Internationalization of European Electricity Multinationals in Times of Transition

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Document Version
Final published version

Publication date:
2022

License
Unspecified

Citation for published version (APA):
Lumbye, K. M. (2022). *Internationalization of European Electricity Multinationals in Times of Transition*. Copenhagen Business School [Phd]. PhD Series No. 32.2022

COPENHAGEN BUSINESS SCHOOL
SOLBJERG PLADS 3
DK-2000 FREDERIKSBERG
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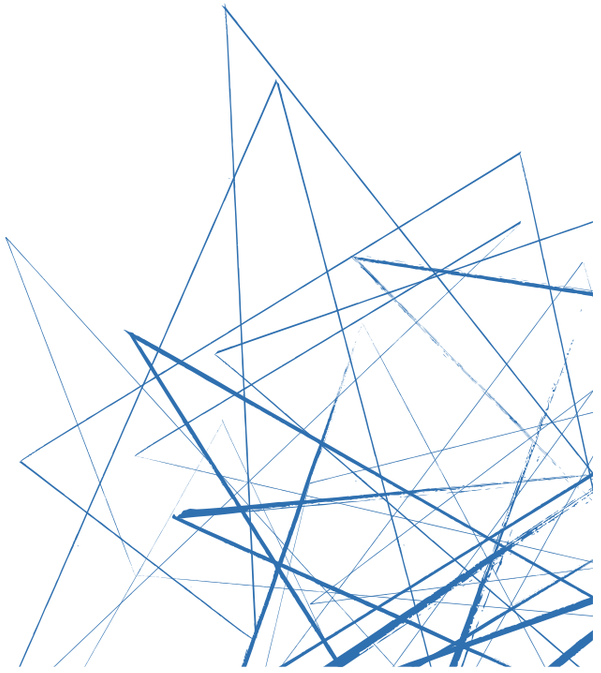
WWW.CBS.DK

ISSN 0906-6934

Print ISBN: **978-87-7568-117-4**
Online ISBN: **978-87-7568-118-1**



INTERNATIONALIZATION OF EUROPEAN ELECTRICITY MULTINATIONALS IN TIMES OF TRANSITION

PhD Series 32.2022

Katrine Maria Lumbye

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CBS PhD School | **PhD Series 32.2022**

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INTERNATIONALIZATION OF EUROPEAN ELECTRICITY MULTINATIONALS IN TIMES OF TRANSITION

Katrine Maria Lumbye

CBS PhD School
Copenhagen Business School, 2022

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First edition 2022
Ph.D. Serie 32.2022

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Abstract

The global transition to renewable energy is of paramount importance to the combat against climate change. In this, truly a *grand challenge* of our time, electricity firms have become a crucial organizational vehicle for change. At the same time, these very firms, as MNEs, are also undergoing processes of internationalization. Together, these developments are drastically reshaping the electricity industry, reshuffling business and re-defining the role of the state. And yet when it comes to European renewable electricity firms, the parallel and interconnected processes of internationalization and the transition to renewable energy remain underexplored.

To help close this gap in our knowledge about these crucial interconnections, the present dissertation contributes with novel empirical and theoretical insights in the context of the European electricity industry. The dissertation is conceptually anchored in international business (IB) literature and further strengthened by insights from broader business and management research. It applies a case-based, multi-level perspective including firm, industry, and institutional levels explored across three papers:

- Paper 1 uses a case study of five firms to explore the significantly different ways firms, when faced with the prospect of tremendous transition, can transform from bureaucratic extended arms of the state to *pro-active* MNEs and, as they begin to specialize in renewable energy technologies, to key agents of change.
- Paper 2 employs the concept of *geographic hedging* to analyze the current process of internationalization of two firms transitioning to renewable energy and argues that in addition to firm, industry, and institutions, the profiles of top management play a pivotal role in strategic change.
- Paper 3 focusses on state hybrids transitioning to renewable energy in order to develop six analytical factors with which to assess how *stateness* works as a potential, flexible resource within a context of firm-specific, industrial, home and host country factors, thus demonstrating how the geopolitical context, often overlooked in IB research, can play a crucial role in internationalization.

Resumé

Den globale omstilling til vedvarende energi er altafgørende for kampen mod klimaforandringer. I denne vor tids helt store udfordring er elselskaber blevet et afgørende organisatorisk redskab til forandring. På samme tid er netop disse selskaber også underlagt internationaliseringsprocesser. Til sammen afstedkommer denne udvikling drastiske omkalfatringer i el-industrien, i business og i statens rolle. Når det kommer til europæiske vedvarende elselskaber, er disse parallelle og sammenhængende processer - internationalisering og omstillingen til vedvarende energi - ikke desto mindre underudforskede.

For at hjælpe til bedre at forstå disse væsentlige sammenhænge bidrager nærværende afhandling med ny empirisk og teoretisk indsigt inden for konteksten af den europæiske el-industri. Afhandlingen er konceptuelt forankret i international business-litteraturen og yderligere forstærket af indsigt fra bredere forskning i business og management. Afhandlingen anlægger et case-baseret perspektiv med flere niveauer, der omfatter selskabsmæssige, industrielle og institutionelle niveauer, der undersøges igennem tre artikler:

- Artikel 1 bruger et casestudie i fem selskaber til at udforske de væsentligt forskellige måder hvorpå selskaber, når de står overfor gennemgribende omstillinger, kan omdanne sig selv fra bureaukratiske forlængede arme til pro-aktive MNE'er og, i det de specialiserer sig i vedvarende energiteknologi, til forandringsaktører.
- Artikel 2 bruger begrebet *geographic hedging* til at analysere de igangværende internationaliseringsprocesser i to selskaber, som omstiller til vedvarende energi, og argumenterer at topledelsens risikoprofiler spiller en afgørende rolle i strategisk forandring.
- Artikel 3 fokuserer på statshybrider i omstillingen til vedvarende energi for således at udvikle seks analytiske faktorer hvormed *stateness* kan vurderes som en potentiel, fleksibel resurse indenfor en kontekst sammensat af selskabs-, industri-, hjemstats- og værtsstats-faktorer, og demonstrerer således hvordan den geopolitiske kontekst - så ofte overset i international business-forskning - kan spille en afgørende rolle i internationalisering.

Acknowledgements

A PhD journey is full of contradicting feelings of excitement, frustration, inspiration, loneliness, collegiality, and creativity. Before I began this journey, I noticed how people with PhD degrees often described their time as PhD fellows as a privilege. Now, I too can say, it has certainly been a great privilege and joy to be working on this PhD dissertation not least because of all the great people I have met along the way and to whom I owe a huge thank you.

First, I would like to express my greatest appreciation to my supervisors Stine Haakonsson and Peter Ørberg Jensen. Thank you, Stine, for being my support all the way and generously providing knowledge, inspiration, advice, and expertise. And thank you for introducing me to, and guiding me in, the often-confusing world of academia. Whenever I felt stuck, you always asked the right questions to get me back on track. Whenever I juggled too many ideas, you helped me focus and constantly sharpen my work. Without your guidance, I would certainly have been lost along the way. Thank you, Peter, first of all for introducing me to the idea of doing a PhD in the first place. This turned out to be a fantastic opportunity. Your thoughtful, substantial, and generous guidance throughout the project helped improving my work and showed me how to think as a researcher. With your sharp comments and deliberations, you always pulled me back on track and I always left your office with renewed inspiration.

I also want to extend my gratitude to the eminent discussants in my work-in-progress seminars and paper seminars, Wolfgang Sofka, Birte Holst Jørgensen, Ulrich E. Hansen, Leonard Seabrook, and Jacob Hasselbalch. Thank you for your rigorous and substantial feedback and comments on my work that challenged me to re-think and re-structure at important times in the process.

A huge thanks to the many people who let me ask tons of questions about their work without whom I could not have completed this study. In no particular order, Christina Aabo who went out of her way to accommodate me, Mogens Rüdiger, Carlo Napoli, Jesper Kühn Olesen, Samuel Leupold, Mark Lie, Gabriel Mejía, Matthias Bausenwein, Michele Bologna, Christoph Ellersgaard, Amandine Chaillous, and Yali Wang. I also wish to express my sincere appreciation to Nicholas Enersen from the Ministry of Foreign Affairs, Ole Emmik Sørensen,

Anders Brix-Thomsen, and Erik Kjær from the Danish Energy Agency, Nikolaj Lomholt Svensson from the Ministry of Climate, Energy and Utilities, Rui Luo at the International Energy Agency, as well as Harsh Vijay Singh, Louise Anderson and the rest of the World Economic Forum energy team.

A special thanks to Andrew Morton for introducing me to the deep complexities of energy systems in a widely different and powerful context in Haiti. The insights on how energy is connected to all parts of human life arising from these projects largely inspired this dissertation.

I have hugely enjoyed the inspiring research, and collegial, environment at the Department of Organization at CBS, which has been a privilege to be a part of. A special thanks to the excellent Political Economy Group for inspirational and always entertaining discussions as well as invaluable comments on my work.

A huge and heartfelt thank you to everyone in the administration particularly Marianne Aarø-Hansen, Marianne Kellmann, Julie Aagaard, and Joan Knudsen, as well as Pia Schjødt Brylov for all your support along the way. I also wish to express my gratitude to the kind and supportive Heads of Department, Signe Vikkelsø and Carsten Greve.

I would like to extend my sincere appreciation to the European University Institute, especially the people at Florence School of Regulation for welcoming me in Italy with open arms in the fall of 2021 despite a looming pandemic.

A big thank you, also to my amazing PhD colleagues for making this journey fun and inspiring especially, Irene, Joachim, Lea, Christian, Lars, Mart, Stine, Sara, Dimitra, Marie, Ann, Alexandrina, Aixa, Mathias, Federico, Bontu, Søren, Malia, and Elias.

Finally, a big thank you to my family and friends for all your love and support. Especially to my husband Rasmus Elling for standing by me with your love, wisdom, and humor as well as invaluable guidance throughout this PhD process. I could not have completed this dissertation without you by my side. And thank you Alva and Ville for truly keeping me grounded and every day reminding me of what is important in life.

Copenhagen, July 2022

Katrine Maria Lumbye

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PART I: FRAME

1. Introduction

Energy is the only universal currency: one of its many forms must be transformed to get anything done. (Vaclav Smil, 2017a)

You see, we should utilize natural forces and thus get all of our power. Sunshine is a form of energy, and the winds and the tides are manifestations of energy. Do we use them? Oh no! We burn up wood and coal, as renters burn up the front fence for fuel. We live like squatters, not as if we owned the property. (Thomas Edison, 1910)

Energy impacts all corners of society and all aspects of modern life. Access to modern energy has brought prosperity, growth, and development. However, the rampant exploitation of fossil fuels continues to cause harm to the planet through pollution and a changing climate. As climate change is intensifying with unprecedented speed, the IPCC estimates that limiting global warming to 1.5℃ and even 2℃ will be unattainable unless the global community delivers immediate and large-scale cut in global greenhouse gas (GHG) emissions (IPCC, 2022). The electricity industry is responsible for a large part of global GHG and a rapid decarbonization of the industry is therefore essential in the combat against climate change. In the past decades, efforts to intensify the renewable energy transition have been made among electricity firms, industries, and nations. Still, the electricity industry is responsible for more than 40 percent of global CO2 emissions and this figure is steadily rising (IEA, 2019a). It follows that the necessary, comprehensive transition of the electricity industry is a tremendous task that will affect all levels of society. Leading electricity producers already play a key role in transitioning to renewable alternatives in an effort that increasingly involves cross-border activity. As such, international diffusion of renewable energy technology and project development through internationalization of renewable energy multinational enterprises (MNEs) play a key role in the ongoing global energy transition.

The transition to renewable energy is not only driven by the climate crisis, but also by concerns over energy security and dependence. Russia's recent invasion of Ukraine has caused what can be labelled as an *energy shock* (Addison, 2022) and exposed, once again, the risk of energy dependence. While the invasion and its consequences may appear unexpected, energy policy has in fact always been tied to geopolitics (Borrell, 2022). In this case, disputes over Russian gas supply through Ukraine have occurred numerous times over the past two decades (BBC, 2006; Reuters, 2009a). Other events in the past e.g., the oil crises in 1973 and 1979, the Iran-Iraq War, the Gulf wars, and tensions in the South China Sea are just few examples of conflicts that when studied closely, are also energy conflicts (Klare, 2014). In addition to states, powerful global energy companies such as *the seven sisters*, or supermajors, e.g., Chevron and BP all play significant roles in today's geopolitics and, through energy, have been part of shaping global history (Vitalis, 2006; Yergin, 1991). Since the 1970s, *the new seven sisters*, many of them state-owned (e.g., Russian Gazprom, Saudi Aramco, and Chinese CNPC (Hoyos, 2007)), have emerged to challenge their Western rivals.

It is against such a geopolitically explosive backdrop that electricity MNEs must navigate their international expansion and concurrent transition to renewable energy. An in-depth understanding of these phenomena and how they are intertwined must therefore include some assessment of the firms' context. Such an assessment will provide crucial nuance and substantial knowledge about internationalization within this specific industry. Therefore, the purpose of this dissertation is to explore the concurrent phenomena of MNE internationalization and transition to renewable energy, and their interrelations through a qualitative, in-depth inquiry. I chose this approach on the premise that novel phenomena must be explored before they can be explained. Hence, exploring this issue, the dissertation asks: **what factors into the relationship between internationalization and the transition to renewable energy for European electricity firms?**

The goal of the combined inquiry of this dissertation is to broaden the understanding of the interrelated dynamics of internationalization and transition and outline possible implications for future research. The research question allows for an investigation looking into different analytical levels, here mainly *firm*, *industry*, and *institutional* levels. By applying several analytical levels, the investigation also explores the emerging phenomena at the interfaces between these levels. For clarity and delimitation purposes, the project focus, in relation to internationalization, is on MNE equity strategies in greenfield development projects, either as joint ventures or sole direct ownership.

The renewable transition of the European electricity MNEs has been all-encompassing, and just a decade ago few would have guessed that some of the former domestic monopolies deeply embedded in the fossil fuel industry would now be labeled the *new clean supermajors* (Eckhouse, Morison, Mathis, Wad, & Warren, 2020 and Toplensky, 2020). The European electricity MNEs are not only transitioning from fossil fuel-based to renewable electricity production but have also undergone a process of liberalization and internationalization.

Despite their drastic transitions, little is known about what drives the MNEs' internationalization or how the dynamics of the internationalization processes and the transition to renewable energy are interconnected. Apart from a few recent contributions (e.g., Bohnsack, Ciulli & Kolk, 2020; Högselius, 2009; Kolk, Lindeque & van den Buuse, 2014), little research has been conducted on the internationalization of the European electricity industry. With renewable sources gradually replacing traditional fuels, we can observe an entire industry with its surrounding institutional landscape changing. The firms' dual transitions from domestic to multinational and from fossil fuels to renewables seemingly happen in parallel. However, the interdependencies and deeper dynamics shaping these transitions are less apparent. In fact, research seems to be absent on internationalization of European electricity generators and former monopolies that takes into consideration the transition to renewable energy. This dissertation explores these important phenomena and offer findings that can be used in future research into these topics.

Another important element to consider when moving towards an understanding of the internationalization of European electricity producers is how the wide-spread state ownership status affects this. Traditionally, the European electricity industry was characterized by domestic state-owned monopolies with vertically integrated structures encompassing generation, distribution, and transmission activities (see the *Energy in Society* section). The EU-led liberalization process spanning the two decades of the 1990s and 2000s drastically changed the industrial landscape resulting in a diverse electricity industry with increasing cross-border activity. Yet, the role of the state in the electricity industry remains significant even if the era of state-owned electricity monopolies is over. One example of this is the diverse ownership configurations with states as minority, majority, or sole shareholders that characterize the electricity industry in Europe today. Another example is the heavy legislative framework surrounding the industry as well as close research and innovation partnerships between firms and public institutions. Yet, research on internationalization of State-owned Enterprises (SOEs)

outside China and emerging markets remains scarce (e.g. Benito, Rygh & Lunnan, 2016; Bruton, Peng, Ahlstrom, Stan, & Xu, 2015; Grøgaard, Rygh & Benito, 2019, and Mariotti & Marzano, 2010). This dissertation will offer new insights on internationalization of state hybrids from small open economies and revisit the concept of *stateness* as a tool in the exploration.

The electricity system as a whole is considered core infrastructure (Mastromarco & Woitek, 2006), or critical infrastructure (Moteff, Copeland & Fischer, 2003), which supplies power to all other critical infrastructure industries in society (Nepal & Jamasb, 2015). The presence of the state therefore goes deeper than percentages of formal ownership in individual firms. Rather, the state is entrenched at the firm, industry, national and supranational levels. Therefore, this dissertation also investigates the role of state ownership in the internationalization of electricity MNEs and contributes with insights on SOE internationalization.

Focusing on the firm, specifically the electricity MNE, the dissertation sets out to explore the MNEs' dual transition paths applying a longitudinal and multilevel perspective. In a sector once completely intertwined with the state and limited to domestic markets, the pace of innovation and development as well as global expansion is accelerating. As such, the electricity sector is seemingly characterized by contradictions and complexities that run deep. Guided by the main research question, I am interested in what is shaping these multifaceted transitions and the interrelations between them. This has prompted the following three sub-questions:

1) *Who is driving the renewable energy transition?*
2) *To what extent is this transition driven by MNEs' anticipated future competitive advantages?*
3) *How do determinants relating to technology, industry, institutions, and firm-specific features lead to different internationalization strategies of state hybrids in the renewable electricity industry?*

However, since the industry, as mentioned above, was formed almost exclusively by SOEs and since state ownership is still widespread in the industry, their status as SOEs connects to internationalization in important ways. This connectivity has prompted two additional sub-questions:

4) *When internationalizing, how can stateness be understood as a resource for SOEs?*

5) *What determines the extent to which stateness is an advantage or disadvantage for the SOE?*

While there are clear overlaps between the five sub-questions, they can be fleshed out around three overall themes, the analysis of which can uncover novel insights about the relationship between internationalization and the transition to renewable energy: 1) MNEs as actors of change: a dual firm evolution; 2) the multi-level determinants of the dual transitions; 3) state ownership and internationalization in the electricity industry.

Each of these subthemes is explored in three individual papers that independently and collectively shed light on the internationalization of electricity MNEs from related perspectives (see Table 1 below for overview).

Table 1. Overview of papers

No.	Title	Research question(s)	Conceptual perspective	Methodological approach	Key argument(s)	Target journal
1	**Green and global: Transformation and internationalization among European electricity providers** Co-author: Stine Haakonsson	Who is driving the green electricity transition? To what extent is this transition driven by MNEs' anticipated future competitive advantages?	Multi-level, evolutionary approach to firm internationalization and transitions with focus on industrial change and integrating perspectives from sustainable transitions literature.	Comparative qualitative case study of five European electricity MNEs and former state-owned energy monopolies triangulated with quantitative measures. Longitudinal perspective applied to assess evolution/transitions. Data: semi-structured interviews, firm documents, policy papers and reports, historical sources, and media.	The role of MNEs develops from being *re-active*, to *active* and finally *pro-active* in changing framework conditions for anticipated change. Findings imply that regime shifts might change incrementally as opposed to in radical shifts. The exploration suggests important interconnections between internationalization and the transition to renewable energy and highlights need for more research.	Competition and Change (under review)
2	**Chase the wind and follow the sun: Determinants of state hybrids' international strategy in the renewable electricity industry** Co-author: Peter Ørberg Jensen	How do determinants relating to technology, industry, institutions, and firm-specific features lead to different internationalization strategies of state hybrids in the renewable electricity industry?	Multi-level approach to firm internationalization. Predominantly resource-based view including institutional industry factors as well as integration of micro-level factors.	Comparative qualitative case study of two European electricity MNEs and former state-owned energy monopolies with historical perspective. Data: semi-structured interviews with firm representatives, and experts from various organizations, firm reports and strategy papers, media, policy papers, and secondary sources.	The paper argues for modifications of Peng and co-authors' *strategy tripod* (2009). First, to embrace factors that affect internationalization and transition to renewables at the micro-level. Second, the need for a dynamic, rather than static, approach to firm internationalization strategy reflecting the continuously changing multi-level factors. The model resembles a braid rather than a tripod. We apply the term *geographical hedging* to denote and sub-categorize internationalization decisions.	Global Strategy Journal (invited for revision and resubmission)
3	**A resource beyond firms: Exploring the fluid role of stateness in internationalization of state hybrids** Single author	When internationalizing, how can stateness be understood as a resource for SOEs? What determines the extent to which stateness is an advantage or disadvantage for the SOE?	Resource-based view of the firm including contingency theory and SOE literature from business and management fields.	In-depth, qualitative case study of Ørsted's entry into Taiwan. Data: semi-structured interviews, official documents and reports, media, policy papers, and secondary sources.	The understanding of how state ownership affects internationalization of MNEs lacks nuance. Firms can choose to use, or not to use, their *stateness* as a multifaceted resource. A state hybrid's stateness can also be used by the host nation, which might pose a risk. Based on findings, the paper identifies factors that shape stateness as a resource.	Journal of International Business Studies/Journal of World Business (TBD)

1.1. Dissertation structure

The dissertation is structured as a paper-based collection of related but individual articles that address one overall research question. Part I introduces and organizes the dissertation, Part II includes the papers, and Part III presents the final conclusions.

Following this introductory chapter, I present the empirical setting by introducing the industry while summarizing relevant historically and contemporary developments. Throughout the dissertation, one of my main arguments for choosing this particular research design is the importance of context and of understanding the complexities in the industry set-up. Therefore, this section also includes an examination of key mechanisms in the industry as well as of challenges. Where relevant, the three papers also outline important background information about the industry and the broader historical setting. Some overlap therefore occurs. However, for the purpose of coherency and legibility, I find it useful to include an extended section on the empirical background in Part I. Hereafter, I continue by reviewing relevant literature that informs the conceptual perspective of the dissertation and which I synthesize into the subsequent analytical framework. Guided by the existing literature and conceptual approach, I thereafter outline my methodological considerations. The methodology chapter presents the qualitative, case-oriented, and interdisciplinary methodological framework that primarily draws on qualitative interviews, documents, literature, and emersion in the field.

Part II includes the three papers that each identify specific research questions with the purpose of answering the overall research question presented above. While Part I of the dissertation outlines the broader conceptual and empirical setting, Part II focuses on three explicitly defined, but related, research topics. Reflecting the interdisciplinary and multi-level perspective of the dissertation, each paper contains an analysis of internationalization in different cross-sections of analytical levels illustrated in Figure 1. A summary of each paper is outlined below.

Part III concludes the dissertation by outlining main contributions and suggestions for future research avenues and policy implications.

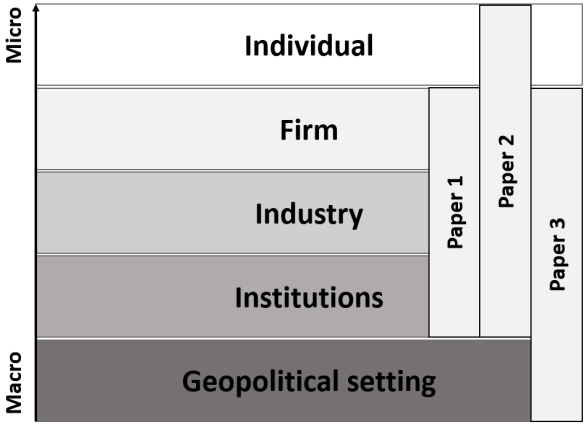

Figure 1. Positioning of the three papers (author).

1.2. Paper summaries

The first paper (P1) explores how the transition to renewable energy and concurrent liberalization efforts have affected the internationalization of European electricity MNEs in a historical perspective. To address this issue, the paper develops a framework that captures the interconnected developments of industrial processes and transitions. The framework is guided by literature from international business (IB) and globalization research agendas, while also integrating perspectives from the sustainable transitions literature. Hence, the framework considers that industrial change is rooted in a broader societal evolution that includes firm, industry, and institution-level changes domestically, as well as across borders.

The paper is structured as a comparative qualitative case study incorporating quantitative measures to illustrate changes in the firms' global footprint and energy mix. We selected five European electricity firms sharing a legacy as former domestic, fully state-owned energy monopolies that have evolved into different types of MNEs. Namely, Électricité de France (EDF), Energias de Portugal (EDP), Enel (Italy), Vattenfall (Denmark), and Ørsted (Denmark). The criteria for choosing which firms to select for analysis in the three papers, as well as in-

depth arguments for choice of research design, are outlined in methodology chapter as well as within the paper.

To illustrate the firms' changing roles in the energy transition and internationalization, we define three historic eras that represent the changing roles of the MNEs with the oil crisis in 1973 as starting point. We find that the role of the firms develops from being *re-active*, to *active* and finally *pro-active* in changing framework conditions for anticipated change. By drawing this conclusion, we show how regime shifts might change incrementally as opposed to in radical shifts that is usually highlighted in the sustainable transitions literature. Finally, zooming in on the last era, we provide an exploratory account suggesting important interconnections between internationalization and the transition to renewable energy (see Figure 2 in P1). These findings spell out paths for future research and underscore the need for further interdisciplinary attention to MNE evolution.

The second paper (P2) takes a similar approach by investigating the determinants behind internationalization and the concurrent transition to renewables in two European MNEs, Ørsted and Enel, both part of the sample in the first paper. However, the conceptual framework in this paper allows for a deeper and more specific analysis of firm-level determinants of international expansion and the renewable energy transition, while also considering the role of the broader industrial and institutional settings. The paper illustrates how the change from fossil fuel-based technologies to renewable energy has transformed the industry including different patterns of internationalization.

Conceptually, the paper's structure is inspired by Peng and co-authors' *strategy tripod* (Peng, Sun, Pinkham & Chen, 2009) and suggests modifications to embrace factors that affect internationalization and transition to renewables at the micro-level. We also highlight the need for a dynamic, rather than static, approach to understanding firm internationalization strategy that reflects the continuously changing multi-level factors. Hence, the model resembles a braid rather than a tripod. We apply the term *geographical hedging* to denote and categorize internationalization decisions by each firm. In this way, we show how the firms have developed into two distinctly different types of firms driven by individual configurations of firm-(including the individual-level), industry-, and institutional-level factors. We also identify relevant characteristics pertaining to the renewable electricity industry and argue for the

relevance of taking this into account to ensure a comprehensive analysis of renewable electricity firms.

The third paper (P3) explores what factors that determine to what extent stateness is an advantage or disadvantage in internationalization of energy MNEs in transition. While P1 and P2 indeed consider state ownership status as one factor in the evolution of the former monopolies, P3 further dissects this particular aspect. The conceptual framework derives its fundament from the IB literature while also integrating literature on SOEs. The paper is designed as an in-depth, qualitative, single case study investigating the factors that have impacted Ørsted's entry into Taiwan. Specifically, the paper explores if and when stateness is an advantage for state hybrids when they internationalize. Hence, the study explores how the concept of stateness can be used and developed in the context of firm internationalization.

With IB researchers as its primary audience, the paper introduces a framework based on the resource-based view of the firm that incorporates a contingency-inspired perspective. Developing a conceptual framework that includes the firm-, industry-, institutional- and geopolitical levels, the paper argues for an integrated and holistic approach to broaden the understanding firm internationalization in times of transition. Hereby, the paper joins a budding trend in IB literature that argues for including broader contextual considerations in certain research designs. To capture characteristics specific to state hybrids the framework also integrates SOE literature. The bulk of SOE literature that analyzes the internationalization of state hybrids focuses on China and other emerging markets. Although conditions and institutional frameworks differ enormously, SOEs from open economies and their role in internationalization have largely been neglected. By analyzing a state hybrid from a small open economy, the paper thus addresses a significant gap in existing SOE literature.

Together, the framing paper and the three individual papers zoom in on firm internationalization within an industry in transition and cross-cuts the different analytical levels. The figure below illustrates the analytical positioning of the dissertation.

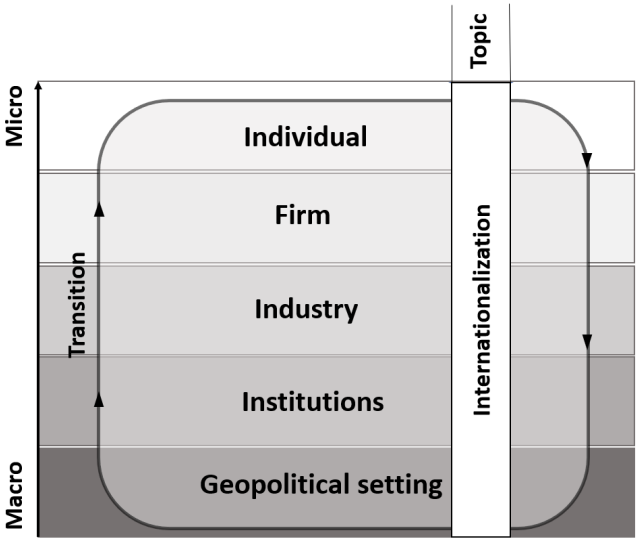

Figure 2. Analytical positioning of topic and contributions (author).

2. Background and setting: Energy in society

Energy is fundamental to every critical infrastructure in modern society from water, sanitation, food, mobility to manufacturing, IT, and communications. Energy can in this way be said to provide the link between technology and humans. The downside is that its generation is one of the largest contributors to climate change. The transition to renewable energies is therefore vital and at the same time one of the most complex transitions in modern society. While the consequences of the anthropogenic climate crisis are evident, research shows that governments all over the globe are failing to respond in an adequate manner (Ripple, Wolf, Newsome, Barnard & Moomaw, 2020). This failure of governance – even by the most developed states – stands in stark contrast to the fact that renewably generated electricity can now compete with conventional energy on price (WEF, 2021). Indeed, electricity firms that are leading the transition to renewables are transitioning *ahead* of national and international policies and regulations (Eckhouse et al., 2020; Toplensky, 2020). Thus, in some cases, firms, not states, are paving the way for at least part of the renewable energy transition. Interestingly, many of these firms were originally established as public entities by so-called 'entrepreneurial states' that have invested heavily in renewable energy innovation and technology (Mazzucato, 2011; Mazzucato, 2016).

Among renewable[1] energy solutions, renewable electricity technologies are the most efficient and the electricity industry is therefore where the renewable energy transition is happening fastest. Consequently, electrification of all sectors of society such as heating, cooling, transport, and industries, and decarbonization of the electric power supply are two key components available for the EU Commission to be able to adhere to the Paris Agreement. In addition, the EU has established its internal goal of a 32 percent share of renewable energy in the energy[2] mix

[1] *Renewable* is used (as opposed to *sustainable*) as the technically most precise term denoting certain sources of primary energy. The term sustainable is used in contexts where it applies to specific literature and theoretical perspectives.

[2] A common misconception is to equate *energy* production with *electricity* production. The renewable energy share of a nation's *electricity* production is often significantly higher than the renewable energy share of a nation's *energy* production since the latter covers all types of energy production.

by 2030[3], and carbon neutrality in 2050.[4] In 2020, the share of renewable energy reached 22 percent in the EU (EEA, 2022). Bearing in mind the future prospects of, first, electricity as the key energy currency and, second, the estimated 20 million people globally who will gain access to electricity each year until 2030 (IEA 2019a), it is certain that worldwide electricity demand will increase significantly.

The past decade has seen an increased focus on how energy relates to a broader range of societal topics. Firstly, the rising awareness of the global climate crisis has put energy, the world's largest source of pollution, on center stage as both problem and solution. Combustion of fossil fuels for electric power generation represents one of the largest chunks of GHG emissions on a global level (IEAb, 2021; Resource Watch, 2022). The transition to renewable energy sources is therefore pivotal in fighting global climate change and hence a key priority in the Paris Agreement.

Secondly, the understanding of energy as an essential, underlying element of sustainable development has only recently become mainstream. A testament to this were the 2015 Sustainable Development Goals (SDGs) dedicating goal number seven solely to energy and, in addition, providing clear links between energy and the remaining goals. Only 15 years earlier, the Millennium Development Goals (MDGs) failed completely to address energy. In fact, the United Nations Millennium Declaration that preceded the adoption of the MDGs, as well as the MDGs themselves, even failed in mentioning the word *energy* itself (United Nations, 2000).

Finally, energy as a political power tool for states with large oil and gas reserves has long been on the agenda of politicians, international organizations, and firms around the world. However, the issue has until very recently largely gone unnoticed in the general political debate in Europe despite returning gas disputes between Ukraine and Russia since 2005 in addition to tensions between some EU nations and Russia around the Russian Nord Stream 2 gas pipeline (De Maio, 2019; O'Sullivan, 2017; Reuters, 2009b). Following the war in Ukraine in 2022, fossil fuel dependence has reemerged as a critical issue for all European states (European Commission, 2022). Russia's use of energy as a 'geopolitical weapon' (e.g. Herbert, 2022; Keating, 2022) to prevent an energy dependent Europe from direct conflict intervention has in turn functioned as a

[3] The EU 2030 climate and energy framework.
[4] The European Green Deal.

developing agent: as a crisis, it has revealed how the lack of diversification in energy sources and suppliers has placed the continent in a vulnerable position.

The following section introduces the energy industry and the characteristics of the electricity system. Hereafter, the renewable energy transition and the interconnectedness with internationalization are briefly discussed. Finally, the section returns to some of the geopolitical issues that affect energy and the renewable energy transition.

2.1. The energy industry: an overview

Broadly defined, the term *energy industry* encompasses all industries involved in producing and selling modern energy[5], namely: the fossil fuel industry, including extraction, refining and distribution firms; the nuclear industry; the electricity industry, including generation, transmission, and distribution firms; and finally, the renewable energy industry comprising firms involved in wind, solar, hydro, tidal and wave, biomass, and geothermal energies. The below figure provides an overview of the different stages of energy production and end-uses presented as a value chain – with bold black highlighting the focus area of this project:

[5] Here excluding the traditional energy industry meaning collection and sales of firewood prevalent in developing countries.

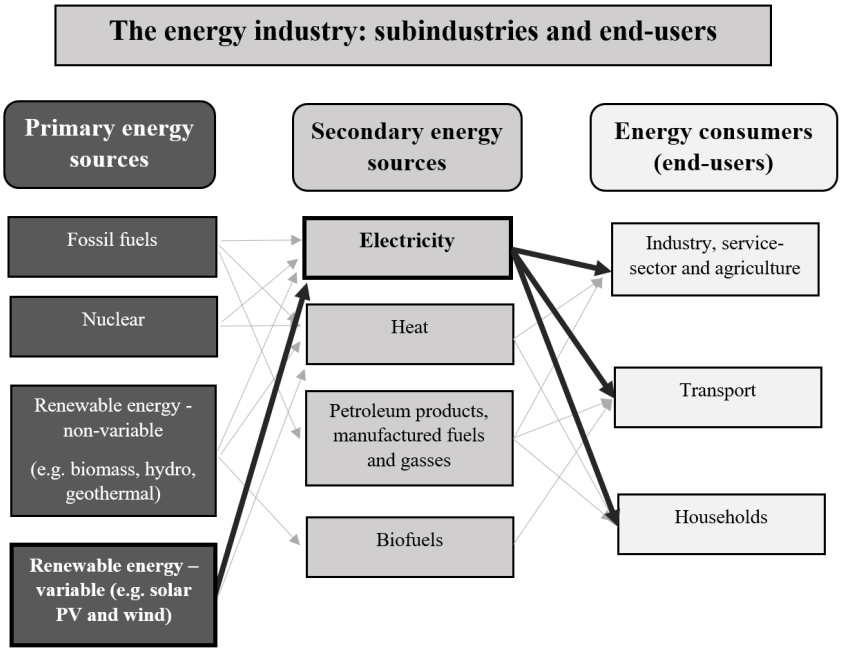

Figure 3. Overview of the energy industry: sub-industries and end-users (author).

Primary energy sources are all energy sources found in nature. Non-renewable sources are oil, coal, natural gas, natural thorium, and natural uranium. Renewables are divided into variable renewables sources[6] such as wind, solar and tidal power, and non-variable renewables such as geothermal, hydro and biomass sources. When primary energy sources have been extracted (fossil fuels) or harvested (renewables) they are ready to produce secondary energy sources. Electricity and heat can be generated using all four primary energy categories. Petroleum products, fuels and gasses are produced by fossil fuels while biofuels are produced using non-variable renewable energy sources. Subsequently, secondary energy sources are ready to be transported to end-users. Except for heat, which is generally not used in transport, all secondary energy sources can be utilized by all types of end-users.

[6] The term *variable renewable energy* covers energy sources such as sun and wind that are intermittent in nature meaning that availability fluctuates according to the weather and/or sunlight.

The energy industry setup is complex, and there are overlaps between industry entities even though they are depicted as separate in the above figure. An energy firm can choose to integrate both primary and secondary energy production stages, or it can specialize in just one industry activity. Similarly, a firm can choose to integrate several types of activities within the primary energy supply or within the secondary energy supply – or be active in only one. Thus, industry borders are blurry, and the exact composition of sub-industries depends on individual firm structures. As illustrated, the electricity industry can be dependent on either fossil fuels, nuclear energy or renewable energy sources, or a mix, to produce electricity. Its end-users are all sectors in society. The following section will elaborate on the electric power supply system.

The electric power supply system

The dissertation focuses on electricity firms. To explain the role of these firms in the renewable energy transition and the challenges and opportunities they face when internationalizing their activities, I will start by outlining their role in the electric power supply system.

Electricity firms are active in one or more of the following three activities: power generation, transmission, and/or distribution. Power generation is the actual production of electricity from primary energy sources that are either non-renewable or renewable. This takes place at power plants, solar parks, or wind farms. When electricity has been produced it must be transported. Most transport of electric power is done through the electrical grid since it is the most efficient and involves the least amount of energy loss. Electric power can also be converted into other energy currencies and be physically moved and stored outside the grid. This is called power-to-x (PtX).[7] PtX technologies are relevant for electrolyzing power to fuels for hard-to-abate sectors such as maritime transport, heavy industry etc. PtX can also be used for back-up where variable renewable energy is the main source of power generation and supply cannot be planned. When needed, the fuel can be converted back to electric power and into the grid. However, PtX technologies are currently not widely developed, and disagreement remains among experts on the severity of challenges with scale-up of PtX e.g., water usage and costs (Danish Energy Agency, 2021; Rothenborg, 2022).

[7] PtX is a broad term and not clearly defined (Burre et al., 2020), but in this paper it refers to electric power converted into liquid fuels, heat, pumped storage or gas such as hydrogen.

When a power plant generates electricity, step-up transformers convert the electric current into a higher voltage. A Transmission System Operator (TSO) manages the transmission grid, which includes a network of high voltage power lines and substations. Lastly, the Distribution System Operator (DSO) manages the distribution substations and the distribution grid with which to channel electric power directly to end-consumers such as private households, firms, organizations, and industry. In Europe, TSOs are often state-owned with notable exceptions (e.g., parts of the grids in Italy, Greece, and Portugal), whereas generators and DSOs have been vertically disintegrated and partly or fully privatized.

The three types of activities (generation, transmission, and distribution) are very different in nature and demands a diverse range of technologies and resources. As mentioned, while the generator produces electricity, the TSO transports it long-distance, and the DSO transports it to the consumer. The transition to variable renewable energy sources therefore affects generators as well as TSOs and DSOs, but in different ways: Generators must deploy new technologies to produce electricity substituting conventional coal-, oil-, and gas-fired power plants with mainly solar and wind farms. TSOs and DSOs, in turn, must upgrade their grid technology to be able to absorb a greatly fluctuating supply of electric power while securing a steady flow of electric power to consumers without brownouts or blackouts. These challenges are diverse in nature, and while it is important to understand the dynamics of the whole electric power supply system, this dissertation focuses on electric power generators, or electric power generation firms. For the purpose of simplicity, these are hereafter labelled *electricity firms*.

Liberalization and internationalization

The dissertation explores the parallel transitions of firms developing from national to international firms and from being fossil fuel dependent to renewable energy reliant. Until the end of the 20th century, power generation in Europe was dominated by large national monopolies. Many EU member states had a sole vertically integrated firm operating as generator, TSO, and DSO and often owned by national or regional governments. These firms were all ‘Born Local’ energy firms and neither competition nor internationalization were part of their initial strategy. However, a wave of liberalization of the electricity market prompted by the European Commission took off in 1996 and was followed by wider implementation plans in

2003 and 2009 (EU, 2020). The figure below illustrates the reorganization of the electricity sector as a result of the liberalization.

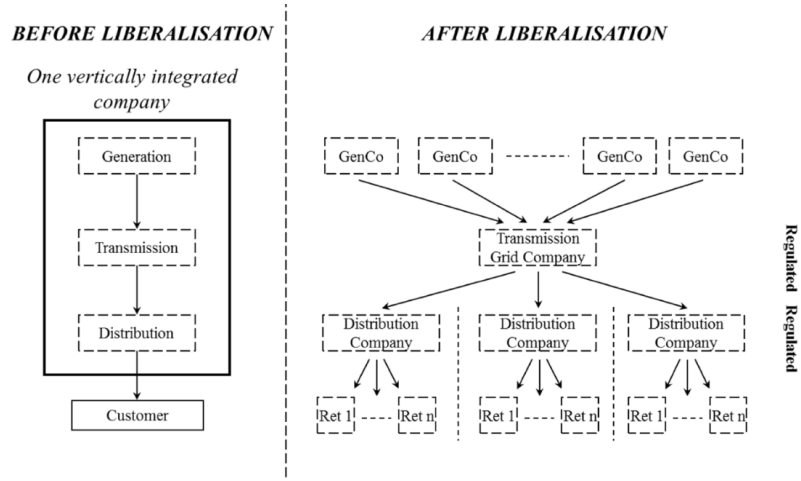

Figure 4. Liberalization of the electricity market (source: Pepermans, 2019).
Note: GenCo = generator. Ret = retailer.

This undoubtedly represents one of the most pervasive transitions of any industry in Europe within the past couple of decades along with telecommunication and IT industries (see Figure 4). The aim of liberalization in the electricity market was to create an environment for competition in electricity generation and retail, while keeping TSOs and DSOs under some degree of regulation (Pepermans, 2019). Today, nearly all EU member states[8] have liberalized their electricity markets and yet still maintain typically one TSO per member state under state control. DSOs and generators now generally operate on market terms and therefore many new actors have emerged.

[8] Except Malta and Bulgaria

2.2. The renewable energy transition

The renewable energy transition is visible across society, from wind turbines and solar parks on open stretches of land to quiet electric vehicles and allocated parking lots with charging stations dotting the urban landscape. More subtle manifestations of the transition appear, for example, within power plants that are substituting fossil fuels with different types of biomass. While the renewable energy transition is moving forward all over the globe, "the rapid but uneven growth of renewable energy is one the most important and least understood developments of our time (Aklin & Urpelainen, 2018: 6)."

Today, the transition to renewable energy is part of a broader global megatrend driven by factors beyond clashes of power asymmetries: the sustainable transition of all parts of society such as consumption, production, waste management etc. – or the Second Deep Transition (Schot, 2016). In the case of energy, the transition entails that renewable energy sources substitute fossil fuels in a growing part of the primary energy supply. The below Figure 5 illustrates how recent and relatively modest the energy transition is. In Figure 6, which shows the transition only in the electricity industry, the share of renewables is evidently higher than in the total energy consumption.

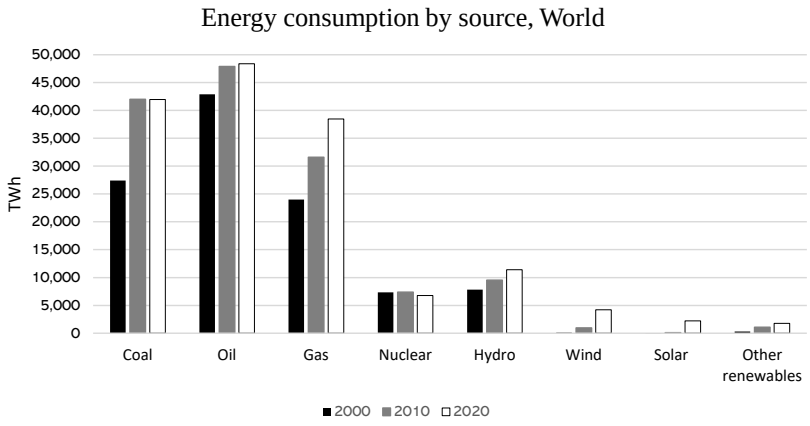

Figure 5. Energy consumption by source, world, 2000-2020.
Data source: Our World in Data based on BP Statistical Review of World Energy.
Note: *Other renewables* include biofuels, geothermal, biomass, and waste energy. An inefficiency factor (the *substitution method*) has been applied for fossil fuels.

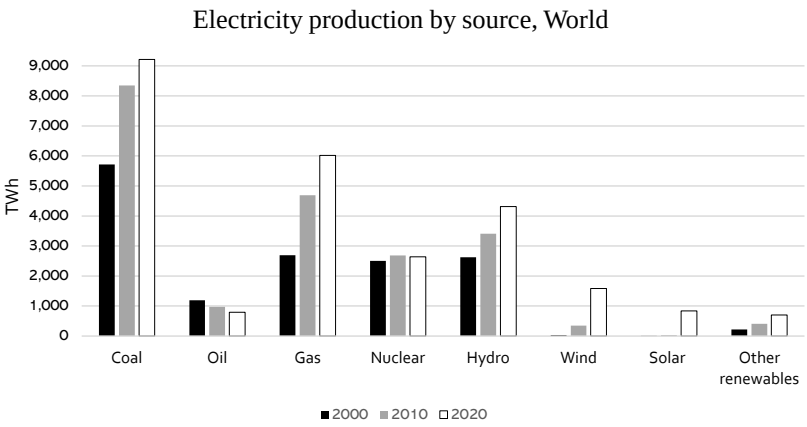

Figure 6. Electricity production by source, world, 2000-2020
Data source: Our World in Data based on BP Statistical Review of World Energy, Ember Global Electricity Review (2022) and Ember European Electricity Review (2022).
Note: *Other renewables* includes biomass, waste, geothermal and wave and tidal energy.

The renewable energy transition is strongly policy-driven with international organizations and multilateral agreements pushing governments to create institutional environments favorable to renewable energy solutions. Depending on the country, the transition translates differently into policy frameworks. At the same time, the transition is also technology-driven, with innovation and improving technologies constantly stretching the limits for what is possible. Here firms play an important role with lead firms pushing the development and upscaling of renewable energy technologies.

Interestingly, the countries that are leading the renewable energy transition are those where the state is actively supporting and funding innovation and technology, what Mazzucato calls the entrepreneurial state (2011). In the European electricity industry, the state has undoubtedly played a significant role in innovation and development. To understand how the renewable energy transition affects the electricity industry, it is therefore necessary to adopt a multilevel framework since this transition is driven by a complex policy-business system characterized by strong interdependencies across productions networks and authorities. This is also reflected in the analytical framework and the methodology of the dissertation.

As mentioned earlier, electricity, more than other energy currencies, plays a key role in the renewable energy transition. Electrification is critical to reduce GHG emissions because of the high energy efficiency of electricity-based renewable energy technologies as opposed to other renewable energy technologies (Diesendorf & Elliston 2018; Dennis, Colburn, & Lazar 2016). A key element of the renewable energy transition is therefore electrification of all sectors of society that currently rely heavily on fossil fuels, specifically transport, industry, heating, and cooling. Consequently, while transitioning to renewable energy, the electricity industry acts as a facilitator of the sustainable transition of many other industries.

Many obstacles stand in the way of a rapid transition to renewable energy. One is the *carbon lock-in* in the electricity industry (Sato, Elliott & Schumer, 2021). This term describes the way functioning fossil fuel power plants lock-out new renewable energy technologies from entering the energy system. A fossil fuel power plant's operational lifetime is usually 30-40 years. From both financial and political perspectives, it can be difficult for firms as well as governments to shut down well-functioning power plants to make way for wind and solar farms.

A related impediment is the price tag of the renewable energy transition. Building new wind and solar farms is extremely costly and so is the construction of the necessary infrastructure needed to enable a renewable energy-based electricity system i.e., updated transmission lines, converters, and smart grids. Most European governments have introduced a broad portfolio of subsidy schemes to encourage investments in wind and solar power. However, in some of the most competitive markets such as Spain, the Netherlands, UK, and Denmark, new wind and solar projects are now often operated with limited or no subsidies. This development is a sign that renewable energy generated electricity is slowly becoming a cost effective and financially viable alternative. However, it also illustrates how the regulatory and institutional framework conditions are constantly changing, which represents a further challenge to firm internationalization.

So far, I have shown how the electricity industry is currently facing a plethora of challenges and opportunities. To make analytical sense of this situation, it is necessary to examine the evolution of the energy industry and the emergence of the renewable electricity industry. A broad historic view on energy evolution is useful for understanding one of the most fundamental challenges of the transition to renewable energy. Indeed, this transition is the first time the world attempts to downgrade to less efficient energy sources, or energy sources with less power density, than the

prevailing ones (Voosen, 2018). Not only do variable renewable energy sources have significantly lower power density than coal and especially oil, but variable renewable energy sources are also inherently unpredictable and difficult to store without significant loss. In essence, electricity firms are transitioning to energy sources that are many times less efficient and less reliable than the previous, while world electricity consumption and dependency increases (IEA 2019b).

This is a tremendous task for the former electricity monopolies that face three overarching challenges. First, a transition to renewable energy which is completely new territory. Although the science behind man-made climate change has been around for decades, if not centuries (Arrhenius, 1896), EU governments and firms have only recently embarked on a renewable energy transition that reaches further than the experimental level. Second, firms must be able to adapt to political and legal frameworks[9] that are frequently changing because of alternating governments and evolving technologies. Third, states originally created energy monopolies to secure the supply of energy and electricity from fossil fuels, nuclear or in some cases non-variable renewable energy. As a commodity, electricity generated by variable renewable energy carries inherently different characteristics. Therefore, the transition to variable renewable energy requires fundamental changes to the firm structure, business model and strategy as well as to the surrounding infrastructure.

Renewable energy and internationalization

The transition to renewables is reshaping the entire energy infrastructure and thus the electricity generation industry. Firms that generate electric power at conventional power plants are dependent on procurement of fossil fuel (typically oil, coal, and natural gas) from suppliers. As with all activities along the electricity value chain, conventional power generation is extremely capital-intensive but also highly geographically concentrated (Schwinkendorf, 2008). However, when transitioning to renewable technologies, energy sources are readily available wherever geographic conditions permit. As opposed to conventional power generation plants, wind farms and solar PV parks can therefore be distributed in many locations. This leads to electricity-producing firms being able to offer an inherently different product in their home markets, and increasingly also abroad, depending on their ability to deploy new and evolving renewable

[9] Including subsidy schemes that vary greatly across countries and regions.

energy technologies. This, in turn, creates previously unseen possibilities for internationalizing power generation.

Hence, the transition to variable renewable energy sources is changing the fundamental organizational industry characteristics through industry disruption in parallel and in connection to the two related transitions: liberalization and internationalization. Because liberalization not necessarily leads to, but merely enables internationalization, this dissertation distinguishes between these transitions while recognizing their connectedness. In short, the dissertation focusses on the dual transitions of internationalization (enabled by liberalization) and the renewable energy transition. While some industry characteristics remain the same as before liberalization, most former domestic energy monopolies in Europe have now internationalized. However, the type of activities that are internationalized and the importance of international operations to their core business and competitiveness, however, seem to vary greatly across the industry. As a direct result of the transition to renewable energy, the electricity industry is becoming increasingly more fragmented in most countries in the world. For example, offshore wind power development requires strong technological skills and large amounts of available capital to invest. Hence, this technology does not suit all types of electricity MNEs. Internationalization therefore becomes the way to spread offshore wind power across countries and regions where offshore wind power potential is high. Enel and Ørsted are examples of such *new clean supermajors* that become organizational mechanisms for the international dissemination and transfer of renewable energy solutions. Thus, the way in which they internationalize their activities is relevant for adoption of energy solutions in host countries This, in turn, affects the efficiency and effectiveness of the combat against climate change. The dissertation sheds light on how the renewable energy transition and the concurrent internationalization of the European electricity industry are interrelated.

2.3. Energy and geopolitics

In a historical perspective, the oil crises of 1973 and 1979 were stark reminders of just how critical energy is to modern societies around the world. It also exposed the close connection between energy and geopolitics. As mentioned above, this realization has reappeared in the collective European and broader Western consciousness following the war in Ukraine. The 1973 oil crisis was a result of an embargo imposed by the Organization of Arab Petroleum Exporting

Countries specifically targeting countries supporting Israel in the Yom Kippur War. Similarly, the 1979 oil crisis, or *oil shock*, was a direct consequence of the sudden halt in the oil production in Iran caused by the Iranian Revolution that same year. Both incidents were instrumental in shaping energy systems as well as international relations up until today. This is also why an in-depth analysis of the evolution of the European electricity industry must include a historical perspective. Interestingly, these incidents also created an apparent necessity for the emergence of the entrepreneurial state to invest in technology and innovation for energy alternatives. In this structural transition of capitalism moving from Fordism to neoliberalism, authorities increasingly saw the need to act as entrepreneurs and investment facilitators.

In a broader political perspective, the renewable energy transition seems to be tinkering with some of the most well-established societal structures and international relations. Within the last five to ten years, the transition to renewable energy has created a new energy reality in which the electricity industry is becoming increasingly more fragmented. A varying percentage of solar parks and wind farms in most countries are now foreign-owned – in some cases by foreign governments. This highlights the acute need to better understand the recent and ongoing re-organization of an industry that is key to the sustainable transition as well as key to a nation's infrastructure. Not least because the energy industry represents a part of a nation's critical infrastructure (ENISA, 2016).[10] While transmission and distribution networks are often highlighted as critical energy infrastructure, generation is also a vital part of critical energy infrastructure (Onyeji, Bazilian & Bronk, 2014; Zahariadis, Volitis, Bertoncini, Drossos & Sarakis, 2017). Firms operating within the energy industry are thus by extension in some way dependent on governments and vice versa.

These issues are not only relevant in high-tension conflicts such as Russia's war in Ukraine. In 2021, the French government threatened to cut power supply via EDF to the UK channel island of Jersey over a dispute about fishing licenses (Boffey, 2021). Considering the highly geopolitical role that the former national monopolies still play in the European electricity industry, it will be interesting to follow the consequences of EDF's recently announced renationalization on the wider industry in Europe.

[10] One of the first uses of the term critical infrastructure is found in *The Report of the President's Commission on Critical Infrastructure Protection, Washington, US (1997)* defined as essential services that underpin society and is critical to the national defense, economic prosperity, and quality of life.

To sum up, the energy industry has some key characteristics that set it apart from other industries. Energy has played a central role in conflicts and geopolitical relations for as long as prosperity and development has been driven by modern energy. Therefore, an in-depth analysis of the internationalization of the electricity industry must include historical and contextual factors as well as the recognition that geopolitical developments have an influence on the industry.

The renewable energy transition of the energy sector is steadily gaining impetus in many countries and as a result, the decarbonization of the energy sector is also moving forward. However, many experts agree that the adoption and implementation of renewable energy technologies is still at an early stage (Smil 2017b; Lee & Birol, 2020). Even so, there is no doubt that the renewable energy transition will continue since the key drivers are the underlying and very real threats of a deepening and irreversible climate crisis as well as energy dependency and risk of scarcity. Therefore, the internationalization of renewable electricity MNEs will likely also intensify, which is why more research is needed on the complex interrelations of internationalization and the transition to renewable energy.

3. International business and beyond: Towards an analytical framework

This dissertation is conceptually anchored in IB literature while also drawing on broader business and management research to explore the internationalization of electricity MNEs. In essence, IB is an interdisciplinary and diverse discipline with a potential to offer a deep understanding of complex cross-border issues. As Doz notes,

> International business (IB) is a rich, open, and complex field of study, partly because the world is intrinsically rich and complex, but also because IB is free from any single core paradigm, does not pursue a single dominant central research question and does not abide by generally accepted simplifying assumptions that would drive the choice of research methods and tightly bound areas of research relevance (2011: 582).

Indeed, IB as a research field undoubtedly has the potential to unpack many of the complexities of internationalization of renewable energies. Such complexities are often embedded in the empirical context of the investigation. Some IB scholars argue that context has often been ignored, or not adequately assessed, in the bulk of IB literature (e.g., Oesterle & Wolf, 2011; Teagarden, von Glinow & Mellahi, 2018). Also, Doh calls for more phenomenon-based research in IB with a "research question related to a contemporary, real-world phenomenon." (2015: 611)

To capture contextual complexities in the internationalization and transition of European electricity MNEs, the dissertation therefore draws on literature outside IB as well, for three overall reasons. First, looking at transitions in an industry characterized by fast-paced evolution, traditional business and management perspectives often fall short in capturing nuances and ongoing change. Second, considering that the industry is characterized not only by wide-spread formal state ownership, but also strong and enduring state involvement, there are gaps in recent IB literature on how state ownership affects internationalization. Third, the energy industry is technologically, economically, and socially complex and therefore the analytical framework should consider and integrate contextual factors that can capture industry-specific nuances.

As mentioned in the Introduction, the internationalization focus of the dissertation is MNE equity strategies in greenfield development projects either as joint ventures or sole direct ownership. The challenge with such research is to integrate appropriate factors in the analysis that can shed light on relevant contextual issues *without* losing complexity and depth. Taking a cue from Teagarden and colleagues' suggestion (2018) to focus on precision in the contextual approach, the dissertation argues for including *micro-context*, *firm-context*, *industry-context*, *institutional context*, and *geopolitical context* (Figure 1). These multiple levels are thus integrated in the analytical framework for this dissertation which will be presented towards the end of this chapter. Empirically embedded in the electricity sector, the dissertation argues that context is key to a comprehensive analysis of the internationalization of MNEs. Through the analytical framework in this dissertation, the hope is to contribute with fruitful suggestions to incorporate context in internationalization research.

The following Section 3.1. takes stock on recent developments within IB research and discusses new ways for IB to address grand challenges. Section 3.2. reviews relevant literature and thereafter outlines the analytical framework for the dissertation that attempts to capture the most important drivers of internationalization of renewable MNEs based on relevant literature.

3.1. Adapting International Business research to tackle grand challenges

IB is a diverse, rich, and cross-cutting discipline that has proven to be well-equipped for shedding light on cross-border activities. However, the continued relevance of international business and management research has long been fiercely debated among scholars in the field. Back in 2002, the title of Buckley's challenging contribution 'Is the International Business Research Agenda Running Out of Steam?' (2002) aptly captured the essence of the debate. Pointing to the three *big questions* of past IB research, 1) explaining flows of FDI, 2) explaining the existence, strategy and organization of MNEs, and 3) understanding the development of internationalization of firms and new developments of globalization, Buckley argued that these topics have been "largely and successfully tackled" which leaves the IB field in need of new challenges to address (2002: 365). Around the same time, other scholars debated the same issues in an attempt to identify the next big question(s) for IB scholarship (e.g., Peng, 2004 and Shenkar, 2004).

Today, twenty years later, the debate articulated by Buckley's comment lives on and has taken new directions reflecting the challenges of the contemporary global economy. Increasingly, scholars are calling for a reorientation toward the global grand challenges of our time (see e.g., Abrahamson, Berkowitz & Dumez, 2018; Buckley, Doh & Benischke, 2017; Ghauri, Strange & Cooke, 2021). Cross-border economic activity, the essence of IB's scope, is deeply intertwined in the world economy, global development and social well-being for human societies. Consequently, authors such as Doh (2019) and Rygh (2019) have advocated for an increased attention to the social value of MNEs. In a similar vein, Dörrenbächer & Gammelgaard (2019) encourage IB scholars to learn from related disciplines and develop stronger critical thinking about MNE activity. They argue that by ignoring what they deem are issues critical to the economy and society, the IB literature is at risk of reduced societal relevance in the long run. In a move toward an inclusive research agenda, they call for interdisciplinarity, recognition of normativity, and critical perspectives on IB that deviate from evidence-based and positivistic IB research (ibid; Dörrenbächer & Michailova, 2019). The IB literature with all its subfields is rich in diverse perspectives on cross-border economic activities. Applying these perspectives and well-established concepts in the context of the renewable energy transition would therefore undoubtedly contribute immensely to the understanding of the dual phenomena that are explored in this dissertation: the concurrent internationalization and transition to renewable energy in the electricity industry.

Indeed, the renewable energy transition has received few perspectives from IB research (Ghauri et al., 2021; Shapiro, Hobdari, & Oh, 2018). Only recently have IB scholars begun to scratch the surface. Some examples include Doh and co-authors who outline the main challenges of the renewable energy transitions and propose new, broad research agendas (2021). In a similar vein, Bass and Grøgaard (2021) outline the drivers of the renewable energy transition in the broader energy system and suggest future research topics to cover the changing nature of FSAs as well as the institutional complexities. Bohnsack and co-authors study business models of 14 European firms across the electricity sector in a mix of generators, technology providers, consultancies, TSOs, and DSOs (2020). The critical stream of IB literature also offers few but valuable contributions on renewable energy, e.g., Asemokha and co-authors (2019) and Kaartemo and Gonzalez-Perez (2020). In research areas closely related to IB, innovation and technological change scholars have also focused on energy-related topics (e.g., Elola, Parrilli &

Rabellotti, 2013; Haakonsson, Kirkegaard & Lema, 2020; Hansen & Lema, 2019; Lema, Quadros & Schmitz, 2015).

These are important contributions and serves as a useful outset to expand the energy focus in IB research. Due to the technical, economic, and social complexities and sheer immensity of the energy industry, there is a need for a much stronger IB focus on the energy transition to reach an understanding of the underlying dynamics. The strong embeddedness of the energy industry in local economics, societies, and environment further highlights the need for energy-related IB research to integrate contextual factors in future research (such as in Hansen, Nygaard & Dal Maso, 2021; and Swilling, Nygaard, Kruger, Wlokas et al., 2022). While keeping within the realm of social science, this focus should rest on an understanding of the fundamental technological mechanisms and dynamics of the energy system. The geographic, industrial, societal, and economic universality of the renewable energy transition makes this topic essential for the IB field. This is because changes in the energy industry, whether technical, institutional, or industrial affect most other industries and businesses across the globe.

Equally, I would argue that the nascent sub-field of energy-related social science needs an IB perspective. Afterall, the renewable energy transition is implemented by firms, states, and communities in concert and depends on the global diffusion of innovation and technology through trade and global integration. Indeed, interdisciplinary energy scholars recognize the significant value of a social science perspective in energy research, in addition to the prevalent natural science and technological perspectives and call for a stronger integration (Felt, 2014; Schmidt & Weigt, 2015; Sovacool et al., 2015; Winskel, 2014). In the inaugural issue of the interdisciplinary journal, *Energy Research and Social Science*, which was founded to address this exact gap, Sovacool highlights the need for a stronger social science perspective to expand and deepen energy research (2014). While not mentioning IB, Sovacool calls for researchers to integrate energy and social science disciplines. This dissertation therefore contributes to the work that has begun in bridging this gap. The analytical framework, which is anchored in IB, will draw on additional perspectives and related literature that help integrate nuanced contextual factors. The following section reviews relevant and fundamental perspectives in IB and related research areas from which the analytical framework is developed.

3.2. An interdisciplinary perspective on the internationalization of renewable energy MNEs

The two main phenomena setting the stage for this dissertation, namely internationalization and transition, are deeply complex. To properly investigate the MNE at the nexus of these phenomena an analytical framework must be able to offer a holistic understanding of phenomena within set boundaries where key features can be explored. The following review synthesizes important contributions from different, but complimentary, streams of literature. From this review, I draw up relevant features in a framework that guides this dissertation.

The empirical setting in a core infrastructure industry (electricity) brings forward three dimensions that shape the conceptual lens through which I investigate this topic. 1) internationalization, 2) transition, and 3) state ownership. From the outset, my perspective on internationalization has been rooted in IB literature. However, as the project progressed related literature on transitions and SOEs was integrated into the framework. I use these different contributions to develop the analytical framework for the dissertation. Hence, the following sections anchor the dissertation within the classic IB perspectives and outline selected and complimentary contributions on transitions and selected SOE literature.

Towards an understanding of SOE internationalization

IB research emerged as an individual research field in the 1960s with pioneers such as Hymer (1960) and Vernon (1966) who sought to deepen the understanding of cross-border economic activity. IB has since developed into an eclectic and wide-ranging field that approaches empirical phenomena of international business activities from different perspectives. I highlight three business and management perspectives that have provided the conceptual foundations for the broader IB research field and show how each of these perspectives have informed the analytical framework of this dissertation, which is inspired by Peng and co-authors (2009). See Figure 7 for outline.

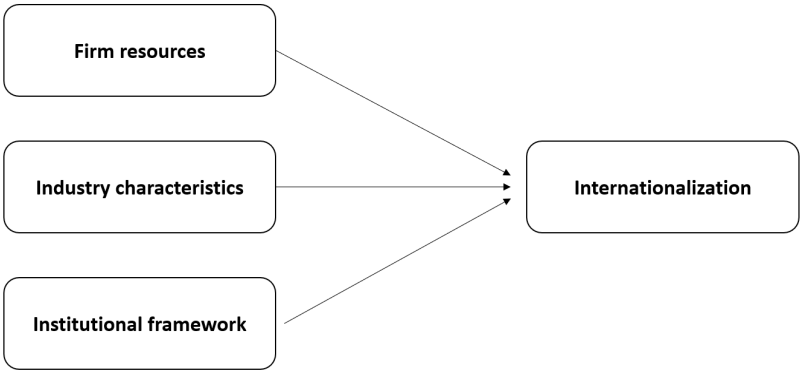

Figure 7. Initial structure adapted by the author from the tripod model by Peng et al. (2009)

First, the resource-based view puts emphasis on technology and knowledge-based competitive advantages (Barney, 1991). Second, the industry-based view focuses on competition and R&D intensiveness (Porter, 1980). Finally, the institution-based view argues that surrounding institutions play a key role in firm internationalization and must be considered (North, 1990; Scott, 1995). In their influential article, Peng, Sun, Pinkham, and Chen criticize the first two perspectives for ignoring the context of firm activities and propose to integrate the three perspectives into a more holistic understanding of firm strategy and internationalization (2009; Peng, Wang & Jiang, 2008). In this way, the three perspectives offer insights into three analytical levels of internationalization: the firm, the industry, and the surrounding environment.

As stated in the Introduction, the goal of the combined inquiry of this dissertation is to broaden the understanding of the interconnections between internationalization and the energy transition and outline possible implications for future research. This implies the need for including firm surroundings i.e., industry and the broader institutional setting. SOEs, the case focus of this dissertation, are particularly embedded in the institutional setting. However, as I will argue below, the literature on SOE internationalization is limited. Integrating these perspectives in a framework to investigate SOEs therefore contributes to a holistic understanding of SOE internationalization. Finally, the framework has an evolutionary approach considering the three perspectives to be dynamic and continually (co-)evolving.

Among the leading contributions to the analysis of firm-level activities and attempts to understand why firms internationalize we find the internalization theory rooted in transaction cost theory (e.g. Buckley & Casson, 1976; Buckley & Strange, 2008; Hennart, 1986; Rugman & Verbeke, 2008, and Narula, Asmussen, Chi & Kundu, 2019), the OLI-framework (Dunning, 2001), the Uppsala Model (Johanson & Vahlne, 1977; 2015; Vahlne & Johanson, 2017), and the resource-based view. While taking into account complimentary perspectives, this dissertation primarily takes a resource-based view of the firm in that it considers the MNE as a *bundle of resources* (Barney, 1991; Wernerfelt, 1986). The basic premise is that the MNE can turn its resources into competitive advantages when they meet certain criteria. For instance, if these competitive advantages are mobile, inimitable, and non-substitutable they can be considered sustained competitive advantages, or FSAs (Barney, 1991; Rugman & Verbeke, 2004; Wade & Hulland, 2004). The success of internationalization thus depends on the MNE's ability to identify its internal resources and turn them into competitive advantages. Applying this perspective, the framework facilitates an understanding of the firm by identifying the resources that the MNEs can turn into competitive advantages when internationalizing i.e., experience, niche technology, knowledge, and financial resources. Within the resource-based view, the knowledge-seeking motive in the internationalization of MNEs have long been an important focus for IB scholars (examples are Awate, Larsen & Mudambi, 2015; Cantwell & Mudambi, 2000; Haakonsson, Jensen, & Mudambi, 2013; Papanastassiou, Pearce, & Zanfei, 2020).

Going beyond the traditional resource-based view, some scholars argue for adding an analytical layer by opening the *black-box* of the company and in this way study managers' perspectives such as culture and behavior (such as Hofstede, Neuijen, Ohayv & Sanders, 1990; Tung & Verbeke, 2010) or microfoundations (Foss & Pedersen, 2019 and Contractor, Foss, Kundu, & Lahiri, 2018). The second paper in the dissertation incorporates a manager perspective by analyzing the role of the CEO. Incorporating this perspective if helpful for a holistic understanding of MNE activities since it recognizes the individual manager's capabilities, in firm internationalization alongside other resources (e.g. Abell, Felin & Foss, 2008 and Contractor et al 2018).

The industry-level perspective views the characteristics of the industry in which the firm operates as main factors affecting firm performance (e.g., Porter, 1980; 1990). Building on this perspective, the dissertation framework integrates industry-level factors that characterize the electricity industry. Features such as demand and supply conditions, large scale investment

needs, and long-term investment horizons as well as the energy transition greatly affect the internationalization of MNEs. The background section in Part I expands on the general conditions and characteristics of the industry while P1 accounts specifically for the evolution of the European electricity industry since the 1970s. To underline the importance for considering the industry level, I highlight how the industry's historical status as a state-owned, natural monopoly is a fundamental element in the industry's DNA. In a European setting, liberalization in this industry is recent and in most countries state ownership prevails to some extent. Former state-owned monopolies therefore have enjoyed legitimacy and financial support through their previous monopoly status that still affect firms' competitiveness today.

This leads to the framework's third perceptive on MNE internationalization: the institutional perspective. Institutions naturally play an important role in internationalization within a highly regulated industry that in Europe is dominated by former monopolies, many of which retain state ownership. With a focus on MNEs from emerging markets and not on SOEs, Hennart argued that there are country-specific advantages, which are only accessible to domestic firms (2012). Building on Landau and co-authors (also outlined in P2), I argue that home country-specific factors also affect internationalization of firms from developed countries, including small open economies (2016). Referring to Landau and co-authors (2016), I posit that not all firms have the possibility to take advantage of the home country's favorable institutions. This is because such conditions can only benefit firms that are able to create idiosyncratic resources through the interaction with the surrounding institutional environment. As also argued in P2, state hybrids in the energy industry are firms that are capable of exactly that.

Recent IB contributions on the energy sector also note the importance of including the institutional framework in analyzing firm internationalization. Here, scholars underline how these firms' historical dominance in the industry as the extended arm of the state has been a key factor in subsequent internationalization patterns (Bohnsack et al., 2020; Georgallis, Albino-Pimentel & Kondratenko, 2021; Kolk et al., 2014). As such, state-owned former monopolies in an industry deeply embedded in the institutional framework are textbook examples of firms that may take advantage of their embeddedness within their home country's institutional framework outside their respective home countries.

MNEs in transition across borders

An important argument in the dissertation is that institutions play a key role in renewable energy MNEs' performance including internationalization and transition. In a globalized world, the transition activities will often expand to internationalization activities (Westney, 2009; Cantwell, Dunning & Lundan, 2010; Hong, Wang & Kafouros, 2015; Horner, 2017). P1 thus utilizes literature that shows how firm strategy changes during, and sometimes because of, internationalization (Cantwell et al. 2010; Dunning & Lundan, 2008) as well as because of technological change (Cano-Kollmann, Cantwell, Hannigan, Mudambi & Song, 2016; Cantwell & Zhang, 2011; Kuemmerle, 1999; Lewin, Long & Carroll, 1999; Haakonsson et al., 2020).

In addition, the paper draws on global-value chain and global product network literature that use the term *organizational decomposition* to denote an organizational process where firms, embedded in a specific industry, increasingly specializes in certain activities (Feenstra, 1998; Lema et al., 2015). The analytical framework in the dissertation does not place focus on value chains or production networks, however; it selectively uses the idea of organizational decomposition and thus how specialization affects internationalization strategies. Firms are able, through organizational decomposition, to identify and build on core technologies that can increase their competitiveness. This leads to industrial organization where highly specialized and competitive actors play a crucial role in decentralizing, subdividing, and specializing internationally (Haakonsson et al., 2020; Schmitz & Strambach, 2009; Shearmur & Doloreux, 2009) and thereby reshape competitive dynamics (Strambach, 2008).

Scholarship on firm, industry, and institutional (co-) evolution and transition offer complimentary insights about the multi-level dynamics that shape firm evolution. While transition is the context of all three papers, P1 digs deeper into the topic of firm evolution by investigating the concurrent evolutions in the European electricity industry - namely internationalization and the transition to renewable energy. Looking at firm evolution, the focus is on the dynamics arising from interconnections – that is, interactions and sometimes interdependencies – between firms, industries, and institutions over time. In this way, the analytical framework in P1 adds the recognition that the process of transitions is multileveled and constant.

Sustainable transitions literature is usually not concerned with cross-border activities of firms (Raven et al., 2012). However, as it will be argued in P1, perspectives on firm transition from

this literature adds a more dynamic view of firm change over time. Furthermore, it also takes into account institutions (landscapes) and niches in efforts to sustain and/or change the overall so-called *socio-technical regime* and therefore, a perspective from the sustainable transitions literature can add a forward-looking dimension to the (co-)evolution idea. The shift in socio-technical regimes happens as a result of changes in bottom-up niche practices and on top-down institutional landscape and societal factors (Geels, 2005; Geels & Schot, 2007; Geels, 2011). Activities at each level influence the transition pathways. Therefore, transitions are thought to be co-created across levels (Geels & Schot, 2007; Verbong & Geels, 2010). Recognizing the multi-level and interdependent processes that lead to transitions, the literature focuses on the complexities that arise. In this way, the sustainable transition perspective shows how a multitude of actors, such as firms, local communities, and public institutions, act to anticipate changes and thereby co-create change because of the expectation of a regime shift in the future. With the multi-actor and multi-level perspective, the sustainable transitions lens incorporates many actors that influence a regime, e.g., research institutions, regulatorily institutions and stakeholders concerned with climate change.

In this way, bringing together literature on sustainable transitions and industrial organization provides a forward-looking, dynamic, and nuanced perspective on MNE evolution.

MNE context-embeddedness

So far, this section has reviewed selected literature that reflects my multi-level approach that include firm-level, industry-level and institutional level perspectives as well as a transitions perspective on firm internationalization. As previously alluded to however, some IB scholars argue that the field, and established perspectives, pay too little attention to context (see e.g., Teagarden et al., 2018 for review). Some contributions do argue for a multi-level, in-depth approach (e.g., Enright, 2002; Teagarden & Schotter, 2013). For example, Enright argues that factors at the supra-national level should be included to understand the forces of globalization (2002). While globalization was a popular topic in the late 1990s and 2000s, global transitions are now widely discussed. In much the same way, I argue that the multi-level approach including the supra-national, or geopolitical level is useful to capture the most important dynamics of today's internationalization challenges.

As mentioned, a key argument in the dissertation is that firm internationalization and transitions are highly context dependent. Hence, the contingency theory lens offers a useful perspective with which to understand factors related to location. Contingency scholars argue that firms must adapt their activities to fit structures in the surrounding environment (Boyd, Takacs Haynes, Hitt, Bergh & Ketchen, 2012; Hickson, Hinings, Lee, Schneck & Pennings, 1971; Ruekert, Walker & Roering, 1985; Stopford, Strange, & Henley, 1991). Environmental contingencies can include changes in government policies, technological change (such as the renewable energy transition), changes in competitors' actions and other external changes that affect firm strategy (Boyd et al., 2012; Zajac, Kraatz & Bresser, 2000). Importantly, Zajac and co-authors underline that the contingencies vary greatly over time and firms must therefore match their own changing contingencies to the changes in the local and general environment (2000). Complementing the institutional-based view and the evolutionary perspective outlined above, contingency scholars posit that MNEs must continuously evolve and adapt to changes in the surrounding environment to ensure a successful internationalization (Egelhoff, 1993; ibid). Consequently, the host nation's institutional framework must also be taken into consideration for an analysis of firm internationalization to be holistic. Indeed, the role of the host nation was also highlighted in Dunning's eclectic paradigm (1988; 2001). The eclectic paradigm enables scholars to uncover interconnections between a firm's competitive advantages and host location factors, which is useful for this analytical framework. However, as a classic IB paradigm, it has a static approach to firm internationalization and lacks a dynamic perspective to embrace firm, industry, and institutional level nuances and features in times of fast-paced transitions.

As this section has accounted for, multi-level perspectives on internationalization and firm evolution are utilized to achieve a holistic conceptual lens and to integrate context into the analytical frameworks. The following section will outline the final nuance that needs to be integrated in the framework, which is the issue of state ownership.

Internationalization of state hybrids: stateness as a flexible resource

While not the at the center of attention in P1 and P2, the issue of state ownership nonetheless appeared as a prominent element in both analyses. This is due to the fact that as an industry with a history marked by fully state-owned, domestic, public entities and only fairly recent liberalization, state ownership and oversight still plays an important role in the electricity

industry. It therefore became evident during the research process that the issue of state ownership deserved more scrutiny to facilitate a comprehensive exploration of the internationalization in the electricity industry. Hence, I decided to focus on the issue of state ownership in P3 albeit still within an analytical framework guided by IB literature.

Thus, P3 explores how stateness affects the internationalization of state hybrids. While originally coined by him, Nettl (1968) does not clearly define stateness. This has led to subsequent confusion about the meaning of the concept of stateness (Andersen, 2017). With its origins in political science, stateness has been defined as "the institutional centrality of the state" (Evans, 1997: 62) and thus as a concept that highlights the role of the state as embedded in surrounding institutions. Recently, some business and management scholars have adopted the term to analyze SOEs. Musacchaio and co-authors employ the term to argue for a *liability of stateness* (2015) – an argument that has since been applied primarily to describe the disadvantage of stateness. (e.g. Mariotti & Marzano, 2020; Cuervo-Cazurra & Li, 2021). Cuervo-Cazurra and Li adopt the term to review business and management literature in which stateness is argued to be either an advantage or disadvantage for SOEs (2021). As these contributions also lack a clear definition of stateness, the term seems to be used more or less synonymously with state ownership, as the following quote shows:

> This analysis [of stateness] thus complements other reviews of how state ownership affects firm behavior […] (Cuervo-Cazurra & Li, 2021: 1)

I will return to a further discussion of stateness as a concept below. In the framework for this dissertation, my usage of the concept also stipulates a degree of state ownership as a premise for a firm to possess stateness. While Cuervo-Cazurra and Li's analysis (2021) includes fully state-owned MNEs as well as state hybrids, my exploration is limited to the latter. This is important since hybridity entails endless configurations of firm structure and governance not applicable to fully state-owned firms that affect firm performance. In fact, the analysis of state hybrids has long caused significant hardship for scholars, possibly because there are as many variations of state hybrids as there are state hybrids. Jacobs (1992) aptly applies *monstrous hybrids* as a metaphor, which is then further developed by Johanson and Vakkuri (2017):

> We are not able to fully grasp the intrinsic characteristics of hybridity and hybrid organizations. Thus, we face dilemmas of understanding, categorizing, and naming institutional activities. In a sense, we see

> monsters on the run among organizational populations because we are not exactly certain what they are and look like, and how we should understand and classify them. (2017:7)

Indeed, one of the problems of studying a firm category so diverse is exactly the question of categorization, generalization, and theorization. However, as will be explained in the methodology section below, the purpose of studying state hybrids in this project is not to generalize. Rather, I aim to contribute to a literature field that contains few empirically substantial insights outside Asia and other emerging market settings and thus to explore the state hybrid phenomenon in significantly different surroundings.

Furthermore, there is a scarcity of business and management literature that addresses the distinct features of state hybrids. While recent contributions have sought to differentiate analysis of state hybrids and fully state-owned SOEs (e.g. Babic, Garcia-Bernardo & Heemskerk, 2020; Bruton et al., 2015; Gupta, 2005; Jing & Tylecote 2005; Vining & Laurin, 2020), there are very few contributions (e.g. Benito et al., 2016; Bruton et al., 2015; Grøgaard et al., 2019, and Mariotti & Marzano, 2010) of empirical knowledge on the internationalization of state hybrids outside China and other emerging markets. The conditions of state hybrids in an emerging market setting as well as the specific state capitalist setting in China are different from a European setting. The extensive literature focusing on China and emerging markets compared to Europe therefore lacks nuance on how hybridity affects internationalization. By zooming in on the internationalization of European state hybrids (all papers) and the concept of stateness using a Danish case firm (P3), I hope to add nuance to the discussion on internationalizing state hybrids. In this way, the hope is that together with similar and future studies, these findings could be used by IB scholars to build more universal and globally inclusive theories.

Returning to the concept of stateness, I have found it interesting to explore how the concept of stateness can be used in business and management literature to uncover important nuances in the internationalization of SOEs. As mentioned, stateness lacks a clear definition in business and management literature. However, stateness has been used as part of the term liability of stateness. Musacchio and co-authors define liability of stateness as "inefficiencies that create […] a performance gap between SOEs relative to private firms." (2015: 116) Following this conceptualization, the advantage of stateness would, in turn, be efficiencies that arise from state ownership. However, rather than measuring efficiency, I bring the concept of legitimacy into

play in order to suggest that stateness should be viewed more as an intangible resource that is not tied to formal ownership. The analytical framework therefore considers stateness as a pervasive filter that influences all drivers of internationalization to certain extents.

In other words, formal ownership ties to the government are not central to the understanding of stateness. Business and management scholars have argued that legitimacy characteristics rooted in state and government can be labelled a *political resource* (Holburn & Zelner, 2010; Sofka, Grimpe & Kaiser, 2021). I expand on this argument to suggest that future research considers stateness as an intangible resource when internationalizing. Specifically, building on Sofka and colleagues' argument that legitimacy tied to a nation state can be transmitted through ex-governmental employees (2021), I propose that stateness has a *rubbing off* effect, not only on firms, but also on host nations.

Whether or not stateness is an advantage for the firm therefore depends on several factors internal to the firm (competitive advantages) as well as external to it (home country, host country, industry, and geopolitical settings) – this argument is elaborated upon in P3. With such a conceptualization, this dissertation therefore treats stateness broader than a degree of state ownership that may or may not result in preferential treatment in the domestic market as outlined by Kowalski (2020). Rather, the dissertation finds that stateness is akin to identity that can be turned into an image: as a label that state hybrids can choose to use – or not to use. In fact, I suggest that choosing when or how to use stateness is a firm resource, or capability in itself.

In this way, I draw on the well-defined argument that state ownership is a continuous variable (Gupta, 2005; Nettl, 1968; Jing & Tyle-cote, 2005) to argue that stateness could be investigated in a similar way as a variable feature. This aligns well with the contingency perspective of constantly changing structures internal and external to the firm. The findings imply that this feature may be used as a flexible resource by firms, but also by host nations if deemed beneficial. As this can pose a significant risk to MNEs, I furthermore argue that a broader geopolitical perspective is needed. Notably, the study is based on a single case study and the purpose of the investigation was to explore a phenomenon that is not fully understood. Hence, rather than offering definitive generalizations, the aim of the paper is to outline implications and future research avenues through which to better understand the role of stateness in SOE internationalization.

3.3. The analytical framework of the dissertation

In summary, the dissertation explores the interconnections between internationalization and the renewable energy transition for European MNEs. As such, the main aim of P1 and P2 is to outline the multi-level drivers, or determinants, of internationalization, as well as their interdependencies and interconnections and how these are related to the transition to renewable energy. To capture the evolutionary aspect of the transitions, the two papers take a longitudinal and dynamic perspective. While also considering the historical grounding and addressing the factors that influence internationalization activities, P3 focuses on how stateness affects firm internationalization in the electricity industry. In this way, all papers are shaped within a similar overall framework and consider similar factors although with different emphases. A visualization of the synthesis of the analytical framework discussed above in an analytical framework for the dissertation is found in Figure 8.

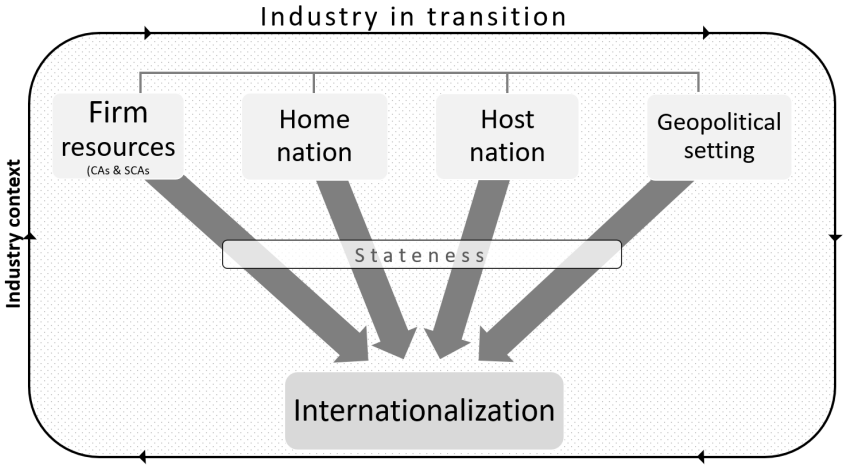

Figure 8. Analytical framework of the dissertation (author).

The initial framework inspired by Peng and co-authors (2009) (Figure 7) outlines firm, industry, and institutions. Based on their framework, and complimented by the analytical framework outlined above, I have developed the analytical approach (Figure 8). This analytical framework will help explore factors that impact firm internationalization and their interdependencies within a transitioning industry.

The main topic of this dissertation is internationalization of the electricity industry with an approach that recognizes the specific industry characteristics. While the findings of each paper are certainly relevant for other industries, especially other core and infrastructure industries, the specific empirical setting has been integrated into the research design. Illustrated as the outer square in Figure 8, industry factors are thus widely embedded across other domains. For instance, boundaries between public and private activities in the electricity industry, both upstream and downstream, are often blurry and vary greatly across different national contexts. Industry characteristics, including transitions, therefore appear to transcend firms, borders, and relevant institutions while also affecting geopolitical issues.

With the resource-based view introduced above in mind, the relevant firm-level factors that impact internationalization are separated into competitive advantages and sustained competitive advantages. The sustained competitive advantages are decisive for the MNE's performance and therefore also internationalization efforts. The home-nation illustrates the institutional framework in which the MNE is embedded. This outlines the home-external conditions for the MNE. Whether the institutional framework provides favorable or non-favorable conditions for the MNE hugely affects the success of its internationalization efforts. How industry, firm, and home nation factors affect internationalization are addressed in P1 and P2.

Hereafter, P3 expands the scope to include the role of the host-nation, which largely mirrors the analysis of the home nation in assessing the institutional framework. In addition, the paper found that a geopolitical perspective was necessary to capture all relevant factors for MNE activities. Whereas P3 specifically analyzed the effect of stateness on firm internationalization, state ownership featured as an important factor in all three papers. As mentioned, stateness should here be understood as a resource, a pervasive filter, which influences all drivers of internationalization to certain extents. Finally, it is important to highlight that the analytical frameworks for each paper take into account factors at all levels that are neither static nor isolated but are constantly changing and interconnected.

As shown in this chapter there is a need for an eclectic and dynamic research design to embrace the complexity and context, which is necessary for understanding the internationalization of electricity MNEs in transition. This is reflected in the methodology, which therefore must be of a qualitative and explorative nature. I will expand on this in the next chapter.

4. Methodology: The power of context

The aim of the dissertation is to uncover the drivers and underlying dynamics of two parallel and connected transitions taking place in the renewable energy industry namely, transition to renewables and transition from a national to multinational industry. To explain my specific choice of methods with which to study the topic at hand, I will revisit some key discussions about the nature of social science and qualitative research. First, I will discuss what IB research can gain from embracing qualitative research and focus on context, which is often somewhat overlooked in IB literature. For example, Michailova argues that IB scholars tend to ignore contexts and "treat them as exogenous variables when they are, in fact, central to the phenomena we research" (2011, p. 130). To explore the topic and its context in depth I use the case study method, which I will discuss along with limitations. Hereafter, the second part of the chapter will present methods and data.

When I began working on the dissertation in 2018, I already had a thorough understanding of the renewable energy transition not as an academic researcher, but as a policy advisor and project manager for almost a decade.[1] These experience-based insights, or initial *Verstehen*, was thus the first step in the exploratory endeavor (Stebbins, 2001). The aim of my PhD is twofold: First, to revisit, or modify when warranted, relevant social science theories based on selected qualitative case studies as well contributing to the refinement of relevant concepts; second, to generate empirical knowledge on two unfolding phenomena (internationalization and the renewable energy transition) in a well-defined historical and geographical context.

The three papers in this dissertation apply a historical and geographical perspective and hence present the cases deeply embedded in their contexts. Importantly, the purpose of these studies is not to make universal formal generalization of the phenomena observed. Attempting such formal generalization makes little sense in "context-dependent empirical enquiries of human

[1] 2008-2017 reverse order: Project manager in the United Nations Environment Program (UNEP) for the Haiti Sustainable Energy Project; Policy advisor in UNEP's Executive Office; Advisor in the Danish Ministry of Climate, Energy, and Building; Assistant in the Clean-tech Team in Invest in Denmark under the Danish Ministry of Foreign Affairs.

activities" (Lund, 2014, p. 225). Instead, I use these case studies for exploration of emerging phenomena and where relevant, analytical generalization aiming to identify fundamental commonalities or differences among the firms in their transition to become renewable and multinational.

Consistent with the analytical framework outlined in the previous chapter, the methodological approach reflects the importance that I attach to the role of context in the research leading to the dissertation. However, context in this dissertation not only refers to what can be observed. Recalling the overall research question, the focus is on exploring what factors into the relationship between internationalization and the transition to renewable energy for European electricity firms. Applying a critical realist perspective to the inquiry, I explore internationalization and the renewable energy transition in terms of the underlying firm-level, industrial, institutional, and societal structures that produce these phenomena (Saunders, Lewis & Thornhill, 2021). I attempt to uncover the underpinnings of these phenomena and reach a deeper understanding than what is directly accessible through observation (Bhaskar, 2005; 2010; Blaikie & Priest, 2017). To reach such a deep understanding, I develop an in-depth historical analysis of firm-external and firm-internal structures, and how they have changed over time in addition to the present-day analyses (Reed, 2005; Saunders et al., 2021). In this way, the dissertation rests on a historical grounding (Cannella & Lincoln, 2011), recognizing how historical developments continuously shape the industry. I have chosen to use a qualitative approach to reach such grounding and to develop an in-depth analysis of ongoing phenomena, which I will discuss in the following sections.

4.1. Qualitative research and the case study design

As mentioned, the aim of the dissertation is to explore an understudied and unfolding phenomenon. This endeavor is driven by curiosity, as well as surprise, by the lack of qualitative investigation of internationalization of renewable energy SOEs within IB research. My research process can be described as an iterative progression visiting and re-visiting theoretical and conceptual literature. In this way, I move between inductive and deductive reasoning when analyzing – or modifying existing theories (e.g., Denis, Lamothe & Langley, 2001; Perlow, Okhuysen, & Repenning, 2002; and Welch, Piekkari, Plakoyiannaki & Paavilainen-Mäntymäki, 2011). This understanding of the qualitative research process is articulated by Lund (2014: 231):

> One is constantly, sometimes aimlessly, moving back and forth between observations, generalizations, abstractions, and theorization rather than following a neat trajectory from one square to the next as hopscotch from start to finish.

In this way, and as I will elaborate below, the design was modified, in accordance with both the theoretical and empirical scope, several times during the process. Rather than being a weakness, I consider the constant movement back and forth between conceptual questions and the empirical reality a strength in this type of research design. As Lund (2014: 231) eloquently writes,

> […] only by shuttling between larger theoretical questions and detailed observations can we institute the problem *and* explain it. It is the *movement* between them and their articulation that produces epiphanies and analytical knowledge. Theoretical questions help to *deduce* critical areas of inquiry, and detailed field research of an *inductive* nature allows us to investigate concrete dynamics.

Hence, while my research started as an exploratory journey, the process gradually became more linear including the development of a solid research design while still retaining iterative elements. The following section will outline how case studies can be used for such a research process.

Case studies and the importance of context

The qualitative case study has within the last couple of decades become an established and recognized method within the field of IB. Case studies are appealing to social scientists due to their capacity for allowing scholars to explore a particular occurrence in depth and within its context. Such rich insights can generate new and groundbreaking theoretical perspectives (Welch et al., 2011). Detractors cite embedded biases in case selection and/or the weak or lacking ability to generalize on the basis of case studies some of the key weaknesses in this method (Flyvbjerg, 2001; Yin, 2009). However, most of the criticism stems from a superficial or inadequate evaluation of the method (Flyvbjerg, 2001; 2006). Welch and co-authors share this view and argue strongly for case studies' theorizing potential in IB research (2011). In the

following sections, I draw on these and other scholars to outline the advantages of using of the qualitative case study method in this dissertation.

Along with an increasing focus on the value of qualitative research, discussions about the role of context in IB and SOE research have also resurfaced (e.g. Benito et al., 2016; Michailova, 2011; Welch et al., 2011). As such, rather than a hinderance, context is a necessity for constructing an explanation in this type of study (Lund, 2014; Welch et al., 2011). This is because existing explanations and theories are insufficient for explaining certain phenomena. Flyvbjerg argues that because of the nature of social sciences as a human-based science where "hard" evidence rarely exists it is difficult, if not impossible, to produce predictive theories (2001; 2006). The value of contextualized knowledge has therefore been unfairly doubted by the scholarly community where the common assumption is that *context-independent knowledge* is superior to *localized knowledge* (Lund, 2014; Tsui, 2004; Welch et al., 2011; Whetten, 2009).

The renewable electricity transition as well as internationalization of the industry are phenomena that are highly context dependent. They are both shaped by the context in which they are embedded. So, what does context mean? With inspiration from Michailova (2011), I define context as a set of factors, processes and events that shapes and influences the phenomenon which is being analyzed. In the sphere that this dissertation is concerned with, these factors include national, regional, and international institutional frameworks; innovation; natural resource endowments; political and social movements; and competition. In addition, I argue that the industry, in this case the electricity industry, differs from manufacturing and service industries as well as other infrastructure industries (see P2, Section 4.2. for elaboration). Understanding the context is therefore key for a comprehensive and satisfactory enquiry.

In fact, the global green transition is itself a context that looks differently depending on the country, region, industry, and time. As a multifaceted phenomenon, it is driven by a myriad of actors, from the intergovernmental and state levels through industries, firms and down to the individual level. It follows that uncovering how firms and other actors drive this transition is highly context dependent. Indeed, it is not only reasonable, but necessary to integrate context into the analysis. Hence, the integration of context in this dissertation allows for "modifying theories through the study of novel phenomena with the aim to enhance the theory" (Meyer, 2015, p. 370).

The qualitative comparative design

Scientific research is always penetrated by some degree of comparative reasoning (Palmberger & Gingrich, 2014; Strauss & Quinn, 1998). As Swanson notes (1971: 145),

> Thinking without comparison is unthinkable. And, in the absence of comparison, so is all scientific thought and scientific research. No one should be surprised that comparisons, implicit and explicit, pervade the work of social scientists and have done so from the beginning: comparison among roles, organizations, communities, institutions societies, and cultures.

In this way, comparison is an omnipresent cognitive process underpinning practically all research. However, there is also well-documented merit in turning comparison into an explicit research tool.

This is what I have done in two of the three papers in this dissertation. While the P3 is a single-case study, P1 analyzes five European electricity MNEs and P2 compares the internationalization and renewable transition in two MNEs, Ørsted and Enel. The research presented in these two papers are, in other words, designed around a qualitative comparative approach. This approach differs from the quantitative comparison in that the former views cases as configurations, or combinations of characteristics (Palmberger & Gingrich, 2014). As Ragin notes, the *observational* and *explanatory* units that are being compared are therefore not stylized, one-dimensional variables, but *configurations* in all their complexity (2014). It follows that the number of cases must be low to be able to analyze in depth.

To obtain a holistic foundation for comparison, the comparative qualitative researcher is often interested in comparing specific historic events and processes and how they have affected similar cases (Ragin, 2014). A historical element is therefore often present in a comparative qualitative case study. This is also the case in this dissertation, as mentioned in the beginning of this chapter. Indeed, the two comparative papers are both concerned with historical sequences and how *historical outcomes* have affected a selection of similar cases in different ways.

While the qualitative comparative case study has long been a well-established and acknowledged method in social sciences, recent decades have seen disagreement on the value of the method. One common criticism, which also applies to single-case studies, is that due to the low number of cases the method is inadequate for formal generalization and for causal inference

purposes and therefore inferior to other methods (e.g. Collier, Mahoney & Seawright, 2004; George & Bennett, 2005). This critique is unwarranted. First, we must ask: what is the purpose of the scientific inquiry? The purpose of the qualitative comparative case study is not to *measure differences* in a controlled experiment-like setup. Rather, the value lies in *understanding* (Lewis, 2003).

Taking a cue from Lewis' work, the qualitative comparative case study method is thus appropriate for exploring the main research question of this dissertation since it:

1) Explains how the manifestations of phenomena (the green transition and internationalization) vary between firms.

2) Explores the interaction between the renewable energy transition and internationalization in different countries within the same region.

3) Explores the context in which the firms are embedded and where the phenomena arise as well as the connection between these entities.

Finally, a qualitative comparative case study is especially useful for scientific enquiries that apply a cross-cultural or cross-national approach (Palmberger & Gingrich, 2014). The small number of cases in these types of studies - such as my first paper (five cases) and second paper (two cases) - allows for an in-depth analysis that is sensitive to the national context. In this way, this method grasps the complexities of the studied phenomena in way that would be impossible with larger quantitative sample.

Limitations

The opposition to the qualitative case study design, which is not uncommon in several social science disciplines e.g., IB, often highlights reliability, validity, and generalization concerns (Yin, 2009). Importantly, these concepts are rooted in the positivist research tradition developed to evaluate quantitative research. Qualitative researchers have then sought to position reliability, validity, and generalization within the qualitative research paradigm (Golafshani, 2003).

Reliability refers to replicability: the extent to which studies are stable and consistent and could be replicated by other researchers (Silverman, 2014). However, since qualitative case studies are situated within a given complex context at a given time, consistent measurements to ensure this type of reliability are unattainable. That does not mean, however that reliability in qualitative

research should be ignored. To mitigate the replicability issue, I instead focus on transparency of the studies. Drawing on Moisander and Valtonen (2006), I have aimed to increase transparency in two ways: first, by offering detailed accounts of the research strategy, data collection, and analysis. This is elaborated in the data collection section below. Second, by clarifying the *theoretical stance* that guides the project and hence the arguments supporting the research design. This was outlined in Chapter 3.

Similarly, the concept of validity, referring to the truth or accuracy of scientific findings, has long been debated among social scientists. In the positivist research tradition from where it stems, the concept of validity often refers to objectivity or truth that is "value-free" (Moisander & Valtonen, 2006). Naturally, the aim of this dissertation is not to offer one, overall objective truth about internationalization of renewable MNEs. Rather, the findings are meant to produce knowledge of certain complex phenomena by offering rich, detailed accounts of a few selected cases guided by specific theoretical perspectives. Evaluating the quality of the studies against a goal of being *the objective truth* is inappropriate. Therefore, I rely on qualitative researchers that have redefined the concepts of reliability and validity to better fit the qualitative research paradigm summarized by Golafshani as trustworthiness, rigor, and quality (2003).

The final concern often being highlighted is the ability to generalize from qualitative case studies (Yin, 2009). Notably, the type of generalization that is made from case studies differs from the formal and universal generalization most prevalent in the natural sciences, but which has also been attempted in social sciences.

To summarize, the qualitative single-case and comparative case study designs undoubtedly have numerous qualities and advantages when used diligently. However, as with all methods, the case study method has its limitations which researchers should consider. In essence, all scientific disciplines benefit from a pluralist approach (Welch et al. 2011). A plethora of methods adds richness to a research field whereas restrictions to the choice of method reduce diversification in research and eventually restrain theory. Hence, the hope is that the findings of this dissertation can generate ideas for further research of the internationalization of MNEs in transition from a multitude of diverse methods within several research paradigms to get perspectives on the phenomena.

4.2. Method and data

To operationalize the methodology of the qualitative research design, I found in-depth case studies, semi-structured interviews, document analysis, and participant observation to be the most appropriate methods. When initiating the project, I had practical knowledge of, and experience in, the empirical field from my prior work with the renewable energy transition, particularly renewable electricity. From the outset, I was determined to focus on the electricity industry, particularly generators. Having followed developments in the field for a while, the initial idea for the research question was thus a distillation of puzzles I had reflected on for some time, such as: We know a lot about internationalization of traditional energy sources, but what happens in the energy industry when fossil fuels are replaced with renewable energy – specifically in the renewable electricity industry? Who and what is leading the renewable electricity transition and how will this affect global power dynamics? What does it mean for the transition to renewables that some of the largest players in the renewable energy transition are state-owned?

With these broad considerations and different units of analysis in mind, I began to search for existing knowledge as well as to conduct preliminary interviews about these phenomena. These steps enabled me to narrow down my scope and specify an angle. Worth noting is that while I overall consider my previous professional experience and insight into the empirical field an advantage, I am aware of my personal bias in the process: from selection of topic, method, interviewees to interpretation and analysis. To mitigate this bias, I have attempted to triangulate data and findings by cross-checking across different sources.

Case selection

The cases in the three papers were selected, on the basis of different criteria, as non-random samples. Non-random sampling, or purposeful sampling, is a common strategy in qualitative research when the aim is not to produce formal generalization, but to gain insights about a certain phenomenon (Onwuegbuzie & Leech, 2007; Patton, 2015). In this way, cases are selected when they are "information rich" (Patton, 2015). The case selection strategy in the three papers varied and overlapped reflecting each of the three individual research designs. Below is an overview of the case firms for each paper.

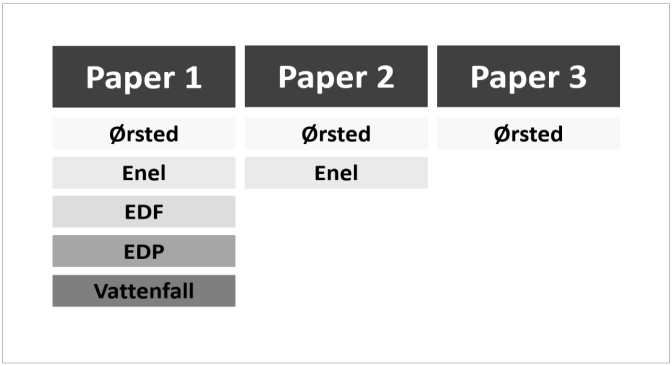

Figure 9. Overview of case firms in each paper (author)

The first paper used a selection of five European electricity companies. Owing to the comparative design, certain criteria were outlined before the data collection began (see Table 1 in P1), akin to criterion sampling (Miles & Huberman, 1994) or information-oriented selection (Flyvbjerg, 2006). The paper investigates why the former European monopolies have developed into international MNEs with widely different portfolios. Due to the strong institutional embeddedness and importance of the EU-led liberalization process, we decided to narrow down the selection to firms that were former monopolies in a member country of the EU/EC during the first leg of the liberalization in 1996. In this way, the firms had a shared regional institutional history and conditions. This narrowed down potential cases. As a qualitative, in-depth case study the number of case firms had to be low to provide a rich, detailed, and in-depth account of each firm (Ragin, 2014). Yet at the same time, we prioritized to have a geographical spread within the EU. Therefore, we selected two firms from northern Europe, one from central Europe and two from southern Europe. Additional firms were considered when we began the data collection, but eventually we decided on five case firms also considering the availability of similar data and reporting (see also the documents and literature section below).

For the second paper, we followed a similar criteria-based and information-oriented selection to identify two case firms. We returned to the same list of firms as in the first paper. Interestingly, we found that Enel and Ørsted stood out among many of their European counterparts in that they had transitioned to variable renewable energy at a fast pace and were touted as among the *new energy giants* (Eckhouse et al.,2020). However, the two firms had followed very different paths both in terms of renewable energy technologies as well as international expansion

strategies. For instance, while Ørsted had developed into a global offshore wind power leader, Enel's management was strongly against this technology and had chosen other technological as well as expansionary strategies. This was an interesting puzzle. We therefore wanted to explore the determinants that resulted in their different, but successful internationalization and transition strategies.

The third paper was a single case study but still focused on the European electricity industry and former state-owned energy monopolies. From prior investigation of the industry, I was familiar with Ørsted's project in Taiwan that was in its initial stages in 2018. Being able to follow the relatively short, but intense project process from the first stages until the first delivery of power in 2022 was a key motivation for choosing this case. In this way, I could follow developments as they unfolded but within a limited timescale. Taiwan also offered an interesting case because not only was there no established offshore wind power sector, there was no offshore industry at all. In addition, Taiwan's unique geopolitical status and its relations with China - with the offshore wind power project physically constructed in the Taiwan Strait separating Taiwan from China and continental Asia - made the case particularly interesting.

Furthermore, I preferred a case study of internationalization outside the MNE's home region. The electricity industry is strongly institutionally embedded and in the first years after the liberalization, traditional European electricity firms expanded mostly to countries in the home region. However, research shows that while fossil fuel generation activities in traditional electricity firms are often home-region oriented, renewable energy generation is to a greater extent internationalized outside the home region (Kolk et al., 2014). The expansion outside the home region is therefore a new but increasing tendency among these firms. Yet research on the interrelations between internationalization and the transition to renewable energy in the European electricity industry remains scarce.

Considering these case characteristics, the cases appear as *extreme cases* as defined by Miles and Huberman (1994) and Flyvbjerg (2006). The advantage of the extreme case is the amount and richness of information they provide. As Flyvbjerg argues, the extreme or deviant case activates more actors and therefore to get to a deeper understanding of the issue at hand more information is required than in a typical case (2006). In extreme cases the focus is thus to clarify the deeper causes and determinants behind certain phenomena. For example, the offshore wind power industry is in the midst of a rapid and fast-paced development. While Ørsted's project in

Taiwan might be an extreme case at this moment, developments in the industry point to an increasingly internationalized industry also across continents (IEA, 2019b). The leading offshore wind developers such as Ørsted, Iberdrola, EDP, and RWE are all Europe-based while active outside the home region expanding outside their home-regions (ibid). Insights from Ørsted's project in Taiwan therefore has a broader relevance when deepening out understanding of the internationalization and transition of the electricity industry.

Interviews

The bulk of primary data in the project is a set of 26 semi-structured interviews with interviewees that can broadly be divided into two types: industry informants and external experts (see Table 2). The original plan was to conduct all interviews face-to-face through fieldwork, however due to the pandemic lockdowns, roughly one-third was conducted using online video meeting software. Although the online format adds a layer of distance between the informant and interviewer, I did not experience major qualitative differences in the interview experience. However, with some interviewees, I sensed some apprehension or hesitation in the beginning of each online interview, and it was harder to establish a sense of confidentiality for informal talk. This might have limited the extent of information interviewees were willing to share.

All interviews were designed as *responsive interviews* (Rubin & Rubin, 2012) that were semi-structured with open-ended questions to drive a dynamic conversation. Illustrative examples of interview questions include:

> *How have Company A's approach to, or preference for, different renewable technologies changed during the different leadership teams (last three CEOs)? And why?*
>
> *On the internationalization of Company A: How would you describe the firm strategy change going from CEO1 to CEO2 – and then from CEO2 to CEO3? Especially in terms of internationalization and technology preference?*
>
> *Compared to Ørsted's other international projects (in e.g., the UK, Netherlands etc) how would you describe the Greater Changhua project? E.g., complexity, bidding process, the client, local content requirements, other factors you can think of?*

Do you recall any specific negative or positive experiences due to Ørsted's state ownership?

Suited to a qualitative case study design (Rubin & Rubin, 2012), this interview strategy proved useful for collecting in-depth material that provided a rich and nuanced understanding of the topics at hand. I aimed to establish a relationship with the informant through what Rubin and Rubin label a "give-and-take style conversation" as opposed to a more "inquisitive" approach (Flick, 2018; Rubin & Rubin, 2012). I briefed the informants ahead of the interview of the overall topic and aim of the interview with examples of concrete questions but did not provide the full list of questions. Reflecting the exploratory nature of the project, I invited the informants to expand on their own experiences and interpretations and deviate from the prepared questions when relevant to gain as much in-depth and rich knowledge as possible. I used three types of questions in a flexible manner: Main questions, follow-up questions, and probes. Main questions were prepared in an interview guide with follow-up questions. Often the interview deviated from the interview guide with spontaneous follow-up questions, and probes depending on the responses. At the end of the interview, I would go through my question list to ensure that key questions had been covered. I kept all interviews between 60 to 90 minutes. One exception was the WEF-group interview, which lasted two hours.

In the qualitative research literature, there is often a distinction between expert interviews and non-expert interviews, also called biographical interviews (Bogner, Littig & Menz, 2009; Flick, 2018; Meuser & Nagel, 2009). In this project, the informants were all experts in their field and therefore they provided expert knowledge. However, the main function of one group of informants, the firm representatives, was to provide insights on the case studies. Therefore, instead of categorizing in expert and non-expert groups, I divide informants in two groups: industry informants and external experts. This illustrates the difference between case study relevant informants and informants with external expertise, but also highlights the differences between the two groups' professional interests and incentive structures.

The term *external experts* refers here to individuals in non-profit and public institutions specializing in policy and law making, industrial framework conditions and relevant scientific fields. While the external experts were interviewed in their capacity as experts in their specific fields, the industry informants were primarily of interest as persons with specific experience in the firms in the case studies, in addition to their general industry expertise. It is important to

consider the underlying interests of both types of interviewees when assessing potential bias. Except for the two academic scholars, informants in both categories represent institutions with either commercial interests or policy interests. Nonetheless, they all demonstrated an exceptional professionalism, deep expertise and in all cases offered balanced and critical responses in the interviews.

The aim with using external expert interviews changed through the research process. In the initial phase, the interviews performed an exploratory function to gain insights into main topics and challenges in the field. As the project progressed, their function developed into avenues for systematic data collection and for specific information I could not otherwise obtain (Bogner et al. 2009; Bogner, Littig & Menz, 2018). This was also the case with several of the industry informant interviews who were also well-versed experts in the field. These interviews thus provided factual information of technological, policy, legal, and organizational nature. However, the external expert interviews also played an additional interpretive function, providing their opinion on the topic and their interpretations of firm and industry developments. As with the industry informant interviews, I thus also explored the experts' subjective orientations and analyses in the interviews (Bogner et al. 2018). The two types of knowledge, factual and interpretive, overlapped since there will always be a degree of interpretation from both parties involved in an interview setup: from the informant and from the researcher.

Both categories of interviews, those with industry informants and those with external experts, required considerable preparation. All interviewees, except one, were professionals with in-depth knowledge of the energy transition. I found that by sharing a *communicative universe* using professional terminology and technical abbreviations related to the energy industry, the interviews became more complex and rewarding (Pfadenhauer, 2009). In this way, the interviews would skip the introductory explanations of basic facts and common abbreviations and be more efficient. However, there were further benefits to this type of interviewer/interviewee-situation, as outlined by Trinczek:

> The interviewer is indeed required to be an expert himself [sic]: the more an interviewer demonstrates knowledgeability during the interview by giving competent assessments, stating reasons, and raising counterarguments, the more managers in turn will be willing to offer their own knowledge and take a stance on issues, thus disclosing their

> subjective structures of relevance and patterns of orientation in absence of strategic considerations. (Trinczek, 2009: 211)

In short, my prior knowledge of the industry-specific culture and jargon was a significant asset.

To begin with, I was able to reach informants through my personal network, which was useful in the initial exploratory phase. As the project developed, the research design became the main guide for targeting specific types of informants. Early in the process, I experienced difficulties getting through to the right informants without being introduced by a common acquaintance. Therefore, I planned to attend *WindEurope* conferences in Copenhagen and Bilbao in 2019 to meet representatives from Enel and other European electricity MNEs where I had no network. These visits were cancelled due to unplanned periods of absence and the following events in 2020 and 2021 were converted to online events due to the pandemic. I therefore relied more on my existing network as well as on contacting firm representatives directly through *LinkedIn*, *Twitter* and by email.

Herein lies a noteworthy bias in selection of interviewees. The change from planned face-to-face research activities to online activities affected the research design of paper one and three. Research for the first paper was initially to rely on interviews with all five case firms that I would approach in person during the *WindEurope* events to target specific profiles. Instead, I contacted the firms in writing, but the informants suggested often did not match the criteria set out in my research design. Hence, the scope of the paper and conceptual framework was revised to incorporate a greater use of document analysis (see below). Nevertheless, we used the interviews from some of the case firms to nuance and triangulate the findings from the documents analysis and thus to strengthen the argument (Eisenhardt & Graebner, 2007).

There were moments when an interview possibility arose with industry informants not related to the cases, when I assessed that the potential yield of insights from the informant could be of high value to the project (Chaillous and Wang). However, as a standard for P1 and P2 I set up criteria for relevant industry informants depending on the theoretical and empirical scope of the paper. For instance, in paper two, the comparative case study design required similar informants in both companies to ensure quality and comparability, and to avoid pitfalls related to the use of informants with very different experience and access to information. If the informants would have vastly different job titles, experiences, and insights, naturally a comparison would be skewed.

Therefore, I set up several criteria guided by the analytical framework of the paper. The informants should be at similar managerial levels, have engineering backgrounds or similar technical insight, with knowledge about the internationalization process and experience with working personally with at least the two latest CEOs in each company. Naturally, it would be near impossible to find exactly similar senior manager profiles since all managers in each company were specialists with long, unique career paths. However, to the extent possible, I sought out matching profiles in each firm. This proved to be a challenge in the case of Enel since I could not rely on the same extensive personal network as I could in the case of Ørsted. However, the informants from Enel that agreed to be interviewed turned out to cover these criteria, even with overlaps.

As a single, in-depth case study, the identification of informants for P3 was guided by the conceptual framework and narrowed down by the specific empirical case: Ørsted's project in Taiwan. My plan was first to explore the strategic drivers behind Ørsted's decision to enter Taiwan as well as the managerial process from the initial project stages in 2018 until implementation in 2022. The list of informants thus included individuals with strategic perspectives on Ørsted's internationalization and the Taiwan project from the firm headquarter (Leupold, Aabo, and Mejía) as well as managerial and strategic perspectives from case location in Taiwan (Bausenwein, Kühn Olesen, and Lie). Owing to the role of the Danish state in this case study, I also interviewed a representative of the Danish Ministry of Foreign Affairs, the Director of the Trade Council of Denmark (Enersen) who had been closely involved in Ørsted's project. Similarly, I was aiming to interview Taiwanese government officials linked to the project, but it was not possible to establish a connection.

Initially, I planned a data collection trip to Taiwan in winter 2020 to meet informants and other relevant connections. However, due to the pandemic this was cancelled and the lack of interviews with host country representatives is therefore a limitation that should be considered. While it would certainly have been interesting to interview Taiwanese government officials, I turned to other information channels to mitigate the lack of interviews with Taiwanese officials by triangulating the methods. I incorporated substantial secondary and tertiary sources assessing Taiwanese energy and trade policy and the use of public diplomacy. To the extent available in English, I also used primary sources such as official government statements, statistics, websites, interviews, and policy papers.

Most commonly, interviews were conducted one-on-one, except for two cases where the group interview format was chosen as appropriate. For instance, the interview with the World Economic Forum, which took place in the beginning of the project process, was particularly useful to gain further insights into the global renewable energy transition and disagreements within the energy community. The group consisted of five energy and electricity industry experts with widely differing perspectives on renewables and internationalization. In the limited time span of two hours, the group provided valuable and nuanced expert input from different corners of the renewable electricity industry and from four continents.

In general, a group interview is an efficient data collection method that has an incorporated quality control function (Patton, 2015). As Patton notes, the members of the group keep each other in check and make sure that extreme points of view filtered out (2015). One disadvantage of this method is the limited number of questions I could address throughout the session, due to the intense discussion (Patton, 2015). Nevertheless, the in-depth and professional discussion at a high technical level between the participants brought out important underlying and complex problems of the industry as well as broader philosophical considerations. For example, the group members had profoundly different views on the path to accelerate the global energy transition. The group format thus stimulated an important intellectual debate between professional sub-groups that would have been impossible to create in a one-on-one interview. What made the interview specifically dynamic and nuanced was the technical and even political disagreements between the experts. In this manner, the debate allowed me to get a deeper understanding of the interconnections and dynamics between energy firms, industries, and states transitioning to renewable energy.

Table 2 below outlines the interviews conducted for this dissertation by year.

Table 2: List of interviews

Interviewees	Title	Organization	Recorded (y/n)	Face-to-face (y/n)
				2022
M. Bausenwein	President, Asia-Pacific	Ørsted	y	n
J. Kühn Olesen	Head of Project Development, Asia-Pacific	Ørsted	y	y
M. Lie	Lead Planner, Greater Changhua projects, Taiwan	Ørsted	y	n
M. Rüdiger, PhD	Associate Professor, Energy Historian	Aalborg University	y	y
C. Ellersgaard, PhD	Associate Professor, Elite Researcher	Copenhagen Business School	n	y
				2021
S. Leupold	CEO Ørsted Wind Power	Ørsted	y	n
C. Aabo	Head of R&D, Offshore Wind	Ørsted	y	n
C. Aabo	Head of R&D, Offshore Wind	Ørsted	y	n
C. Napoli	Deputy Director of Enel Foundation	Enel	y	n
S. Leupold	Board Member of Enel	Enel	y	n
M. Bologna	Head of European Affairs	Enel	y	n
N. Enersen	Director	Trade Council of Denmark, Taipei, Ministry of Foreign Affairs	y	y
				2019
C. Aabo	Head of R&D, Offshore Wind	Ørsted	y	n
G. Mejía	Lead Partnerships & Global Alliances Manager	Ørsted	y	y
C. Napoli	Deputy Director of Enel Foundation	Enel	y	n
				2018
J. Kühn Olesen	Head of Project Development, Asia-Pacific	Ørsted	y	n
C. Aabo	Head of R&D, Offshore Wind	Ørsted	y	n
M. Lie	Lead Planner, Greater Changhua projects, Taiwan	Ørsted	y	y
K. Schumann	Business Developer	EDF	n	y
Y. Wang	Analyst	Major renewable energy MNE N.N., China	n	y
A. Chaillous	Manager, Power Purchase Agreements	Neoen, France	y	y
R. Luo	Deputy Head of the Clean Energy Ministerial Secretariat	International Energy Agency	y	y
Group interview	5 Electricity sector experts	World Economic Forum	y	y
O. Emmik Sørensen	Director, Global Cooperation	Danish Energy Agency	n	y
A. Brix-Thomsen and E. Kjær	Chief Advisors, Global Cooperation	Danish Energy Agency	y	y
N. Lomholt Svensson	Special Advisor	Danish Ministry of Climate, Energy and Utilities	y	n

Thematic case analysis

To analyze the industry interviews I used the thematic analysis method, a prevalent method among qualitative researchers. This method is premised on an iterative process moving back and forth between the different stages of the analysis (Braun & Clarke, 2006). Owing to its flexibility the method "can potentially provide a rich and detailed, yet complex, account of data" (2006: 78). Critics of the method highlight examples of the *anything-goes-critique* displayed in some qualitive case studies (ibid). To avoid this pitfall, I drew on Braun and Clarke's article that underline the importance of a clear and structured approach by using six steps: familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, producing the report (ibid).

In each paper, I analyzed transcripts from the relevant interviews following such a six-step process. First, I transcribed the relevant interviews while taking notes and writing memos throughout the transcription phase. Then I proceeded to generate initial codes. Due to the small-N design of the case studies I coded by hand directly in the transcripts. While the initial coding phase was largely data-driving, I searched for, and identified, features in the data, semantic or latent, that responded to the conceptual framework and research questions (ibid, 2006). Next, I reviewed my notes and memos while considering the codes in a broader context to develop and thereafter review themes. By organizing the data into themes, it became apparent that some of the themes were either overlapping or there was a lack data to support them. When this was done for one dataset, I compared the themes across the relevant data sets and integrated them into one document. Hereafter, I refined the themes considering the theoretical relevance and purpose of each theme. Importantly, thematic analysis deploys writing as a method throughout the six phases not merely at the end (ibid). Writing memos and extensive note-taking was therefore a more or less constant process throughout the project process: initial research design, data collection, transcription and analysis processes.

Documents and literature

In addition to interviews, the project relies extensively on document analysis which plays a key role in all three papers however, most pronounced in the research design of P1 and P3. Throughout the dissertation, I have studied annual reports, sustainability reports, public strategy and policy papers, marketing material, and other material published by the MNEs. In addition, I

scrutinized reports, strategy papers, websites, and analyses from NGOs, thinktanks, and industry associations, as well as from intergovernmental organizations – including Wind Europe, World Resource Institute, CONCITO, State of Green, UNEP, IEA, IRENA, and World Economic Forum to name a few. Furthermore, I investigated relevant policy papers and statistics from the EU, EU commission reports, as well as official governmental reports and national statistics from Denmark, France, Italy, Portugal, Sweden, and Taiwan.

P1, the only paper with a quantitative element, relies extensively on analysis of the MNEs' annual and sustainability reports to compare similar data for change in renewable capacity and international presence over a ten-year period. While the annual reports appeared similar in content there were distinct differences in their reporting of data, which complicated the data collection process. For example, one firm would report renewable *capacity installed* (in GW) by source e.g., solar PV, onshore and offshore, while another firm would report these exact sources but only as *production* (in TWh). Yet another firm would only report the combined figure and not per source. In some instances, these changes occurred in the same firm over different years, which complicated data collection. Another example was the reporting of the geographical footprint of each company that would sometimes be by region thereby obscuring the data for the home country as this was included in home region data. I then obtained the data that was missing from the annual reports either from other firm documents, calculations, where possible, or by contacting firms directly. To secure reliability, I cross-checked the data across the dataset or with other firm sources where possible.

As a rule of thumb, I applied Scott's criteria for document analysis: authenticity, credibility, representativeness and meaning (Scott, 1990). Especially the fourth criteria, *meaning*, was important to bear in mind when relying on publicly available firm documents. While annual reports are required by law, these reports are also intended for a larger audience and often used to showcase successes of the firms. To ensure the quality of the project, I therefore used information from other sources such as independent media channels, energy history books, relevant journal papers etc. to triangulate and validate the findings. The table below outlines the different types of documents and literature used.

Table 3. Documents, media, and literature.

Primary data		**Secondary and tertiary data**	
Type	Source	Type	Source
National energy statistics, maps, reports	National energy agencies, national statistics services, and other official channels	Interviews with government officials of case firm countries	National and international news outlets
Speeches, interviews, and podcasted utterances by government representatives	Government websites, major news outlets, official *Twitter* accounts	Statistics and reports from international organizations	OECD, World Bank, UN agencies
Speeches, interviews, and podcasted utterances by firm and industry representatives	Firm websites, major news outlets, official *Twitter* accounts	Global energy statistics, maps, and reports	International non-governmental organizations (e.g., IEA, IRENA, WEF, and UN agencies)
Speeches and interviews with representatives from energy NGOs and think tanks and representatives	Mostly in Denmark, e.g., CONCITO, State of Green, Green Transition Denmark	Industry and country-specific consultancy reports	Consultancy agencies, e.g., McKinsey, Eiger Law, Carnegie Endowment for International Peace
Reports and press releases	Relevant ministries and bureaus of case firm countries, e.g., Ministries of Foreign Affairs, Ministries of Trade, Bureaus of Energy	General media coverage	National and international news outlets
Company press releases, general information	All case firms and industry competitors	Energy history books in English, Italian, and Danish	Historians
Annual reports	All case firms and industry competitors	Company history publications, published by companies	Historians
Flyers and other event material	Hosts of events	Journal articles	Scholars published in peer-reviewed journals
		Handbooks, encyclopedias, monographs, textbooks	Authors

Participant observation

In accordance with the analytical framework, the purpose of participant observation as a means of data generation for the dissertation was to dive into the research field and gain rich, in-depth knowledge within its context. Commonly associated with ethnography, sociology, and anthropology, this method is also used by qualitative researchers from other social science disciplines as a strategy to immerse oneself into the field of study (Denzin, 1989; Flick, 2018). By getting involved in the double role as participant and observer, the researcher can "produce penetrating insights and highly contextual understanding" (Guest et al., 2013: 3).

For the dissertation, participant observation consisted of actively partaking in conferences and workshops organized by and with actors involved in renewable energy topics. The gatherings served two overall purposes. First, by attending presentations, workshops, and panel debates on current renewable energy issues I gained additional information and knowledge and remained updated on developments in the field through formal presentations, materials, and workshops. Second, by chatting to other participants in breaks and during networking sessions, I could get a better sense of the challenges that firms and regulators were facing in their everyday operations. Such moments of informal conversation with industry and government representatives were ideal for asking in-depth questions and follow-up questions about the industry.

Researchers conducting participant observation often have an ethnographic interest in behavior and human interactions (Jerolmack & Khan, 2014). My main interest, however, was to investigate developments at the firm, industry, and institutional levels. Such developments are more abstract in nature than human interaction and individual behavior in a confined space, and therefore not directly observable. The aim of immersing in the field through participation for the purpose of this dissertation was thus a little different from ethnographers' general approaches. However, in one way the purpose was similar, namely in using findings obtained in these sessions to validate the findings from interviews and documents. Here, articulated by Becker and Geer (1957):

> Participant observation can thus provide us with a yardstick against which to measure the completeness of data gathered in other ways, a model which can serve to let us know what orders of information escape us when we use other methods.

As a highly individualized process, I identified relevant events either by topic or by which attendees I could expect to meet (see Table 4 for list of events). Compared to the stylized format of the interviews, the less formal setting was beneficial for conducting relevant conversations with other participants. From the relaxed and informal conversations, I would often gain novel insights that I could investigate further. During the events, I often experienced a stronger need to invoke my industry expertise and use professional terminology than in the interview setup. Discussing complex industry challenges or recent political developments within the energy field in conversation with other attendees facilitated the establishment of rapport, while at the same time bringing out interesting nuances that I would further explore. After such informal talks, I

would often return with an immense amount of new knowledge and perspectives that helped in the overall process in generating ideas.

Table 4. List of events

Event	Organizer	Year
Power-to-X in Denmark – A conference	The Ministry of Foreign Affairs of Denmark, Invest in Denmark	Spring, 2022
Workshop: The emergence of sustainability in the Danish energy system through the prism of Ørsted	Scholars at Department of Organization, CBS	Fall, 2021
Green Taxation: Stakeholder workshop	Green Transition Denmark	Summer, 2021
Yearly event	The Energy Section of Confederation of Danish Industry	Spring, 2019
The Road to a Fossil Free Society	The Energy Section of Confederation of Danish Industry	Spring, 2019
Network event with major donors and industry representatives (e.g., EU Commission, Ørsted, and Siemens Gamesa)	Copenhagen School of Energy Infrastructure, CBS	Fall, 2018
Yearly event	The Energy Section of Confederation of Danish Industry	Spring, 2018
Conference - Transforming for Sustainability	UN City, Copenhagen	Summer, 2018
Nordic Clean Energy Week	UN City, Copenhagen	Spring, 2018

Because of the benefits of this method, I planned an extensive list of events to attend in Denmark and abroad. However, due to the pandemic, most events were cancelled or postponed while some were converted to online events. Since the main benefit of participating in the events was the informal talks and networking, and considering the preparation needed, I decided to limit participation to physical events. In this way, the pandemic quite significantly constrained my ability to use this method.

Participating in these events were often surprisingly time-consuming. Preparations for each event included familiarizing myself with the specific topic at hand as well as getting an overview of participants. Being among so many industry professionals was an excellent opportunity to prepare questions or “test” some of my ideas for the dissertation. I would thus prepare questions to be asked in the Q&A sessions or in informal conversation during

networking sessions. After the events, I collected my notes and summarized the most important findings. In addition, I noted down my new contacts and made sure to reach out when agreed e.g., on *LinkedIn* or by e-mail.

While the flexible and subjective nature of participant observation has a range of qualities these features naturally also constrain this method. These types of observations are stand-alone events that can hardly be formalized or repeated, and it is therefore important to consider the role of observations in the research design (Flick, 2018). In this dissertation, participant observation was used as a complimentary method to support the interviews and document analysis. In this regard, the method proved to be a useful add-on to the main methods.

As articulated in this chapter, the qualitative, case-based approach is particularly useful for uncovering two recent and interconnected phenomena, namely, the transition to renewable energy and internationalization. In addition, the chapter shows how IB research can gain valuable insights from embracing qualitative research and focus on context, which is often somewhat overlooked in IB literature.

PART II: PAPERS

Paper 1. Green and global: Transformation and internationalization among European electricity producers

Green and global: Transformation and internationalization among European electricity producers

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Abstract

Over the past decades, national and state-owned energy providers have developed into multinational enterprises (MNEs) at the core of the transition towards a greener and non-fossil-based energy system. The transition from national and state-owned energy companies to MNEs has been characterized by industrial dynamics similar to those found in the broader process of industrial globalization and re-structuring, such as diversification, liberalization, and an anticipated green transition. Furthermore, this transition was driven by substantial institutional and technological changes at national, regional, and global levels. The companies, at the time state-owned enterprises, were subjected to pressures from the oil crisis and liberalization, and this instigated their transformation to MNEs. Subsequently, the anticipated green transition created new windows of opportunity, as energy companies began to specialize in renewable energy generation and expanded their geographic reach regionally and globally. This paper builds on perspectives on industrial change and combines these with insights from the literature on sustainable transition. Empirically, the paper illustrates this process by analyzing case studies of five large European electricity producing MNEs. This analysis reveals that the role of MNEs in the green transition is underexplored. The case of electricity producing MNEs shows their transformation into actors of change in several ways: they *re-act* to, *act*, or *pro-act* in changing framework conditions to anticipated change.

Keywords

Electricity producers; energy industry; renewable energy; multinational enterprises; internationalization; green transition.

1. Introduction

The global agenda to mitigate climate change and transition to renewable energy sources has emerged in parallel to a process of specialization, privatization, and liberalization of European state-owned energy companies. National electricity and energy providers have been transformed into highly competitive, technologically specialized corporations that increasingly operate beyond their home markets and are characterized by strategic positioning through specialization and internationalization. Consequently, a new type of corporate actor, electricity producing multinational enterprises (MNEs), has emerged in parallel to the continuous political focus on green transition. Transition to non-fossil and green energy sources has led to the re-organization of electricity producers that were previously nationally oriented. This saw a change in the perception of electricity from being a public good to being a product. As a result, former domestic energy companies now operate as electricity MNEs amid fierce global competition.

At a time of global transitions, the research fields of economic sociology and economic geography, linking industrial organization and IB, are seeking to develop new approaches to better understand the impact of transition on firms and vice versa. While recent contributions take an energy transition perspective in researching diverse types of MNEs (Bass & Grøgaard 2021), business models (Bohnsack et al. 2020) and foreign direct investments (FDIs) by electricity producing MNEs (Patala et al. 2021), the role of energy MNEs in driving the green transition has not received sufficient attention (though see Ghauri et al. 2021). This is particularly noticeable in terms of the corporate actors that lie at the core of the transition towards carbon neutrality: electricity producing MNEs.

This paper investigates how electricity producers have evolved in a context of changing political agendas and firm-level technological advancement and specialization. Our main focus is how changes in the institutional framework impact firm level strategy and vice versa at this juncture of the sustainable transition. A comprehensive analysis of five European cases sheds light on these firm-level development processes by exploring drivers of change. Specifically, we ask: Who is driving the green transition? To what extent is this transition driven by MNEs' anticipated future competitive advantages? This paper considers how MNEs strategically cope with the uncertainties of the unfolding green transition.

The European electricity industry has evolved from national utilities and energy firms – often state-owned – providing energy for domestic markets where they hold a monopoly. The oil

crisis of the 1970s saw firms explore new energy technologies to improve resilience, seeking to reduce their dependency on oil. Some firms invested in coal and gas and/or the development of nuclear and hydropower, while others prioritized variable renewable energy sources, such as wind and solar power. All received major support from their national governments. During the 1990s and early 2000s, electricity producers experienced a shift in the established competitive dynamics due to increased liberalization and privatization. As a result of rapid technological change and scale-up, renewable energy sources reached grid parity in the early 2010s, i.e. the cost of energy for newly installed renewable energy capacity became competitive with the cost of newly installed coal-powered energy plants. This parity was a game-changer for European electricity producers. They were now ready to scale up globally and become genuine multi-national enterprises.

This evolution from nationally anchored firms, characterized by national monopoly, state ownership and vertical integration across the energy sector, to multi-national enterprises deserves closer scrutiny. Today, these firms are at the center of the green transition to carbon neutrality. They now specialize in niche segments such as offshore/onshore wind, solar, nuclear and hydro. The electricity producers have become drivers, co-developers and buyers of state-of-the-art renewable energy technology, impacting the value chains of most industries. At the firm level, this process is mirrored by strategies for taking advantage of the global trend toward a green transition.

Conceptually, this paper's starting point is to bridge the literature on economic sociology and geography with the more recent approaches to sustainable transition. It examines the drivers of sustainable transition at the intersection between firms and the institutional framework, across multiple levels. We explore this agenda at the firm level, viewing firms as potential 'facilitators' of change that act to anticipate change in the market and institutional frameworks. We investigate the interaction between corporate actors and the institutional environment as they push for change to various degrees. Empirically, the paper focuses on five European electricity producers. The remainder of the paper is structured as follows: Section 2 sets out the conceptual framework, introducing the concepts of industrial re-organization and the green transition literature; Section 3 provides background to the European energy industry and outlines the methodology; Section 4 situates the transformation of the European energy industry through three phases, describing the dynamics behind the restructuring of the industry as it confronts the

global green transition; Section 5 summarizes the organizational transformation of the industry and presents avenues for further research.

2. Integrating internationalization and the green transition

The re-organization of industries - leading to an increase in firm internationalization and specialization strategies - is today largely guided by the anticipation of an imminent and continuous sustainable transition. In turn, this relies on these industries facilitating restructuring for transition at the global level, e.g. by sharing technologies and standards for a new industrial regime. This is particularly the case for those industries responsible for the initial shifts toward sustainable transition, such as electricity producers, but over time, all industries will be affected if a regime change is to take place.

Whereas strands of the IB literature explain previous trajectories of industrial change, the transitions literature provides a forward-looking perspective, showing how firms act to anticipate change, and thereby become its co-creators, due to the expectation of a regime shift. In times of transition, dynamics of industrial reorganization are found between institutions and firms within the prevailing technical and industrial regime (Köhler et al., 2019; Elzen et al., 2004; Grin et al., 2010). Hence, bridging the literatures on global industrial re-organization and sustainable transition into a framework to understand how these two processes co-exist and impact on each other is essential. Together, these two perspectives provide a tool for analyzing how the anticipation of a sustainability transition impacts the reorganization of industries and vice versa.

2.1. Industrial (re-)organization – understanding the industrial dynamics of a green transition

For decades, the globalization of industries has been manifested in a general industrial reorganization and disintegration of firms and industries into distributed networks of production, innovation, and services. This is characterized by internationalization and vertical specialization along global production networks and value chains in which lead firms have specialized technologically or functionally. This process has accelerated in the manufacturing industries since the 1980s (Feenstra, 1998; Gereffi, Humphrey & Sturgeon, 2005; Coe & Yeung, 2015; Chesbrough, 2003; Langlois, 2003; Lazonick, 2010). Recently, however, this reorganization has

also reached the energy industry, resulting in technological specialization and international integration. The shift saw MNEs' increased specialization in specific (green) technologies while divesting from other (fossil) technologies. Some scholars refer to this process as 'organizational decomposition', highlighting an organizational process in which firms within a specific industry increasingly focus on specialized activities, sometimes developing these into transferable technological 'modules' (Feenstra, 1998; Lema et al., 2015).

Through organizational decomposition, lead firms strategically focus on identifying and building competitiveness within their core technologies, leading to a form of industrial organization where highly specialized actors play a crucial role in decentralizing, subdividing, and specializing internationally (Haakonsson et al., 2020; Schmitz & Strambach, 2009; Shearmur & Doloreux, 2009) and thereby reshape competitive dynamics (Strambach, 2008). Although lead firms, due to their history, often have geographically agglomerated and vertically integrated origins, while specialized lead markets or regions are characterized by accumulated domain knowledge, firms' specialization is grounded in their potential function as 'intermediaries of knowledge' at a global scale, allowing them to play an important role in the transfer of technology and knowledge (Schmitz & Strambach, 2009; Shearmur & Doloreux, 2009; Huggins, 2011; Miles, Belousova & Chichkanov, 2018). This is relevant for the dissemination of technologies for energy transition, while concepts of internationalization, specialization, and technological specialization contribute by interpreting internal drivers of transition.

Furthermore, some strands of the literature see the roots of industrial change in broader societal changes, intra-industrial dynamics, and firm-level responses. An example is how firms change strategy during a process of internationalization (Cantwell et al. 2010; Dunning & Lundan, 2008) and/or in times of technological change (Cano-Kollmann, et al. 2016; Cantwell & Zhang, 2011; Haakonsson et al., 2020; Kuemmerle, 1999; Lewin et al., 1999). Moreover, from an evolutionary perspective, change is understood as something that can be almost invisible, taking place gradually. As summarized by Strambach and Pflitsch (2020: 2): 'Gradual and distributed institutional changes that add up to more fundamental change only over time are especially hard to track and have largely remained a "black-box".' Such change is a constant, however, in the contemporary business and industry environment, where processes – or at least concepts – of transition and transformation and anticipated changes through trajectories of the green transition

and sustainable development goals have a strong impact on current processes of industrial re-organization (Mazzucato, 2018).

2.2. The sustainable transitions lens

The sustainable transitions literature offers a framework for analysis of change over time. The focus here is on integrating institutions (landscapes) and niches in an effort to sustain and/or change the overall socio-technical regime. The transition literature draws on sources in the science and technology studies literature and on studies related to national or regional innovation. However, there is less emphasis on the international perspective (Raven et al., 2012). Transitions literature focuses on bottom-up niche practices and on top-down institutional landscape and societal factors in shifting socio-technical regimes (Geels 2005; Geels & Schot 2007; Geels 2011). The transition pathways are determined by activities at each level; hence transitions are often co-created across levels, and this complexity sometimes leads to unintended results (Geels & Schot 2007, Verbong & Geels 2010). The literature provides a forward-looking perspective, showing how actors - e.g. local communities, public actors, firms - act to anticipate changes and thereby co-create change due to the expectation of a regime shift in the future. This multi-actor perspective allows for further integration of processes and regulatory regimes. Applied to industry and firm level analyses, the sustainable transitions approach encompasses all actors influencing a regime, e.g. stakeholders concerned with climate change, universities, and research institutions.

Transitions generate multiple technology opportunities as they affect or attract businesses and industries. Furthermore, in a destabilized regime, the sustainable transitions approach allows for an understanding of firm-level strategy and action as outcomes of expectations about the future, i.e. the subsequent future regime. The literature brings in three defining aspects that characterize our case: 1) multi-dimensionality and co-evolution in processes that are not necessarily linear and often characterized by unexpected consequences; 2) multi-actor processes where firms do not necessarily cause the changes that take place; and 3) a dichotomy and complementarity of stability and change among the multiple actors (Köhler et al., 2019). The focus is often on industrial and institutional actors as they are seen to play multiple key roles in sustainable transitions. Firms and industries may develop new technologies and business models as well as push for new legislation and policies (Farla et al. 2012; Planko et al. 2016). With few exceptions (e.g. Bergek et al., 2013; Berggren et al., 2015), transition studies often depict incumbent firms

as regime-defending actors and newcomers as the drivers of change (Köhler et al, 2019). However, as will be shown in this study, incumbents' roles in sustainable transitions are highly context-dependent and influenced by, for example, the type of industry, as well as by future expectations in the industry. In addition, their role may change over time.

The electricity industry is at the core of the sustainable transition. The level of transition of firms in this industry is easily measured by assessing the percentage of renewable energy in their energy mix. Some initial contributions to the sustainable transitions literature focused on electricity (e.g. Verbong & Geels, 2012; Verbong & Geels, 2010).

Looking at transitions provides the opportunity to investigate how an anticipated future affects industrial developments. When a regime is under pressure, it creates a re-organization spiral that conceptually can generate a more nuanced analytical framework capturing interactions and interdependencies between firm-internal and industry-external dynamics over time. These types of interactions have the potential to steer the process of internationalization (Westney, 2009; Cantwell et al., 2010; Hong et al., 2015; Horner, 2017). In the case of state-owned enterprises, the literature is limited (Cahen, 2015; Li & Hendrischke, 2020; Funk et al., 2020). Moreover, adopting an evolutionary and forward-looking approach to understanding the internationalization of firms further contributes to research that engages with institutional change and the resolution of societal challenges (Buckley et al., 2017). At the industry level, such a perspective can facilitate studying the interaction between dynamic processes of firm strategy (Choudhury & Khanna, 2014; McWilliam et al., 2020; Gereffi et al., 2005; Aggarwal et al., 2011).

2.3. Reorganizing industries through anticipation

Bringing together the push-factors from industry level and the pull-factors in the sustainability transition, Figure 1 depicts the interaction between the industry and the anticipated shift in the regime, where firms and industries along with the institutional settings take on key transformative roles in the evolution of a new sustainable regime – partly through the anticipation of a sustainable transition. This is a two-sided transition with at least two dynamics: (1) A push embedded in the reorganization of industry through changed firm level strategies that lead to specialization and internationalization, in which firms and industries actively take on roles as facilitators (or the opposite) for change of a current socio-technical regime by

destabilizing the existing regime and offering alternatives that fit the anticipated transition; and (2), a pull into shifting firm level strategies based on an anticipation of a forthcoming (green) transition due to pressures on the current regime. Industry actors have always been seen to *re-act* to societal change by taking on the task of co-creating change, but in a transition firms also *act* or even *pro-act* to anticipated change. As a result, firm level strategies lead to industrial reorganization and are potentially active in co-constructing regime change. Future-based strategies for anticipated change become an additional factor that takes into account how future expectations of change themselves drive transitions. Very few industries have gone through such a transition. The following sections will apply this framework to the electricity industry during the green transition.

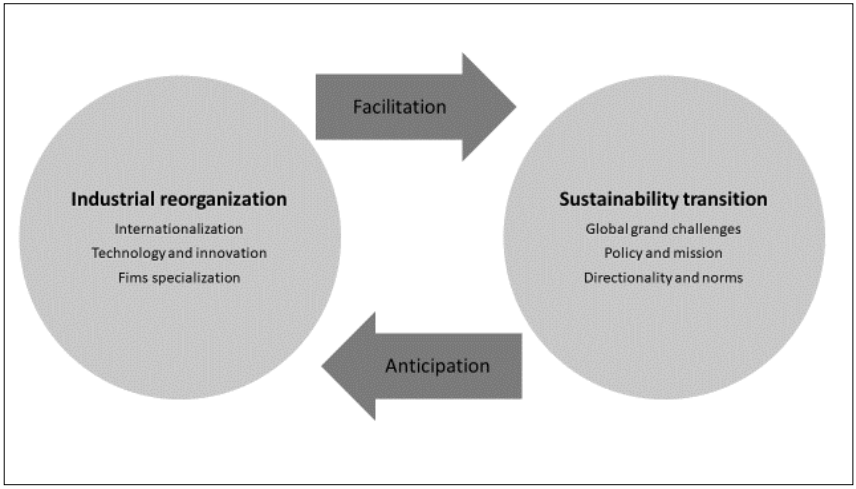

Figure 1: Interactions between industrial dynamics and anticipated sustainable transition (authors)

2.4. Methodology

To investigate the complex dynamics between internationalization, reorganization and the context of the green transition, a qualitative and comparative case study design is particularly useful (Lewis, 2003; Lund, 2014; Welch et al., 2011). Internationalization of the European electricity industry, and how this relates to the green transition, remains largely underexplored.

Therefore, a qualitative case study method is the optimal approach to gain an in-depth and rich understanding of this phenomenon (Eisenhardt & Graebner, 2007; Welch et al., 2011). Furthermore, and in line with other researchers using the qualitative, comparative method, we find that applying a historical perspective in comparing cases is crucial to obtain a holistic analysis of the phenomenon (Ragin, 2014). To fully grasp the multidimensional processes of the transition to renewable energy and the transformation to MNE status, we identified five cases of European electricity producers, all former national monopolies, that represent the southern (EDP from Portugal and Enel from Italy), central (EDF from France), and northern parts of the EU (Ørsted, previously Dong Energy, from Denmark, and Vattenfall from Sweden).

Selection of the five electricity companies was based on a number of criteria (see Table 1). The geographical scope of the case selection was limited to electricity producers based in the EU. We investigated their transition to renewable energy and concurrent transformation into MNEs. These firms had to be formerly state-owned and operating as monopolies in their home countries before the liberalization, while also sharing a common European institutional context and history. Although other firms met our requirements, we decided to limit the number of case companies to five since the qualitative comparative case design requires a small number of cases for an in-depth analysis (Palmberger & Gingrich, 2014). In addition, we considered the comparability of available firm data and selected firms with similar reporting methods. To explore developments in the industry in a European context, we conducted 27 semi-structured interviews with firms (17 interviews with the case companies) and 10 interviews with industry associations, governmental agencies and academia. We also attended a large number of workshops and seminars (mostly online) on the transition of the energy industry. For in-depth historical data on each firm's internationalization and transition to renewables, we analyzed annual reports from 2000 to 2019, comparing performances in a qualitative manner. In addition, we used public firm strategy papers, EU and national policy papers, and newspaper articles. To fully illustrate the developments in the international context, we applied quantitative measures for comparing the firms in the form of a) gigawatts (GW) installed abroad, and b) proportion of GW installed as renewable energy (%).

Table 1. Main features of the five selected case study firms (authors)

	Founded	Initial privatization (year)	State ownership (% in 2021)	Primary type of renewable energy sources*	Internationalization (# countries)	
					2009	2019
Ørsted	1972	2013	50.1%	Wind (1970s)	8	14
Vattenfall	1909	N/A	100%	Hydro (1909), wind (1980s)	8	11
Enel	1962	1999	24%	Hydro (1962), solar (1981), wind (1984)	27	48
EDF	1946	2004	84%	Hydro (1946), wind (1990s), solar (1983)	17	29
EDP	1976	1997	0%	Wind (2005), hydro (1976)	10	19

Source: annual reports and firm information

*Excluding biomass, still disputed as to whether it is a bona fide renewable energy source.

3. Background

In 1973, the oil crisis shook the electricity industry to its core, resulting in a total transformation of the industry. Rising prices and supply shortages forced oil-dependent electricity companies to implement diversification strategies in order to secure supply (Rüdiger 2011). This pushed firms to diversify, to explore and implement alternative technologies – renewable, conventional and nuclear – and to upgrade their innovation and development activities through the 1980s and 1990s. Up to the late 1990s, the electricity industry in Europe was organized into state-owned, vertically-integrated monopolies. With few exceptions, each country had its own national electricity producer that was primarily responsible for supplying electricity to domestic consumers and industries. Competition was almost non-existent, and there were no financial incentives to internationalize. There were no neighboring foreign markets to enter, since they, too, were protected, national monopolies.

Developments at the EU level laid the foundations for a subsequent transformation, internationalization, through the liberalization of the electricity industry. Liberalization of electricity utilities enabled the unbundling of activities along the electricity value chain. While governments kept transmission, and to some extent distribution, under state regulation and

control, power generation companies were to operate on market terms. Liberalization also affected ownership structure, with governments now being pushed to partly or fully. The first two phases we study situate the industrial reorganization narrative, informing the paper on developments and events that enabled diversification, internationalization, and the transition to renewables. The third phase (2010-2019) begins when the firms shed their national organization and consolidate as MNEs, and the transition to renewables intensifies. As illustrated in Table 1 above, the firms were all state-owned but four are now privatized to varying degrees. The firms have all specialized within renewable energy sources, with differing technological focus. Finally, they all expanded their international reach significantly between 2009 and 2019. While it is difficult to define periods of transformation in precise intervals due to their evolutionary nature, we have considered the most important megatrends and events on three analytical levels: institutional, industry and firm. In view of the specific factors related to the energy transition and the international re-organization, we defined the following three phases.

Diversification (1973-1995): The first phase begins with the oil crisis in 1973 that completely transforms electricity producers, forcing firms to diversify into new energy sources. Electricity producers are capital intensive companies. Thus, strategic decisions to invest in modernized power plants and R&D in new technologies tends to lock in firms for decades to come.

Liberalization (1996-2009): The second phase begins with the initial liberalization of the European electricity market. This EU-led institutional process enables firms to unbundle activities and seek out investment opportunities abroad. Firms ramp up competition. Early institutional moves toward a greener energy transition emerge. At the end of this period, some firms begin to consider specialization in renewables as a potential competitive advantage.

Transition (2010-2019): During the third phase, firms speed up their international activities in response to increasing competition in the industry. For many firms, international expansion is the most viable option for growth. Renewable energy technologies become competitive in price and efficiency. At the same time, new international treaties such as the Paris Agreement and the SDGs push governments to increase efforts to reduce carbon emissions and set tangible emission reduction targets. Firms respond to these pressures by setting green transition targets as part of their company strategy.

In the analysis below, we begin by discussing changes in the diversification and liberalization phases and thereafter focus on the profound changes that take place in the transition phase in terms of both internationalization and green transition. A stronger analytical focus on the transition phase is justified, as companies have installed more renewable energy capacity from the 2010s onward. Still, understanding the interconnectedness of institutions, industry and firms in the two earlier phases is vital for developing a comprehensive perspective on the electricity industry.

4. The transformation of the energy industry

This section explores the two interconnected dimensions of industrial re-organization found in the energy industry: Technological specialization and internationalization. Both dimensions are present in individual firms, in industry and at institutional levels throughout all three phases. We begin with a discussion of the *technological specialization* in the first two phases. This relates to the enablers of technology and industrial organization. We then describe the *internationalization* of the firms during the first two phases. Finally, we analyze the outcomes of technological specialization and internationalization as it takes form in the most recent third phase, detailing firm level dynamics and responses.

4.1. Technological specialization in the first two phases: 1973-2009

At the beginning of the 1970s, the European Community (EC) did not have significant known oil, coal or gas reserves and relied largely on imports. Oil dependency was high and Western Europe imported an average of 75% of its oil needs from one region, the Middle East (Lacey, 1981). The 1973 oil crisis forced governments and national energy producers to rethink energy security and supply issues (Rüdiger, 1998), with most governments introducing energy policies aimed at diversifying the energy mix, switching from oil consumption to other sources such as coal and natural gas (Rüdiger, 2011).

During the ***diversification phase (1973-1995)***, countries engaged in small-scale experiments and learning processes within renewable energy innovation. These experiments were driven by private actors, research institutions and governmental bodies. In Denmark, for example, the government initiated wind power experiments, and innovation took the form of a wind energy program in 1976. Based on the results of this program, however, wind power was not considered

sufficiently competitive in financial terms compared to fossil fuels (Danmarks Vindmølleforening, 2013). Ørsted's (then known as DONG – Danish Oil and Natural Gas) first priority, mirroring the Danish government's focus and reflecting its status as a state-owned monopoly, was to secure a reliable energy supply and improve cost-efficiency. In the 1980s and 1990s, the government became more ambitious about CO2 reduction policies (Rüdiger 2011). Ørsted was obliged by the state to integrate more renewable energy sources despite the higher cost, lower efficiency and, for wind, the intermittency issue. Ørsted strategized in response to government pressure and reluctantly began to introduce renewable energy technologies.

Vattenfall realized decades before the oil crisis that Swedish hydropower potential would be exhausted by the 1970s due to geographical constraints. As a result, Vattenfall shifted its focus to nuclear power as its primary energy alternative (Nilsson et al., 2004; Vattenfall, 2020). The government and Vattenfall initiated a national nuclear program in partnership with the private sector, a program which developed through the 1960s and 1970s. The nuclear adventure proved to be short-lived, however, due to public opposition to nuclear power. The national strategy shifted towards wind power, and a public wind power research program was implemented. Vattenfall, the extended arm of the Swedish state, also changed its strategy and invested in innovation and development in wind power and natural gas.

The oil crisis also led Enel, the state-owned electricity monopoly in Italy, to pursue an energy diversification strategy. The government's first National Energy Plan in 1977 identified a vast nuclear potential, but it also outlined a range of renewable energy options to be explored and further developed, (Cardinale & Verdelli, 2008). Enel pursued nuclear research but similar to the Swedish case the program was forced to cease activities in the 1980s in response to rising public opposition. Meanwhile, Enel had been engaged in R&D in solar PV in the 1970s, and in 1981, it opened the world's first solar power plant (Enel, 2009). In the mid-1990s, the increased focus on climate change at both national and EU levels - including EU legislation - prompted Enel to refocus on solar power (Silvi, 2007). Enel initiated its Wind for Electricity program (VELE), but by the end of the 1990s, both public institutions and industrial counterparts had lost confidence in the future potential of wind power (Pirazzi & Silvi, 2005).

EDF also adopted measures to diversify supply after 1973, borrowing capital to accelerate the development and construction of nuclear plants (Brass, Dinger & Cohen, 2010). Unlike Italy and Sweden, the French government continued to pursue its ambitious nuclear implementation plan, despite public opposition. However, similar to its counterparts in other European countries,

EDF pursued innovation and development in solar power (Laali & Benard, 1999). France's strategy of achieving energy independence through nuclear power proved to be overambitious. By the late 1980s, EDF had significant overcapacity and was suffering huge financial losses. The pressure from the state to recover some of these losses prompted EDF to sell electricity abroad. In an early internationalization move, from 1985 EDF exported surplus electricity through the underwater, cross-channel interconnector linking France and Britain. Later, EDF began to sell its nuclear expertise through consultancy agreements with China, South Africa and South Korea (Framatome, 2020; Sfen, 2020; Veron, 2011).

The Portuguese EDP was founded in 1976 by the new socialist government that had nationalized Portugal's power generation following the 1974 revolution. While the Portuguese government, in common with governments across Europe, struggled to simultaneously guarantee and diversify its energy supply while recovering economically after the oil crisis, the state and EDP faced additional difficulties amid the chaos and political turmoil of the post-revolution years. The electricity sector had been neglected, and there were no innovation programs in place. Even so, EDP managed to secure loans from the World Bank and investments in the electricity sector increased significantly even though the firm struggled to meet national demand (World Bank, 1985). EDP's efforts to diversify its supplies of oil and coal during this period lagged behind the other case firms. Indeed, EDP found itself dependent on oil imports throughout the 1970s and 1980s.

During the ***liberalization phase (1996-2009)***, national and international government bodies began to pursue more ambitious environmental and climate policies. In most European countries, this led to public investments in developing renewable energy technologies. Small private innovation networks continued to experiment with renewable technologies. However, most of the case firms discussed here followed the status quo, retaining their fossil fuel-based energy strategies. Ørsted, for example, despite having enhanced its wind power capacity and inaugurating the world's largest offshore wind park in 2002, Horns Rev 1, maintained its focus on fossil fuels, mainly oil and gas, by acquiring BP's stake in the gas field Ormen Lange in 2005. The national framework conditions for renewable energy investments remained insecure, and the government placed several wind parks on standby in 2001 (Rüdiger 2011) marking the period from 2001-2005 "the black hole" (Sperling & Rüdiger, 2020). Towards the end of this period, Ørsted began to develop more and larger offshore projects, leading to a new 85/15 strategy, 85% renewables and 15% fossil fuels by 2040.

Meanwhile, in Sweden, the government introduced carbon taxes and subsidies, nurturing the market for renewable energy for Vattenfall. In addition to hydropower, biomass and wind power were the most important renewable energy sources in Sweden in terms of policy development and initiatives (Nilsson et al., 2004). However, wind power development still lagged behind other countries. According to Nilsson et al. (2004), the lag was due to the government's assumption that the established actors within the energy system would drive the market and technological development. Another factor in Sweden's slow development in the wind power sector was the lack of an established, domestic wind turbine industry. By the turn of the century, however, wind technology had taken over as Vattenfall's preferred renewable energy source for the future.

Moving south to Italy and France, a different picture emerges. In the 1990s, Enel continued its specialization into the development of nuclear power, supplemented with renewables such as solar farms and wind parks. In 2008, Enel Green Power was formed as a subsidiary to Enel, and most of the Enel Group's renewable energy projects were managed in this new space. This was an attempt to move towards green solutions without disturbing the core business and maintaining a diverse energy portfolio of different technologies. In France, EDF benefitted from its unwavering commitment to nuclear technology, which gave the firm a distinct competitive advantage compared to its competitors (Brass et al., 2010). Nuclear power was seen as the better option. EDF initiated the EOLE 2005 program in 1996 (Laali & Benard, 1999), the goal of which was to support wind power in France and be able to achieve a competitive position in this market by 2005. By 2004, EDF Renewables (then EDF Énergies Nouvelles) was founded as a separate entity, with wind power as its main business, though it also invested in and developed solar power (EDF). Though EDP had relied heavily on hydropower since its establishment in 1976, the rate of installation of solar and wind power remained low. From 2000, however, Portugal saw a steep increase in installation of wind power capacity (Bento & Fontes, 2016). Similar to EDF and Enel, EDP established a subsidiary for renewable energy in 2007 (called EDP Renováveis), with a primary focus on wind power development and to a lesser extent, solar and hydro.

Summing up developments in the first phase, the oil crisis sent waves through governments and the industry as a whole, causing firms to develop new strategies of diversification. All five firms acted as the extended arm of their respective governments, reacting to pressures from their national authorities, but also from international governmental levels that pressed the industry to

pursue alternatives to fossil fuel supplies. The firms followed this pattern during the diversification phase and into the beginning of the liberalization phase, when they began to operate on market terms. To secure supply, they all adopted new energy technology. In Denmark, Sweden, Italy and France, the oil crisis also led governments through the 1980s to prioritize developing technology for renewable energy solutions. The state-owned energy firms were obliged to engage in solar and wind development programs in collaboration with national energy agencies and other public actors. However, quite far into the 1990s, despite a growing awareness of the climate crisis and a commitment by all five governments to reduce GHG emissions, neither energy companies nor governments were particularly committed to pursuing large-scale variable renewable energy projects as alternative energy was still inefficient and expensive. This situation gradually changed during the liberalization phase, when companies took the initiative to increase the share of renewable energy.

All five companies assumed positions as leaders in renewable energy technologies, although each had different specializations. EDP, in view of its geographical location and national institutional innovation context, took the lead in onshore wind power, while Ørsted led in offshore wind. Vattenfall, Enel and EDF retained large capacity in hydro, while also installing wind power. Indeed, overall, their incremental technology initiatives enabled them to gain competitiveness within their specialized field. This was partly due to the political incentives prioritizing non-fossil-based energy technology development, but was also a result of continuous R&D since the 1970s. With the experience gained in the first decade of the 2000s, the companies were faced with a scenario of both heightened collaboration and competition between each other, leading to a move toward further organizational specialization.
During the liberalization phase, the first traces of a forthcoming *regime shift* appeared. This shift took the form of increasing levels of renewable energy in the electricity mix and in governments' sustained political focus on the energy transition. Reacting to these new priorities in the 1990s, companies increased their investments in renewables. In this period, the firms also became active in their response to exogenous transitional dynamics and began asserting agency. The institutional push for a renewable transition continued throughout the 2000s, resulting in active firm strategies.

4.2. The internationalization of electricity producers: from national to global players (1996-2009)

In the 1970s and 1980s, all five case firms were state-owned monopolies operating within their respective national territories. During the second phase, however, the firms started to look for opportunities abroad. With increased liberalization, they were pushed to scale up, and this led to their early internationalization. EDF had already used its nuclear expertise to gain consulting contracts abroad in the 1980s, e.g. in China, but none of the other four firms had significant investments abroad. In the early 1990s, however, EDF slowly turned its attention to other European and Latin American markets, searching for new revenue streams to cover the cost of its expensive nuclear adventure (Brass et al., 2010). In Sweden, Vattenfall faced a similar challenge - stagnating energy consumption in their home market and thus an inability to grow. Three factors (stagnating domestic energy consumption, liberalization and increasing competition) were instrumental in Vattenfall's ambitious internationalization strategy. This also led to the formation of a separate international subsidiary, Vattenfall International.

During the liberalization phase, institutional enabling mechanisms became important. For example, the EU's demand for a total liberalization of the electricity sector prompted Ørsted to pursue a new consolidation strategy to bolster the firm against competition. Ørsted invested heavily and broadly across the energy industry, including oil and natural gas exploration and production, construction of new coal generation plants, as well as investments in biomass and wind power. As a result, Ørsted evolved into an all-encompassing energy firm (Rüdiger, 1998; Rüdiger, 2011). At the same time, Denmark was eager to embrace the liberalization of the electricity industry and was quick to unbundle – and vertically disintegrate activities in the industry (Clifton, Díaz-Fuentes, & Revuelta, 2010). Ørsted's internationalization strategy commenced in the early 2000s as it established its first significant international presence in the offshore wind power industry in the UK.

The Swedish government's decision to decommission nuclear power plants incentivized Vattenfall to look abroad for growth options. In the mid-1990s, Vattenfall acquired energy firm stakes in Finland (Vattenfall, 2020). Furthermore, Germany had been Vattenfall's priority from the beginning of the internationalization process (Högselius, 2009). By 2006, more than half of Vattenfall's revenue derived from international activities, compared to just 6% in 1999 (Clifton et al., 2010).

In Italy, the center-left coalitions that governed between 1996 and 2001 were eager to implement wide-ranging liberalization policies that went beyond the EU's requirements. Enel responded quickly to the EU's initial liberalization process by diversifying its activities (Di Giulio & Moro, 2016). By 2000, Enel had secured significant capital to continue its international expansion. From having no international activities in 1999, by 2009 Enel was present in 27 countries in Latin America, North America, Eastern and Southern Europe, and Russia (Enel, 2009; Di Giulio & Moro, 2016). One key event that increased Enel's international presence, especially in Latin America, was the 2007-2009 takeover of the Spanish utility Endesa (Di Giulio & Moro, 2016).

The French government and EDF's management both opposed the liberalization of the industry, fearing loss of control and jobs (Brass et al., 2010; *The Economist*, 2000). The government managed to delay liberalization initiatives, but in 1998, a new CEO, François Roussely, joined EDF and the firm started to embrace the liberalizing electricity market in Europe, eyeing several promising investment opportunities (*The Economist*, 2000). While EDF had initially dragged its feet in the European liberalization process, the firm was now busy chasing international investment opportunities. As early as 1999, EDF was earning 18% of its revenue from international activities. A decade later, EDF had become a significant player in Europe and the Americas (Clifton et al., 2010).

By the 1990s, EDP's economic situation had finally improved after a decade of financial strife. Nevertheless, the firm's debt remained high. Focus was now on securing capital. The political climate supported the deregulation and liberalization of a number of industries, including the energy industry, making Portugal an attractive location for foreign investment (Lorenz & Cohen, 2010). In the mid-1990s, EDP began to involve itself in international activities, initially focusing on Ibero-American markets. Following an internationalization pattern similar to that of Ørsted, Vattenfall and Enel, EDP earned very little revenue from its international engagement until the early 2000s. It was at this time that EDP broadened its interest in other European markets, acquiring stakes in wind farms in France, Poland and Belgium. With the 2007 acquisition of Horizon Wind Energy in the US, EDP restructured its renewable energy activities, forming EDP Renováveis and re-locating its headquarters from Portugal to Spain.
Throughout the 1990s and 2000s, broadly within a similar political framework, though with national differences, the five companies experienced a shift toward increased privatization and internationalization. Liberalization, under the direction of the EU, was the underlying condition

of the firms' internationalization. Two further factors that both enabled and stimulated the market were stagnating domestic energy demand (market) and increasing competition (competitors). The technological specialization and track records of the companies allowed them to gain a competitive foothold in the global market, reaching beyond the EU and succeeding in transitioning away from oil. Since 2000, while all five firms have actively pursued internationalization strategies, each has targeted different geographic locations, with different levels of ambition and different technological portfolios. With the increase in renewably sourced energy in the firms' energy mix, the main type of renewable energy technology gradually became an important determinant in selecting new markets. Whereas fossil fuel-based power plants can be built in almost any location, solar and wind power parks must be placed in areas close to a readily available, reliable energy source.

4.3. The transition phase: Restructuring for global green transition: 2010 – 2019

Through technology specialization and organizational decomposition, the companies achieved a level of competitiveness and capability within certain renewable sources. Furthermore, through liberalization and early internationalization, the firms established capacity and capabilities for further scale-up. Given the firms' specialization and internationalization, the transition phase led to a consolidation of the competitive advantages gained in the first two phases; they all moved away from dependence on oil and towards renewables and an international presence. This trend was re-enforced by the climate change agenda that encouraged specialization in renewables to dominate the strategic agenda of the firms, both in terms of innovation focus and as regards to internationalization with a path toward becoming global corporations and multinational enterprises. The impact of climate change policies on firm strategy is illustrated by a senior manager:

> They [managers] could see that there were opportunities outside neighboring geographical areas. And were driven by a, perhaps, idealistic agenda that wind power should be installed in other places than only around Denmark (Interview, senior manager, Ørsted).

The firms' geographic scope expanded from the national to the regional and now global level, thus constituting three major regimes within the industrial development. In recent years, with the consolidation of climate change related energy policies at national and global levels, the

companies have increasingly focused on a combination of system integration and diversification of renewable energy sources and technologies to secure supply.

In the transition phase, Ørsted continued to invest heavily in offshore wind power projects. Following the adoption of the Paris Agreement by governments in 2016, Ørsted took another major step in pursuing its renewable vision, going beyond EU climate goals by announcing that it would be largely fossil-free by 2023 and would phase out its oil and gas business. Ørsted was already partly privatized, and the firm was listed on the stock market in 2016, with the Danish state continuing as majority shareholder. Ørsted went from having several regional activities, including fossil fuel-based investments, all centered in Northern Europe in the early 2010s, to being a truly global MNE in 2019 with projects in Taiwan, the USA and Japan. By the end of the 2010s, Ørsted's activities abroad consisted entirely of renewable electricity production. Although Vattenfall had been investing in wind power since the 1980s, the firm had only installed 1GW wind generation capacity out of a total of 39GW by 2009. Over the following decade, however, Vattenfall sold off more than half its fossil fuel generation capacity and tripled its wind power generation capacity. While Vattenfall still had significantly less variable renewable capacity than the other four firms, this was an important achievement in view of its post-financial crisis struggle and consequent downsizing. From 2010 to 2015 Vattenfall divested most of its non-wind activities outside its new core markets of Sweden, Netherlands and Germany, simultaneously reducing its total installed capacity (Vattenfall 2020b). By the second half of the decade, and with its new focus on wind power, Vattenfall again turned its attention to international market opportunities for offshore wind investments.

Throughout the 2010s, Enel continued its energy diversification strategy and pursued investments and initiatives across a range of technologies, including variable renewable energy. Over a ten-year period, Enel doubled its onshore capacity, with more than 10MW installed by 2019, reaching a total of 16% variable renewable energy as a proportion of its total installed capacity. Throughout the 2010s Enel maintained its international presence, slightly increasing its capacity installed abroad while downsizing at home. By 2019, 68% of Enel's total installed capacity lay outside Italy. Enel had become a genuine global firm. EDP underwent a process of privatization, but in a more comprehensive way than Enel, EDF and Ørsted. In 2011, the privatization of EDP was finalized, with the Chinese state-owned power firm, China Three Gorge Corporation (CTG), as the majority shareholder. The Portuguese government had long

been proactive in privatizing EDP and welcomed CTG. As a private firm, EDP now had to focus on securing value for its shareholders. With limited growth opportunities in the region, EDP escalated its international operations significantly in the 2010s, both in the Americas and in the rest of Europe. EDP was an early investor in wind power and, despite its relatively small size, was ahead of the other case firms in absolute terms, having installed 6.2GW variable renewable capacity during the 2010s, reaching 11.2 GW by 2019. In France, EDF continued to pursue its international strategy, expanding its operations in Northern and Central Europe, as well as in the US and China. After 2012, the scope broadened, and EDF Renewables entered markets on most continents. By 2019, EDF had become not only the largest electricity company in terms of capacity installed but had also achieved a global presence in the renewable electricity market. However, due to its size, EDF's total of 9.7GW variable renewable capacity installed in 2019 accounted for only 8% of its total capacity, the lowest percentage of the five case firms.

The organizational changes and establishment of MNEs among the five case firms is shown in Figure 2. The horizontal axis of Figure 2 shows the shift towards energy production from sustainable sources, while the vertical axis shows the degree of internationalization. These results are supported by data shown in Appendix I. All five case firms have moved along both axis, from the bottom left toward the top right corners. The analysis by a senior manager at Enel illustrates the connection between the two dimensions of change:

> The international footprint, […] is very, very relevant if you want to go for renewables because resources are where they are. The international footprint, besides giving you access to places where you have renewables, gives you the managerial and technical capabilities to go somewhere else, because when you want to do business abroad, it's not something that you can invent from one day to another. (Interview, senior manager, Enel)

While EDP has the highest percentage of renewable capacity in both years, as well as a high degree of internationalization, Ørsted and Enel have experienced the most significant change. Ørsted has completely changed its strategy and is now fully engaged in sustainable energy solutions on a global scale. The three largest firms (EDF, Enel and Vattenfall) have decreased their total installed capacity, while the two smallest firms (EDP and Ørsted) have significantly increased installed capacity through their international expansion (see Appendix I, tables 2A-C). These two firms, along with Enel, have also had the largest increase in their installed renewable

capacity as a proportion of their total capacity. Though Ørsted's increase from 20% to 61% renewable capacity is particularly noteworthy, it is indicative of Ørsted's past poor performance in integrating renewable energy into the energy mix. Another achievement worth highlighting is Enel's increase in renewable capacity from 26% to 50%. This corresponds to 42GW renewable capacity installed in 2019 compared to EDF's 32GW, EDP's 20GW, Vattenfall's 15GW, and Ørsted's 8GW. Figure 2 also reveals that those companies that have fully evolved across the three phases are more internationalized and further advanced in the green transition than those with a high degree of state ownership (Vattenfall 100% and EDF 84%).

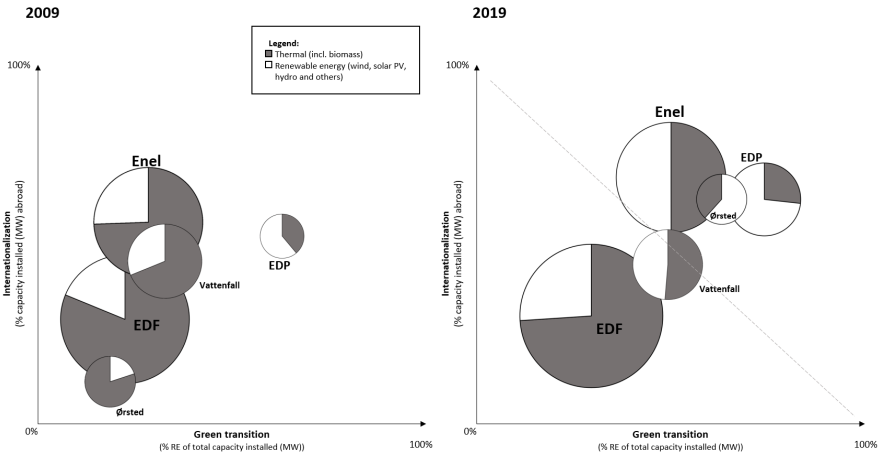

Figure 2. Evolution of five European electricity producers between 2009 and 2019 (authors)

Note: X-axis illustrates the level of green transition as a percentage of installed capacity in renewables. Y-axis illustrates the percentage of installed capacity abroad.
Source: annual reports of all five companies and supplementary information provided by the companies at the authors' request (see also Appendix I). Please note: Thermal energy includes both fossil fuels and biomass.

Figure 2 also shows a split between two types of companies. Adding a diagonal line from the top left to the bottom right shows that some of the firms have changed their strategies of internationalization and renewable technology to a far greater degree than others. Those with the least change, both in terms of internationalization and green transition, are Vattenfall and EDF.

They differ from the other three firms as they are still state-owned firms and have not fully evolved to become MNEs. They are more reluctant to shift their strategies than the others and are not particularly progressive in riding the wave of globalization and harvesting the advantages of their technological specialization. While EDF and Vattenfall have evolved on both parameters, it is not to the extent seen in the other firms. A second characteristic these two firms share is their technological specialization from the oil crisis onward, namely in hydro and nuclear power. Hydro power enjoyed a massive advantage for a while but was relatively quickly implemented to its full potential. Nuclear power is not renewable and although it minimizes dependency on oil and emissions of carbon dioxide, it comes with other dilemmas of resource dependency and waste. Both technologies showed themselves to be economically viable and stable for the two firms at the time of installment and specialization. However, they have not generated a legacy for the two firms to take the technological lead in the green transition. This discrepancy is a pertinent area of research in terms of both the green transition and the internationalization of state-owned companies.

5. Moving forward on industrial re-organization for sustainable transition

Analyzing the internationalization of the European electricity industry, our study provides theoretical and empirical contributions for understanding drivers of change among electricity producing firms that play a key role in the green transition. Conceptually, our inquiry uncovered how industrial dynamics unfold in times of transition. This was informed by sustainable transitions literature as well as perspectives from economic geography and sociology. At the firm level, the study showed the institutional and firm level factors and characteristics that drive both the green transition and internationalization. The analysis of five case companies revealed important dynamics in the European electricity industry, specifically illustrating connections between the firms' dual transitions from being national to international and from being black to being green.

All five European energy firms have undergone significant changes, reflecting the changes in the industry generally over the past four decades. Formerly national energy companies have evolved into competitive electricity MNEs. Oil and coal-based energy producers are now major

players in the green transition. The electricity industry is indeed an extreme case. All five companies have been subject to major changes in the framework conditions that have driven their development through the three phases. In the diversification phase, the oil crisis of the early 1970s sent shock waves through governments and the industry and pushed firms to develop reactive strategies and more efficient, alternative technologies. In the following phase of liberalization, the firms continued to respond or react to changes at the regime and landscape levels. However, they also began to develop their own active strategies aimed at increasing specialization and internationalization. In the current transition phase, all the firms have increasingly adopted more ambitious climate targets and accelerated their transition to renewables. Some firms more than others, as the state-owned firms have changed more slowly and reactively than the more privatized ones.

In the shift from being reactive to more proactive actors in the green transition, the firms' relationship to the institutional framework changed from being objects of change to co-creators and more recently autonomous creators of change. The five case firms have broadened their scope from the national to the global level, and their strategies have evolved and are now driven by anticipated changes. Conservative national, state-owned oil-dependent energy companies have now become innovative, global actors at the technological forefront of the green transition. They have undergone a restructuring process based on expectations of the future i.e., an anticipated regime shift to green energy. Although the five case firms are European and have their roots in similar institutional settings, surprisingly their journeys towards internationalization have varied greatly. The two state-owned companies, Vattenfall and EDF, were rather slow adapters to change, while Ørsted and EDP constituted 'high-flyers' in both parameters. Enel also showed significant change, especially considering its size.

With the green transition, firms also gained competitiveness at the international scale and developed solutions that could be applied far beyond their home market. Looking at this through a sustainability transition lens highlights how firm and institutional levels interact. Responses and adaptation at both levels are crucial for capitalizing on the potential industrial benefits of the green political agenda. Given the development of organizational and technological competencies, and their track record and experience in operating in a constantly changing market, these new MNEs can be said to have acquired the requisite organizational setup for harnessing future opportunities. The role of actors at both firm and industry levels increases

when a regime is under pressure, such is the case for the energy regime in a time of climate change. This finding is relevant when examining other industries that may be further away from the core of the green transition and further downstream in the value chain, such as the auto, food and beverage industries. This paper has shown how MNEs, at a time of transition, strategize according to both actual and anticipated futures.

Conceptually, this paper has sought to show the benefits of bringing together strands of economic geography, IB and the literature on sustainable transition that focuses on regime shifts. All five firms have moved from re-acting to change to enacting change in their own respective contexts, and even to new pro-active practices. Our findings respond to the call for understanding what the rise of pro-active strategies means for industrial restructuring and shows that we need to rethink the role of MNEs in times of transition. We also need to re-examine the sustainable transitions literature as our analysis of the electricity industry reveals how regimes may shift incrementally rather than radically. Transitions and regime shift may not necessarily be radical. Anticipation and expectation can themselves bring about change as well.

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Appendix I:

Capacity installed abroad				
	Abroad 2009 (GW)	**Abroad 2019 (GW)**	**% cap. installed abroad of total cap. 2009**	**% cap. installed abroad of total cap. 2019**
Ørsted	0.7	7.5	10%	76%
Vattenfall	17.5	13.5	45%	44%
Enel	54.8	57	58%	68%
EDF	37.4	33	27%	27%
EDP	10.5	16	50%	60%

RE* capacity installed				
GW	**2009**	**2019**	**% RE cap. installed of total cap. 2009**	**% RE cap. installed of total cap. 2019**
Ørsted	1.3	7.8	20%	61%
Vattenfall	12.29	15	31%	48%
Enel	24.3	42.2	26%	50%
EDF	26.6	32.2	19%	26%
EDP	12.9	19.7	61%	73%

*Excluding biomass

Capacity installed (GW)		
	Total (100%) 2009	**Total (100%) 2019**
Ørsted	6.6	12.7
Vattenfall	39.3	30.5
Enel	95.3	84.3
EDF	136.2	123.6
EDP	21.1	26.7

Table 2A. Installed capacity in renewable energy (GW) (source: annual reports of all five companies and authors request for information from the companies).

Table 2B. Share of total installed capacity situated abroad (source: ibid.).

Table 2C. Size of the firm in installed capacity (GW) 2009 and 2019 (source: ibid.).

Source: annual reports of the five firms and correspondence with firm representatives

Paper 2. Chase the wind and follow the sun: Determinants of state hybrids' international strategy in the renewable electricity industry

Chase the wind and follow the sun: Determinants of state hybrids' international strategy in the renewable electricity industry

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Abstract

The cross-border diffusion of sustainable technology matters for the combat against climate change – a "grand challenge" of our time. In this context, we investigate determinants of the international strategy of "state hybrids" in the renewable electricity industry, studying the internationalization of two front-runner firms. By applying a case-based research approach, we explain the firms' contemporary stage of internationalization. Notably, the change from fossil fuel-based technologies to renewable energy has turned the industry upside down entailing different patterns of internationalization. We apply the term 'geographic hedging' to explain expanding decisions. In addition, risk profiles of top management played pivotal roles in the strategic change. Theoretically, we suggest that analysis of the interdependent relationship between influential factors and inclusion of micro-level factors can contribute to global strategy research.

Keywords: State-owned Enterprises; global strategy; renewable energy; case-based research; internationalization.

1. Introduction

At the global level, the choice of energy sources, the design of energy supply system, and the production of energy go hand in hand with one of the "grand challenges" of our time, climate change. Grand challenges "typically transcend geographic, economic, and societal borders, and are therefore multinational by nature" (Buckley, Doh & Benischke, 2017: 1046). According to Buckley and co-authors (2017), international business research can (and should) inform grand challenges, since they relate to the interaction of organizations and individuals across borders within the context of the global business system. In this paper, we study the internationalization of MNEs in the renewable energy industry based on the cases of two frontrunner firms in the industry, respectively ENEL from Italy and Ørsted from Denmark. Being labelled the new "green super majors" (Eckhouse, Morison, Mathis, Wad, & Warren, 2020), these firms serve as the organizational mechanism for the international transfer and dissemination of renewable energy solutions. How they internationalize therefore matters for the adoption of energy solutions in host countries and thus for the efficiency and effectiveness of the combat against climate change. Interestingly, these companies share a history as former national monopolies embedded within the European institutional framework with similar firm setup. Today, they are distinctly different in their global expansion patterns as well as technological specializations. This paper investigates how and why these firms have evolved in two different directions.

One of the important features of the two case firms is that they are both partially state-owned enterprises (SOEs; in the remainder of the paper we use the term "state hybrid", similar to e.g. Bruton, Peng, Ahlstrom, Stan, & Xu, (2015); Cuervo-Cazurra, Inkpen, Musacchio, & Ramaswamy (2014) and Rodrigues & Dieleman, 2018). In the management literature, research on state hybrids is underexplored (Bruton et al. , 2015), yet there is a growing interest from international business scholars in understanding the role of state hybrids in international markets (e.g., Benito, Rygh & Lunnan, 2016). Nevertheless, research is sparse concerning state hybrids that are partly or fully state-owned in (international) markets that historically were seen as public goods markets. This includes, for example, markets in the domains of communication, rail and sea transportation, and postal services.

From a sustainability perspective, the energy industry stands out as particularly important. The strategies of energy firms concerning use of fossil vs. renewable energy sources as well as the strategies directing technology development and application determine the possibilities of firms,

private households and society as a whole to embark on a sustainable pattern of consumption. As state hybrids in the energy industry take the leap from primarily operating on the domestic market – their traditional domain – to the international market, their influence on renewable energy production and consumption increases correspondingly.

In the interface between state/government and market, the state hybrid presents itself as a model that offers a combination of private logic, i.e. operating on market terms, and institutional logic, i.e. operating under the influence of non-market factors (Bruton et al., 2015; Rodrigues & Dieleman, 2018). The combined capabilities that enable the state hybrid to respond to this contextual diversity seem well suited to meet the requirements in the energy industry. In view of the importance of market imperfections in the market, high entry barriers, and the lead-time for return on investment, an efficient and effective transition to renewable energy requires that large, powerful organizations (i.e., large MNEs, the government, state hybrids) play leading roles since they possess the necessary resources. The resource requirements are significant and include, for example, a firm size that can achieve scale and scope advantages, financial and organizational robustness, the ability to apply a long-term investment perspective, and R&D capabilities.

As regards the internationalization of state hybrids, Rodrigues and Dieleman (2018) suggest that the motivation of state hybrids to internationalize is rooted in different factors. When state hybrids expand internationally, the relative importance of the domestic market is reduced, the firm obtains access to new resources and income sources, its dependence on domestic ties to the home country government is reduced, and in combination, this improves the autonomy of the state hybrid (Rodrigues & Dieleman, 2018).

Against this backdrop, we pose the following research question to study variations in internationalization strategies of state hybrids that engage in international markets from a similar point of departure: How do determinants relating to technology, industry, institutions, and firm-specific features lead to different internationalization strategies of state hybrids in the renewable electricity industry? Although questions related to energy, energy transition, and to sustainability have recently attracted increasing interest in international business research (e.g. Bass & Grøgaard, 2021; Bohnsack, Ciulli, & Kolk, 2020; Patala, Juntunen, Lundan, & Ritvala, 2021), the multi-level and multi-actor context of energy transition opens a range of questions

(see Doh, Budhwar & Wood, 2021) including, to the best of our knowledge, the question we pose.

We take international business and strategy research as our theoretical point of departure and apply an eclectic and integrative theoretical approach to the study. We pose a question specifically related to the emerging research on long-term energy transition toward renewable energy (Doh et al., 2021). In addition, we respond to the concerns and recent calls for research (Buckley et al., 2017; Ghauri, Strange & Cooke, 2021) to remedy the relative isolation of international business research, its lack of integration with other academic disciplines, and its limited impact on government policy and international business practice. Herein lies also our main contribution, as we shed light on how influences from institutions, public policy, market and industry characteristics, and business strategy and decisions in combination forge the internationalization of state-owned MNEs in the renewable energy industry.

The paper contributes with empirical and theoretical insights. Empirically, we show how electricity MNEs use geographical spread through internationalization as hedging strategy, which we label 'geographical hedging'. Firms use geographical hedging in different ways depending on their technological expertise and home country. First, to minimize risks associated with fluctuating renewable energy. Second, to minimize risks connected to changing and unstable framework conditions for firms common in the renewable energy industry. This helps explaining why the two case firms have pursued different internationalization strategies with regard to market segments, target countries and geographical diversification despite similarities in their outset. Importantly, public policy at home country (and regional) and host country level can create incentives for internationalization. However, the differences in internationalization strategies are outcomes of differences in technology features of wind and solar energy, industry factors, host country policy and institutions, and the host country's natural resource endowments. Furthermore, central strategic decisions at critical moments by top management have had a defining influence on the two case firms' international strategies. Theoretically, the paper offers a nuanced perspective to the tripod model. First, by considering a micro-perspective to understanding the firm's internationalization strategy along the macro-components. Second, we apply a process perspective to the tripod model and suggest that the "legs" of the tripod should be regarded as interdependent and dynamic instead of static.

The paper is structured as follows: In section 2, we draw on the literature on institutions and international business and present our analytical model. Section 3 presents the case-based research method. Section 4 condenses the main findings from the two cases followed by section 5, in which we discuss the implications of the findings. Section 6 concludes the paper.

2. Theoretical foundations and analytical model

In their seminal article, (Peng, Sun, Pinkham, & Chen, 2009) integrated various theoretical perspectives into a generic model for the analysis of firm strategy, coined the "strategy tripod". Arguing, "it takes three legs to sustain a platform" (Peng et al., 2009, p. 63), the authors make the case for including three different but complementary perspectives in the study of firm strategy. These perspectives are, respectively, the industry-based view, the resource-based view, and the institution-based view.

To build a model of the evolution of the international strategy of state hybrids in the renewable energy industry, we follow a similar comprehensive and, to some extent, eclectic approach. In this section, we draw on previous research to elicit key points that relate to the three above-mentioned theoretical perspectives. In this regard, we specifically include studies in the renewable energy domain, due to their close affiliation with our question.

An overall observation is that the three theoretical perspectives should not be seen in isolation but rather as interrelated and interdependent. Insights from North's (1990) work on institutional theory point to such connections. While North (1990) focuses on the processes that underpin economic growth at the macro level, it is noteworthy that the beliefs of individuals play an important role, as they provide the basis on which the external institutional environment is constructed. This coincides with the evolution of international business research, where the role of top management teams and managerial intentionality has come to the fore (e.g. Hutzschenreuter, Pedersen & Volberda, 2007). We shall revert to the role of individuals below.

For our focus on the internationalization of state hybrids, which for many years operated exclusively in their countries of origin, the role of institutions in the home country is particularly important. In a critique of Dunning's OLI-paradigm (e.g. Dunning & Lundan, 2008), Hennart (2012) argues that it is a mistaken assumption that country-specific advantages are freely accessible for both domestic and foreign firms. According to Hennart (2012), the situation is

quite the opposite since there are country-specific advantages that in practice are only available for domestic firms. This argument underscores the importance of home-country institutional factors as enablers of, or constraints for, firm internationalization. Hennart's (2012) objective is to develop a theoretical foundation explaining the internationalization of MNEs from emerging markets, but following Landau and co-authors (2016), we find it reasonable to extend his arguments to encompass also MNEs from developed economies. In the same vein as Hennart (2012), Landau et al. (2016) consider home country specific advantages as important as enablers of firm internationalization, but narrow the scope even further. According to Landau et al. (2016), not all firms can take advantage of the home country's favorable economic institutions since such conditions benefit only those firms that are capable of creating idiosyncratic resources via interaction with their institutional environment (Landau, Karna, Richter, & Uhlenbruck, 2016).

Recent studies of the energy sector suggest that home-country institutional factors influence the internationalization of energy firms and utilities, which in particular is helped by their historical dominance as domestic monopolies (Bohnsack et al., 2020; Georgallis, Albino-Pimentel & Kondratenko, 2021; Kolk, Lindeque, & van den Buuse, 2014). However, internationalization in these studies more specifically relate to the regionalization of energy firms within Europe, and show e.g. that this regionalization is driven by the liberalization of the EU internal market and the formulation of targets for renewable energy production. As Kolk and co-authors (2014) point out, this dimension of internationalization matters since home-region internationalization is associated with lower liability of foreignness than expansion into other regions. In comparison, our study goes beyond the regional dimension of internationalization and addresses international expansion outside home regions. In both cases, the firms have expanded into country markets in the Americas and Asia, and this geographical reach allows us to study the internationalization of state hybrids in a context with a greater exposure to various liabilities of foreignness.

As we alluded to in the introduction, industry-level characteristics, i.e. one of the three legs in the "tripod", play important roles in the electricity industry. Building on Porter's (1980) work, the industry-based view states that the conditions and characteristics of the industry in which a firm operates are the primary factors that influence firm performance (Peng et al., 2009; Su, Peng, & Xie, 2016). In the electricity industry, specific factors in combination provide fundamental features that set the stage for competition in the industry. These include e.g. large

investments and a long-term investment time horizon. As a result, the ability to achieve scale economies is a necessary license for firms to operate. Combined with the high switching costs associated with energy infrastructure for the buyer (typically the government), this creates entry barriers for potential new entrants in the industry. We shall revert to these and other industry characteristics and their role in a later section. At this point, however, it is noteworthy that these industry characteristics are tied to the historical argument for the creation of "natural monopolies". This has provided these utilities and energy firms with legitimacy for their position as domestic monopoly firms. The domestic monopoly position provided a unique and protected platform for the growth of firm resources, which brings us to the third and last element of the tripod concerning the competitive resources of state hybrids in the electricity industry.

Our approach to the role of firm resources largely follows the arguments of resource-based theory (Barney, 1991; Wernerfelt, 1986). However, to complement the firm level of analysis, we add a more detailed level of analysis. This implies that while the resources at the firm-level are central in the analysis of firm internationalization, the roles and capabilities of individual managers also matter for the firm. Such capabilities are at a micro-level, since they are embedded in individual persons. In our study, they consist of the former and present top-level managers in the two case firms. Such individual (micro-level) management capabilities connect to the firm (macro) level, since they concern decisions and actions that have overall importance for the firm (see Abell, Felin & Foss, 2008, and Contractor, Foss, Kundu, & Lahiri, 2018 for discussion).

Using the strategy tripod as a structural tool for our study, we summarize the central elements in an analytical model (Figure 1). In this model, we place the internationalization of the electricity firms as the outcome of the analysis, whereas the factors influencing firm internationalization flow from left to right. The research design takes an ex-post, historical perspective to study the internationalization of the two firms. This implies that we seek to disentangle the various factors that over time have influenced the contemporary stage of internationalization. First, industry characteristics (including technology) related to the production of electricity provide the foundation for firm competition. The institutional environment then further influences the competitive conditions in the industry. For the two cases firms, institutional factors at the national level as well as at the super-national level, in this case the EU, play a role. The industry characteristics and the institutional environment in combination constitute the framework for the development and application of resources. Firm level resources and capabilities distinguish

between the firm as a whole and capabilities specifically tied to individual key decision makers within each firm.

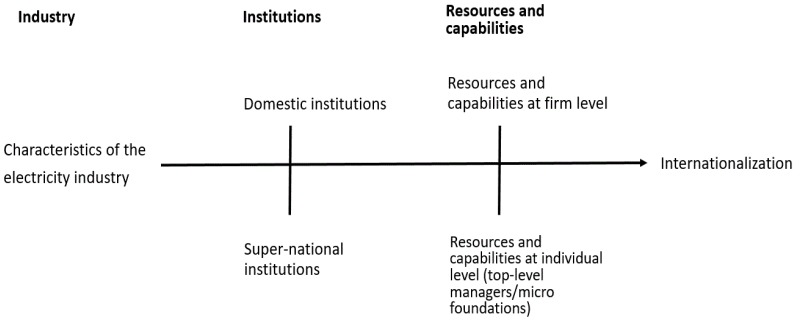

Figure 1. Analytical model

3. Methodology

While the energy industry includes all industries involved in production and distribution of energy such as the nuclear industry, the fossil fuel extraction, refinement and distribution industries, and the renewables industries, this paper studies internationalization dynamics specifically in the electricity industry. Designed as a multi-level qualitative study, this study includes the industry level, the firm level, and the individual level in the firms by assessing the role of top managers in the transition of both companies.

We have selected two case companies for comparison, Enel and Ørsted, based in Italy and Denmark respectively. Following an information-oriented selection (Flyvbjerg, 2006), we selected these two companies since they share a number of characteristics and are therefore comparable, but nevertheless they have pursued different internationalization and technological strategies. To undercover the complex dynamics driving the internationalization and green transition of the two firms, we rely on the qualitative comparative case study method. Using this approach enables us to explore the cases in depth (Yin, 2009). In this way, we provide a rich,

contextual understanding of why these emerging and underexplored phenomena (internationalization and green transition) materialize differently within the two firms (Eisenhardt & Graebner, 2007; Lewis, 2003; Lund, 2014; Welch, Piekkari, Plakoyiannaki & Paavilainen-Mäntymäki, 2011). We incorporated a longitudinal element to enrich our analysis since a historical perspective in comparative case designs is useful to obtain a holistic understanding of a studied phenomenon (Ragin, 2014).

3.1. Case selection and data

Both firms are electricity generators producing electricity from power plants fueled by fossil fuels and renewables. They are also former national monopolies that are now partly privatized however, still maintaining the state as the main shareholder. Both companies' home countries are developed economies within the EU thereby they share a common European history and institutional and legislative framework including EU's push for liberalization of the electricity industry in the 1990s and 2000s and energy transition programs through the 1990 until today. The firms also stand out among electricity generators by transitioning to renewables at a fast pace. Nevertheless, they have pursued different internationalization strategies and have become very diverse firms, which is why we chose a comparative case-study design. In this way, analysis of divergent paths can be helpful for generalization and typology of new phenomena at the intersection of internationalization and transition to RE. Observing and comparing different paths can contribute to the broader effort of understanding global sustainable transitions.

Empirically, the paper relies on 21 qualitative, in-depth interviews with individuals in the energy industry, government agencies, international organizations, and in each company (see Table 1 below). All firm interviewees were at the managerial level and we interviewed managers with technical/engineering as well as business administration educational backgrounds in both companies. We prepared semi-structured interview guides to ensure that the same topics were covered, but also allowing each manager to elaborate and diverge from the questions. To complement our interviews, our findings also rely on company annual reports, policy papers, media coverage including interviews, and publications on company histories in Italian, Danish and English.

Table 1: Overview of interviewees

Interviewees	Organization	Time frame	No. of interviews
Senior management	Enel	2019-2021	2
Senior management	Enel	2021	1
Management	Enel	2021	1
Senior Management	Ørsted	2018-2021	4
Senior Management	Ørsted	2021	1
Senior Management	Ørsted	2022	1
Senior Management	Ørsted	2022	1
Management	Ørsted	2018-2022	2
Associate Professor, Energy Historian	Aalborg University	2022	1
Associate Professor	Copenhagen Business School	2022	1
Advisor	Danish Energy Agency	2018	1
Advisor	Danish Energy Agency	2018	1
Advisor	Danish Energy Agency	2018	1
Advisor	Danish Energy Agency	2018	1
Senior management	IEA	2018	1
Focus group of 5 electricity industry experts	World Economic Forum	2018	1

4. Empirical findings

4.1. Historical background

The transition from fossil fuels to renewables have been long underway affected by industry-, institutional- and firm-level factors. The two oil crises in the 1970s were key events pushing the European energy industry to find alternatives to oil imports from the OPEC (Rüdiger, 2019b; Matthies, 1993). The first priority for energy firms such as Ørsted[1] and Enel was to diversify energy mix away from oil to secure reliable and affordable supply. Initially, toward fossil alternatives that could quickly replace oil. However, the oil crises underlined the perils of being dependent on imports of finite resources. Due to the EU-led liberalization of the electricity industry in the 1990s and early 2000s, the former monopolies began to face competition in their

[1] Named DONG (Danish Oil and Natural Gas) until 2006 and subsequently DONG Energy until 2017. However, for coherence we use the name Ørsted throughout the paper.

home market, while also presenting them with opportunities abroad (Haas, Auer, Glachant, Keseric, & Perez, 2006). In this new competitive landscape, firms increasingly turned to renewable energy (RE) technologies to gain competitive advantages that allowed for global scale-up. The parallel transitions of internationalization and renewable energy have altered the industry immensely. The following section outlines the industry-level factors, institutional-level factors, firm capabilities, and internationalization strategy in the cases of Enel and Ørsted in their development from fossil fuel-dependent national monopolies to multinational electric power providers transitioning to renewables and examines the multi-level factors that have affected this transition.

4.2. The industry

Five important characteristics set apart the renewable electricity industry from other industries and determine internationalization patterns. These features affect and shape internationalization strategies as well as adding to the complexity of executing a successful expansion.

1) As a *network industry* (a category that also includes e.g. gas, railways, telecom) it is capital intensive and characterized by economics of scale (Glachant & Perez, 2008). Electricity as a commodity is intangible and firms are dependent on the network, the electrical grid, to sell and distribute their product. Access to the grid is therefore a prerequisite to do business and grid access conditions differ from region to region making it a key variable. In European settings, the grid is often state-operated while in the US, for example, the grid is almost exclusively privately owned.

2) *Demand* conditions in the industry are tricky. Firms must respond immediately to a "variable and unpredictable demand at all times and all locations" (MacGill & Watt, 2015).

3) With an increase in variable renewable energy (wind and solar power) in the energy mix, the *supply* side is becoming increasingly complex too. Conventional fossil-fueled power plants allow firms to plan and predict supply through combustion. Conversely, variable renewable energy supply is impossible to predict, as it is 'intermittent' in nature. With the current lack of adequate storage technologies, firms are obliged to administer their excess renewable energy supply as well as securing backup when production does not meet demand. This is one of the key economic and strategic risks for firms transitioning to renewable energy.

4) The product, electricity, offered by generators such as Enel and Ørsted requires *no regional adaptation* and firms do not engage with end-consumers. Instead, they negotiate power purchase agreements (PPA) with local governments, municipalities or private electricity providers. This often includes local content requirements.

5) The *climate crisis* places the industry at the heart of the climate and sustainability agenda. The energy sector as a whole (mainly electricity, transport and heating) accounts for two thirds of global GHG emissions (Lee & Birol, 2020), putting the electricity industry in an uncomfortable spotlight for climate policy. However, experts agree that electrification of sectors such as transport, building, industry, and heating is one of the fundamental building blocks of decarbonizing the energy sector (IEA, 2021; IPCC, 2018). Decarbonization, which in effect means electrification, as well as increasing levels of renewables in the energy mix, are therefore key priorities for most governments. A direct result will be that future electricity demand, and therefore opportunities for the industry, can be expected to increase significantly.

In addition to decarbonization, scholars have identified two other interdependent key drivers of change in the electricity industry: decentralization, and digitalization (Rosetto & Reif, 2021; Sivaram, 2018). Decentralization of power production began with liberalization and continues with the growing number of decentralized electricity providers. Digitalization of the entire electricity value chain (generation, distribution, transmission and retail) is also a recent, but impactful driver of change in the industry. The implementation of AI using big data for machine learning allows for a more flexible energy system that can e.g. integrate more renewable energy, optimize demand response and cater to more EVs (Brown, Woodhouse, & Sioshansi, 2019). Digitalization also enables companies to create new mobile products and solutions that are scalable across borders and thereby facilitate internationalization.

Before we outline the institutional settings and firm capabilities in the subsequent sections, we will shortly touch upon how these factors affect the industry since these three “legs” all influence each other. In most of Europe, the different entities of the electricity industry (generators, DSOs and TSOs) have been traditionally organized as SOEs with monopoly status. The EU-led liberalization process finalized in the 2000s opened the market (mainly generation) for competition and created incentives for the firms to seek opportunities abroad. However, in Europe the former SOEs still hold a dominating role in electricity generation for several reasons.

First, the capital intensity of the industry and lock-in effect[2], especially for fossil fuel power plants, creates high entry-barriers for new entrants. Second, as former SOEs, the electricity generators have enjoyed sustained government support for renewable energy R&D since the 1970s creating a source of competitive advantage compared to newer entrants. Third, these firms have a long record of accomplishment of reliable and efficient delivery of electric power, which is a key component in a nation's critical infrastructure. In addition, many of the firms are still partly state-owned, which is an advantage in itself as a token of reliability and stability when entering new markets (where electricity is also part of the critical infrastructure). Along with their specialization and building on their accumulated national experience, these firms have reoriented their focus to the global market.

4.3. Institutional context

Traditionally, the electricity industry is deeply embedded in national and international institutional frameworks as part of a nation's critical infrastructure. For several decades after the oil crisis, government-funded programs, grassroots associations, and universities drove R&D in the energy industry. The institutional framework conditions changed radically when the EC kick-started the liberalization of the European electricity industry in three steps from 1996 to 2009. From being vertically integrated SOEs, the liberalization process required the former monopolies to unbundle activities across the electricity value chain. The aim was to separate generation, distribution and transmission activities into separate entities. Although the industry has been partly privatized, it is still subjected to heavy regulation and occasional political intervention. Enel and Ørsted developed from monopolistic SOEs to international hybrid-SOEs within the same European institutional framework however with different national framework conditions and political agendas.

Enel, a state-owned electric power monopoly since 1962, was obliged by the Italian state to follow an energy diversification strategy after the oil crisis due to its dependence on imported petrochemicals (Cardinale & Verdelli, 2008). This materialized in the first National Energy Plan in 1977, which identified a vast nuclear potential (ibid). In addition, a range of renewable energy options were outlined to be explored and/or developed further, primarily hydro, which by the

[2] "a self-perpetuating inability to change from existing carbon-intensive activities and technologies to less carbon-based activities" (Rentier et al., 2019, p: 620)

late 1970s was already an important energy source, but also geothermal, solar and wind (ibid). Accordingly, Enel pursued nuclear research, but increasing public opposition forced Enel to put construction on hold in the 1980s. At the same time, Enel initiated its Wind for Electricity program while several large industry players also invested in wind power R&D (Pirazzi & Silvi, 2005). In the 1990s, wind power R&D continued and there was a certain interest in competing with Northern European manufacturers, but neither public institutions nor industrial counterparts fully believed in the future potential of wind power (Pirazzi & Silvi, 2005). Incited by the state, ENEL was also engaged in R&D in solar PV and in 1981 it opened the first solar power plant in the world to supply electricity to the grid, but scale-up of wind and solar PV capacity was not a priority until the late 1990s (Bergami, Celli, & Soda, 2012). The growing institutional focus on climate change in the end of the 1990s prompted Enel and other energy industry players to turn their attention back to renewable energy with R&D continuing in the 2000s (Silvi, 2007).

The Danish government also implemented an energy diversification strategy because of the oil crisis (Rüdiger, 2019b). Primarily through shifting oil consumption to coal and gas and in parallel by supporting R&D in renewable energy alternatives. While security of supply was the most important goal for Danish energy policy in the 1970s, the 1980s saw the priority change toward greater safeguarding of the environment (Rüdiger, 2011). In the 1990s, the Danish government was quick to implement the EU-directed liberalization measures in the electricity industry (Clifton, Díaz-Fuentes, & Revuelta, 2010) still maintaining Ørsted as a fully state-owned company until 2014. Through the 1990s, the Danish government continued its focus on ambitious environmental and climate policies including public investments in wind power development. The first offshore wind power farm was installed in Denmark in 1991 by Elkraft as a result of decades of private initiatives and sporadic support from changing governments. However, for Ørsted as a company, the only raison d'être remained to secure a reliable and affordable supply of energy. This was something offshore wind power could not provide at the time. Subsequently, Ørsted maintained its focus on diversifying supply of mainly fossil fuels. The new center-right government[3] had put several wind parks on standby in 2001, a move that was intended to downplay the issue of climate change (Rüdiger, 2011). Yet, wind power projects were growing in size and in 2005 the first large-scale offshore wind farm was added to Ørsted's portfolio through the merger with Elsam. In addition to Elsam, Ørsted merged with

[3] From 2001-2009

four[4] other Danish energy companies in one of the largest mergers in Danish history, which also solidified Ørsted's presence in the electricity industry (Rüdiger, 2011).

Wind power projects have enjoyed favorable conditions in Denmark since the 1970s with governments and private associations boosting R&D to the extent that local turbine manufacturers Vestas and Bonus Energy (later Siemens Wind Power) have been able to remain global industry leaders for decades. Overall, the institutional framework, including supportive governments, active lobbying associations, private developers, state-of-the-art R&D, and support from the public have enabled Danish utilities to start the transition to wind power (MoeSingh, 2012). While Ørsted remained a strongly fossil fuel-based company in 2009, it was beginning to develop more offshore projects and opened the large Horns Rev 2 offshore wind power park in 2009. In the same year, Ørsted's adopted its new vision, the 85/15 strategy. Ørsted had committed to reverse the 2009 scenario of producing 85% of its electricity and heat with coal and only 15% from renewables to 85% renewables and 15% fossil fuels by 2040. Three key factors led to the sharp turn in Ørsted's strategy: First, the company was facing increasing criticism of its "black" image enforced by the COP15[5] in Copenhagen in 2009, and secondly, Ørsted's income from its thermal power plants due to falling energy prices (Rüdiger, 2011). 3) Third, to remain competitive on the global market, Ørsted had to catch up with its competitors underlining the need for a more diversified portfolio in energy sources and locations.

Institutional framework conditions also affected Ørsted's internationalization strategy. According to one Ørsted interviewee, management took the decision to spread out geographically beyond Northern Europe, to the US and Asia in 2013. One of the reasons was the subsidy dependency of offshore wind at the time:

> One risk was that they [subsidies] could disappear, like in the UK, and then reappear all depending on which government that was in charge in each country. We were aware that being present in a number of countries with different political agendas was an advantage (Ørsted informant).

[4] NESA, Energi E2, Frederiksberg Forsyning and Københavns Energi
[5] The 2009 United Nations Climate Change Conference

In this way, we conclude that Ørsted has perceived subsidies as a driver for internationalization activities since subsidized projects reap a higher margin while Enel has viewed subsidy dependence as a key risk and reason for not pursuing offshore. To hedge the risk of changing subsidy schemes Ørsted has spread its investments to different policy locations.

4.4. Firm-specific resources and capabilities

Having examined the industry and institutional level factors, we now explore firm-specific capabilities on the organizational level and managerial levels. We investigate the latter by opening up the "black box" of the firms to shed light on the role of the CEO.

Company response to liberalization

Enel responded quickly to the first step of EU's liberalization process (Di Giulio & Moro, 2016). By 2000, Enel had secured significant capital to continue its expansion through the unbundling of activities and by floating 30 percent of Enel's shares on the stock market (ibid). Hereafter, Enel turned its attention to possible investment opportunities abroad. In the beginning, Enel searched the market for companies to acquire in an "opportunistic manner" (Enel informant). According to one Enel informant, the first acquisitions also served as a "learning lab where the company could test its internal capabilities of becoming something different."

From having no international activities in 1999 and being a "hesitant internationalizer" (Clifton et al., 2010), Enel had developed into an MNE present in 25 countries in Europe, North America and Latin America ten years later (Enel, 2009). One key event that increased ENEL's international presence, especially in Latin America, was the 2009 takeover of Endesa. This remarkable development continued and in 2020, Enel had become truly global being present in 47 countries spanning five continents (Enel, 2020).

During the liberalization process, Ørsted also pursued a new strategy to bolster the firm against competition: consolidation. Ørsted invested heavily and broadly across the energy industry including oil and natural gas exploration and production, construction of new coal generation plants as well as investments in biomass and wind power. In the early 2000s, the Danish government was eager to embrace liberalization of the electricity industry and was quick to

unbundle activities in the industry (Clifton et al., 2010). In the new competitive landscape, Ørsted's internationalization strategy kicked off in the early 2000s. The change in revenue generated abroad from 1999 to 2003 was remarkable, increasing from 0-30% with most international sales centered in the UK, Germany, and Sweden (Clifton et al., 2010; DONG, 2003). On these markets, Ørsted was largely active in producing fossil fuel-generated energy and trading oil and gas. However, from 2006, Ørsted established its first significant international presence in the offshore wind power industry in the UK.

Impact of R&D and RE innovation on company strategies

The increase of renewable energy sources in Enel's energymix has been a strong driver of internationalization of activities in the past decade. As one Enel informant comments:

> It's inherent in the business [renewable generation] to internationalize. You cannot do that business if you don't internationalize. You have to go where the resources are. Good wind, good sun. And market. (Enel informant)

Having a diversified portfolio in different geographical locations also mitigates the risks of intermittency. In other words, the risk of not having sun or wind decreases with the number of geographical locations a company is present. Both firms have a long track-record of investing in R&D in renewable energy technologies positioning them among the few "new green energy majors" (Yergin, 2021; Sheppard, 2020; Eckhouse et al., 2020). The choice of renewable energy technology is closely connected to country-specific advantages. For Enel, investment and innovation in variable renewable technologies have been a central part of Enel's strategy for decades (Bergami et al., 2012a).

The transition to renewables has been a long journey since the 1980s and is in "the DNA of the company", according to an Enel manager (Enel informant). As the second largest electricity company in the world (Forbes 2021), Enel has significant capital for innovation as well as a strong presence in the industry. Through a range of partnerships with research institutions, universities and start-ups, Enel has maintained knowledge of the newest technological developments and has a strong green profile. According to one Enel manager, Enel's renewable strategy is "extremely aggressive. Everything is about sustainability and not for a goodwill reason, but because it's good business". Importantly, innovation investments have allowed the company to experiment with emerging technologies in large-scale set-ups, which is crucial for

assessing production capacity, costs, endurance etc. (Enel informant). Enel is "technology agnostic" (Enel informant) and keeps a broad innovation portfolio experimenting with different solutions to have the knowhow and capabilities ready if a specific technology proves to be successful. Reflecting Enel's long history with developing onshore wind and solar PV projects, and home-country geographic location in the Mediterranean, these sources are the largest renewable technologies[6] representing 15% and 5% of Enel's total installed capacity (Enel, 2020).

For Enel, an important driver for the transition to renewables as well as for internationalization is the self-hedging properties of variable renewable energy. As an Enel manager pointed out in our interviews, a geographically and technologically diversified portfolio operating solar PV and wind power in different locations ensures output (from wind, sun) in at least some of the localities. While fossil fuel costs follow the global market price, the cost of wind and solar powered energy once installed is very low:

> You essentially do not have any cost for the fuel. But you can have wind in one place and don't have it in another place and those things tend to compensate. (Enel informant)

Enel's CEO Francesco Starace has taken this argument further noting that with the technologies available today, renewable energy is a better investment than fossil fuels, which he believes are the true intermittent energy sources owing to unstable geopolitical factors that makes these energy sources extremely volatile (Barisoni, 2021).

Ørsted also benefitted from the sustained R&D in renewable energy technologies, but with a different outcome. Focusing on primarily one renewable energy source, offshore wind, Ørsted was a first mover within this technology and began to develop large-scale projects already in 2006. The firm is currently the global leader in, and largest developer of, offshore wind power generation. Offshore wind power is a considerably more complex and risky than onshore wind power due to the high costs and tough conditions at sea for materials, installation and maintenance. However, recent years have seen a steady decline in prices making offshore wind competitive with no subsidies in mature markets (Jansen et al., 2020). From Ørsted being one of the only operators on the market ten years ago, the global competition today is "extremely

[6] Not considering hydro power as this is neither a new technology nor considered for further development

intense" (Ørsted informant). While Ørsted, like Enel, uses the partnership-model when developing offshore wind power projects, the company also has solid knowledge and R&D capabilities in-house.

As opposed to conventional fossil fuel powered plants, renewable energies such as wind and solar PV are location dependent. Therefore, renewable electricity firms first consider geographic locations and climatic condition when internationalizing. Since the strategy shift in 2012-13 Ørsted's primary activity has been offshore wind power. Access to the North Sea with shallow sea and strong and steady winds makes Denmark a perfect location for development of offshore wind power, as well as the UK, which was the first international offshore location for Ørsted.

Ørsted was in a different and more difficult position than Enel around 2008-2012. Not having Enel's capital and size, Ørsted needed a higher margin on its energy production as well as a competitive advantage within a niche segment. According to an Ørsted informant, this prompted the company to take the risky decision of investing in large-scale offshore projects as the first company to do so. However, the firm was in a critical financial situation and needed capital to fund its new international offshore wind adventure. The Danish government refused to inject capital into Ørsted, which led the firm to sell off 19 percent of its assets in a controversial sale to Goldman Sachs (Milne, 2016). The partial privatization and divestments of non-core activities such as Betterplace, enabled Ørsted to go all in on the relatively expensive offshore wind technology (Rüdiger, 2014). Enel, on the other hand, was in a more comfortable position allowing them to make careful decisions and to invest where the risk-return profile was best: In smaller projects and where the technology is less demanding (Enel and Ørsted informants). The informant also points out that Ørsted still has a risk-taking approach embedded in its strategy partly to reap the higher margins associated with the higher risks. At present, this translates in Ørsted's location decisions as the industry commonly considers both Taiwan and especially the US to be risky offshore investment opportunities (Ørsted informant).

In recent years, Ørsted has again broadened its technological portfolio supplementing its offshore assets with onshore projects, solar PV and storage. Strategically, this decision reflects the common understanding in the industry that a 100% renewable electricity system requires a diverse energy portfolio as well as storage. The gradual transition to renewable energy solutions pushed Ørsted's internationalization activities further. Consequently, Ørsted was present within offshore and onshore wind power in eight countries in Europe, the US and Asia (Ørsted, 2020).

As former electricity monopolies, Enel and Ørsted have evolved in similar institutional environments and followed similar journeys towards becoming MNEs. However, from being similar national monopolies, Ørsted and Enel are now different in many aspects. Ørsted has vertically disintegrated all activities except for generation and has thereby removed itself from end-users. Although the company has introduced other renewable energies, Ørsted is mainly an offshore wind company and generator, thereby claiming a niche within energy solutions. Conversely, Enel is present across most of the electricity value chain as a generator like Ørsted, but also as a network operator and in retail. In addition, Enel is advanced in digitalizing its activities thereby positioning itself to reap current and future business opportunities as add-ons to traditional electricity production. For Enel, digitalization enables increasingly flexible energy systems, prosumer[7] connections, rollout of electric mobility services as well as banking services, ultra-broadband and smart home solutions. Digitalized services are easier to scale and thus easier and cheaper to internationalize than generation activities.

The role of senior management

In addition to firm-level capabilities at the organizational level, and in line with our analytical framework, the role of the individual decision makers within the company is a key factor in strategy development and implementation. Therefore, the following section examines the role of the CEOs of Enel and Ørsted in their internationalization strategies as well as in their transition to renewable energy in the past two decades.

Table 2: CEOs of Enel and Ørsted for the past two decades.

CEOs	
Enel	**Ørsted**
Francesco Starace (2014 – 2021)	Mads Nipper (2021 - present)
Fulvio Conti (2005 – 2014)	Henrik Poulsen (2012 – 2020)
Paolo Scaroni (2002 – 2005)	Anders Eldrup (2001 – 2012)

From being a company with a diverse portfolio including water, telecom and property, Paolo Scaroni refocused Enel's strategy to its core business: electricity (Bergami, Monti & Moradin,

[7] An individual, typically a household, which produces and consumes electricity.

2012). When Fulvio Conti took over in 2005, the divestment of Enel's non-core activities had raised a large amount of capital. This enabled Fulvio Conti to implement an ambitious internationalization strategy that culminated in the acquisition of the large Spanish utility Endesa in 2009. Through this significant takeover, Enel gained access to the Spanish and Latin American markets and had become an important international player (Soda & Forti, 2012). According to an Enel informant working together with Fulvio Conti at the time:

> Internationalization was the path followed by Mr. Conti and that was very right: If you wanted to succeed in the future, you needed to be big, solid, geographically differentiated.

The informant further connected Enel's internationalization to the company's transition to renewables:

> …probably one of the reasons why [Enel] could switch so much [to renewables], is the fact that we had the largest diversified portfolio. The diversification. This is something Conti initiated, the diversification [of the energy mix and of the market] is fundamental, something you cannot do without in this business. (Enel informant)

Despite Enel being a large, former monopoly in a traditionally slow-moving industry, Fulvio Conti and Francesco Starace's leadership styles have allowed and encouraged discussions about the strategic direction of the company. As an Enel informant stated: "The internal debate about critical decisions is usually tough. Fair and tough all the time. It must be." (Enel informant). According to the informant, "it is sort of against the odds that Enel [being a utility] is so innovative and fast moving", but one of the most important drivers for that is the leadership. Francesco Starace and Fulvio Conti are:

> …people who have been able to see a little bit more ahead of time and a little bit more... The path followed by the company is to a wide extent a consequence of a different leadership.

He adds,

> We've usually allowed […] a small number of crazy people and a little bit of failing. You need a small number of crazy ones

> who wants to challenge the existence of the status quo. We have always had our troublemakers and we have always allowed troublemakers to be there in the mix besides a number of very solid, efficient engineers doing the day-to-day job.

To exemplify, the informant mentioned how Fulvio Conti set up renewables division, Enel Green power, in 2008 and appointed Francesco Starace as its director. Francesco Starace:

> …started, his personal revolution [of increasing renewables], under Mr. Conti. But also under the push of Mr. Conti. He [Conti] was aware that in the future renewables would be very relevant. So he decided to give Francesco Starace the task of bringing the renewable division to the next stage. In a way, this is not much different than what Mr. Starace did with Enel X. He said, "give us some trouble. Let's try something really different out there, but a little bit separately, just not to upset too much the rest of the business."

Both Francesco Starace and Fulvio Conti appear more risk averse in their leadership style than the Ørsted CEOs who for a long time focused on only one, complex and risky technology. In addition, Francesco Starace has perceived subsidy dependent technologies as risky (Andersen, 2019). Conversely, the level of subsidies has appeared to be a direct driver for Ørsted's international expansion. This indicated that change in subsidy schemes has been a risk Henrik Poulsen was more than willing to take.

In Enel, the leadership has also had a specific vision regarding the choice of renewable energy to pursue. Francesco Starace has been adamant in his critique of offshore wind power restating that Enel will not invest since the technology is still too expensive and most importantly, too risky (Andersen, 2019). As an engineer, Francesco Starace has often pointed to the issue of the complexity of the turbines' operation, maintenance and long-term performance in a harsh marine environment and he has even labelled offshore wind power as a "toxic asset" (Staffetta Quotidiana, 2019).

Like Enel, Ørsted have had three CEOs during the past three decades and all three leaving different marks on the firm. Anders Eldrup took over when the company was a traditional energy company steaming ahead fueled by coal and gas while adapting to a newly liberalized

electricity market. However, after a few years Eldrup completely reformed the firm strategy embarking on the huge task of greening the black company. Eldrup's radical decision to shift focus completely to renewables, especially offshore wind power, faced opposition from the majority of the executive management group (Voldsgaard & Rüdiger, 2021). One informant recalls:

> If I should point to one single factor, as the most important cause for the steps we have taken, it is Anders Eldrup. His personal business and political vision and the drive […] to take some slightly risky decisions very early and thereby getting us a head start.[…] Not least regarding our wind power strategy. It really started with him. (Ørsted informant)

In the years 2009 to 2012, Ørsted's leadership took some radical decisions on large-scale investments in offshore wind power and Anders Eldrup was the driver behind it:

> Definitely driven by Anders Eldrup. He was the kingmaker. No doubt. […] He was the one who said, okay, this [wind power] is the way forward. (Ørsted informant)

Henrik Poulsen, who took over as CEO in 2013, continued Anders Eldrup's offshore vision and took it even further by divesting Ørsted's onshore business. According to an Ørsted informant, Anders Eldrup was clearly vision driven however leaving the company with little financial room to maneuver (Ørsted informant). Henrik Poulsen's decision to divest was thus to raise more capital to fund the expensive and risky offshore strategy. He also appointed Samuel Leupold, an engineer specializing in energy technology to lead the new offshore wind power division as Vice President. From that moment, the leadership's strategy was to focus solely on offshore. As one informant recalls:

> It was a top management decision [only to develop offshore] and it was a surprise because we thought we would develop everything and then the message was that we should focus on offshore. But it was definitely the right decision! (Ørsted informant)

From early in his CEO tenure, Poulsen appeared to have continued Anders Eldrup's vision of making Ørsted a green energy leader where climate concerns seemed to be one of the main

drivers (Ørsted, 2015). Henrik Poulsen cemented Ørsted's new idealistic identity for which Anders Eldrup had previously outlined and paved the way. Yet, Henrik Poulsen's leadership differed somewhat from Anders Eldrup's style. The firm strategy became more streamlined with a focus on stabilizing the business and securing profitable margins. Furthermore, Henrik Poulsen narrowed down firm activities from a diverse portfolio with a broad focus on the renewable energy transition, e.g., electric vehicle operation and bioethanol, to a sole focus on wind power. However, Anders Eldrup and Henrik Poulsen had each their clear strategies on both the renewable transition direction and the internationalization journey of the company, their leadership styles have encouraged employee engagement at all levels. As one Ørsted informant explains:

> There is a bottom-up movement. Always a lot of pressure on our leadership from employees in the organization. For me, it [Ørsted] is probably the company with the most informal structure that I have experienced, when it comes to employees influencing what's going on in the company. (Ørsted informant)

Since 2021, Mads Nipper has taken over as CEO in Ørsted and already one month into his CEO tenure, he announced that Ørsted was ready to move into floating offshore. A move that was welcomed by the employees, but was also understood as a change in leadership style. While Henrik Poulsen and especially Anders Eldrup have demonstrated a high degree of risk tolerance compared to Enel's senior management, Mads Nipper might tolerate an even higher risk according to one Ørsted manager (Ørsted/Enel informant). However, after merely one year as CEO it is too early for a deeper analysis of Mads Nipper's leadership.

5. Discussion

In this paper, we take a historical, evolutionary perspective to study the internationalization strategies and processes of two frontrunner firms in the renewable electricity industry. Here, an overall observation is that the key determinants of internationalization in the industry seem to have shifted through the decades. In the 2000s, it was important for the firms to grow to bolster themselves against the increasing competition due to the liberalization of the industry. To expand, firms had to internationalize, as there were not enough opportunities in their domestic markets. As renewable energy sources became more important so did a diverse geographical

portfolio to mitigate the risk of sudden changes in framework conditions (subsidies, tariffs etc.) depending on the political agenda in each country. The transition to renewable energy was thus one of the key enablers and drivers of internationalization. Since the mid-2010s until today, renewable energy has become more competitive, and thus solar and wind generated electricity is often cheaper than the cheapest fossil fuel-based electricity even without subsidies (IRENA, 2020). Consequently, for firms with solid capabilities within renewable electricity generation, such as Enel and Ørsted, unsubsidized wind and solar power are now often more profitable than conventional projects creating an even stronger incentive to internationalize.

In Table 3 below, we complement the overall analytical model (figure 1) with a summary of more specific findings in the "tripod legs" of respectively, industry, institutional factors, and firm resources and capabilities. We relate these observations to the two case firms to enable a comparison of the internationalization.

Table 3: Determinants of internationalization

Industry	Enel & Ørsted
Liberalization	Both firms impacted in similar ways by the EU-led liberalization process
RE technology as emerging competitive advantage	Both firms have strong competitive advantages within RE tech through in-house R&D and partnerships
Niche RE technology as emerging competitive advantage	Enel has a long R&D pipeline experimenting with niche RE parallel to their main business. For Ørsted, niche RE (offshore) is their main business.
Digitalization as emerging competitive advantage	Enel is a global frontrunner within digitalization of electricity. Ørsted is not present in this business area.
Sustainability as emerging competitive advantage	Green image important driver for both firms.
Institutional factors/environment	
Geographic hedging: natural resources	Important driver for Enel with presence in 47 countries. Not relevant for Ørsted at this moment.
Geographic hedging: shifting political agendas	Important driver for both. However, Enel aims to be in markets without subsidy schemes whereas Ørsted factors in subsidies in strategy
Climate crisis: EU regulation and pledges by governments	Both firms impacted by EU and national government legislation to transition to RE, which then enabled internationalization. A slightly stronger political push from the Danish national government 1990s and 2000s than the Italian.
Long-term government support for R&D	Strong support from national governments in both Italy and Denmark since the 1970s.
Firm specific resources and capabilities	
Pace of RE transition	Fast pace of transition to RE for both firms in the 2010s onwards. Enel's transition started earlier than Ørsted's.
Specialization	Both firms are specialized within renewable electricity tech. However, offshore being a highly complex, risky, niche tech, Ørsted is more specialized than Enel. However, Enel has a broader RE tech portfolio than Ørsted including a long pipeline of R&D and experimental projects parallel to main business.
Risk tolerance of CEO/Management	Medium-level risk tolerance among CEOs in Enel. Ørsted's CEOs have exhibited particularly high risk tolerance in decision making processes.

As depicted above, Enel and Ørsted share similar characteristics on a number of areas related to their transition to multinational renewable firms. However, on a few decisive parameters the two firms are distinctly different. While Ørsted has invested heavily in a one, risky and complex

technology, Enel has created a much broader technological portfolio characterized by low-risk technologies. In this way, Ørsted's internationalization strategy aims at few, but more capital-intensive and risky projects that in turn have higher profit margins. Contrary to this, Enel has a large number of smaller projects that are low risk with smaller profit margins.

In addition, we note that the type of RE technology each firm has invested in affects which international markets that each firm will choose. Enel is present in 47 countries on five continents, also in developing nations, which is partly due to firm size, but also due to their RE technologies being relatively easy to scale. Solar PV and/or onshore technologies make sense to install in many parts of the world and in many types of landscapes. Furthermore, solar PV and onshore wind projects do not need to be large scale to be profitable. In contrast, for Ørsted's offshore projects (the main business), geography and geology are determining factors, which limit location options. Offshore wind power projects require shallow seas and good wind speeds while not being too far from shore. Moreover, since offshore wind power projects are large and capital-intensive, host-nations must be economically developed and have a strong institutional framework with few voids.

As state hybrids and generators, Enel and Ørsted have developed in different directions. Industry dynamics have turned niche RE technology and digitalization of electricity into key competitive advantages. Ørsted has established itself as a global leader within a generation niche: the offshore wind power market, while having some onshore projects on the side. From being an integrated energy company in the 2000s, Ørsted has narrowed its firm profile to be active in electricity generation only. Enel has maintained its scope as an integrated energy company and while Enel continues to invest in R&D within renewable electricity generation, the firm has built up a strong competitive advantage within digitalization. This has altered the firm profile from being a traditional energy company to becoming a frontrunner within smart energy systems. While we still characterize both firms as electricity firms, Enel and Ørsted have been moving into separate niche market segments: offshore and digitalization/smart energy systems. We also note that each firm have been leaders within each niche market segments.

5.1. Industry

From the above findings, it appears that for electric power producers, it is not a question of *if* they should internationalize, but rather *how*. To repeat one source: "Internationalization is inherent in the business". However, internationalization also seems to be merely one of the numerous ongoing interconnected transformations in this industry. The all-encompassing nature of the transition from large and rigid, former state-owned electricity providers to new innovative and dynamic multinational "green energy majors" cannot be understated. Because of this industry change, firms have completely transformed their core technology and product, ownership structure, geographical footprint and raison d'être.

At the industry level, transition to renewables has made it necessary for firms to expand to secure market shares and competitive advantage within specific renewable energy technologies. R&D within wind and solar power technologies is moving fast so to keep up firms must secure presence in new and relevant markets.

In contrast to Kolk and co-authors (2014), we did not find a home-region orientation for generation activities in any of the two firms. Rather, firms expanded seemingly without the incremental pattern, from neighboring countries onto other continents. Hence, we found that the firms do not follow a classic internationalization pattern such as the Uppsala model or Forsgren's idea of internationalization decisions being based on incremental learning (Forsgren, 2002). This might be a result of the transition to renewable energy in both firms and the impact renewable energy technology has had on expansion opportunities. Due to the nature of the end-product, no regional adaptation is required. Instead, expansion decisions in both firms depended on a) availability of resources (wind or sun) on location, b) profitable market conditions including local content requirements and c) strong institutional framework.
Moreover, and in contrast to Rodrigues and Dieleman (2018), we did not find that cutting ties to the home country to increase autonomy was a motive for internationalization within these types of state hybrids. Increasing autonomy obtained via internationalization might be an outcome, but it was not a driver. Finally, we saw that geographical factors were particularly strong drivers of internationalization within this industry. For both companies, a geographic diverse portfolio served as hedging against two types of risks: First, a geographical diverse portfolio hedges against sudden changes in national institutional framework conditions of host countries, which are common in the electricity industry. Second, For Enel, a spread in locations also served as

hedging against unfavorable weather conditions. In sum, this suggests that the presence of location-specific factors and an enabling institutional environment guide market location choice within this industry.

5.2. Institutions

One of the key legacies from the oil crises was the initiation of national innovation programs to develop alternative energy sources. Both firms have used such programs as a foundation to create their competitive advantages. Although domestic climate and energy politics differ somewhat, both firms have benefitted from sustained government support such as collaboration with national innovation systems and willingness to pay above-market prices. In a capital-intensive industry such as electricity, these measures have helped overcome market imperfections and difficult take-off conditions for new renewable energy technology (Estrin, Meyer, Nielsen, & Nielsen, 2016). Together with home-country support, the liberalization process created a new market and hence strong incentives for both firms to internationalize. Enel was a more aggressive expander taking a giant and sudden leap when acquiring Endesa while Ørsted began its expansion in a few Northern European countries and then jumping to the US and East Asia. As renewable electricity has become more profitable and international demand has increased, both firms are a lot less dependent on home country institutions. While national and EU-level climate policy demands as well as public expectations initially prompted both firms to initiate the renewable transition, firms now drive the transition.

5.3. Firm resources and capabilities

Scholars such as Johanson and Vahlne (1977) and Acedo and Jones (2007) assert that risk averseness among executive management restrains internationalization. In the case of Ørsted and Enel, we found that CEOs in both firms displayed a high degree of risk tolerance. The high degree of risk tolerance affected their internationalization strategy, but not only in the degree of internationalization. Enel has a large international presence also in countries with a degree of institutional voids much in line with the established theorization. However, for Ørsted, the high level of risk tolerance of the executives has not resulted in a wide international presence. Conversely, Ørsted is merely present in seven countries. Still, two of these markets are perceived as high risk for offshore wind, namely the US and Taiwan.

We note that other reasons for Ørsted's limited international presence compared to Enel could be that a) the offshore wind power market is still in the growth stage and b) offshore wind power projects are highly capital intensive and have a longer pipeline and therefore international expansion in this domain has a longer lead time; and c) from the outset of the industry's internationalization, Enel had installed capacity many times larger than Ørsted (Enel, 2020; Ørsted, 2020).

In analyzing how and why these large MNEs have internationalized, we discovered that although state hybrids carry a legacy e.g. by being embedded in a strong institutional framework within a highly regulated industry, the CEO as an individual also has a strong influence on firm strategy. In fact, while developments in Enel and Ørsted share many characteristics, analysis of the CEOs revealed the most noticeable differences between Enel and Ørsted. Henrik Poulsen and Anders Eldrup's leadership styles have been vision-driven, but also pragmatic in the sense that Ørsted, supported by the domestic institutional environment and related industries, had a distinct competitive advantage within offshore wind power. However, to go all in on an expensive and complex technology that was far from profitable also betoken a high degree of risk-tolerance. In comparison, Enel's senior management exhibited more risk averseness in RE technology selection and international expansion strategies. We do not find evidence supporting Bruton and co-authors' (2015) expectation that CEOs who do not come from government or other SOEs are more skilled in reshaping the SOE in an innovative and market-oriented direction. In contrast, Eldrup and Conti, coming from government and SOE positions respectively, implemented ambitious innovative strategies and were instrumental in turning Ørsted and Enel into leading global renewable energy firms, or as they are now labelled, 'New Energy Giants' (Eckhouse et al., 2020).

Building on Peng and co-authors' (2009) argument that industry factors, firm resources and institutional framework constitute the three, complementary 'legs' of a firm's strategy tripod, we have seen that these pillars also shape internationalization strategy. One initial contribution of the tripod (Peng et al., 2009) was the distinct positioning of the three elements in the tripod. However, our study suggests that a more precise theoretical understanding of the interdependencies and dynamic relationship between the elements could enrich the tripod's explanatory power. While the strategy tripod predominantly is a static analytical tool, we have utilized the strategy tripod to analyze a transition hence adding a process perspective to the

framework. From this perspective, we showed that the three legs in the tripod (industry, firm resources and institutional framework) are not static pillars supporting a platform, but rather dynamic entities that co-evolve, much like a braid, and drive the changing strategies of the firms.

Furthermore, the study showed that the decisions of individual managers are central. The findings point to the relevance of adding a micro-level perspective to the "firm resource leg" to assess how individuals' actions within the firm affect the overall strategy. In view of our findings, a theoretical proposition is therefore that complementing the strategy tripod with a micro-level perspective can help bridge the gap between macro- and micro-level analysis in international strategy (Contractor et al., 2018). This extension is not confined to the renewable energy industry but has potential for application in other internationalizing industries.

6. Conclusion

In this paper, we apply a dual case study approach to investigate factors determining the internationalization of "state hybrid" MNEs in the renewable electricity industry. From a climate change perspective, a "grand challenge" of our time (Buckley et al., 2017), this sheds an important light on internationalization of state-of-the-art renewable technology and thus international diffusion of technologies that would otherwise not be available.

For both firms, the legacy as a protected monopoly in the home market played a role in creating the conditions for the international take-off. The combination of home country institutional support (e.g., subsidies and R&D) and market dominance was central for the development of the scale and nature of firm resources and capabilities. Once the international electricity market opened, both firms had acquired the size and strength necessary to compete.

In the wake of the electricity market liberalization in Europe, the internationalization of ENEL and Ørsted evolved as an outcome of the combination of market pull factors and technology push: The opening of the international market reinforced the need to sustain scale advantages, and to build and defend a prominent position in the market. Furthermore, the emergence of international opportunities enabled the firms to use geographic diversification as a strategy to

hedge risks. Together, these market factors created an incentive for continued internationalization.

Theoretically, the “strategy tripod” model by Peng and co-authors (2009) served as the main structure in our analytical model. While the three elements helped explain the internationalization of ENEL and Ørsted, we suggest an extension of the theoretical model. In addition, we show that the three legs in the tripod are dynamic entities resembling a braid, rather than static pillars.

Finally, we showed how industry and technology-specific characteristics have determined internationalization patterns. By doing so we respond to Gehman and co-authors’ call for management scholars to address grand challenges in a more direct manner instead of as “merely a context for exploring extant theoretical perspectives” (Gehman, Etzion, & Ferraro, 2021). The change from fossil fuel-based technologies to renewable energy have created a new industry and with it new internationalization patterns.

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Paper 3. A resource beyond firms: Exploring the role of ‘stateness’ in internationalization of state hybrids

A resource beyond firms: Exploring the role of 'stateness' in internationalization of state hybrids

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Abstract

Since state hybrids come in all shapes and sizes, contextual factors are key to analyzing how state ownership affects state hybrids undergoing internationalization. Despite the increasing presence of state hybrids in the global economy, representing 50 percent of global GDP, research on state hybrid internationalization outside China and emerging markets remains scarce and fragmented. Through an in-depth qualitative case study of Ørsted's groundbreaking offshore wind power project in Taiwan, this paper explores and refines the concept of *stateness* in order to facilitate a deeper understanding of SOE internationalization. Drawing on resource-based theory and contingency theory, the paper situates stateness as a multifaceted resource empirically illustrated by the electricity industry. Six factors are introduced that can facilitate an assessment of stateness as an advantage or disadvantage for state hybrids. The findings indicate that stateness as a potential, flexible resource can be exploited internally in the firm, but also by external actors. In addition to being shaped by Firm-Specific Advantages, industry, home and host country factors, the findings show that the geopolitical context, often overlooked in international business research, can play a crucial role in internationalization.

Keywords

State-owned firms, state-owned multinationals, internationalization, advantage, disadvantage, stateness, renewable energy, state hybrids

1. Introduction

In-depth knowledge of the dynamics at play between firm internal and firm external factors, when State-owned Enterprises (SOEs) from advanced economies internationalize remains scarce and fragmented. This is a paradox since SOEs have recently increased their presence in the global market competing fiercely alongside private multinational enterprises (MNEs). With SOEs constituting 20 percent of the world's 2000 largest firms and representing 50 percent of global GDP, they play a key role in economic growth worldwide (Gaspar, Medas & Ralyea, 2019). In other words, with the partial exception of the case of China and emerging markets, with conditions and institutional surroundings widely different from those in open economies (Bruton, Peng, Ahlstrom, Stan, & Xu, 2015; Cuervo-Cazzura, 2018; Cuervo-Cazzura & Li, 2020), there is a critical gap in international business literature.

A reason for this might be a dual tendency, in the literature as well is business circles, to 1) overemphasize the importance of private MNEs as drivers of internationalization through the privatization waves of the 1990's and 2000s and 2) perpetuate the myth of the 'lazy state' (Mazzucato, 2018). However, whereas private MNEs certainly do play a key role in a world economy undergoing waves of globalization, the common conception of SOEs as historically irrelevant or as being inefficient, bureaucratic, and poorly managed among politicians and industry representatives seems outdated and not in line with SOEs' actual performance (Mariotti & Marzano, 2020). Considering the importance of SOEs in advanced economies, it becomes strikingly clear that a deeper understanding of the role of *stateness* in the configuration of Firm Specific Advantages (FSAs) is needed.

The paper contributes to our knowledge of the modern SOE and explores and refines the concept of stateness as a resource and advantage when internationalizing. While originally coined within political science by Nettl (1968), stateness still lacks a universally agreed-upon definition (Andersen, 2017). Recently, the term has been applied by business and management scholars that have adopted the term to analyze SOEs (e.g. Mariotti & Marzano, 2020; Cuervo-Cazurra & Li, 2021). However, the term also remains largely undefined in the context of international business. The paper therefore explores what conditions shape stateness as a resource. These are outlined as six factors.

The need for a fuller understanding of a global economy and its political entanglements that takes into consideration the internationalization of SOEs becomes particularly evident in the case of the electricity industry. This is a giant industry undergoing processes not only globalization but also a massive green transition. Hence, the present study uses the electricity industry as focus area to address a broader need for a stronger understanding of internationalization.

Specifically, the paper raises the overall question: When internationalizing, how can stateness be understood as a resource for SOEs? Zooming in on the institutional surroundings, I further ask: How and under what host country conditions can stateness, as an advantage, be exploited? To answer these questions, I present a qualitative, in-depth case study of Ørsted, a Danish renewable energy SOE and former monopoly, and its recent entry into the Republic of China on Taiwan (hereafter Taiwan) with the Taiwanese government as client. As a single-case study, this paper has an exploratory purpose looking into an unfolding phenomenon and investigate underlying complexities. The case uncovers important nuances in the interplay between the SOE's FSAs, the home, and the host nation that will contribute to a deeper understand the role of stateness in internationalization. I situate that examination within a conceptual framework that draws on a resource-based understanding of internationalization in which stateness is treated as a multifaceted resource.

I proceed by uncovering how stateness affects internationalization through complex dynamics when SOEs expand outside their home country. Stateness can be turned into a competitive advantage or disadvantage (Benito, Rygh & Lunnan, 2016; Cuervo-Cazurra & Li. 2021; Kalasin, Cuervo-Cazurra & Ramamurti, 2019; Luo, Xue & Han, 2010). I delve into this argument and posit that stateness as an advantage, is different from traditional FSAs. In addition, drawing on Dunning's seminal work (1988), the paper also considers the interdependencies between FSAs (or O advantages) and location characteristics of the host economy and suggests including a geopolitical dimension to the analysis of SOE internationalization.

With findings from the Ørsted case study that illuminate the dynamics between SOE's FSAs, the home, and the host nations – dynamics that resemble those studied by Zajac and co-authors in their 'fit' argument (2000) – I argue that cross-country relationships and interdependencies, as

well as industry-specific dynamics, all testify to the fact that context is utmost important when working towards a more holistic understanding of SOE internationalization.

In the following Section Two, relevant literature is reviewed to guide a conceptual framework outline. Section Three presents methodological considerations while Section Four outlines the findings. Section Five discusses the findings against the conceptual framework and suggests future research avenues that can expand on the findings. Finally, Section Six concludes the paper with remarks on contributions.

2. Internationalization of SOEs drawing on Resource-Based Theory

The SOE category includes a vast variety of firms in many types of industries and with myriad types of ownership structures. Even within the same industry, firms vary greatly. They often have a double role competing and/or collaborating with private sector MNEs (Peng, 2001) while at the same time retaining links to the government, sometimes even resembling government agents, all of which makes it difficult to generalize. At the same time, SOEs are also highly important players in many economies around the globe comprising 132 out of 500 of the largest companies in the world (OECD, 2021). The following section outlines the literature on internationalization theories, FSAs and SOEs while highlighting relevant gaps. This outline, then, provides the basis for the conceptual framework that will guide the further exploration of stateness as a resource for SOEs in their internationalization.

2.1. SOEs and internationalization

The above-mentioned factors make SOEs an interesting phenomenon worthy of increased scholarly attention. Yet although the internationalization of SOEs is a phenomenon growing in size and importance, research remains scarce (Bruton et al., 2015). Specifically, scholars such as Cuervo-Cazurra and Li (2021) have argued that the role of state ownership in firm internationalization remains critically underexplored.

For example, whether state ownership of MNEs is an advantage or disadvantage, or both, remains an ongoing debate. In a recent review of relevant literature, Cuervo-Cazurra and Li assess the diverging views on stateness as either predominately an advantage or disadvantage when firms internationalize (2021). However, conclusions are diverse and multifaceted leaving

the discussion open for further investigation. Benito and co-authors also argue that research on SOEs lacks nuance and stress the need for contextualization and further exploration due to the varying conditions within which SOEs operate (2016).

This gap becomes clear when reviewing the literature. With the major exception of China (see e.g., Lin, Lu, Zhang & Zheng, 2020 for review) and other emerging market settings (e.g., Cuervo-Cazzura, 2018) there are only few examples of in-depth scholarship of SOE internationalization elsewhere. This also goes for the resource-based literature, which tends to focus on SOEs from China (Bruton et al., 2015; Buckley, Clegg, Cross, Liu, Voss, & Zheng, 2007; Cuervo-Cazurra & Li, 2021; De Beule & Zhang, 2022; Mariotti & Marzano, 2020) as well as emerging economies (Cuervo-Cazurra, 2018; Kalasin et al., 2019; Rodrigues & Dieleman, 2018). As the second largest economy in the world, China is undoubtedly an important empirical case. However, studies on Chinese SOEs may not capture important factors for SOEs from other countries and regions (Bruton et al., 2015). For instance, the bulk of recent literature that highlights the issue of SOEs' negative reputation as being more bureaucratic and less transparent than private MNEs are based on studies in China (e.g. Liu & Woywode, 2013; Meyer, Ding, Li & Zhang, 2018; Zhang, Zhou & Ebbers, 2011).

Hence, the unequal geographical distribution of case studies raises questions not only about representativeness of existing literature but also about potentials for generalization and theorization. Indeed, the lack of research on cases other than emerging markets and China might explain the abundance of arguments in the literature from agency and neo-institutional perspectives that underline the disadvantage of stateness (see Cuervo-Cazurra & Li, 2021 for review) owing to, for example, efficiency and legitimacy issues. These findings are intriguing and important for a further development of the concept of stateness, but do they apply to settings outside China and emerging markets? Will outcomes be different in small, open economies? This has yet to be thoroughly investigated. To address this gap in the literature, I will analyze internationalization mechanisms of a state hybrid from an advanced, small, and open economy.

Finally, the term stateness seemingly lacks a clear definition among business scholars, as well as in the broader political science field from where it stems (Andersen, 2017). Several business and management scholars introduce the term when arguing for the liability of stateness (e.g. Musacchaio et al., 2021; Sun, Doh, Rajwani & Siegel, 2021; Wright, Wood, Musacchio, Okhmatovskiy et al., 2021), which has since been applied primarily to argue for the

disadvantage of stateness. (e.g. Mariotti & Marzano, 2020; Cuervo-Cazurra & Li, 2021). Cuervo-Cazurra and Li adopt the term to review business and management literature that argues for either the disadvantage or advantage of stateness (2021). While making interesting and substantial arguments about the role of state ownership, these contributions also seem to lack a clear definition of stateness. This paper will therefore contribute to refining stateness as a concept in business and management literature.

2.2. SOEs from a resource-based view

The conceptual framework of this paper draws primarily on literature from the international business literature and research on SOEs. The literature offers several perspectives on firm internationalization. These include Dunning's seminal Eclectic Framework (OLI) (1988), the Institutional approach (North, 1990; Peng, 2003), Porter's Industry Perspective (1990), the Resource-based View (Barney, 1991; Wernerfeldt, 1986), and Contingency Theory (Hickson et al, 1971; Ruekert, Walker & Roering, 1985). Here, Zajac and colleagues propose the concept of *strategic fit* that is dynamic and multi-levelled and captures how the 'fit' between firms and surroundings is in constant motion (2000). While each of these explanatory frameworks provides independent and compelling arguments for firm behavior, their proposed perspectives also overlap. Hence, the paper takes a resource-based view on internationalization while at the same time it draws on complimentary approaches.

The resource-based view of the firm focusses on resources internal to the MNE that can be turned into a competitive advantage, or FSAs, when these are mobile, inimitable, and non-substitutable (Rugman & Verbeke, 1998; Rugman, Verbeke & Nguyen, 2011; Wade & Hulland, 2004). As such, the firm is viewed as a bundle of resources, some of which have FSAs. The success of the MNE when internationalizing therefore depends on the firm's ability to identify and exploit these resources.

Firms use FSAs to create superior goods or services and thereby obtain competitive advantages (Barney, 1991). From this perspective, state ownership turns into a source of FSA, also called the state ownership advantage (Benito et al., 2016; Cuervo-Cazurra & Li, 2021; Luo et al., 2010) or *the helping hand* (Kalasin et al., 2019). State ownership advantages take a variety of forms such as access to financial resources (Luo et al., 2010) and indirect political and legal support (Hoskisson et al., 2013). According to Kalasin and co-authors (2019), the state

ownership advantage becomes a helping hand when firms internationalize because governments can supply firms with economic resources. In addition, the home country government can support the firm when entering foreign markets by acting as a broker of disputes with host country governments (Doh, Teegen & Mudambi, 2004; Hong et al., 2015; Kalasin et al., 2019; Luo et al., 2010). However, firms can experience state ownership disadvantages when home nations impose their political and other non-economic goals onto the SOE e.g. *the hindering hand* (Kalasin et al., 2019).

To explain how state ownership affects internationalization, Marano and co-authors' argue for including formal and informal institutions in an analysis of firms' performance (2016). They emphasize the importance of understanding the degree to which a firm is embedded in the home country's formal and informal institutions, since institutional embeddedness affects performance. From a resource-based perspective, the firm's embeddedness in home country institutions can thus be regarded as a resource and potential advantage for the SOE. In this way, including formal and informal institutional embeddedness in home country factors will add to the complexity of the SOE analysis.

The understanding of how FSAs shape internationalization of SOEs can help shed light on important interconnections affecting the global economy. Yet, resource-based literature on the topic is still fragmented. Significant contributions, as highlighted in the above section, predominately argue that state ownership is on either side of the disadvantage-advantage spectrum or follows an S-curve relationship, with variations according to different set criteria (see Kalasin et al. 2019). However, to explore the underlying dynamics of SOE internationalization and the state ownership advantage in detail, I will draw on additional SOE and internationalization perspectives to add nuances to the conceptual framework.

2.3. FSAs for state hybrids

State hybrids (i.e., firms that are partly owned by the state) operate on different terms than fully state-owned multinationals and private MNEs. However, in-depth research on state hybrids' FSAs remains limited. An important contribution by Bruton and co-authors argues that state hybrids enjoy an advantage of legitimacy compared to private firms (2015). They assert that firms can use their stateness in legitimacy-building with host country governments while also

seeking profit maximization for their shareholders. In this way, viewing FSAs for state hybrids from a resource-based perspective allows us to treat stateness as an FSA in and of itself.

This goes against the neo-institutional view, which suggests that SOEs are being perceived as being less trustworthy. Authors argue that host country governments consider SOEs illegitimate actors, or *agents of a foreign government* (Li, Xia, Shapiro & Lin, 2018; Wei & Nguyen, 2017; Zhang et al., 2011; Cui & Jiang, 2012). This perception stems from host governments' impression that SOEs put political goals over profit. Again, as with most literature on SOEs, these studies focus on Chinese SOEs. However, in the case of open economies, firms appear to enjoy high levels of legitimacy pertaining to their stateness. This is an argument that will be elaborated on in the analysis below. Here, the distinction between fully state-owned multinationals and state hybrids may be important. However, most SOE literature omits this divide.

Indeed, the concept of legitimacy is useful when exploring stateness in internationalization. In their article, Sofka and colleagues explore how MNE subsidiaries hire employees with experience from host nation governments to mitigate their liability of foreignness and lack of legitimacy (2021). By hiring employees with governmental experience, they argue that foreign MNEs can gain political connections and access to host country institutions. Strategic management scholars have labelled this type of legitimacy a *political resource* (Holburn & Zelner, 2010; Sofka, Grimpe & Kaiser, 2021). Sofka and colleagues (2021) argue that employees with high level governmental experience, bring legitimacy, which is beneficial when dealing with host governments. I expand this argument to take into consideration the stateness that is embedded in SOEs. In this way, stateness becomes a resource, or firm specific advantage, which SOEs can exploit to overcome the liability of foreignness (Zaheer, 1995).

Internationalization of state hybrids differs from privately owned enterprises owing to their complex and diverse ownership structures (Vining & Laurin, 2020). Building on the argument by scholars such as Gupta (2005), Jing & Tylecote (2005), and Bruton and co-authors (2015) – that state ownership should be regarded as a continuous variable – this paper similarly considers the advantage of stateness as flexible and continuously varying. For state hybrids, their ownership structure – with states not being the sole owner – can become a tool for instating an arm's length relation when needed. As opposed to traditional FSAs, stateness is thus a mobile

advantage. Going forward, I analyze stateness as an advantage separately to the traditional FSAs.

There is a vast variety of state hybrids with different levels of state control and influence (Babic, 2021; Bruton et al., 2015). Although state hybrids in many cases are market-oriented, the state has some degree of influence and control through majority or full ownership (Bruton et al., 2015). However, regardless of the level of state interference state hybrids are, by definition, tied to the state and therefore a political actor. States can use state hybrids as channels to enact economic, political, or social activities (ibid). The close relationship can be an advantage for state hybrids, for example having government members acting as diplomats of the business activities abroad (Benito et al., 2016; Mariotti and Marzano, 2019; Cuervo-Cazurra et al., 2014). Therefore, when state hybrids move across borders, their role as conduits for states turn them into a political, or diplomatic entity to some extent (Bass & Chakrabarty, 2014). In such manner, states have the possibility of using domestic state hybrids for their political purpose. Following this logic, host country states might also be able to use foreign state hybrids for their own political agenda.

2.4. Internationalization of state hybrids

In addition to assessing FSAs, this paper also explores the host location. Several internationalization perspectives highlight the importance of context. One such theory is Dunning's eclectic paradigm (1988) that aptly illustrates the interconnections between a firm's FSAs and host location factors in firm internationalization.

Similarly, the contingency theory lens offers a useful perspective that catches dynamics related to the location. Indeed, the premise of this approach is that no single structure is useful for all types of activities (Boyd, Takacs Haynes, Hitt, Bergh & Ketchen, 2012; Hickson et al 1971; Ruekert, Walker and Roering, 1985; Zajac et al., 2000). Firms must adapt their approach according to context. Hence, the emphasis lies on the importance of the interplay between the MNE and the surrounding environment (Kano & Verbeke, 2019; Stopford, Strange, & Henley, 1991). Constant MNE adaptation to changes in the environment is therefore required for successful international expansion (Egelhoff, 1993). The firm's entry strategy is adapted according to the specific context and host location as well as the nature of the FSAs, which in

this industry, is characterized by capital-intensiveness, state interference and rigid legal frameworks, as well as fast-paced R&D.

In addition, how host nations perceive foreign state hybrids is highly context-dependent and tied to factors such as location, geopolitical relations, industry, and risk. For instance, owing to the special characteristics of the electricity industry, the 'client' in the host economy is often the host economy government or authorities, which makes the interaction between host country and state hybrid even more complex. The four actors in this internationalization case are therefore: the state hybrid, the industry, the home country and the host country government. How these actors each perceive and/or operationalize the internationalizing firm's stateness as a competitive advantage for their own agendas is elaborated below.

The issue of control is also important to address when analyzing stateness as an advantage. Control of how stateness is being used is different than the type of control that governments exert over SOEs. The latter is addressed by e.g. Babic and co-authors (2020) as well as Bruton and co-authors (2015). If host nations can use the presence of foreign state hybrids for their own agenda, it can be assumed that the state hybrids in question have little influence on how host nations use the state hybrid's presence. In this way, the state hybrid is not in full control of how stateness is becoming an advantage for and in the host nation. From a resource-based perspective, the way in which a host economy uses state hybrids' presence could therefore turn into an unexpected disadvantage for the SOE.

This, in turn, depends on the importance attributed to, or not attributed to the stateness of the specific state hybrid by three different actors: the home economy, the host economy, and the state hybrid itself. Moreover, cases where the host country is also the client, geopolitical relations also affect the advantage of stateness. As such, the extent to which stateness is an advantage for the state hybrid depends on the host country's geopolitical position vis a vis the home country. In sum, stateness as an advantage can thus be both internal as well as external to the firm, which supports the argument above to treat stateness differently than traditional FSAs.

The literature outlined above offers a rich canvas for exploring stateness as a resource and advantage and add nuance to the perception of stateness being a potential disadvantage. Synthesizing the different streams of literature and approaches to internationalization and state hybrids, the conceptual framework guiding the ensuing analysis highlights the following three

factors: FSAs, home country, and host country. Hence, Figure 1 illustrates how these three factors, individually and interdependently, shape stateness as an advantage that is detached from traditional FSAs while also taking into consideration specific industry dynamics.

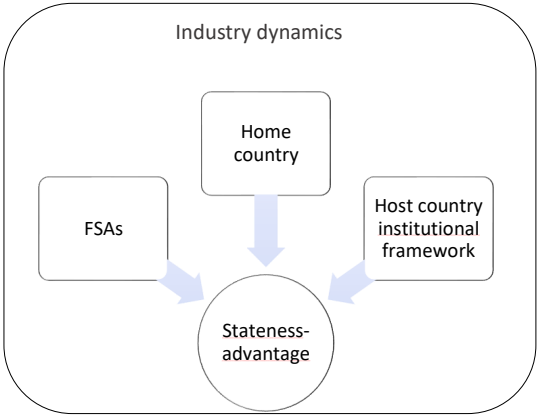

Figure 1. Factors that determine when stateness is an advantage (Author)

3. Method

While the bulk of literature on internationalization of SOEs focusses on Chinese and emerging market SOEs, this study explores an SOE from a small, advanced open economy.
To incorporate context into the analytical framework, the study is designed as an in-depth case study relying on qualitative data. This approach is useful for exploring a case in depth and for providing a rich understanding of an underexplored phenomenon (Eisenhardt & Graebner, 2007; Welch, Piekkari, Plakoyiannaki & Paavilainen-Mäntymäki, 2011; Yin, 2009), here internationalization of state hybrids.

This paper explores the internationalization of an electricity MNE in transition to renewables as well as the role of stateness in internationalization. As outlined in the previous section, these phenomena, and their interconnection, remain largely underexplored, for which reason the qualitative case study method is a fitting approach (Eisenhardt & Graebner, 2007). Opponents of

the qualitative case study often emphasize the problem of generalization and its context-dependence as key weaknesses. Flyvbjerg (2006) counters that this criticism reflects an evaluation of the method that falls short of understanding its main contributions. Rather, context-embeddedness is not only an advantage of this method but a requirement for obtaining a deeper understanding of societal phenomena (Lund, 2014; Welch et al., 2011).

Ørsted's wind power project in Taiwan is intriguing for many reasons. The case possesses characteristics of an *extreme case* (Flyvbjerg, 2006; Miles & Huberman, 1994). First, there was no existing offshore wind industry in Taiwan prior to the Ørsted project (Ferry, 2020). The case therefore illustrates the setup of a new, capital- and knowledge-intensive industry with foreign companies playing a key role and where institutional framework conditions had to be developed. Second, Taiwan's unique political status and its relations with China with the offshore wind power project physically constructed in the Taiwan Strait separating Taiwan from continental Asia made the case particularly interesting. Taiwan is a small, developed and open economy, but the industrial and political settings are constantly changing. This makes Taiwan an attractive and challenging market at the same time. Third, it is a case study of internationalization in the electricity sector outside the home region, which is a novel, yet developing tendency. Indeed, research shows that while fossil fuel generation activities in traditional electricity firms are often home-region oriented, renewable energy generation is to a greater extent internationalized outside the home region (Kolk et al., 2014). The advantage of the *extreme*, or deviant case design is the richness and complexity of the information that can be collected. The extreme case approach is therefore beneficial for understanding underexplored phenomena such as this in-depth case study (Flyvbjerg, 2006).

The empirical foundation of the paper consists of primary data including a set of 22 semi-structured interviews as well as numerous documents, statistics, transcribed speeches, statements, and reports. To ensure validity and reliability of the data, primary data was triangulated with secondary sources such as articles from independent media channels, consultancy reports, history books, country analyses, and relevant journal papers. The interview set consists of interviews with informants in the firms, governments, and international governance agencies, as well as academic experts (see Appendix I). The paper also uses a solid collection of primary and secondary data to illuminate visible as well as tacit host country conditions and institutional framework conditions (see Appendix II).

4. Findings

4.1. From state-owned, fossil fuel monopoly to renewable energy MNE

In 2015, Ørsted's senior management decided to explore offshore wind opportunities in Taiwan and set up office the following year. Entering Taiwan was an important step in two parallel strategic transformations of the firm. Firstly, Ørsted was embarking on a change from predominantly being a fossil fuel company to becoming a world leader in renewable energy production. The 2017 name change from DONG Energy (Danish Oil and Natural Gas) to Ørsted (after the Danish scientist H.C. Ørsted) was to signal just that. Secondly, to succeed in this endeavor, Ørsted had to gain international presence beyond its home region of northern Europe.

Only nine years before, in 2008, the Danish national energy monopoly was responsible for one-third of Denmark's carbon emissions (Reguly, 2019). In fact, the Danish state-owned utility was one of the most carbon-intensive electricity generators in Europe. Coinciding with the United Nation's climate conference, COP15, taking place in the Danish capital in 2009, Ørsted announced a surprising ambition. The 85/15 ratio in Ørsted's electricity production representing 85 percent fossil fuels and 15 percent renewables was to be swapped before 2040 (McKinsey, 2020). In the turn-around that followed, Ørsted reached this goal already in 2019 mainly due to its heavy investments in offshore wind power.

Offshore wind power is a capital-intensive technology and Ørsted was in dire need of capital influx to fund its offshore wind adventure. One key enabler of Ørsted's ensuing development as global offshore leader was the capital inflow following Ørsted's partial privatization in 2014 resulting in 50.1 percent ownership by the Danish state. Another large inflow of capital arose from the divestment of non-core activities (Rüdiger, 2014). Ørsted's ability to pursue an ambitious offshore adventure was also partly rooted in favorable framework conditions and a unique offshore wind technology legacy in the home country. Private grassroot developers as well as companies in Denmark had experimented with offshore wind for decades with Elkraft constructing the world's first offshore wind farm in 1991 (Ingeniøren, 1989; Rüdiger, 2011). Interest in offshore wind power grew among research institutions, state agencies, and in the industry in the 2000s. Ørsted, as the national monopoly, enjoyed access to state-of-the-art

offshore wind power technology, a specialist recruitment base, and a favorable institutional environment.

Initially, Ørsted had no incentives to internationalize as it was enjoying monopoly in its home base within the oil and gas sector. This changed when the European electricity sector was liberalized in the late 1990s and 2000s, leading to the introduction of competition in the EU electricity market. Competition intensified between former state-owned monopolies and private electricity actors all gradually adopting renewable energy alternatives. To compete, Ørsted's strategy was to expand activities to include electricity by acquiring already functioning electricity companies in the mid-2000s (Volsgaard & Rüdiger, 2021). Hereafter, Ørsted began targeting markets in neighboring countries with favorable subsidy schemes and offshore wind power potential.

Ørsted's positioning as global offshore wind power leader in the 2010s happened alongside an increasing demand by governments for renewable energy alternatives driven by several factors. First, with increasing focus on the climate crisis and subsequent adaptation of the Paris Agreement governments around the globe had committed to speed up the transition renewable energy. Second, with declining prices for renewable energy, this option was also increasingly attractive. Third, for some natural resource-poor nations that were highly dependent on energy imports, a renewable energy alternative also had security policy implications. In this way, Ørsted's project responded to several strategic ambitions in Taiwan, which will be further assessed below.

4.2. Taiwan's energy puzzle

Just as Ørsted's decision to enter Taiwan was a key strategic move for the firm, the move also constituted a pivotal moment for Taiwan's energy transition. To understand the dynamics at play between Ørsted and the Taiwanese government, it is crucial to unpack Taiwan's energy challenges and thereafter, Ørsted's role in meeting these.

Energy transitions are highly context dependent and shaped by factors such as national institutions, industry, natural resource availability and geography. Like in most nations, the Taiwanese government faced several challenges and dilemmas in solving the complex puzzle of transitioning to a more sustainable energy system while ensuring a stable and reliable energy

supply. In the case of Taiwan, balancing the energy transition while considering energy security, stability and reliability was an especially intricate challenge for the following reasons.

Firstly, Taiwan is a natural resource-poor nation completely dependent on fossil fuel imports, which makes the country vulnerable to changes in international market prices and geopolitical developments (Feigenbaum & Hou, 2020). Secondly, due to an upsurge in public resistance to nuclear energy following the Fukushima incident in neighboring Japan, the government decided on a full nuclear phaseout by 2025. Simultaneously, the government has committed to net-zero carbon emissions by 2050 and prohibited the increase of fossil fuel-based generation as substitute to nuclear. (Kung & McCarl, 2020). Evidently, all of this added pressure for developing renewable energy at a fast pace.

Thirdly, energy policy has long played a key role in Taiwanese domestic politics. The ambitious energy transition targets have left critics fearing impending difficulties in securing a steady and affordable energy supply (Taipei Times, 2021). The island has experienced several power outages affecting Taiwan's energy-heavy industries (that consume 37 percent of Taiwan's electricity) as well as private households (Ferry, 2021). The outages led to heavy criticism of Taiwan's ruling party and doubts about its ability to steer Taiwan safely through the energy transition plans (Chung, 2017; Wang, 2021). The Taiwanese government was therefore under pressure to fast-track offshore wind development to meet demand. Concerns about pollution and public health risks associated with the energy sector have added to the pressure on the Taiwanese government to find cleaner energy sources (President, Asia-Pacific (AP), Ørsted, interview).

The transition to renewable energy had come to play a central role in Taiwanese politics and a key component in the plans for the island's long-term economic development, as President Ing-wen Tsai stated,

> […] over the past four years, renewable energy has grown by leaps and bounds in Taiwan, and Taiwan has become an important hot spot for international investment in renewable energy (Office of the President, 2020).

An additional incentive for the Taiwanese government to prioritize efficient and substantial offshore wind power projects was the longevity and competitiveness of Taiwan's most important industries, such as the semiconductor industry. Evidently, the offshore wind power

projects had the highest strategic priority within the government. Following the then largest renewable corporate power purchasing agreement in the world, President Tsai commented,

> Strengthening Taiwan's green power competitiveness will also strengthen the future competitiveness of Taiwan's industries. The best example is Taiwan Semiconductor Manufacturing Company (TSMC), which purchased 920 megawatts of green energy this year from Ørsted Wind Power's offshore wind facility. (Office of the President, 2020)

However, the government's renewable energy vision was not without its challenges. While the government introduced ambitious renewable energy targets and halted all expansion of fossil fuel capacity, electricity demand in Taiwan continued to rise (Ferry, 2021). This continues to represent a challenge to the government, as Deputy Director-General, Bureau of Energy, Lee Chun-li commented: "We hope to decouple economic growth from power consumption, but so far, we don't see that decoupling happening" (Ferry, 2021).

In this context, offshore wind power has become essential for Taiwan's transition to renewable energy, for its future energy supply as well as for securing the competitiveness of the island's industries. When considering Taiwan's geography and political reality, there are several reasons that can explain why Taiwan was the first country in the region, outside mainland China, to invest in offshore wind power technology. Land is scarce. Mountains make up most of the island leaving only one-third habitable and therefore densely populated and overcrowded (Wang, 2020). Meanwhile, shallow seas and abundant and stable wind resources of the Taiwan Strait makes this location ideal for offshore wind development (Tsai & Lin, 2021).

The below Figure 2 and Table 1 illustrate the Taiwanese government's target for its electricity mix in 2025. These figures reveal an ambitious target for renewable energy increasing from six percent in 2019 to 20 percent only six years after (Bureau of Energy, 2020). Out of the 20 percent renewables, the offshore wind power target equals approximately 18 percent, or 5.7 GW (Bureau of Energy, 2022). The bulk of renewable energy capacity target will be fulfilled by solar PV representing approximately 66 percent, or 20 GW. Nonetheless, the 5.7 GW target for offshore wind is ambitious. In comparison, Denmark, with a more than 30 years of history with offshore wind power, reached 1.7 GW offshore wind power capacity in 2020 (Danish Energy Agency, 2021).

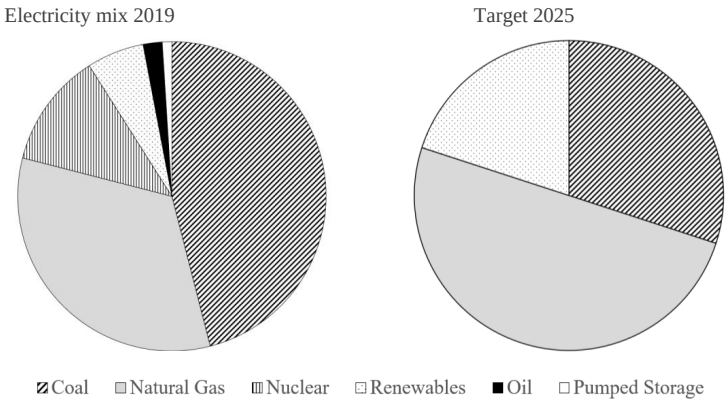

Figure 2. Status and target of Taiwan's electricity consumption (%).

Source: Bureau of Energy, Taiwan (2020) and Feigenbaum & Hou (2020).

Table 1: Status and target of Taiwan's electricity consumption in figures

Electricity mix in 2019		Target 2025	
Coal	46%	Coal	30%
Natural Gas	33%	Natural Gas	50%
Nuclear	12%	Nuclear	-
Renewables	**6%**	**Renewables**	**20%**
Oil	2%	Oil	-
Pumped Storage	1%	Pumped Storage	-

Source: Bureau of Energy, Taiwan (2020) and Feigenbaum & Hou (2020)

4.3. Ørsted's entry into Taiwan

According to Head of R&D Offshore Wind in Ørsted, the decision to expand beyond Northern Europe was taken between 2013 and 2015 when the firm turned its attention to the US and East

Asia in search of places with which to expand its geographical footprint. In the offshore wind industry's infancy in Europe, Ørsted reaped the benefits of generous government subsidy schemes. However, in the latter part of the 2010s, the European offshore wind market reached maturity and competition increased while prices plummeted (Jansen et al, 2020). In a 2019 interview, the Head of R&D Offshore Wind in Ørsted described this situation:

> The competition is extremely intense. Ten years ago, we enjoyed immense political support through a range of subsidy schemes, but then you risk that they disappear like in the UK. So, in 2013 we took the decision to be present in a wider geographical area. To lower this risk. (Head of R&D Offshore Wind, interview)

Despite a maturing market in Europe, Ørsted still maintained a competitive advantage as industry leader:

> One motivation for Ørsted [*to enter Taiwan and US, ed.*] was to say: we are one of the few who can take massive technical risks. So let's go where the water is deep. That's where we can really play our competitive advantage. (CEO Wind Power in Ørsted, interview)

> Being the first mover in Taiwan and to the US was because we were under such competitive pressure in Europe and so many others were starting to bid. The margins were getting smaller and smaller. So we said, let's be the first to go to new markets. There are many players in Europe that would never dare this because they think it's too risky. But if we go there will be less competition. We always try to move to the frontier of this market. (CEO Wind Power in Ørsted, interview)

As a first mover, Ørsted exploited its advantage of being technically superior to its competitors by moving into new and demanding markets. Host governments mitigated the risks for offshore developers moving into difficult markets by offering generous subsidy schemes. Taiwan was one such market.

On a technical level, Ørsted's offshore wind projects in Taiwan were complicated not least due to the large scale of the projects, but also because of the absence of an existing offshore industry. Hence, the challenges for offshore developers entering Taiwan in the nascent stage of

industry development were substantial. Nevertheless, Ørsted's management found the Taiwanese market attractive for two reasons. Firstly, the European offshore industry was maturing and Ørsted found itself facing an "increasingly red market in Europe, with competition soaring and prices plunging." (Head of Project Development, AP in Ørsted, interview). Entering Taiwan was a way for Ørsted to grow its business in a profitable market. While subsidies were disappearing in most European markets, Taiwan still offered subsidy schemes in the initial project phases:

> The subsidy schemes were favorable in the beginning, and that was another driver together with a fundamental need for offshore wind in Taiwan and other framework conditions. As such, the subsidy itself was not a driver, but through them we were able to compensate for the higher risk and show a business case that works (AP President, Ørsted, interview).

In this way, Ørsted could exploit its expertise by moving into challenging markets with a non-existent offshore industry and higher risks but would then be compensated by higher profit margins.

Secondly, Taiwan was an ideal hub to function as a steppingstone into Asia-Pacific (AP President, Ørsted, 2022). Not counting China – most international renewable developers avoided the Chinese market in the 2010s due to unfavorable framework conditions – Taiwan, Japan, South Korea, and Vietnam are the top potential offshore wind markets in the region (Lim, 2020). Early in Taiwan's offshore wind power plans, Ørsted saw the potential of Taiwan as a market that fit the firm's strategy well. Therefore, Ørsted opted to become part of the joint venture with JERA, Macquarie, and Swancor to deploy Taiwan's first offshore wind power project and test project, Formosa 1. The below Figure 3 depicts the location of Taiwan's offshore wind power projects in the Taiwan Strait approximately 150-200 kilometers from the Chinese mainland.

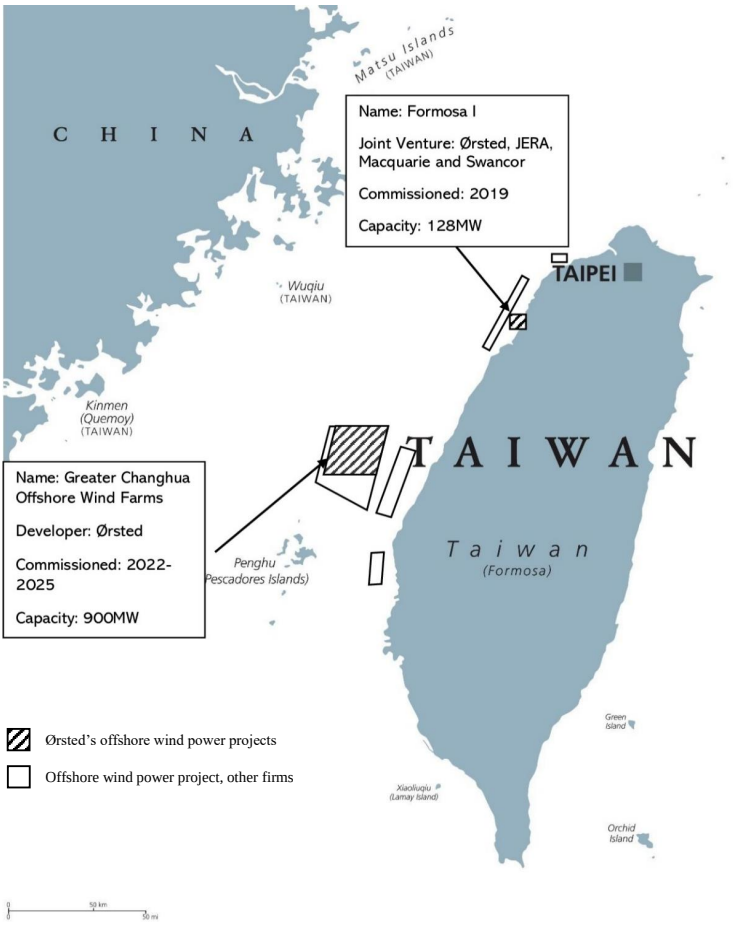

Figure 3. Stylized map of offshore wind project locations in Taiwan (Author)

Source of offshore wind project data: Eiger Law Wind Energy (2020)
Note: Original base map by Peter Hermes Furian (2017), iSTock.

While competition in Taiwan was not as fierce as in Europe, recent developments suggest that competition was gaining speed. For example, Copenhagen Infrastructure Partners (CIP), a Danish offshore wind power developer founded by a small splinter group from Ørsted, was now competing against their old workplace and was allocated large offshore wind projects in the

Taiwanese auctions (CIP, 2018). The founders of CIP who were ex-offshore wind executives in Ørsted, therefore came with extensive knowledge about the industry. Offshore wind technology is rapidly maturing, which is also reflected in the increasing and intensive competition (IRENA, 2021). European firms such as Iberdrola, RMW, SSE and Vattenfall are just a few of the firms that are quickly catching up with Ørsted. Ørsted's advantage as being first mover with niche expertise is therefore being challenged by firms that seem equally equipped to develop offshore wind power project in difficult environments.

One of the deciding factors when evaluating Taiwan as a potential market for Ørsted was the range of subsidy schemes for the offshore wind projects offered by the government (AP President, CEO Wind Power, Head of R&D Offshore Wind, Ørsted). In 2015-2016, the subsidy schemes were generous compared to other offshore wind markets, which were instrumental in getting Ørsted, the global leader in offshore win, to invest. The advantageous subsidy schemes were offered, in part, to alleviate the challenges connected to the absence of an offshore industry (Lead Planner, Taiwan, Ørsted and Head of Project Development AP, Ørsted, interviews). Everything needed for establishing an offshore industry, including installation vessels, had to be brought in from abroad, and ports suited for offshore operations, re-training of local staff and suppliers had to be developed from scratch. Undoubtedly, the dual challenge of developing a completely new industry while building large-scale, cost-effective offshore wind parks with close to no offshore industry capacity was immense (Ferry, 2020). Furthermore, elaborate local content requirements challenged Ørsted in different stages of the process e.g., the use of local suppliers and a specific percentage of Taiwanese nationals as crew on ships working on the offshore wind projects. (Lead Planner, Taiwan, Ørsted and AP President, Ørsted, interviews).

Another important factor in Ørsted's evaluation of Taiwan as investment destination in this case was the high political priority of offshore wind development. As mentioned above, offshore wind played a central role in domestic Taiwanese politics with increasing popular demand for cleaner and more reliable energy. Also, offshore wind would increase Taiwanese energy independence and reducing vulnerability related to energy. All firm and home nation informants expressed a pervasive "can do" attitude among authorities reflecting the Taiwanese government's ambitions as well as individual ambitions. For example:

> The Minister of Economic Affairs was very ambitious. He tried to secure his own and his ministry's legacy as being the ones that achieved for

> Taiwan what the semiconductor industry did before. It was a huge ambition and huge expectations to this new industry [*offshore wind, ed.*]. And there was no existing foundation. Nothing to build on. His determination to make the projects succeed as well as his negotiation skills were impressive. (Head of Project Development AP, interview)

Taiwan was undeniably a risky destination for Ørsted with no existing industry setup and therefore no upstream suppliers nor national recruitment base. Local content demands were stringent, which complicated the project further. However, this was also a perfect setting for Ørsted to exploit its advantage as industry leader: "Where the risk is high, only very sophisticated players like themselves can go. And by doing that they avoid part of the competitive pressure." (Director, Trade Council of Denmark, interview) The high risk was mitigated by generous subsidy schemes and local authorities that were proactive, efficient, and constructive throughout the process making Taiwan an attractive market.

4.4. The role of the home and host economy relations

As most nations around the world, Denmark adheres to the 'One-China policy'. This means not recognizing Taiwan as a sovereign state nor having diplomatic ties. Instead, the Trade Council of Denmark (TCD), a governmental export and investment promotion organization under the Danish Ministry of Foreign Affairs, represents Danish interests in Taiwan as a trade office and not as a diplomatic mission. For instance, Danish firms, can procure consultancy hours from the TCD to support investments in Taiwan. In this context, Ørsted had similar conditions as any private Danish company with the TCD providing a fixed set of services (Director, TCD in Taiwan, 2021). While relations between Ørsted and the TCD resembled a regular client-consultant relationship, Ørsted's stateness, however, was used as a selling point by the TCD as well as by Ørsted itself:

> Sure, in our story-telling, when we went around presenting Ørsted and telling the offshore wind story, we did emphasize that the Danish state is the majority shareholder of Ørsted. And is a partly state-owned enterprise. We used this as an advantage. Along the lines of state-to-state relations, we used that fact as an element. There was something ceremonial about the state ownership status. So we always used it in the introduction of

> Ørsted. Whether or not it made a difference, I don't know, but at the time we believed so. Our relationship with Ørsted, on the other hand, was purely commercial. They were our client. (Director, TCD in Taiwan, interview)

Perpetuating Denmark's reputation as leader of the green transition has long been a priority for the Danish government, authorities and industry and is used actively in export and FDI activities (see e.g. the State of Green initiative or Ministry of Foreign Affairs, 2022). Promoting Ørsted as being Danish was therefore useful in creating a connotation associated with leading the transition to renewables in a global setting:

> As the Danish representation, we went out [in Taiwan] and told the story about how we as country had long focused on developing green technologies especially offshore wind. (Director, TCD in Taiwan, interview)

The role of the TCD was to facilitate meetings with the relevant authorities and branches of the Taiwanese government e.g. The Ministry of Economic Affairs and the Bureau of Energy. This included meetings with the minister and on a few occasions at the presidential level (President AP and Head of Project Development AP, Ørsted, and Director, TCD, interviews). In this manner, Ørsted was supported by the TCD throughout the project process however, mostly in the initial stages. As the Director in the TCD notes,

> In the beginning they [Taiwanese authorities] preferred discussing the project between state representatives. The firms could then go through their respective representatives. But Ørsted increasingly took direct dialogues as their setup in Taiwan grew. (Director, TCD in Taiwan, interview)

One disadvantage of lacking diplomatic ties between Denmark and Taiwan was the limited diplomatic toolbox of the TCD. High-level visits by Danish government representatives were not possible while balancing a good relationship with mainland China:

> We had to find a balance. Taiwan's Ministry of Foreign Affairs focused on winning a number of small victories, for example getting MoUs here and there. (Director, TCD in Taiwan, interview)

In this way, the Taiwanese government seemed to aim for recognition through high-level foreign state visits as well as obtaining Memoranda of Understanding (MoUs), for example such as the MoU on offshore wind power between the UK and Taiwan (British Office Taipei, 2019). The TCD on the other side, had to perform a balancing act based on precedence. Only if certain visits, agreements, or processes had been made in the past, this could be repeated.

> They [Taiwanese authorities] were excited that it was Denmark, a Danish company, and they appreciated the dialogue and I think because Denmark is such a small country, they could compare themselves a bit to us… But it wasn't like that they could use us for… anything else than as a trading nation. If it had been the US or Japan, maybe they could integrate other topics into the dialogue. We underlined that this was a trade office: This is what we can offer, but we can't give you more than that. (Director, TCD in Taiwan, interview)

Still, the high priority attached by the Taiwanese government to offshore wind projects, and to the cooperation with the Danish state, was highlighted on several on occasions. As an example, this comment by President Tsai is illustrative:

> Denmark is a major player in wind energy, and we hope to learn from Denmark's experience to develop our own green energy industry. Our goal is to turn Taiwan into an industry cluster for offshore wind energy technology in Asia. Over the past few years, cooperation between Taiwan and Denmark has grown closer with the help of the Trade Council of Denmark in Taipei (Office of the President, 2020).

According to all Ørsted informants interviewed for this paper, Ørsted functions like a private firm in terms of strategy, operations, and the daily running of the business. They underlined that to them, the state's ownership is a mere formality that does not affect the business. Nevertheless, in the Taiwan case, the firm used its state hybrid status to convey legitimacy. When asked if the Taiwanese government regarded Ørsted differently than private firms, an Ørsted informant, replied,

> Yes, and we have used the term 'owned by the Kingdom of Denmark' on several occasions because it gives this credibility. (Head of Project Development, AP, Ørsted, interview)

The use of Ørsted's state hybrid status was also supported by Ørsted's Regulatory Affairs department. However, the above informant underlined that Ørsted is first and foremost a highly skilled engineering company and a leader in its technological niche. While Ørsted's stateness was thus not the *main* component of Ørsted's legitimacy, it did contribute to Ørsted's highly respected status.

Interestingly, several informants mentioned that while always being transparent about ownership structure, Ørsted did not use its stateness in contexts where this was not considered an advantage. For example:

> No, we would not use the 'Kingdom of Denmark' brand in the US, simply because it is not an advantage in the way it is in Taiwan. (Head of Project Development, AP, Ørsted, interview).

In Ørsted's case, state ownership is not a part of the company narrative on their website, in public interviews with senior management nor in other types of communication. Ørsted's use of stateness can therefore seemingly be switched on and off depending on the context. In this way, Ørsted can refrain from using its stateness where such a label would be disadvantageous.

The home nation of Ørsted played a role in the entry into Taiwan. The Danish authorities' efforts to promote Denmark as a green nation in terms of technology, development and renewable energy education was estimated to benefit Ørsted in its storytelling of being the global leader in offshore wind. The story of Denmark as the home of offshore wind energy was well in line with Ørsted's ambitions. By underlining the Danish origin and state ownership of Ørsted, the firm added to its legitimacy and trustworthiness as an offshore wind champion.

5. Discussion

Research on the internationalization of SOEs and state hybrids remains scarce and findings on the advantage or disadvantage of state ownership when internationalizing are fragmented and inconclusive. This in-depth case study shows that the concept of stateness can add nuance to

understanding the internationalization of state hybrids. Although state hybrids are operating similarly to private firms on most observable parameters, stateness can be mobilized as a resource depending on factors at the firm, industry, institutional, and wider geopolitical levels. The following section discusses these issues and identifies relevant avenues for future research.

5.1. Stateness and the 'rubbing off' effect

While stateness in business and management literature has yet to be defined, scholars have used the term to study the advantage or disadvantage of stateness (e.g. Sun et al., 2015; Mariotti & Marzano, 2020; Cuervo-Cazurra & Li, 2021). The findings suggest that stateness can be turned into a resource that under certain conditions can provide legitimacy to state hybrids. These conditions will be outlined in the following subsections. In the article by Sofka and colleagues, the legitimacy advantage is gained through the ex-government employee in what I label, *rubbing off effect* (2021). In much the same way, a state hybrids' stateness that is connected to the home nation can rub off on the host nation and provide legitimacy through stateness.

In this way, stateness constitutes a firm resource that embodies legitimacy particularly tied to the state of the home nation and is thus an intangible resource inaccessible to most private firms. Stateness is therefore a special quality that through its association with a nation state, but importantly not conditioned by formal ownership, can manifest legitimacy. Whether or not stateness as a resource provides an advantage for state hybrids depends on factors internal and external to the firm, which will be elaborated later.

Although stateness intrinsically is connected to the state, the findings do not exclude the possibility of private firms obtaining stateness. Sofka and co-authors' argue that an ex-employee from the host nation can provide legitimacy for the firm (2021). Similarly, it is likely that an individual with a previous high position in the home country government can rub off stateness on a private firm. If this is so, it would support the suggestion that stateness is not conditional of formal state ownership. Investigating stateness as a resource for private firms can thus be an interesting and important line of future research.

5.2. Formal and informal ties between firm and home country government

In this case study, the state hybrid is a global first mover within offshore wind power, and a global technology leader having a strong position in its home economy as well as state support.

However, an increasing number of competitors have embarked on offshore wind power development and some of them have proven successful e.g., Iberdrola and RWE (McKinsey, 2022). Therefore, technological leadership, while being an advantage, does not seem to be inimitable and is therefore not a true FSA (Rugman and Verbeke, 1998; Rugman et al., 2011; Wade and Hulland, 2004). Rather, the findings suggest that the state hybrid's FSAs are the unique experience and first-mover status as well as the legitimacy as a Danish state hybrid. Ørsted's unique experience and legitimacy bear the hallmarks of long-term FSAs by being mobile, inimitable, and non-substitutable. Both FSAs are tied to the state. Ørsted has obtained its experience through the legacy of public investments in offshore wind technology, development, and education in Denmark. Legitimacy is partly signaled through the state ownership by a developed and open economy. Considering the capital-intensiveness and technological complexities that characterize the offshore wind industry – an industry that is furthermore also considered critical infrastructure – clients would naturally be risk averse when choosing a developer and hence prioritize a firm with both FSAs.

This case suggests that home nation factors are important determinants for stateness as a resource for state hybrids. This includes both formal and informal ties between the state hybrid and home government. In this case, the home government, research institutions, and wider industry landscape had worked for decades on perpetuating Denmark as a leader within renewable energy technologies. Home nation factors aligned well with Ørsted's endeavor, which in turn affected the extent to which stateness as a resource was an advantage. However, some state hybrids might not be aligned as clearly with their home country governments. Future research can analyze how misalignments between state hybrid and home country governments affect the international expansion of state hybrids and stateness as a resource.

5.3. Industry (nature of product)

In view of the findings, contextual factors play an important role in determining whether stateness is an advantage for state hybrids. The case illustrates that industry settings are important; however, this might differ depending on the industry. The presence of states as owners is strategically more important and prominent in core and critical industries (e.g., energy, financial services, extractives, and communication). However, SOEs are also present in other sectors such as manufacturing and real estate (European Commission, 2016; IMF, 2020). Industries vary greatly in for example competition, political priority, and regulation. In this case,

the electricity industry remains highly regulated and influenced by the state although it is often fully or partly liberalized.

The industry is also characterized by a wide-reaching and fast-paced transition that involves a large range of actors such as private and public research institutions, private developers, policy makers, and intergovernmental institutions. The findings suggest that the degree to which stateness is an advantage to state hybrids therefore also depends on the industry setting. Future research can explore how industry factors influence whether or not stateness is an advantage. For example, is stateness an advantage in non-core industry firms such as Renault, Volkswagen or JBS SA.? Or is it advantageous in industries that are not undergoing the same fast-paced and politically prioritized transition? Also, looking further into how mergers between private firm as SOEs affect stateness can uncover additional nuances of stateness.

5.4. Geopolitical position of the home nation

As discussed above, the paper suggests that stateness can be considered a special quality associated with the home nation. Whether or not stateness is an advantage for a state hybrid therefore must depend in part on which home nation it represents. Here, the findings suggest that stateness is a resource that can be used by the firm but also by host nations when association with the home nation is deemed beneficial. Indeed, Taiwanese authorities seemed to perceive Ørsted's stateness beneficial. The 'Kingdom of Denmark' as it was marketed by Ørsted and the TCD, enjoyed a good reputation. As a small, modern economy in northern Europe with good relations to most nations as well as a reputation as being a renewable energy frontrunner, large Danish infrastructure investments would garner prestige for Taiwan as well as for the Taiwanese officials involved in the project development.

While a good reputation matters for the extent to which stateness is an advantage, the findings imply that the home nation's geopolitical position is also important. In this case, a source compares Denmark to the US and Japan indicating that if it had been a larger and more strategically prominent country the host nation might have sought additional benefits from an association with the home nation. This implies that the type of home nation greatly affects the extent to which stateness is an advantage for state hybrids. Future studies can look further into this topic and determine first, which home nation factors are decisive and second, which factors

are most influential, e.g., size of economy, economic and social development, and geopolitical power.

5.5. Geopolitical position of the host nation

The aim of this inquiry was to come closer to an understanding of stateness as an advantage for state hybrids. However, the findings indicate that the host nation can also use the foreign state hybrid's stateness as an advantage for their own benefit. In this way, the study points to an important and underexplored function of stateness as a firm resource that is also available for external actors. Some of the sources in this study alluded to the geopolitical aspect being important when understanding how the host nation can benefit from a foreign state hybrid's stateness. Future research can investigate how a state hybrid's stateness plays into the host nations pursuit of soft power or public diplomacy efforts.

In this case, the absence of foreign diplomacy recognition by most nations has impelled Taiwan to pursue soft power and public diplomacy strategies where output and visibility matters (Rawnsley, 2012). One such avenue could be the presence of foreign stateness: e.g. a foreign state-owned company, investing in a large, state-of-the-art infrastructure project with the ensuing visits from foreign officials (Mengin, 1997). This could be used as testimony to, if not formal, then informal recognition of Taiwan. This issue is extremely delicate, which is why it is difficult to produce hard evidence for this motive. It is nonetheless important to consider in future research of SOE internationalization.

Focusing on the role of the host nation also brings into question when stateness could become a disadvantage for the state hybrid. Even though a state hybrid might be functioning like a private firm with no evidence of public ownership on the surface, state ownership is arguably a part of the firm DNA. While the state hybrid can refrain from advertising its stateness in contexts where not considered an advantage, the state ownership status is an inescapable premise for firm internationalization - not only when it can be applied as an advantage, but also when an external actor's use of a state hybrid's stateness can potentially become a disadvantage. This could be a potential disadvantage to the state hybrid or the home nation. This finding further supports the suggestion of adding a geopolitical factor in the conceptual framework.

5.6. Perception of state ownership in the host nation

Additionally, the findings imply that the degree to which stateness is an advantage for state hybrids depends on whether or not the host nation perceives state ownership as advantage. In this case, Ørsted deemed that in Taiwan, stateness was an advantage, while in the US it was not. Hence, the study suggests that perception is based on, at least, a dual evaluation by host nations. The first factor is how state ownership in general is perceived by the host nation. This case indicates that such perception is likely very individual to each host nation. As outlined in Section Two, the literature often outlines two opposite perspectives on SOEs on either side of the disadvantage and advantage spectrum (e.g., Cuervo-Cazurra and Li, 2021; Mariotti and Marzano, 2019). The negative view highlights issues such as inefficiency, illegitimacy, government dependency, and SOEs as agents for government policy. In contrast, the positive view emphasizes advantages such as preferential access to state resources, institutional support, and higher risk tolerance (ibid). A host nation's perception of state ownership likely falls on the spectrum between these to categories. Future research can analyze how host nations' view on state ownership is shaped by factors such as economic history, political and institutional systems, and geopolitical status. The second factor is how the state hybrid's home nation is perceived by the host nation. The home-host nation relationship plays an important role here but also the home nation reputation.

Based on these findings, the above factors appear to be decisive when determining the extent to which stateness as a resource for state hybrids is an advantage or disadvantage. Each factor has an impact on stateness as a resource. Further research can investigate how to measure the impact of each factor, which are likely not equally influential on stateness. In this study, the factor categories are broad. An interesting future research aim can thus be to scrutinize these factors to investigate how they can be further divided into sub-categories that are easier to measure and explore.

5.7. Stateness as a flexible resource for state hybrids

In this case, the state hybrid understood its stateness as a resource that could be used or not used depending on the context. The state hybrid is thus a flexible firm that can apply different levels of attachment to its stateness varying from complete arm's length, detachment to closeness. This supports the previous suggestion that stateness moves beyond formal ownership ties and

becomes a flexible resource when state hybrids internationalize. For state hybrids to know if, when and how to use their stateness is reminiscent of firm capability in its own right. In this way, stateness becomes a factor in the 'strategic fit' between the state hybrid and the host country (Zajac et al., 2000). For stateness to be an advantage, when and how the state hybrid uses its stateness therefore must be adapted constantly to changes in the surroundings.

State hybrids that possess this capability will likely have an advantage compared to state hybrids that do not. Depending on the configuration of factors in Figure 4, the firm can assess to what extent stateness is an advantage when internationalizing. If stateness is found to be inconvenient, the state hybrid can purposely downplay it while still being transparent about ownership structures. One such example was Ørsted's project in the US. Considering that this case has a unique configuration of the factors listed above, this raises the following questions: how do each factor, and their interrelations, affect the extent to which stateness is a competitive advantage? Would this six-factor approach be relevant in all types of host nations? Will the six-factor approach be relevant for state hybrids from larger home nations or emerging markets, and what are the differences across industries? The implications of the findings in this case suggest that to be able to answer these questions and move closer to a conceptualization of stateness, future research could benefit from taking outset in this six-factor approach.

Based on this study, stateness understood as a resource for state hybrids is deeply nuanced. Future research can find ways of nuancing the degree of advantage vs. disadvantage of stateness on a spectrum, rather than a black or white definition, in Figure 4 represented by arrows.

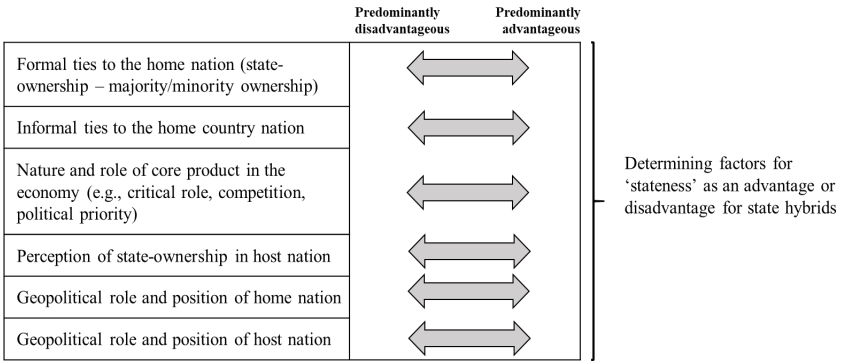

Figure 4. Determining factors for stateness (Author)

6. Concluding remarks

Based on an in-depth case study of Ørsted's offshore wind power project in Taiwan, the paper explores how stateness can be understood as a resource for SOEs, specifically looking at state hybrids. Drawing on resource-based theory and contingency theory as well as SOE literature, I situate stateness as a multifaceted resource and illustrate this in the context of a specific industry – here the energy industry.

Venturing outside the usual geographic realm of SOE literature, this study finds a *liberal* type of state hybrid, which despite majority state ownership, functions similarly to a private company without displaying the classic SOE traits that have led to widespread criticism of SOEs for many decades. The paper, however, also suggests that state hybrids, which on most parameters function like private firms, still possess stateness as a resource that most private firms do not have access to. Indeed, state ownership plays a role, but in a different way than normally highlighted in the literature. Rather, the concept of stateness appears to encapsulate this resource more appropriately than state ownership. The paper suggests avenues for future research to refine and further define the concept stateness in business and management research.

The paper has four main contributions. First, it explores the concept of stateness in business and management research and moves closer to a description of the role of stateness as a flexible resource for state hybrids when internationalizing. Second, the paper introduces six factors to

facilitate an assessment of whether stateness is an advantage or disadvantage for state hybrids. This makes it possible to explore if stateness could be both an advantage and disadvantage for a state hybrid at the same time. Third, the study adds important nuances to the understanding of contemporary SOEs and state hybrids in business and management literature that has largely neglected to investigate internationalization of state hybrids from open and developed nations. Fourth, the findings show the importance of including contextual dimensions, such as geopolitical factors, industry, the home and host nation contexts in studies of internationalization of SOEs and state hybrids.

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Appendix I: List of interviews

Title	Organization
	2022
President, Asia-Pacific	Ørsted
Head of Project Development, Asia-Pacific	Ørsted
Lead Planner, Greater Changua projects, Taiwan	Ørsted
Associate Professor, Energy Historian, Ørsted expert	Aalborg University
Associate Professor, Elite researcher	Copenhagen Business School
	2021
Director	Trade Council of Denmark in Taiwan, Ministry of Foreign Affairs
CEO Ørsted Wind Power	Ørsted
Head of R&D, Offshore Wind	Ørsted
Head of R&D, Offshore Wind	Ørsted
	2019
Head of R&D, Offshore Wind	Ørsted
Lead Partnerships & Global Alliances Manager	Ørsted
	2018
Head of Project Development, Asia-Pacific	Ørsted
Head of R&D, Offshore Wind	Ørsted
Lead Planner, Greater Changua projects, Taiwan	Ørsted
Deputy Head, Clean Energy Ministerial Secretariat	International Energy Agency
Director	Danish Energy Agency
2 Advisors (group)	Danish Energy Agency
Advisor	Danish Ministry of Climate, Energy, and Utilities
Focus group: 5 Electricity sector experts	World Economic Forum
Analyst	Major Chinese Energy MNE, N.N.
Business Developer	Electricité de France (EDF)
PPA Manager	Neoen, RE MNE

Appendix II: List of documents, literature, and media

Primary data		**Secondary data**	
Type	Source	Type	Source
National energy statistics, maps, reports	Bureau of Energy, Ministry of Economic Affairs, Taiwan (MOEA)	Interviews with Taiwanese government officials	Taiwanese and international news outlets
Maps, press releases, statistics	Thousand Wind Turbines Project, hosted by the Industrial Technology Research Institute and MOEA	Industry and country specific consultancy reports	Eiger Law, Carnegie Endowment for International Peace
Speeches, press releases	Office of the President, Taiwan	Statistics and reports from international organizations	OECD, IRENA, World Bank
National energy statistics	Danish Energy Agency	General media coverage	Taiwanese, Danish, and international news outlets
Reports and press releases	Ministry of Foreign Affairs of Denmark		
Company press releases, general information	Ørsted, CIP, Wpd, RWE		
Annual reports	Ørsted		
Press releases	British Office Taipei (Gov UK)		

PART III: CONCLUSION

Conclusion and contributions

I began this dissertation with a curiosity about how internationalization and the transition to renewable energy are connected. With the European electricity industry as the empirical context, I have put forward an analytical framework embedded in IB literature and related disciplines that embraces the nuances needed for obtaining an in-depth understanding of the role of firms in the two interconnected phenomena.

With an interdisciplinary, context-focused analytical framework that identifies factors to consider when understanding emerging internationalization and transition to renewables, the contribution of this dissertation is three-fold. First, the dissertation introduces ways of including factors that embrace contextual differences in a dynamic analytical framework. Second, the dissertation adds substantial nuance to a selection of concepts with which we understand and analyze internationalization. Third, the dissertation offers rich empirical insights from the European electricity industry with which to inform further research and policy development. Contributions and implications for future research are presented and elaborated in the following section.

The areas of contributions derive from the three papers presented in this dissertation. Those papers, in turn, were shaped by three themes: 1) MNEs as actors of change: a dual firm evolution; 2) the multi-level determinants of the dual transitions; 3) state ownership and internationalization in the renewable electricity industry. The dissertation has been guided by the overall question: what factors into the relationship between internationalization and the transition to renewable energy for European electricity firms?

The findings show that universal and static perspectives are insufficient for understanding internationalization of firms and industries that are in constant change. They also illustrate that context matters when seeking to understand such complex transitions and the multi-level structures that form them.

To address the role of MNEs and their activities in a changing global economy, this dissertation has applied an internationalization perspective using IB concepts and frameworks that capture contextual elements. However, in order to embrace contextual factors and the dynamic nature of these transitions, the dissertation also draws on ideas and concepts from related disciplines. Through qualitative, in-depth case studies, three papers explore the topic with the aim of

providing rich and nuanced analyses. In terms of methodology, I argue in line with proponents of the qualitative research approach for the value of contextual and in-depth knowledge that can be obtained through a qualitative, case-based research designs. In sum, the dissertation illustrates how a qualitative exploration can shed light on complex and novel phenomena.

The main contributions of the dissertation are outlined below including a discussion of implications for future research and policy development.

Contributions and implication for future research

The dissertation provides empirical and theoretical contributions for understanding determinants of internationalization among electricity producing firms, which play a central role in the transition to renewable energy.

Embracing the context

The question of why firms internationalize has been discussed for more than half a century and the international business and management literature offers a plethora of insightful findings. However, the dissertation contributes with crucial nuance to established theoretical perspectives by considering dynamics connected to ongoing transitions that have intensified during the last decade. To capture these dynamics, the analytical framework applies in-depth, contextual knowledge as well as an evolutionary and historical approach. Arising from these insights, the dissertation shows that transitions across borders can follow incremental paths of change rather than in the radical shifts often highlighted in the sustainable transitions literature. Based on the findings in this dissertation, future IB research can benefit from including a dynamic and forward-looking perspective on firm internationalization. For inspiration, such research can turn to literature on sustainable transitions and industrial change to add further nuance to the understanding of firm internationalization in times of transitions. Similarly, the findings suggest that sustainable transitions literature can broaden its reach by incorporating an internationalization perspective to transitions.

In addition, the dissertation applies and expands Peng and co-authors' framework for understanding firm strategy, the strategy tripod (Peng et al., 2009). By applying the tripod model to firm internationalization and transition, the dissertation shows that each perspective within the tripod - firm, industry, and institutions - are dynamic and interrelated rather than static and

siloed. A more fitting illustration would be a structure resembling a braid that is in constant motion and where the perspectives are connected and shaped by each other. Furthermore, the tripod, or braid, is expanded to include the management perspective. As a result, an in-depth analysis of the interdependent relationship between influential determinants and inclusion of micro-level factors can contribute to future IB and strategy research. To develop the multi-level firm strategy model further, future research can investigate ways of including dynamic elements into firm strategy models that consider the complexities of transitions across borders.

With its interdisciplinary, context-focused, and multi-level analytical framework (see Figure 8, Part I), the dissertation integrates relevant perspectives to get a deeper understanding of the factors driving firm internationalization during transitions. These factors are also present in each of the frameworks for each of the three papers. The importance of a multi-level perspective on firm internationalization has long been acknowledged (e.g., see review by Buckley and Casson, 2009). I build on this approach and argue for adding a geopolitical perspective to the analysis depending on the context. I aim to show that a such a context-dependent perspective is particularly pertinent when investigating state-owned enterprises and/or industries that have core or critical functions in society e.g., for energy security reasons. In this way, the dissertation integrates the impact of state ownership across firm-, industry-, institutional, and geopolitical levels and adds important nuances to understanding firm internationalization. Future IB research can further explore how geopolitical factors affect different types of internationalization modes and strategies. Such research can also explore how geopolitical factors affect different types of industries. In addition, an identification and categorization of concrete geopolitical factors that are relevant for IB research can be beneficial to expanding this perspective.

Refining and developing terms and concepts for nuanced internationalization perspectives

The dissertation adds nuances to concepts used for understanding and analyzing firm internationalization. The first paper applies the terms *re-active*, *active*, and *pro-active* to characterize the different roles that MNEs assume in different phases of transition, including internationalization. These terms refer to how industrial and transition dynamics interrelate and evolve over time and deepen the understanding of these phenomena. In this way, characterizations can help clarify what and who drives actions of change at different stages of transitions. Based on the findings, the MNEs are found to be *actors of change* due to the MNEs' own anticipation and expectation of change in the industry and in the institutions in which they

are embedded. In industries that are characterized by fast-paced and complex transitions, treating MNEs as actors of change that can be re-active, active, or pro-active can help to nuance the understanding of the firm's international activities. The findings explore what pro-active strategies means for industrial restructuring and shows that future research should re-evaluate the role of MNEs in times of transition.

The second paper introduces the term *geographical hedging* to denote a diversification strategy in firm internationalization. The suggested term is based on the specific empirical context where MNEs mitigate risks by diversifying in two ways: first, by covering large geographical areas (across time zones and climate zones) to maintain a steady production of variable renewable electricity. Second, by being present in different national and regional settings to mitigate the risk of sudden changes in framework conditions such as subsidy schemes. While these examples are empirically embedded, geographical hedging will be relevant for understanding internationalization in other industries that are either strongly policy dependent or affected by natural resource availability. Future research can deepen the investigation of the interrelations between internationalization and the transition to renewable energy including e.g., a differentiation between types of renewable energy technologies, types of firms (e.g., SOEs vs. private MNEs), and types of economies (e.g., emerging vs. industrialized, open vs. protectionist).

The third paper explores the concept of *stateness* in internationalization in the context of the renewable electricity industry. Based on the case findings the paper moves closer to a definition and conceptualization of stateness in IB. Originating in the 1960s within political science, disagreement on how to define stateness remains. While also not clearly defined within business and management research, Cuervo-Cazurra and Li (2021) effectively uses the concept to assess whether stateness is an advantage or disadvantage when internationalization. Recognizing the growing importance of SOEs in the global economy, the dissertation explores the term in business and management research. By applying the concept in an IB and renewable electricity industry context, I view stateness as a flexible firm resource that embodies legitimacy particularly tied to the state of the home nation and is thus an intangible resource inaccessible to most private firms. As a flexible resource, stateness can be used by the firm itself as well as by external actors, e.g. host nations. Based on the findings, I outline six factors that can be used in an assessment of whether stateness is predominantly advantageous or disadvantageous for state hybrids. This makes it possible to understand stateness as both an advantage and disadvantage at

the same time. Finally, by applying the concept of stateness to firm internationalization, the paper adds important nuances to the understanding of contemporary SOEs and state hybrids. Future IB and management literature can build on the findings to further investigate internationalization of state hybrids from open and developed states.

Empirical insights

This dissertation contributes with rich empirical insights from an industry that is currently undergoing tremendous change while also playing a key role in the larger fight against climate change. Internationalization of the European electricity industry is a recent phenomenon that has not been explored in depth in connection to the renewable energy transition. In fact, renewable electricity firms in general have received little attention in IB literature (Ghauri et al., 2021; Shapiro et al., 2018). With perspectives informed by this literature, the empirical insights offered by this dissertation are therefore relevant to future internationalization research on the renewable energy transition.

Although based on a small sample, the first and second paper demonstrate that internationalization is inherent in the business models of renewable electricity firms. With this finding, the dissertation illuminates the interconnections between variable renewable electricity generation, embedded in natural resources, and internationalization. Specifically, the dissertation contributes with crucial insights about how the *variable* characteristic of renewable energy shapes internationalization of electricity MNEs.

The findings show that it is not always evident who drives transitions. The parallel and interconnected transitions of internationalization and transition to renewable energy are reshaping the electricity industry, reshuffling activities, and re-defining the role of the state. Despite widespread liberalization in the electricity industry, many states have retained ownership and control, but now in an increasingly internationalized industry. With governments around the world heavily investing in renewable energy, the role of European electricity MNEs in the global energy industry has changed drastically.

However, the findings also illustrate how in some cases, firms, not states, are paving the way for at least part of the renewable energy transition. The roles of the firms have changed over the years, from bureaucratic extended arms of the state to pro-active MNEs. In some instances, the firms have become vehicles for the renewable energy transitions in the electricity industry.

Indeed, some of these electricity MNEs are *ahead* of national and international policies and regulations (Eckhouse et al., 2020; Toplensky, 2020).

Still, although the case firms operate like private firms, the findings show that state ownership, or stateness continue to matter when these firms go abroad in the context of the renewable electricity industry. The findings show that state hybrids, still possess stateness as a resource that most private firms do not have access to.

Implications of these findings are relevant for policy development concerning global upscaling of renewable energy alternatives. The findings are also of relevance to national, regional, and global policy development regarding foreign state ownership of core infrastructure. Finally, policy developers can use the findings for a longitudinal, internationalization perspective on the state's role in the renewable energy transition. This is also relevant when investigating re-nationalization of former state-owned energy monopolies.

Furthermore, in an attempt to categorize the electricity industry and identify key characteristics that affect firm internationalization, the second paper outlines five industry-specific features that can be considered in future analyses of internationalization within this industry: the network industry setting, demand conditions, supply conditions, lack of local adaptation requirements, and the climate crisis (see the second paper for elaboration).

Several firms within the European electricity industry are among the industrial leaders of transition to renewable electricity at a global level. In the context of climate change and the massive challenges of the global sustainable transition, it is therefore important that researchers and policy makers broaden the understanding of how and when renewable electricity firms internationalize – and thereby diffuse state-of-the-art renewable energy generation to a broader geographical area. This includes developing countries where electricity demand is set to experience immense growth (IEA 2019a).

To summarize, a consistent argument of this dissertation, is that developing our understanding of the context is a scientific value in itself. When studying phenomena related to grand challenges, established context-independent theories are inadequate in explaining underlying factors and interconnections. The hope is therefore that this dissertation contributes to the understanding of the internationalization of one of the key industries driving the renewable energy transition.

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Appendix III: Co-author statements

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CO-AUTHOR STATEMENT

Title of paper	Green and global: Transformation and internationalization among European electricity producers
Journal and date (if published)	

1. Formulation/identification of the scientific problem to be investigated and its operationalization into an appropriate set of research questions to be answered through empirical research and/or conceptual development

Description of contribution:

Identification of research area and identification of empirical material on which to base the study.

2. Planning of the research, including selection of methods and method development

Description of contribution:

Identification of empirical material and operationalization to a comparative case-study

3. Involvement in data collection and data analysis

Description of contribution:

Interviews were conducted by Katrine Lumbye
Interview analysis and data presentation were conducted by Katrine Lumbye
Application of data into wider analysis in the paper was a shared undertaking.

4. Presentation, interpretation and discussion of the analysis in the form of an article or manuscript

Description of contribution:

Writing and paper development in all paper sections was a shared undertaking.

Publication

Please note that the article will be published electronically and in a limited edition in print as a part of the PhD thesis by the CBS library in connection with the PhD defence.

1. Co-author (PhD student)	Katrine Lumbye Name
I hereby declare that the above information is correct	
30-06-22 Date	Signature

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MEMORANDUM OF UNDERSTANDING FOR CO-AUTHORSHIP

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1.1 This Memorandum of Understanding (hereinafter referred to as "the MoU") contains the Parties' understanding regarding the Parties' collaboration on a joint research article or manuscript ("the work").

1.2 The contribution of the co-author may be, but not limited to:

a) Formulation/identification of the scientific problem to be investigated and its operationalization into an appropriate set of research questions to be answered through empirical research and/or conceptual development.

b) Planning of the research, including selection of methods and method development.

c) Involvement in data collection and data analysis.

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1.3 By signing this MoU, the Parties agree to sign CBS' co-author statement upon completion of the work. The MoU is non-terminable and will expire upon submission of the PhD thesis.

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Description of contribution:

Identification of research area, identification of empirical cases on which to base the study

2. Planning of the research, including selection of methods and method development

Description of contribution:

Identification of empirical material and suggestion for conducting a comparative case-study

3. Involvement in data collection and data analysis

Description of contribution:

Interviews were conducted by Katrine Lumbye
Interview analysis and data presentation were conducted by Katrine Lumbye
Application of data into wider analysis in the paper was a shared undertaking

4. Presentation, interpretation and discussion of the analysis in the form of an article or manuscript

Description of contribution:

Writing and paper development in all paper sections was a shared undertaking.

Publication
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1.1 This Memorandum of Understanding (hereinafter referred to as "the MoU") contains the Parties' understanding regarding the Parties' collaboration on a joint research article or manuscript ("the work").

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b) Planning of the research, including selection of methods and method development.

c) Involvement in data collection and data analysis.

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