Tampere University

MARJA HELENA SIVONEN

Petroholism, Competitiveness, and Looking to the West

The construction of security in energy transitions in Estonia, Finland, and Norway (2006–2023)

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I had this dream, our planet surviving
The guiding stars always growing
And all the worlds, the fates of the countries
They're all rebuilding at the same time

Gojira, "Global Warming". *From Mars to Sirius*, Listenable Records, 2005

From its roots in early environmental and nature conservation movements, climate change has grown into a major global policy issue, requiring action at all levels of society, from the global to the local. Despite extensive discussions and tangible efforts, 2024—the year this thesis took its final form—was recorded as the warmest year on the planet. In Finland, where I write, the climate is warming faster than the global average, with rainy winters and heatwaves disrupting established patterns of life. Other catastrophes are not tuning down but spiralling up, fuelled by the climate crisis and injustices around world. Yet, hope persists—in us, in art, in science, and in politics. It is the small streams that form rivers, which ultimately lead to an ocean of hope. This thesis would not have been the same without the many people who placed their hope both in the future of the planet and in my endeavours.

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Throughout the years, academic encounters have indeed been plentiful and enriching—I have had the honour of meeting talented, insightful, and kind colleagues throughout this journey. Although I was fortunate to visit other research institutes, this was far from certain, as the first two years were spent largely at home due to COVID-19. Finally, in February 2022, I had the opportunity to be in Oslo during a research visit to the Fridtjof Nansen Institute when news broke of Russia's unlawful invasion of Ukraine. Despite the sombre context, the visit itself was a truly

memorable experience. Thank you to everyone who made my stay so enjoyable amidst such beautiful surroundings.

It took some time, but I am immensely grateful that the planned visit to SPRU at the University of Sussex eventually materialised. My heartfelt thanks go to Dr. Marie Claire Brisbois and all the other wonderful colleagues, especially the wonderful group of postgraduates at the Business School for their warm welcome. The cherry on top was my visit to SPRI at Cambridge University, where I had the pleasure of staying with doctoral researcher Emilie Canova. Emilie, thank you for making me feel so welcomed and for the joy of being able to call you my friend. I am also deeply thankful to doctoral researcher Tanja Riekkinen for introducing me to the rewarding world of teaching at Oulu University and for your friendship.

It is important to recognise that doctoral studies are about far more than the hard science—though there has been plenty of that as well. For me, this time has been enriched by spending quality moments with friends and colleagues at participating and organising conferences, summer schools, and courses. In general, the STRN community has been a wonderful nesting place for sharing of ideas and learning new. The community for early career researchers provided by NEST has also been an important gateway to sustainability transitions networking, thank you for carrying it onwards. It was truly wonderful experience to organise a conference fully online with my fellow organizers, Viktor Werner, Nur Gizem Yalçın, Abe Hendriks, Machteld Simoens, Leo Frank, and others involved, and I have enjoyed our encounters in real life ever since. The Arctic provided a wonderful context to meet the kindest and most enthusiastic of friends and colleagues: Yue Wang, Trym Eiterjord, Juho Kähkönen, Eda Ayaydin, Emil Ísleifur Sumarliðason, and many others from Calotte Academy, around and in the Arctic—it has been an absolute joy getting to know you all!

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around with headphones on, talking away. The views have been stunning, from the majestic Norwegian mountains to the sprawling English countryside and the dense Finnish forests. But in truth, it was never just about the places; it was about you, my friends, because you shared the most precious gift of all: your time. To Mariela, Tuuli-Julia, Vilma, Kaisa, Laura, Heidi, Teppo, Satu and Elina, and my beautiful girls in Oulu—Reeta, Anna, and Emma—thank you from the bottom of my heart for the love, help and much needed distractions.

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I hope my work offers encouragement to other women seeking to create positive change in their lives. Hope exists in all circumstances—we just need to uncover it. As I write, war, conflict, and wildfires rage across the world, yet I remain steadfast in my belief in a just and peaceful future.

Marja Helena Sivonen
In snowy Tampere in January 2025

To Reeta and Lucas

ABSTRACT

The phenomenon of decarbonising fossil fuel-based systems has been influenced by global crises such as climate change, the Covid-19 pandemic, economic recessions, and (geo)political disruptions. There is still a strong demand for oil and gas despite the widespread awareness of the negative implications of greenhouse gases on the atmosphere. Fossil fuels have historically been closely associated with national security and defence. However, the ongoing energy transition and the electrification of societies also have implications for security and defence policy. It is essential to address negative and unintended consequences of climate change mitigation, such as vulnerabilities in defence, internal security, the stability of energy systems, cybersecurity, and geopolitical considerations. However, discussion around these concerns in Europe was muted before Russia's February 2022 invasion of Ukraine, although the Ukraine–Russia gas disputes in 2006 and the annexation of Crimea in 2014 had begun the process of redefining energy security in the European Union.

Against that background, this dissertation examines how security is discursively constructed in relation to energy transitions and what that may mean for sustainability transitions more broadly. Its aim is to contribute to the understanding of institutional change through the discourse around sustainability transitions in general and energy transitions in particular. This is important because there is an identified research gap that can be filled by empirically investigating how the potential unwanted and negative consequences of energy transitions are discursively constructed. The research is empirically grounded in decision-making in Estonia, Finland, and Norway and energy, climate, security, and defence policy-making from 2006 to 2023. The results indicate that negative security – that is, state-based, coercive conceptions of security – are hindering energy transition processes even during peacetime.

The dissertation has three objectives. First, it studies the power of discourse in sustainability transitions. Second, it illustrates contextual and interdependent policy-making in the globalised world and increases our understanding of the issues that renewable energy and increasingly electrified societies encounter. The third objective is to take a fresh look at the concept of security and how its discursive construction may impact climate change mitigation. This is done by empirically investigating the many interrelations between energy transitions and security.

This research is theoretically grounded in the tradition of discursive institutionalism, studied as an element of world society theory that seeks explanations for nation-states' homogenous actions via world culture. I connect these with the sustainability transition literature, according to which solutions to climate change require major alterations to our living habitats, which are known as socio-technical systems where socio-economic, socio-cultural, and technical development merge. Sustainability transitions refer to alterations that occur in interaction with the current system, such as the energy sector facing innovations that seek to disrupt the existing state of affairs, and to broader pressures that may tip the balance enough for a change to occur. Central elements of this interaction are actors, institutions, and technologies, with "energy transitions" being one socio-technical system change among others. The dissertation also uses the concepts of positive and negative security to broaden security thinking beyond state security and the military.

Methodologically, this dissertation combines the qualitative research methods of social constructivism and interpretative policy analysis to identify and characterise underlying currents in policy-making during a major transition in one of the most important sectors of any society – the energy sector – in the midst of another major disruption to everyday policy-making, a full-scale war in Europe. With discourse analysis, it is possible to increase the explanatory research power in sustainability transitions through language. The data consists of strategy documents and expert interviews.

The three articles provide empirical conclusions and findings. Article I argues that security is constructed through narrative meaning-making, where justifications for policies are conveyed to audiences via epistemic work by political actors. Security is constructed via claims of protection against uncertainty, the unknown world in which the state must operate. To remain secure, other states and institutions must be evaluated based on reliability and shared world views, and those assessed as reliable are openly identified. Defining not only threats but also concepts is a sign of power. For example, Norway defines sustainable development as including continued fossil fuel production.

In Article II, the interviewed experts were assumed to have the capacity to "speak security" and thus to identify, justify, and discuss issues they saw as part of energy transitions' security and defence considerations. The second conclusion is that while renewable energy has gained status as a provider of national security, renewable energy has not been fully securitized and the process does not appear coherent in

the case countries, even though similar threats as well as objects to be secured were recognised.

Third, inclusive and comprehensive decision-making is the key to just and sustainable energy transitions. Article III shows that the definition of security is broadened even further when analysing the interrelations of these sectors on a regional level, where global pressures from both the energy and security sectors merge. Justice was identified as an important concept alongside security and was viewed as a policy goal in which transition processes are advanced while enabling desirable living conditions. Here, the importance of also studying security from the point of view of positive security was striking, as many significant issues were connected to transition processes that are not traditionally classified under national security.

This dissertation makes four conceptual and theoretical contributions. First, the analytical lens of discursive institutionalism on the local and regional levels of policy-making highlights the cultural contexts and temporality of transitions. Second, the interpretative power of institutions is recognised as important. However, who comprises the fabric of those institutions matters greatly, and taking this into account in a detailed and accurate fashion strengthened the analyses by bringing in the actor and agency perspectives of socio-technical transitions. The third contribution is connected to the second, as multi-actor thinking allows for a more holistic view of the case at hand, including in security theorisation. Finally, I suggest as the fourth contribution that world culture increases the theoretical depth of the landscape concept because it explains the spread of the cultures, ideas, and practices that create the all-encompassing setting in which policy-making occurs.

TIIVISTELMÄ

Valtiot ympäri maailman tavoittelevat uusia keinoja muuttaa energiajärjestelmiään kohti päästöttömyyttä. Ilmiössä on kyse siitä, että fossiilisiin energiamuotoihin nojaavat energiajärjestelmät pyritään korvata uusiutuvilla, päästöttömillä energiamuodoilla ja energian kulutuksen tavoilla. Maailmanlaajuisesti näiden päämäärien toteuttamiseen kuitenkin vaikuttavat erilaiset kriisit kuten pandemiat, talouden laskusuhdanteet ja (geo)poliittiset muutokset. Siitä huolimatta, että tietoisuus ilmastonmuutoksen ja kasvihuonekaasujen negatiivisista vaikutuksista kasvaa, öljyn ja maakaasun kysyntä säilyttää paikkansa maailmanmarkkinoilla. Nämä fossiiliset energialähteet ovat jo historiallisesti yhteydessä kansalliseen turvallisuuteen ja puolustukseen. Meneillään olevalla energiamurroksella, samoin kuin yhteiskunnan sähköistymisellä, on kuitenkin myös huomioon otettavia yhteyksiä turvallisuuspolitiikkaan. Tällaisia tunnistettuja tekijöitä ovat esimerkiksi maanpuolustukseen, sisäiseen turvallisuuteen, energiajärjestelmien vakauteen, kyberturvallisuuteen ja geopoliittisiin muutoksiin liittyvät seikat. Jotta ilmastonmuutoksen hillitsemiseen tarkoitetut uudet, vähemmän saastuttavat energiajärjestelmät voivat toimia tarkoituksenmukaisesti, on perustavanlaatuisen tärkeää käsitellä ja löytää ratkaisuja myös kielteisiin ja tahattomiin seurauksiin. Euroopan unionissa alettiin määritellä energiaturvallisuuden käsitettä uudelleen jo Ukrainan ja Venäjän välisen vuoden 2006 kaasukriisin ja Krimin vuonna 2014 tapahtuneen valtauksen jälkeen. Tästä huolimatta keskustelu laajemmista turvallisuuspoliittisista seurauksista energiasiirtymien osalta ei ollut aktiivista ennen Venäjän aloittamaa hyökkäyssotaa Ukrainassa helmikuussa 2022.

Tarkastelen tässä väitöstutkimuksessa energiapolitiikan ja turvallisuuden välisiä yhteenliittymiä Suomessa, Virossa ja Norjassa vuosina 2006–2023. Eritoten kiinnitän huomiota siihen, miten turvallisuutta rakennetaan sosiaalisen vuorovaikutuksen keinoin politiikanteossa tekstin ja puheen avulla, eli millä tavoin diskurssien kautta käsiteltävä maailmankuva suhteessa turvallisuuden eri ulottuvuuksiin vaikuttaa energiamurroksiin ja laajemmin kestävyyssiirtymiin. Tämä on erityisen tärkeää siitä syystä, että ei ole olemassa kattavasti tietoa siitä, miten energiamurroksen ei-toivotut ja kielteiset vaikutukset rakentuvat asiayhteyksissään vuorovaikutuksellisesti ja mitä merkitystä tällä on lyhyen ja pitkän aikavälin politiikan suunnitteluun.

Väitöskirjalla on kolme tavoitetta. Ensimmäisenä tavoitteena on tarkastella diskursseja osana valtaa ja hallintaa kestävyyssiirtymissä. Toisena tavoitteenani on

havainnollistaa tilannesidonnaista ja toisistaan riippuvaista politiikantekemistä globalisoituneessa maailmassa ja lisätä ymmärrystä ajankohtaisista kysymyksistä, joihin uusiutuvan energian kasvavan käytön ja alati sähköistyvien yhteiskuntien tulee vastata. Kolmantena tavoitteena tämä väitöskirja tutkii turvallisuuden käsitettä uudella tavalla, ja sitä miten sen käsitteellistäminen vaikuttaa ilmastonmuutoksen hillintätoimiin.

Teoreettis-metodologinen pohja tälle väitöskirjalle pohjaa diskursiivisen institutionalismin perinteeseen osana maailman yhteiskuntateoriaa. Maailman yhteiskuntateoria etsii selityksiä kansallisvaltioiden homogeeniselle toiminnalle yhteiskuntien järjestäytyessä eri tavoin. Tarkastelen erityisesti sitä, miten kansallinen konteksti mukautuu kahteen globaaliin politiikkamalliin: ilmastonmuutoksen hillitsemiseen ja ideaaliin kansallisesta turvallisuudesta. Yhdistän diskursiivisen institutionalismin kestävyyssiirtymäkirjallisuuteen, jonka mukaan ilmastonmuutoksen ratkaisut vaativat suuria muutoksia elinympäristöihimme, joita kutsutaan sosioteknisiksi järjestelmiksi. Näissä järjestelmissä sosioekonominen, sosiokulttuurinen ja tekninen kehitys yhdistyvät. "Kestävyyssiirtymillä" tarkoitetaan muutoksia, jotka tapahtuvat nykyisen järjestelmän, esimerkiksi energiajärjestelmän, uusien innovaatioiden, sekä laajempien paineiden ja odotusten välisessä vuorovaikutuksessa. Uudet innovaatiot pyrkivät muokkaamaan nykyistä järjestelmää uusiksi, ja ulkoiset paineet voivat mahdollistaa uusien toimintatapojen ja teknologioiden pääsyn osaksi vallitsevaa järjestelmää keikauttamalla vallitsevaa järjestelmää. Tämän vuorovaikutuksen keskeisiä elementtejä ovat toimijat, instituutiot ja teknologiat, ja "energiasiirtymät" ovat yksi sosiotekninen systeemimuutos muiden joukossa. Lisäksi tämä väitöskirja hyödyntää positiivisen ja negatiivisen turvallisuuden käsitteitä laajentaakseen turvallisuusajattelua kattavammaksi, kuin valtion turvallisuuteen ja esimerkiksi armeijaa koskeviin asioihin.

Keskeinen väitteeni on, että energiasiirtymiä suunnitellessa niihin liitettävät turvallisuuden negatiiviset ominaisuudet hidastavat prosessia myös rauhan aikana. Vaikka kestävyyssiirtymät ja energiamurrokset ovat laajalti yhteisiä periaatteita, ja ilmastotavoitteiden saavuttamiseksi tehdään paljon työtä eri politiikan tasoilla ja käytännössä energiasektorilla, kapea turvallisuuden käsittely osana vain valtiokeskeistä turvallisuutta ei jouduta, saatikka mahdollista energiamurroksia niiden vaatimalla nopeudella tai esimerkiksi sosiaalisen kestävyyden huomioon ottamisen kannalta.

Metodologisesti tässä väitöskirjassa pohjaudutaan laadullisiin tutkimusmenetelmiin. Sosiaalisen konstruktivismin, diskurssianalyysin ja tulkitsevan politiikka-analyysin avulla voidaan tunnistaa ja luonnehtia politiikanteon taustalla olevia virtauksia yhteiskunnan taitekohdassa. Energiasektori on yksi keskeisimmistä yhteiskuntaa ylläpitävistä sektoreista, ja muutokset siinä koskettavat ihmisiä ja yhteiskuntia laajasti. Lisäksi toinen suuri huomioon otettava muutos politiikanteossa on sota Euroopan mantereella. Laadullisella lähestymistavalla onkin mahdollista lisätä ymmärrystä kestävyyssiirtymien diskursiiviseen luonteeseen. Työni aineisto koostuu strategia-asiakirjoista ja asiantuntijahaastatteluista, ja niitä analysoidaan kolmessa eri tutkimusartikkelissa.

Ensimmäisessä artikkelissa väitän, että turvallisuus rakentuu narratiivisen merkityksenteon kautta, eli politiikan oikeutukset välittyvät yleisölle poliittisten toimijoiden episteemisen työn avulla. Erilaisten toimijoiden tuottamien väitteiden avulla rakennetaan turvallisuutta halutulla tavalla suojaamaan epävarmuudelta ja tuntemattomalta maailmalta, jossa valtion on aktiivisesti toimittava. Tätä työstetään myös yhteistyössä muiden toimijoiden kanssa, ja nämä muut valtiot ja instituutiot arvioidaan luotettavuuden ja yhteisten maailmankatsomusten perusteella. Luotettavaksi arvioidut kumppanit osoitetaan avoimesti muille.

Toisessa artikkelissa tutkimushaastateltavina toimineilla asiantuntijoilla oletettiin olevan mahdollisuus "puhua turvallisuudesta", eli tunnistaa, perustella ja keskustella asioista osana energiasiirtymien turvallisuus- ja puolustuspolitiikan yhteenliittymiä. Näistä aiheista ei kuitenkaan aina päästy yhteisymmärrykseen edes saman maan sisällä, vaikka turvallisuusuhkiin ja -riskeihin liittyviä yhtäläisyyksiä voitiin tunnistaa eri valtioissa samoilla tavoilla.

Kolmannessa artikkelissa osoitan, että turvallisuuden määritelmää on kannattavaa laajentaa analysoitaessa turvallisuuden ja energian välisiä suhteita alueellisella tasolla, etenkin silloin, kun sekä energia- että turvallisuusalojen maailmanlaajuiset paineet yhdistyvät. Oikeudenmukaisuus nousi tärkeäksi käsitteeksi turvallisuuden rinnalla arktista aluetta tarkasteltaessa, mutta myös poliittisena tavoitteena, jotta energiasiirtymäprosessit voitaisiin toteuttaa ottaen samalla huomioon hyvän elämän mahdollisuudet. Tässä turvallisuuskysymysten tutkimisen merkitys myös positiivisen turvallisuuden näkökulmasta oli silmiinpistävää, sillä siirtymäprosesseihin yhdistettiin monia merkittäviä kysymyksiä, joita ei perinteisesti ole ajateltu osaksi "kansallista turvallisuutta", mutta joilla kuitenkin on vaikutuksia siihen.

Tämä väitöskirja tarjoaa neljä keskeistä käsitteellistä ja teoreettista näkökulmaa tutkimusaiheeseen. Ensinnäkin diskursiivisen institutionalismin tarjoama analyyttinen katsaus paikallisen ja alueellisen tason päätöksenteossa valaisee siirtymien kulttuurisia konteksteja ja ajallisuutta. Toiseksi instituutioiden tulkintakyky tunnustetaan merkittäväksi, vaikka on kuitenkin olennaista huomioida, ketkä muodostavat nämä instituutiot. Analyysissa sisällytettiin tämä toimijuus tuomalla mukaan toimijoiden ja toimijuuden näkökulmat sosioteknisiin siirtymiin. Kolmas näkökulma liittyy läheisesti tähän, sillä monitoimijanäkökulmat mahdollistavat kattavamman ymmärryksen myös turvallisuuden teoretisoinnissa. Lopuksi ehdotan, että maailmankulttuuriteoria syventää ”landscape” käsitteen teoreettista ulottuvuutta, sillä se selittää kulttuurien, ideoiden ja käytäntöjen leviämistä, jotka luovat sen kokonaisvaltaisen ympäristön, jossa päätöksenteko tapahtuu.

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Article II — Sivonen, Marja Helena, and Paula Kivimaa. 2024. "Securitization of Energy Transitions in Estonia, Finland, and Norway." International Political Sociology 18, no. 3. https://doi.org/10.1093/ips/olae017.

Article III — Sivonen, Marja Helena, and Paula Kivimaa. "Interrelations between Security and the Zero-Carbon Energy Transition in the Finnish and Norwegian Arctic." Accepted for publication for Energy Research & Social Science 6.11.2024.

1 INTRODUCTION

Energy transitions driven by nation-states represent a global endeavour (International Energy Agency 2023c; International Renewable Energy Agency 2022; World Economic Forum 2023). This phenomenon of transitioning energy production and consumption from being based on fossil fuels to renewable energy has been influenced by global crises such as the Covid-19 pandemic, economic recessions, and geopolitical fluctuations and via discursive changes over time and place (Genus 2016; Rosa and Machlis 1983; Scrase and Ockwell 2010). Despite the widespread awareness of the negative implications of greenhouse gases caused by fossil fuels accelerating climate change, there remains a strong demand for oil and gas as sources of energy (IEA 2023c). While national security and defence have historically been closely linked to fossil fuels (Scrase and Ockwell 2010; Siddi 2018; Yergin 2009), the ongoing energy transitions and the rapid electrification of societies have numerous implications for national security and defence policy. These include concerns related to traditional state defence, internal security, the stability of energy systems, cybersecurity, and geopolitical considerations (Kivimaa and Sivonen 2023). The negative and unintended consequences of climate change mitigation must be robustly addressed concurrently with the development of new, less polluting energy systems. However, discussion around these concerns was muted in Europe before Russia launched a full-scale war in Ukraine (Kivimaa 2024) in 2022, although the Ukraine–Russia gas disputes in 2006 (Szulecki 2018) and the invasion of Crimea in 2014 had spurred efforts to redefine energy security (Westphal and Szulecki 2018).

Given this context, it is evident that understanding the connections between energy transitions and national security and defence are significant, even crucial. Cohesive and integrated policy-making would improve the overall planning and consistent aspiration towards a decarbonised energy system (Kivimaa 2022). However, previous research indicates that this has not been the case. The energy and defence sectors have long been understood as separate, with limited discussions of security concerns in the renewable energy context and little interest in renewable energy in the defence sector (Kivimaa and Sivonen 2021). When the 2022 energy crisis struck Europe, a

surge in political interest in the interplay between energy transitions and security was triggered, and the practical and political importance of stable, reliable, and affordable energy was reinforced. With the drastic change in the expectations of European energy flows, energy and security were connected anew, with varied perspectives adopted in different discourses in both public debate and political fora. At the same time, interest in increasing renewable energy grew, and its role as a provider of national security was highlighted. Yet, the production and consumption of fossil fuels manufactured in the EU and Norway also enjoyed a notable boost and were discussed in connection with national security. These overlapping and often contradictory discourses were troublesome and revealed the need for a more nuanced discussion about this interplay in policy-making. Therefore, my main research problem in this dissertation is as follows: How is security discursively constructed in relation to energy transitions, and what does that mean for sustainability transitions more broadly? This question is investigated in the context of the small Northern European countries of Estonia, Finland, and Norway.

Security has been described as ultimately a "slippery term" (McSweeney 1999) with myriad meanings and purposes deployed in different contexts, but it is at its core a political term (Williams 2008). The sociology of security specifically asks what security means and what security does (Bigo 2008), drawing attention to the specific ways it is deployed in interactions. Security has also been described as a defensive concept that seeks to protect what is already in place (Wæver 1997). As this dissertation is rooted in an approach underlining the "social construction of reality" (Berger and Luckmann 1967), I broaden the definition of security to include more than state-based security notions of threats and vulnerabilities. I view security and insecurity as changing qualities "of a relationship, grounded in human needs, which encourages confidence in the participants that their legitimate values are protected in a manner compatible with the capacity of others to do likewise" and to continue the academic and practical use of the term more holistically (McSweeney 1999, 100).

However, as transitions are fundamentally about change and subordinate to political decision-making (e.g., Avelino et al. 2016; Meadowcroft 2011), I follow the conceptualisation adapted from the field of international relations: that is, the understanding that security can also have positive characteristics with multiple actors involved, also referred to as "positive security," in addition to the traditional idea of hard security among nation-states, referred to as "negative security" (Hoogensen Gjørv and Bilgiç 2022; McSweeney 1999; Roe 2012). In addition, the multifaceted

concept of securitization (Buzan, Waever, and de Wilde 1998; Floyd 2019) helps understand the political nature of security in transitions (Szulecki 2020) when viewed from a sociological standpoint (Bigo 2008; McDonald 2021; McSweeney 1999; Wæver 1997). Indeed, transitions are profoundly political and thus debatable processes (Scrase and Ockwell 2010), and the way security is constructed in relation to transitions has a powerful impact on whether a given transition succeeds or fails. In fact, I argue that the negative characteristics assigned to security when discussing energy transitions hinder such transitions, even during peacetime.

The energy sector and the defence and security sectors are operated by institutions and organisations that possess significant power (Avelino et al. 2016) over climate change mitigation. In 2019, electricity and heating contributed to 34% of global greenhouse gases and was thus the single biggest emitter by burning fossil fuel-based energy sources (Environmental Protection Agency 2024). Emissions in the defence sector are difficult to estimate, but the data recently available suggests a large contribution to the global carbon footprint (Parkinson and Cottrell 2022). For this reason, developments in each of these sectors significantly influence the achievement of global climate goals. Treating them together with an eye towards climate neutrality is challenging but vital (Kivimaa 2022, 2024; Kivimaa and Sivonen 2021, 2023; Sivonen and Kivimaa 2023). Moreover, the discourse surrounding their potential as instruments for advancing these objectives, or the lack thereof, has enduring and widespread consequences. The military sectors contribution to environmental impacst even during peace time, is topic that I argue, should be discussed more. This is because the analysis in this study clearly shows that the military sector has significant impacts on the energy transitions, as well as the current societies.

1.1 Connecting discursive institutionalism to sustainability transitions

This dissertation is theoretically grounded in the tradition of discursive institutionalism, following Pertti Alasuutari (2015) by emphasising culture and discussed as part of the new institutionalism which seeks explanations for nation-states' homogenous policy-making and for how they organise society according to similar cultural scripts (Lechner and Boli 2005; Meyer 2004; Meyer et al. 1997). According to Lechner and Boli, "world culture – the culture of world society, comprising norms and knowledge shared across state boundaries, rooted in

nineteenth-century Western culture but since globalised, promoted by nongovernmental organizations" (2005, 6), explains the way everyday activities and institutions are often so similar in widely different parts of the world. "Culture" is understood through the long-standing tradition of the analysis of socially constructed realities in which it means the "shared symbolic and meaning systems that become embedded in objects, organizations, and people," although it systematically goes beyond individual comprehension (Lechner and Boli 2005, 16). Critics, however, point out that the world culture theorisation is too heavily based on Western, Christian and capitalistic assumptions of the world, modernity and culture (Buhari-Gulmez 2010).

"Institutions – or the institutional infrastructure composed of the institutions – are more or less equated with culture and society" (Alasuutari 2015, 165) as part of world society theory. Discursive institutionalism complements this understanding by allowing a more detailed opportunity to discuss the motivations of actors in relation to interrelations between energy transitions and security and defence issues. Indeed, by using discursive institutionalism, I study the core institutions and discourses that motivate different actors to follow or attempt to deviate from the globally agreed scripts that presuppose climate change mitigation, despite widespread expectations to conform to them (Alasuutari 2015).

I connect discursive institutionalism with the sustainability transition literature, according to which solutions to climate change require major alterations to our living habitats: that is, "socio-technical systems" in which socio-economic, socio-cultural, and technical development merge (Grin, Rotmans, Schot, Geels and Loorbach 2010; Köhler et al. 2019). Socio-technical systems can be shaped by interaction between the current system, disruptive innovations, and broader pressures that compel change (i.e. the landscape) (Geels 2004). The central elements of this interaction are technologies, actors, and institutions (Kivimaa 2024). "Sustainability transitions" refer to these alterations, and "energy transitions" comprise one such socio-technical system change. Energy transitions require shifts in technological innovation and institutional development (Edomah, Bazilian, and Sovacool 2020), highlighting the political, social, and economic transformations that those transitions bring with them in the wider political sphere (Brisbois 2020; Raven et al. 2016; Stirling 2014). In addition, changes in individual behaviour, motives, norms, and understandings of the change at hand are a prerequisite (Steg, Perlaviciute, and van der Werff 2015). These are created and conveyed via institutions, which in this dissertation comprise

formal and informal rules, laws, policies, markets, and regulations (Andrews-Speed 2016), values and beliefs (Geels, Kern, Fuchs, Hinderer, Kungl, Mylan, et al. 2016; Ghosh and Schot 2019), and other organisations partaking in the life of a society (DiMaggio and Powell 1983). A frequently used theoretical lens to study socio-technical system change is the multi-level perspective (MLP), in which the interrelations between niches (as protective spaces for emerging technologies and services), the regime (comprised of incumbent actors, infrastructure, and prevalent norms and values), and the landscape (the external developments pressuring the regime) are investigated (Geels 2004; Geels and Schot 2007).

Among sustainability transition scholars, particular attention has been paid to states as carriers of coercive power in the form of the military and capacity to make war as major actors in global energy networks, thus participating in shaping the success of transitions (see, e.g., Geels 2014; Johnstone and Newell 2018; Morgunova 2021; Stern 2006). However, despite the undisputed importance of those phenomena, there is a relatively small body of literature on the interrelations between energy transitions, especially renewable energy and national security, and defence at a policy level. Novel work has been conducted by scholars like Phil Johnstone and Peter Newell (2018), who first discussed war and other military activity as part of sustainability transitions and further argued that the analytical lens should be directed beyond energy policy and towards sectors where actions relevant to transitions were occurring (Johnstone, Stirling, and Sovacool 2017). A historical perspective on the role of how war shapes energy systems is offered by Johnstone and McLeish (2020, 2022), who draw attention to the unsustainable practices of the military–industrial complex that has been maintained since World War II. These have had long-lasting ramifications not only for current energy systems but also for the ways food and transport are organised (Johnstone and Schot 2023). The fossil fuel industry's connections to the military have also been acknowledged in passing by Geels (2014), and the military's needs to secure critical resources has been discussed as shaping states' approaches to war (Ford and Newell 2021). These studies take a state-centred, realist approach to security and place states using and producing fossil fuels at the centre, thus potentially hindering the energy transition.

Furthermore, geopolitical concerns, cybersecurity, land use disputes, and internal conflicts have been discussed as part of transitions (Fischhendler, Herman, and David 2021; Vakulchuk, Overland, and Scholten 2020; Verbong and Geels 2010; Żuk and Szulecki 2020). Researchers have also studied renewable energy policies in

post-conflict societies (Chaar et al. 2020; Fischhendler, Herman, and David 2021). In addition, an important body of research discusses notions of justice as part of energy transitions (Jenkins, Sovacool, and McCauley 2018; Sovacool and Dworkin 2015; Sovacool, Sidortsov, and Jones 2014). Recently, the interrelations between energy transitions and security have been examined from the perspective of small countries as part of the IDEALE project – of which this dissertation is an independent part – bringing attention to, for example, policy coherence and integration between the two sectors (Kivimaa 2024; Kivimaa and Sivonen 2021), to the interconnected issues in the energy, security, and defence sectors (Kivimaa and Sivonen 2023), and to connections with other policy sectors, such as trade, in cascading climate impacts (Kivimaa, Hildén, Carter, Mosoni, Pitzén and Sivonen 2024).

Studies using interpretative discourse approaches among transition scholars that highlight the debatable and therefore political nature of transitions are increasing in number (Isoaho and Karhunmaa 2019; Simoens, Fuenfschilling, and Leipold 2022). A closely related branch of this field is the study of power and politics in sustainability transitions (Avelino 2021; Avelino et al. 2016; Brisbois 2020; Patterson et al. 2017; Raven et al. 2016). Previous research has pointed out the need to plan for the long term despite the short political cycles of institutions (Meadowcroft 2009) and to better understand the role of institutions (Kern 2011) and culture in socio-technical system change (Geels 2004; Geels and Schot 2007). In a Foucauldian interpretation, knowledge is "produced, shaped and constituted by the exercise of power" (Avelino and Rotmans 2009, 558), which is why attention to discursive power and action in policy-making has been addressed in major systems change (Isoaho and Karhunmaa 2019; Kainiemi, Karhunmaa, and Eloneva 2020; Karhunmaa 2021; Simoens, Fuenfschilling, and Leipold 2022). For example, different tactics, such as supporting a specific energy policy in the name of national security (Johnstone, Stirling, and Sovacool 2017) and how the political atmosphere operates as a tool for energy transitions success or failure (Lockwood 2018; Szulecki 2018; Szulecki and Kusznir 2018), demonstrate that those possessing institutional power aim to influence their audiences in multiple ways. Furthermore, it is vital that policy-makers be capable of imagining the future of the new energy system and that it be appropriately communicated to their audiences (Scrase and Ockwell 2010). For example, Karhunmaa (2021) takes the step from studying energy transitions as a major challenge towards investigating the solutions policy-makers have been able to imagine and the frames and discourses around those solutions. The widely shared

imaginary of carbon neutrality was still important, but definitions and solutions varied widely between policy-makers.

This dissertation investigates policy-making from the perspective of changing societies. Although world society theory holds that societies aim to conform to shared scripts in the forms of global policy, national contexts often vary significantly and may act contrary to what was otherwise agreed upon. To understand change through discourse, I enrich the analysis by using the epistemic governance framework as a theoretical approach (Alasuutari and Qadir 2019; 2014). Sustainability transition research can be enhanced by investigating how discourse is used in negotiations over how to best adapt to and decouple from global scripts. This increases the explanatory power of the mechanisms through which transitions come about in the first place and of the inertia with which they meet. For example, Hironaka and Schofer argue that broad social changes such as environmental protection to reduce emissions require a vast number of different and mutually reinforcing, complex mechanisms. These come about due to legitimated cultural norms and discourses that "produce a cascade of reinforcing dynamics" that may then lead to major institutional changes (2002, 40). In their study, they were able to show that in relation to chlorofluorocarbon emissions, international institutional change did create a significant social transformation. However, those authors also highlighted that many mechanisms were involved and that emphasising one over another could lead to missing the broader context. These mechanisms of change include legislation, cultural shifts, media discourse, and successful science communication to the public that leads to behavioural modification (Hironaka 2002). In sustainability transition studies, these types of mechanisms are often studied in an assumed technical, institutional, or actor-based interaction where change takes place.

According to the MLP, new ideas in the form of innovations for decarbonised systems, for example, come about when they have matured enough in a protected space, such as research and development projects, with smaller networks of actors nurturing and investing in the idea, or in a bounded geographical area (Smith and Raven 2012). Subsequently, they may be introduced and diffused to the broader public at an appropriate time. That timing depends on the overall expectations that may be transformed by the events that alter the atmosphere so that it is favourable to change (Geels 2005). The world society theory frame suggests that these interactions only come about because of the globally agreed scripts (Lechner and

Boli 2005; Meyer 2004; Meyer et al. 1997). Many nation-states have agreed to global climate agreements, such as those negotiated at the United Nations Climate Change Conference (COP28) in Dubai in 2023.

Although it cannot be claimed that sustainability transitions are truly global, their institutional embeddedness enables the present study to follow the dynamics introduced in the MLP in different evolving contexts in myriad sectors around the world (Coenen, Benneworth, and Truffer 2012). It has been argued that this is possible because the global script of environmental and climate action has homogeneously shaped the way nation-states organise their governance (Frank, Hironaka, and Schofer 2000; Lechner and Boli 2005; Meyer 2004; Meyer et al. 1997). In addition, if one is to follow the reporting of the largest international organisations, energy transitions indeed are global (IEA 2023c, 202; International Renewable Energy Agency 2022; World Economic Forum 2023). However, it must be noted that recent research in sustainability transitions questions the ostensibly universal applicability of models developed in the Global North, pointing out the very different settings in which transitions may unfold in the Global South, such as (a lack of) democracy in planning new systems (Ghosh and Arora 2022), weaker institutions, and dependence on external finance (Hansen et al. 2018).

While not explicitly claiming to study "transitions" as such, a vast amount of world society research has directed its analytical lenses at significant moments in societies going through change, whether that involves human rights (Hafner-Burton and Tsutsui 2005), promoting women's rights (Ramirez, Soysal, and Shanahan 1997), constructing education policy (Ramirez and Tiplic 2014; Rautalin 2013), economic turbulence (Pi Ferrer 2020), financial aid (Heimo and Syväterä 2022), or climate policy-making (Sivonen and Syväterä 2023). Each such scenario illustrates the way culture, context, and discourse impact on institutional change. Similarly, attention to discourse as part of institutional change has become part of sustainability transition scholarship. For example, Kern (2011) shows that discourse and ideas can impact the way governments decide to tackle the same problem with very different means, which showcases the interaction between institutions and discourses in transitions.

1.2 Introducing the research approach

I have chosen to investigate the phenomenon using qualitative analysis, paying particular attention to the way security is constructed in discourses in text and speech. I am especially interested in the two widely accepted global principles or scripts of zero-carbon energy systems (with roots in environmental policy, but now often also discussed as part of climate policy while mainly operating via energy policy) and national security and defence (nation-state building and the ideology behind the sovereign state). As the circumstances of these scripts vary, the results of policy measures and their underlying reasons will differ as well, which can lead to empty promises or even hypocrisy (Alasuutari 2015; Meyer 2004), despite the fact that the same shared goals are ostensibly the target. By investigating the zero-carbon energy transition and national security and defence together as global policies carried out on the national level, I draw attention to the ways nation-states react to the same problems: in this case, how to mitigate climate change while ensuring national sovereignty. I use a social constructivist approach to investigate how the latter is constructed in energy policy; the way security is produced and defined in discourse as part of lived experience (Yanow 2007) has implications for the contexts in which transitions are taking place.

In practice, my examination is carried out by using the toolbox of discourse analysis (Juhila 2016; Potter and Wetherell 1987) on two data sets: policy documents and expert interviews. I empirically investigate the energy, security, and defence policies of Estonia, Finland, and Norway, countries that represent the less deeply explored perspective of energy transitions in small liberal democracies that are considered to be highly technologically advanced and have publicly claimed to be striving for decarbonised futures (IEA 2022b, 2023a, 2023b). With Estonia and Finland as members of the European Union (EU), and Norway contributing via the European Economic Area, all three are actively part of Nord Pool, a shared energy market. They all border Russia, an energy superpower, and since 2023 have all been part of the North Atlantic Treaty Organization (NATO). In this study, the examination begins in the year 2006, because a change in EU energy and security policy was detected at that time (Kuzemko, Keating, and Goldthau 2016). The sectoral definitions of energy, security and defence were dictated by the empirical setting, that is, I followed what energy policy entails in each country. For security and defence policies, there was no need for an exhaustive separation, as they were intertwined in the data.

1.3 Aims, research questions and empirical and theoretical conclusions

This thesis is organised in three original articles. Their ideas grew from the realisation that socio-technical transitions and energy transitions in particularly are laden with political expectations regarding climate change mitigation. While political interest in advancing the transitions may be admirable on both global and national levels, global CO2 levels are reportedly not decreasing; indeed, quite the contrary is underway. Mitigation efforts are and have been taking place globally, but academic and empirical interest in the negative and unwanted consequences of these transitions is recent. Yet, when the energy crisis began in Europe in 2022 due to the Russian invasion of Ukraine, two overlapping and contradictory discourses took over the energy transition discussion. On one hand, renewable energy was considered a provider of (national) security through the now mature wind and solar power technologies that provide a reliable, domestic supply of energy. On the other hand, Europe, along with the rest of the world, began to stockpile fossil fuels. The production of oil and gas had to be secured from producers deemed reliable, such as Norway, under the auspices of national security. Several questions piqued my curiosity when following the public discussion: how is it that the discourse could so easily be transformed, when discussions of the relationship between renewable energy and security and defence policy had previously been limited largely to concerns about energy security and the security of supply? Who was directing the discussion, and were some actors left outside it in both the energy sector and the defence sector? What was actually meant by "security" in these discussions?

In this context, I repeat the main research question: how is security discursively constructed in relation to energy transitions, and what might that mean for sustainability transitions more broadly? In practice, I study the discourses constructing security in the energy, climate, security, and defence policies of three case countries, Estonia, Finland, and Norway. It is true that the discursive constructions of security in energy transitions could appear similar in other European countries. However, country-specific nuances make this setting unique. In democratic European countries that are part of the EU, energy flows are arranged through shared energy markets. Many countries are also dependent on importing fuel, such as liquefied natural gas from Russia, due to their infrastructure and other lock-ins. However, the case countries show that there are persistent attitudes towards

both security and energy transitions that are not necessarily shared with others in the EU.

In answering the main theoretical problem, I have three objectives. The first objective is to study the power of discourse in sustainability transitions, and the second is to illustrate contextual and interdependent policy-making in the globalised world and to increase our understanding of contemporary issues that renewable energy and increasingly electrified societies encounter. The third objective is to empirically investigate the interrelations between energy transitions and security to study the concept of security and how its discursive construction may impact climate change mitigation.

The aim of this dissertation is to study institutional change in relation to sustainability transitions through discourse formulated in speech and text. In the three articles, I address the objectives from different points of view with different research questions:

1) How have zero-carbon energy and security issues co-evolved with, strengthened, or undermined one another in the national policy strategies of Estonia, Finland, and Norway between 2006 and 2023? (Article I)

2) To what extent are zero-carbon energy transitions a securitized phenomenon, did the Russian invasion in Ukraine in 2022 change the security discourse, and what might the implications of the findings for sustainability transitions be more broadly? (Article II)

3) How are energy transitions and security intertwined in the Finnish and Norwegian Arctic, and what are the justifications for hindered transitions? (Article III)

The three original articles included in this dissertation help achieve these three objectives and answer the main research problem. The analysis of Article I indicates that the two scripts of the zero-carbon energy system and national sovereignty are not competing goals, although the importance of stability, including via economical means, favours national security and thus may hinder decarbonising efforts. Other goals, such as national competitiveness and finding reliable partners (preferably from the West), are found to be high on the agenda. Article II highlights the social construction of "security" by analysing interview data before and after the onset of

a full-scale war in Europe. The notion of the power of that term is tangible, and even though elements of securitization, where decision-making is moved into the hands of the elite with restricted public access, is detected, caution is still distinguished and understanding of the consequences for democratic decision-making recognised. As a key finding, the article argues that the success of energy transitions depends on this interaction.

Article III considers the complexity of the energy transition in areas with complex governance and where significant contradictions already exist, which highlight the local interpretation and adaption of global-level scripts to meet the principles of a socially just transition. In the case of the Finnish and Norwegian Arctic, the discourses identified in Article I materialised: the continued exploitation of fossil fuels and increasing material and mineral extraction prevail, both of which are claimed to contribute to the energy transition and to national security. The embeddedness of oil in the social fabric of Norway was particularly sharply referred to by calling Norwegians "petroholics" who are hooked on oil. Here, the contradictory interpretations of the necessary measures and their planning may hinder the transitions.

From the analyses of the three articles, I draw three key empirical conclusions. Article I argues that security is constructed through narrative meaning-making, where justifications for policies are conveyed to audiences via epistemic work by political actors that includes claims of protection against uncertainty and the unknown world in which the state must operate. To remain secure, a state must evaluate other states and institutions on their reliability and shared worldviews, with those assessed as reliable openly identified. The transitions are advanced in all case countries, but the way both sustainability and security are defined has significance for decarbonising efforts. Although security is viewed differently in energy policy and defence policy, both seek the same policy goal of a functioning society, and the defence sector is dependent on the energy sector.

The second conclusion is that although renewable energy has gained in status as providing national security due to geopolitical changes, no policy-making consensus on renewable energy has yet been reached. In Article II, the interviewed experts were assumed to have the capacity to "speak security" and thus to identify, justify, and discuss issues they saw as part of energy transitions' security and defence considerations. These interpretations over what security is in relation to energy

transitions influences if and how transitions succeed. With the concept of securitization, the article concludes that the security concerns regarding energy transitions are understood differently and that this has implications for transitions.

The third conclusion suggests that a broad definition of security is needed when analysing the interrelations of these sectors on a regional level, where global pressures from the energy and security sectors merge. Article III shows the nuanced context of energy transitions and security, with justice emerging as an important concept alongside security. It was also viewed as a policy goal in which the transition processes are advanced while enabling good living conditions. Here, the importance of also studying security issues from the point of view of positive security was striking. Many significant issues connected to the transition processes are not traditionally classified under "national security." Nevertheless, these issues may impact quality of life and security may thus be constructed through positive meaning-making.

Based on previous studies and the identified knowledge gap, I make at least four important contributions to the scholarship of world society theory and transition studies. First, the analyses I have carried out in this dissertation deepen the relevance of discursive institutionalism beyond the macro level of societal studies and onto the regional level of interaction between the global ideal and local interpretation (Alasuutari 2015). I bring forth the consideration of temporality, as major changes can occur even in a very short time frame if conditions are suitable. As an example, I refer to the major disruption to energy policy after Russia attacked Ukraine in 2022. By connecting transition studies with world society theory, I have added important nuances to the ways that world culture has already impacted policy-making broadly and deeply in the political system, but the negotiation over their adaption continues. The second contribution is made in further conceptualising institutions and their interpretative power over transitions in sustainability transition studies. Although it is widely recognised that institutions such as nation-states are powerful actors, those who make up the institutional power through discourse should be studied in detail. This broadens the group of actors within and around states.

The third contribution to the literature is increasing empirical knowledge around security and defence issues in sustainability transitions (Johnstone and McLeish 2020, 2022; Kivimaa 2022, 2024; Kivimaa and Sivonen 2021) by connecting notions of justice and positive security to each other. In addition, I argue that a broader

perception of actors in relation to security is of utmost importance to achieving a more comprehensive understanding of discursively constructed security conceptualisation. I suggest a contribution by expanding security studies beyond international relations and increasing the discussion on the theoretical development of security beyond state security thinking. Specifically, I seek to contribute to a research stream where this assumption has been acknowledged and theorisation can move forward to match societal complexity, with cybersecurity serving as a good example (Cassotta and Sidortsov 2019; Floyd 2019; Hoogensen Gjørv and Bilgiç 2022; McSweeney 1999).

My fourth contribution is to suggest that by studying world culture alongside sustainability transitions, I can increase the theoretical depth of the concept of landscape in the MLP. World culture explains the migration of cultures, ideas, and practices that create the all-encompassing setting where policy-making occurs, or the landscape of the socio-technical.

The thesis is organised as follows. Section 2 lays out the study context by discussing the social construction of climate change mitigation. Section 3 reviews previous research concentrating on the discursive construction of policy, the turn towards discourse in research, and energy transitions and security and defence concerns. The fourth section reports the theoretical foundations on which the three articles build, and section 5 addresses the research design, including its context, methodology, and data. My positionality as a researcher is also discussed in this section, with particular attention to my process of conducting the research. This is followed by section 6, which discusses the articles' results in detail. Finally, section 7 applies the conclusions that emerge in the research connected to the wider societal setting, addresses study limitations, and suggests topics for future research.

2 BACKGROUND

This dissertation studies how institutions change societies by altering values and attitudes and how those are perceived through discourses: that is, how they are a socially constructed (Berger and Luckmann 1967). Climate change and its multifaceted impacts on various spheres of social life are central issues because the changing climate, accelerated by human actions, forces societies to adapt and mitigate at all levels of life (Intergovernmental Panel on Climate Change [IPCC] 2023). The IPCC defines *adaptation* as "the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities" in human systems and *mitigation* as "human intervention to reduce emissions or enhance the sinks of greenhouse gases" (IPCC 2023, 120, 126). These human interventions in or responses to climate change all have impacts, and they carry adaptation and mitigation risks of their own. This dissertation focuses on the latter from the point of view of how discourse on security can impact climate change mitigation through decarbonising energy systems.

Our understanding of the threats to the planet began to grow during the 1970s and 1980s. Works such as *Limits to Growth* and reports from the Club of Rome highlighted that more than technological development was needed; a holistic approach is vital to tackle the problems caused by climate change (Hannigan 2022). Further attention to the degradation of the environment caused by, for example, chemicals was successfully piqued by popular books like Rachel Carson's *Silent Spring* (2002), originally published in 1962. These efforts helped advance the cultural understanding of how human behaviours and actions impact the natural environment. The mass environmentalism we see today in the form of numerous organisations, institutions, and environmental or climate ministries and agencies draw on "a common global culture, often formally codified and institutionalized within international treaties and organizations" (Hironaka 2014, 2), as described by world society theory (Frank, Hironaka, and Schofer 2000; Hironaka and Schofer 2002; Meyer et al. 1997; Schofer and Hironaka 2005).

Environmental protection first became part of global governance with the 1972 United Nations Conference on the Human Environment in Stockholm. The

Stockholm Declaration initiated the dialogue between developing and industrialised countries about addressing pollution and environmental protection. This groundbreaking work began a new era, and although it could not have appeared in a vacuum without a history of raising awareness, it was the first time when previously scattered issues were gathered and labelled global problems. According to Hironaka (2014, 25), "the Stockholm era represents an episode of social construction that fundamentally changed the way that modern environmental problems were understood." This "cultural innovation" had a significant impact on the way environmental concerns developed as part of global efforts to find solutions.

Intergovernmental processes of assessing climate science and creating global climate policy continue to be illustrated in environment and climate conventions (Hulme and Turnpenny 2004). The 1992 Earth Summit in Rio de Janeiro adopted the concept of "sustainable development" to mark the way for all nations, which led to developing solutions to greenhouse gases via climate policy (Hironaka 2014). The Earth Summit also began the work that led to the seventeen Sustainable Development Goals (commonly referred to as SDGs), which were globally agreed on in 2015 as the blueprints for peace and prosperity in the world. This included balancing socio-economic and environmental dimensions. The Paris Agreement, signed in 2015 as part of the work done by the United Nations Framework Convention on Climate Change (UNFCCC), set a new goal for the world: global warming should not increase more than 1.5°C beyond pre-industrial levels. Since then, numerous meetings and conventions have been held and agreements drawn up to acknowledge and react in global unison to the climate crisis. This led to the COP28 agreement in 2023, where the need to end mass-scale fossil fuel extraction was finally openly acknowledged (UNFCCC 2023).

Yet, the very tools used to monitor climate change mitigation policies around the world are socially constructed. For example, the IPCC is a highly technocratic international organisation that controls the future scenarios upon which policy-makers rely when discussing and crafting policies aimed at reducing emissions to keep global warming below the 1.5° target, often by legally binding mandates. Indeed, Clift and Kuzemko (2024) argue that the integrated assessment models that are key tools for the IPCC wield significant power over what future policies will look like. Those models use historical data to predict the future, which is not compatible with real life; it is inaccurate and undermines the very message of urgency that the IPCC itself so actively seeks to convey to the world's policy-makers. Furthermore,

since its origins, the concept of sustainable development has faced criticism and been modified to accommodate its practical use at a global level (Meadowcroft 2000).

Discourse plays a critical role in shaping climate change mitigation strategies, particularly in the highly polluting energy sector (Genus 2016; Fløttum and Gjerstad 2017). Key topics among social scientists interested in energy include the organisation of society in response to the growing realisation of finite energy resources, the environmental and societal impacts of pollution from fossil fuel combustion, and the governance of energy and climate policies (Rosa, Machlis, and Keating 1988). The "predicament" of energy, as Rosa and Machlis (1983, 1988) describe it, has become inextricably linked to fossil fuel-based energy, driven by 1970s oil embargoes, rising energy prices, and concerns about alternative energy technologies such as nuclear energy. The key question that arose was "What is the optimum policy strategy for supplying future energy needs?" (Rosa and Machlis, 1983, 171). The search continues in the contemporary context of transitioning from fossil fuels to decarbonised energy systems.

In this dissertation, transition refers to the political, cultural, technological, and economic changes needed to move from an old system to a new one even though the new system is not fully developed. The energy transition, led by nation-states within their jurisdictions, is among the most significant efforts to mitigate climate change. Due to intensive carbon emissions, the transition presupposes a major shift in technology. Political decision-making partly dictates which directions are taken and – contrary to what is often claimed in political discourse – there is no technologically neutral policy (Azar and Sandén 2011). Furthermore, "the technological is socially constructed, and the social is technically constructed" (Bijker 1995, 273), so politicians must also be able to imagine a future with a new energy system, to debate it, and to make informed decisions regarding it (Karhunmaa 2021). As energy policy is inevitably part of climate policy due to the mitigation efforts it can provide (Scrase et al. 2009), the investigation of discourse in energy policy is fundamental to understanding the dynamics of energy transitions.

3 PREVIOUS RESEARCH

Because climate change mitigation is political, it is crucial to understand the discursive construction of global policies and policy-making contexts. This has been extensively studied across various sectors from both historical and contemporary perspectives. This section discusses the existing literature in three subsections. First, macro-level discourses are reviewed as part of sociological institutionalism and how they diffuse global culture through, for instance, the domestication of trendy terminology, adaptation, and decoupling. The second focus is on sustainability transition research, in which the ontological shift to study language and discourse has recently increased. My assumption is that sustainability transitions are substantially influenced by the effective formation of global discourses on the environment and climate policy. Finally, in the third subsection, I discuss the connections between sustainability transitions and security studies. The way security is connected and discussed as part of energy transitions in general and renewable energy in particular is a growing field of study.

3.1 The discursive construction of policy from the global perspective

Institutional isomorphism refers to the tendency of governments to converge in their policy-making practices and encapsulates the phenomenon by which organisational actions become progressively homogenised. The academic tradition studying this theorisation is called *sociological institutionalism,* operating on the premises of social constructivism (DiMaggio and Powell 1983). Furthermore, institutional perspectives address the context in which actors operate and view them "as enactors of social or cultural rules and scripts provided by their wider environment" (Schofer et al. 2012, 58). Institutions thus operate as pathways for these kinds of global policy models to become infused into national policy-making through world culture (Boli and Thomas 1999; Lechner and Boli 2005; Meyer et al. 1997). This type of theorisation does not emphasise the differences between states as institutions but instead concentrates on the similarities in their operations (Meyer et al. 1997).

The mechanisms of how policy-making is enacted and reflected in relation to world culture have been studied especially from a *neoinstitutionalist* perspective, which comprises three types of institutionalism: *rational choice*, *historical*, and *sociological* (Hall and Taylor 1996). Although they highlight ideas and discourse in understanding the cultural setting of policy-making, Schmidt (2010) suggests that *discursive institutionalism* as an added type is needed to study societal change[1] because it assumes that there are gradual shifts within institutions led by the discursive stance of the actors involved. That is, speaking of change rather than merely thinking about it leads to changes in policy-making (Schmidt 2011). Discursive institutionalism includes various interpretative approaches sharing the notion that meaning is at the heart of interpreting societies and that policy processes are interdependent of the communication of ideas and discourse that carry "explanatory power" (Schmidt 2008). It emphasises that institutions and the actors operating them define, shape, and situate goals and ideals in specific normative and historical settings (DiMaggio and Powell 1997, 7). Indeed, previous research stresses that international organisations deploy narratives strategically in their attempts to exert influence (Heimo and Syväterä 2022).

Alasuutari (2015, 163) writes that in neoinstitutionalist sociology, institutions are "initiators and carriers of culture" and products of their historical past, operated by actors who are guided by different frames that give meaning to their actions. Thus, societies are neither static nor universal but living entities shaped by time and context, and they can be studied from macro-sociological points of view. Alasuutari argues that discursive institutionalism can be applied alongside world society theory when paying attention to the essential role of culture. I follow this perspective and consider institutions significant cultural entities that provide stability to and opportunities for change in policy-making. This can be viewed as compatible with the idea of institutional change as a prerequisite for socio-technical change in sustainability transition research (Andrews-Speed 2016; Berkhout, Smith, and Stirling 2004; Bijker 1995; Geels 2004). In transition studies, Andrews-Speed (2016) answered the call to increase institutional theory (Nilsson et al. 2011) by arguing that it enhances our understanding of the conditions and context in which socio-technical transitions occur and that discourse is vital in transition processes such as learning and adapting to new technologies.

[1] Details on the relationships of the other three types of institutionalism as part of energy transitions can be found in Andrews-Speed (2016).

Studies by world society theory scholars present examples of a national context operating in dialogue and under the influence of the global "regime," creating, crafting, and constructing the values and norms around policy-making that lead to new directions for national policies. They show how both prevalent ideals such as human rights and individual terms can be adopted from the global, abstract level and brought into national policy-making while constructing culture within institutions.

For instance, while the adaptation of human rights from international or global discourse into national policy-making may not have a significant impact on practices at the national level, non-governmental organisations (NGOs) use human rights treaties – often under the aegis of the United Nations – when influencing governments to concretely secure human rights (Hafner-Burton and Tsutsui 2005). As another example, the globally fashionable term "austerity" became "domesticated" and was used as a term to justify national policy-making (Alasuutari and Qadir 2014). This differed from the previous use of the term, which was limited to fiscal policy, and became popular through changes in discourse (Pi Ferrer, 2020; Pi Ferrer and Alasuutari 2019). In addition, the role of international organisations in the global proliferation of policies was studied by Heimo and Syväterä (2022) using official documents that they describe as crafted narratives. In this way, international organisations influence the construction of policy models by actively producing and partaking in discourse.

The diffusion of any policy from the global sphere to the national level is often unpredictable and may well be incompatible with "local practices, requirements, and cost structures," which is why global policies are often idealised meta-level approaches to major global problems (Meyer et al. 1997, 154). However, states still aim to conform to global policies, especially in sectors, such as environmental protection and human rights, where attention is gained by legitimising global agreements, but implementation rests on national governments (Hafner-Burton and Tsutsui 2005; Hironaka 2014). This type of policy-making is common; policy-makers who adopt a pretence of ceremonial acceptance instead of concrete policy may use several types of discursive tools to convince their audiences, whether key interest groups, voters, or the public at large. Beyond formal parliamentary politics, these tools include using scientific knowledge to achieve solutions (Sivonen and Syväterä 2023) and media as an arena (Hajer 2009). Governments may also opt out to "decouple" their countries from officially agreements and implement policies leading in different or even opposing directions (Meyer et al. 1997, 152). Indeed, in relation to climate policy, measures regarding carbon reduction and increasing carbon sinks

are lagging even in pioneering democratic states such as Finland (Harring, Jager, and Matti, 2019; Sivonen and Syväterä 2023). Nevertheless, Hironaka and Schofer (2005) report that given the right conditions, such as persistence and strong structures between levels of governance, policies may work in favour of climate change mitigation.

Previous research also shows how policy-makers and other stakeholders use discourse to steer outcomes in climate policy in the desired direction. This is done, for example, by politicising climate science (Miller 2004), claiming the narrative in media discussions (Sivonen and Syväterä 2023), and constructing the problem at hand through framing or labelling issues in relation to climate policy (Hajer 1993). Although international institutions and the cultural meanings they convey can foster social change in terms of environmental protection, they simultaneously allow vast amounts of room to define the problems, cultural meanings, and contexts around those problems. International organisations thus operate as both empowering and hindering the operational environment (Hironaka 2014).

More research is needed to address the next phase of policy-making. I aim to explore the processes by which a state has already accepted a global discourse, institutionalised it, and has begun to enhance it by organising strategies, measures, and other ways of governing. This happens while the state tries to balance other equally accepted global discourses, such as (national) security. I approach this phenomenon from the perspective of mitigating climate change through energy policy while addressing the negative and unwanted consequences it entails.

3.2 Discursive approaches in sustainability transitions

Sustainability transition research examines how socio-technical systems can shift economically, technically, socially, and culturally towards more sustainable production and consumption patterns on all levels of society (Berkhout, Smith, and Stirling 2004; Geels 2002, 2004). This shift requires understanding that technology and society are interdependent (Rip and Kemp 1998) and in constant interaction (Geels and Schot 2007). Understanding these interactions between different actors within a society, but also more widely in a transnational and global level, is key to the success or failure of transitions. In the context of climate change and decarbonising societies, the discursive form of power has been shown to have an impact, especially in regime resistance: that is, incumbent actors' inability to adapt to change (Geels

2014). This is closely linked to important work on developing a conceptual framework of power in the interdisciplinary research field of transition studies (Avelino 2021; Avelino and Rotmans 2009), as it is inaccurate to analyse power in transitions with interpretations of power that "seem to privilege stability over change" (2009, 548). The aim of their work was to broaden the notions of power to enable approaches from various disciplines and to facilitate research in broad empirical fields, "thereby increasing the descriptive and explanatory potential of transition theory" (Avelino and Rotmans 2009, 563). Avelino (2021) highlights that the way knowledge is woven into studies of social change is a powerful act in and of itself and that discourse plays a profound role in both research and the empirical field under scrutiny.

In addition, a change in power distribution in socio-technical systems is already taking place through the involvement of diverse actors using decentralised systems in the energy trade (Brisbois 2020). This is an important notion, because while it is often assumed that sustainable transitions are mainly about radical changes, they are often gradual and small. This emphasises the need for negotiation proficiency in politics (Raven et al. 2016). It is also well established that the political relationships between the social, economic, and political spheres are shifting because of changes in the societal setting where energy policy transitions take place (Brisbois 2020; Raven et al. 2016; Stirling 2014). This emphasises the importance of communication and discursive tools.

The ontological shift towards using interpretative research designs has increased in the last decade or so in the sustainability transition literature (Isoaho and Karhunmaa 2019; Simoens, Fuenfschilling, and Leipold 2022). Karoliina Isoaho and Kamilla Karhumaa (2019) reviewed these approaches in relation to energy policy and welcomed them as a useful addition to the field more broadly. Discursive approaches have expanded the academic investigation and empirical understanding around politics, the role of institutions, and the way technologies are perceived as part of transitions generally. Research has shown that "using discourse analysis has led to a more politically sensitive understanding of transition processes" (Simoens, Fuenfschilling, and Leipold 2022, 1842) in transition studies (Kern, 2011). Simoens and colleagues (2022) identify interpretative discourse analysis, institutionalised and alternative discourses, dominant, marginal, and radical narratives, strong and weak discursive agency, and meta-discourse as core discursive elements that can be used in studying and understanding both stability and change in the social sciences.

To understand the landscape level of the MLP, meta-discourses characterise the landscape with unchallenged values and presumptions fit for multiple systems and sectors. Following Michel Foucault's "order of discourse" (1972) and further studied by Norman Fairclough (2010), meta-discourses are powerful yet abstract ideas which interact between discourses, narratives, and actors, such as "globalisation" and specifically "transitions." I understand meta-discourses as compatible with the world culture introduced by world society theory: narratives, ideas, and discourses shape the institutional culture in which transitions take place. The origins of these meta-discourses are embedded in world culture; they are not static and taken for granted but rather enacted, interpreted, and reproduced anew in each setting. Previous research argues that from a narrative meaning-making point of view, landscape shocks only create adequate pressure on a regime if the narrative of the shock was a close enough match to the socio-political environment at hand and thus the social construction of the meaning of the issue to those most closely involved (Hermwille 2016).

Deep transitions scholarship, in turn, has studied the explanatory power of the way events, ideas, and phenomena have occurred and been organised in the past and how they affect current and future socio-technical systems. Deep transitions refer to "long-term, connected, radical system shifts in the same direction" (Schot and Kanger 2018) in which historical developments influence the way discourse formulates and impacts today's policy (Kanger and Schot 2019). Rapid, significant shocks changing the institutional settings are called exogenous shocks. They occur during deep transitions that are otherwise characterised as long-term developments across many socio-technical systems. The shocks can be natural disasters or wars, for example, and they are always disruptive to otherwise path-dependent socio-technical systems. Exogenous shocks have been previously studied as windows of opportunity for radical niche innovations to emerge and enter the current regime, providing new practices, technologies, or ways of operating, such as energy consumption in a decarbonised society.

In addition, an institutional context has previously been identified as constraining for strategic planning during or after a shock's emergence. To complement the understanding of external factors in sustainability transitions, Johnstone and McLeish (2020) and Johnstone and Schot (2023) discuss the concept of imprinting, where temporality – the speed and time-sensitive context of a shock – is addressed. Imprinting has affected the way energy systems have been organised since World War I. It explains why the consequences of the world wars are still impacting

societies daily through the need for an ample supply of oil, centralised governance, and the way oil production has been organised internationally (Johnstone and Schot 2023). Imprinting, as part of sociotechnical transitions, refers to these long shadows of war that dictate modern societies' energy systems, even during peacetime (Johnstone and McLeish 2022). The global scripts discussed in this dissertation, climate change mitigation and national security, initially appear to stand in great contrast when it comes to imprinting. However, the shock of the 1973 oil crisis tipped the balance and changed the rules. Because oil became an unreliable energy source for providing national security, other forms of energy gained importance. This is in line with the environmental movement gaining momentum and consequently leading to the formation of a global script. The interaction between rules and the emphasis on scripts is enabled through discourse that interacts on an institutional level.

The institutional contexts where sustainability transition policies are negotiated have been studied by, for example, Florian Kern (2011) in relation to the "systems innovation" policy in the United Kingdom and the Netherlands. By using a discursive-institutionalist perspective (as built on by Vivienne Schmidt and Maarten Hajer), Kern highlights that despite states having similar problems to tackle, the measures they use can differ widely based on the way they are presented – that is, discursively communicated – to policy-makers. Kern (2011, 1129) argues that the "interplay of ideas with existing institutional arrangements and interest-based politics" had an impact on the policy outcomes. Radical policy changes can only be expected if new discourses are convincing enough to challenge the existing state of affairs. Another example of the power of discourse over sustainability transition policy is Bosman et al. (2014), who showed that storylines are used by incumbent actors to enforce their status and to bolster mutually agreeing partners, which impacted outcomes.

This connects to world society literature through the construction of reference groups: national policy-makers refer to suitable peers to support their agendas and distance themselves from those who do not conform to a similar approach in policy-making (Pi Ferrer, Alasuutari, and Tervonen-Gonçalves 2019). This is especially important when policy-making is carried out with significant uncertainty (Scrase and Ockwell 2010) regarding facts and outcomes. For example, technologies in energy transitions are being developed without certainty about their feasibility. Their regulation and governance should still be in place if they do make it to commercial use. This includes, for example, safety and security concerns. Furthermore, it is

essential to note that the new technologies' success is dependent on the international level of cultural change within and around institutions. At the same time, those technologies must also meet other sectors' needs and requirements in the context of which they are part, such as the military sector, a major energy user. Furthermore, is not enough for a new sustainability technology simply to exist and to function; it must also meet the expectations of the referent economic environment, the markets, and industry or find the necessary regulatory environment. It also needs to be culturally accepted within prevalent societal values and norms (Geels and Verhees 2011). Discursive approaches are crucial to understanding and studying these highly complex and intertwined institutional settings.

The field of discursive approaches in energy transitions is broad and of a significant size; Isoaho and Karhunmaa (2019) state that while discourse and framing analyses have been the most popular methods for examining the discourses in energy policy, renewable energy has not been studied in as much detail as the discourse around nuclear energy. They also point out the constructive status of researchers' interest in specific technologies and fields in energy policy and thus acknowledge the active role that scholars have in the field of research. In their foundational piece on the discursive and linguistic framings of energy policy, Scrase and Ockwell (2010) argue that reframing both challenges and solutions to energy policy is a powerful way of shaping energy transitions. Energy-importing nations' priority regarding energy security has been an uninterrupted flow of energy, understood as the prerequisite for a functioning economic sector, which has had significant implications for the way new policies, practices, and technologies have been developed.

Although these studies have shown the discursive construction of energy policy and sustainability transition policies more broadly, they do not fully explain the overarching linkages between other policies that have an impact on the formation of a given policy. Moreover, there are no studies concentrating solely on renewable energy, although the topic is mentioned from time to time. In this dissertation, attention is paid to the discursive interaction between renewable energy and security and defence concerns using recent examples from the existing literature.

3.3 Security in sustainability transitions

"Energy security" as a concept of its own is a vast and widely researched field (see, e.g., Cherp 2012; Cherp et al. 2016; Sovacool, Sidortsov, and Jones 2014). This is a

closely related field of study, and I briefly discuss studies that have impacted this dissertation. However, I use a broader conceptual understanding than energy security when discussing (renewable) energy and security together. As the aim is to understand how security is discursively constructed among energy transitions, the interpretation benefits from not linking the discussion too closely to any previous definition. Following Szulecki (2018, I do not aim to define energy security in a totally new way, as definitions are already abundant; I merely wish to point out that in the context of public policy, energy security is often defined from the point of view of a decision-maker that is ultimately within the unit of a nation-state. The aim is also to clarify a detail mentioned by Szulecki regarding "security" in energy transitions: if the threat (security from whom) is not clarified, energy security is understood from the merely material point of view of securing energy for use in the energy system. Nevertheless, notable work on contemporary energy security and energy policy has been done to comprehend energy security more broadly as a socially constructed concept (Szulecki 2018). Energy security is studied, for instance, by using securitization theory in analyses of political discourse in Germany and Poland (Heinrich 2018; Heinrich and Szulecki 2018) and paying specific attention to the often-overlooked area of the electricity sector in security studies (Lis 2018). In addition to the assumption of avoiding significant damage to the environment (Narula and Reddy 2015; Szulecki and Westphal 2014), energy security should also include justice as a built-in principle (Goldthau and Sovacool, 2012).

In the sustainability transition literature, important connections between energy policy and security and defence concerns have been made. These studies have taken a state-centred, realist stance on security, placing "hard security" issues at the heart of the conflict. They also generally discuss fossil fuel-based energy, leaving a gap to fill with discursive analysis on renewable energy transitions. For instance, while investigating the role of the nation-state and the military in sustainability transitions, Johnstone and Newell (2018) argue that the varied and often contradictory state roles in transitions can explain the inertia of those transitions. Those authors encourage us to think of states "in a more dynamic, relational and practice-oriented manner" among other actors in transitions (80). Incumbent fossil fuel-based regimes emerged as part of the war effort during the world wars. This consolidated the role of the state in conflict as the state is the central unit in war, but states also sometimes begin conflicts over resources (Ford and Newell 2021). Geopolitical and internal security concerns, including the risk of tensions resulting from injustices, have also been discussed as part of energy transitions (Fischhendler, Herman, and David 2021; Szulecki 2020; Szulecki and Kusznir 2018; Vakulchuk, Overland, and Scholten 2020;

Verbong and Geels 2010). These are important studies that have paved the way for a more profound understanding of the complexities, transnational linkages, and overlapping interests related to energy transitions.

In this dissertation, I take a step further to study the concept of security with more than state-based attention, while the state remains a central unit. This is to seek a more comprehensive analysis of the contemporary issues of renewable energy and new electrified systems may face. This type of thinking allows me to connect the institutional approach to be discussed simultaneously with sustainability transition studies because states, although highly influential, are just one kind of actor among many culturally connected institutions that influence the way transitions proceed (Alasuutari 2015).

The discursive nature of security and its use in policy-making has been studied in relation to the Polish energy transition, where links between right wing populism, climate change sceptics, and energy policy have been analysed (Żuk and Szulecki 2020). Kacper Szulecki and Kirsten Westphal (2014) conducted an extensive literature review to study the EU's energy policy and governance. Their findings show that the tensions between national interests and the EU's attempts at common governance are causing incoherence and inadequacy in energy policy planning in the rapidly changing global energy landscape. In their review, Szulecki and Westphal call for a new energy security policy that is more proactive rather than reactive regarding the evolution of energy systems from being based on fossil fuels to renewables. Maria Morgunova (2020) argues that although countries share similar pressures on the landscape level, such as growing energy demand, volatile oil prices, geopolitical challenges, and climate change, their actions and reactions differ widely. Morgunova points out that not only economics but also geopolitics and security concerns weigh in during transitions. These studies have vividly illustrated that the broader societal concepts of nationalism, internal stability, and justice are an inseparable part of the energy discourse. I contribute to this research stream by making explicit the connection to security discourse in renewable energy policy.

Renewable energy and security policies have been studied together in a small country setting in a novel way by Paula Kivimaa (2022, 2024; Kivimaa and Sivonen 2021, 2023). Her research has shown that policy sectors were not integrated or even coherent in pre-2022 policy-making. This was evident in administrative interactions and even direct conflicts in policy objectives and measures when advancing energy transitions on one hand and national security on the other. Drawing on extensive

interview and policy document data, Kivimaa and Sivonen (2023) identified security concerns when energy transitions are pursued, such as cautions related to traditional state defence, internal security, the stability of energy systems, cybersecurity, and geopolitical considerations. Moreover, when their interviewees discussed renewable energy growth and how that may impact security, they also considered positive expectations, such as increased energy independence, improved supply security through micro-grids, and enhanced socio-economic stability (if the transitions are well governed). Negative concerns were related to price increases, new technology interdependencies with regimes such as China, and system malfunctions. Major concerns were related to cybersecurity in increasingly electrified societies and geopolitical concerns about new conflicts over obtaining critical materials for new energy systems. Wind energy was an especially common topic: it was viewed as having a positive impact on security by reducing dependence on imported energy. However, conflicts with military radar systems remained an issue that was in the process of being solved. After February 2022, the case countries showed improvement in many of these areas, such as improved administrative collaboration or even cooperation in planning and conducting energy projects, increasing attention to energy policy and the geopolitical context, open discussions about the international and global contexts of the energy trade especially in relation to Russia, and allowing the debate to become part of daily politics (Kivimaa 2024).

In summary, the transition literature is currently lacking an analysis of discursive interactions between seemingly separate policy domains that in practice clash, contribute to, and influence one another. In addition, while institutional change involving international organisations, NGOs, national governments, and even local decision-making is well documented in both world society theory and transition studies, the interactions between policy sectors and comparisons of such interactions between states have received less attention in both fields. More empirical attention should be paid to energy transitions in small countries. While work on this subject has developed a certain momentum, this dissertation contributes to further filling this gap.

4 THEORETICAL FOUNDATIONS

The theoretical framework of the three articles connect sociological constructivist theories, sustainability transition perspectives on socio-technical systems in transitions, and the sociological understanding of security. In this section, I discuss the theoretical choices made in the analyses of each of the articles.

4.1 Epistemic governance

The epistemic governance framework suggests that social change "is always premised on actors' understanding of the world and the situation at hand" (Alasuutari and Qadir 2019, 8). The framework illustrates the premises of decision-making by showing the unspoken tactics actors use when trying to convince their audiences. These techniques construct the reality in which policy-making occurs, and because they are subtle claims over what is known or acceptable, they are effective as such (Sivonen and Syväterä 2023). The three objects of epistemic work according to the epistemic governance framework are as follows: "(a) ontology of the environment, (b) actor identifications, and (c) norms and ideals; in other words, these are constructions of what the world is, who we are, and what is good or desirable" (Alasuutari and Qadir 2019, 19). All epistemic work entails all three objects, although it may be subconscious work done with discursive methods in speeches in writing, or even in bodily gestures, as shown by Sigurdardóttir and Rautajoki (2024). By setting the scene through references to the ontology of the environment, an actor can claim control of the situation by ensuring that comparisons to some other countries will make the situation with regard to a specific policy look better (Pi Ferrer, Alasuutari, and Tervonen-Gonçalves 2019).

The actors and their values in the discourse are an important factor. For example, the discourse around human rights in the international political arena showed that although actors participating in the debate represented various backgrounds, their arguments were traceable to a shared understanding of human rights (Vento 2024). Heimo's (2024, 53) description of epistemic governance is particularly appropriate for this dissertation: "In essence, epistemic governance can be perceived as a

discursive struggle over ideas and meanings and the power to define the situation." The research conducted in this dissertation studies societal change from the point of view of energy transitions as a social phenomenon, but during the process of writing it, another major change transformed the circumstances, as Russia launched a full-scale war in Ukraine in February 2022. The actors involved, especially with immediate authority over policy-making, had to claim their definition of the situation to gain control over it, and the meanings given to the situation had to be assessed anew. Previous research has shown that myriad actors and clashing discourses may delay these kinds of processes significantly (Alasuutari et al. 2019).

4.2 Socially constructed security

4.2.1 The social constructivist approach to security

It is beyond the scope of this dissertation to tackle the vast field of security studies as part of international relations scholarship (Floyd 2019; McSweeney 1999; Peoples and Vaughan-Williams 2021). However, it is necessary to present the basis for the security thinking in this study in order to extrapolate more general notions of the discursive use of security.

Bill McSweeney notes that the idea of nation-states as the central point of security studies has its origins in the Cold War. The academic community interested in security set out to understand the conditions by which a single enemy, the Soviet Union, had become the target of the Western world. This created a need to analyse and comprehend the security context in a new way. According to McSweeney (1999, 2), at least for Europeans, "the world of anarchy and state sovereignty which governed interstate relations required insecurity as its condition." He continues that the term "national security" as an idea only became popular in political discourse around the 1940s as a reaction to the fear of the unification of militaries:

> "National security" was an idea, a doctrine, and an institution, designed to bridge the traditional division between the interests of the state abroad and those of the state at home, and to merge the culture

> of everyday life with that of the defence of the national interest. (1999, 20).

According to Wolfers (1952, 483), the term "security" was established as suitable to "designate an objective of policy distinguishable from others." If the term had an original, positive meaning of protecting a condition or even a person, during the Cold War the meaning expanded to encompass the nation-state: "Now it belonged primarily to the state; the people, like the armed forces, were its instruments, and also, potentially, its enemies" (McSweeney 1999, 21). This shifted the term towards negative meaning-making. In traditional security thinking, it is through the state and its practices, culture, and shared values and norms that national security is institutionalised and constantly reproduced. Most states have rather effectively institutionalised the idea of security in functional operations. However, they are called departments or ministries of defence, not security. McSweeney argues that the reason behind this conceptual terminology change is because "security," at least in the context of the United States, indicated the "national interest," whereas the events before and after World War II needed a unification of all state functions, which brought the terms together (1999).

Since the early days of international relations and security studies, scholars have engaged with Berger and Luckmann's (1967) social construction of reality and begun to study security questions using constructivist frameworks of analysis. Although not the only option, the social constructivist security framework is certainly the most popular because it embraces the political elements embedded in security: "A constructivist analysis would emphasize the importance of a range of social, cultural and historical factors that encourage particular forms of meaning to be given to different actors and their intentions" while avoiding any "universal and abstract analytical definitions of security" to study the range of actors, beliefs, identities, and identity building among other factors related to security building (McDonald 2021, 61). A constructivist approach is fitting for this dissertation, as its premises broaden security thinking beyond military and coercive power towards the development of norms and global governance (McDonald 2021). Indeed, the political nature of security definitions (Williams 2008) as defined in this dissertation also includes "any level: individual, family, society, state, international system, or humanity" (Baldwin 1997, 6) and the security of the environment (Williams 2008).

Another popular framework is international political sociology, which provides direct questions regarding the constructive nature of security: what security is and

means and what security does (Bigo 2008). Ole Wæver (2010) argues that there is a need to weave the political more deeply into security studies and that a sociological stance can provide the necessary bridge. Of the many ways to conceptualise the processes by which security is addressed in theory, this dissertation adapts the discursive stance of security theory from the standpoint of *securitization* to understand how security is constructed as part of political decision-making from the perspective of framing a given issue as a security issue (Wæver 1997), because discourse is considered essential for these developments (Buzan, Waever, and de Wilde 1998).

4.2.2 Securitization theory

There are many definitions and uses of securitization theory, but I have adopted Thierry Balzacq's (2015) sociological view of securitization. This means that the political and therefore socially constructed aspect is part of any security or securitization process. I broaden the Copenhagen School's theorisation beyond mere speech acts (Balzacq 2011; McDonald 2021) to encompass the discursive politics of security. Barry Buzan's (1998) units of analysis for the theory include the existential threat and the referent object, whereas Balzacq (2005) proposes conducting analysis from the pragmatic point of view of agent and action. Over the last decade, Balzacq's theory has been further developed to enable its use in empirical research (see, e.g., Balzacq, Léonard, and Ruzicka 2016; Heinrich and Szulecki 2018; Lis 2018; Roe 2012; Szulecki 2020). In this dissertation, I adopt a theory-developing stance and group five categories together to study the discourse around energy transitions and security. The categories used in Article II are *existential threat* (Floyd 2019)*, referent object* (Buzan, Waever, and de Wilde 1998)*, extraordinary measures* (Heinrich and Szulecki 2018; Kuzemko 2014)*, power and governance* (Heinrich and Szulecki 2018), and *riskification* (Corry 2012). With these categories, I can identify the threat related to energy transitions more broadly, beyond mere energy security or security of supply, which has been, as discussed above, the main field of interest in energy security. In addition, I identify actors, norms, and ideals in relation to the transitions and security concerns that pertain to them. It is worth noting that by including riskification in the analysis, it is possible to reach a more nuanced understanding of the discursive, as it is not necessary to view every risk or concern as a security threat.

4.2.3 Positive and negative security

To further expand how the scope of security is understood, constructed, and operated in analytical and empirical settings, I engage with the concept of positive and negative security (Hoogensen Gjørv 2012; Hoogensen Gjørv and Bilgiç 2022; McSweeney 1999; Nyman 2016; Roe 2012). Gunhild Hoogensen Gjørv (2012) links these concepts with the concepts of negative and positive security (i.e., freedom from and freedom to). A broad understanding of McSweeney's work on the divide between the negative and positive is needed to capture the nuances that go beyond the "masculine." Whereas the male-dominated fields of the military and state security were considered to lack a human approach, a positive understanding of security allowed the "feminine" to return to security discussions. This does not mean that women as such would be related to positive elements of security, but rather that the feminine is associated with worldwide attempts to make public policy more equal. In turn, the masculine associated with negative security restricts the discussion to male-biased spheres which women have had difficulty entering and influencing for structural reasons. To achieve justice among humankind, equal representation of values connected to security is needed (McSweeney 1999). Hoogensen Gjørv's influential work developing the concept of positive security suggests that

> positive security addresses important gaps not addressed by negative security, demanding an examination of how security is produced, by whom, and upon which epistemological foundation (in other words, what basis of knowledge informs that understanding of security). The "whom" (actors) must be further supplemented by three variables – the nature of the practice of security (how), the context of the security practice (where), as well as the values lying behind these practices (why). A multifactor-based approach to security brings negative and positive security into "the same room," so to speak, combines both state and non-state actors, encouraging a negotiation between potentially competing security agendas within a given context. (2012, 837).

The emphasis here is on the multi-actor, which allows more than state actors to participate in the construction of security, its definition, and the way it is used. It does not exclude negative security but welcomes openly addressing challenges. Thus, for Hoogensen Gjørv, the two concepts are not opposites but rather mutually enforcing ways to comprehend security as a concept with diverse characteristics. Negative security refers to security from a threat, as in the traditional thinking about security found in the state-based, coercive power over the military. Positive security

is built on previous conceptualisations around the gaps of negative security (see, e.g., McSweeney 1999; Nyman 2016; Roe 2012) and refers to security to as an enabling aspect of a good life. It also includes the value of justice as an explicit part of security thinking (Hoogensen Gjørv and Bilgiç 2022).

Positive security as security from and security to enables rather than constrains actors other than the state to have political agency as part of the security framework. It is argued that juxtaposing security with insecurity strips away the complexity of a real-life context. To avoid this, a broader understanding of the "security game" is needed: "once multiple actors encounter and interact with each other in the security game, their affective, corporeal, or discursive can change not only actors' self-perceptions but also what they understand from security and insecurity" (Hoogensen Gjørv and Bilgiç 2022, 4–5). In addition, by broadening the concept of security to include domestic yet internationally impacted conflicts with the notion of social justice embraces the importance of emancipation in security thinking. If security indicates the absence of threats (Buzan 1983), emancipation in turn emphasises people's opportunity to live freely according to their own aspirations. Restrictions on doing so include not only war or the threat thereof but also inadequate access to education or nutrition and political oppression. Ken Booth argues that emancipation is security, and it should be valued higher than power or order when discussing security theoretically (1991).

4.3 Sustainability transition frameworks

The literature on sustainability transitions offers frameworks for this dissertation that allow for investigating the concrete policies, measures, regulations, and plans that the case countries have in place. With detailed analytical frameworks, I am able to study the political processes where energy transitions are concrete and to show that significant policy measures are already in place. The frameworks of the MLP and its derivatives of six policy intervention points and transformative outcomes (TOs) are introduced below. By connecting these frameworks to the world society theory that informs the epistemic governance framework and discursive institutionalism, I am able to study the discursively constructed nature of sustainability transitions.

4.3.1 The multi-level perspective

With theoretical roots partially in neoinstitutional theory (Geels 2020), the MLP offers a nuanced and elastic research framework to study contested and conflicting socio-technical transitions, which occur in interactions between the three analytical lenses of the MLP: niches, regimes, and landscapes (Geels 2002; Geels and Schot 2007). Niches comprise protected spaces for radical innovations that are nurtured, shielded, and empowered (Smith and Raven 2012), such as spaces for the development of technologies or ideas that have not yet been institutionalised or popularised and are considered alternatives to the current state of affairs (Rip and Kemp 1998). These alternatives may penetrate to the regime level; that is, they may become economically, culturally, and socially acceptable solutions to organise society, such as reducing energy sector emissions. This kind of moving towards the regime, where resistance to the new is usually prevalent (Geels and Schot 2007), is also laden with political, cultural, and democratic challenges in relation to incumbency positions and in transitions research (Stirling 2014). The landscape level is viewed as the political, economic and institutional context in which the regimes operate. By placing pressure on the regime, the landscape level enables niches to find a foothold in the regime (Berkhout, Angel, and Wieczorek 2009).

Criticism of the landscape level has argued that the term is too vague (Geels and Schot 2007) and that the MLP lacks aspects of politics and power overall (Geels 2020). Burgeoning research interests have been directed at these concerns (e.g., Geels 2014; Markard, Suter and Ingold 2016) and to increase the understanding around discourse and narratives in the MLP (e.g., Hermwille 2016) and the social construction of landscapes (Rosenbloom, Berton, and Meadowcroft 2016). For instance, Antadze and McGowan (2017) show that institutional discourse is influenced by niche-level actors' macro-systematic discourse. This connects to sociological institutionalism, as the discourses include the assumption of institutions being comprised of actors with values and goals that depend on their historical contexts (Powell and DiMaggio 1991).

I connect the three objects of epistemic work to public policy analysis on energy transitions. Previous studies on policy mixes bring together sectoral policy-making to allow for systematic change (Kanger, Sovacool, and Noorkõiv 2020; Kivimaa and Kern 2016; Rogge and Reichardt 2016). This work has paid attention to the concrete goals, strategies, and instruments as part of the policy process. However, building on the work of Kanger, Sovacool, and Noorkõiv (2020), who studied the cross-sectoral

prerequisites for transitions, I have identified epistemic work in policy discourses. Kanger, Sovacool, and Noorkõiv proposed six policy intervention points in sustainability transitions that 1) stimulate different niches, 2) accelerate those niches, 3) destabilise the existing regime, 4) address the broader repercussions of regime destabilisation, 5) provide co-ordination to multi-regime interaction, and 6) tilt the landscape, which may accelerate transitions.

4.3.2 Transformative Outcomes

A framework of TOs was created based on the MLP levels "to orient the efforts of science, technology, and innovation policy actors to enable transformations" (Ghosh, Kivimaa, Ramirez, Schot and Torrens 2021, 739). With this framework, it is possible to study interventions as processes that lead to accelerated transitions. TOs operate on the premises of deeply political transitions and are based on the assumptions that to create a truly sustainable new system, inequalities and injustices must be addressed openly and constructively (Ghosh, Kivimaa, Ramirez, Schot and Torrens 2021). By using this framework, researchers have been able to show that although some policy programmes, in this case Finland's circular economy programme, having been impressively designed to include coordination between administrative levels and relevant actors from the public, private, and third sectors, they still do not support the system destabilisation that is recognised as essential for creating new, truly sustainable policy outputs (Lazarevic, Salo, and Kautto 2022). The original framework includes a total of twelve TOs, organised under three macro-processes of niche building, niche acceleration and embedding, and regime decline. Building and nurturing niches includes TOs of shielding, learning networking, and navigating expectations. Under expanding and mainstreaming niches are upscaling, replicating, circulating, and institutionalising TOs. In opening and unlocking regimes, de-aligning and destabilising, unlearning and deep learning in regimes, strengthening regime-niche interactions, and changing perceptions of landscape pressures are listed as TOs to seek. Each of these points has suggested concrete experimental policy engagements that guide policy-makers towards achievable policy solutions. The TOs help focus the analytical lens on the concrete policy-making built on global policy models, scripts, and values.

5 RESEARCH DESIGN

5.1 Context

The research for this dissertation was performed as part of the IDEALE project (see note above). Using sustainability transition literature lenses, this project investigated the connections between energy and climate policy and security and defence policy strategies and processes. The empirical research consisted of examining the policies of Estonia, Finland, Norway, and Scotland and the United Kingdom from 2006 to 2023.

The case studies for this dissertation, which are elaborated on in the published articles, include a comparison of Estonia, Finland, and Norway in relation to how security is constructed while decarbonising energy systems. I excluded Scotland and the United Kingdom from this dissertation to keep the focus on Northern European countries for the sake of coherence. For the purposes of this study, the countries share important similarities: populations less than six million, liberal, democratic, highly technology-driven and climate-ambitious political environment, and membership in NATO, with Finland joining in 2023. The selected countries strive for decarbonised futures in their official energy strategies (IEA 2022b, 2023a, 2023b). They also share a border with Russia, which affects not only their energy policy but also their national defence and security policies. They are also part of the same interconnected electricity network, Nord Pool. The countries also differ in many ways, which makes them interesting objects of study from the point of view of interpreting zero-carbon principles (see Table 1 for more details).

Table 1: Country selection with types of energy used and share of GDP spent on defence.

Country	**Total energy supply 2022, (three most significant)**	**Electricity generation**	**Share of GDP spent on defence**
Estonia	Coal 63%, biofuels and waste 25.3%, and natural gas 5.9%. (IEA 2024)	Coal 66%, biofuels 17.1%, and wind 7.5%. (IEA 2024)	3% in 2023 (Kaitseministeeriu m 2024)
Finland	Biofuels and waste 34%, oil 24%, and nuclear 22% (IEA 2022a)	Nuclear 31%, hydro 19%, and wind 17% (IEA 2022a)	2.5% in 2023 (Puolustusministe riö 2024)
Norway	Hydro 39%, oil 25%, and natural gas 22% (IEA 2024)	Hydro 88%, wind 10% (IEA 2024)	2% in 2024 (Norwegian Ministry of Defence 2024)

Estonian energy and climate policy changed dramatically during the investigation period of 2006 to 2023. From having one the largest carbon footprints among IEA countries (IEA 2019), Estonia's efforts to decarbonise the energy sector are now estimated to achieve climate neutrality by 2025. However, heavily polluting domestically produced oil shale still comprised the biggest share of its total energy supply and electricity generation in 2022 (IEA 2023a). The energy sector's independence from Russia was a long-term goal even before the invasion of Ukraine (Kivimaa 2022; Tuohy, Bulakh, and Tsarik 2017), including the process of desynchronising from the Russian grid. Estonia has significant deposits of critical materials and minerals that are important for the EU's energy transition (IEA 2023a). The Estonian defence sector is governed by the Ministry of Defence, but the strong emphasis on cybersecurity also includes the Ministry of Interior and Foreign Affairs and the Ministry of Economic Affairs and Communications. While Estonian defence expenses had been at the NATO baseline of 2% of GDP, the Russian attack on Ukraine had a significant impact on defence policy and led to an increase in military expenditures to 3% of GDP (Kaitseministeerium 2023). Estonia hosts the NATO

Cooperative Cyber Defence Centre of Excellence in Tallinn and has placed great importance on NATO participation (Studemeyer 2019).

The Finnish energy sector's decarbonisation plans aim to achieve climate neutrality by 2035, a target bolstered with a legal obligation (Työ- ja elinkeinoministeriö 2022). The goal has provoked political tensions especially related to Russian energy flows (Kivimaa 2022; Tynkkynen 2019) and to local, easily storable peat (Lempinen 2019). Carbon neutrality is planned to be achieved by using a high share of nuclear energy, growing electricity generation and heat production from renewable energy sources (mainly biomass from forestry, hydro, and wind), and refining energy efficiency. Significant efforts are aimed at electrifying the energy sector and reducing emissions from land use, and Finland is ranked as the world's leader in overall energy innovation technology (IEA 2023b). Fossil fuels are imported, and in 2021, Russian energy imports were regular: almost all fossil fuel-based energy sources, half of electricity net imports, and 34% of total energy consumption originated from Russia (Official Statistics of Finland 2021). In 2022, only about 18% of all energy forms (mainly coal, crude oil, and timber) came from Russia, although there is a great deal of uncertainty and estimation in these calculations (Suomen virallinen tilasto 2022). The energy relationship with Russia had been deemed asymmetrical (Tynkkynen 2019) even before the events of 2022.

Finland's defence sector operates on a comprehensive security concept, which means that society as a whole aims to ensure societal functions even during a time of crisis. This includes the authorities, the economic sector, NGOs, communities, and individual citizens (Valtioneuvoston kanslia 2017). After February 2022 Finland updated its priorities in the security environment with plans to increase cooperation with the EU, the other Nordic countries, and key partners including Arctic Ocean and Barents Sea cooperation, as well as increasing its emphasis on cybersecurity (Valtioneuvosto 2022). Furthermore, Finland joined NATO in 2023. NATO's Defence Innovation Accelerator for the North Atlantic (DIANA) will be established in Finland, which will further support research, development, and innovation in the country.

Norway enjoys the exceptional status of having almost full self-sufficiency in energy and uses mainly hydro for electricity. The country is a net exporter of energy, sending 87% of its energy production abroad). It aims to become a low-emissions society by 2050; significant decarbonising efforts have already been made in the electrification of buildings and in electricity generation. However, major efforts are still needed in

transport and industry, with expectations placed on electric vehicles and carbon capture and storage technology (IEA 2022b). However, as a major oil and gas producer, Norway's role in European fossil fuels markets is significant (IEA 2022b), and the economic importance of its energy trade cannot be disputed. As a part of EEA but not the EU, Norway still claims to meet EU climate targets, although not without local opposition, especially in relation to wind power production (Skjærseth and Rosendal 2022). Traditionally, energy and climate policies have been kept apart in policy-making to protect the country's hydrocarbon production (Kottasová 2021). Norway's Total Defence framework, which is based on the NATO principle of collective defence, "enables relevant civilian assets to support the national and allied defence efforts during peacetime, crisis and armed conflict" (Norwegian Ministry of Defence 2020, 2. With what is deemed "a more demanding security situation," plans to significantly increase the defence budget beyond the NATO baseline have been laid out, including growing the military sector as a whole (Norwegian Ministry of Defence 2024, 4). Furthermore, although all case countries have interests in the Arctic region to varying degrees, Norway's Arctic policy is the most integrated, not least due to its oil and gas exploration and the importance of North Sea fisheries.

In the Arctic region (which in this study largely means Finnish Lapland and Norwegian High North), the energy transition and security and defence issues have been discussed as part of Arctic development before and after 2022. On a national level, however, these two policy sectors were not frequently addressed together before the Russian war in Ukraine began in 2022. The Arctic region is viewed as a significant area in energy transitions not only for the Nordic states but also for the wider EU (European Commission 2021) through the commercially appealing natural resources in the seabed, land, and air (Boyd et al. 2015) which the EU plans to use to help drive European renewable energy production. At the same time, the geopolitical importance of the region is growing (European Commission 2021), and the area has been described as "geopolitically contentious" (Koivurova and Shibata 2023), especially after Ukraine was invaded in 2022. All case countries are part of this intricately interconnected fabric of renewable energy transitions and security and defence considerations in the Northern European context, although Estonia is not yet officially part of Arctic governance.

5.2 Methodology

The methodological approach taken in this dissertation is qualitative. As a starting point, I use social constructionism as described by Berger and Luckmann's (1967) socially constructed reality. This means that the three articles explore how "security" is constructed in energy transitions through written or spoken language and what kinds of consequences that may have for broader climate mitigation via the energy sector. The concept of discourse is regarded as untangling the dichotomy between reality and the perceptions related to that reality (Alasuutari 2011). Discourse in this study refers to all kinds of spoken and written interaction, following the definition that Potter and Wetherell (1987) used in studying social life and interaction. Discourse is not limited to individuals but also examines institutions, which brings perceptions of power and governance into the analysis. This is because the elements and positions of power can be constructed, changed, and rearranged through discourse (Alasuutari 2011; Foucault 1978). Foucault points out that there can be many discourses in the same strategy; they may conflict with and oppose each other. The interest in studying discourses is found in their two manifestations: the effects of the discourses and the practice there may be in their use and their contradictions (Foucault 1978, 102).

Discourse analysis has previously been referred to as a "broad theoretical framework" (Potter and Wetherell 1987, 175), yet in this dissertation it refers to research where language or other meaning-mediated action is used to analyse how social reality is produced in detail in different social practices (Juhila 2016). The social practices under investigation in this study are policies regarding climate change mitigation in the energy sector and national security and defence policies. My interest lies in how the reality of certain phenomena is produced and how and when it is defined (Jokinen, Juhila, and Suoninen 2016). With this method, I can contribute to the growing explanatory research in the sustainability transition literature (Köhler et al. 2019).

The study follows interpretative policy analysis, which refers to the study of public policy in its human complexity, deriving its premises from an ontological and epistemological basis (Yanow 2007). Interpretative policy analysis takes language to understand meaning-making in policy-making. Politics is about power struggles over who gets what, when, and how, which is why the underlying meaning of the arguments used in the political field are important to understanding the phenomena. It is not only about the words that are used, but also about what is actually being

said. Meaning-making stems from lived experience, and if the idea of the hermeneutic circle is included in policy analysis, we can interact with the phenomena in an informed manner by engaging openly with the data, taking into account our interest in the framings or discourses that are part of policy-making (Yanow 2007). An illustrative example of the use of interpretative policy analysis is the case of acid rain in the United Kingdom: neither the trees nor the rain were not socially constructed problems, but the multiple discourses regarding controlling the situation of dead trees and unhealthy rain provided the best approach to solve the issue (Hajer 1993). In this dissertation, interpretative policy analysis enables studying energy transitions, notions of security and defence, and the issues that may or may not connect them with an open mind, without taking the concepts, norms, or practices related to them for granted. This also applies to the major phenomena of sustainability transitions that are equally constructed with mutually accepted goals and measures.

5.3 Data

This dissertation draws on two different data sets. The first consists of what is known as "naturally occurring data," which means data that exists without a researcher's efforts and is not produced for research purposes (Potter 2002). Policy strategy documents are revealing data to study. Although they do not by themselves provide the operational insights into a state policy, they do offer a perspective on the social facts transparently represented to various audiences (Atkinson and Coffey 2011). The research was conducted by comparing three small European countries' strategy documents on energy and security and the Arctic policy domains. By comparing strategies from 2006 to 2023, I was able to detect changes within state policy over time as well as differences between state policies. All relevant documents were collected by browsing the states' websites, contacting ministry personnel, or through reference to other key documents. Documents written in English were used whenever possible: those in the original language were used as a secondary source and translations provided. In total, 73 documents (Estonia $N = 19$, Finland $N = 22$, and Norway $N = 33$) were analysed. In addition, all published Arctic strategies since 2006 ($N = 11$) and their official updates from Finland ($N = 5$) and Norway ($N = 6$) were analysed. The data starting point is 2006 due to that year's Russian–Ukrainian gas dispute, which led to a new era in energy and security politics in the EU (Kuzemko, Keating, and Goldthau 2016).

The second data set consists of two groups of semi-structured, in-depth expert interviews, carried out in three rounds of interviews.[2] The first set comprises 68 interviews conducted in Finnish and English in two sections to gain insight into the periods before and after the Russian invasion of Ukraine in 2022. The first round comprised 46 (anonymous) interviews: 16 in Estonia and 15 each in Finland and Norway. The interviews were carried out between September 2020 and May 2021. The second round consisted of 22 interviews – nine in Estonia, seven in Finland and six in Norway – carried out between December 2022 and March 2023. The interviewees were representatives of energy, national security, defence, international affairs, and cybersecurity, and came from public administration, industry or businesses, academia, and political decision-making bodies. The third interview round consists of interviews with 23 Finnish ($N = 9$) and Norwegian ($N = 14$) Arctic actors and experts and conducted between April 2022 and March 2023 and it also includes representatives from the 3rd sector and Indigenous Peoples representation. The first round of interviews was conducted entirely online due to the Covid-19 pandemic. The second and third rounds were conducted both online and in person, in planned interview meetings, at conferences, and on site when possible. The data is rich and relevant, as global climate agreements are being implemented, creating pressure for national stakeholders to keep up with the pace of emission mitigation. Additionally, the pandemic highlighted and complicated concerns around the security of energy supply around the world (Chiaramonti and Maniatis 2020) and issues such as the Nord Stream 2 gas pipeline from Russia are still causing global debate (Kramer 2020; Olterman and Harding 2020), especially since the alleged sabotage of Nord Stream in 2023 (Camut and Gavin 2024).

Studies involving a wide range of stakeholders are especially suitable for examining public problems that connect diverse sectors, people, and organisations (Bryson 2004). Furthermore, rapidly changing environments are likely to be captured in interviews. When conducting research using expert interviews as data, it is important to note that there are details only the experts involved can provide and that experts are difficult to replace given that they are the knowledge holders of the field (Alastalo and Åkerman 2010). The definition of an expert was decided based on person's ability to "speak security" (Peoples and Vaughan-Williams 2021), that is, they were able to talk about security in relation to energy transitions and knew what security

[2] Of the total of 91 interviews, I conducted 50, Paula Kivimaa and I carried out 33 collaboratively, and 8 were conducted by Kivimaa on her own. The interview protocol was collaboratively designed in a joint project. I analysed all the interviews for Articles II and III, while Kivimaa provided cross-checking.

talk entails in this context. The interviewees were selected by scoping relevant organisations and people, relying on previous fieldwork knowledge, and using the snowball method. This provided exhaustive use of the sources, as the phenomena connecting both sectors were not widely discussed in any of the case countries before February 2022. This is one reason why we did not concentrate on civil society actors – the field was too narrow at the time.

The data is comprehensive in regards of the first round of interviews. Exhaustive representation was not possible to achieve on the second or third round of interviews due to practical issues such as people were not available at the time of the data collection. In addition, due to the radically changed situation resulting from the war, new actors emerged during and after the crisis, and some older ones gained new importance. We held importance in interviewing the same experts but were able to expand somewhat for the interviews in relation to Arctic case study. One direct limitation of the data was the fact that we concentrated on the political decision-making and policy and, thus did not interview civil society representatives, such as societies.

Regarding the coding, the data were coded using the qualitative data analysis software NVivo. This helped to organise and gain coherent picture of the vast data available. It was also easier to cross-check the coding between the authors. This meant that while one author was in charge to fully code and interpret the data, the other checked if the coding was consistent and mutual understanding was in place. This method was used to ensure replicability and reliability of the analysis.

5.4 Positionality of the researcher

The positionality of the researcher is an important feature of interpretative analyses and is most evident in interview-based data analysis (Alasuutari 2011; Juhila 2016; Potter and Wetherell 1987; Yanow 2007). According to Dvora Yanow (2007, 114), "the researcher is herself part of the interaction she is studying." Researchers place themselves in conversation with previous knowledge produced by other researchers, interact with the data, often in close cooperation with colleagues, and may continue interaction long after an interview has been conducted, following the rules of research ethics and integrity (TENK 2024). The researcher's status as part of the interaction is not hidden away but addressed openly. In sustainability transition studies, acknowledging the positionality of the researcher in the planning phase, in

defining terms, and in addressing the underlying preconceptions related to the phenomena at hand are all regarded as important (Susur and Karakaya 2021).

The fact that I identify as female brought some challenges when studying generally male-dominated fields. I contemplate the possibility that had I served in the military (as it is getting increasingly popular among women to serve voluntarily in Finland), I might have enjoyed improved access to key personnel in the security and defence sectors. However, this is not a straightforwardly gender-based question, as many of those who identify as male also do not serve in the military. In addition, I encountered the challenge of patronising attitudes from some (identified as) male research participants. However, most interactions were respectful, and I successfully secured enough interviews despite my lack of military experience.

Achieving gender balance among interviewees proved daunting, particularly before 2022, when finding interviewees to discuss renewable energy alongside security and defence was difficult generally. Despite thorough research, several potential interviewees, mostly (identified as) women, declined to speak with us, citing a lack of expertise, even though I had identified them as qualified. By contrast, (identified as) male respondents were generally more confident and willing to participate. I am grateful for the enthusiastic contributions from all interviewees, but I hope to see greater confidence among women in the future. In addition, interviews with non-Finnish speakers were conducted in English because neither I nor the project supervisor is fluent in Scandinavian languages or Estonian. While this could be seen as a minor limitation, the interviewees were fluent in English and agreed to use it.

My Northern Ostrobothnia dialect immediately identified me among Finnish speakers, which I believe helped ease the sensitive periphery–core dynamics at play in that country. Additionally, my studies and work at the University of Oulu and the University of Lapland, and the networks I built at those institutions, facilitated access to the field. This also relates to the issue of representation, as my background as a peat-producer's daughter who grew up in the countryside set me apart from the core regions, such as the capital or the country's economic hubs.

The research also involved issues related to Sámi, Indigenous population. Given the importance of including the Sámi perspective in Arctic discussions, I was fortunate to obtain their viewpoints and hope this work respects their contributions while recognising the diversity within Indigenous populations. Future research should be conducted collaboratively with Indigenous communities from the outset,

acknowledging the colonial structures in academia and in society and striving for greater inclusiveness and equality (Heikkilä 2021; Junka-Aikio, Nyyssönen, and Lehtola 2021).

It is important to note that I, as the researcher, specifically prompted interviewees to discuss the connection between renewable energy and security, especially before 2022, when few had linked these sectors. By doing so, I contributed to shaping the perception that renewable energy and security could indeed be interconnected. After 2022, this was no longer as common an issue, as the shifting geopolitical landscape in Europe brought renewable energy to the forefront.

6 FINDINGS AND DISCUSSION

This section reviews each article, highlighting its theoretical and empirical contributions to the objectives and aims, and discusses the findings. Regarding the contributions of the main objectives of the thesis, Table 2 gives examples of each article. Section 7 gives detailed evaluations. Although the phenomena can be studied from various viewpoints, the discursive and constructivist perspectives used in this dissertation increase understanding at least in three different ways. First, the empirical understanding around the unwanted and negative implications of sustainability transitions are identified and addressed. Second, scholarship on sustainability transition benefits from gaining more knowledge on the specifically socially constructed nature of those transitions. Third, the methodology used increases our understanding of discourses in socio-technical transitions. A summary of the three articles appears in Table 2.

Table 1: Summary of the three research articles

	Article I	**Article II**	**Article III**
Main problem	How is security discursively constructed in relation to energy transitions, and what might that mean for sustainability transitions more broadly?		
Empirical research questions	How have zero-carbon energy and security issues co-evolved with, strengthened, or undermined one another in national policy strategies of Estonia, Finland, and Norway between 2006 and 2023?	To what extent are zero-carbon energy transitions a securitized phenomenon, did the Russian invasion in Ukraine in 2022 change the security discourse, and what might be the implications of the findings to sustainability transitions more broadly?	How are energy transitions and security intertwined in the Finnish and Norwegian Arctic, and what are the justifications for hindered transitions?
Aim	Identify the discourses that contextualise, justify, and explain policy-making.	Untangle how securitization is part of the discourse regarding energy transitions.	Provide a case study of the interrelations between energy transitions and security.
Data	Documents	Interviews	Documents/interviews
Methods	Discourse analysis	Discourse analysis	Content analysis
Findings	The key policy-making discourses identified were: 1) transitions occur in a risk-filled world, 2) reliable partners vs. unpredictable neighbours, and 3) cautious energy transitions.	Energy transitions are securitised, but caution surrounds to maintain democratic decision-making. Identifying reliable partners and state–non-state interactions is key to a comprehensive security definition.	The development of the North is connected to continued oil and gas production. Security as a performative concept contribute to just transitions, but negative security prevails.
Contribution to the main theoretical problem	Policy-making is risky and actors use epistemic work to gain support. The discursive nature of security is clear in case of Russian energy: energy trade was acceptable before 2022 but became a risk thereafter.	Energy transitions increasingly shape national security, policy, and transition speed. Even post-2022, fossil fuel access remained central, while renewables gained prominence within state security frameworks.	Acknowledging regional and local contexts is vital for a just transition and this may slow progress if overlooked. Expanding security concept beyond the state redefines its meaning.
Contributions to the research	O1: The zero-carbon energy system and national sovereignty	O2: Transitions introduce new threats, e.g. to cybersecurity,	O3: Renewable energy in Finland and Norway intertwines fossil fuels

objectives, examples	are not competing goals: however, stability, including via economical means, favours national security and may hinder decarbonisation.	and may centralise power through securitisation. This may undermine democracy, especially if contradictions remain unresolved.	financially and politically. Positive security broadens security thinking beyond the state and military.

6.1 Discourses on the interrelations between energy transitions and security

The analysis of Article I on energy, climate, security, and defence policy strategies from the case countries presented an empirical understanding around overlapping and even contradictory policy-making. The aim was to identify the discourses that contextualise, justify, and explain policy-making in the energy–security nexus, by which I mean the social, technological, political, economic, and geopolitical factors that positively intertwine in energy and security and defence policy (Kuzemko 2013). This type of context is central, because transitions as part of socio-technical systems are fundamentally contested and disruptive; they have winners and losers (Geels, Sovacool, Schwanen and Sorrell 2017).

The identified discourses were as follows: 1) transitions happen in a world full of risks, 2) reliable partners and unpredictable neighbours, and 3) energy transitions with reservations. These were derived from epistemic governance framework, from its three aspects of the social world: the ontology of the environment, actor identifications and norms and ideals (Alasuutari and Qadir 2019). The discourses construct and maintain the idea that state action and intervention are needed to manage insecurity in a world that impacts the national situation. For example, in Norwegian strategy work, the official discourse took control of the definition of transition by defining sustainable development to include continued fossil fuel extraction while also advancing the active electrification of the transport sector. This claim is an act of power via discourse in transitions (Avelino 2021).

Although all three countries actively promote sustainable development, Estonian policy-making operated with an emphasis on sovereignty and the desire to look to the West for more secure energy resources and alliances. In Finland, economic incentives were at the centre of policy-making. This was done in the name of improving national competitiveness and is also a known policy model adopted in

attempts to gain power in policy-making (Kantola 2014). These findings support the main argument that the negative, state-based security characteristics assigned to security when discussing energy transitions hinder the process, even during peacetime. National security dominated the discourse, highlighting negative security concerns. Significant changes in discourse occurred when Russia invaded Ukraine. While Estonia had previously declared its reservations about the energy trade, Finland and Norway had continued cooperation with Russia until the events of 2022 forced them to reconsider. This highlights the discursive construction of security because the same actor was considered a security issue in defence strategies, but in the energy strategies cooperation with Russia was continued. "Security" was thus understood differently from the energy policy point of view than from the defence perspective.

In addition, all six policy intervention points were detected. They highlight the political rhetoric in which can detect policies that enable transitions. The six policy intervention points are 1) stimulate different niches, 2) accelerate those niches, 3) destabilise the existing regime, 4) address the broader repercussions of regime destabilisation, 5) provide co-ordination to multi-regime interaction, and 6) tilt the landscape (Kanger, Sovacool, and Noorkõiv 2020). For example, the Estonian phase-out of oil shale was only accelerated when the EU demanded transition and when other ways to secure energy were confirmed (points 3) and 4)). The importance of EU and Nordic partners in decarbonising efforts was important for all countries (point 5). All countries wished to accelerate niche technologies (points 1) and 2)) but lacked actions to tilt the landscape towards decarbonisation (the lack of point 6).

6.2 Discursively constructed security

As discussions about energy and security and defence escalated after 2022, it was impossible to avoid hearing the word "securitization" in general use, and it was increasingly popular to connect it to new, renewable, and electrified energy systems. However, in academic use, "securitization" usually refers to a process studied as part of securitization theory. This theoretical approach has several interpretations, but it is most commonly understood as different discursive processes (Peoples and Vaughan-Williams 2021, 115) in which an "issue is presented as an existential threat, requiring emergency measures and justifying actions outside normal bounds of political procedure" (Buzan, Waever, and de Wilde 1998, 23–24) or as "an issue […] moved from normal politics into the realm of security politics" (Floyd 2019, 21). For

Buzan et al. (1998), the key interest is to find out what is and what is not a security issue. The specific theoretical contribution to the aim of the dissertation lays in the identification of the existential threat and the referent object. Moreover, as security is ultimately a "context-specific social construction" (McDonald 2021, 64), it was of utmost importance to expand the analytical framework of securitization theory to include more nuanced identifications. In addition to the two categories noted above, Article II draws on the literature to add the categories of extraordinary measures (Heinrich and Szulecki 2018; Kuzemko 2014), power and governance (Heinrich and Szulecki 2018), and riskification (Corry 2012).

The analysis of the expert interviews in Article II reveals that energy transitions are to some extent a securitized phenomenon. This means that all five securitization points were detected in the discussions about energy transitions. However, the final category, riskification, was especially interesting. Riskification indicated that there are certain factors in transitions on which the experts do not agree: some felt that they should not be categorised as security threats but as risks that should be monitored. The main referent object detected was the state and its sovereignty in all countries, but the energy system and its operability in all circumstances were also important. The main threat in all countries was Russia, although open discussion over it increased in all countries after 2022; in Finland, Russia was not an encouraged topic in the energy sector before the war. Although it was known that Russia was the main threat in terms of cybersecurity, it had been easier to discuss anonymous threats rather than make or even countenance any direct accusations. Cybersecurity as a threat enabled broadening the theorisation of security beyond the state's "hard security," such as tanks and marines, to contemporary thinking over war and conflict. Moreover, the identification of a referent object goes beyond the state as an institution and all the way to an individual electricity user, as when malicious activity causes problems in accurately invoicing consumers.

By including the category of extraordinary measures in the analysis, it was possible to highlight the unique setting of state–business interaction via Nord Pool, the shared electricity market, when the 2022 energy crisis resulted in the questioning of solidarity. The importance of defining security in these interactions is pivotal. Even if the security threat would not result in losing state sovereignty, it would cause major harm to internal security and could even lead to a panic in energy storage. In addition, there could be a setback in transitions, such as a re-introduction of easily storable fossil fuels in the heating system.

By connecting securitization theory with sustainability transitions, it was possible to discuss both the benefits and disadvantages that major system transformations bring about. Indeed, energy transitions bring forth new types of threats or may shift the focus to new types of security, such as cybersecurity in increasingly electrified societies. When brought into policy-making, they may be addressed in a more systematic and centralised manner. However, securitizing issues related to transitions may also change the power balance towards elite power, where decisions are made outside the realms of democratic decision-making. This may lead to significant challenges in democracy overall, especially if the current contradictions in relation to energy transitions are left unsettled. Article III delves into these contradictions in more detail.

6.3 Energy transitions broadening notions of security

Article III focuses on the specifics of the Arctic area from the perspective of Finland and Norway. Estonia, although keen to participate in Arctic affairs (Varik 2023), does not have land or sea areas in the Arctic and has not been granted observer status at the Arctic Council, the intergovernmental forum promoting cooperation in the Arctic. The findings of the analysis of expert interviews and Arctic strategies reveal that although it is a well-known and accepted fact that the Arctic is facing more severe negative consequences of climate change, that has not translated into concrete political action. Renewable energy development in both Finland and Norway materialises in terms of fossil fuels both financially and politically. In this article, concepts of positive and negative security (Hoogensen Gjørv and Bilgiç 2022) were used to categorise the different issues that interviewees discussed as part of energy transitions and security. They helped to broaden security thinking beyond the state and the military. The TOs (Ghosh, Kivimaa, Ramirez, Schot and Torrens 2021) directed the analytical lens to policies that can lead the transition.

The findings indicate that negative security thinking prevails in these discourses. National security and defence issues were used to justify continued fossil fuel extraction. One interviewee went so far as to describe Norwegians as suffering from "petroholism" that the world enables. Furthermore, the regime decline TO was not detected in the strategy work. The development of the renewable energy sector would happen on the terms of the fossil industry, suggesting a careful niche development. Nevertheless, the interview data showed a more multifaceted security landscape, where issues other than state security, defined as positive security,

broadened the overall understanding around security. Some solutions to major problems were also presented, such as improving representation in policy-making to enable more just policy outcomes. This highlighted the performative status of security as a whole, as even when state actions were questioned and debated, such as the Fosen wind power park in Norway, the status of states as governing bodies were not. Quite the contrary was true; inclusion in state-level decision-making would enhance the state presence in the area, although now in a more socially acceptable way.

Notions of justice in energy transitions were discussed especially in relation to the vulnerable status of Indigenous people. Although non-Indigenous individuals living in the area face similar kinds of challenges related to land use and competing sectoral needs (e.g., tourism), the position of the Sámi population is particularly jeopardised. One reason is the intricate relationship between reindeer herding and Sámi cultural survival, but the Sámi have also been forced to comply with national borders that were imposed from outside their traditional lifestyle and cultural heritage (Magga 2024). The land use conflicts related to energy transitions in the Sámi homeland regions, the Sápmi, are significant not only because of the consequences that policies, actions, and measures have on the area, but also because the discursive struggles around them can have long-lasting and unexpected effects, such as a loss of trust in the constitutional state resulting from knowledge claims and disputes over knowledge, science, and scientific evidence (Fjellheim 2023; Johnsen, Ivsett, Gaup Eira, Mathiesen, and Oskal 2022). These are central questions concerning power and governance and require more research from the point of view of the Indigenous peoples and Indigenous knowledge traditions. This challenging situation presents an example of discursive ways to gain power while transitions are ongoing, although in this case, the Indigenous peoples aim to gain a foothold on issues that affect the present and the future of their culture and very way of life. For example, local people saw themselves as capable of providing security to the state in the form of patrolling the vast and largely uninhabited land areas familiar to them.

7 CONCLUSIONS

The methodological background addressed in this dissertation was to investigate the interrelations between energy transitions and security from a discursive constructivist perspective. The question asked was how "security" is discursively constructed in relation to energy transitions and what that means for sustainability transitions more broadly. The investigation was carried out on Estonian, Finnish, and Norwegian energy, climate, security, and defence policies. The study had three objectives. First, it aimed to study the power of discourse in sustainability transitions. Second, it intended to illustrate contextual and interdependent policy-making in the globalised world and to increase our understanding of the issues that renewable energy and increasingly electrified societies encounter. The third objective was to study the concept of security and how its discursive construction may impact climate change mitigation. This is done by empirically investigating the interrelations between energy transitions and security.

Methodologically, this dissertation utilises the qualitative research methods of social constructivism, discourse analysis, and interpretative policy analysis. With these as the background, it was possible to study the subtle dynamics of policy-making during a major socio-technical transition aimed at mitigating climate change. The qualitative approach was used to increase understanding around discursive tactics in sustainability transitions. By using document analysis, I was able to find policy-making ideals from 2006 to 2023 and to capture the nuances that different political leaderships had intended in the energy–security nexus. The rich interview data provided the needed contemporary perspective on the policy discourse, and as another of round of interviews was conducted after 2022, it was possible to capture the changes after a major shift in the geopolitical setting that directly influenced the nexus in all three case countries.

7.1 Empirical contributions

In this dissertation, I draw three main empirical conclusions from the results presented in the separately published articles. First, after analysing the energy–

security nexus in strategy documents, I concluded that although all three case countries seemed to follow global climate agreements, the means to achieve those goals vary and may even be dubious (Article I). The title of this dissertation reflects these findings. In Estonia, national sovereignty trumped other goals, and the planning of the energy system was to be carried out in cooperation with Western partners to rid the country of its old, polluting Russian system. In Finland, economic incentives were considered the most important factor and aimed to bolster national competitiveness. The development of the renewable energy sector was to contribute to this goal. In Norway, sustainable development could only have been achieved according to Norway's own definition of sustainability, which includes the continued production of fossil fuels: that is, the country's "petroholism", as one interviewee described it.

The second conclusion connects directly to renewable energy's newly gained status as contributing to national security. In practice, the reliability of the case countries' energy systems did not change. However, renewable energy received increased attention in public discussion, which increased the pressure to increase renewable energy production nationally. The word "securitization" was used especially in relation to renewable energy. From an analytical standpoint, this was problematic because the word has a different meaning in the vernacular. Its definition also varies in the academic literature, but in this dissertation, I use it as a sociological concept: securitization is a process in which an issue is moved beyond the normal political decision-making that occurs behind closed doors (Balzacq 2015). Article II argues that renewable energy as a phenomenon was indeed securitized to some degree in all case countries, especially after 2022. However, it must be noted that some experts also wished to leave some aspects of renewable energy policy out of the sphere of security talk and considered them less severe. This led to the conclusion that there is a need to address the consequences of claiming energy policy per se as a national security issue. This is a valid move in the context of democratic decision-making; when an issue is deemed to be important to national security, decision-making around it may be shifted into the hands of an elite working behind closed doors. I also argue that by enabling closed decision-making around national defence, the military activities, fossil fuel culture (Johnstone and McLeish 2022) and operation based on fossil fuels have thrived. In light of the analysis of this thesis, however, the defence sector uses the same energy as the civil society, which suggests a much-needed change in the discourse around civilian and military cooperation in relation to preparations. Since 2022, attention to dual-use technologies has grown and policy-making has been more coherent in the case countries.

The third conclusion is that inclusive and comprehensive decision-making is the key to just and sustainable energy transitions. The importance and difficulty of this point was highlighted in the case of Arctic energy and security interconnections. The Arctic is widely viewed as a critical resource to provide for Europe's growing energy, mineral, and material needs. These pressures cause concerns for the locals, which is why it is vital to discuss for whom different policies are providing security. Article III argues that notions of justice are parallel to notions of security. This was visible, for example, when local people justified their way of living through their ability of participating in national defence by keeping the land inhabited and providing security of supply during crises.

These findings concur with my argument regarding negative security hindering energy transitions, even during peacetime. They indicate how differently security can be constructed and that its construction has consequences for the way sustainability transitions unfold. As the concept of imprinting discussed above implies (Johnstone and McLeish 2020; Johnstone and Schot 2023), these constructions influence the organisation of our future energy systems to an unknown extent.

7.2 Conceptual and theoretical contributions

Theoretically, the three original articles and this introductory chapter of my dissertation make four important contributions. First, the analytical lens of discursive institutionalism on local and regional level of policy-making highlights the cultural contexts and temporality of transitions. Regarding this contribution, I argue that world culture has profoundly influenced the policy-making of the case countries' socio-technical transitions. This is especially visible in the Arctic areas, where Western, Christian, and capitalistic assumptions of modernity and development have overruled Indigenous Peoples rights. However, the epistemic work (Alasuutari and Qadir 2019) each country conducted in its policy strategy work revealed national, regional, and cultural nuances. The findings indicate that the two well-adopted global scripts of climate mitigation and national security are not competing goals, even if national security dominates for the time being. They are enacted and pursued simultaneously in a contemporary setting, although their political emphasis varies over time and according to policy sector and can change rapidly. The discourses that constructed which policy should be emphasised draw from the same goal of a safe and stable society. This was possible by investigating the global scripts from

institutional point of view, where the institutions that make up the operational enactment of nation-states were at the centre of the study.

Second, the interpretative power of institutions was recognised as important for any change, policy, or goal for policy-making. However, those who make up the fabric of the institutions matter greatly, and taking this into account in detailed and accurate examinations strengthened those analyses by bringing in the actor and agency perspectives of socio-technical transitions (Geels 2020). The explanatory power over why transitions happen the way they do has been enhanced with the research presented in this dissertation. By investigating the energy transitions as part of global scripts or culture together with a broader security theorisation, the theoretical assumptions of what is 'sustainable', 'development' or 'sovereign' in the first place were highlighted as far from self-evident and that the local interpretation of those concepts as policy models reveals that discursive institutionalist viewpoint is necessary to understand the wider picture.

The third contribution is connected to the second, as multi-actor thinking also allows a more holistic view of the case at hand in security theorisation. I contribute to security studies beyond international relations and to the theoretical thinking of sustainability transitions to include the multi-actor perspective (Floyd 2019; Hoogensen Gjørv and Bilgiç 2022; McSweeney 1999). I argue that this leads to an increased understanding of the complexity of the major institutional changes that decarbonising energy systems bring forth. As the negative and unwanted consequences of this socio-technical system change unfold, the status of quo of either research or policy-making is no longer useful – what was done before does not apply to the evolving ways of ensuring both energy system operability and national security. By widening the participation pool, the opportunities of more diverse groups of people and encouraging intersectional thinking and acting in decision-making would create better opportunities for a just and sustainable societies. As a practical point on conducting research, this would also broaden the data sample of studies on currently rather male-dominated fields of energy, security and defence.

The fourth contribution adds structure to the concept of landscape in the MLP. In its origins, the MLP has been described as a ubiquitous part of human beings (Rip and Kemp 1998). I suggest that world culture increases the theoretical depth of the concept because it explains the migration of the cultures, ideas, and practices that create the all-encompassing setting we call culture or society, where policy-making

occurs. Like all cultures, the cognitive and ontological principles and models define the social fabric; world culture does the same. Operating on the global level, it works toward diffusing global norms and scripts to policy-making (Boli and Thomas 1999). Indeed, as the landscape conditions change, for instance because of war as Johnstone and McLeish (2020) have suggested, the reactions and new actions spread around the world at a striking pace and uniform fashion, because of world culture.

In addition, the military, the ultimate state power institution, is dependent on a functioning energy system during times of both peace and conflict. This example underlines the social construction of security, following Hajer (1993). Although tanks rolling into Ukraine are not a social construction, they were only considered a real threat to the European energy sector after the events of 2022 and not during the 2014 invasion of Crimea. This also points out the possibility of rapid changes in discourses and their implications more broadly.

7.3 Limitations of the study and future research avenues

The phenomena discussed in this dissertation are major and complex, and the intention was not to explain the interrelations of energy transitions and security and defence in full. Rather, the aim was to make sense of the ways discourse is used in policy-making around these two policy sectors in specific national contexts. As world culture suggests, states generally follow globally agreed scripts but deviate from them when policies are implemented on the national level. Against this analytical background, I was able to compare three countries' efforts to mitigate climate change while maintaining national sovereignty. This approach provided a framework for understanding their differing strategies and challenges. By connecting sustainability transition approaches to macro-sociological theory, I was able to study the nuances and variations within policy-making and do justice to the fact that a great deal is being done to advance transitions to decarbonised energy systems. As this study only included three countries, further research should include more countries sharing energy systems and geopolitical concerns. In addition, because major countries within the EU like Germany and France have significant power over energy and climate policy, understanding the construction of security in their policy-making would be important. Broadening the scope of the study to include the interactions of non-Western states and international organisations such as NATO and the EU would also be an important addition, because of their role in forming global climate and security governance.

A minor limitation to this dissertation is that defence and security policy are discussed in relation to energy policy. The justification is that I studied climate change mitigation via energy policy. However, it can be argued that the defence sector should include more active mitigation policies. Cybersecurity as a field of its own was discussed, as the implications of increasingly electrified societies were recognised, but measures were limited due to a lack of general political interest and resources. Here lie some further policy needs; because cybersecurity is an important issue for current and future energy systems, the kinds of policy changes needed to increase its status and how to do that without securitising it are key, as the sector already requires strong technical expertise that excludes many from the discussion.

Another limitation is that the conceptual understanding in policy-making did not go beyond these two policy sectors, although climate mitigation and national security cross over into other policy sectors, notably trade policy. Further research is encouraged specifically on this point: as trade and financial markets broadly are so crucial to both energy and security and defence policy, the way major fossil fuel exporters influence climate policies should be studied. For instance, what are the ways in which Russia aims to influence renewable energy investing?

Although rigorous efforts were done to ensure the reliability and transferability of the qualitative analysis methods and practice, there is always some room for interpretation of the results. Often the comparability of the qualitative data is a challenge, and this was avoided in this study with some strategic choices in the research setting. For instance, the case countries and their political systems allowed documents that were easily treated equal, and the interviewees from each country were chosen following similar sectoral divides, for instance. In the beginning of the study there was a concern that Finnish contacts would dominate the cohort due to the place and origin of the study being conducted, but this was not the case in the final data collection. To ensure reliability, cross-checks were done between the authors of the paper throughout the analysis.

7.4. Recommendations for policy-makers

Finally, I argue that in light of the findings of this research, policy-making in both the energy sector and the security and defence sector should operate in closer cooperation. Knowledge exchange between these two vital sectors should be a

prerequisite to changes, and decision-making should involve greater inclusion of different actors. However, security and defence issues should not dominate energy policy-making, especially if security is understood narrowly as state-based, military, and coercive security. If an issue is claimed to be part of national security, it may benefit those who already are included in the inner circle. However, distributing the responsibility for these complex, nuanced, and uncertain fields in a structured, democratic, and just way will benefit society as a whole. Indeed, as Karhunmaa (2021) has stated, policy-makers must be able to imagine a decarbonised future to work towards it. This requires a shared understanding of not only imagery but also knowledge and robust communication. For energy policy, a broader understanding of security instead of concentrating only on security of supply and energy security would be a relevant improvement. Policy-makers must be ready to meet the challenges that decarbonisation brings, such as the increasing need for critical and non-critical minerals and materials and the growing societal shifts that climate change and mitigation efforts will inevitably lead to in the labour market and land use.

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Politics in the energy-security nexus: an epistemic governance approach to the zero-carbon energy transition in Finland, Estonia, and Norway

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ABSTRACT

To reduce the energy sector's CO_2 emissions, sustainability transitions are essential but may have unexpected national security consequences. We investigate policymaking around energy transitions and national security, combining sociology with sustainability transitions thinking to analyse 73 policy documents issued between 2006 and 2023 in Estonia, Finland, and Norway and investigate how zero-carbon energy and security issues have co-evolved with, strengthened, or undermined one another by analysing the rhetoric in official national strategy documents. With an epistemic governance framework, we identify the discourses that contextualise, justify, and explain policymaking in the energy–security nexus. We find that sustainable energy transitions are strengthened by connections to national security when alternative energy niches have matured but undermined for the same reason when fossil fuels are viewed as more robust sources of security. We detect policy intervention points aiming to indicate how transitions are enabled. Estonia and Finland evince strategic directions to destabilise the regime while supporting niches, whereas Norway focuses on continued oil and gas production. Whereas all are in principle in favour of sustainability transitions, they define transitions differently: Estonia values national sovereignty, Finland preparedness and the economy, and Norway sustainable development and economic security tied to hydrocarbons.

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1. Introduction

Modern society depends on uninterrupted energy flows; nearly all economic processes require energy to function (Löschel, Moslener, and Rübbelke 2010), and the need for decarbonised energy has become indisputable. Energy efficiency and energy security have become increasingly important on policymaking agendas, especially after geopolitical disruptions to energy flows, such as the Russian – Ukrainian gas disputes in 2006 and 2009 (Goldthau 2008) and the 2022 Russian invasion of Ukraine, which dramatically reshaped the European energy sector. In addition, crises induced by natural catastrophes, such as the Fukushima nuclear accident in 2011, have quickened the pace of energy transitions (Loorbach and Verbong 2012). Cyber-attacks and human and software malfunctions can also cause major damage to energy services (World Energy Council 2019). Therefore, it is worth exploring how governments have dealt with security concerns in the context of zero-carbon energy transitions between 2006 and the events in 2022 that elevated security on energy policy agendas across Europe.

We rely on two theoretical concepts: epistemic governance and sustainability transitions. Epistemic governance offers an account of how vast societal changes are advanced under myriad interconnecting interests. For example, energy transitions are not only impacted by technological solutions or key actors' decisions but also by actors' perceptions of a given situation and the rhetorical strategies they employ to justify their political choices. Politicians aim to persuade their peers and citizens of a given reality and the responses that are required (Alasuutari and Qadir 2014, 2019) to enable sustainability transitions without jeopardising national security. Thus, we seek an answer to the following question: How have zero-carbon energy and security issues co-evolved with, strengthened, or undermined one another other in national policy strategies of Estonia, Finland, and Norway between 2006 and 2023?

We study policy documents from a 17-year period in three small Northern European countries: Estonia, Finland, and Norway. Despite transnational efforts (IPCC 2022) and strong domestic commitments to significantly lower emissions, these countries still produce and use fossil fuels. In 2020, 39.5% of Estonian energy production came from oil shale (Statistics Estonia 2021), while 14% of Finnish energy production was from fossil fuels (OSF 2021). Although Norwegian hydropower enables almost fully decarbonised electricity, Norway supplies 2%–3% percent of global oil and gas (IEA 2022a). Why have these

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highly developed and seemingly pro-climate countries yet to fully decarbonise their energy systems? We respond that framings of national security influence progress in zero-carbon energy transitions. We analyse national political discourses in government policy strategy documents to identify the rhetorical tactics by which politicians justify their arguments and decisions around energy transitions. We study how these documents articulate and envision the connections between energy, climate, and security issues and their normative underpinnings when trying to convince audiences in the energy–security nexus.

That nexus refers to the connections between the energy and security sectors: that is, the social, technological, political, economic, and geopolitical features present in contemporary policymaking regarding zero-carbon energy transitions. It 'reflects a combination of two different perspectives on energy: environmental and geopolitical' (Kuzemko 2013, 3). In that nexus, energy and security are treated as positively related, covering both energy security and climate targets with increasing state intervention, and leading to the increased influence of geopolitics in the energy sector (Kuzemko 2013).

This paper addresses energy as part of sustainability transitions and 'socio-technical systems' as socially constructed (Geels 2020; Geels et al. 2017). Transitions involve a complex group of actors with differing beliefs and values, societal statuses, and interests. They are fundamentally disruptive and contested, 'not only about the market diffusion of new technologies but also about changes in user practices, cultural discourses, and broader political struggles' (Geels et al. 2017, 464). Due to complexity, uncertainty (Hoppmann, Huenteler, and Girod 2014), and differing objectives, transitions are only feasible via cooperative negotiations and trade-offs between stakeholders. They are directional, pursuing visions and pathways for change (e.g. Yang, Schot, and Truffer 2021) and emphasising an important role for states in guiding transitions via politics and policy (Johnstone and Newell 2018). Research on public policy in sustainability transitions has increased (e.g. Kern and Rogge 2018; Kern, Rogge, and Howlett 2019), but studies on how policies are framed, envisioned, and justified – that is, socially constructed – in national policymaking are rare. Bijker (1995, 273) states that 'the technical is socially constructed, and the social is technically constructed', calling attention to the technological bearings that are closely connected with social aspects. Geels (2020) argues for more social constructivist theory in transitions literature, as transitions cannot be separated from their cultural and social aspects and impacts. Sociological theorisation evaluates this contextuality of transitions and ongoing reconstruction by the myriad actors involved (Markard, Raven, and Truffer 2012).

Our contributions to the sustainability transition literature are to investigate the partly unexpected security connections of energy transitions and to demonstrate how political culture and language operate as significant influencing factors (Geels et al. 2017; Victor 2015). We analyse political rhetoric in comparison with the policy intervention points identified in the sustainability transitions literature as enabling transitions to materialise (Kanger, Sovacool, and Noorkõiv 2020). Additionally, we test the epistemic governance framework in a novel way with transition studies.

This paper is structured as follows. Section 2 presents a brief overview of literature on states in governing energy transitions and previous research on rhetorics in sustainability transitions studies. Section 3 presents the analytical framework, while Section 4 contextualises the case countries. In Section 5 research approach and method are described, followed by Section 6 where we present our analysis. Section 7 discusses the results and Section 8 concludes.

2. Conceptual foundations of sustainability transitions research

2.1. States governing sustainable energy transitions

Critical constructivist thinking about security focuses on how power is integral to the social world and how security is perceived in several cultural sources (Peoples and Vaughan-Williams 2021). We understand state capacity in the energy–security nexus to cover, for instance, energy security, defence, security of critical infrastructure, and geopolitics, all of which are subject to political debate. Security and the securitisation of fossil fuel-based energy (policy) have been widely researched (Siddi 2018; Wilson 2019), with increasing attention to the security of renewable energy sources (Szulecki and Kusznir 2018; Blondeel et al. 2021; Kivimaa and Sivonen 2021), including critical materials for energy transition technologies (Lee et al. 2020) and linkages between right-wing populism and energy transitions (Lockwood 2018; Żuk and Szulecki 2020). Research also suggests less severe consequences of transitions if problems are addressed proactively, with renewable energy sources reducing large energy conflicts (Scholten et al. 2020) and increasing fairness (McCauley et al. 2019).

Transitions have been described as long-term socio-technical system shifts (Grin and Schot 2010). According to the multi-level perspective, which is often used to investigate transitions, transitions involve the dynamic interplay of three levels: the landscape putting pressure on regimes, a socio-technical regime that is a rather stable entity of rules that only change slowly due to, for instance, path dependency,

and niches as protected spaces where new disruptive innovations are developed that may later overturn the regime (Geels 2004). Geels and Schot (2007) describe the differing pathways in which these dynamics may play out.

The energy sector has long been researched as part of sustainability transitions, a key area in empirical transitions research (Loorbach and Verbong 2012). Early interest on policymaking in (energy) transition research was low, but such research has since blossomed (Rogge, Kern, and Howlett 2017). Johnstone and Newell (2018) draw attention to states' roles in global energy networks, where their coercive power can be demonstrated through foreign policy measures and even war to alleviate their own pressure to provide sufficient energy. Those authors note that the military sector, like other 'non-environmental' policy sectors, has not been included in theorisations of transitions, despite having a significant impact. Johnstone and McLeish (2022) recently demonstrated the role that the world wars played in the formation of today's global hydrocarbon-based energy system.

Public policy plays important roles in transitions, as states and public actors have the capacity to accelerate innovations and/or destabilise current systems by, for example, withdrawing state support (Kivimaa and Kern 2016). One important stream of research has examined policy mixes – the interacting policy goals, strategies, instruments and processes (Kanger, Sovacool, and Noorkõiv 2020; Rogge and Reichardt 2016) – as bridging sectors to enable comprehensive system change (Kivimaa and Mickwitz 2011). This stream has dominated, perhaps at the expense of research on the politics of transitions, although the need to understand those politics has been recognised (e.g. Kern and Rogge 2018).

Building on previous research, Kanger, Sovacool, and Noorkõiv (2020) propose six policy intervention points to develop cross-sectoral understandings of policies in transitions: 1) stimulate different niches, 2) accelerate those niches, 3) destabilise the existing regime, 4) address the broader repercussions of regime destabilisation, 5) provide co-ordination to multi-regime interaction and 6) tilt the landscape. We apply these points to our empirical setting to determine if they can be recognised as 'facilitating transformative systems change' (Kanger, Sovacool, and Noorkõiv 2020, 8). We apply the policy intervention points to the energy–security discourses identified to assess whether those discourses respond to those enabling points, which can be situated between means (policy instruments) and goals (system change).

2.2. Discourse and rhetoric in sustainability transitions research

As sustainability transitions require social change (Geels et al. 2017; Köhler et al. 2019), the epistemic governance approach enables studying the rhetoric and framing of governing actors (those behind the policy documents) and how they try to influence their audiences. Actors aim to present their interests as the interests of the whole to validate actions like investing in national security or innovations. Previous research has shown that politicians manage uncertainty and threat by using 'sociotechnical imaginaries', which 'though never strictly determinative of policy outcomes, are powerful cultural resources that help shape social responses to innovation' (Jasanoff and Kim 2013, 190). Framing energy policy to match a government's fundamental goals is a central element and often includes aspects of national security (Scrase and Ockwell 2010). Government actors are recognised as leading actors in transitions, although actors can be difficult to pinpoint due to shifting, overlapping positions (Fischer and Newig 2016).

Several studies have investigated how power deploys discourse and rhetoric in sustainability transitions (e.g. Isoaho and Karhunmaa 2019). Scrase and Ockwell (2010) point out the messiness of policymaking, suggesting a 'discourse perspective' and rejecting any assumption of neutral policy language. They show how energy policy was successfully constructed to address fundamental government priorities like economic growth and national security with an emphasis on technocratic and nationalistic policies.

In a Foucauldian interpretation of exercising power via knowledge production and communication, power is a dynamic concept, and knowledge is 'produced, shaped and constituted by the exercise of power' (Avelino and Rotmans 2009, 558). Avelino (2021) emphasises the contested nature of power in social changes and directs attention towards discourse and knowledge development exercises by, for instance, defining 'transition'. Indeed, the political processes of zero-carbon transitions must be studied as they are: profoundly value-laden and debated phenomena (Avelino et al. 2016; Geels et al. 2017; Roberts et al. 2018), where decision-makers have publicly declared a direction towards emissions-free energy systems. Understanding the processes that move towards this goal is important, because in those processes lie the outcomes of decision-making (Isoaho and Markard 2020).

3. Analytical framework: epistemic governance and six policy intervention points

Epistemic governance is an analytical-methodological tool to study societal changes (Alasuutari and Qadir 2019). It is influenced by Foucault's thinking on governmentality and power and adopts a methodology based on discourse analysis. It focuses on how actors work on people's beliefs by further developing thinking around the 'rules of the game' and paying

attention to perceptions and justifications. As the framework is meant 'to open up processes of change' (Alasuutari and Qadir 2019, V), it is well suited for our purposes. Political power operates publicly, and the perceptions of those operating that power play a significant role. The epistemic governance framework allows attention to be directed to actors who seek to reclaim power, instead of merely elites or experts. As the conditions of governance are deeply global, with myriad power holders, such as governmental and non-governmental organisations (Boli and Thomas 1999; Meyer et al. 1997), closer scrutiny of how power is embedded in the social world is vital (Alasuutari and Qadir 2019). Using the framework, researchers have investigated how cross-national comparisons are used as a tool for governance to align people with similar perspectives to achieve desired policy goals (Vähä-Savo 2020) and how reference group comparisons in national policymaking during crises are significant by synchronising national policies with the global context (Ferrer, Alasuutari, and Tervonen-Gonçalves 2019).

In this paper, we analyse how the energy–security nexus is discussed by focusing on three objects of epistemic work (Alasuutari and Qadir 2014, 2019). We first examine the ontology of the environment to identify how the world is depicted to justify actors' approach to the phenomena. The subtle techniques constructing reality that any actor can use are often quite unseen, reinforcing their effectiveness. This is linked to how transition studies reveal how perceptions about shifting landscape pressures are formed (Ghosh et al. 2021). The second objective is to work on people's comprehensions of who they identify with and the communities to which they belong. Again connecting to transition studies, this refers to potentially shifting regime alliances and the formation of new actor coalitions around expanding energy niches and in the multi-regime energy–security nexus (Kanger, Sovacool, and Noorkõiv 2020). We aim to determine who actors identify with in the energy–security nexus while also paying attention to those who go unmentioned, even when they might be expected to be noted. The aim is to recognise who 'we' are and who the 'others' may be. Nationalism is a good example of these kinds of actor identifications, as it is often a subtle but significant aspect in seeking social change. The third object of epistemic work is related to people's norms and ideals in the nexus that help understand policymaking principles. Energy transitions require vast public support and funding; thus, perceptions of norms are significant and affected by the perceived 'broader repercussions' of transitions (cf. Kanger, Sovacool, and Noorkõiv 2020). Actors appeal to the norms and ideals they expect the others to value and depict what will follow if those values are honoured, thus aiming to guide the 'correct' action.

After identifying the objects for epistemic work, we compare them in relation to the six policy intervention points in section 2.1 (Kanger, Sovacool, and Noorkõiv 2020). These have been recognised in the literature as possible enablers of sustainability transitions amid calls for more studies on the relevant actors' motivations and capabilities. We analyse the six points as part of the epistemic work the incumbent actors undertake when trying to convince their audiences of the right thing to do, in terms of the energy–security nexus, regarding unfolding energy transitions.

Of the six points, we regard the last three as particularly important to that nexus. The broader repercussions of regime destabilisation (point 4) may, for example, increase or decrease security threats. Related to more positive outcomes, Kanger, Sovacool, and Noorkõiv (2020) argue for the need to decrease the negative socio-economic impacts of transitions (e.g. through financial aid or workers re-training) and to initiate social deliberation regarding system change. Co-ordination of multi-regime interaction (point 5) relates to active efforts to acknowledge system interlinkages between, for example, energy and security and address them as the transition proceeds. Tilting the landscape (point 6) may result in broad global or regional changes that affect the overall security landscape.

With these points in mind, we thus analyse not the normative assumptions of how things should be done to further energy transitions, but how transitions are perceived in the rhetoric of incumbent policymakers in light of the normative policy intervention points from the literature.

4. Empirical context

The three countries studied differ in important ways. In this section, we present the context for each (see Table 1). Estonia is unique among European Union (EU) member states because its oil shale reserves have ensured almost complete energy independence while creating the largest carbon footprint among all International Energy Agency (IEA) countries (IEA 2019). Its conflict-laden history with the Soviet Union and Russia has greatly influenced its energy policy (Kama 2016; Kivimaa and Sivonen 2021): It first sought energy independence and then synchronisation with European energy markets. Estonia's main energy policy goals are security of supply, energy independence, and competitive energy prices (Ministry of Economic Affairs and Communications 2017). Oil shale phase-out is key to Estonia's energy transition, and discussions of its future have gone on since Estonia regained independence from Russia in 1991 (Sillak and Kanger 2020), with current plans to cease production by 2035 (IEA 2021). During the last three decades, Estonia has oriented itself towards the

Table 1. Population, energy exports and imports, share of renewable energy, and reliance on Russian fossil fuels.

Country (Population)	Total primary energy supply (TPES) or Total final consumption (TFC)	Main exports/imports	RES share of energy consumption in 2020 (EEA 2022)	Reliance on Russian fossil fuel imports in 2020 (IEA 2022b)
Estonia (1.3 million)	TPES: Oil shale, natural gas, bioenergy and waste, oil, wind, coal and peat, hydro, electricity (IEA 2019)	oil shale export, biofuel imports (IEA 2019)	30.8%	16,0%
Finland (5.5 million)	TPES: Biofuels and waste, oil, nuclear, coal, natural gas, electricity imports, heat imports, hydro, peat, wind (IEA 2018)	electricity imports and exports, coal, natural gas and oil imports (IEA 2018)	43.8%	44,6%
Norway (5.4 million)	TFC: hydro, oil, natural gas, bioenergy and waste, solar, wind, tide, coal, heat (IEA 2022b)	oil and natural gas, electricity exports; kerosine and fuel oil, biofuel imports (IEA 2022a)	77.4%	3,5%

West by opening its energy markets and joining key international organizations like NATO, the EU, and the IEA (IEA 2019). In addition to creating energy connections with neighbours, Estonia has pursued de-synchronisation from the Russian grid since 2007. A political roadmap to synchronise with the EU electricity system was signed between the Baltic states, Poland, and the European Commission in 2018 (IEA 2019). Estonia's national security objective is to maintain its independence and sovereignty, with a heavy reliance on NATO and the EU (Kaitseministeerium 2017).

Finland's energy infrastructure relies on EU sources like nuclear power, natural gas and some coal and domestic sources like bioenergy, peat, hydropower, and wind power. Oil and gas were mainly imported from Russia before 2022. Energy security is a priority due to Finland's high dependence on imports (IEA 2018), and energy policy is steered towards carbon neutrality, with Finland having targeted a carbon-neutral society by 2035 (Finnish Government 2019). Like Estonia, Finland is a member of the Nordic electricity market Nordpool and imported roughly 10% of its electricity in 2021. The electricity sector is largely decarbonised, but hydrocarbons are used in heating, transport and industry. Phasing out peat production has been a politically difficult challenge, while Russia was a deeply sensitive subject; before the invasion an 'apolitical' approach was taken, under which difficult questions were treated as technical rather than political (Haukkala and Vaahtoranta 2016). Finland's energy relationship with Russia was viewed as asymmetrical (Tynkkynen 2021). Finland operates on the total security concept, which means cooperation between public authorities, industry, and citizens to safeguard vital societal functions. After the Russian invasion of Ukraine, Finland's security environment changed radically for the worse; it applied for NATO membership in 2022 and was admitted in 2023 (Ministry for Foreign Affairs 2023).

In Norway, societal prosperity is based on significant hydrocarbon exports. As a result, Norway is highly self-sustaining: its domestic energy consumption is almost fully based on hydropower, leaving the country with one of the lowest emission levels in Europe (Energifakta 2021) when exports are not counted. Part of the European Economic Area (EEA) but not the EU, Norway trades electricity with Europe and has strong connections with other Nordic countries through shared electricity markets (IEA 2022a). Norway's alignment with EU targets for climate neutrality have faced domestic opposition, such as protests against the expansion of onshore wind power and local land use rights (Skjærseth and Rosendal 2022). Politically, the energy and climate sectors have been kept apart due to the economic importance of hydrocarbon production, but pressure from environmental activists (Kottasová 2021) and foreign policy actors (Hornburg and Sending 2019) is increasing. Norwegian defence policy relies on a Total Defence framework 'which enables relevant civilian assets to support the national and allied defence efforts during peacetime, crisis and armed conflict' and is based on NATO's collective defence (Norwegian Ministry of Defence 2020). Norway's security policy is aimed at strengthening international and bilateral relations, to which the 'High North' (i.e. Arctic region) belongs (Ministry of Foreign Affairs 2021).

5. Research approach and method

We chose to undertake a discourse analysis of energy, climate, Arctic, security, and defence policy strategy documents. Although such documents do not paint the full public policy picture, they do offer a perspective on the 'social facts' presented in a transparent way to varying audiences (Atkinson and Coffey 2011). The countries were chosen based on their northern location, size, differing energy profiles, similar democratic decision-making processes, and sharing a border with Russia. We expected similarities due to NATO membership and subtle differences in implementing global climate agreements due to different energy profiles and roles in the global energy market. By comparing these states, we can achieve a more coherent picture of the energy–security nexus and cover a broader geographical scope than would emerge from investigating only one or two countries.

The documents were collected from official websites and by contacting ministry personnel. We used

documents in English if possible and originals when English versions were not available. We excluded from the analysis paragraphs that did not involve wider security or defence issues, such as those referring purely to 'security of supply' or discussions of oil spills only as an environmental rather than a national security threat. If a paragraph clearly discussed energy – especially new energy systems in relation to other countries – it was included in the coding due to the international relations connection. In total, we analysed 73 documents[1] (19 from Estonia, 22 from Finland and 33 from Norway). The start date of 2006 was chosen due to the Russian – Ukrainian gas dispute that is viewed as inaugurating a new era of EU energy and security politics (Kuzemko, Keating, and Goldthau 2016). To enable comparisons over time, the documents were divided into four time periods: 2006–2010, 2011–2015, 2016–2020 and 2021–2023 (see Appendix 1).

After the material was collected, a keyword search was conducted, with energy and climate strategies scanned for 'security', 'defence/defense', 'geopolitic*', and 'threat' and security and defence strategies scanned for 'energy', 'electricity', 'heat', 'nuclear power', 'fuel', 'oil', 'gas', 'peat', 'renewable', 'wind', and 'solar'. This approach helped reveal connections that the two policy domains may have by referring to fields and themes in the other policy domain. The first author used discourse analysis to code the data, paying close attention to language and how it is used to understand the phenomenon (Alasuutari 2011; Wood and Kroger 2000) and assessed objects of epistemic work to inductively concentrate the rhetoric used in a country-by-country analysis. The second author cross-checked the coding. The data were coded using the qualitative data analysis software NVivo.

Analysing political rhetoric with the epistemic governance approach is especially useful, as 'people's perceptions, understandings and desires are key ingredients of government, even though they might not be the only ingredients' (Vähä-Savo 2020, 3). The key actors in energy and security politics must not only convince other key actors but also the wider public to gain support for their proposals, especially as they often involve large, expensive, and uncertain projects. The documents provided fruitful data and are public, formal means to communicate the political leadership's agendas. Analysing policy intervention points in the discourses can contribute to understanding perceptions from policymakers' perspectives by helping to identify how sustainability can best be achieved and maintained. The first author identified the discourses using the epistemic governance framework and then compared them to the policy intervention points to reveal the interrelations of the two policy sectors and how they may co-evolve with, strengthen, or undermine one another and what that may mean for sustainability transitions. Summary of detected discourses with recognised policy intervention points is presented in Table 2.

6. Identified policy interventions in prevalent discourses in the energy – security nexus in Estonia, Finland, and Norway

6.1. Transitions occur in a world full of risks (ontology of the environment)

The energy–security nexus in Estonian documents described the need for the nation to prepare for global pressures while maintaining international cooperation. Oil shale production enjoyed political importance as more than a commodity because it had provided energy independence to a young country. Over time, strategies turned to renewable energy: thus, [1] *stimulation of niche technologies* began with financial aid; towards the 21st century, [2] *acceleration* became visible, leading to plans to [3] fully *destabilise the oil shale regime* over time. In the earlier phase (2006–2010) of the time period of interest, however, energy strategies still justified the use of oil shale in terms of security of supply and energy independence, leaning heavily on national security needs. By describing the uncertainties of a risky world, the strategies [4] *addressed broader repercussions*, because internal stability could be jeopardised if the oil shale phase-out was carried out before desynchronisation from Russian grids was complete and without considering the poorer populations of North-East Estonia. Replacing Russian energy with exports to the West was depicted as an important political task throughout the studied period.

Preparations for possible threats were mentioned as an economically favourable environment to invest in renewables. Thus, [5] *multi-regime interaction* and the need for policy coherence are clear in relation to wind power development: Estonia's Ministry of Defence was noted to be involved not only in preparing the energy sector for crises but also in the planning of wind farms to avoid disrupting the operation of air surveillance radars. Estonia is strongly presented as part of the West throughout time, shaping the country's identity through international cooperation. The latest security strategy (2023) recognises this as a risk, noting a potentially increased risk of terrorism and unwelcome political influence and the global rivalry over energy. The following quote demonstrates that the creation of a renewable energy policy is politically difficult, due to national security that oil shale is depicted as providing:

> Despite gradual reduction of the environmental impact through utilisation of novel and more efficient technologies, the negative environmental impact associated with oil shale will always remain the price

> that has to be paid for energy security and the security of supply. (Government of the Republic 2017, 73)

In Finland, the prevalent themes were competitiveness and economic stability in an unpredictable world. Global markets were viewed as offering opportunities for Finnish technological expertise, including in the Arctic region. Technological energy innovations that involved [1] *stimulating* and [2] *accelerating niches* were described as contributing to global energy transitions and to [3] *destabilising regimes* beyond Finland's borders:

> Increasing Finland's energy self-sufficiency, in particular by increasing the use of renewable energy and improving energy efficiency, will also have a positive impact on the balance of trade. (Finnish Ministry of Employment and the Economy Energy and the Climate 2014, 70)

The potential [4] *broader repercussions* of the regime change were addressed by increasing domestic renewable energy production. Although peat phase-out was recognised as politically challenging, it was described in the policy documents as a significant internal or security of supply issue like the oil shale phase-out in Estonia (although its actual importance is lower; for more detail see, e.g. Lempinen 2019). In Finland's latest energy strategy, published in 2022 after the Russian invasion of Ukraine, the importance of peat energy is justified by security of supply concerns. Until 2022, security was addressed in terms of cooperation and trade rather than framed as related to open conflict. Security risks pertaining to Russia were not explicitly addressed in energy policy documents but were acknowledged in security and defence documents. This inconsistency between sectors suggests a predominantly business-driven orientation framed to benefit the greater good. [5] *Multi-regime interaction* can be detected in relation to wind power planning throughout the study period, as the defence sector must consent to it, demonstrating the importance of national security and the potential co-evolution of the two sectors with robust planning, which is similar to Estonian development plans.

Like the other countries, energy transitions in Norway were perceived as materialising in a risky world as part of the global arena via trade and cooperation and an actively engaged society. However, as Norway's economic well-being is based on hydrocarbon exports, and because its own electricity consumption is nearly completely decarbonised thanks to hydropower, the proposed strategies sought to justify maintaining and increasing offshore oil and gas exploration, especially in the Arctic. This is done by claiming Norway's leading role as a seagoing nation, with responsible resource management for both the oil and gas industry and fisheries. The area is geopolitically important, with an increased importance over time, and the melting polar ice possibly offering new revenues from hydrocarbon and mineral exploration. The energy–security nexus in Norwegian documents was less focused on the transition than in Estonia and Finland, perhaps because the biggest leaps in any such transition are in the oil and gas sector and because technological development regarding carbon capture and storage is in the early stages, with little [3] *destabilisation of regimes* detected. However, in more recent policy documents, including some from 2023, renewable energy was increasingly mentioned as part of foreign and security policies in connection to economic development, indicating support for [2] *niche acceleration* through economic incentives:

> Norway's position as a significant energy exporter and as a country responsible for the administration of important natural resources extending over large sea areas has an important bearing on security policy. (Norwegian Ministry of Defence 2008, 7)

> Renewable energy is another priority area for Norwegian development assistance related to climate and the environment. More than 60 per cent of greenhouse gas emissions relate to the use of energy. According to the international energy bureaus, we must double our energy efficiency and replace most fossil fuel with renewable energy if we are to reach the Paris Agreement targets. (Ministry of Foreign Affairs 2019, 50)

The documents emphasised Norway's responsibility, desire, and capacity to govern the sensitive and important Arctic area. Climate change poses a major risk, but the global energy transition of which hydrocarbon-rich Norway will inevitably be part is undermined by security justifications, with a strong emphasis on continued production after the Russian invasion of Ukraine. Globalisation was depicted as a major concern in relation to the increased security challenges posed by cybercrime and in energy in terms of the risk of terrorist attacks.

To summarise, all countries describe a similar, unstable, and risky global context within which energy transitions are being governed; this is the ontology of the environment. Unsurprisingly, national security policy trumps energy transitions in all countries, although climate change was recognised as a major global risk and used as a justification for energy system change throughout the study period. However, the ways in which those risks were to be managed differed over time and between countries. Estonia's strategy had the biggest change, moving from justifying extended oil shale production and consumption with national security concerns to a complete phase-out and identifying renewable energy as the core provider of national security via mature, extensive, and EU-funded renewable energy-based technologies. In Finland the strategic increase in decarbonisation was consistent throughout, although the Russian energy

trade ended only due to the war in Ukraine, strengthening domestic renewable energy production on the one hand. On the other it bolstered peat production, because peat was typically framed as a reliable, domestic, and easily stored source of energy. Although all three countries cast themselves as part of the democratic West and shared energy markets, Norway's strategies did not emphasise this point until the Ukraine war began, whereas the importance for Estonia was part of its assertion of its sovereign, democratic status from early on.

6.2. Reliable partners and unpredictable neighbours (actor identifications)

In Estonian strategy rhetoric, the EU grew in importance over time. Due to pressure from the EU, Estonia accelerated its energy transition, which also aided its energy de-synchronisation from Russia. More recently, Estonia was presented as ready to build an energy system without either oil shale or Russia, while [4] *addressing broader repercussions* by, for instance, a just and stable labour market policy. The strategies created a long list of different actors in the nexus, suggesting well-managed communication between sectors but also the significance of the nexus in general when [5] *multi-regime co-ordination* is needed. The rhetoric presented Estonia as a strong, independent nation, seeking support from international fora as a trustworthy partner that is separate from Russia, especially for national renewable energy production. This kind of [2] *niche acceleration* through selected international partners grew over the study period, indicating the importance and success of this policy. Countries like Finland, Latvia, and Lithuania were safe references as representing good, active relations in energy and security policy, with reliable business relations and similar situations in terms of Russia and the EU. By referring to Russia as an active participant in cyber-(in)security, Estonian documents maintained the long-signalled threat and instability of a hybrid threat especially from Russia.

In Finnish documents, the EU was a significant reference point that increased in importance over time. Although national actors like relevant ministries and the National Emergency Supply Agency were mentioned, that language was passive, directing action towards external actors with guidelines and regulations to follow. Cooperation between Russia, EU, and Finland was long described as stable, with increasing mentions over time. After the invasion of Ukraine, the 2022 energy strategy mentions Russia's banning trade with 'unfriendly states' as its reason for stopping trade with Finland. The energy strategies do not openly address the potential threats, indicating a lack of [5] *multi-level regime interaction*. Energy trade and other business-orientated solutions were portrayed as keys to confronting climate change aiming to [6] *tilt the landscape* by showing progressive examples to others. Nordic energy markets were portrayed as valuable to industry, and political decision-making was not to jeopardise economic growth as a way to [5] *address broader repercussion of the transitions* by, for instance, investigating gender-biased labour markets, especially in the later period. Numerous actor identifications indicated a scattered policy environment and a lack of multi-regime interaction.

> Among others, Russia is paying increasing attention to resource efficiency and the improvement of energy efficiency in industry and society at large. Finnish expertise is of the highest standard and widely recognised in Russia; for example, Finnish technologies permit sustainable mining in the Arctic environment. (Prime Minister's Office 2013, 34)

Throughout the study period, Norwegian documents presented the government as active and Norway as a unified, unfaltering nation. The most visible national actor discussed in the nexus was the Norwegian Water Resources and Energy Directorate (NVE), with a growing role in the energy sector and increased responsibilities in cyberspace. The number of NVE mentions increased over time, and Norway had the longest list of different national actors. NVE is a directorate under the Ministry of Petroleum and Energy, which is the most frequently named ministry. Russia played a dual role: as a military and economic threat due to its vast natural resources, especially in the Arctic, and an important trading and knowledge-transfer partner where [5] *multi-level regime interaction* is detected in relation to energy and security operations. Nordic neighbours were important actors for cooperation and in energy markets. Although Norway is actively involved with the EU and NATO, our analysis indicates that the energy–security nexus is treated as domestic:

> Russia has also named the High North as a target area in terms of energy recovery. It is also a fact that these areas have a strategic military importance for Russia. As such, we face a persistent requirement to update our knowledge within the defence sector on the developments and security challenges in the High North, and to increase our knowledge of environmental and climate changes. (Norwegian Ministry of Defence 2013, 10)

To summarise, all three countries identified Russia as a threat, but Finland and Norway regarded trade and technological partnerships with it as valuable, leading to incoherence in policymaking before 2022 (cf. Kivimaa 2022). In Finland, the threat was kept out of energy policy, with a focus on positive cooperation and economic benefits, similarly to Norway. Estonia was already de-synchronising from the Russian grid and directing trade towards the EU and the West more generally. All three countries valued Nordic

cooperation in energy and security, but whereas the importance of the Arctic and the various actors operating there grew in importance in Finland and Norway, Estonia (a non-Arctic state) did not mention this factor. Estonian and Finnish strategies showed some level of multi-regime co-ordination with security to accelerate energy transitions, while in Norwegian documents regime stability was perceived as important. The EU's significance to the Estonian and Finnish transitions was substantial, while strategic industrial cooperation for Europe's energy transition was not highlighted in Norway until the 2022 war. NATO was identified as an actor in the nexus, and major global actors like China, India, and the United States were mentioned in most strategies, but only in passing.

6.3. Energy transitions with reservations (norms and ideals)

Underlying norms and ideals are important to recognise, as they communicate what is important and valuable to policymakers. Thus, the audience can either support or oppose them. In Estonian documents, national interests were highlighted as a priority, yet they also emphasised Estonia as part of the wider world. Developing the energy sector towards sustainability also allowed strengthening security guarantees through cooperation and trade. Especially towards the end of the study period, building a national identity as a sovereign state decarbonising its energy system co-evolves in both sectors:

> Promoting and defending Estonia's interests on global issues requires a positive image and considerable influence on the international arena. A proactive and constructive contribution to the digital, cyber, human rights, climate, energy and connectivity agenda increases Estonia's involvement and allows to better protect its interests in these areas, but also creates other opportunities. (Republic of Estonia 2023, 16)

Towards the end of the study period, the strategies began to address the [4] *broader repercussions* of regime change, such as security of supply beyond oil shale production once national renewable energy production and exports were balanced. The rhetoric changed towards economic development, as Estonia aims to use modern green technologies to export energy. These expensive operations are also ways to connect more firmly to Western grids and ensure audiences that Estonia aspires to be a green, modern, and technologically savvy society. The ambitious development of cybersecurity is paid due respect, with regular references to the 'e-state' clearly signalling the desire to develop the field further in electrified systems.

In Finnish strategy rhetoric, preparedness, economic interdependence (specifically in references to Russia, which are unsurprising given the two countries' long, valued trade partnership), and sustainability were highlighted. Climate diplomacy was mentioned as part of foreign relations on all levels, implying the Finnish aim to be a leader in soft power international negotiations and its determination to provide the structural premises for climate-friendly actions through energy policy. If realised, these ambitions would have significant implications for the security and defence sectors, which are also expected to consider their own negative impact on the climate. Finland's well-connected civil society is regarded as a strength, and cross-sectoral cooperation between ministries is intended to be enhanced. This reflects a comprehensive take on security, where all societal aspects are considered in a [5] *multi-level regime action*. The transition is to be based on economic growth premises:

> Russia and the EU are strategic partners and their mutual relationship, especially in the area of the economy, is extensive. The EU is Russia's biggest trading partner and the most important market for its energy exports. Russia is also the most important energy supplier for many EU countries. (Prime Minister's Office 2013, 34)

Norwegian strategies discussed sustainable development, societal stability, science and research, and international cooperation, especially in the Arctic. Climate change was clearly recognised as causing serious damage to the environment and uncertainties for society and government, with pleas for science-based policymaking. The energy transition was supported, with [1–2] *niche stimulation and acceleration* through wind and wave power serving as examples, although that would not mean reducing fossil fuel production: thus, [3] *regime destabilisation* was absent. The oil and gas industry was viewed as part of sustainable development by, for instance, using renewable energy to run oil rigs and providing green energy to rural areas. The defence sector's interest in hydrogen for vehicles was cited as a measure not only to shift that sector away from fossil fuels but also to highlight the sustainable development ideal and not destabilise the regime, given that gas would still be exploited. NATO's seven baseline requirements, one of which is critical infrastructure, were mentioned as part of civil–military cooperation. Along with this element, developing the IT sector was discussed in the context of international cooperation in the nexus and securing trustworthy allies. Some signs of [6] *tilting the landscape* could be detected in the numerous mentions of different international agreements and were perhaps intended to indicate Norway´s ambitious goals to be a leading global partner, with the caveat that Norway would still provide oil and gas to the world in the most reliable and responsible fashion.

During the study period, norms and ideals were framed in a similar way, with an increased emphasis on national security after the invasion of Ukraine in

Table 2. Summary of detected discourses with recognised policy intervention points.

Country	**Transitions occur in a world full of risks** *(ontology of the environment)*	**Reliable partners and unpredictable neighbours** *(actor identifications)*	**Energy transitions with reservations** *(norms and ideals)*
Six policy intervention points: [1] stimulate different niches, [2] accelerate those niches, [3] destabilise the regime, [4] address the broader repercussions of regime destabilisation, [5] provide co-ordination to multi-regime interaction, and [6] tilt the landscape. (see Kanger, Sovacool, and Noorkõiv 2020)			
Estonia	Transitions accelerated with the involvement of the MoD and on its terms, highlighting the insecurity of the world [1] [2] Sustainable transitions undermined due to national security concerns, until oil shale phase-out is inevitable due to global pressures. [3] [4] Global climate crisis forces co-evolution of the two sectors. [5]	EU for safety and decarbonising efforts, with importance growing over time. [2] Baltic and Nordic neighbours as 'safe' references and partners. [4] Russia depicted as an unpredictable neighbour and threat to safety throughout the study period. [5] Cybersecurity threats strong throughout the period. [5]	Developing the energy sector with EU and Western partners to support security guarantees through cooperation and build a national identity. [5] In the last period, sustainable economic model mentioned as part of security strategy strengthening the zero-carbon energy goal. [4]
Finland	Economic incentive is clear: Finnish technology to contribute to national and global energy transitions. [1] [2] [3] Increasing domestic renewable energy production in peat phase-out. [4] Russia as a potential security threat recognised in security and defence strategies but not energy strategies. Co-ordination with the MoD needed as part of wind power development, co-evolving throughout the time period. [5] No major changes detected.	EU and Nordic countries are important partners in decarbonising efforts, increasing significance over time. [5] [6] Russia seen as a reliable trading partner in energy sector though 2021, but the security sector consistently identified the potential threat. [lack of 5] Nordic neighbours as reference groups and partners, but business can also be done with Russia (prior to 2022). [lack of 5]	Preparedness, economic interdependence (specifically in references Russia, a long-time trading partner), and sustainability. [5] Climate diplomacy, cross-sectoral decarbonising plans. [5] Economic benefits with sustainability transitions. [5]
Norway	Risks and uncertainty in the world, yet society is active and part of globalised world through trade and cooperation. [2] Claims over sea areas due to importance of oil and gas production and fisheries: 'responsible resource management' in the Arctic connected to security policy and increasing interest over time. [5] Connections to other countries important, but not highlighted until after Russian invasion of Ukraine, unlike in Finland and Estonia. [lack of 5]	Norwegian government and NVE nationally important. [5] Nordic neighbours are trading partners and reference groups. [5] MoD part of energy policies in the Arctic. [5] NATO not significantly mentioned. [lack of 5] Russia powerful and unpredictable but important trade and research partner (especially in the Arctic). [5]	Sustainable development can be achieved with science and research, but stability of society and international cooperation cannot be jeopardised. [6] Continued oil and gas production, but with measures to increase sustainable production. [opposite to 3] Increasing domestic wind and wave production. [1] [2]

2022. Estonian policymaking changed from energy independence through oil shale to promoting 'green' initiatives and the modern 'e-state', bringing its policymaking closer to Finnish and Norwegian norms of 'sustainable development'. In Estonia and Finland but not Norway, comprehensive preparedness of society for potential risks was valued in the energy–security nexus. In Norway, economic development was used to justify policies through principles of sustainability development and preparing for potential future risks. Norwegian documents showed no discourse involving regime destabilisation or addressing the broader repercussions of such destabilisation.

7. Discussion

We used the epistemic governance framework and its specific objects – how society and the world in the nexus are depicted, who is involved and the norms and ideals connected to policymaking (Alasuutari and Qadir 2019) – to shed light on the 'epistemic work' policymakers do when justifying policies. By using this framework, we identified three main streams of discourse in all three countries: 1) transitions occur in a world full of risks, 2) reliable partners and unpredictable neighbours, and 3) energy transitions with reservations. After the events of February 2022, the available documents emphasised these discourses, as Europe's energy sector was in an unprecedented crisis.

The discourses maintain the premises of transitions by providing cause and effects, the broader picture that governments wish to convey, and the directions they want to take, using far from neutral language (Scrase and Ockwell 2010), despite that kind of neutrality often being a goal of technological and security talk. However, they also feature disclaimers that not everything is possible – both schedules and the best-laid plans may be obliged to change. The policy strategies, therefore, provide justifications as to why it takes such a long time to decarbonise energy systems – some of those claims may be more realistic and others merely symbolic. One example is how the importance of peat in Finland has been framed in terms of energy security, although its actual importance has been seen as low (Lempinen 2019). Therefore, attention to how policy strategies are epistemically governed is important to help make these processes more transparent.

As Avelino has previously discussed, defining transition is a powerful move (Avelino 2021). In our analysis, Norway took its own route in defining the kind of transition it is making: one with continued oil and gas production, justified by its being the world's most

environmentally sound producer. By analysing which policy intervention points sustainable transitions need to target (Kanger, Sovacool, and Noorkõiv 2020), we were able to understand why the three countries in the study are still using and producing unsustainable energy forms. The world is framed as too risky to change course rapidly – until the landscape shock in 2022 occurred. Even when transitions progress slowly, national security is sometimes presented as too important to endanger while it is otherwise completely ignored in the texts. The construction of the energy–security nexus was described as requiring constant balancing between reliable partners and unreliable neighbours; however, even sharp pivots can materialise and allow sustainability transitions to move forward. All countries presented a strong desire to decarbonise while keeping their domestic audiences happy: the national economic interest is simply not to be jeopardised. This kind of framing has resulted in policy frameworks lacking co-ordination or coherence in practice (Höysniemi 2022; Kivimaa 2022). However, the Estonian case showed that renewable energy can be branded as significant for national security if the energy niches are strong enough, and the Finnish case showed that rapid changes in policy discourse are possible when landscapes are tilted as they were in 2022.

The discourses were connected to six policy intervention points that have been identified as creating a successful path towards sustainability transitions. According to Kanger, Sovacool, and Noorkõiv (2020), all points must be addressed to succeed, although the importance of each point may differ depending on the chosen direction. They are thus normative in their underpinnings, which made them an effective and thought-provoking frame to link with epistemic governance.

We found all six policy intervention points supported in the Estonian documents, but the emphasis regarding sustainable policies changed greatly over time. Support for moderate destabilisation of the oil shale regime did not appear until later periods because oil shale was so strongly connected to Estonia's national security needs. Over time, national policymaking begun addressing the repercussions of the oil shale phase-out, with destabilisation of the regime made possible due to both landscape pressures like the growing awareness of climate crisis and because niche acceleration had been successful, meaning that the national energy system and (Western-directed) international energy trade had developed further. Although fossil fuels were not fully phased out during this time period, significant changes in justification regarding fossil fuel use appeared. It can be argued that Estonia gradually built its national security and sovereignty aspirations alongside its energy transition by emphasising reliable partners and national, sustainable energy production that is well matched with global climate agreements agreed to by the EU and the other Baltic states, which are crucial Estonian trade partners. The de-synchronisation from the Russian grid set to happen in 2025 was also framed as an issue of national security.

In Finnish strategy planning, niche stimulation and acceleration were emphasised through the technological development required. Regime destabilisation via technological advancements domestically and globally is being developed in Finland, making it a major export sector. In terms of the country's peat production phase-out, it was once an important sector providing domestic energy and security of supply, but production was nearly shut down for climate reasons; yet it was reintroduced on the policy agenda after Russia invaded Ukraine. Here, the broader repercussions of losing a domestic, reliable and easily stored form of energy were seen as too great to tackle, with attention directed instead to other gender-biased fields in the energy sector to alleviate costs. As the country's comprehensive security concept entails, Finland's Defence Forces were to partake in climate mitigation practices, indicating the co-ordination of multi-level regime action: open and public dialogue regarding wind power development and radar systems had been acknowledged, and the desire for a mutually beneficial solution was expressed. It is to be seen, if the open dialogue continues as a NATO member, or if the decisions are made behind closed doors without public disclosure.

In Norway, although many niche developments were noted, regime destabilisation regarding the oil and gas sector was not present. The importance of climate change mitigation and adaption was visible, however, and Norway reiterated its desire to be part of the international solution, but on its own terms. The state placed hope in new and emerging technologies like carbon capture and storage that would enable future hydrocarbon production. The Norwegian discourse was more connected to international developments rather than domestic security and defence.

As to our second, broader question – why these highly developed and seemingly pro-climate countries have yet to fully decarbonise their energy – our analysis shows that sustainable energy transitions are constantly being both strengthened and undermined by rhetorical means. Framing certain energy forms, renewable or otherwise, as important to national security strengthens them. In turn, simultaneously justifying policy measures to extensively support other energy sources can be difficult unless the landscape changes considerably. Indeed, after the invasion of Ukraine, renewable energy forms – but also liquefied natural gas – were increasingly connected to sovereignty and energy independence and not only to security of supply. In Norway, this also increased the

debate on energy sovereignty, which unlike other countries, saw increased wind power as decreasing national sovereignty by being controlled more by the EU (Hansen and Moe 2022). While landscape changes may benefit sustainability transitions (Antadze and McGowan 2017; Kanger, Sovacool, and Noorkõiv 2020), they can also be interpreted as taking pressure off national decision-making. Indeed, as the owner of the world's largest sovereign wealth fund, Norway could have a tangible impact on transitions if its policies and investments were tuned towards environmental sustainability (Froggatt, Stevens, and Bradley 2020).

Our findings confirm the association between states and global energy networks (Johnstone and Newell 2018) as the data present close if varied relations to other states in energy matters. Indeed, one anticipated finding was that states seek international cooperation, but only with carefully selected partners. Framings of 'threat' and 'us vs. them' are significant because public perceptions of issues determine transition directions, sometimes even in a physical sense. With epistemic work, actors can assure the status quo will not be jeopardised even as global climate agreements will be acknowledged. However, rhetoric of this sort is also likely to ignore the broader repercussions of transitions and its multi-regime nature. It appears that the purpose of such strategies in the energy–security nexus is not to provide the best solutions for transitions, but rather to craft the best arguments that will convince as many audiences as possible about the desire to transition the energy sector without jeopardising national security or the state's economic growth.

Transitions governed by states are expected to provide much more than responding to obvious landscape pressures such as climate change: they must also provide wider societal benefits, such as societal security (Kivimaa and Sivonen 2023). One such example involves cybersecurity as part of the provision of societal security, as the analysis clearly shows that all countries seek to develop this sector, which spans multiple governing levels. This may be one of the most significant components where the nexus comes together and tangible cooperation is needed.

When security policy outstrips energy policy, decision-making may become more closed and secretive, and practices in energy transitions may become securitised (Floyd 2019). However, considering security in energy policymaking may be essential to prepare for the broader repercussions of energy transitions (cf. Kanger, Sovacool, and Noorkõiv 2020), as the situation in 2022 showed, and to involve less extreme measures than traditional securitisation theory proposes (Heinrich and Szulecki 2018). Some have framed this softer version of securitisation as geopoliticisation (Herranz-Surrallés 2022). Yet, considerations of security must remain characterised by open discussion and dialogue in democratic states in order to avoid elite hegemony. If processes are closed, it becomes almost impossible to analyse decision-making.

8. Conclusions

This study has investigated how national strategic energy, climate, security, and defence planning unfolded under increasing pressures to decarbonise energy systems. We call this area of governance the energy–security nexus. Previous research has paid little attention to it in small states. We analysed policy documents in three Northern European states, Estonia, Finland and Norway, over a 17-year time period (2006–2023). Despite political efforts and grand promises, these countries continue to use and produce fossil fuels. We expected that perceptions of national security could affect how their policies frame zero-carbon energy transitions and sought answers to the question of how zero-carbon energy and security issues have co-evolved with, strengthened, or undermined one another in national policy strategy documents. Additionally, we sought to shed light on why these highly developed and seemingly decarbonising countries still use and produce fossil fuels.

The epistemic governance framework is ultimately about social change and proved to be useful in analysing and comparing the discourses in official policy strategies. The analysis provided knowledge for sustainability transition governance to understand policymaking as an area where perceptions matter, and not just actions or technological advancements. The prevalent discourses to keep up certain framings in the policymaking context were identified: 1) transitions happen in a world full of risks, 2) reliable partners and unpredictable neighbours, and 3) energy transitions with reservations. After identifying the discourses used for epistemic work, we compared them in relation to policy intervention points for transitions from the literature: 1) stimulate different niches, 2) accelerate those niches, 3) destabilise the regime, 4) address the broader repercussions of regime destabilisation, 5) provide co-ordination to multi-regime interaction, and 6) tilt the landscape (Kanger, Sovacool, and Noorkõiv 2020). We can only comment on these points based on discourses in the energy–security nexus of the studied policy documents rather than the documents in their entirety because the data comprised individual paragraphs identified in the documents. Full texts were not included, as the representation of the energy–security nexus was captured with a carefully selected word search.

We identified all six policy intervention points in Estonian and Finnish discourses. The strategic direction appeared similar in these two countries, yet the emphasis differed until the major landscape shock of war in Europe aligned the Finnish attitude towards

Russian trade with Estonia's view. In Norway, regime stabilisation was not detected at all, making it an expected finding in Norway's path towards zero-carbon energy policies. The intervention points indicated that despite seemingly grand efforts to participate in global climate agreements, Norway did not provide concrete policies that would lead to fossil fuel phase-out in the energy–security nexus. Perhaps the suggestion to think about the intervention points in a different order (Kanger, Sovacool, and Noorkõiv 2020) would be useful, as Norway's reluctance to avoid regime destabilisation appears static, yet major landscape changes may still destabilise its fossil fuel regime.

Our study also contributes to the theoretical understanding of sustainability transitions by illustrating how rhetorical tools are practical and institutional tactics in legitimation. Policymakers must gain legitimacy for policy measures by defining threat scenarios while demonstrating their aspirations to fulfil global climate agreements. Governments need to demonstrate responsibility to achieve institutional legitimacy by presenting factors causing instability in society during a transition, defining those who are the causes of it, and finding suitable solutions based on existing societal norms and ideals. The analysis shows that the last task in particular differs between countries when it comes to the energy–security nexus: while sustainability was important to all of the countries, Estonian strategies highlighted national sovereignty, Finnish strategies emphasised preparedness and the economy, and Norway's approaches tied its sustainable development and economic security to hydrocarbons.

Interestingly, NATO was not significantly visible in the nexus, despite its orientation to energy security (Bocse 2020). Another unexpected point was that Norway did not seem to explicitly advertise for the importance for Europe of fossil fuels sourced from a stable and reliable country until the Russian invasion of Ukraine in 2022.

We close by arguing that the greater inclusion of security- and defence-related aspects in energy politics or broadening energy and climate politics to also consider security and foreign politics would significantly expand the perspectives under which both sectors operate. This would enhance the understanding regarding the complex global system of energy flows and the need to improve the preparedness of both sectors for future challenges. However, this approach also carries risks, such as security and defence concerns becoming the supreme concern and thus hindering sustainability transitions. Path dependencies are also connected to the expansion of renewable energy sources, creating new interdependencies with broader repercussions, such as through global power competitions that create more physical and rhetorical obstacles to sustainability transitions. Generally, the co-evolution of the two sectors would benefit both sectors and bring long-term benefits for climate change mitigation.

Note

1. Not all documents included cross-references.

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Appendix 1: Policy documents selected for the strategy analysis involving policy interplay

		2006–2010	2011–2015	2016–2020	2021–2023
Estonia 19 documents	**Energy/ Climate 8 documents**	National Development Plan for the Utilization of Oil Shale 2008–2015 (2008), Ministry of the Environment Development Plan of the Energy Sector until 2020 (2009), Ministry of Economic Affairs and Communications Development Plan of the Estonian Electricity Sector until 2018 (2009), Ministry of Economic Affairs and Communications National Renewable Energy Action Plan 2020 (2009), Ministry of Economic Affairs and Communications	National Development Plan for the Use of Oil Shale 2016–2030 (2015), Ministry of the Environment	National Development Plan for the Energy Sector until 2030 (2017), Government of the Republic General Principles of Climate Policy until 2050 (2017), The Riigikogu Estonian National Energy and Climate Plan 2030 (NECP 2030) (2019), Government of the Republic	
	Security/ Defence 11 documents	Cyber Security Strategy (2008), Ministry of Defence Estonian Long-Term Defence Development Plan 2009–2018 (2009), Ministry of Defence National Security Concept of Estonia (2010), The Riigikogu	National Defence Strategy (2011), Ministry of Defence National Defence Development Plan 2013–2022 (2013), Ministry of Defence & Defence Forces Estonian National Cyber Security Strategy (2014), Ministry of Economic Affairs and Communication	National Defence Development Plan 2017–2026 (2017), Ministry of Defence National Security Concept of Estonia (2017), Government of the Republic Digital Agenda 2020 for Estonia (2018), Ministry of Economic Affairs and Communication Cyber Security Strategy (2019), Ministry of Economic Affairs and Communication	National Security Concept of Estonia (2023), Republic of Estonia, Government
Finland 22	**Energy/ Climate 9 documents**	Long-term Climate and Energy Strategy (2008), Prime Minister's Office Valtioneuvoston tulevaisuusselonteko ilmasto- ja energiapolitiikasta: kohti vähäpäästöistä Suomea (2009), Prime Minister's Office	Kansallinen energia- ja ilmastostrategia (2013), Ministry of Employment and the Economy Kansallinen energia- ja ilmastostrategia Taustaraportti (2013), Finnish Ministries Energia- ja ilmastotiekartta 2050 (2014), Ministry of Employment and the Economy	Valtioneuvoston selonteko kansallisesta energia- ja ilmastostrategiasta vuoteen 2030 (2017), Ministry of Economic Affairs and Employment Taustaraportti kansalliselle energia- ja ilmastostrategialle vuoteen 2030 (2017), Ministry of Economic Affairs and Employment Finland's Integrated Climate and Energy Plan to EU (2019), Ministry of Economic Affairs and Employment	Carbon Neutral Finland 2035 – National Climate and Energy Strategy (2022)
	Security/ Defence 13 documents	Strategy for Safeguarding Vital Societal Functions (2006), Ministry of Defence Suomen turvallisuus- ja puolustuspolitiikka 2009), Prime Minister's Office Yhteiskunnan turvallisuusstrategia (2010), Ministry of Defence	Puolustushallinnon yhdyskunta- ja ympäristöpolitiikka (2011), Ministry of Defence Suomen turvallisuus- ja puolustuspolitiikka (2012), Prime Minister's Office Suomen kyberturvallisuusstrategia (2013), Prime Minister's Office Finland's Strategy for the Arctic Region (2013), Prime Minister's Office	Government Report on Finnish Foreign and Security Policy (2016), Prime Minister's Office Update to Finland's Arctic Strategy (2016), Prime Minister's Office Society's Security Strategy (2017), Prime Minister's Office Government Report on Defence (2017), Prime Minister's Office Finland's Cyber Security Strategy (2019), Prime Minister's Office	Valtioneuvoston puolustusselonteko (2021), Finnish Government

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(Continued).

Norway 33 documents	**Energy/ Climate 14 documents**	Norwegian climate policy (2007), Ministry of the Environment Strategi for økt utbygging av bioenergi (2008), Ministry of Petroleum and Energy	Fullskala CO2-håndtering (2011), Ministry of Petroleum and Energy En næring for framtida – om petroleumsvirksomheten (2011), Norwegian of Petroleum and Energy Vi bygger Norge – om utbygging av strømnettet (2012) Ministry of Petroleum and Energy Norwegian Climate Policy (2012), Ministry of the Environment	Kraft til endring Energipolitikken mot 2030 (2016), Ministry of Petroleum and Energy Norway's Climate Strategy for 2030: a transformational approach within a European cooperation framework (2017), Ministry of Climate and Environment Health, safety and environment in the petroleum industry (2018), Ministry of Labour and Social Affairs Norway's national plan related to the EEA joint committee (2019), Ministry of Climate and Environment Vindkraft på land – Wind power on land (2020), Ministry of Petroleum and Energy Regjeringens hydrogenstrategi (2020), Ministry of Petroleum and Energy	Energi til arbeid – langsiktig verdiskaping fra norske energiressurser (2022), Ministry of Petroleum and Energy
	Security/ Defence 19 documents	Norwegian Defence 2006 (2006), Ministry of Defence The Norwegian Government's High North Strategy (2006), Ministry of Foreign Affairs Norwegian Defence (2008), Ministry of Defence New Building Blocks in the North (2009), inistry of Foreign Affairs	The High North (2011), Ministry of Foreign Affairs Cyber Security Strategy for Norway (2012), Norwegian Ministries Competency for a new era (2013), Ministry of Defence Norway's Arctic Policy (2014), Ministry of Foreign Affairs Core values of Norway's defence sector (2014), Ministry of Defence Norges strategi for internasjonalt samarbeid for reform av subsidier til fossile brensler (2014), Ministry of Foreign Affairs Unified Effort – Expert Commision on Norwegian Security and Defence Policy (2015), Ministry of Defence	Risk in a Safe and Secure Society (2016), Ministry of Justice and Public Security Setting the course for Norwegian foreign and security policy (2017), Ministry of Foreign Affairs Cyber Security (2017), Ministry of Justice and Public Security Norway's Arctic Strategy (2017), Norwegian Ministries National Cyber Security Strategy for Norway (2019), Norwegian Ministries Norway's Role and Interests in Multilateral Cooperation (2019) Ministry of Foreign Affairs The National Strategy for Artificial Intelligence (2020), Norwegian Ministry of Local Government and Modernisation The defence of Norway Capability and readiness (2020), Ministry of Defence The Norwegian Government's Arctic Policy (2020), Norwegian Ministries	

PUBLICATION II

Securitization of Energy Transitions in Estonia, Finland and Norway

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Securitization of Energy Transitions in Estonia, Finland and Norway

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This paper analyses the extent to which zero-carbon energy transitions are a securitized phenomenon in selected countries and what that means for sustainability transitions more broadly. Without taking a normative stance on securitization, we focus on the ways in which security is constructed through in-depth interviews with experts in the energy, security, and defense sectors in Estonia, Finland, and Norway. We use a securitization framework to study how securitization as a process is discussed by identifying "securitization moves." The analysis is also connected to the literature on sustainability transitions: the zero-carbon energy transition can be depicted as a large-scale socio-technical transition related to environmental sustainability. Our findings suggest that energy transitions are securitized to an extent because we were able to detect all "securitization moves" in the interview data. The interviews showed different ways in which security is interpreted and what is achieved by its construction in specific contexts. For example, the identified threats were connected to preserving sovereignty in Estonia, the inability to openly discuss threats related to energy transitions created new concerns in Finland, and the connections between the two sectors were urgently and inescapably addressed in Norway only after Russia invaded Ukraine in 2022.

Cet article analyse si les transitions énergétiques zéro carbone constituent un phénomène sécuritisé dans une sélection de pays, puis l'implication des résultats pour les transitions durables au sens large. Sans adopter une posture normative vis-à-vis de la sécuritisation, nous nous concentrons sur les processus de construction de la sécurité grâce à des entretiens approfondis avec des experts des secteurs de l'énergie, de la sécurité et de la défense en Estonie, en Finlande et en Norvège. Nous employons un cadre de sécuritisation pour étudier le traitement de la sécuritisation en tant que processus par l'identification de ≪ coups de sécuritisation ≫. L'analyse rejoint également la littérature relative aux transitions durables : la transition énergétique zéro carbone peut être décrite comme une transition sociotechnique à grande échelle en lien avec la durabilité environnementale. D'après nos résultats, les transitions énergétiques sont sécuritisées dans une certaine mesure, car il est possible de détecter tous les ≪ coups de sécuritisation ≫ dans les données d'entretien. Les entretiens font apparaître différentes interprétations de la sécurité et les résultats de sa construction dans des contextes spécifiques. Par exemple, les menaces identifiées étaient liées à la préservation de la souveraineté en Estonie, l'incapacité de discuter ouvertement des menaces relatives aux tran-

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sitions énergétiques générait de nouvelles préoccupations en Finlande, et les liens entre les deux secteurs n'ont été traités dans l'urgence et de façon contrainte en Norvège qu'après l'invasion russe de l'Ukraine en 2022.

En este documento analizamos hasta qué punto las transiciones energéticas con cero emisiones de carbono son un fenómeno securitizado en determinados países y lo que eso significa para las transiciones en materia de sostenibilidad en general. Nos centramos, sin adoptar una postura normativa sobre la securitización, en las formas en que se construye la seguridad utilizando, para ello, entrevistas en profundidad con expertos en los sectores de la energía, la seguridad y la defensa en Estonia, Finlandia y Noruega. Utilizamos un marco de trabajo de securitización con el fin de estudiar cómo se debate la securitización como proceso e identificando, para ello, ≪movimientos de securitización≫. Nuestro análisis también se relaciona con la literatura sobre transiciones de sostenibilidad: la transición energética con cero emisiones de carbono puede describirse como una transición sociotécnica a gran escala que está relacionada con la sostenibilidad ambiental. Nuestras conclusiones sugieren que las transiciones energéticas están securitizadas hasta cierto punto, debido a que pudimos detectar todos los "movimientos de securitización" en los datos obtenidos de las entrevistas. Las entrevistas mostraron las diferentes formas en las que puede interpretarse la seguridad y lo que se logra con su construcción en contextos específicos. Por ejemplo, las amenazas identificadas estaban relacionadas: con la preservación de la soberanía en Estonia, con la incapacidad de debatir abiertamente las amenazas relacionadas con las transiciones energéticas en Finlandia y como esto creó nuevas preocupaciones, y con las conexiones entre los dos sectores, las cuales solo se abordaron de forma urgente e ineludible en Noruega después de que Rusia invadiera Ucrania en 2022.

Introduction

The Russian attack on Ukraine in February 2022 revealed the vulnerability of global energy flows and fossil fuel-based energy systems. The war expedited the implementation of policies aimed at the substantive and prompt enhancement of domestic energy sources. While the 2006 and 2009 Russia–Ukraine gas disputes and the invasion of Crimea had already alerted the EU to address energy as a security issue (European Commission 2014), many EU member states had not paid sufficient attention to the geopolitical or climate security risks around energy before 2022. This is despite the fact that hydrocarbon-based energy flows were known to be one of the main causes of harmful CO_2 emissions (IEA 2021) and subject to disruptions ranging from geopolitical concerns to internal instabilities in oil-producing countries (Blondeel et al. 2021).

Literature on the geopolitics of energy describes the rapidly accelerating zero-carbon energy transitions to bring along unexpected negative consequences (Kivimaa and Sivonen 2023), such as cyber security threats, potential conflicts over land use and the risk of internal tensions and conflicts (Vakulchuk, Overland, and Scholten 2020; Żuk and Szulecki 2020; Fischhendler, Herman, and David 2021). These exist alongside the beneficial security developments of energy transitions, such as reducing dependency on fossil fuels, contributing to peacebuilding and bolstering community support (Vakulchuk, Overland, and Scholten 2020; Żuk and Szulecki 2020; Kivimaa et al. 2022). This diversity of connections between energy transitions and security was not considered in many EU countries' policymaking before 2022 (Kivimaa 2022; Kivimaa and Sivonen 2021). However, Szulecki (2020) was able to show that energy governance can be used as part of the core state power

together with military, fiscal and public administration. Yet, the debate about securitizing energy has rarely addressed energy transitions specifically.

Therefore, in this article, we aim to untangle how securitization is part of the discourse regarding energy transitions. The research questions are (1) To what extent the zero-carbon energy transitions are a securitized phenomenon, (2) Did the Russian invasion of Ukraine in 2022 change the security discourse, and (3) What may be the implications of the findings to sustainability transitions more broadly.

In security studies, the meaning of the term "securitization" ranges from a process where an "issue is presented as an existential threat, requiring emergency measures and justifying actions outside normal bounds of political procedure" (Buzan, Waever, and de Wilde 1998, 23–24) to a process "whereby an issue is moved from normal politics into the realm of security politics" (Floyd 2019, 21). As a process, it not only focuses on where security is mentioned and any extraordinary measures pursued, but also on how language is used in constructing urgency and the need for action (Judge, Maltby, and Szulecki 2018) and how receptive audiences are to securitization moves (Floyd 2019). In relation to energy policy, Szulecki (2020) has called securitization a mechanism in which state power is challenged from both above (international agreements) and below (citizen engagement), highlighting the politically performative nature of securitization. As alternatives to securitization, security talk around energy can be politicized by being openly debated (Kuzemko 2014) or depoliticized when markets are assumed to be capable of dealing with any problems (Höysniemi 2022). The present study seeks to increase understanding of the ways in which energy has been constructed as a security issue in contemporary settings and what those constructions may imply for decarbonizing energy systems. Because of limited space, we must exclude the debate around normativity in securitization theory but acknowledge Roe's (2012) work.

We explore how security can be a "context-specific social construction," utilizing a constructivist understanding of security where actors and structures are mutually constituted (McDonald 2008). Here, the struggle to negotiate threat identification and the best strategies to mitigate related insecurities are key to the constructive stance of the paper (Bigo 2008), because they show how socially constructed security is placed in real-life contexts. We examine empirically how energy transitions are connected to securitization before and after 2022 in Estonia, Finland, and Norway.[1] This is done by analysing two rounds of interview data ($N = 68$), conducted with energy and security experts in the case countries in 2020–2021 and 2022–2023. The interviews allowed us to inspect the rapidly changing phenomenon and to form an up-to-date understanding of the way the energy transitions and security are discussed together.

As a key finding of the analysis, we claim that energy transitions are securitized to an extent. We detected aspects toward securitization, while it must be noted that the expert perceptions differed and during 2020–2021 many mentioned topics and issues specifically to be less severe in nature. Security as a constructed concept allowed the discourse to include national security, cyber security, energy security, and security of supply. Additionally, it enabled these topics to be intertwined in our discussions with the experts, who sought to promote their claims about what is and is not significant from a security point of view. Although it was clear who or what the threat was and what the object that should be protected was, the measures nor the governance were not as clear. After the 2022 events, security was more easily

[1]The countries were chosen because of their northern location, geographical proximity to the energy superpower Russia, ambitious climate targets and comparable political governance systems. However, they differ in significant ways. During the first round of interviews, Finland's NATO membership was not on the table, while Estonia and Norway were already NATO members. Norway is not an EU member but participates in energy markets via the European Economic Area. Security and defense collaboration between these countries has increased since Russia invaded Ukraine, and co-operation in the energy sector has been extensive due to the shared Nord Pool trading system.

connected to energy transitions than before, and more open discussion about the threats to the society was allowed.

The article opens with connections previously made between sustainability transitions and security research: we argue that although research is beginning to bridge security and transitions, more analyses in academia and policy practice are needed. Here, we also discuss the theoretical premises, thus setting the basis for the "securitization moves." The next subsection provides methodological insights into the analyses. Subsequently, we describe the results of our analyses and conclude by bringing the case countries together in a discussion and conclusions.

Theoretical Premises

Security and Energy in Transition

Zero-carbon energy transitions are shifts away from carbon-intensive sources toward decarbonized production and consumption (Loorbach, Frantzeskaki, and Avelino 2017). They go beyond technological change to involve institutions, markets, and practices (Geels et al. 2019) and thus connect with security through technological, actor-based, and institutional aspects (Kivimaa et al. 2022). Transitions create winners and losers that are expected to negotiate trade-offs and tensions on different scales. They require cultural and political changes and involve numerous actors from civil society, politics, and industry (Geels et al. 2017). This type of socio-institutional approach to sustainability transitions allows us to study the phenomenon beyond technology and pay attention to the power struggles and discourses that comprise the fabric of transitions (Loorbach, Frantzeskaki, and Avelino 2017).

Sustainability transitions research has grown recently (Köhler 2019), with some emerging studies connecting zero-carbon energy transitions and security (Johnstone and Newell 2018; Johnstone and McLeish 2020; Kivimaa and Sivonen 2021, 2023). Here, we assume that state actors and the actors closer to the state are able to "speak security," meaning that they are in a privileged position to discuss what security is in relation to transitions. However, we also acknowledge other actors' involvement in security. Johnstone and Newell (2018) describe states as major enablers or inhibitors of sustainability transitions: a dynamic, relational, and practice-orientated state power can alter outcomes, which requires more nuanced observation. Moreover, nation-states and their political actors use different tactics to promote their energy policy agendas, which are sometimes justified in the name of national security (Johnstone, Stirling, and Sovacool 2017; Sivonen and Kivimaa 2023). Approaches to energy transitions and security differ between states: some consider the need to decarbonize energy systems an industrial opportunity and path toward reduced import dependency, while others cling to traditional energy sources (Mata Pérez, Scholten, and Smith Stegen 2019). Differing political atmospheres regarding renewable energy have also impacted transition processes, as Szulecki and Kusznir (2018) suggest, to the extent that possible security threats even overshadow its benefits.

The security implications of transitions are relevant due to the rapid electrification of societies (Szulecki and Kusznir 2018). However, Gjesvik and Szulecki (2023) demonstrate that cyber security issues related to a digitalized society have not enjoyed the broader audience's interest. Decarbonization can enhance energy security by diversifying sources and reducing the need for cross-border energy trade, but not all measures are equal in all states and locations (Jewell, Cherp, and Riahi 2014). Positive geopolitical effects can emerge when energy's potential as political leverage decreases (Blondeel et al. 2021). Power over energy may be shared more equally between different countries but is still limited by engineering and technological competencies and control over rare earth materials (Criekemans 2018).

The very nature of transition implies change, whereas security is an inherently defensive concept that implies not changing what is already in place (Wæver 1997). This tension can make it difficult to identify—beyond obvious societal needs—precisely what should be defended. In addition, the intermittent nature of renewable energy sources is often alleviated by cross-border trade to receive electricity from other locations. So, who are the "us and them" positioned in opposition, if not nations and people? Ideologies, perhaps? These kinds of questions are important in the changing landscape of energy transitions as defining security has implications toward energy policy as well. This would echo Szulecki and Kusznir's (2018) work on how a country's political atmosphere is one determinant in the progress of energy transitions.

Securitization Framework

We adopt the definition of security in its broad and ultimately political meaning (Williams 2008): that is, as the absence of threats to acquired values (Wolfers 1953). It has been developed by Baldwin (1997, 6) to involve "any level: individual, family, society, state, international system, or humanity." We also recognize the security of the environment as vital for human life (Williams 2008). Additionally, we follow the international political sociology approach regarding constructed security, which not only considers the international zone but also emerges from the understanding of security and insecurity as processes whereby security is constructed through speech and in various networks of those managing insecurity (Bigo 2008). Furthermore, if security is thought of as including "societal security," the role of the state changes and attention can be given to units of inspection beyond military defense and international relations. According to Bigo (2008), these aspirations can be struggles for comfort and even survival.

The political and thus debatable nature of security has been further elaborated through the concept of securitization (Wæver 1997, 2010; Bigo 2008). Securitization is an element of the speech act in which actors—who are often state representatives—can frame any topic as a threat needing defence and thus action by securitizing the issue through changing the rules of the game. Securitizing an issue may take it out of the quotidian political realm, with the usual procedures stripped of their validity and decision-making limited to a power elite, leaving less space for democratic decision-making. However, securitization is also used in a less dramatic sense by calling the necessary attention to an issue by framing it as a security question (Floyd 2019). Such examples are visible, for example, in securitizing the environment (Peoples and Vaughan-Williams 2010) and climate change (Dupont 2019).

The securitizing process includes not only political debates on international security and defense but also the ways in which ordinary bureaucratic processes of any policy are concerned with internal security, including the use of technologies and information exchange. The specific features of the securitization process are socially and politically constructed: saying an issue is a security issue makes it one. At the same time, Floyd (2019) also acknowledges the presence of objective security threats that may not be recognized as such.

In a sociological view of securitization (Balzacq 2015), we understand the political as an inseparable part of security and securitization processes, with the actions taken negotiated in the political sphere. When discussing policies and policymaking around security-related issues in energy transitions, we follow Balzacq's broadening theorization of securitization. This way of thinking enables moving beyond the Copenhagen School of speech acts[2] and further analyzing discussion as part of the

[2]This term is inspired by Austin's language theory and refers to "forms of representation that do not simply depict a preference or view of an external reality" but bring an item into being (McDonald 2008; Balzacq 2011, 69).

"discursive politics of security" in which, for instance, an actor not only identifies a threat but aims to persuade audiences of the correct way to respond to it (Balzacq 2005). In addition to the units of analysis of existential threat and referent object proposed by Buzan et al. (1998), Balzacq (2005) has suggested thinking about security as pragmatic on the levels of agent and act. These levels allow us to weave the fabric of security more closely into the real-world setting through the identification of the status of speakers and audiences in a society by foregrounding the aspects of securitization that are beyond linguistic comprehension.

According to Balzacq, the speech act framework can be refined by engaging in three assumptions: first, "an effective securitization is highly context-dependent. Second, an effective securitization is audience-centered. Third, securitization dynamics are power-laden" (2005, 179). As to audience acceptance, the importance placed by the Copenhagen School's theorization of securitization has been challenged by scholars (Léonard and Kaunert 2011), with multiple alternatives offered. For instance, Balzacq (2008) suggests that securitization may happen without audience acceptance when investigating securitization processes around policy instruments instead of mere discourses.

The securitization framework has been extensively developed, mostly due to the need to use it more efficiently in empirical research (Balzacq, Léonard, and Ruzicka 2016). It provides us with the means to investigate linkages between securitizing moves, referent objects, existential threats, and emergency measures (Buzan, Waever, and de Wilde 1998).

Categories to Analyse Securitization: Securitization Moves

The analytical framework for this study is drawn from securitization theory (Buzan, Waever, and de Wilde 1998), with securitizing moves constituting the analytical categories. Buzan et al. (1998, 23) call these categories the "speech acts" by which an issue is presented as "a supreme priority."

We analyze the securitization processes by identifying five categories according to their definitions in the literature: (1) an existential threat, (2) a referent object, (3) extraordinary measures, (4) power and/or governance, and (5) issues of riskification. An *existential threat* to fulfilling basic human needs and living minimally decent lives (Floyd 2019) raises a question: a threat from what? With this category, we identify the threats mentioned in relation to energy transitions but also strive to understand the connections between security, defense, and energy transition in securitization processes, including cyber security (Hansen and Nissenbaum 2009). The identified threats must relate to the *referent object* at hand (Buzan, Waever, and de Wilde 1998), such as the state, energy as critical infrastructure or people, that is, a unit that legitimately deserves protection. To capture *extraordinary measures*, actors (the interviewees in our case) may identify or rhetorically justify new policy measures as extraordinary by dramatizing or determining an issue to be implemented as a result of security concerns. To recognize when security is discussed as part of extraordinary politics, it must be noted that it may be difficult to determine what "normal" politics actually involves (Kuzemko 2014). Heinrich and Szulecki (2018, 45) suggest three aspects of securitization: "breaking of/with norms guiding political practice, shifting power, and competences, and constraining access to information." We view going beyond the normal energy security thinking (Cherp and Jewell 2014) as part of this move.

Heinrich and Szulecki (2018, 41) have asked "who should be *exercising power and governing* the energy sector" in this context, offering a useful point to investigate: how security challenges connected with energy transitions are governed. This is an additional aspect to consider while looking at the exceptional measures that may be proposed as part of a securitization process. Looking at those who are seen to have power in the context also enables thinking beyond military and hard security

measures and turning to the political nature of energy transitions. This may happen when an actor refers to the responsible parties or explicitly indicates those who oversee a given situation. In this article, we use this securitization move to identify central actors as well as uncommon actors in the interviews. The move emphasizing governance in this article is understood when interviewees mention plans, for instance, to enhance measures to increase the resilience of a given object, connecting and sometimes overlapping with the next move. Corry's (2012) *riskification* identifies possibilities of harm that indicate "long-term precautionary governance"; they are not specific security threats but are viewed as important enough to be mentioned in this context. According to Corry, governance in precautionary terms refers to the filtering of serious risks, located in the future, from those that would cause merely harm. It is about the potentiality of the threat that must be evaluated in the present day. With this category, we are better equipped to analyze the complicated nuances of these phenomena. We do so "in terms of conditional causality—a kind of second-order security politics that focuses on the conditions of possibility for harm rather than on direct causes of harm" (Corry 2012, 256). Riskification, in this article, is understood and used as a move to allow inclusion of issues that were seen as important enough to mention, but which were explicitly mentioned not to be threats.

It is beyond the scope of this article to determine if and how well any given audience has accepted a given move. Thus, we do not claim that securitization as a process is fully completed in the instances we describe; rather, we analyze the securitizing moves that lead to or away from securitization processes.

Research Approach and Method

In this study, Estonia, Finland, and Norway are the context where securitization is analyzed with respect to contemporary zero-carbon energy transitions. Our research approach is a qualitative analysis of in-depth interviews, aiming to explore the power-laden dynamics related to securitization and sustainability transitions (Avelino and Rotmans 2009).

A semi-structured questionnaire guided 68 interviews, conducted in Finnish and English in two periods to gain insight into the interviewee's perceptions before and after the 2022 energy crisis. The first round comprised forty-six interviews: sixteen in Estonia and fifteen in Finland and Norway. The second round consisted of twenty-two interviews: nine in Estonia, seven in Finland, and six in Norway. The interviewees possessed considerable authority on security or energy and represented the public administration, the energy industry, academia, and politics.

Participants were selected through extensive research and the snowball method until data saturation was reached. Notably, we refrained from defining security for the interviewees, thus, allowing them to interpret it freely. Many had not considered the intersection of these topics, making it initially challenging to find participants, even with guarantees of anonymity. However, the second round, after Russia's invasion of Ukraine, saw increased interest in participating. The areas of interest were energy (27 interviews) and security and defense (19 interviews), though some participants had overlapping roles. A second round of interviews involved largely the same key individuals, with a few exceptions due to organizational changes. The interviews lasted 30–90 minutes and were conducted online or in person.

The interviewees are central to the understanding of the process of zero-carbon energy transitions and their possible security implications, meaning that they can "speak security" (Peoples and Vaughan-Williams 2010). This means that the interviewees possessed the authority to define and discuss what security is and what it entails. Following a Foucauldian discourse-laden understanding of finding out what security is, we treat the interviews as discourses where realms of security are (re)produced and constructed, going beyond language (Peoples and Vaughan-Williams 2010, 65). We are not aiming toward the "truth" in their national contexts, as this is unachiev-

able, but to find out what security speech in the context of energy transitions is like.

Discourse analysis is frequently used to understand how actors identify and make sense of a threat. Its critical function is to investigate the power struggles manifest in the descriptive use of language: metaphors, policy tools, image repertoires, analogies, stereotypes, and emotions (Balzacq 2011). In this context, discourse is understood as political, context-bound, and institutional, with actors enabling changes in issues of broad public import (Fairclough and Fairclough 2013). However, merely using the word *security* does not facilitate analyzing securitization. Indeed, we introduced the topic to the interviewees deliberately.[3]

The first author coded the data with the securitization moves, defined as described above, and reread and analyzed the coded paragraphs to create a list of the most discussed issues. The interviewees were not acting as representatives of states in the formal sense, although they were treated as actors able to discuss a given state's situation from their own perspective. To identify an issue as a "securitization move," the first author examined it in context, studying how surrounding claims were related to it. The coding was straightforward: a *threat* must be addressed as a significant issue, with an identified referent *object* needing protection. For *extraordinary measures*, those practices were identified that were described as unusual by interviewees. Regarding *governance*, issues were identified that were explicitly noted as aspects of energy–security interconnections whose governance the interviewees were able to discuss. For *riskification*, we identified issues explicitly considered minor but worth mentioning. In the following section, we present the findings.

Estonia

> We see a very determined and aggressive Russia rising from the ashes and threatening Europe, Finland and the Baltic states.

As this interview excerpt makes clear, the main threat identification in Estonia was explicitly and frequently Russia. The country's influence was viewed as jeopardizing Estonian autonomy and sovereignty, with societal stability, energy security, economic stability, international trade, and the general social resilience specified as referent objects. As part of any securitization process, threat identification indicates recognition of friends and foes. This becomes especially clear in the cyber security realm because electrification rapidly moves societal functions into the digital sphere. Cyber security provides a setting in which defense against a threat is already concrete and well-advanced, instead of being an abstract risk (Corry 2012). Indeed, it was specifically noted before 2022 that it is more probable that a security risk is of a non-military nature, such as cyber security, rather than of a military nature. Estonia has enhanced its cyber defense as part of the total defense concept and hosts the NATO Cyber Defence Centre headquarters. The two categories—existential threat and referent object—are prevalent in the data and indicate some securitization of the energy transition. The content and importance of the categories remained the same in post-2022 interviews. However, change was noted in the attitudes of others: the Russian threat was no longer only an issue for Estonians but had become widespread. One expert described this shift in attitudes to be "a liberating experience," because it was no longer necessary to go "circling around" the topic.

Notably, many interviewees described Estonia as a largely rule-abiding society, but the Russian threat is so significant that normal policymaking rules may not always hold, and exceptions may be necessary:

[3]This was especially significant before the Russian invasion of Ukraine, as the interviewees were not fully comfortable discussing renewable energy in connection with national security and defense concerns. This reticence, however, changed radically after the invasion.

> I mean, in that sense, we have a rather regulated society, and I would not say that there are some kind of, informal hidden practices, but of course as I said, there is this Russian threat in the blood of Estonians, including in policymaking.

In addition to policy exceptions regarding Russian relations, Estonia was described as having a small but powerful elite running national energy transitions. As a result, Estonia has undergone an extraordinary sectoral build-up, with one interviewee describing the state-owned company Elering as a "quasi-security authority" in the energy sector. It was reported to have concentrated power over the development of the sector that is tightly connected to national security and the defense sector. This was seen to restrict access to information over future development plans and to limit democratic decision-making around major decisions. After the 2022 invasion of Ukraine, exceptional measures were described to ensure energy security, and it was explicitly noted that national security concerns passed other issues, because it was essential to accelerate the implementation of crucial measures, like increasing key personnel at the responsible ministry, allocating funds to procure new surveillance radars compatible with wind power sites, and establishing close collaboration between the energy sector and defense forces to secure energy sites, all of which had previously been deemed too bureaucratic to be solved adequately.

The oil shale phase-out in Ida-Viru is a notable case of riskification discussed in all Estonian interviews. The region has a significant Russian-speaking population, and it was described as culturally and politically close to Russia before 2022. It has also been the heart of Estonian domestic energy production through the important but heavily polluting production of oil shale. The energy transition was described as having proceeded in such a way that the phase-out was advanced: for instance, the EU's Just Transition Funds (JTF) have been directed toward the region. However, the area was also described as a potential risk to national security (both domestic tensions and Russian interference), if left without good long-term governance. In post-2022 interviews, this risk to national security was viewed as decreasing, which may be due to the concrete aid provided to the region by the JTF and to oil shale regaining popularity as a strategic reserve of domestic, storable energy since the 2022 energy crisis. In addition, as connections to Russia had been cut, people in the area have less access to Russian media and propaganda. However, one interviewee noted that people were put in a difficult situation, with Russian relations a highly sensitive topic that was tearing apart friends and families. Ultimately, because the risk remained, no consensus on recent developments could be detected. This example demonstrates the operationalization of the riskification category well: when the second round of interviews ended, the situation in the area was not out of control but was still acknowledged as an important topic.

The general stability and rule of law in the Baltic region and within the EU and the Nord Pool system were connected to regional governance and displayed the risks related to international energy systems. Although significant instability in any of these tightly connected systems would cause significant security of supply concerns in Estonia which is aiming to desynchronize itself from the Russian grid, the issue was described as manageable. The desynchronization process under which Estonia aims to disconnect from the Russian electricity system by 2025 is an outcome of long-term planning and would lead Estonia, with the other Baltic countries, to synchronize with the European electricity grid. A frequently mentioned change after February 2022 relates to the pace of the desynchronization process and progress toward energy security, because of "a bomb in our corner that could go off any time now," as one interviewee noted.

Finland

In Finland, Russia was the most commonly cited threat. While the threat identification was clear and acknowledged throughout the data in Estonia, the position in Finland was murkier. We detected a significant circumspection in the data which showed inconsistency, both between official statements and individuals' opinions, and between the opinions of different experts. The interviews revealed tacit guidance that threats and risks related to the Russian energy trade were not to be openly discussed. Many interviewees were aware of both the threats and the fact that connections were not to be made explicit. This is especially interesting given that the Finnish defense sector was described as having been built on the threat from the East. Yet planning and developing a nuclear power plant with partly Russian ownership was well on the way despite the knowledge that Russia uses energy as political leverage. Some contradictory statements were made, with descriptions of those who spoke their minds about energy trade with Russia subjected to ridicule. In essence, consciously ignoring the Russian threat to the energy sector as a (non-) referent object is an example of desecuritizing the energy sector and the energy transition before 2022.

Another explicitly noted threat involved cyber security. As in Estonia, cyber security was described to be high on the agenda for the security and defense sector under the total defense concept. However, the energy sector was viewed as lagging in cyber security legislation and specific measures were needed to secure the rapidly changing energy system. New actors, such as new energy companies, were regarded as not taking enough action to secure their systems, often for financial reasons. The new decentralized energy system brings new threats that demand new thinking beyond "the familiar insecurities." Generally, it became clear that although Finnish cyber security was viewed as among the best in the world with its organized cooperation and close connections to friendly Western countries, improvement needs were reported in areas such as funding, coherent governance and the general approval of the vitality of the sector. The situation was perceived as improving post-2022, with "basic cyber hygiene instructions" having gained appreciation. Interestingly, cyber threats were mentioned by nearly all interviewees as a significant danger to national security and energy systems in transition. An explanation for this explicit and direct threat identification was contemplated:

> Maybe it's just easier to talk about cyber rather than some traditional military threats because it's kind of faceless; it could be anyone, and you don't point any fingers in any direction that it's Russia that's doing it.

This excerpt reveals the undercurrent that, although it was not acceptable to talk openly about the Russian threat, there were subtle ways of addressing the threat despite the political atmosphere. Indeed, as part of the exceptional measures related to Russia and the energy trade, many mentioned restricted discussions behind closed doors. This, however, was not enough to prevent the Russian state-owned nuclear energy company to nearly possess some ownership in the Nordic electricity infrastructure, a development halted after 2022. The undercurrent in the first round of interviews emerged into the open when energy trade with Russia significantly reduced. This change was also explained to be due to the energy transition benefitting two causes simultaneously. Yet, a new undercurrent emerged from a few interviews post-2022: buying energy from the most competitive seller, with even Russian trade not categorically excluded.

The energy system as part of the critical infrastructure and security of supply emerged as a referent object. Unlike in Estonia, the sovereignty of the Finnish state received less emphasis before 2022, although the assumption of a truly free, autonomous nation was present in relation to striving for energy independence. Furthermore, Finland's energy independence had already increased after Russia's 2014

annexation of Crimea. Before 2022, some still perceived renewable energy sources as unreliable due to their intermittent nature, and some participants identified potential new path dependencies in technology and critical minerals. After 2022, this had changed, and renewables were generally regarded as bolstering national security, although the security of supply of critical minerals and technological components was identified as an issue to be addressed. Although peat production had gradually been discontinued, it was returned to the short-to-medium term energy portfolio as a domestic and easily storable source.

Heinrich and Szulecki (2018) describe constraining access to information as an extraordinary measure and, hence, a securitization move. An example of that was described by an interviewee in the way in which security and defense issues are discussed in the public deliberately using jargon, which means that only those in the inner circle can understand. However, others saw the cautious approach as justified. Similarly, a securitization move emerged when security and defense concerns trumped renewable energy developments, which was noted several times in relation to wind turbines interfering with defense radar surveillance. Even before 2022, one interviewee said that "the defence forces have the opportunity, at the moment, to slide any national defence-related element into almost any issue, because people are on their toes due to the current international political situation." Full disclosure of the reasons why certain areas are not permitted to develop wind power was regarded as jeopardizing national security. After the events of 2022, this approach expanded to the energy sector in the name of national security: it was noted that the energy sector "received everything it asked for" when rearranging energy flows away from Russia. This suggests a small degree of securitization (mostly pertaining to wind power in the Southeast and Eastern Finland), but otherwise, the degree of public debate on energy transitions and security indicates politicization instead of securitization.

The disparate statements regarding governance around energy and security present an interesting case regarding Finland's total defense concept. On one hand, several interviewees noted that because the concept was well received in the Finnish society, many actors feel responsible for national security. The Ministry of Economic Affairs and Employment, which oversees energy policy, was cited as the main organization in this regard, with committees and other bodies named as part of energy security governance. On the other hand, some saw a complete lack of central coordination, with tight-knit silos and conservative security perspectives overwhelming contemporary security needs, including climate security. Moreover, the political guidance coming from the EU was viewed as out of sync with national plans, despite energy policy being formed following global climate agreements and the concept guiding defense policy. After 2022, some described an increased will to bridge communication gaps and share knowledge between relevant parties, while others saw no change in the centralized governance of the energy sector. Some participants noted an improvement in energy transitions and a broadening of security thinking. However, in the second interview round, it was clarified that energy companies' preparedness plans were expected to have the possibility of suspended Russian energy "on the first page," indicating that this scenario had become a priority, even though it was essentially a taboo topic before 2022.

Finland's open society was identified as a riskification issue: the locations of and access to critical infrastructure locations through open data policy in a society is based on trust and were viewed as a vulnerability. Malicious activity would be easy to undertake, and long-term precautionary planning was emphasized during and after the energy transition. This issue was elevated to a significant security threat after 2022. The Finnish energy sector had to adopt increased precautionary planning after the events of 2022, including resilience in cyber security. This was described as a major change: for example, permit rounds driven by value chain thinking did not serve the country's growing needs, and improved distribution networks had not

previously been a priority. Another major change that emerged from the interviews was the thinness of European solidarity generally, particularly regarding shared energy markets. This suggests that during crises, there should be no assumption of a consensus.

Norway

In Norway, Russia was generally perceived as the country's primary existential threat by many interviewees already before 2022. There had been a continuous need to engage with Russia as a diplomatic partner until the 2014 invasion of Crimea altered Norway's approach to one aimed at addressing the adverse impacts of Russian foreign policy. According to the interviews, Norway's interests in Russia encompass economic ties in Arctic fossil fuels, a history of disputes over sea and land territories, and concerns related to fisheries and organizing search and rescue services. These factors are pivotal in understanding the need to maintain a cordial relationship while acknowledging Russia's varied approaches toward Norway which is both a neighbor to Russia and a NATO member. This delicate equilibrium was the cornerstone of Norway's approach, indicated before 2022. After 2022, concrete examples of Russian hostility toward the Norwegian energy industry, and toward exceptional measures, were mentioned: when the Home Guard, a branch of Norway's armed forces, was sent to patrol oil rigs as a new initiative, it served as a fundamental demonstration of a loss of trust in Russia. Meanwhile, Russian cyber security attacks on energy companies' systems were considered "business as usual," indicating a known threat.

Notably, there was no consensus about Russia being the main threat to Norway before February 2022. Many participants also expressed that China's growing interest in the Arctic and in technology like 5 G development were significant threat scenarios:

> I think it's important to also highlight that after, although it's for Norwegian defence analysts it's Russia Russia Russia Russia, but over the last couple of years China has also emerged as a threat – but more of a long-term soft security concern.

This was connected to known threats in the cyber security sector, as Norway had already experienced malicious activity in its energy and public sectors. The increasingly electrified and decentralized energy system was acknowledged to bring new kinds of threats with it, including the electrification of offshore oil installations to cut production-related emissions. This is significant for the energy transition in Norway, as the country has a paradoxical approach to transition: maintaining fossil fuel export while decarbonizing domestic consumption (Sivonen and Kivimaa 2023). The oil installations in the North Sea were already known to be subject to a cyber threat, indicating that the energy sector was considered volatile. After 2022, cyber threats were emphasized more, with increased budgets for cyber security improvement in the national energy sector.

The discussions frequently revolved around the energy sector's volatility, encompassing aspects such as oil rigs, energy self-sufficiency, system and industry stability, and the condition of critical infrastructure, including aging hydropower dams. The relatively infrequent mention of state sovereignty as a referent object indicates Norway's confidence in its role as a net energy exporter and its extensive history as a NATO member. When sovereignty did arise in conversations, it was primarily linked to Norway's interactions with the EU. Norway, a part of the European Economic Area but not the EU, is required to adhere to EU energy policies without being able to influence them through a vote. According to the interviews, altering this arrangement would entail ceding some national sovereignty to the EU:

> That's – as you are aware, the Norwegian economy is quite carbon-based – so at the very top of our national interest is ensuring our sovereignty, our territorial integrity, our national interests and that we are not being put under political pressure. This is another balancing act for the energy system to negotiate.

These discussions around sovereignty became even more prominent after the 2022 events when energy prices had reached historical highs. Additionally, the continuation of the oil and gas industry's social acceptance was acknowledged, thus calling into question the nation's and the EU's future economic security.

The Ministry of Petroleum and Energy has authority over the energy sector, although this aspect was not particularly emphasized. Notably, the interviews indicated a somewhat pragmatic approach to addressing security concerns in energy transitions, from the point of view of power and governance. The Norwegian Water Resources and Energy Directorate (NVE), a directorate in the above ministry, was identified as responsible during both times of peace and of crises. According to one interviewee, NATO's seven baseline requirements play a fundamental role in shaping energy policy, suggesting that the alliance somehow influences the energy sector's overarching organization. After 2022, this element was only reinforced.

Furthermore, NATO and the Norwegian Defence Forces rely on a civilian electronic communication system and power supply, both of which are overseen by the NVE. This organizational structure seemingly separates foreign policy from the oil and gas sector. However, one interviewee emphasized that they were intricately linked, not only because the oil and gas sector supports the military financially, but also because Norway's foreign policy is significant for major global players like the United States. Foreign relations are highly valued in governing energy transitions, given the global nature of energy markets. A well-managed transition was deemed essential because "orderly, well-negotiated, trusted relations can be a valuable asset when seeking to harness renewable energy."

Nonetheless, this specific viewpoint was met with opposition. It was noted that Norway lacks a clear strategic understanding of the fact that the rest of the world is moving towards decarbonization. This suggests inconsistency in climate policy and was emphasized in post-2022 interviews, with the caveat that Norway had earned record revenues from oil and gas and was even being accused of profiting from war. This can be interpreted as a momentary setback for energy transitions. However, the clear security and foreign policy connections with the energy sector may also accelerate the development of renewables as more reliable and ethical sources of energy.

The special role of the oil and gas sector in energy policy and its contradictory role in society was reflected in the fact that the sector was not considered critical infrastructure until a new national security act came into force. It was only after that point, for instance, that the sector had to abide to measures that require clearance checks for non-Norwegian job applicants and to other measures related to cyber security. This change can be interpreted as an extraordinary measure to compel the industry to evaluate its role internationally and in the Norwegian society; Equinor, the state-owned oil and gas company, participates in global energy security maintenance and was considered to be at the core of renewable energy development in Norway. This measure was emphasized in post-2022 interviews, at which point the act had come into force. One interviewee noted that the reason this measure was passed was directly linked to global geopolitical changes and the unavoidable political acknowledgment of the oil and gas industry's role as part of those shifts.

The security risks mentioned in the Arctic region can broadly be interpreted as a securitization move from the riskification perspective. The area has attracted significant interest from non-Arctic states and an increased focus by the major Arctic players, such as the United States and Russia, with long-term, precautionary planning deemed vital. Norway's energy–security interrelations also include fisheries,

with one interviewee declaring that "carbon and protein go hand-in-hand" in the Norwegian Arctic. The cautious addressing of the Arctic was expected because it has long enjoyed stability despite the many competing interests and actors operating in the area.

As in Finland, the openness of Norwegian society was also seen as a risk in examples such as when the EU demanded more detailed information to improve electricity markets. The solidarity over shared markets was mentioned as jeopardized by Russia's invasion. The Norwegian interviewees mentioned the clash between wind turbines and military radar activity, but this discussion did not advance further because the interviewees were not deeply informed on this matter. Furthermore, Norway's concerns related to wind power being turned from "a symbol of progress towards an emissions-free energy system" into "the symbol of destroying Norwegian nature" exposed another type of risk to address by one interviewee.

Discussion and Conclusions

This paper set out to analyze the extent to which zero-carbon energy transitions can be viewed as a securitized phenomenon, how this differs before and after the events of 2022, and what this may mean for sustainability transitions more broadly. We avoided taking a normative stance on securitization as a phenomenon; rather, we were interested in the ways in which security is constructed by experts in the energy, security, and defense sectors. These experts were able to "speak security" in their respective societies of Estonia, Finland, and Norway. As discussed in the theoretical section of this paper, we took a political, context-dependent, and socially constructed approach to securitization as developed by international political sociology (Bigo 2008). Here, merely using the word *security* was not enough. Instead, it had to be justified and further connected to energy transitions through securitization moves that comprised the five categories of our analytical framework: (1) an existential threat, (2) a referent object, (3) extraordinary measures, (4) power and/or governance, and (5) issues of riskification.

In answering the first question regarding the extent of securitization processes, we conclude that we were able to identify all securitization categories of the framework in the discourses of the experts from all case countries. The two traditional categories (existential threat, referent object) followed similar paths of recognition. Russia was discussed as the most recognized threat, followed by cyber security. However, whereas in Estonia and Norway, the recognition was direct and open, the Finnish interviews prior to 2022 revealed an undercurrent that the Russian threat was not to be discussed openly in the energy context. To answer the second research question, a major change was caused by Russia's invasion of Ukraine in February 2022, when a type of "awakening" was said to have happened in Finland and even in Norway, where the Russian threat had long been an obvious but under-addressed issue. In Norway, cooperation with Russia in energy became a security issue, creating fundamental changes in the operation of the energy sector and forcing a readjustment of foreign policy, geopolitics, and the security of the energy infrastructure. In Finland, the previously publicly unaddressed issue of threat regarding Russian trade forced a change in attitudes and future investments and an increase in domestic energy production from both renewable and non-renewable sources. The Russian threat was indirectly existential in Finland and Norway, but in Estonia, the threat to Estonian sovereignty was explicitly noted.

Cyber security was especially interesting in all cases, as it was prominently recognized as a threat to society and energy systems, both carbonized and decarbonized. However, its status among decision-makers, businesses, and other relevant actors was described as low and generally too expensive to implement. Although Hansen and Nissembaum (2009) treat cyber security as a category of its own, in our analysis, the defense sector, the energy sector, renewable energy, and cyber security were

intertwined, especially after 2022. In Estonia, cyber security was considered a significant threat to the energy transition and to the area of security and defense more broadly before and after the attack. On the contrary, in Finland cyber security was considered a politically safe field in which to counter the Russian threat, because the attacks generally lack readily identifiable perpetrators. In Norway, the sector received funding and respect through an insecurity that was felt in the energy sector. Here, the role of the state in governing security broadens (Bigo 2008) from acquiring tanks and ammunition: it provides software, network stability, and training for qualified people and monitors who is "safe" enough an employee to work in a critically important sector. Here also lies a caution that this type of security can only be operated by experts in Information Technology (IT).

Since the case countries are highly developed and increasingly electrified, other referent objects needing protection were similar in all of them. A reliable energy system is a prerequisite for every aspect of a modern society. Norway's status as an energy exporter and a member of the NATO charter led to confidence that can be interpreted as constructing security around energy. Indeed, the discussions after the 2022 events highlighted Norway's role in the global energy security sphere and the responsibility intrinsic to governing the energy transition within Norway. This is exactly the kind of pragmatic use of security that Balzacq (2005) refers to: it was through discourse change that energy transitions were brought to the fora of securitization.

As we were interested in broadening the usability of securitization theory in an empirical setting, we tested certain clarifications suggested in the literature. In all three countries, we detected what Heinrich and Szulecki (2018, 45) call extraordinary measures that go beyond state secrets and military planning: "breaking of/with norms guiding political practice, shifting power, and competences, and constraining access to information." The energy transition is politically laden and, as the war showed, political preferences can pivot rapidly. However, as we omitted politicization from the analysis and treated security as an inherently political concept, we can conclude that the security constructed around energy transitions is beyond party politics, although not free from it. Power dynamics and the distinction between "us" and "them" play a significant role in shaping not only policy planning but also economic and security considerations. The three countries in question form part of the trusted "us," with both defense and energy cooperation. Nonetheless, solidarity regarding shared energy resources was questioned during crises.

In paying attention to the governance of energy transitions, following Heinrich and Szulecki (2018) was useful in identifying the nuances in how each country engages with those phenomena. Significantly, before Russia invaded Ukraine, the nexus was not seen as particularly significant in Finland and Norway, and the sectors were mostly kept apart on an official level. Yet in practice, cooperation and preparations were in place, not least because of the concept of total defense. Since Estonia's independence over critical infrastructure had only partly been achieved, as its power grid was still synchronized with that of Russia, the country had a different approach. The responsibility for critical infrastructure was believed to be well-known and organized, although there were some exceptions in which power over the energy transition, energy independence, and national security was held by a single actor. The finding that Finnish experts did not agree on how well the interrelations between energy transitions and security and defense were governed may be because of self-censorship regarding the Russian threat: when information is kept classified, decisions made behind closed doors, and a culture of secrecy becomes the norm, the logical chain of governance is not feasible. The policy coherence between the sectors, however, was described as having improved since the 2022 events. The impressions in this context have implications for energy transitions since states are inevitably major actors in their success or failure. By including governance as part of the framework, we further support Balzacq's (2005) sociological understanding

of securitization, where politically governed notions of security are inseparable parts of the security of the whole. National security, cyber security, energy security, and security of supply were all intertwined in our discussions with the experts, who also sought to promote their claims about what is and is not significant from a security point of view. This highlighted the contextual power claims central to securitization. These findings accord with Kivimaa 2022, who showed that the governance of interrelations between the energy and security sectors is challenging because of differences in worldviews.

To answer the third research question, we claim that the securitization perspective can offer both benefits and disadvantages for sustainability transitions. On one hand, it creates greater awareness of the downsides of sustainability transitions and the need to assess threats and risks related to socio-technical transitions. On the other hand, if it leads to hidden decision-making and the hegemony of security arguments in transitions, securitization may hinder the advancement of socially just and environmentally urgent transitions.

Energy transitions as part of sustainability transitions are meant to succeed in shifting from unsustainable systems to new, sustainable ones. Significant changes are necessary across all sectors of society, and there are anticipations for adjustments in laws, regulations, and cultural norms at all societal levels. We adapted riskification to the analytical framework to capture those issues that are inevitably part of the interrelations between energy transitions and security and defense but may not be fully acknowledged as threats that are governable. This is significant for sustainability transitions more broadly, as in order to achieve genuinely sustainable new systems, they must be just and accepted by society in terms of good governance and thoughtful planning that considers not only the benefits of transition but also its unwelcome and unwanted consequences. This also applies to other countries in the midst of transitions. Yet, countries outside the scope of this paper may have a different approach to defense and the military in general: smaller countries may be more prone to protect their nations instead of partaking in wider military actions elsewhere.

Although we successfully identified all five securitization moves through our analysis of interview data conducted both before and after the events of 2022, we refrain from asserting that a complete securitization process has taken place. This reservation stems from our omission of audience acceptance from the analysis and the evident desire among interviewees to maintain a certain distance between security concerns and some aspects of energy transitions. Nevertheless, it remains important to illustrate how the status of renewable energy evolved within the security discourse following a major geopolitical event, such as the war in Ukraine. Prior to the outbreak of the conflict, attitudes towards Russia within the security and defense sectors were cautious, yet the way Russia's role as an energy exporter changed was visible, especially in Finland. This observation underscores the necessity to shape the narrative surrounding Russian energy while simultaneously ensuring the concrete security of Finland's energy requirements.

Claiming issues to be of national security interest may favor those already in the inner circle and exclude others, although the development of the discourse since 2022 also showed how the security rhetoric can open new possibilities for niche actors operating in renewable energy and energy efficiency. Securitization may create complicated and undemocratic governance structures and misconceptions over the best solutions to confront threats, especially if there is no shared understanding regarding a given threat, to begin with. It may, however, also speed up processes, support new developments, and increase general interest in changing behavior. For instance, framing renewable energy as part of national security changes the nature of the sector and focuses political and public attention to it instead of securitizing it by moving it outside the public eye. These findings support Balzacq's (2008) focus on the functions and implications of securitization in an attempt to encounter

identified social or policy problems. In addition, although energy transitions can be viewed as having taken a partial step back (at least in terms of climate change) because of the rapidly changing global security situation, the interrelations between energy transitions and security and defense have become undeniable. As many of the technologies are already mature enough to be considered reliable, the transition has a healthy tailwind.

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Interrelations between security and the zero-carbon energy transition in the Finnish and Norwegian Arctic

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Original research article

Interrelations between security and the zero-carbon energy transition in the Finnish and Norwegian Arctic

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ABSTRACT

The Arctic faces major energy-related changes: its production, consumption and transportation must be decarbonised. Furthermore, geopolitical interests in the area are growing, with tensions around land use expected to increase. In this paper, we investigate energy transition processes in the Finnish and Norwegian Arctic from the niche development and regime decline viewpoints. We mirror these processes onto concepts of positive and negative security to analyse the security environment affecting the transitions. We hypothesise that notions of security can explain delays in transitions. We analysed recent Finnish and Norwegian Arctic strategies and expert interviews to examine how energy transitions are discussed in the security context. Although energy and defence policies are national rather than regional, the analysis revealed interesting Arctic-wide issues. While strategies mainly concentrated on justifying support for fossil fuel production for socio-economic and national security purposes, the interviewees discussed more nuanced approaches to developing the energy transition. Notions of justice during the transition received attention in both countries in relation to security, with the local population gaining a deeper sense of responsibility for the areas they inhabit. We call for positive security to support sustainable energy transitions, where uncertainty and responses to changes are dynamic and based on multi-actor processes.

1. Introduction

The Arctic faces major energy-related changes: its production, consumption and transportation must be decarbonised. The worldwide energy transition, with global energy flows made exceptionally visible when Russia invaded Ukraine in 2022, is also an on-going process in the Arctic. The area has broad importance to the European energy transition due to its vast natural resources [1]. Yet, energy transition in the Arctic has received scant attention in the transitions literature [2]. Previous research has shown that the oil and gas industry has a strong foothold in the Arctic, resulting from long-term development and expansion since the 1970s oil crises, despite serious climate change impacts already happening in the Arctic and elsewhere [3]. More recently, the Arctic is of increasing interest for the critical raw materials it provides, among other things, for the energy transition [4]. In addition, the Arctic is one of the areas of interest for green energy investments [5].

Security is tied to Arctic energy transitions in different ways. The area continues to be of geopolitical importance to major global superpowers, including militarisation by Russia [6] and NATO [7]. Meanwhile, disputes over land use rights at local and regional levels cause active disruptions to Arctic residents' lives [8,9], posing more local effects on security. Hence, this paper takes the nexus of zero-carbon energy transitions and security in the Arctic as its focus. It combines sustainability transitions research with sociology and the concepts of positive and negative security to conduct analysis of this nexus pertaining to Norwegian and Finnish Arctic areas.

Zero-carbon transitions are "disruptive, contested and non-linear processes" ([10], p. 464), which require cultural and political changes that are difficult to achieve. Thus, to capture the complexity of transitions, a socio-technical lens is often used [10]. Sustainability transitions research is essentially interested in how socio-technical systems change to become more environmentally and socially sustainable. It thus offers a fruitful avenue to examine Arctic issues, as Arctic challenges related to sustainability are diverse in scale, systems of governance, and the actors involved [11,12]. In terms of sustainable production and consumption, several challenges are regarded as significant to lock-ins: strong path

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dependencies, institutional and cultural obstacles and obstructing practices [13]. In the Arctic, these are all amplified with extreme weather conditions, global interests and local conditions enabling a good life.

A frequently used framework to study sustainability transitions is the multi-level perspective (MLP) which addresses changes in socio-technical systems [10]. Such systems are formed and become relatively stable over time, so the complementary elements of technologies, infrastructure, rules and practices resist change due to path dependencies.

Drawing from security studies, we use the concepts of positive and negative security to understand the dynamics more broadly during the socio-technical system change. Originally introduced to broaden from state- and threat-centred security thinking (i.e. negative security), positive security emphasises the importance of human perception in international relations theorisation [14] and offers an alternative to the traditional negative security -oriented approach [15]. Positive security has been used to refer to conditions that improve human wellbeing and promote peace by enabling communities and individuals [16,17].

Previous research has shown that, although national and international policy-making encourages cleaner energy production and consumption, inertia perpetuates the resource extraction industry in the Eurasian Arctic [2,18]. In this paper, we investigate two national perspectives on the Arctic, comprising Lapland in Finland and the "High North" in Norway. Norway is a major oil and gas exporter with a long coastline and keen interests also in fisheries, on-shore energy production, security and cooperation between other Arctic states. Unlike Norway, Finland has no coastline nor oil and gas in the Arctic but increased interests in military and security cooperation within NATO member states and significant mineral deposits and wind energy potential. However, both countries' plans are not without disputes regarding land use conflicts, growing needs of the tourism sector and the responsibilities to ensure the indigenous people's traditional way of life. The two countries are officially committed to climate change mitigation via the Paris Agreement. Finland is a European Union (EU) member state, while Norway complies with some EU legislation via its signature to the European Economic Area (EEA) agreement.

Based on previous research, our hypothesis is that issues regarded as negative security are used to justify military presence in the Arctic and continued fossil fuel extraction, thus prompting a hindered transition. Further, the paper aims to answer two questions: How are energy transitions and security intertwined in the Finnish and Norwegian Arctic, and what are the justifications for hindered transitions?

As sustainability transitions are deeply political processes [19], this study contributes to understanding political discourse, called for in the transitions literature [20]. To capture the processes of sustainability transitions in the Norwegian and Finnish Arctic, we concentrate on niche- and regime-level interaction and pay attention to the actors that influence and navigate sustainability transitions [21].

The paper is organised as follows. A literature review presents the key concepts and establishes the ontological foundation for the study (Section 2). Section 3 describes the methods and data. Section 4 introduces the background to the Finnish and Norwegian Arctic, and Section 5 presents the findings, focusing on key elements introduced in literature review. In Section 6, we provide notes for discussion, followed by conclusions in Section 7.

2. Conceptual foundations

2.1. The multi-level perspective and the Arctic

The multi-level perspective (MLP) describes interactions between three levels: the socio-technical system or regime itself, the level of niches and the landscape level, which may provide stimuli to alter the established regime. Niches foster space for socio-technical innovations, regimes are formed by the incumbent political, industrial and cultural actors, and the landscape level comprises the exogenous context where pressure is at times placed on the regime level to change, enabling selected niche innovations to expand or curtail previous practices, norms and the like, potentially creating more sustainable solutions [10,22].

Socio-technical regimes comprise the deep rules around established socio-technical systems including technological, socio-cultural, scientific, market and political dimensions [23], indicating that a system to transition towards sustainability needs a broad group of actors, rules and norms in addition to technical advancements [19]. In the literature, specific attention has been paid to the discursive turns contributing to the accumulation of knowledge about why regime stability seems so permanent [24].

In turn, niches foster change, even in the face of major uncertainties and risks. Unlike the other MLP levels – regime and landscape – niches are not regarded as "ontological descriptions of reality, but analytical and heuristic concepts to understand the complex dynamic of socio-technical change" ([25], p. 1259). Whereas regime-level institutions and organisations, such as regulations, laws and other rules enable connections and linkages that strengthen dominant social practices, the niche level fosters alternatives to established routines with "hopeful monstrosities" ([25], p. 1261); that is, initially underdeveloped, expensive and laborious technologies, practices or models of which some may become part of the regime if given the chance. This can happen through monetary support (like state subsidies) or protected spaces, as in military planning and development or confined geographical areas.

Landscape changes can create "windows of opportunity", a metaphor for the material context outside the society, which then puts pressure on the regime [25]. Climate change is an example of such pressure, causing sustainability transitions to emerge in different societal sectors, from the cultural to the economic. Alternatively, some 'landscape shocks' may strengthen the existing regime, such being the case with the 2022 energy crisis in Europe for countries possessing domestic fossil fuel resources [26].

Despite being part of the original idea of MLP dynamics, specific focus on the decline of incumbent socio-technical regimes is a rather recent orientation in transitions research. In effect, an 'innovation bias' has been argued to characterise the transitions literature [27]. The concept of regime destabilisation gained ground since 2012 e.g. [28], whereas phase-out of fossil fuels became a more dominant discussion since 2017 [29]. The research on regime decline has pointed out the path dependency and stability of regimes, partly explained by the notion of incumbency [30]. As we note below, more recent research has aimed to introduce processes that characterise regime destabilisation or decline.

The MLP has been used in a wide range of empirical contexts, and its popularity may be explained by its ability to combine ideas from economics, the sociology of innovation and institutional theory to allow its use as dynamic inspection [31]. The framework has also been criticised for the landscape being an overly generalised concept, the absence of agency and certain ontological assumptions [13,22,32]. Nevertheless, we find it helpful in examining the nexus of energy transitions and security, particularly as many security issues can be described as landscape pressures for the energy transition [26,33].

Whereas energy transitions typically involve the expansion of renewable energy and energy efficiency related niches as well as decline of fossil fuel-based regimes, security plays a role especially on the landscape level. Recent research points, for instance, the long-term influence of wars through imprinting of the landscape [32,34], geopolitical perceptions and expectations of the landscape shaping energy transitions [26], and major environmental accidents influencing the risk perceptions pertaining to the landscape [35]. Hence, the MLP provides a suitable lens to examine the nexus of energy and security.

Regarding the Arctic, the MLP has previously been used by Maria Morgunova who studied landscape and regime interaction in Eurasian Arctic natural resource extraction [3], and identified four main

landscape pressures: growing energy demand, oil prices, geopolitics and climate change. Morgunova [2] argued that the links between the landscape and regime levels are not strong enough in the investigated area, which enables addressing the influence of landscape pressures by manoeuvring regulations and restrictions by national and international communities to allow continued fossil fuel production. One explanation for this type of "regime decline in hibernation" is the fact that many oil and gas producers are state-owned, which can enable "broader institutional power" ([24], p. 34). Hence, Morgunova calls for a more detailed understanding and qualitative assessment of the interaction between the landscape and regime levels. For instance, as the petroleum industry is so tightly connected to national strategic planning, policies and regulations encouraging more sustainable energy production are not sufficient to overcome national security concerns [2].

Building on the MLP, Bipashyee Ghosh et al. suggested a framework of transformative outcomes (TOs) to increase understanding on the ways in which transitions can be better supported by policy and other actors, by which they mean ways "to orient the efforts of science, technology, and innovation policy actors to enable transformations" ([19], p. 739). TOs allow for inspecting the changing aspects of transitions that actors may attempt to fulfil to enable sustainability transitions to emerge. TOs are not strict guidelines but a framework of steps to consider while investigating pathways towards accelerated transitions. They are described as processes of interventions for individual actors, groups and organisations. For example, regime actors could break from incumbent rules and practices, leading to deeper changes in rules that maintain the regime's systems. TOs have also embedded in their thinking the deeply political nature of transition processes, including relevant actors, and an understanding of the systemic inequality and injustices that must be addressed for a truly sustainable new system to emerge and survive [19].

The TO's comprise three macro-processes: niche building, niche acceleration and embedding and regime decline which we have used to guide the analysis. The niche building sub-processes are closely related to previous research on niche development and navigating expectations, social network building and learning [19,36,37] but with an orientation to deepening and broadening such interactions [19]. The accelerating and embedding niche macro-process draws on research that describes upscaling, replicating, circulating and institutionalising as relevant sub-processes [19,38,39]. Opening up and unlocking sub-processes includes new categorisations like de-aligning and destabilising, unlearning and deep learning, strengthening regime-niche interactions and changing the perceptions of landscape pressures [19], being important in specifying what type of processes and activities regime destabilisation contains. In another context, researchers [33] have further developed the regime decline processes from a security perspective, being informed by the Ghosh et al. [19] categorisation. They describe key processes of regime decline as disrupting and repurposing skills and assets [40,41], unlearning and deep learning [19] and deinstitutionalisation and shifting pressures [42].[1] We used these processes as tools in the data analysis (see Section 3).

2.2. Negative and positive security

Sociology of security asks what security means and what security does [43]. Hence, we use the concepts of negative security and positive security to identify the kind of security that is actually meant when policy documents or experts discuss the Arctic and energy transitions and what that means for the process of decarbonising the energy sector. Although states can have significant power over the outcomes of transitions [44] and are the sole administrators of state sovereignty in the international security system [45], the role of the state is contested in both transitions research [44,46] and security studies (e.g., [41]). Moreover, the conceptual widening of security has had significant implications for how power is wielded in the social world more broadly, going beyond the state as both security actor and the object to be secured. This means that a richer conceptualisation of security is used in policy-making, widening the definitions of threat and peace alike [14].

Booth [48] and Roe [49] treat the positive security concept as meaning freedom from insecurity, human wellbeing and emancipation. Hoogensen Gjørv [17] continued the development of the conceptualisations of positive and negative security to enable ethically robust, broader discussion around security in a multi-actor security approach. She uses negative security to mean "security from" a threat and the traditional, state-centred assumptions about the military as provider of security. According to Hoogensen Gjørv, positive security broadens security thinking to seek answers to "how security is produced, by whom, and upon which epistemological foundation" ([17], p. 837). These classifications do not fully represent the political practice of security. They both maintain the thinking that security is something that can be achieved by countering or eliminating threats or by achieving specific conditions. Hoogensen Gjørv and Bilgiç [15] direct the conceptual development away from the security–insecurity dichotomy that upholds state-centric thinking towards multiple actors' discursive practices, with the perceptions of each relevant actor able to shape the narrative of their status.[2] The concepts of negative and positive security are not to be understood as normative assumptions of "good" and "bad"; rather, they enable discussion and thinking beyond the restrictions of conceptual foundations while still accounting for empirical phenomena [15].

Positive security holds the assumption of 'security to' freedom, rights and justice. Negative security implies 'security from' by mitigating threats. The importance to address and include also non-state actors is a way to diversify the way security has been so far understood. Hoogensen Gjørv and Bilgiç ([15], p. 5) note that diversification helps in "detecting and problematising structural forces such as nationalism, capitalism, racism, and patriarchy", bringing the "everyday" to the complexity of security [15]. When planning and implementing energy transitions policy, in a complex region such as the Arctic, it is of utmost importance to be able to think beyond the state as the foundation of the transitions, that the transitions must be socially just [50], and to also recognise emancipation[3] as part of security [16].

In the context of the Arctic, particular attention has been paid to human security to "democratise" security thinking in an area where diverse communities live under various systems of governance and artificial borders created by nation-states [51]. The Arctic security setting is a complex set of regional, national and local interests with the shared intention to mitigate and adapt to the effects of climate change. The challenges are not straightforward, as positive developments like improved infrastructure may come with investments by global mining companies, while those projects may also be the cause of environmental destruction [52]. Additionally, Indigenous and non-Indigenous local people are highly dependent on the local ecosystem, leaving them vulnerable to any developments in the energy sector, sustainable or otherwise [9]. Peace and stability have been at the core of Arctic cooperation, but the often-connected concept of Arctic exceptionalism (a narrative in which the United States and Russia – the two Arctic superpowers – agree to maintain peace in the area) has been contested in an effort to broaden the range of those who can define and partake in Arctic security discussions without jeopardising the overall stability of the region [83].

[1] These processes have been used before and explained in detail in the form used for this analysis [33].

[2] The significant risks in reconceptualising security are not to be ignored; a careful approach that avoids maintaining structural violence of any kind must be followed [15].

[3] Booth [16] discusses emancipation as part of security in a way that it frees people from restrictions to live life as they choose to. War and threat of war provide such limitations to individuals and groups.

3. Research approach

3.1. Data

The data consist of documents and interviews: all published Arctic strategies since 2006 and their official updates from Finland and Norway ($N = 11$) and thematic expert interviews ($N = 23$) conducted in 2022–2023 (see Tables 1 and 2). The strategies provide overall goals, measures and future development plans since the beginning of strategic planning for the Arctic area, while the interviews provide contemporary information supplementing the strategies and the real-life interpretation of the two countries' strategic aims. The Arctic strategies can be seen to mirror the changes and growing global interest in the Arctic area; hence, they can be viewed as the culmination of political focus on the region [54]. The strategies form a condensed description of the directions that policymakers have envisioned and aim to convince others of the best possible way to mutually address aims and actions. To quote Goffman [55], the strategies operate as backstage action, as only a carefully curated outcome is provided. The interviews reflect this interplay between aims and actions in the real-world context at the front of the stage.

The expert interviews were conducted by the first author in person and online, lasting between 30 and 120 min each, a total of 1631 min. The experts were selected to obtain broad representation: national and Indigenous politicians, public officials, journalists, and researchers from national, international and multi-national decision-making bodies, NGOs, research institutes, universities and news agencies. The selection was made based on the first author's knowledge, by searching organisational websites and through the snowball method. The questions covered the Arctic energy transition, security concerns, governance, and national/ international policies in the Arctic.

3.2. Methodology

The methodological approach was an inductive theory-laden content analysis described by Tuomi and Sarajärvi [56]. The points of interest for the analysis came from the theoretical background, meaning that the first author explicitly coded the data according to the literature. This means that she searched the data with the issues and themes found in the literature, starting with coding that recognised the interrelated issues between the two sectors, identifying the TO's and the coding the notions of security within that specific issue. The codes were then grouped together to represent the discussion around energy transitions and security interrelations, and the analysis was written while paying attention to similarities and differences between the countries.

The analysis was conducted by the first author by identifying issues connected to niche development and acceleration and regime decline (or support) and then discussing the ways they interact in terms of security-related issues. For instance, when an interviewee mentioned expected population increase via labour needs brought about by green investments and connected that to keeping the land inhabited as part of national security that is provided by oil and gas production, the author detected an interaction. However, if an issue discussed between the niche and regime was not explicit, but relevant and connected to security, the author coded it to interact either with niche or regime and security issue(s). An example of this could be the support found for the oil and gas production, as it was connected to regime and security.

Table 1
Analysed Arctic strategies from Finland and Norway (2006–2021); analysis conducted in fall 2023.

Finland ($N = 5$)	Norway ($N = 6$)
2010 Finland's Arctic Strategy	2006 The Norwegian Government's High North Strategy
2013 Finland's Strategy for the Arctic Region	2009 New Building Blocks in the North: The next Step in the Government's High North Strategy
2016 Update to Finland's Arctic Strategy	2011 The High North: Visions and strategies
2017 Action Plan for the Update of the Arctic Strategy	2014 Norway's Arctic Policy
2021 Finland's Strategy for Arctic Policy	2017 Norway's Arctic Strategy – between geopolitics and social development (English short version)
	2021 The Norwegian Government's Arctic Policy

Table 2
Interviews conducted with Arctic experts between April 2022 and November 2023.

	Public officials	Politicians	Researchers	Other, 3rd Sector	Total
Finland	4	3	1	1	9
Norway	4	3	3	4	14
Total	8	6	4	4	23

Originally, the depiction of TOs comprehends 12 sub-processes. However, in the presentation of findings we concentrate on macro-processes of multi-level interaction: developing niches[4] (in which we combined niche building, niche acceleration and embedding) and regime decline. The reason for this is that the broader policy processes involving energy transitions in the Finnish and Norwegian Arctic reveal how energy and security are discussed together in the context of the MLP, and the data did not reveal detailed sub-processes. We also created a new code, regime support, to capture the nuances that were clearly indicated towards supporting oil and gas industry.

The interactions between the energy transition and security were coded as "niche development" and "regime decline". Although we concentrate on macro-processes, we used the 12 identified TOs [19] as clues for coding. Detailed list of the TOs, added code and the order of analysis can be found in Fig. 1.

The identified text extracts were then mirrored onto the concepts of negative and positive security to see how security was discussed in the identified interactions. Negative security was recognised in relation to, for example, military activity, and positive security was noted when newly built infrastructure was regarded as a positive contribution to the demographic development and wellbeing of the area. Positive security appears also whenever other than merely state actors are discussed as part of the security discourse, or when the locals may be emancipated via meaningful participation to decision making processes regarding the area. It is also noteworthy to mention that by studying these two dimensions of security we also acknowledge the diversity of individual standing points between and within different groups of people. There may also be overlaps between these two categories as the 'messiness' of the everyday. In addition, if the issues discussed suggested a lack of (positive or negative) security, this was also included in the analysis. We used the data management software NVivo to organise and code the data.

4. Background: Finnish and Norwegian Arctic

While the Arctic can be defined in various ways, we concentrate the empirical lens on the Norwegian (High North) and Finnish Arctic (Lapland) areas. When it comes to geopolitics, a highly nuanced term, we refer to "the interaction between geographical factors, politics and international relations" ([57], p. 7). We go further to investigate how geographical assumptions are used in policy-making [58]. For our Arctic analysis, we adopt the more critical take on geopolitics, i.e., the contextual and socially constructed nature of it [84].

[4] We took the stance that the interviewees decided which energy forms or technologies were discussed as niches. For instance, wind power is not always considered a niche in some places due to the abundant and widespread production. It also must be noted, that many also mentioned that for instance wind and hydro may not be new technologies as such, but because their use is causing current disturbances, they were discussed.

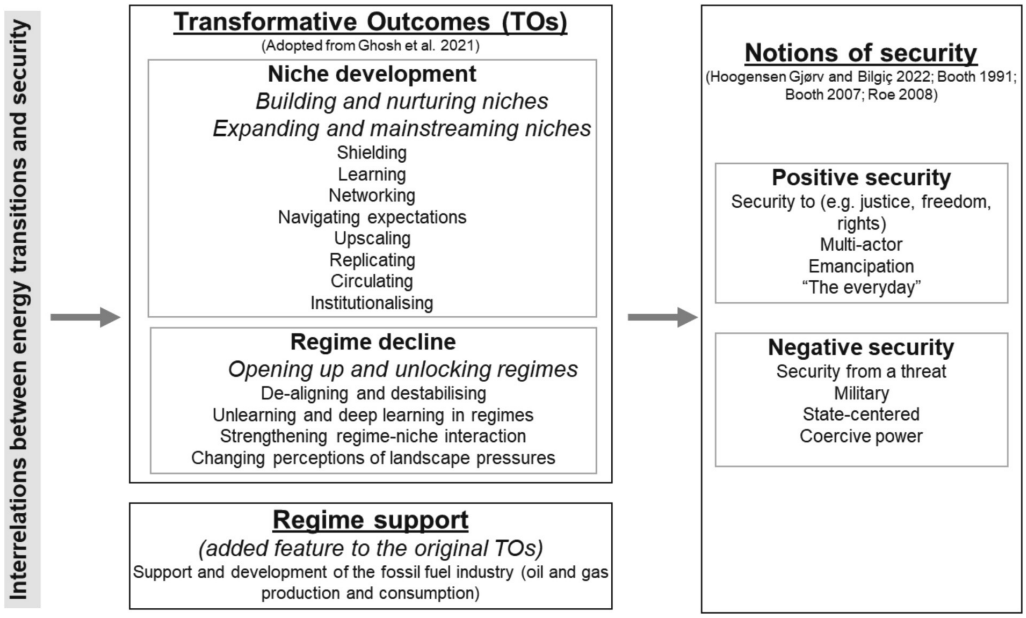

Fig. 1. Operationalisation of the key concepts in the analysis.

Norway defines the Arctic as the areas between the Arctic Circle and the North Pole. Although the region has remained stable for a long time, the most recent Norwegian government Arctic Policy [59] clearly states that Russian military activity is a threat and that Norway relies on a strong NATO presence in the area. Arctic issues are at the core of the country's foreign policy; almost half a million of its citizens live in the area. Although it is not densely populated, it covers a third of Norway's territory and most of its maritime exclusive economic zone. It is also rather well integrated with the rest of the country in practice [60]. Officially, the most commonly used term is "High North", which comes from the Norwegian word *nordområdene* (officially "the northern regions", but in English "High North" is mostly used to refer to northern areas in connection to foreign policy and international relations, especially Svalbard, and the states around the Barents Sea). Russian relations are an important factor in this context [61]. The politically loaded term 'High North' is connected to "efforts to safeguard Norwegian interests through various initiatives and cross-border cooperation in the North Calotte region and the Barents region as a whole" [59]. Interest in developing a more robust Arctic policy has grown in recent years in Norway because of climate change, which allows more activity in the polar areas, technological development and increasing commercial activity [62]. At the same time, there is no "scramble for the Arctic", despite the media claims [63]. The area has been characterised by political stability and well-functioning regimes [62].

Finland officially claimed the title of an Arctic state in its 2010 Arctic strategy, although it has been an active participant in northern and Arctic cooperation for much longer [54]. The key strategic points are connected to climate change, inhabitants' wellbeing, expertise in cold-climate activities and infrastructure and logistics ([64], p. 63). Finland does not have Arctic coastal areas and has been defined as a sub-Arctic area. Changes in geopolitical fora over the last 15 years have increased political, economic and infrastructure development interests [65]. International cooperation in the defence sector has increased with close partnerships with the United Nations, the Organization for Security and Co-operation in Europe and EU and, in regional cooperation, through, for instance, NORDEFCO (Nordic Defence Cooperation). Along with other political connections, these collaborations are seen as vital for security and defence networking in the area, which is increasingly under global focus [66]. Finland joining NATO adds a new factor to the Arctic security and defence atmosphere. The Finnish Arctic area (defined as both above the Arctic Circle and the Region of Lapland) is sparsely populated, and the status of Indigenous communities is contested (e.g., [60]). The EU's actions in the Arctic depend on member states' acceptance and recognition of its right to act in the area [68]. However, the EU is also an Arctic actor on its own [69] with its own, growing strategic interests [85,86].

5. Results

5.1. Niche development and expansion

Throughout its strategies, Norway claims to be the leader in the Arctic energy sector. Renewable energy developments were noted as important; yet the way this development was discussed evolved over time in the strategies, with variations in emphasis. The first strategy aimed at creating Norway as the world's leading nation in renewable energy, and later developments posed renewable energy development as a local issue. The regional development of the north, including improved access to energy, renewable or not, was seen as an important policy objective for demographic development. This interacts with negative security, as it was explicitly noted in the 2011 strategy: "issues related to access to energy and energy security will become increasingly important both in themselves and as part of foreign and security policy" ([70], p.15). Via negative security thinking, the state provides possibilities for people to inhabit remote areas to keep them under state monitoring while providing access to the military if needed.

In Finnish Arctic strategies, niche development and expansion did not have a significant presence. Overall, both energy and security issues were only discussed briefly in the strategies, concentrating on foreign relations and cooperation and the business and innovation potential of the Arctic. However, an indirect reference was found in the 2010 strategy, where mining activities received more attention because

mining is perceived central to clean energy technology that will help meet climate targets. Later, in the 2021 strategy, cultural and social aspects of Arctic development were addressed. For instance, the strategy noted the need to minimise the negative consequences of mining and that nature and local populations must be at the forefront. This indicates a view of the development that improves actor perceptions and broadens regime learning to include more than regime actors, such as by officials considering Indigenous culture, suggesting a positive security development via meaningful participation opportunities and putting local populations at the forefront, for example.

The Norwegian interview data provided a more detailed outlook to the strategies. The interviewees discussed several different types of renewable energy that are already in use or can be increased (hydro, wind, solar, bioenergy) and technologies that have potential for the region (hydrogen, nuclear, fusion, osmosis, carbon capture and storage). Several of these were noted for the potential scaling of renewable energy production in the north to export to European markets. This expansion was explicitly discussed in connection to the war in Ukraine, and it was also mentioned that the extensive electricity transmission and distribution networks could become targets in wartime, indicating a negative security approach where states provide security to critical infrastructure.

The energy exports from the Norwegian Arctic to the European market were regarded as hindering the energy transition in the short term, because the exported energy is mainly oil and gas - the exports of which to the EU have increased after 2022, Norway being perceived as a reliable producer. However, the scaling up of renewable energy and its exports to the EU would advance the energy transition, once renewable energy production reaches a sufficient level of maturity. Others saw no connection with security nor sovereignty in these transition processes. It was seen that extending electricity transmission networks, constructed to transmit renewable electricity elsewhere, would decrease the overall cost of electricity and bring industrial development and economic wellbeing to the Arctic. The latter perspective is linked to positive security thinking, in which locals would have more agency in planning and operations through regional political bodies. This includes the reindeer herders, who struggle with electricity network expansion and wind farms, because they decrease reindeer grazing lands even as the herders grasp the need to improve critical infrastructure. Indeed, "in a European context, North Norway has vast wind energy potential" ([69], p.63), as indicated also in the strategy work and needs broader attention for inclusive decision-making.

Similarly to the Norwegian case, the Finnish interviews provided more details compared to the strategies. Several niche energy forms and technologies (as identified by the interviewees) were mentioned: onshore and offshore wind power, biofuels, solar, hydrogen, wave power, and carbon capture and storage. Many noted that energy policies in the Arctic and northern regions are developed as part of national energy policies, although certain special conditions exist, such as challenging weather conditions and long electricity transmission lines in sparsely populated areas. The development of new energy technologies was interpreted to contribute to both negative and positive security: the resulting cultural and socio-economic wellbeing (positive security) provides settlements in remote areas needed to safeguard sovereignty (negative security). This is a way to navigate expectations as the defence sector is treated as operating according to national energy policy, without substantial Arctic-specific differences.

The newly appointed Sámi Climate Council was mentioned as a measure to institutionalise inclusive decision-making on climate policy. It has a legally recognised position that increases the role of the more marginal indigenous group in decision-making related to the energy transition thus advancing positive security.

It was noted that security of supply in the area is not sufficient under the current system, given the long distances and the road infrastructure to transport food and fuel in need of improvement. Local solutions (such as maintaining foraging culture) to improve conditions were viewed as jeopardised because of tensions related to different land use pressures, such as mining, biofuels, hydro dams, and wind power parks, with negative impacts on the traditional way of life, including reindeer husbandry, hunting, gathering and nomadism. The issue is exacerbated by the risk that access to food from the south would be unexpectedly cut: "If we don't have those people who can roam around the forests for reindeer, game and fish … then we will die of hunger" (Interview, Indigenous, politician. These examples highlight the connections between energy transitions and demographic development. They connect to positive security, and with the policy presented in the strategies, with the actors themselves having the agency to define their living standards and take part in the energy transition in their own way: "Climate change mitigation is a central objective. Northern livelihoods and Indigenous peoples' rights will be safeguarded, and thorough impact assessments will be produced of all key Arctic projects" ([62], p.63).

In the interviews, the current energy transition tied with other land use pressures (e.g. tourism and forestry) was seen as exceptionally unjust and harmful, with the humane perspective ignored due to the need to produce less polluting energy for Europe:

> Yes, it [energy transition development] is experienced as very unjust in that we have given up our best pastureland for commercial forestry, for instance. We have given up our best areas for tourism. We have given up major grazing lands for hydro power. When is it going to be enough? (Interview, Indigenous, politician)

At the same time, the traditional way of life was also explicitly connected to negative security in references to providing surveillance and patrols in remote areas for the state: "On the Eastern border, the reindeer herders operate as eyes and ears […] and in a war situation, these kinds of people are worth more than gold [as] they have the equipment and know-how to survive in the forest", as the same representative noted. Therefore we interpret that if energy transitions happen at the expense of reindeer herding, it is indirectly creating a trade-off with national security.

Similar connections between the development of the energy sector and Indigenous populations' rights in terms of culture and heritage were discussed in the Norwegian interviews. As one 3rd sector interviewee noted, "the cheapest form of defence is having people living in the region." Developing wind power, as discussed as a niche by the interviewees, in the remote areas would benefit their socio-economic wellbeing, but for strategically important areas, such as Vardø, wind parks are precluded because they interfere with military air surveillance radars, as another public official interviewee remarked. Unlike in Finland, the effects of wind power turbines on radars is not a public topic in Norway cf. [33]; nor is it willingly discussed with the regions involved. The opposition to wind power was mentioned as shared with broader public, too. However, previous research shows that supporters are also active [72]. In the interviews, the rights of the Sámi and reindeer herders were at the core of the opposition, because the conflict over land use is serious and complicated: whether to use the land for renewable energy production, such as wind production, to extract minerals for the purpose of enabling the transition elsewhere or to support the Sámi and their cultural heritage rights. Here lies some of the key points of messiness of "the everyday" regarding security and its definitions, following the positive security approach [15].

One frequently mentioned example from Norway was the Fosen wind farm. In 2021, the Supreme Court of Norway ruled the licensing of the farm to be an illegal breach of the human rights of Indigenous people and ordered it dismantled. At the time of writing, however, agreements between one of the opposing Sámi groups and the owners of the wind farm had been made [73], the issue remains unresolved for others. In the interviews, the windfarm development was described as an internal security concern, establishing the discourse and actions for future development and renewable energy production more broadly. The tensions around land use during the transition have had a significant impact on the lives of those who had had little input into the decision-making

processes. Some interviewees described learning new skills to be able to fight for their rights, while others point out the inefficient structural system in licensing processes in general: a lack of time and resources, asymmetry in levels of governance and communication and general mistrust of the system: "it's not enough anymore to be very skilled with the reindeer in the tundra. Now you have to master a whole other game" (Interview, Indigenous, 3rd sector).

Neither of the countries' Arctic strategy work discusses energy transitions with security and defence issues in detail, omitting issues revealed by the interviews. The reason for this may well be that these issues are discussed in particular policy sectors' strategies, and the development of the Arctic is seen as part of national policies. However, the interviews from both countries clearly indicate a need to address the Arctic issues specifically and comprehensively. The interviews vividly show that niche development, social acceptability and just transition are deeply connected.

5.2. Regime decline

As the strategies in both countries indicated, regime decline will only happen when niches are mature enough. The production and consumption of fossil fuels continues as an increasing niche-regime interaction, where new ideas, practices and technologies towards green energy are constantly being tested and trialled, often financed with oil and gas revenues. This happens while enabling the local living conditions. In the Arctic, this means that areas populated is one way to put security into everyday practice: earning a living, childcare and learning one's own language are a few examples discussed in the interviews. Demographic development connects to positive security, as those who already live in the area should feel that it is safe enough to raise families and invite more people to arrive along sustainable energy industrial developments (such as data centres, battery factories).

In the Finnish interviews, the EU's call to ban fossil fuel production in the Arctic was frequently mentioned. Although many described it as inefficient, suggesting its status as merely ceremonial and yet to be determined in practice, the possibility was regarded as an important opening. This can be interpreted as an attempt to change perceptions of the seriousness of climate change. The Arctic Council, an intergovernmental forum promoting cooperation in the Arctic, was discussed as a good structure for monitoring and knowledge dissemination in climate change mitigation and adaptation. While the Arctic Council is not a security actor, this can be interpreted as providing positive security by offering a platform to broaden the epistemological foundation on which discussions are based, although the Council officially does not deal with issues of negative security. Arctic cooperation was seen as a major challenge due to Russia's war in Ukraine, which has created palpable military security pressure on energy transitions and sustainable development. However, its actual effectiveness in relation to the transition was questioned: "The Arctic Council is a paper tiger on this issue.… Oil and gas drilling are and have always been part of their inventories, and the academic community is doing a good job, but this has had no effect on decision-making" (Interview, Finland, researcher).

TOs indicating to regime decline were not very visibly discussed in either of the country's strategies, and only in passing in Finland. This provides a question of scales in transitions in these two countries. On the one hand, Norway is an oil producing country, but it mainly exports oil and gas and aims for carbon neutrality domestically. Finland, on the other hand, imports all of its fossil fuels, and despite grand plans, decarbonising the society is not granted in planned time. Therefore, regime decline would occur on an international scale in Norway if it were to cease fossil fuel extraction, on a national scale in Finland if it were to implement a genuinely effective decarbonisation policy, and regionally in the Arctic if the necessary materials, minerals, and technologies were sustainably and ethically sourced from northern areas.

5.3. Regime support

In the Norwegian strategies, the electricity transmission network development was connected to new petroleum and other business activity in the High North, suggesting support for rather than the decline of the regime. The 2011 strategy posited energy as a significant part of future efforts to develop Arctic areas; this would be primarily oil and gas, but there would also be renewable energy – an example of positive security thinking, as the developing energy sector would boost population growth and create prosperity beyond the energy sector. These views were echoed in the interviews, with an acknowledgment of the negative effects of climate change that were viewed as jeopardising positive development.

The Norwegian strategies pointed out that the renewable energy sector of the northern areas would not be developed on its own. Rather, it would be developed in connection to fossil fuel production. However, the strategies throughout frame the production of fossil fuels as according with sustainable development goals. They do not consider the whole chain from production to end consumption and the emissions of usage, thus only allowing discussion at a broad and partial level. One niche beyond fossil fuel production to be developed is bioenergy from algae. However, the 2009 strategy did not consider its potential to be strong, thus, managing expectations already in the beginning. Although hydropower can be understood as part of the regime due to its long history and abundant energy production, it too was harnessed to support plans for fossil fuel energy production.

Norwegian strategies so consistently and closely bind renewable energy development to fossil fuel production that we did not detect any mentions in which the current regime would not be supported. Although the strategies repeatedly mentioned the importance of environmental protection and climate change mitigation, we did not detect any concrete measures to encourage regime decline. At the same time, (fossil fuel) energy policy is intricately connected to foreign and security policy. Here, security discourse was mainly linked to negative, state-centred approaches in which areas are needed to be secured from external threats. The oil and gas sector was discussed as a comprehensive part of development in all aspects of society. This was mirrored in the interviews, with many mentioning that because prosperity is so bound up with oil and gas, the decline of the sector was slow and grudging. Others noted that there was openness in the process and felt uncomfortable about discussing the topic:

> The focus of Norwegian energy policy is thus continuing its historical shift towards the north. At the same time, energy issues are acquiring a foreign policy dimension as energy supply and security become increasingly important in international relations. In many countries, energy is becoming more clearly defined as a part of security policy. The main lines of Norway's petroleum policy are well established. However, we must be aware of and respond to the increased importance of energy issues as we implement our foreign and security policy. ([69], p. 14).

> And Norway, Sweden, and Finland are on different sides of the table in that thinking; of course, in the words of the politicians, they say "oh yeah, we need to support the green shift and we need to do that" but everyone knows that Norway's main focus is still oil and gas drilling. I mean, that's the reason why we are millionaires.… I used to say that the Norwegians are petroholics. We know that it is bad, but we can't resist. We just need one more drilling, one more oil platform. "No, yeah, put it away", like alcohol, you know. Just one more. (Interview, Norway other)

The Finnish strategies discussed continued fossil fuel production in Norway. The plans were to provide expertise in cold-climate operations and business for the oil and gas sector, supporting the regime in both Russia (prior to 2022) and Norway, an issue that was also mentioned in the interviews. Although we detected only a few direct references in the

strategies to keeping the Arctic area inhabited explicitly through these plans, it is reasonable to assume that one way to gain positive security was to connect regime support and unsustainable energy production to security justifications, even in Finland, which has no oil and gas production.

Regime support was scarcely discussed in the interviews, although several participants mentioned the improbability of simply halting oil and gas production due to the economic dependence of four Arctic states: Russia, the United States, Canada and Norway. As the interviews were conducted after Russia's invasion of Ukraine, this was directly connected to hard security issues of protecting the state, its assets and its claims of sovereignty over maritime areas. This highlights the importance of more diverse paradigms that the framing of positive security allows.

6. Discussion

As noted above, energy transition processes are not straightforward and are governed with discursive tools [74]. Finnish strategies employed minimal direct or clear action-directing language, maintaining instead a largely passive tone that suggests a cautious approach to Arctic issues but is also a general style in Finnish policy strategies. By contrast, Norwegian documents used active and straightforward language, reflecting a hands-on attitude and emphasising the importance of the High North to both Norway and Europe. This alignment between the actions described and the language used in the documents contributes to cohesive and clear policy planning. This style would also allow for more comprehensive consideration, such as regarding the supply chains. We treated the text as a way to understand the process of energy transitions, specifically through regime-niche interaction.

We used transformative outcomes (TOs): the three macro-processes and 12 sub-processes [19] for data analysis. However, the analysis showed that, in the European Arctic context, the findings could mainly be presented in the level of macro-processes (merging niche development with niche expansion and regime decline). Due to the strong support given still to fossil fuels in the region, we added a category of regime support to the analysis. Previous research on Eurasian Arctic regimes has shown that the state as a regulatory and funding body is so closely connected to fossil fuel production in the area that powerful pressure from the regime has facilitated continued action [2,3].

We found only a few mentions of niche development in the strategies. This does not, however, mean that niches are not developed or supported in the Finnish and Norwegian Arctic areas; rather, the energy sector simply has not been treated with Arctic specifics, especially in Finland. This was discussed in the interviews, where the pressure exerted by the energy transition is on national and EU policymaking. We estimate that the energy sector was not of interest in policymaking related to specifically Arctic issues and that Finnish interests in the Arctic are less developed and refined than their Norwegian counterparts. In light of contemporary renewable energy development projects in Finnish Lapland, perhaps this should change, with a more comprehensive take on Arctic policy implemented. This would of course require Finland to take a stronger stance on Arctic policy in general, as at least until the most recent strategy (2021) the aims have not been clear, despite significant efforts to justify Finland as an Arctic state. At the time of the writing, this remains the latest update on Arctic policy. Although NATO was not strongly present in the data, we expect that Finland's recent NATO membership will change that in the future, perhaps towards more emphasis on the negative security thinking, as Finland brings significant land and air force assets to NATO in the Arctic. In turn, the establishment of the Sámi Climate Council in 2023 enshrined in the revised Finnish Climate Act, creates an improved opportunity to link positive security to the energy transitions. Meanwhile, Norway continues to use its own definition of sustainable development, one that includes oil and gas production [75].

To answer the first research question of how renewable energy and security are intertwined, we can say that they were connected to each other on various ways. In both countries, land use disputes over wind production, minerals mining and expanding electricity transmission networks were directly discussed as positive security issues, as “the everyday” is intricate to those developments. They imply significant changes to the inhabitants, and for the Sámi also their right to their traditional culture and way of life. Security was defined to be of multi-actor premises, where ability to participate in decision-making and defining what security is and to whom it should be provided when energy transitions proceed was highlighted. As our analysis has revealed, notions of justice are deeply an aspect of security. Indeed, many interviewees wished to discuss issues of injustice in the context of security, even when not directly asked about them.

According to the analysis pertaining to Norway, oil and gas production is used to claim sovereignty, hence, sovereignty as a notion of security is delaying the energy transition. In addition, oil and gas provide national wealth (i.e. socio-economic security) that finances, not only military and surveillance activity, but also the overall socio-economic development of the Arctic region, including renewable energy production. This emphasises state as the main provider of security, and the state's right to define security. Renewable energy and sovereignty were not discussed in detail. However, previous research on the Norwegian debate has shown that renewable energy developments are not straightforwardly believed to be increasing sovereignty. The opposite was found, especially in relation to Norway's position to EU energy policy that was seen to decrease sovereignty [76]. In the Finnish strategies, claims of sovereignty are not as direct, although Finnish Lapland provides a military training ground of strategic significance. In the interviews, connecting issues were the different views on how to keep the land inhabited and by whom, land use claims and the policy measures by which the energy transition could be governed under changing landscape pressures, such as the war in Ukraine. The emphasis was on negative security during the transition, with the state operating as the primary authority on both the energy and defence policy sectors.

This connects to the second research question on what might hinder energy transitions. We detected reservations from security policy actors about trying out new forms of energy and more sustainable practices. Whereas the Finnish strategy documents did not discuss this issue at all, the interviews revealed that the pressure for the transition was exerted at the national level by indicating that the military uses the form of energy that is currently available. This is particularly interesting in Finland, where also large land areas of Lapland are used for military exercises, and interest from allied countries to practice in cold climates is expected to increase in the coming years. In a broader context, however, the Arctic does not stand out from the plans of Finland's Ministry of Defence to participate in climate change adaptation [77], although details are absent from the data. Climate security (impacts of climate crisis) also did not appear in the data, despite future scenarios that are deemed stark [78], especially for the Arctic region. One reason why climate security was not explicitly discussed may be that the interviewees took it as self-evident. Risks and threat scenarios related to Arctic climate change may have been the reason they participated in the first place, so they may not have felt the need to emphasise it.

Other justifications for hindering the transition in the Arctic were related to long distances, sparsely populated areas, disputes over land use and claims of ownership and user rights among Indigenous and non-Indigenous populations and the technological challenges of cold climates. Previous research has also pointed out the general populationś concerns over “green grabbing” and “Europeanization” in Norway, where legal and physical control over renewable energy development is gradually transferred to the EU, away from Norway [76]. Overall, land use questions are especially tightly bound up with questions of human rights [67], an issue that was discussed in the interviews but was absent in the strategy documents of both countries. In Finland, the new Sámi Climate Council could be a fruitful body to strengthen regime-niche interactions in a fair manner by allowing non-state actors to have a

role in decision-making, if under a mandate of the state. It is yet to be seen what actual impact the council will have over the medium and long term. Additionally, the role of the Sámi Parliament could be enhanced in the decision-making.

In our strategy document analysis, we did not find many mentions of regime decline in either Finland or Norway. In fact, we created a new code for the support the regime received in those documents. In Norway, support for fossil fuel production correlates well with national ambitions and policies [79]. However in Finland, phasing out fossil fuels is an important part of national climate and energy strategies [80]. The support that Arctic strategies appeared to show for continued fossil fuel production or use in both countries connects to positive and negative notions of security. In negative security thinking, military and national interests, sovereignty and landownership are central. This is present when Norway claims sea areas with oil and gas industry installations and when economic advancements in Finland are sought from cold-climate technology development, enabling, for instance, winter passage and machine durability. The connection to positive security can be found in both countries' aims to keep remote areas inhabited by enabling safe socio-economic wellbeing that will encourage people to stay in the area. Infrastructure and other state-provided basic living condition elements are needed to keep people in the north, along with cultural, political and technical solutions that can offer the same living standards as in the south. Here, positive security as a multi-actor discursive practice [15] provides a useful perspective; the Norwegian strategies claim support of and possibilities for local and Indigenous populations to take part in decision-making, but our analysis echoes previous research that more is needed [9,81]. This is significant because democratising security thinking can foster change in practice. However, it is by no means an easy process, from ontological differences [8] through land use and the costs and benefits of, for instance, mining activities [82]. The latter may either contrast energy transitions with security (when energy-related land use threatens reindeer herding or broader environmental security) or align them (when mining creates employment in the north and supports the energy transition), showing the complexities of the energy-security nexus.

Although both countries follow comprehensive security principles, climate security was not strongly visible in the documents in the sense of reducing emissions from the fossil fuel sector. Climate change and the risks brought by it are an undercurrent in the area in general and is considered a landscape pressure to allow continued development in the area, despite its negative implications for the environment and Arctic inhabitants. This is part of human security thinking that calls for attention to communities first before scaling up towards inclusive and just development [51]. Including human security and positive security perspectives in the planning and development of the Arctic would enable a fair distribution of both benefits and burdens [9], with a deep awareness of the actual impact of measures on the people who are affected by them. According to our findings, there is also a wish to participate in providing negative security through the knowledge and possibilities that people have. This contrasts with the way that "participation" is currently interpreted: the land is seen as a provider of vitally needed less-polluting energy and the material and minerals needed to produce it. When thinking about positive security from the broader conceptual perspective, our findings indicate that the people living and operating in the Arctic are calling for positive, inclusive and just security that they themselves are part of defining and thus defending. The energy transitions in both countries are inevitably part of directing the process, but the unequal position of participants in decision-making must be recognised and addressed.

Climate change is also one key factor in thinking about the scales in which the Finnish and Norwegian Arctic issues are discussed in the data. While the negative impacts of climate change are global, and the local population in the North have not been part of the problem, the solutions to (at least) European climate change mitigation via energy transition are expected to come from the Arctic air, sea and land. Historically this has been dramatic, and current "green transition" is feared to have (re) colonial traits [8]. Local people, politicians, activists, entrepreneurs, and civil officials are in constant parallel to the global, national, and local. Lack of resources, time and leverage on these levels does not support sustainable development overall.

7. Conclusions

We conducted a content analysis of all published Arctic strategies and carried out expert interviews in the Finnish and Norwegian context to identify the processes of energy transitions with niche development and regime decline. The identified aspects were then addressed using the concepts of negative and positive security to broaden the understanding of security in energy transitions. The broader aim was to find out why fossil fuel production and consumption are still going strong in environmentally fragile and globally significant Arctic areas. Our hypothesis was that security and defence-related questions have significance in the justifications used to support the petroleum-driven regime. Indeed, we argue that the challenges related to energy transitions and security in the Arctic are closely intertwined and that the governance of these phenomena needs a broader understanding of security, inclusive decision-making and coherence in strategic planning as part of national and international policymaking.

Our main finding from the analysis supports the hypothesis, as the development of the north in Norway is intimately connected to continued oil and gas production and the success of the Norwegian state, including financing the military sector. This has been present to the extent that climate-related landscape pressures have not changed the narratives of policymaking. For Finland, this link has not been so evident. Yet even though Finland does not have its own oil and gas production, its Arctic policy until 2021 was partially framed to support the fossil fuel industry with economic incentives. This concept extends beyond Finland, resonating within the broader Arctic context. The development potential across the entire Arctic region, involving the Arctic 8 states and other interested parties, places significant importance on oil and gas production. The major question is to which direction this interest is steered to in relation to Arctic onshore and offshore wind, mineral and metals. To that, Finland, and other Nordic states, have possibilities to contribute to.

The performative nature of security is also present in the findings, as the changed global security situation has demanded people in the Arctic to perceive themselves as agents of security through demographic claims of sovereignty. It has also opened an avenue to negotiate an improved institutional will to better living conditions, starting from mundane life choices to local political value choices. This finding showed a more general insight provided by this paper, i.e., how justice is intertwined with questions of security, both in the perceptions of actors as well as concretely (keeping the north inhabited), suggesting that research on just transition can also benefit from the security perspective.

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CRediT authorship contribution statement

Marja Helena Sivonen: Writing – review & editing, Writing – original draft, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Paula Kivimaa:** Writing – review & editing, Validation, Supervision, Resources, Project administration, Investigation, Funding acquisition, Conceptualization.

Declaration of competing interest

No potential conflict of interest was reported by the author(s).

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Data availability

The data that has been used is confidential.

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