connected to *deinstitutionalization and shifting pressures*. In deinstitutionalization, legitimacy is decreased when social and political pressures change, resulting in changes in fundamental structures of leadership and authority, power relations, and interests (Novalia et al., 2022). Niche development and regime decline processes dynamically influence each other and may even overlap. Hence, they cannot be considered as mutually exclusive, but rather as complementary, processes.

In the country chapters, I focus on selected cases related to niche development and regime decline that appear important from the perspective of security. Identification of such cases was not always easy, because many previous niches (such as wind and solar power) have increasingly become a part of regimes. In turn, some energy sector developments, especially those related to nuclear energy or hydropower, cannot be described in terms of either niche development or regime decline and are, rather, nondeclining parts of incumbent energy regimes – but their contexts change when transitions are in place in the broader energy system. The cases explored in the country chapters include, for example, wind power and defence air surveillance radars (Estonia and Finland), security of hydropower infrastructure (Norway), oil shale phaseout (Estonia), peat phaseout (Finland), and nuclear security (Scotland).

This ends the first, conceptual, part of this book. Part II presents empirical analyses of the four country case studies and shows how security and defence intertwine with energy policy questions and transitions in these countries.