

# Risk management as practice

Hendrik Ruiter

Institute for  
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Hendrik Ruiter

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# **Risk management as practice**

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# **Risk management as practice**

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# Table of content

|                                                                                                                |     |
|----------------------------------------------------------------------------------------------------------------|-----|
| <b>Chapter 1</b>                                                                                               | 13  |
| Introduction                                                                                                   |     |
| <b>Chapter 2</b>                                                                                               | 29  |
| The background of unpredictable and dynamic complexities:<br>the energy transition                             |     |
| <b>Chapter 3</b>                                                                                               | 45  |
| The dynamics of risk management – a systematic literature review                                               |     |
| <b>Chapter 4</b>                                                                                               | 85  |
| Risk management practices serving the security of supply –<br>a case study drawing on Schatzki's site ontology |     |
| <b>Chapter 5</b>                                                                                               | 129 |
| Conclusions and discussion                                                                                     |     |
| <b>Thesis summary</b>                                                                                          | 143 |
| <b>Samenvatting van het proefschrift [Summary in Dutch]</b>                                                    | 149 |
| <b>References</b>                                                                                              | 155 |
| <b>Appendices</b>                                                                                              | 163 |

# Glossary and abbreviations

## Regarding electricity transmission and distribution

|                          |                                                                                                                                                                                                 |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electricity transmission | Large-scale transfer of electric energy from the generation to the distribution networks. Electricity transmission connections are the highways for electricity transfer over longer distances. |
| High voltage             | Within the Netherlands, this refers to a voltage above 100 kV.                                                                                                                                  |
| TSO                      | Transmission System Operator.                                                                                                                                                                   |
| Electricity distribution | Electricity transfer to end-users like home owners and companies.                                                                                                                               |
| DSO                      | Distribution System Operator.                                                                                                                                                                   |

## Other abbreviations

|      |                                                                                     |
|------|-------------------------------------------------------------------------------------|
| ACM  | <i>Autoriteit Consument &amp; Markt</i> The Dutch regulator for the energy industry |
| AJG  | Academic Journal Guide                                                              |
| ANT  | Actor–network theory                                                                |
| B.V. | <i>Besloten Vennootschap</i><br>Company with limited responsibility                 |
| CSR  | Corporate Social Responsibility                                                     |
| EB   | Executive Board                                                                     |
| ERM  | Enterprise Risk Management                                                          |
| HEI  | Higher Education Institution                                                        |
| IP   | Investment Plan                                                                     |
| NIT  | New Institutional Theory                                                            |
| OIE  | Old Institutional Economics                                                         |

## Preface

*"Consider a turkey that is fed every day. Every single feed will firm up the bird's belief that it is the general rule of life to be fed every day by friendly members of the human race 'looking for its best interests,' as a politician would say. On the afternoon of the Wednesday before Thanksgiving, something unexpected will happen to the turkey."*

*Taleb, 2007, p. 40*

Humans, just like turkeys, cannot understand future events by looking backwards only. Instead, we need to anticipate to changing circumstances. This thesis aims to challenge the basic assumption of human rationality underpinning our reasoning with regard to future events. In particular, the thesis raises questions about how organizations are able to respond effectively to future events in the organization's external environment.

My co-supervisor dr. Koos Wagenveld suggested me the possibility to study the dynamics of risk management as the main theme of my PhD thesis. From the very beginning, I was really enthusiastic about this theme and I started to read a lot of papers about risk management. While doing so, I raised more and more questions about the well-known systematic risk management approaches within organizations and I looked how to perform research on the dynamics of risk management. Later on, dr. Wagenveld introduced me to prof. Vosselman. The journey of performing this research was about to begin.

Now, looking back over the years, I am grateful and delighted to finish this journey and I acknowledge I could not have completed this journey without the support of many. In particular, I would like to thank my supervisors prof. Ed Vosselman and prof. Rob Ross and my co-supervisor dr. Koos Wagenveld. I remember the many conversations we have had, both online and in person. I reflect on your ongoing support to come to a research proposal. I appreciate to get to know each other a bit more in the informal meetings we arranged from time to time. I have always admired your dedication to my study.

Special words of thanks to Koos Wagenveld as my former colleague at HAN University of Applied Sciences (HAN) who never ceased to support me and who encourages me personally when appropriate.

Moreover, I kindly thank the HAN for their financial support. I want to express special words of thanks to the HAN Academy for Financial and Economic Management (AFEM). I thank the former academy director Jolanda Berntsen for her support to get the research project going and I am glad that the current director Willem Leijten is among those who have supported me during the years we both work at the HAN. I really enjoy to combine the teaching activities at the HAN with doing research. It is a pleasure to have this opportunity and to share my knowledge with students and colleagues along the way.

Subsequently I want to express my thankfulness to the TenneT organization. For reasons of anonymity, I cannot mention the names of the TenneT employees who contributed to this research as an interviewee. Especially, I thank Jos Slangen whose interest and dedication prove to be important to get access to the TenneT organization. It has been a pleasure to work with the TenneT professionals and to deepen my insights in the energy transition.

On the one hand, I have really enjoyed to dedicate myself to the research activities and to develop myself further in the field of academic research. It has been a pleasure to join multiple accounting conferences in Germany and several other European countries. On the other hand, completing this research took a lot of effort and hard work. Since life is far more meaningful than doing your job and spending lots of time behind a desk, I am glad to complete this thesis successfully. In this, I thank my wife Petra for her love, patience and ongoing support over the years. During our honeymoon in the United States we read a beautiful message on a little bakery shop, saying: "When I count my blessings, I count you twice." I have never forgotten these words. Dear Petra, every single day of this life, I know what it means to love someone by heart and I know what it means to be loved. I am also glad to share life with our beautiful daughters Fenne, Suze and Jinte. These blessings invite me to look forward!





## Chapter 1

# Introduction

---

*"Uncertainty is the only certainty there is, and knowing how to live with insecurity is the only security."*

John Allen Paulos – Professor of Mathematics at Temple University in Philadelphia.

These words underline how uncertainties affect every aspect of human coexistence. This reality might feel uncomfortable to us as, in general, humans dislike negative surprises. Humans have proven to be risk-averse in many situations (Kahneman, 2011) and for that reason they prefer to know which things around them can be perceived as certain. For instance, many feel comfortable in a situation of financial stability, which is a situation in which you can be certain that you can earn the money to make a decent living.

## 1. The functionalistic view of risk management

Kahneman (2011) points out that humans "are driven more strongly to avoid losses than to achieve gains" (p. 302). Humans strive to understand the risks they face ahead of time. That is, they act to avoid the negative consequences of the risk or, at least, they aim to limit the consequences. In many different situations, humans aim to manage risks in the sense of aiming to take as much control over their situation as possible.

Zooming in on organizations, management accounting is generally considered to be a tool in human hands to ensure that the organization's objectives are achieved. We refer to this view as a functionalistic view since the function of management accounting is foregrounded.

We argue that the same applies to risk management. As such, risk management is regarded as solely the result of human intentions and rational decision-making. Following the idea that humans are able to understand future events and to predict how these events cause risks, it makes sense to prepare for these risks. The functionalistic view of risk management drawing on human rational decision-making has gained prominence since the Age of Reason (the Enlightenment). This view is anchored in A) the human ability to reliably forecast future events and B) the ability of the human intellect to make sense of this prediction and to act rationally in the face of uncertainty. This view takes rational decision-making by individual humans as a key point of departure. As such, the functionalistic view resonates with mainstream research in the field of economics.

Knight (1921) distinguishes between the categories of “uncertainties” and “risks”. According to Knight, risk refers to a situation, a future event, in which “the probability distribution of outcomes – either exact or estimated” is known (Miller, 2009, p. 159). Uncertainty refers to all situations in which humans are unable to quantify the outcome probability. Uncertainties are left out of the risk management scope as the information needed for calculating risk is not available.

Knight’s distinction has deeply affected thinking about risk management for decades. Particularly, risk management gives centerstage to the calculation of risks by multiplying the chance that the risk might materialize by the related damage as an amount of money. As such, Knight’s work has provided a primer to understand risks and to quantify and control them accordingly.

A new chapter in the development of risk management started with the publication of the COSO report about internal control in 1992. Power (2004) argues that internal control has developed as something “in the heart of organizational governance” (p. 6). As the COSO report foregrounds internal control as closely related to risk management, risk management has become more prevalent in the organizational context. Power summarizes that “internal control and risk management have become increasingly co-defined” (p. 6). The link between internal control and risk management is even more strongly reflected in the September 2004 COSO-ERM report (COSO, 2004).

Enterprise risk management (ERM) refers to an integrated and enterprise-wide approach for risk management. “Integrated” in this sense reveals the aim to integrate the various kinds of risks with different origins into one enterprise-wide risk management approach. Integrating the effects of the various risks in one aggregated approach is supposed to be helpful to shed light on the risk position the organization is facing as a whole. In this regard, the adverse effects of one risk might be compensated by the opposite effects of a risk from another origin. COSO-ERM has become one of the prevailing risk management approaches.

Quantifying risks is at the core of the ERM approach since to integrate multiple risks from various origins, risks need to be consistently quantified. Risks are made measurable by quantifying the chance an event may occur and the amount of damage the event would cause if it would occur. As such, following Knight (1921), risk managers strive to draw on statistics and scientific knowledge for calculating risks and for advancing the risk calculations. Improving the risk calculations applies to both the chance that the risk becomes manifestable as well as the damage the risk might cause.

Typically, forecasts become more reliable by utilizing detailed information about past events. For instance, an insurance company can reliably forecast the chance a specific type of car will be stolen in the next twelve months, based on statistics about car theft in previous years. Taking into account the events that might happen within a limited timeframe, for example in the next twelve months, improves the forecast precision and contributes to the reliability accordingly.

In this example the insurance company implicitly assumes that the nature of the risk does not change due to external circumstances which were not included in the forecast. Foregrounding human rationality, the implicit assumption is that all relevant aspects about future events that might affect the chance a car will be stolen are taken into account. In other words, future events are not assumed to be a surprise.

Notably, many risks that organizations have to face in contemporary society are dynamic in nature: Neither the probability that a risk becomes manifestable nor the damage that the risk might cause can be calculated reliably upfront as these are both subject to change. As a result, future events which cause risks come to the fore as unpredictable. Humans are limited in their ability to understand these future events which applies to both the chance that an event might occur as well as to the effects an event might generate if it becomes manifestable.

Recently, the risks related to cybercrime have gained prominence as an emerging risk category in which determining the chance of occurrence is quite problematic. Regarding the amount of damage, the Colonial Pipeline ransomware attack in the United States (May 2021) shows that both the societal impact and the financial consequences can be severe.

The functionalistic view of risk management typically understands risks as tame risks and this view intends to manage them accordingly. In this regard, tame risks refer to problems which have “an optimal solution arrived at through persistent and careful analysis of the sub-problems from which they are made up” (Hancock & Holt, 2003). Tame risks can be complicated as many sub-problems might underlie the tame problem. Expert knowledge and specific skills might be required to solve the problem. Nevertheless, an optimal solution can be achieved.

However, many risks cannot be treated as tame in contemporary society as multiple stakeholders have different perceptions of the nature of the problem and of the direction of a possible solution. Elaborating on Rittel & Webber (1973) and Rowe (1987), Holt (2004) claims that in these situations “different groups of key decision-

makers hold different assumptions, values and beliefs that are in opposition to one another" (p. 259). As a result, no consensus exists about the problem itself, nor about the roads to a solution. The diverse perceptions of multiple stakeholders give rise to a background of complexities.

Reputational risks provide an example: These risks might change over time as the risks depend on the perception of various groups of stakeholders pursuing their own interest. Power (2004) points to the reputational damage Shell experienced after the company had announced the disposal of the Brent Spar in the North Sea in 1995. Furthermore, following this announcement many European consumers refused to buy fuel at Shell gas stations, causing a huge financial loss.

In sum, due to many shifting interdependencies and uncertainties in the external environment, risks are dynamic in nature and in many situations they are unpredictable as well. Organizations typically face risks against the background of unpredictable and dynamic complexities. Given these complexities, the ability of the functionalist view of risk management to understand risks might be seriously challenged.

We outline how several scholars have discussed the limitations of the functionalistic view of risk management. Drawing on this stream of literature, the present thesis highlights that risk management practices unfold beyond the perception that risk management is solely the result of human intentions and decision-making.

After highlighting the thesis' societal relevance in section 2, section 3 discusses the literature criticizing the functional view of risk management in more depth. Furthermore, the thesis' overarching research question is presented and discussed in section 4. This research question gives centerstage to understanding the risk management practices. We discuss the thesis' intended scientific contribution in more depth in the remainder of section 4. Section 5 highlights the thesis methods and contains an introduction to the case study. Finally, section 6 presents a brief outline of the entire thesis.

## 2. The thesis' societal relevance

The limitations of the functionalistic view of risk management given the background of unpredictable and dynamic complexities uncover the thesis' societal relevance. As such, this thesis challenges the extent to which humans are able to understand future events and how these events might cause risks.

In particular, the thesis focus is to understand how future events might affect the ability of a large network operator to facilitate the secure electricity transmission in the Netherlands. As such, the thesis introduces network operator TenneT Holding B.V. (hereafter referred to as TenneT) as the case company and we focus on the investment realization in the electricity transmission networks. Being a large network operator, TenneT's role in the reliable electricity provision is crucial for the entire country. TenneT's investments take a huge amount of public money, underlining the study's societal relevance. TenneT needs to make a risk-based tradeoff to schedule and prioritize the spending of efforts effectively. In order to make this tradeoff, TenneT needs information about future events that might affect the required capacity of the electricity transmission networks (the required grid capacity).

In this regard, we draw attention to the intended shift of electricity generation from fossil fuel to electricity generation from renewable sources as the unpredictable and dynamic complexities which affect the TenneT company. Given these complexities, TenneT needs to ensure that the electricity transmission remains reliable. Chapter II outlines that complications and uncertainties surround future events which might affect the required grid capacity in the years and decades to come.

## 3. Risk management research in recent decades

Risk management research includes papers that criticize the functionalistic view of risk management. Power (2009) reflects that the prevailing risk management approaches such as COSO-ERM are based on models which have been developed based on what happened in the past. Such risk management models fail to understand the risks which are at the core of the model assumptions. For instance, the model assumptions refer to the maximum magnitude of fluctuations of the interest rate and the various foreign exchange rates. Another assumption is that there will always be the opportunity to complete a certain transaction in a well-functioning market for each specific kind of financial instrument. These assumptions proved to be wrong in certain specific circumstances which occurred during the global economic and financial crisis (2007 – 2009).

Following up on the stream of research criticizing the functionalistic approach, Chapter III of this thesis presents a systematic literature review of the stream of literature showing the dynamics of risk management. For this literature review we have selected 24 high-quality papers that move beyond the functionalistic view of risk management after Power's 2009 paper as mentioned above.

In brief, the literature review shows that the state-of-the-art literature in the field of management accounting has uncovered the limitations of the functionalistic view of risk management from multiple perspectives. These perspectives include the work of Foucault, institutional theory, actor–network theory (ANT) and, more recently, practice theory. The selected papers in Chapter III oppose the perception that risk management within the organizational context equates a stable and systematic approach.

Drawing on the work of Foucault, two of the selected papers discuss how the guidelines and textbooks on the well-known risk management approaches like COSO-ERM, together with the practices associated with COSO-ERM, become dominant over other kinds of risk management practices and understandings. As such, the systematic approach of COSO-ERM and its associated risk perception become stronger and stronger over time.

From an institutional perspective, several case studies show how an organization introduces a systematic risk management approach like COSO-ERM. Drawing on institutional theory, the literature review shows the role of internal dynamics and external pressures enabling the introduction of an integrated risk management approach covering the entire organization. As such, the selected risk management papers drawing on institutional theory underline the reasons for the risk management introduction within an organizational context beyond functionalism.

Furthermore, drawing on a more relational approach, scholars show how risk management comes into being in the relationships between the risk management approach, risk management tools and humans. In particular, the selected papers drawing on ANT demonstrate that risk management is established within actor-networks and in the ever-shifting relations between non-human and human actors. As such, the selected ANT-oriented papers critically reflect on the way the idea of an integrated risk management approach materializes in the organizational practices. The ANT-oriented papers give centerstage to the unintended effects of the existing organization's risk management approach and the practices which are associated with this approach. In essence, the ANT-oriented papers oppose the view that the

organization's risk management is embodied by a systematic approach like COSO-ERM. Instead, these papers outline that the organization's risk management is established in the relationships between non-humans, like risk management tools, and humans, like risk managers.

The selected studies that draw on practice theory posit that the risk management within an organizational context emerges and evolves through the simultaneous enactment of multiple practices. Similar to ANT, the selected papers that draw on practice theory oppose the view that the organization's risk management is a stable system.

Notably, the selected papers that draw on practice theory take the organization's risk management approach as their point of departure. For instance, Tekathen (2019) studies the organization's ERM approach as a management accounting concept. Additionally, we argue that practice theory opens up room to understand risk management practices as open-ended in nature. We outline this as a fruitful research direction. In particular, this applies to the risk management practices given the background of unpredictable and dynamic complexities.

All in all, foregrounding the risk management practices, this thesis offers an alternative to the functionalistic view of risk management. Moreover, in addition to the existing risk management papers that draw on practice theory, the present thesis begins by understanding risk management practices as open-ended in nature. That is to say, the borders of risk management are not given and cannot be determined by humans. As such, the thesis takes non-official risk management practices into scope as well. Non-official risk management practices are practices which are not directly associated with the organization's formal risk management approach.

## 4. Overarching research question and scientific relevance

We aim to foreground the risk management practices in order to understand risk management, drawing in full depth on a dynamic perception of social order. For this aim, we present the following overarching research question:

*How and why do risk management practices unfold against the background of unpredictable and dynamic complexities?*

Practice theory foregrounds the practices as the building blocks which constitute social reality (Nicolini, 2012). That is to deny the pre-existence of “all the apparently durable features in our world” (p. 6) such as organizations and risk management approaches. This thesis draws on the work of Theodore Schatzki (2002, 2003, 2005, 2006a, 2006b and 2019) which is a form of practice theory. The specific and novel contribution provided by Schatzki is to advance the understanding of the context, the site, in which practices are carried out. Presenting the site ontology, Schatzki (2002, 2005) has significantly deepened the body of practice theory in recent years. Nicolini considers the work of Schatzki to be “one of the strongest and far-reaching versions of practice theories available to date” (p. 15).

According to Schatzki, practices are organized human activities (Schatzki, 2005). Moreover, people do what is practically intelligible to them. Given the context, spaces of intelligibility emerge. This insight is at the core of Schatzki’s site ontology: Spaces of intelligibility form the site, which is the specific context against which practices are carried out. Practices can only be understood through understanding the site as a specific kind of context. As such, Schatzki emphasizes the human activities or actions as a key component of a practice. Utilizing Schatzki’s site ontology, this thesis gives centerstage to the actions performed by TenneT staff members. We acknowledge them to be knowledgeable professionals.

Ahrens & Chapman (2007) have introduced Schatzki’s site ontology (2002, 2005) in the accounting literature. The authors present a case study, showing how management control as a social phenomenon unfolds in a restaurant chain as the case company. The authors highlight that “neither does an objective system determine activity, nor can social phenomena be explained simply by the aggregation of individual actions” (p. 8). Outlining the middle road between those two, the case study by Ahrens & Chapman highlights that actions are performed in line with invisible structures. They conclude that management control practices are supportive to connect the diverse activities of organizational members (p. 26). Their case study underlines that the restaurant managers skillfully respond to the actual situation and the dynamics therein, utilizing management control tools in a way that makes sense to them. Similarly, this thesis aims to reveal how the risk management practices within TenneT affect various kinds of practices outside the circles of risk management and management accounting.

To answer the thesis’ overarching research question, we need a dynamic perception of social order. Departing from the prevailing perception of social order as regularity or stability, the functionality of risk management within an organizational context

is grounded in the idea that both individual humans and organization departments have their specific role and responsibility. The various departments and the human managers representing the departments have to give an account of how they contribute to the overall risk management objectives. As such, the functionality of risk management is a point of departure and this comes to the fore in the interaction between entities.

Schatzki (2002) opposes to perceive social order as regularity or stability as this would draw on pre-existing categories. As such, Schatzki's approach is ontologically open: Entities receive their meaning through the enactment of practices. We advocate that the perceptions of social order as regularity or stability fall short to study risk management against the background of unpredictable and dynamic complexities. Following up on Schatzki (2002, 2005) and Ahrens & Chapman (2007), this thesis draws on a more dynamic perception of social order. For that reason we argue that Schatzki's site ontology is highly adequate to study the complicatedness of the risk management practices which are enacted in the TenneT company.

Other scholars who have recently studied risk management practices within an organizational context draw on Schatzki's site ontology as well (Tekathen, 2019, Bui et al., 2019; Klein & Reilley, 2021; Moschella et al., 2023). The thesis' intended scientific contribution, extending to the existing papers, can be reflected by two themes. Firstly, we highlight the necessity of understanding risk management practices as open-ended. We do not limit the research scope beforehand to the actions performed by a limited group of practitioners, as we do not know beforehand which practitioners will perform the actions to manage risks. Neither can we limit the research scope to the actions initiated and performed by practitioners who belong to a certain organizational unit like the risk management department. Instead, we highlight the inclusion of non-official risk management practices, which are the practices that are not directly associated with the organization's risk management approach.

Secondly, we aim to understand how actions that are part of the risk management practices are prefigured. Prefiguration refers to the question which actions seem to be practically intelligible to perform. Following Schatzki (2002), Tekathen (2019) has revealed the important role of the prefiguration of the organization of risk management practices with regard to the actions performed by risk managers and risk assistants. This thesis extends the theme of prefiguration to the actions performed by other kinds of professionals within an organizational context. As such, this thesis shows that in some particular situations it makes sense to

practitioners to respond intuitively to the challenges they have to face. These actions are prefigured as well.

Similarly, we demonstrate that the organization of the risk management practices might prefigure practitioners to rely on tacit knowledge to explore novel risks which emerge in the surrounding environment. Normative texts and scientific knowledge are at the core of the prevailing risk management approaches. These formal sources of knowledge might be supportive to prescribe the activities in response to the well-known risks the organization is familiar with. Additionally, following the prefiguration of the organization of practices, this thesis sheds new light on the actions to respond to novel risks utilizing tacit knowledge.

## 5. Methods and the introduction of the TenneT case study

As the research question focuses on *how* and *why* the risk management practices unfold, the thesis' overarching research question needs to be addressed by a qualitative study. Chua (1986) highlights that a qualitative methodology offers an alternative to the assumption that "empirical reality is objective and external to the subject" (p. 611). Therefore we argue that a qualitative methodology is highly suitable for studying risk management practices and for understanding how these practices unfold.

The method of this thesis is to perform an in-depth case study. According to Guba and Lincoln (1994), qualitative research is conducted by a dialogue between the researcher and the topic of research. To enable this dialogue, the researcher needs to be closely involved with the case organization as the subject of research. We were invited to study the risk management practices within TenneT in great detail over a long period of time. The TenneT organization has turned out to be an excellent opportunity to be involved with the risk management practices in an organizational context. Within the TenneT organization, we had the opportunity to study the TenneT risk management practices in depth by performing interviews and observation studies. As such, we were able to think through the TenneT risk management practices and to deepen the understanding of these practices in line with the thesis' intended contribution.

Being a state-owned company, TenneT is dedicated to serving the public interest by facilitating high-voltage electricity transmission throughout the Netherlands and a

part of Germany. The thesis' scope is limited to TenneT's activities in the Netherlands. The choice to focus on TenneT's activities in the Netherlands has been made as these activities are subject to Dutch law, while TenneT's activities in Germany are subject to German law. The differences between the laws and legislations in both countries can be meaningful. One regulator has the responsibility to monitor that TenneT acts in line with Dutch law, while another regulator is in charge to monitor TenneT's activities in Germany. The rules set by the government are quite important to understand TenneT's activities. We would rather focus on the activities in one country in order to understand these activities in full depth, including the role of the regulator, than to discuss the activities in both countries.

Electricity transmission and distribution refers to the transfer between the electricity generation and the electricity consumption by end-users. Electricity transmission needs to be reliable in order to avoid the interruption of electricity supply. In this sense, one of TenneT's key responsibilities is to grant reliable electricity transmission, which is generally referred to as the security of supply.

The TenneT organization is highly suitable as the case organization to answer the overarching research question for multiple reasons. Firstly, TenneT acts against the background of unpredictable and dynamic complexities. In particular, these complexities refer to the intended switch to the use of electricity from renewable sources like wind and sun in the years to come. The Dutch government has set the overarching objective that the entire energy consumption of the Netherlands be generated by renewable sources by the year 2050 (Rijksoverheid, 2019). To achieve this objective, the electricity transmission networks need to be adjusted and extended in the years to come. This shift is generally considered to be part of the energy transition. Chapter II discusses the energy transition in more depth and how this affects TenneT.

Secondly, the TenneT case study provides an example of a public company that needs to give an account of its activities to the regulator and, ultimately, to the public in general. On the one hand, the regulator provides clear guidelines to TenneT for managing risks. These guidelines mainly reflect the functionalistic view of risk management, considering risks as manageable items and foregrounding a systematic risk management approach. On the other hand, on top of the explicit requirements to give an account to the regulator, TenneT is a regular subject of public debate. We might understand from this that TenneT has to take into account implicit public expectations.

As a result, the TenneT case study offers the opportunity to study how different kinds of risk management practices unfold in one organizational context. Tension might arise between the different kinds of risk management practices. To understand this tension in depth might be relevant for many organizations within the public sector that are the subject of economic regulation.

## 6. Thesis outline

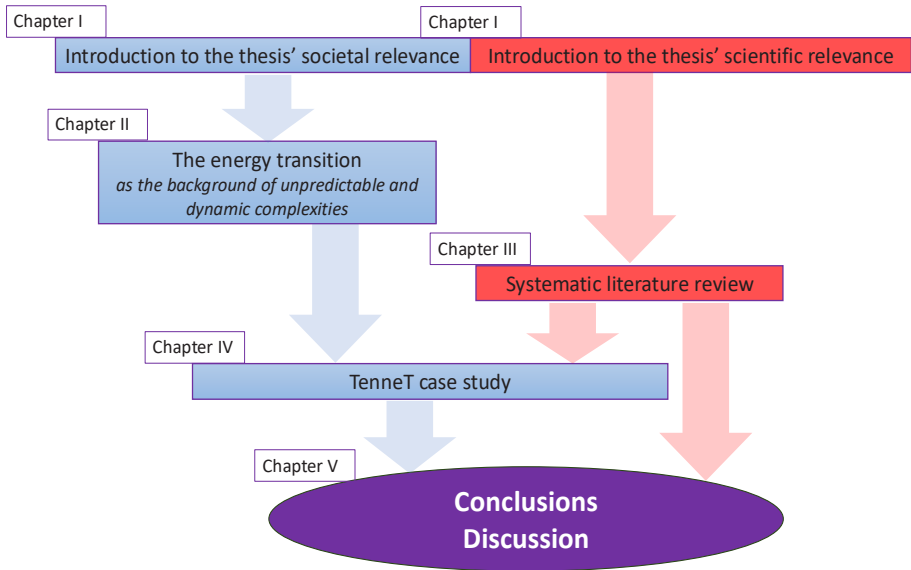
This chapter introduces the thesis' societal and scientific relevance as well as the overarching research question. Opposing the functionalistic view of risk management, this thesis aims to contribute to the study of how risk management practices unfold within an organizational context against the background of unpredictable and dynamic complexities. Following this introductory chapter, Chapter II sheds light on the energy transition as the background of unpredictable and dynamic complexities TenneT has to deal with.

Preceding the TenneT case study, we perform a systematic literature review to ensure we deliver the intended contribution to the risk management literature as outlined above. As such, Chapter III presents a literature review about the dynamics of risk management based on the state-of-the-art risk management literature as part of the field of management accounting. Moreover, Chapter III identifies a knowledge gap and highlights the thesis' scientific relevance in full detail.

Chapter IV presents the in-depth case study we performed within the TenneT organization. This chapter shows how different kinds of risk management practices serving the security of supply jointly give rise to the totality of risk management practices. The case study reflects how the background of unpredictable and dynamic complexities proves to be highly relevant to understanding how risk management practices are enacted within the TenneT organization.

Finally, Chapter V provides a conclusion, in response to the overarching research question. Furthermore, this chapter discusses the findings and we provide several suggestions for future research.

*FIGURE 1* shows how the different chapters fit together.



**FIGURE 1:** Thesis outline





## Chapter 2

# **The background of unpredictable and dynamic complexities: the energy transition**

---

# 1. Introduction

The Dutch Climate Agreement (Rijksoverheid, 2019) provides a clear ambition with regard to the use of electricity for the year 2050: All electricity consumption in the Netherlands will be generated by renewable sources, like wind energy and solar power. The Climate Agreement contributes to a reduction in the use of fossil fuels and the associated emission of greenhouse gas, in line with the Paris Agreement (2015). Pursuing this ambition, a diverse range of stakeholders like energy companies, governmental organizations and network operators are mobilized for action to each deliver their specific contribution.

With regard to TenneT and its responsibility to grant the security of supply now and in the future, we point out that the dynamics associated with the energy transition are highly relevant: The energy transition limits the extent to which TenneT can reliably predict future events which will affect the security of supply. This chapter discusses in more detail the background of the energy transition as this equates to the background of unpredictable and dynamic complexities against which the TenneT risk management practices unfold. We uncover the energy transition as being the reason why the TenneT case study is highly suited to study the risk management practices against the background of unpredictable and dynamic complexities.

This chapter is based on international state-of-the-art literature and on publicly available sources regarding the energy transition in the Netherlands. These sources include publications by the Dutch government, the network operators and the Autoriteit Consument & Markt (ACM) which is the Dutch regulator for the energy sector. Furthermore, we draw on some of the insights outlined in our earlier paper (Ruiter et al., 2024).

The remainder of this chapter starts by highlighting the existing role of TenneT and the risk management practices that facilitate the security of supply (section 2). Subsequently, we introduce the scope of the changes which are the result of the set ambition as reflected in the Dutch Climate Agreement (section 3). While section 3 discusses the dynamics we currently witness, section 4 focuses on future events which might affect the energy transition in the decades to come. We emphasize how these future events are hard to predict in nature. This contributes to the background of unpredictable and dynamic complexities. Section 5 provides a conclusion and summarizes how the energy transition is relevant for the TenneT case study as presented in Chapter IV.

## 2. Security of supply within the TenneT organization

The reliable provision of energy is a key public service to contemporary society. Although the energy industry is operated by many profit-driven organizations as well as public companies, the reliable supply of electricity is commonly regarded as one integrated whole which is crucial to the entire society. To ensure security of supply, the energy sector is regulated by the government. For instance, in line with European legislation, the Dutch government has determined that energy production and trading should be separated from transmission and distribution. The underlying principle is that the transmission networks need to enable access for all energy-producing companies to ensure fair competition from various European countries. One European energy market with fair competition is believed to strengthen the security of supply.

With regard to electricity transmission in the Netherlands, several interconnected networks are being operated in different regions in a joint effort by multiple network operators to facilitate electricity transmission throughout the country. Among the network operators, TenneT is known as the Transmission System Operator (TSO), showing the contrast with the Distribution System Operators. TenneT is the only network operator permitted to operate the high-voltage (380/220 kV) electricity transmission networks in the Netherlands. Moreover, TenneT has been appointed by law to balance the demand and supply for electricity transmission. In short, TenneT's role as network operator is crucial to electricity transmission in the Netherlands. *TABLE 1* shows some key indicators derived from the Integrated Annual Report 2023 (TenneT, 2024).

**TABLE 1:** *TenneT key indicators (TenneT, 2024)*

| Key indicator                      | Amount 2023 |
|------------------------------------|-------------|
| Total circuit length (kilometers)  | 25,435      |
| Number of pylons (approximately)   | 27,900      |
| Sum of investments (* € 1,000,000) | 7,603       |
| Number of internal employees (FTE) | 6,937       |
| - Of whom in the Netherlands       | 2,805       |

The TenneT case study focuses on understanding risk management practices serving the security of supply in the field of electricity transmission in the Netherlands. Given the vital role of electricity to contemporary society, considerable efforts to

secure the electricity supply are generally accepted. Society requires electricity transmission to be highly reliable. However, inherently, the possibility remains that an outage can occur due to failing electricity transmission. In this regard, TenneT pursues a rational tradeoff between security of supply and the public money required to grant this. Consequently, TenneT does not strive to eliminate all risks which might affect the security of supply; this would take an unacceptably large amount of public money. Instead, a very limited risk that the TenneT grid may fail and cause an outage is generally accepted. This is comparable to facing the chance that a flood or a serious seismic incident occurs in several regions around the world. TenneT has to ensure that their networks are adequate to facilitate electricity transmission in the Netherlands. For this end, TenneT has to perform maintenance activities to ensure that the existing assets continue to function. Equally important, TenneT needs to invest in new assets. For instance, new electricity transmission lines are needed to serve the growing population in certain cities and regions in the Netherlands. Moreover, TenneT has to replace old network components after their economic life.

Typically, realizing investments in the electricity transmission networks serves the security of supply in the long run. Network components like stations and transmission lines typically need to last for a long period, such as 40 or 50 years. TenneT therefore has to predict which electricity transmission networks are needed in the long run and which investments in network components need to be prioritized. Both are hard to determine exactly ahead of time.

On the one hand, TenneT cannot afford to limit and postpone the realization of investments in order to save money. This might negatively affect the security of supply. On the other hand, the availability of adequate resources is severely limited; in particular these limitations refer to well-educated technical staff members and to the availability of construction companies. TenneT cannot strengthen the transmission networks beyond what is considered reasonable. Importantly, TenneT has to give an account of the public money the company spends in building new assets.

Consequently, reliable prediction of future events is required to make the tradeoff with how much investment is needed and to prioritize the investment adequately. Several complications need to be taken into account with regard to this tradeoff. For instance, statistics may display the frequency with which heavy gales occurred in the various regions of the Netherlands over previous centuries. However, extending this information about the past to the future could be problematic as the frequency

with which gales occur might be affected by climate change, for instance. From a technical point of view, difficulties arise in ensuring that the components keep functioning adequately over such a long period of time. For instance, the influence of the wind from the sea might shorten the economic life of some particular assets in coastal regions in comparison to the assets in other regions.

That the existing electricity transmission networks need to be strengthened is quite clear. Currently, the existing grid capacity is not sufficient to connect all end-users upon request within the required period of time. Huge investments are scheduled for strengthening the existing networks and for extending them further in the years to come. However, given the uncertainties and dynamics discussed above, TenneT cannot reliably forecast future grid demand. Investments which seem to be reasonable in the current circumstances might prove to be unnecessary and a waste of public money by the time the investments are realized. This is even more complicated, since realizing investments to extend the grid is time-consuming: Typically, TenneT needs a period of at least ten years to build a new line for electricity transmission.

Societal pressure on TenneT has increased in recent years due to a shortage of network capacity. As a result, many individual electricity end-users cannot get connected to the electricity network within a reasonable term (Netbeheer Nederland, 2024). This does not affect the security of supply directly, but further demonstrates that network operators have not managed to adjust the electricity transmission networks in time. Notably, tension arises as the principle of reliable electricity transmission as a public provision is threatened when individual electricity end-users are unable to get access to the network within a reasonable term.

The societal debate about how, when and where the investments to ensure the security of supply will be realized has intensified in recent years. Politicians and citizens regularly debate the need for and the financing of these investments.

In sum, we emphasize the risk management serving the security of supply within TenneT as being part of a public provision: Multiple organizations each deliver their specific contribution to achieve the objective of security of supply of electricity in the current situation and in the future. To forecast future grid demand reliably can be complicated. We now show how what was once a stable situation without major fluctuations has changed in recent years as a result of the energy transition, turning the background into a situation dominated by unpredictable and dynamic complexities.

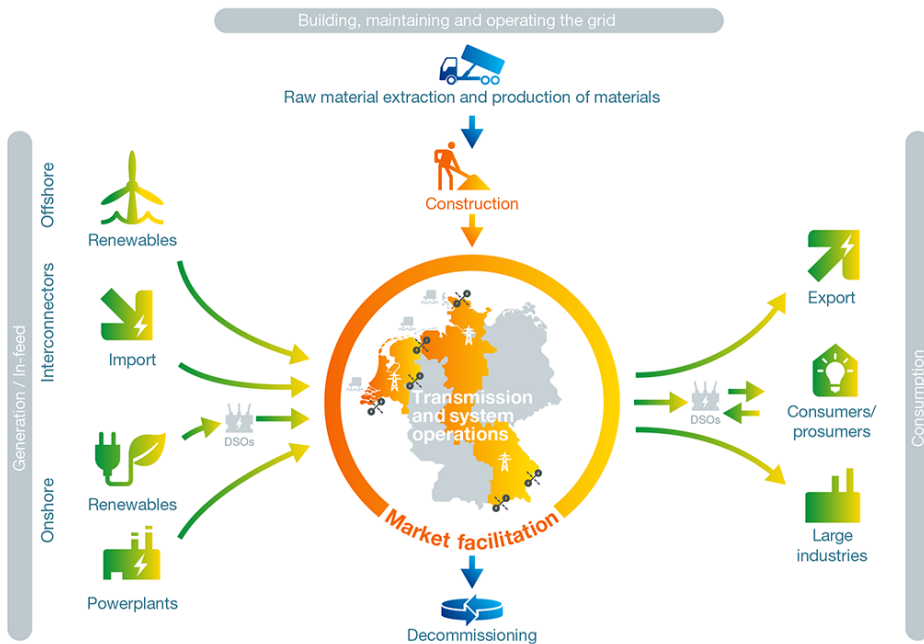
### 3. The dynamics of the energy transition

Society aims to switch to the use of electricity from renewable sources like wind and sun, for which reason the electricity transmission networks need to be adjusted and extended in the coming years. This shift is generally considered to be part of the energy transition. The scope of the energy transition is much broader than just the consumption of electric energy; this is also relevant for mobility and for central heating systems within buildings like homes and schools, for instance.

#### 3.1 How the energy transition affects the security of supply

TenneT's key responsibility – to ensure security of supply – and how the energy transition affects the objective to grant security of supply, is quite well displayed by the following diagram (FIGURE 2).

**TenneT in the supply chain**



**FIGURE 2:** TenneT in the supply chain.

Extracted on November 10, 2022, from <https://netztransparenz.tennet.eu/electricity-market/connecting-to-the-dutch-high-voltage-grid>.

Change unfolds at the supply-side of the supply chain as the generation of electricity shifts from generation in big powerplants, which are concentrated in a limited area in the country, to generation from renewable sources like wind power and solar energy. In the new situation electricity is generated by a variety of big and small companies and home owners all over the country. Many of these individual entities produce a limited amount of electricity compared to the conventional powerplants. For the sake of electricity transmission from its generation to the end-users, all locations in which electricity is generated need to be connected to the electricity transmission networks.

Moreover, the amount of energy produced in one hour can be scheduled in the case of generation by the use of fossil fuels in a powerplant, but this amount is highly variable in the case of generation by windmills and solar farms. Due to weather conditions, the amount of electricity production from wind and sun varies from one hour to the next. Given the inherent limitations of storing electricity, utilizing the electricity generated from renewable sources requires flexibilities in the entire supply chain. For instance, if the weather conditions are favorable for electricity generation, such as a lot of wind and sunshine, the electricity generation might contribute considerably to the actual grid demand. During these hours the plants do not need to produce much electricity. However, during the night, the winter and days without wind, the plants need to have the flexibility to produce a lot of electricity.

Equally importantly, electricity consumption has increased both rapidly and unexpectedly over recent years. Striving to contribute to the energy transition, many citizens and organizations prefer to utilize electricity for driving cars and heating buildings instead of utilizing fossil fuels. The Dutch government supports this shift financially, anticipating to a situation in which electricity generation will be completely based on renewable sources in the coming decades. In this way, choosing to utilize electricity as much as possible is assumed to contribute to achieving the ambition for the year 2050.

### **3.2 Dynamic complexities**

We witness that diverse groups of stakeholders involved in the energy transition tend to act in accordance with their own interests and ambitions. For instance, an innovative company which produces cars has the aim of selling many electric cars. This company advocates the availability of multiple locations to charge electric cars. By contrast, the companies that sell fossil fuels strive to continue their business as long as it increases the company's profit. In this example, the national government

is not directly involved; however, the government might purposefully contribute to the spread of electric car-charging points by supporting these initiatives with financial incentives.

Typically, the national government shapes the conditions for the energy transition to happen. The laws and regulations governing the energy transition serve to enable the energy transition. Bhattarai et al. (2022) point out that the energy transition is set in motion by political pressure, driven by international agreements like the Paris Agreement (United Nations Environment Programme, 2015), rather than governments issuing laws to direct the outcome of the energy transition. Sung & Park (2018) pursue the same point as they reveal a multi-actor perspective to understand the energy transition. They distinguish between actors that directly promote the energy transition and actors that have an indirect influence on the energy transition such as the public in general.

The group of stakeholders involved in the energy transition includes both profit-driven organizations like energy providers and not-for-profit organizations like network operators. Furthermore, the energy transition stakeholders are both governmental organizations such as municipalities, and non-governmental organizations such as those which belong to the environmental movement.

The interrelation of the different groups of stakeholders brings the dynamics of the energy transition to the fore and in some situations the achievement of the stakeholder's goals depend on the actions performed by other stakeholders. Laws and legislation play their part as well. In particular, these might cause both intended and unintended effects, contributing to the whole of dynamic complexities.

Furthermore, public debate influences the speed of the energy transition. Over time, ideas about the energy transition and the need to make efforts to reduce greenhouse gas emission might drift, impacting public debate as well. Importantly, political denominations might change their view on how much public money they want to spend to achieve the 2050 ambition. In particular, this change occurs in the face of elections or in the face of an economic downturn.

Another point which contributes to the dynamic nature of the energy transition in the field of electricity is the interrelatedness with the energy transitions in the field of natural oil and gas. Following the energy transition, aiming to reduce the emission of greenhouse gasses, both companies and individual citizens search for new solutions for driving cars and heating buildings like homes and shops. The

result might be a sharp increase in electricity demand, putting pressure on the existing transmission capacity to facilitate this demand. In this situation, it might be even harder to shift to electricity generation from renewable sources, as building new network components typically reduces the scarce grid capacity during the years of the building activities.

With regard to international interdependencies, we point out that a considerable amount of the electricity consumed annually in the Netherlands is generated in Norway. The European Union (European Commission, 2012) emphasizes “securing Europe’s energy supplies”. The key point is the EU ideal for an integral secure energy system which does not depend on countries outside the EU. In this regard, severe limitations exist to purchase electricity which is generated by solar farms in countries in Northern Africa or the Middle East, for instance. This shows that the scope of the energy transition in the field of electricity cannot be limited to the Netherlands. The dynamics in the global energy market and the market conditions in the countries surrounding the Netherlands have to be taken into account.

### 3.3 Summary

TenneT’s responsibility to ensure the security of supply has become more and more challenging in recent years due to the energy transition. The Dutch energy transition with regard to electricity refers to the intended shift to the total consumption of sustainably generated electricity by the year 2050. This energy transition causes several important changes in the entire supply chain from electricity generation to electricity consumption.

This section underlines the dynamics of the energy transition which come to the fore as different stakeholders pursue their own interests. These dynamics emerge as stakeholders are dependent on each other, while in other situations the interests of one stakeholder runs counter to the interest of another. TenneT has to take into account the interests of the various stakeholders, while the company needs to pursue the overarching societal objectives as well. The dynamic complexity of the energy transition in the current situation severely affects the TenneT risk management practices to grant the security of supply, as the grid demand changes and will continue to do so in the coming years and decades.

Notably, the energy transition ambition refers to the situation by the year 2050. The dynamics of the energy transitions we currently witness are only the beginning. Much effort will be required in the decades to come to achieve the overall long-term objective. In this regard, the following section highlights the unpredictable

complexities which emerge during the energy transition era. We underline the relevance for this thesis focus on the TenneT investments, since the realization of new transmission networks and network components are intended to serve the security of supply over a long period of time. Being a key player in the national electricity provision, TenneT risk management practices that schedule and prioritize the investments are highly relevant to the entire society.

## 4. Unpredictable complexities

This section deepens our understanding of the future events which will drive the energy transition and the dynamics which might unfold if these future events occur. These events and the related consequences for the security of supply are hard to foresee, given the timeframe which needs to be taken into account. Consequently, the dynamics that will unfold as the future events occur extend to the dynamic complexities we currently witness (section 3).

We have discussed how future events like natural disasters might affect the security of supply in the current situation (section 2). Important limitations surround the question of forecasting how exactly these future events might affect the grid demand and, consequently, which investments will be needed to grant the security of supply in the decades to come.

In this regard, the current section deepens our insights into future events by discussing two of their key dimensions which are at the core of the background of unpredictable and dynamic complexities. These dimensions are A) the occurrence and probability of future events and B) the extent of the consequences of future events. Regarding these two dimensions, we show two extreme positions (*TABLE 2*): The first is the position of complete knowledge about all relevant future events. The second position represents the very opposite.

**TABLE 2:** Two dimensions of future events

| Complete knowledge about all relevant future events                                                                                                                                                                                | Space between the two extreme positions | All future events are completely unknown and completely unpredictable                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A.</b><br>The occurrence of future events is perfectly predictable in nature. We know with certainty that future events will not surprise us.<br><br>The probability of the occurrence of future events is given ahead of time. | <<<                      >>>            | The occurrence of future events is completely unknown and unpredictable; the occurrence of future events is entirely random.<br><br>The probability of the occurrence of future events cannot be derived from what has happened in the past. |
| <b>B.</b><br>The extent of the consequences of future events is limited and known ahead of time.<br><br>Future events only have consequences within a limited period of time.                                                      | <<<                      >>>            | The extent of the consequences of future events is far-reaching and this extent is revealed as the future events occur.<br><br>Future events have consequences in both the short and long run.                                               |
| <i>Example partly reflecting this extreme position: buying a new car for your own personal use.</i>                                                                                                                                |                                         | <i>Recent example partly reflecting this extreme position: the COVID-19 pandemic.</i>                                                                                                                                                        |

With regard to the TenneT risk management practices that maintain the security of supply in the era of the energy transition, in the following sections we discuss to what extent future events can be predicted and to what extent the dynamic complexities associated with these events can be understood ahead of time. These sections (4.1 and 4.2) are structured by the dimensions A and B as listed above.

#### 4.1 A – The occurrence of future events

In order to complete the energy shift to achieve the 2050 ambition, the energy transition is highly dependent on the availability of technical innovations. This refers to the improvement of existing technical possibilities and features and refers to technical innovations that open up totally new possibilities. We emphasize the need for technical innovations as the scope of the existing technical possibilities fall short of achieving the energy transition ambition by the year 2050. For instance, no alternatives currently exist for using fossil fuel for flying airplanes. The same applies to certain specific parts of heavy industry in the Netherlands such as the

production of chemicals. Whether the appropriate innovations will occur in the years to come remains uncertain.

With regard to the improvements of existing technologies, we point to the example of hydrogen for energy storage and energy transfer over long distances. Future improvements in this area might affect the demand-side of the electricity supply chain. In short, if hydrogen becomes available for massive-scale use to replace fossil fuel or for use as the preferred energy carrier over long distances, this might cause a sharp and unexpected increase at the demand-side of the supply chain.

Another recent example of a more or less unexpected event was the start of the Ukrainian war (February, 2022). The Ukrainian war has highlighted the vulnerability of being dependent on Russian gas. Moreover, terrorist attacks like the ones on September 11, 2001, might also cause international tension, affecting energy prices and economic development in a broader sense. The terrorist attacks back in 2001 show that threats like these can go far beyond our imagination. It follows that humans are unable to predict whether or not similar attacks will occur in the future, and nor can they estimate the effects of these attacks.

Adding to the complexity of how future events might affect the security of supply in the years to come, we consider how the mere chance that a future event might occur can affect the need for future investments in the electricity transmission networks. For instance, if the European authorities were to debate and carefully consider introducing a new tax for fossil fuel, this might stimulate people to buy electric cars.

## **4.2 B – Future events are open-ended**

The extent of the consequences of the energy transition is far-reaching as this directly affects the daily life of many citizens as well as the operations of big and small companies. With regard to the electricity transmission networks, the huge amount of investments needed in the coming decades is a first indication of the extent of the consequences which are unfolding in the energy transition era. In this sense, the need to strengthen the existing electricity transmission networks to achieve the ambition set for the year 2050 is commonly underlined. Investments are needed, but TenneT must schedule and prioritize these investments with great care.

On the one hand, the extent of the consequences is open-ended and, typically, the consequences go far beyond what humans expect ahead of time. Open-ended, in this sense, refers firstly to the scope of the consequences in the sense of who is

being affected. Secondly, open-ended refers to the limitations of grasping the long-term consequences of the shift to total electricity generation and consumption from renewable sources. Multiple technological innovations in the past proved to have long-term consequences which could not be foreseen at the moment that the innovation became available. We point to the unintended and surprising consequences following the introduction of the cell phone or the invention of printing books in late Medieval times. Similarly, the long-term changes following the massive use of artificial intelligence (AI) technology cannot be reasonably foreseen. These consequences are open-ended, in terms of both the scope of the consequences as well as the timeframe in which the consequences come to the fore.

On the other hand, various consequences might compensate each other in particular circumstances. For instance, an increase in the use of electric cars might directly cause an increase in the grid demand as car owners switch from the use of fossil fuel to electricity. However, the charging of electric cars opens up possibilities to improve the way citizens utilize the electricity transmission networks more efficiently.

Emotions play their part as well which particularly affects the achievement of the overall long-term ambition. The energy transition is not only about investing in building new assets on a massive scale, but also about the question of how to extend the current electricity transmission networks in a way which is socially acceptable. In particular, building pylons and cables meets severe resistance among the inhabitants of the involved areas. Alternatives have to be considered, as it is generally accepted we cannot continue to build pylons and cables at the pace we have witnessed in recent years.

The extent of the consequences might also refer to possible side effects of extending the electricity transmission grid. We might think of health damage caused by living close to an electricity line. Even where health damage is not yet evident, people might become increasingly resistant if they believe that health damage could occur.

In sum, future events are open-ended in nature in the sense that the extent of the consequences is nearly impossible to foresee. Unintended and surprising effects of future events might severely affect the pace of the energy transition. In this sense, the energy transition might be compared to the global Covid-19 pandemic. Facing this pandemic, humans combined future-oriented measurements to prevent the

spread of the virus with actions to fight the pandemic in real time. Moreover, the long-term effects of the pandemic have become evident over time; these effects also apply to the long term as we think of the people who became disabled for work.

## 5. Conclusion

The energy transition has severely changed the entire supply chain from electricity generation till the electricity consumption. Dynamic complexities are revealed since the various stakeholders pursue their own interest. Moreover, unpredictable future events might contribute to the complexities.

This background of unpredictable and dynamic complexity of the energy transition severely affects the TenneT risk management practices to grant the security of supply as the grid demand changes unpredictably. Scheduling and prioritizing the investments to facilitate the security of supply becomes increasingly challenging against this background.

For this reason the TenneT organization is well suited to study how the risk management practices unfold against the background of unpredictable and dynamic complexities. The case study as presented in Chapter IV follows up on this, highlighting the risk management practices with regard to the investment realization aiming to grant the security of supply both today and in the future alike.

## 6. Chapter summary

TenneT plays a key role in ensuring the security of supply in the Netherlands as part of the supply chain from electricity generation to electricity consumption. TenneT needs to ensure that the electricity transmission networks remain adequate to facilitate uninterrupted electricity transmission. The TenneT risk management practices serving the security of supply are vital to the entire society.

This chapter underlines the difficulties in achieving the objective of security of supply in the era of the energy transition. The energy transition refers to the intended shift to the total consumption of sustainably generated electricity by the year 2050. In order to achieve this ambition, TenneT needs to extend its existing electricity transmission networks, but the consequences of the energy transition are hard to foresee. In this regard, this chapter highlights the difficulties in making

a reasonable tradeoff to effectively realize investments that will serve the security of supply in the decades to come while avoiding the waste of public money. That is to say, risk management refers to trading off the need to strengthen the electricity transmission networks on the one hand and the available resources on the other. Risk management aims to prioritize the realization of the investments which are most urgently needed.

The energy transition in the Netherlands has given rise to a background of unpredictable and dynamic complexities. With regard to the energy transition in the field of electricity, this chapter highlights several dynamics which have unfolded in the current situation as a result of the energy transition (section 3) and the chapter draws attention to the unpredictable nature of the future events which might affect future grid demand (section 4). The dynamic complexities come into being as the various stakeholders tend to pursue their own interests and they will continue to do so in the years to come. This results in a situation of ever-shifting interdependencies and relationships between the stakeholders. The complexities are unpredictable in nature as well; the future events that drive the energy transition are highly uncertain. Difficulties surround the question of understanding how stakeholders respond to the occurrence of future events. Moreover, the future events are open-ended in nature: Humans are unable to adequately understand the extent of the consequences ahead of time.

Complicating things even further, the future events cannot be regarded as being separate from the dynamics we currently witness, and nor can the various events be understood as standing alone. Rather, we should understand the unpredictable and dynamic complexities as one integrated whole in which future events hang together with the current situation and dynamics within this situation. Moreover, if future events unexpectedly occur, this might affect the relationships between stakeholders, and in some situations might also change their interdependencies. Stakeholders consider over and over again how to respond to the complexities they face. The complications can affect both the pace and the direction of the shift to electricity generation from renewable sources.

The unpredictable and dynamic complexity of the energy transition severely affects the TenneT risk management practices to grant the security of supply as the grid demand changes unpredictably. This situation will be the case for the coming years as well. Scheduling and prioritizing the investments to facilitate the security of supply becomes increasingly challenging against this background.



## Chapter 3

# **The dynamics of risk management – a systematic literature review**

---

## 1. Introduction and research question

The rules of the game are essential in the sport of football (soccer). The basic rules of football are assumed to have been written down for the first time in England, back in 1815. Despite the basic rules remaining unchanged, playing football has been developing and changing ever since people started playing the game. The football players and teams develop and advance their ways of playing the game by experience, by improving their skills and adjusting their tactical approach. These are the dynamics by which the game is played in a different way today than it was 20 years ago and there might also be differences between the ways the game is played in various parts of the world.

Similar to the rules of football, risk management approaches are often considered to be stable systems. They provide a predefined framework to assess and manage risks and they pave the way to introduce a risk management approach into an organization effectively.

Starting with the financial industry, we observe a shift from silo risk management to enterprise risk management (ERM) (Mikes, 2009; Jabbour & Abdel-Kader, 2015). Silo risk management refers to managing different kinds of risk such as credit risk, foreign exchange risk and interest rate risk, separately. By contrast, ERM strives to understand these risks from various origins in one integrated approach. Basel II and Basel III are commonly considered as examples of an ERM approach as risks from various silos are aggregated for the entire organization (Mikes). Moreover, the ERM approach has become broadly accepted in other kinds of organizations as well. The Committee of Sponsoring Organizations of the Treadway Commission, COSO, published their report on ERM in 2004 (COSO, 2004). An ERM approach like Basel II and III and like COSO-ERM might be considered to be a prevailing risk management approach, as the COSO-ERM report has become a worldwide and dominant standard (Power, 2009; Hayne & Free, 2014).

As the dynamics in football do not come into being by an adjustment in the rules of the game, risk management dynamics are not purposeful changes and adjustments of the predefined risk management approaches. We would rather argue that risk management dynamics occur *despite* the stable nature of the prevailing risk management approaches. The introduction of an ERM approach might cause “complex, unforeseen dynamics” (Bromiley et al., 2015, p. 273). Such dynamics can only be studied through fieldwork. They have been explored in several case studies

in the field of management accounting (Tekathen & Dechow, 2013; Hall et al., 2015; Arena et al., 2017; Thomsen & Skærbæk, 2018).

Several authors criticize the prevailing risk management approaches for paying too much attention to the known risks while the approaches proved to fail in responding effectively to emerging risks (Power, 2004 and 2009; Taleb, 2007). Known risks often refer to uncertainties which cause quantifiable adverse effects. For instance, an insurance company calculates and models the result of an increasing interest rate in the international capital market. Power (2009) underlines that risk management designs like COSO-ERM fail to include the externalities which go beyond the design parameters. Typically, the ERM design parameters in the insurance and financial industries are based on the relevant economic values in recent years, denying the possibility that future developments turn out to be radically different from developments in the past. The global financial and economic crisis (2007–2009) provided multiple examples.

The prevailing risk management approaches have been criticized for not being able to save financial institutions from serious consequences such as financial losses and reputational damage during the global financial and economic crisis (Ashby et al., 2014). These risk management failures and their impact show why it makes sense to raise questions about risk management capabilities to realize its primary objective. Power (2004) signals, despite this criticism, the rise and persistence of risk management: Following the organizations in the financial industry, many profit-driven and not-for-profit organizations have adopted an ERM approach in their risk management approach.

However, ERM as a concept is not clearly defined: Arena et al. (2010) confirm that “ERM can be different things in different organizations, or even within the same organization at different times” (p. 659). According to Bromiley et al. (2015), consensus only exists upon a limited number of ERM's core elements. These core elements, for instance, refer to integrating traditional operational risks like risks related to product liability and accidents and strategic risks. Against this background, risk management dynamics are likely to occur: The way organizations plan and execute activities to manage risk might develop and change over time.

This chapter presents a systematic literature review to uncover the state-of-the-art knowledge about the dynamics of risk management. In particular, the study focus is to review the literature which challenges the functionalistic view of risk management.

For that end, we have selected the studies that belong to the interpretative research paradigm. In this regard, we present the following research question:

*What is the state-of-the-art of interpretive research regarding the dynamics of risk management as expressed in management accounting literature?*

The current literature review reveals that the dynamics of risk management have been studied from various theoretical angles including an institutional angle (Arena et al., 2010), an ANT angle (Jordan et al., 2013; Thomsen & Skærbæk, 2018) and, more recently, a practice theory angle (Bui et al., 2019; Tekathen, 2019).

The remainder of this chapter is organized as follows. Section 2 details the methods and gives an account of how we have selected the papers. Section 3 presents the categorizing of the selected papers. Subsequently, starting from section 4, we discuss the contribution of the individual papers in more detail. Section 9 contains a summary and discussion of the findings. Moreover, section 9 discusses the knowledge gap we have identified in this literature review and this section details how the present thesis follows up on this knowledge gap.

## 2. Methods

This study follows a systematic approach, avoiding selection bias as much as possible (Tranfield et al., 2003). Connected to the review protocol and in line with the principles of a systematic literature review (Massaro et al., 2016, for instance), the present section describes the applied search criteria in detail to enable repetition for future use.

The database search as the first part of the literature selection is based on the ISI Web of Science database as this database covers many high-impact journals in the field of accounting and management. These journals are commonly considered to be the leading ones in the field. For the purpose of this study, the search was limited to the following three categories in the database: Business finance, Management, and Business. In each of these three categories we have selected the Top 30 highly ranked journals. The chosen timeframe was the period from 2009 to 2019. The year 2009 was chosen as the start of the period, because the year 2009 is generally regarded as the end of the global financial and economic crisis. During this crisis the limitations of risk management in the financial industry became apparent as many financial organizations were severely affected by the consequences of the

crisis. The organization risk management proved in many situations unable to foresee the dynamic consequences. We assume that after these years, scholars tend to question the role of risk management more critically.

Selecting the Top 30 quality journals in the various ISI Web of Science categories implied a first quality check. In addition, we chose to use the Academic Journal Guide 2018 published by the Chartered Association of Business Schools (ABS); this rating is commonly referred to as the AJG rating 2018. The AJG rating has been used in a number of recent academic papers, for instance Picard et al. (2019) and Hussain et al. (2020), which were published in highly ranked journals. Another argument in favor of using the AJG rating is that the ABS has publicly announced how the AJG rates were determined.

We have excluded all journals with an AJG rate of less than 3 to ensure the literature review is based on high-quality articles. Performing this quality selection and removing duplicates resulted in a selection of 67 journals as the basis for the database search.

We started the database search in the ISI Web of Science with “risk management” as the search term in the field Topic. The term “enterprise risk management” would also have been an adequate term to start with to reduce the number of hits outside the field of accounting and management. However, useful hits might have been left outside the selection as well. The selection applied to this search strategy, based on the 67 selected journals, included 584 academic articles.

Many scholars underline the importance of using more than one search strategy to avoid missing important articles (e.g. Massaro et al., 2016; Booth et al., 2016). Following up on this principle, we extended the gross selection with the scientific papers citing Power’s article “The risk management of nothing” (2009) according to Google Scholar over the period to 2019. This search using Google Scholar resulted in hits which were not included in the database search. After performing the same quality check using the AJG rating as outlined above, 21 articles were added to the selected items in the first step. The result of the combined search strategy as outlined above was 605 hits. The related article references were imported into EndNote online. Subsequently, we have excluded papers and essays which do not contain empirical data. Literature reviews and editorial writings were also left out of the selection for the same reason.

The following criteria were applied to select the hits that are relevant for the goal of this study:

We only included sources in the English language;

- Hits which were obviously not relevant for the field of accounting and management were excluded;
- Books were excluded as we cannot verify that they are peer-reviewed.

After these steps, we performed an additional database search in Business Source Complete. Utilizing the same search terms and excluding criteria, this additional search yielded 22 additional hits. In doing so, we aim to reduce the possibility of leaving relevant items out of the research scope.

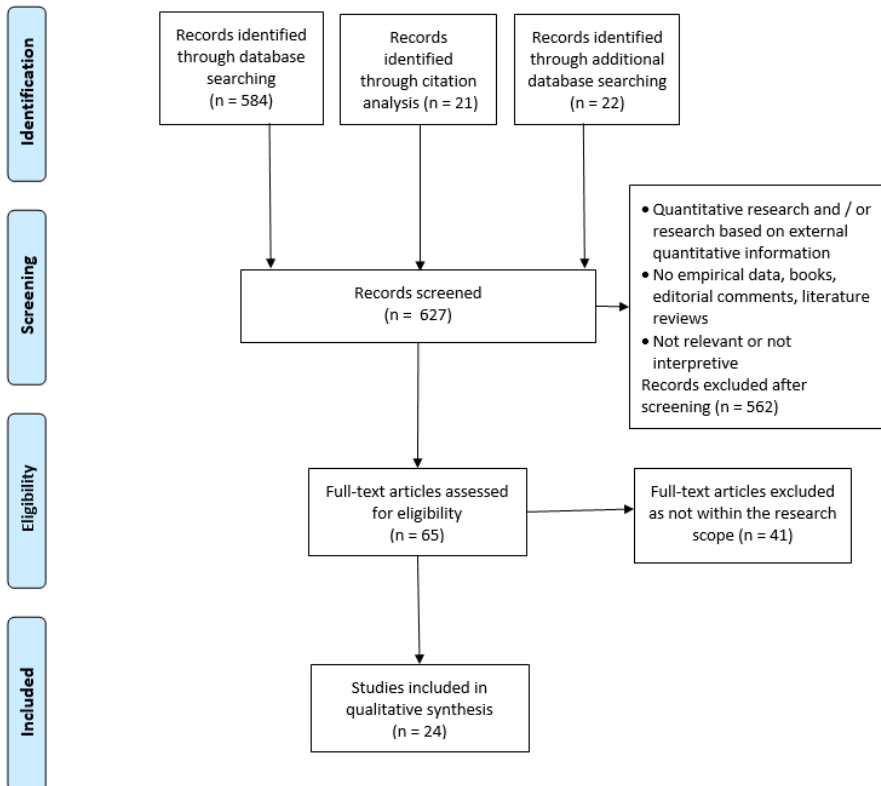
Due to the chosen search strategy, the selection contained some papers which were not about risk management. For example, a number of papers which were included in the database search only contain the search term “risk management” in the references list. These papers were excluded. Besides these papers, another category of papers were about risk management as included in corporate governance or about risk management as part of supply chain management. These papers were qualified as not relevant in the light of the research question.

Moreover, given the research question, we needed to exclude all the articles that had a quantitative and positivistic research approach, such as the articles using empirical data which were mainly based on the company’s external financial reports, CSR reports and information about the company share price. In their literature review, Kihn & Ithantola (2015) identify the following articles as belonging to the positivistic paradigm: “if the findings and the conclusions were facts or (causal) relationships between variables rather than interpretations” (p. 241). For example, the studies by Paape & Speklé (2012) and Baxter et al. (2013) are examples of papers we excluded on the basis of this criterion.

Furthermore, Kihn & Ithantola (2015), following Chua (1986), argue that an article belongs to the interpretive paradigm “if the empirical analysis was or seemed to be based on fundamental assumptions that social reality is emergent, subjectively created and objectified through human interaction” (p. 241). In particular, we qualified research work as interpretive and included papers in the review “if the findings and the conclusions were interpretations of the actors’ everyday world” (p. 241), or if the research objective was to describe, understand and interpret the human intentions, the social nature of and changes in risk management systems and / or risk management practices.

The search for relevant items and the selection steps leading to this selection of 65 articles is detailed in *FIGURE 3*. Following the PRISMA guidelines (Moher et al., 2009), the figure shows the number of items we have excluded in each step.

We still acknowledge that the qualification of some papers might be subject to debate. Ultimately, of 25 academic articles about risk management we were convinced that they should be included in the scope of this systematic literature review. During the process of writing this literature review we decided to exclude the paper by Shapiro & Naughton (2015) from the final selection, as this paper only discusses risk management briefly. All in all, as detailed in *TABLE 3*, the final selection for the current review is 24 academic articles. Section 3 details how the selected papers have been categorized.



**FIGURE 3:** Overview of the selection process

### 3. Categorizing the selected studies

The prevailing risk management approaches, such as COSO-ERM and the requirements issued by the Basel Committee, are normative in nature (Mikes, 2009). We also refer to these as to the formal risk management approaches. For instance, regarding financial institutions, the Basel Committee provides requirements on how risk management should be operationalized, including detailed instructions for performing risk calculations. The risk management framework is considered as given and functional with limited room for discussion or interpretation. We denote this view as a functionalistic view of risk management, as the function of the risk management system is foregrounded. This functionalistic view equates “a rational-instrumental view” (Van Loenen et al., 2021), stressing the human ability to introduce risk management based on rational decision-making. Risk management systems, including ERM systems, may be considered as the technologies, the tools in human hands to realize the ideal of risk management. According to this view, the implementation of a risk management system has a clear start and finish.

Departing from an interpretative research paradigm, the selected papers in this literature review challenge the emphasis on human individuals. Rather, contrasting the individual that acts rationally, several of the selected papers highlight that human behavior and decision-making is conditioned by a certain discourse. A discourse refers to a collection of interrelated texts and practices “that systematically form the object of which they speak” (Foucault, 1979, p. 49, cited by Hardy & Maguire, 2016, p. 83). A discourse unfolds independent of its origin, within the relation between human and non-human actors. Foucault underlines that a discourse might become powerful in the unfolding relations within an organizational context.

In this regard, the first category of the selected papers utilizes the related concept of governmentality by Foucault. Governmentality is about how we govern and organize others and ourselves. Drawing on the concept of governmentality, these papers stress that a certain understanding about risk management might prevail over other understandings. The concept of governmentality shows how ideas about risk management are able to cross boundaries of space and time (section 4).

Understanding risk management tools as “boundary objects” (Carlile, 2002, 2004) provides a second reason why ideas about risk management travel between boundaries of space and time. We distinguish the papers that study risk management based on the concept of boundary objects as a second category.

These papers, which are discussed in section 5, conceptualize risk management tools like risk matrices and risk reports as objects. They might change beyond their original design, travelling in various contexts.

Furthermore, Miller (2009) points out that “much of the organizational risk research treats organizations as if they were unitary decision makers” (p. 160). The selected papers which are rooted in an institutional perspective challenge this assumption, as an institutional perspective discusses the reasons why organizations change beyond rationality. As such, these papers highlight the reason why organizations introduce risk management within the organizational context and how risk management becomes part of organizational life. These papers are discussed in section 6.

Subsequently, ANT sheds new light on how knowledge and ideas about risk management impact the risk management practices within an organizational context (section 7). This fourth category of the selected papers understands that the organization’s risk management is established in the networks consisting of associations between human and non-human actors such as risk managers, risk management systems, risk management guidelines and tools. In this regard, risk management emerges and evolves in the relations between human and non-human actors; we refer to ANT as a relational ontology.

In this sense, the risk management system is regarded as an actor (or perhaps better: actant) that can mobilize other actors. Following ANT, these studies stress that actors produce the organization’s risk management which is a “fragile network – in a constant state of transformation” (Tekathen, 2019, p. 978). Consequently, the unintended effects of risk management become highly relevant.

The selected papers which draw on practice theory as another relational perspective give centerstage to the risk management practices that constitute the organization’s risk management. These papers underline the significance of what organization members actually do to manage risks, underlining that the day-to-day activities compose the social and vice versa. The papers drawing on practice theory are denoted as the fifth category (section 8), completed with the paper by Bednarek et al. (2019), which highlights the organization’s risk management practices from the perspective of organizational work.

TABLE 3 displays how we position each of the selected papers in one of the five categories to structure the presentation of the findings in the remainder of the chapter. We acknowledge that some papers display the features of more than one

of the five categories; however, the categories are open and are utilized as first indications for the focus of the various studies. For each category we discuss the contribution of the individual papers.

**TABLE 3:** *Categorizing the 24 selected studies*

| Authors                                         | Source                                        |      |
|-------------------------------------------------|-----------------------------------------------|------|
| <b>Governmentality - section 4</b>              |                                               |      |
| Fischer & Ferlie                                | Accounting, Organizations and Society         | 2013 |
| Louth & Boden                                   | Financial Accountability & Management         | 2014 |
| <b>Boundary objects - section 5</b>             |                                               |      |
| Hall et al.                                     | Management Accounting Research                | 2015 |
| Meidell & Kaarbøe                               | The British Accounting Review                 | 2017 |
| Arena et al.                                    | Accounting, Organizations and Society         | 2017 |
| <b>An institutional perspective – section 6</b> |                                               |      |
| Mikes                                           | Management Accounting Research                | 2009 |
| Arena et al.                                    | Accounting, Organizations and Society         | 2010 |
| Mikes                                           | Accounting, Organizations and Society         | 2011 |
| Subramaniam et al.                              | Accounting, Auditing & Accountability Journal | 2013 |
| Tekathen & Dechow                               | Management Accounting Research                | 2013 |
| Ashby et al.                                    | Journal of Business Research                  | 2014 |
| Jabbour & Abdel-Kader                           | Accounting Forum                              | 2015 |
| Caldarelli et al.                               | Accounting Research                           | 2016 |
| Gendron et al.                                  | European Accounting Review                    | 2016 |
| Giovannoni et al.                               | European Accounting Review                    | 2016 |
| Carlsson-Wall et al.                            | Financial Accountability & Management         | 2019 |
| Soobaroyen et al.                               | Accounting Forum                              | 2019 |
| <b>Actor-network theory (ANT) - section 7</b>   |                                               |      |
| Tremblay                                        | Financial Accountability & Management         | 2012 |
| Jordan et al.                                   | Management Accounting Research                | 2013 |
| Vinnari & Skærbæk                               | Accounting, Auditing & Accountability Journal | 2014 |
| Themsen & Skærbæk                               | Accounting, Organizations and Society         | 2018 |
| <b>Practice theory - section 8</b>              |                                               |      |
| Bednarek et al.                                 | British Journal of Management                 | 2019 |
| Bui et al.                                      | The British Accounting Review                 | 2019 |
| Tekathen                                        | European Accounting Review                    | 2019 |

## 4. Governmentality

Drawing on the work of Foucault (1991), two of the selected papers utilize the concept of governmentality, showing how ideas about risk management are able to cross boundaries of space and time. Gephart et al. (2009) state that the concept of governmentality refers to social regulation and control. In the role of “moral government”, a program like risk management might be, for instance, important for the state to govern the people, that is to stimulate and press them to take on a certain understanding. In this regard, risk management in the organizational context is considered to be a set of technologies and regulations that strengthen the discourse of risk management. A discourse, such as the discourse of risk management, might become stronger over time as actors are pressed and stimulated to agree with this discourse. Moral government gets shape. This might refer to the idea that an integrated risk management approach is considered key for good governance (Power, 2004).

The concept of governmentality with regard to risk management demonstrates that risk management within an organization is not solely the result of rational decision-making by humans. Rather, the human actions and decision-making are conditioned by the discourse of risk management. A discourse of risk management can be or can become a discourse in the meaning of “an authoritative body of knowledge” (Fox, 1999, p. 19). Drawing on Foucault, Hardy & Maguire (2016) discuss the dominant discourse of risk: The guidelines and textbooks about the well-known risk management approaches like COSO-ERM together with the practices associated with COSO-ERM become dominant over other kinds of practices and understandings. These establish a dominant discourse of risk. As a result, the assumptions underlying these risk management approaches are no longer subject to debate.

Departing from Foucault’s concept of governmentality, Fischer & Ferlie (2013) and Louth & Boden (2014) focus on how a shared understanding of risk management unfolds to pursue neo-liberal organization goals. These goals are associated with striving for manageability and control. On their part, Louth & Boden show how risk management became an “economic ideology” to save costs (p. 320).

Fischer & Ferlie (2013) highlight the rise of the rules-based mode of risk management in an organization in the field of mental health care. Rules-based risk management is grounded in “ideals of objective truth and calculable knowledge” as part of the underpinning discourse of truth (p. 33). In this discourse, calculation rules prescribe

the risk management practices; the rules are separated from the practices. In line with the dominant discourse of risk, stressing the role of scientific knowledge, the authors demonstrate the separation between the realm of knowledge and the realm of action.

Fischer & Ferlie's (2013) case study shows how individuals are resistant to the rules-based risk management mode and its underlying discourse of truth as their practices used to be rooted in a more ethics-orientated risk management mode. Instead of hybridization between the two modes, the rules-based risk management mode was becoming more and more accepted as the discourse of truth. In line with Fox (1999), the authors report that in the beginning people might be resistant to this discourse. However, as time goes on, it seems to get harder and harder to resist; the discourse of truth underlying the prevailing risk management approach becomes more and more powerful over time. The discourse becomes dominant and it reigns over the people who are involved.

Louth & Boden (2014) present a case study of a procurement team in an organization associated with the UK Royal Air Force. Drawing on the concept of governmentality, the case study shows how risk management might provide individual military staff members with reference points. Risk is "conceived of as a hegemonic discourse that shapes and frames individual and collective action" (p. 306). Within this discourse, the idea is promoted that state institutions benefit from risk management to make their operations more efficient. Instead of considering risk management a technology, it turns out to become a credo which "homogenized thought and action" (p. 320). In this sense, the concept of governmentality supports a shared understanding and shared context of risk management. Ultimately, according to Louth & Boden, individual human staff members become "economic citizens and workers rather than military personnel" (p. 303). This implies a shift to take up reference points associated with efficiency. In this regard, the risk management discourse affects the identity of human actors.

In sum, the papers by Fischer & Ferlie (2013) and Louth & Boden (2014) show how a discourse of risk management becomes manifestable as an authoritative body of knowledge. This is consistent with Hardy & Maguire (2016) who outline how guidelines on risk management and risk management practices might form a dominant discourse of risk. Through this discourse, the realm of knowledge and the realm of action are strictly separated, emphasizing the use of normative texts about risk management.

## 5. Boundary objects

As an alternative to the departure from the point that knowledge about risk management is given and stored externally, Carlile (2002, 2004) develops a pragmatic view of knowledge in practice. Carlile (2002) problematizes knowledge in organizations arguing that knowledge in organizations is hard to manage. Carlile introduces the concept of boundary objects as the carrier of knowledge by which knowledge in practice might travel across intra-organizational and extra-organizational boundaries. Boundary objects are highlighted as the means to represent and translate knowledge at different hierarchical organizational levels and in different departments as well as between different organizations.

Boundary objects are objects “that are shared and shareable across different problem solving, contexts” (Carlile, 2002, p. 451). On the one hand, boundary objects should be adaptable to specific needs. On the other hand, boundary objects need to be robust to keep their own identity. Boundary objects develop and change as an object, largely independent from their origin, contributing to the dynamic nature of risk management within the organizational context.

The papers by Hall et al. (2015), Meidell & Kaarbøe (2017) and Arena et al. (2017) utilize the concept of boundary objects. These papers show how risk representations and risk tools, like risk matrices and traffic lights graphs appear to become boundary objects. These objects carry the organizational knowledge about risks and risk management across organizational boundaries. As such, these boundary objects become part of the organization’s risk management. The boundary objects are able to change and travel within an organization independent of their origin, giving rise to a specific body of organizational knowledge about risk management.

The papers show how risk management knowledge in an organizational context is established and developed in the relation between human actors, such as risk managers and senior management, and the risk management tools. For instance, a traffic light as an easy-to-understand risk representation might become more important as senior management perceives this as meaningful. In response, risk managers might enrich and develop this risk representation by including more information in the tool.

In essence, these papers present an alternative to the view that risk management is solely the result of human action and intentions as this is common in the functionalistic view of risk management. In other words, risk management emerges

from the intended and unintended effects caused by the interaction between humans and risk management tools within the organizational context.

Hall et al. (2015) focus on the processes of tool-making in two financial institutions: Risk managers deliberately introduce and change tools to enlarge their organizational influence. Risk managers adjust the tools to make them understandable for use outside the risk management department. Consequently, risk management knowledge in the organization is developed in practice in the relation between the risk managers and the users of the risk management tools. In other words, by the “on-going adaptation of tools” (p. 4) risk management knowledge arises within the relation between the risk managers who adjust the tools and the users of the tool.

The tools are referred to as boundary objects; Hall et al. (2015) emphasize the role of risk managers as the human actors who gain influence by the toolmaking processes. Hall et al.’s case study underlines the intended effects of risk management and risk management change as a directional movement. The papers by Meidell & Kaarbøe (2017) and Arena et al. (2017) stretch further by showing that risk management emerges in the relations between both human actors such as risk managers and non-human actors such as tools and processes. Drawing on a relational approach, Meidell & Kaarbøe (2017) and Arena et al. (2017) both stress the unintended effects that arise from the relation between humans like risk managers and non-humans like tools and processes.

Meidell & Kaarbøe (2017) emphasize the role of boundary objects in the way risk managers influence the organization’s decision-making processes. Their longitudinal case study in a Norwegian oil and gas producing organization shows that risk managers contribute to the translation of knowledge about risks following the ERM introduction. For instance, the risk managers organize workshops with all stakeholders to create a common quantitative driven understanding of risks. In this way, risk managers enlarge their influence on the decision-making process over the years.

The process of representing risks in quantitative terms limits the scope of which kinds of threats might be considered and accepted as risks. In particular, representing risks in quantitative terms might emphasize quantifiable risks at the cost of uncertainties which cannot be quantified reliably. In general, numbers are considered suitable for the goal of representing risks (Jordan et al., 2018). Risk representations which are assessable and easy to understand are likely to become boundary objects. Typically, numbers and amounts are key components in these representations.

Arena et al. (2017) argue that boundary objects might “be central to the construction of a shared context for risk identification, communication and management” (p. 68). In this way, representing risks might direct and limit the scope of which uncertainties are to be considered and recorded as a risk. In other words, the organization risk management contributes to a certain shared context and understanding about the concept of risk. Similarly, Arena et al. demonstrate in their case study how risks are conceptualized as the expected variations in the EBIT. One of the two case companies frames the knowledge of risks by the question “How solid is your profit?” Consequently, uncertainties which do not impact the company’s profit are excluded from the risk management’s scope. In this way, a certain limited understanding of the concept of risk directs a shared understanding of risk management.

In brief, the case studies of Meidell & Kaarbøe (2017) and Arena et al. (2017) show how the use of boundary objects adds to a certain shared context of risk management. In particular, a shared context of risk management emerges in the relation between risk managers and the users of the risk management tools. Conceptualizing risk management within this shared context, the selected papers drawing on boundary objects point out that risk management is not solely the result of human intentions and rational decision-making.

Moreover, the concept of boundary objects shows how the relations between human and non-human actors give rise to organizational risk management including both intended and unintended effects. As such, the knowledge of risks within an organizational context unfolds and develops over time as knowledge about risk management transfers across organizational boundaries. Knowledge about risk management comes into being by the ongoing interaction between risk managers and representatives of different organizational departments. The concept of boundary objects shows how risk management is constituted in the relations between human and non-human actors. As these relations are subject to change, these three studies underline the dynamic nature of risk management within an organizational context.

## 6. An institutional perspective

Twelve of the selected papers depart from an institutional perspective. From an institutional perspective, organizations might have reasons to adopt a risk management system that move beyond its predefined functionality.

## 6.1 New Institutional Theory (NIT)

New Institutional Theory (NIT) points to organizational legitimacy and not functionality as a key reason why risk management is introduced in numerous organizations; this is reflected in several of the selected studies based on an institutional perspective. Organizational legitimacy can be gained if an organization adapts to the rules and expectations in the external environment in order to survive (DiMaggio & Powell, 1983). An important concept DiMaggio & Powell draw upon is isomorphism. Referring to Hawley (1968), the authors state that isomorphism refers to a “constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions” (p. 149). As a result, multiple organizations coping with the same environmental conditions become more and more alike.

Meyer & Rowan (1977) also focus on the theme of legitimacy, linking this with isomorphism. According to Meyer & Rowan, organizations “which exist in highly elaborated institutional environments and succeed in becoming isomorphic with these environments” (p. 352) gain the legitimacy to survive. The authors argue that many elements of formal structure are highly institutionalized (p. 344). By legitimacy-seeking behavior, organizations strive to cope with the expectations and rules in this external and highly institutionalized environment.

On the question of why risk management is introduced in an organization, several of the selected papers depart from a NIT approach, emphasizing coercive forms of isomorphism (DiMaggio & Powell, 1983). Coercive isomorphism “results from both formal and informal pressures exerted on organizations by other organizations” (p. 150). These external pressures are diverse in nature; they refer to law, legislation and factual obligations. For instance, the papers by Arena et al. (2010) and Tekathen & Dechow (2013) point to corporate governance regulations as the trigger for the ERM implementation. Regarding the financial industry, Basel II and III are commonly regarded as the reason to implement an ERM system.

Besides coercive forms of isomorphism, DiMaggio & Powell (1983) distinguish mimetic and normative isomorphism. The mimetic form of isomorphism is related to uncertainty. In response to new and uncertain conditions, organizations tend to model the practices in use by already successful organizations. Normative forms of isomorphism relate to professionalization as a source of organizational change. Isomorphism might result from the development of professional knowledge at university or from knowledge shared by consultancy firms or in professional networks.

In particular, these normative forms of isomorphism might be supportive to understand how risk management increasingly becomes a separated organizational field defined by its own set of specific norms. For instance, Mikes (2009) addresses the role of rating agencies in the context of risk management in the banking industry. The author thus uncovers a surprising form of normative isomorphism, highlighting how the rating agencies set normative requirements to risk management in the organizational context of an individual bank. These pressures support the development of risk management as a separate professional field within the financial industry.

Soobaroyen et al. (2019) draw attention to legitimacy-seeking behavior as key in the introduction of risk management in UK Higher Education Institutions (HEIs). The authors particularly outline that the rise of risk management is rooted in neo-liberalism and New Public Management, pressing for greater accountability and transparency. The HEIs need to explain and to show the stakeholders that a risk management approach has been implemented, in line with the corporate governance code. According to the authors, a symbolic form of governance is constructed with the goal to maintain the organization's legitimacy. Soobaroyen et al. even conclude that "risk oversight is largely limited to a public performance of process and compliance activities" (p. 423).

Furthermore, Gendron et al. (2015) aim to understand how risk management credibility is being constructed within corporate boardrooms despite risk management failures which might cast doubt upon the risk management efficacy. The authors have conducted 35 interviews with corporate board stakeholders, mostly board members and consultants. The authors show how the interviewees hold on to the risk management ideal in the face of the risk management failures as unexpected events. Doing so, the corporate board stakeholders seek risk management legitimacy, contributing to the risk management credibility as well.

Gendron et al. (2016) point to the concept of sense-making (Weick, 1995) to explain this paradox. Sense-making "consists of processes by which people construct meaning, especially when being confronted to surprising events" (Gendron et al., p. 555). Furthermore, this links up with mimetic forms of isomorphism: Against the background of uncertainty, organization members tend to model the well-known risk management approaches which are in use by other organizations.

According to Gendron et al. (2016), the risk management ideal implies that risk management is reliable and credible in "times of uncertainty" (p. 551). Their study

uncovers how the interviewees hold on to the ideal of risk management without questioning its core assumptions. The ideal of risk management survives as disruptions are made sense of with a certain hindsight: Disruptions are explained as an exception which does not imply the need to question the normative risk management assumptions.

The selected paper by Giovannoni et al. (2016) conceptualizes the ERM introduction as moving from one archetype template to the next. An archetype template in this regard refers to a legitimized pattern of an organizational design based on a single set of beliefs and values (Greenwood & Hinings, 1993). Giovannoni et al. present a longitudinal case study within a banking organization.

Greenwood & Hinings (1993, 1996) emphasize that archetype templates are key to understanding the stability of organizational structures and management systems. Organizations tend to hold on to the archetype template they currently utilize instead of moving to the next. The latter is referred to as a process of radical change; Giovannoni et al. (2016) indicate that the ERM introduction within the case organization equates a process of radical change as the organization shifts from risk-based management as the existing archetype template to holistic risk management as the new archetype template (p. 123).

Giovannoni et al. (2016) draw attention to the internal dynamics in the change process. Following Greenwood & Hinings (1993), Giovannoni et al. point to the precipitating and enabling dynamics. The precipitating dynamics include the point that a “a group of actors is dissatisfied about how its interests are realized” (p. 112). In the case study, the risk experts were dissatisfied about the silo risk management within the banking organization embedded in the existing archetype template of risk-based management. By the precipitating dynamics the pressure increases to take up a broader conception of risk, aiming to understand risk in a holistic way. That is, moving to the archetype template of holistic risk management.

The enabling dynamics have the potential to facilitate a process of radical change as the prevailing archetype template might give power to a certain group of actors. Change might be enabled if this group of actors has the technical capabilities to act, moving towards the next archetype template. In Giovannoni et al.'s (2016) case study, the organization's risk experts were actively supporting the ERM tools to increase their influence in the organization; they enabled the shift from risk based management to holistic risk management. The authors underline that the risk experts support this shift as they assume that their interests are better served by

the use of ERM-based reporting tools and indicators. In brief, the ERM introduction is revealed to be an example of radical change driven by the internal dynamics by which risk experts manage to increase their influence.

## 6.2 Old Institutional Economics (OIE)

Old Institutional Economics (OIE) gives centerstage to rules and routines rather than rational design or decision-making by individuals. Rules are the “formalized statement of procedures” and routines are “the procedures actually in use” (Burns & Scapens, 2000, p. 7).

Through its focus on organization routines, OIE has frequently been regarded as a theory to understand organizational stability (Hamilton, 1932; Greenwood & Hinings, 1993). Routines might be subject to change, but this happens over a longer period of time. Over time, “repeated behavior leads to a reproduction of the routines” (Burns & Scapens, 2000, p. 10), which implies a gradual shift from old to new routines. Finally, the new routines are taken for granted. That is to say, they become institutionalized. As such, the selected paper by Jabbour & Abdel-Kader (2015) discusses how the ERM introduction in the organizational context can be understood as a change process of routines.

Drawing on Old Institutional Economics, following Burns & Scapens (2000), Jabbour & Abdel-Kader (2015) present a case study of a large UK insurance company. Their paper highlights the shift from old capital allocation rules and routines to new ones related to an ERM implementation. Being responsible for capital allocations, the Risk department introduces new capital allocation rules in line with ERM. Ultimately, over time, organization members start to reproduce the new capital allocation rules. Finally, the adjusted ERM-based rules for capital allocation become institutionalized.

Jabbour & Abdel-Kader (2015) underline the far-reaching effects of the ERM implementation as the ERM system opens up the strategic possibilities of taking into account holistic risk management in the decision-making process. The capital allocation practices become more risk-based. The authors discuss the change of existing routines of capital allocation – new routines emerge as the existing routines “were not strong enough to deal with ERM as a key driver of change” (p. 295).

## 6.3 Institutional logics

Lounsbury (2008) argues that neo-institutional work might be extended beyond the themes of legitimacy and isomorphism. Lounsbury advocates a “focus on

institutional rationality in the form of multiple, competing logics” (p. 358). According to Lounsbury, this understanding of rationality is an important extension to the limited understanding of rationality in the context of individual rational decision-making as taken up by DiMaggio & Powell (1983). Instead of stressing rationality at the individual level, Lounsbury urges the adoption of “a more collective or institutional notion of rationality” (p. 352).

Lounsbury’s paper (2008) might be considered to be a contribution to the stream of literature commonly referred to as institutional logics. According to this stream of literature, competing logics deepen our insight into the origin of logics and practices. The actor’s behavior and decisions are “enabled and constrained by the prevailing institutional logics” (Thornton & Ocasio, 2008, p. 103). Lounsbury shows that institutional logics provide an explanation of “organizational heterogeneity and practice variation” (p. 352). The papers by Arena et al. (2010) and Tekathen & Dechow (2013) draw on the work of Lounsbury, highlighting the intra-organizational actions which depend on the institutional environment of the organization in which an integrated risk management approach is implemented.

Arena et al. (2010) present a multiple case study showing the diverse ways in which organizations introduce and develop an ERM approach. The authors strive to understand the different institutional logics which impact the intra-organizational actions. In particular, the case study shows the impact of the pre-existing practices the three case organizations had in place before the ERM introduction. These pre-existing practices vary from “silo approaches to risk such as environmental and IT risk management, as well as budgeting” (p. 671). Arena et al. draw attention to the COSO-ERM ideal to grasp uncertainties by representing uncertainties into manageable risks. According to Arena et al., this ideal of risk management is part of the risk rationality underlying ERM as envisaged by COSO-ERM (2004).

Arena et al. (2010) stress that the rationality of introducing an integrated risk management approach varies between the three different case organizations. Dependent on the way risk management is rationalized, heterogeneity comes to the fore in the different ways risk management becomes part of organizational life within each of the three case organizations. The authors report that “ERM can be different things in different organizations” (p. 659). Rationality varies from “building a new corporate governance image” (case organization Cicero, p. 665), to a decision by the parent company for all its subsidiaries “to satisfy the Italian self-regulation code for listed companies” (case organization Phoedrus, p. 667) and to performance management by individual managers (case organization Virgilio, p. 669). In brief,

the various institutional logics embedded in the existing organizational context give rise to a heterogeneity of the ways in which the integrated risk management approach was implemented.

Taking inspiration from Arena et al. (2010), Tekathen & Dechow (2013) demonstrate how the COSO-ERM approach enables the development of organizational accountability, from the perspective of individual staff members, from the perspective of departments, and ultimately from the perspective of the entire organization. Holding yourself accountable is revealed to be the most prominent institutional logic which comes to the fore in the introduction of COSO-ERM within the case company.

As such, the authors emphasize their contribution extends to the insights uncovered by Arena et al. (2010) and Mikes (2009, 2011): Arena et al. and Mikes highlight that the rationale to introduce an integrated risk management approach refers to the theme of compliance or performance management. Tekathen & Dechow (2013) provide a novel contribution outlining that the rationale associated with COSO-ERM might unfold differently at different hierarchical levels within one organization.

Following Tekathen & Dechow (2013) and Arena et al. (2010), accountability is revealed as closely related to the ideal of risk management by quantifying risks, based on the risk rationale of representing risks as manageable items. Mikes (2011) pursues the same point as she outlines that counting risks starts with creating categories to enable measuring risks. Striving for accountability, the concept of risk needs to be translated into measurable items.

#### **6.4 Normative literature about risk management**

The papers by Mikes (2009) and Caldarelli et al. (2016) describe the risk management practices based on the normative literature about risk management. The normative literature refers to guidelines for risk management as the COSO-ERM framework. With regard to organizations in the banking industries, the papers highlight the guidelines issued by the Basel Committee as the external pressure forcing the banking organizations to introduce an ERM approach for managing risks.

Both papers present a case study, drawing attention to the risk management practices in banking organizations following the implementation of an ERM system for the purpose of integrated risk management. The implementation of the ERM systems in both case studies proves to be a unique way of how the mandatory risk management guidelines are transferred into the context of an individual

organization. From this perspective these papers underline the heterogeneity in the way risk management practices become institutionalized within banking organizations. As such, we categorize these two studies as being part of the institutional stream of research, although the authors do not explicitly refer to institutional theory as their theoretical underpinning.

Furthermore, the paper by Carllson-Wall et al. (2019) discusses the limitations of the formal ERM system as the risk management approach in a case organization in the public sector. The authors point out that the introduction of the ERM system within the organization was driven by governmental rules as the external demands requiring to introduce an ERM approach. In particular, the authors focus on the use of a heat map which was explicitly required by the governmental rules.

The study shows how local managers proved to experience severe limitations in the day-to-day use of the heat map to manage particular risks with regard to the purchase processes. In response to these limitations, staff members developed local systems in the context of their work to manage the risks more adequately. These systems were not officially sanctioned in the organization's hierarchy. In particular, Carllson-Wall et al. study the interaction between these local-developed systems and the ERM system. Referring to Meyer & Rowen (1977) and DiMaggio & Powell (1983), the authors emphasize that "attempts to rationalize organizational behavior result in the creation of formal systems" (p. 14). This also applies to the ERM approach as a formal system that is limited to manage the organization-specific risks at a more operational level.

## 6.5 Summary

The twelve selected papers which depart from an institutional perspective show that organizations might have reasons to advance a risk management system besides its predefined functionality. Drawing on OIE, the paper by Jabbour & Abdel-Kader (2015) highlights that the ERM introduction within the organizational context proved to be a far-reaching change process. This process takes a considerable amount of time and the process opens up room for risk managers to present themselves as the organization's risk experts in order to increase their influence in organizational life. This runs counter to the functionalistic view which assumes the ERM implementation is a seamless process with a clear start and finish. We summarize that the paper by Jabbour & Abdel-Kader highlights the internal dynamics which result from the various ways by which risk management is introduced within an individual organization.

From a NIT-perspective, scholars emphasize that organizations might have reason outside rational decision-making to introduce an integrated risk management approach. In particular, the selected papers drawing on NIT highlight external pressures as the reason for introducing organizational risk management. Due to these external pressures, organizations tend to pursue accountability of the management of risks. To this end, organizations introduce accounting-driven risk management systems, striving for an integrated risk management approach.

Furthermore, Arena et al. (2010) and Tekathen & Dechow (2013) draw on institutional logics to demonstrate that the way an integrated risk management approach is rationalized within an organizational context might be different in different organizations (Arena et al.) or in various hierarchical levels within one organization (Tekathen & Dechow). Despite the origin of ERM in predefined models, heterogeneity in the ERM function between organizations is common. Different institutional logics are at the core of this heterogeneity.

## 7. Actor–network theory (ANT)

The selected papers include four studies drawing on the work of Latour, Callon and Law, which is commonly referred to as actor–network theory (ANT). In essence, these authors are “particularly concerned with a sociology of translation, accounting for how ideas become materialized and localized in specific situated practices” (Van Loenen et al., 2021). With regard to the four selected papers drawing on ANT, the papers by Tremblay (2012) and Jordan et al. (2013) focus on the theme of translation of the ideas about risk management into local practices. Rejecting the primacy of human agency, ANT perceives humans and non-humans as mediators: They can only act by association with others. Translation of ideas from the outside world into the organizational context and its practices unfolds as mediators associate themselves with others. For instance, humans might associate themselves with a risk management system, making the system more powerful. By these processes of association, networks between non-humans and humans come into being. According to ANT, knowledge emerges as mediators give their interpretation to ideas, translating the ideas into the concrete situations in society or in the context of an organization. Consequently, ANT rejects the separation between the realms of knowledge and action. During the processes of translation the mediators might change as they interpret ideas from the external world in their own way. Being a relational ontology, ANT is based on the idea that knowledge, action and practices are mutually constituted, they are entangled, giving rise to reality (Caldwell & Dyer, 2020, for instance).

Referring to the field of accounting, ANT rejects the idea that accounting objectively represents knowable facts. In a similar vein the core of risk management is not to represent risks in line with a predefined framework. Instead, the organization's risk management comes into being by the actors' efforts to manage risk. ANT highlights the fluidity of risk management (Tekathen, 2019), underlining that risk management unfolds in the networks and relations between humans and non-humans.

Subsequently, the papers by Vinnari & Skærbæk (2014) and Themsen & Skærbæk (2018) depart from the performativity thesis (Callon, 1998) to understand how risk management becomes materialized in the context of a case organization. The performativity thesis argues that theories, frameworks and technologies may produce the worlds that they describe (Callon, cited by Themsen & Skærbæk, p. 20). Performativity is the reason that some theories and frameworks become more powerful than others. The performativity thesis might contribute to our understanding of how risk management frameworks as technologies become meaningful to organizational actors in striving for the ideal of risk management.

Following the performativity thesis, Callon (1998) utilizes the related concepts of frames and overflows. According to Callon, "the frame establishes a boundary within which interactions [...] take place more or less independently of their surrounding context" (Callon, p. 249). Frames are limited as no model can determine its own outcomes beforehand. Drawing on Callon, Vinnari & Skærbæk (2014) highlight that "framing devices are connected to the outside world" (p. 496). That is to say, openings in the frame are inevitable and through these openings, overflows will occur at some moment in time. Overflows give rise to unforeseen effects. For instance, Vinnari & Skærbæk point to the existence of black money accounting in Russia as an external influence their case organization has to deal with.

Tremblay (2012) discusses the adoption process of a new governance regulation which introduces internal control and risk management as the means to improve efficiency and accountability within the public sector. In this regard, Tremblay highlights how ideas and models are able to "transgress the barriers of local time and space" (p. 398). In particular, Tremblay draws on the concept of translation by Latour to understand how ideas are materialized and translated into action.

Tremblay's (2012) aim is to better understand the conditions in which the idea of corporate governance and the means to realize this idea are translated into regulatory frameworks. According to Tremblay, these conditions include the conceptualizations of failings. Failings, such as cases of fraud and malversation,

reflect the need for change. This need becomes publicly known and accepted. Subsequently, theorization provides “the specification of the failing for which the proposed regulation will act as a solution or treatment” (p. 398). Moreover, theorization creates some kind of legitimacy for the preferred solution. In this way, the ideas about and the practices of corporate governance, risk management and internal control, which originated in the private sector, were translated into legislation for state-owned companies.

Furthermore, Jordan et al.’s (2013) case study shows how the risk maps are in use for the sake of governing activities and, for this end, the risk maps are assumed to reliably represent the underlying risks. The authors present a case study about the cooperation between three entities in a large project in the Norwegian petrol industry. The risk maps were designed to record information about managing risks and to share this information between the three entities. The authors conclude that over time the risk map has become meaningful beyond its predesigned role: The risk map “was also enrolled [...] for mediating concerns between different actor groups in an inter-organizational setting” (p. 172). As such, the risk maps have become powerful in their role as mediating instruments between the three project partners.

Jordan et al. (2013) show how translation processes were at the core of the production of the risk management framework. Based on the work of Latour, the authors show how claims about risk management were translated into facts, constituting actor-networks “that are constantly produced and reproduced by socio-technical relations between human and non-human actors” (Latour, 1987, 1993, cited by Jordan et al., p. 158).

In addition to the studies by Tremblay (2012) and Jordan et al. (2013), Vinnari & Skærbæk (2014) and Themsén & Skærbæk (2018) shed light on the unintended effects of the formal risk management framework. The studies by Vinnari & Skærbæk and Themsén & Skærbæk both utilize the notion of a frame by Callon (1998) to draw attention to the limitations of the organization’s risk management framework. In essence, these limitations refer to limiting the concept of risk to what was known before the risk management framework was established. Citing Callon et al. (2009), Vinnari & Skærbæk posit that the term “risk” only refers to “those uncertainties that have already become the object of risk management” (p. 494).

Vinnari & Skærbæk (2014) present a longitudinal case study about risk management in a Finnish municipality in which risk management is implemented

as a tool for internal audit activities. In this setting, the organization's internal auditors increasingly become the organization's risk experts: They adjust the risk management devices, making the frame stronger and stronger. For instance, the internal audit manager introduced a COSO-ERM-based assessment model to define the parameters of risk management and to identify the various key groups of actors. In this way, the group of internal auditors is linked with the frame "through the devices that maintain the frame" (p. 497).

Themsen & Skaerbaek (2018) also discuss the risk expert's role in their case study concerning risk management in a program to replace all existing railway signaling systems in Denmark. This program was executed by Rail Net Denmark which is a state-owned company. Rail Net Denmark had contracted a consultancy firm to support them in the process. The consultants took up a role as risk experts and they determined which uncertainties should be recorded as a risk and which should not. The consultants framed the boundaries by determining the forms of uncertainties that the actors were to think and talk about as risks, namely as "probabilistically measurable events with effects on project objectives" (p. 24). In this way, the risk experts established a frame for risk management in which risks were limited to what is objectively observable.

The case studies of Vinnari & Skærbæk (2014) and Themsen & Skærbæk (2018) both critically reflect on the role of the risk experts in the case organizations: The experts were uncovered as defenders of the existing frame. Their influence proved to be meaningful in the framing process which triggered the overflows. Striving to uphold the existing frame, the risk experts typically consider an overflow to be an exception. From their perspective, an exception is a reason to adjust the frame without questioning the basic assumptions underpinning the frame. Opposing this view, the authors uncover that the overflows reveal the limitations of the existing frame.

In both case studies, the frame limitations draw attention to the unintended effects of risk management. The frame is implicitly based on the assumption that the frame functions independently from the external environment. Actors are encouraged to consider the existing frame as a stable system, even if the opposite proves to be the case. However, like the overflows and its unintended effects demonstrate, the existing frame is not stable. The frame is unmasked as illusory.

The case studies by Vinnari & Skærbæk (2014) and Themsen & Skærbæk (2018) show that due to their connections with the external world, risks cannot be

managed within the boundaries of a frame. The underlying ontological assumption displayed by the risk management frames in both case organizations is that the risk management frames are a result of human intentions and actions. That is, human actors are assumed to be prior to the risk management system and practices. According to this assumption, human actors design risk management frameworks and they determine which kind of uncertainties are taken into account as risks and which are not. Based on the knowledge claims which are anchored in taken-for-granted risk management approaches, the risk experts translate knowledge into the risk management frame and into risk management practices alike.

Subsequently, unexpected effects come to the fore, due to the tension between the frame on the one hand and the way risk management unfolds in an organizational context on the other. The formal risk management approach is revealed as an effect generator as the frame generates important unforeseen and unintended effects. In essence, risk management is established by networks and by the changing relations between actors in these networks. Following ANT, the frame is studied as being part of the broader network of actors constituting the organization risk management.

In sum, the four selected studies discussing risk management from an ANT-perspective focus on the organization's risk management as an actor-network or even as multiple actor-networks which are interconnected. Following ANT, these actor-networks consist of human and non-human actors and their everchanging relations. Instead of foregrounding human intentions and agency, ANT argues that agency emerges and evolves in the relations between human and non-human actors, like risk management tools and systems. This underlines that ANT provides a post-humanistic approach. Denying the separation between the realms of knowledge and action, ANT shows how risk management emerges and unfolds as part of the network of relations between human and non-human actors. Risk management, the knowledge about risk management and risk management practices are established in the relationships within actor-networks.

Consequently, the four selected ANT-oriented studies about risk management demonstrate the shortcomings of risk management prescriptions like models and risk management frameworks. These prescriptions might provide a simplified representation of the truth as in-depth reflections and discussions on practical implications are lacking (Tremblay, 2012, for instance). Instead, the selected studies based on ANT highlight the unintended effects which come to the fore in the unfolding of risk management in networks and relations. In other words, the selected studies drawing on ANT emphasize the unintended effects that emerge in

the tension between the formal risk management approach on the one hand and the risk management which unfolds in actor-networks on the other.

Ultimately, ANT understands the world as made up of many associations of actor-networks which are in a constant state of flux. Consequently, risk management cannot be understood as something stable which belongs to an individual organization as a pre-existing entity. Rather, following ANT, risk management comes into being in the associations between human and non-human actors, entities and actor-networks.

## 8. Practice theory

Practice theory is another relational approach. However, instead of understanding that reality consists of actor-networks, practice theorists understand the world around us as made up of practices. Nicolini (2012) argues that practices are behind “the apparently durable features of our world” (p. 6). The social world and social phenomena such as organizations consist of many practices which hang together. That is to say, these practices form social order.

Reckwitz (2002) outlines that social theorists have discussed the *homo economicus* and the *homo sociologicus* to understand how social order emerges. From the perspective of the *homo economicus*, the social is the result of the actions performed by many human individuals pursuing their own interests. By contrast, from the perspective of the *homo sociologicus*, social order is “guaranteed by a normative consensus” (p. 245). As an alternative to both these perspectives, Reckwitz points to practice theory which situates the social in the practices, as a different realm. This equates a novel ontological view which considers practices as the compositional feature of the social.

Concerning organization studies, Nicolini (2012) distinguishes a weak and a strong practice-based program. The weak program stresses the study of everyday activities within an organization, calling for a ‘turn to work’ in academic research. Among the selected papers in this literature review, Bednarek et al.’s (2019) paper can be considered to be part of this weak form of practice theory. Bednarek et al. study the everyday risk management practices within 35 insurance companies in different countries, both in countries with more and with less developed insurance markets. In particular, the authors study the practices of transferring risks from the insurer to a reinsurance company. By transferring risks, the insurer also transfers

expected benefits to the reinsurance company. As such, the insurance company has to tradeoff the expected benefits and harms to decide to which extent transferring risks might be appropriate. In this sense, the authors provided an extension to the existing literature as the majority of the literature emphasizes the need to control or prevent risks, implying that the term risks is associated with danger and hazards.

The strong practice-based program moves beyond studying and describing day-to-day practices as this program equates an alternative ontological view. In the remainder of this thesis we discuss this strong practice-based program as “practice theory”, although we acknowledge that under the heading of practice theory there is a family of theoretical approaches and that practice theory is therefore multiple (Nicolini, 2012; Hui et al., 2016). Up to this moment, accounting studies and risk management studies have particularly drawn on Schatzki’s site ontology (Schatzki, 2002). Schatzki’s site ontology is generally considered to be an influential form of practice theory (Nicolini, 2012, for instance). The two selected papers drawing on practice theory (Bui et al., 2019; Tekathen 2019) both utilize Schatzki’s site ontology.

According to Schatzki (2002, 2005), practices are composed of human actions which are doings and sayings. Schatzki (2002, p. 75) presents “action intelligibility” as the driver for human action: People do what makes sense for them to do. Furthermore, Schatzki (2002, 2005) presents his version of practice theory as a “site ontology”, foregrounding the site as the specific context in which these practices are enacted. The context provides a space in which certain actions are intelligible, in which they make sense to the actors. A practice is “a temporally evolving, open-ended set of doings and sayings” (2002, p. 87). By pointing to “doings and sayings”, Schatzki draws attention to the actions performed by humans. Furthermore, Schatzki outlines that actions are taken into a practice by four ordering principles: teleoaffective structures, rules, general understandings and practical understandings. Teleoaffective structures refer to the specific ends that afford people to perform doings and sayings. Rules “are formulated directives, instructions, or remonstrations” (Schatzki, 2019, p. 30). General understandings are meaningful as they help to organize temporal practices. According to Nama & Lowe (2014), Schatzki suggests that general understandings are generally accepted within a certain site. They might be expressed in doings and sayings, they are about “the manner in which people carry out projects and tasks” (2002, p. 86). Practical understandings, by contrast, “are understandings of how to carry out particular intentional actions in particular circumstances through performances of bodily actions” (Schatzki, 2019, p. 30). They are about what makes sense for people to do in a particular situation, which depends on the context in which practices are carried out (Tekathen, 2019).

Moreover, we report that Schatzki (2002, 2005) underlines the richness of human activity. As such, drawing on Schatzki's site ontology, risk management in the organizational context might be understood from the actions performed by knowledgeable professionals. Yielding primacy to human activities shows a sharp contrast with ANT as ANT treats human and non-human actors as equally important. In this sense, Schatzki site ontology posits risk management between the perception of risk management as solely the result of human intentions and decision-making on the one hand and the post-humanistic understanding of ANT on the other.

Elaborating on Schatzki's site ontology, Bui et al. (2019) study how risk management practices affect risk management change. The authors argue that the existing body of research on risk management has paid much attention to the possible variations in risk management practices. Extending to the existing body of literature, Bui et al. discuss risk management change as a directional move; in this situation as a shift to strengthen the organization risk management practices. The authors present a case study about the risk management practices in two local municipalities facing seismic risk events in New Zealand.

Bui et al. (2019) conclude that Schatzki's site ontology is useful to understand how risk management practices are organized and how they change. In particular, Bui et al. point to changing the general understandings which drive risk management practices, instead of adjusting the risk management frameworks as the rules of the game. Bui et al. argue that risk management change is inevitable when facing new risks. The authors consider "changing the general understandings as an important way of making RM [risk management] change fundamental and sustainable" (p. 313). For one municipality as a case organization they draw attention to the shift from 'insular thinking' to 'honesty and openness'. As such, Bui et al.'s paper shows how studying risk management from a practice theory approach provides a valuable contribution to understanding risk management dynamics.

Furthermore, Tekathen (2019) shows how practitioners give rise to risk management practices in the context of the case company's ERM. Tekathen's point of departure is that ERM can be considered as a fluid management accounting concept, like the Balanced Score Card (BSC). According to Quattrone (2009), the BSC consists of a core image which is constant whereas the content of the four boxes change, depending on the circumstances. In this way, the fluid management accounting concept provides some free space which can be enacted by the user. Tekathen argues that management accounting concepts gain their fluidity by the practices which unfold in this free space; this also applies to ERM.

Tekathen (2019) presents an ethnography of ERM at a large division of a German producing company. Taking the management accounting concept ERM as his object of research, Tekathen distinguishes one site, which he refers to as “the ERM site”. Tekathen underlines that the site is constituted by arrangements and practices. According to Schatzki (2002), an arrangement is “a nexus of entities in which they relate, occupy positions, and possess meanings” (p. 21). Similar to ANT, arrangements include human entities, such as risk experts, and non-human entities, such as risk management tools. The author emphasizes that heterogenous arrangements and practices form a meshwork that constitutes ERM as a site.

Subsequently, Tekathen (2019) identifies a number of actions that compose the site and he categorizes the actions in different practice-arrangement bundles. These practice-arrangement bundles include, for instance, “risk reporting practices” and “risk governance practices”: On the one hand, the arrangement remains stable like the core image in BSC as a management accounting concept. On the other hand, the activities performed by the ERM staff are subject to change. More precisely, the practice-arrangement bundles prefigure “the actuality of actions” (p. 981). Practice-arrangement bundles make the outcome of a certain action more probable or less risky. In this way, practice-arrangement bundles prefigure actions without predetermining the action outcome.

The papers by Bui et al. (2019) and Tekathen (2019) demonstrate that risk management within an organizational context is the enactment of risk management practices within a certain site. Practices unfold, they are enacted. Actions cannot be predetermined and practices cannot be predetermined or prescribed either. Drawing on Schatzki’s site ontology (2002), Bui et al. emphasize how these risk management practices might be changed as a directional move. The authors demonstrate risk management change as a directional move, by changing the general understandings. This insight extends to the existing papers which offer diverse reasons why risk management change occurs without a clear change direction. Subsequently, Tekathen underlines that the enactment of actions is prefigured by the ERM site in the organizational context.

Risk management receives its fluidity as it depends on how actions are performed. Bui et al. (2019) underline that Schatzki’s site ontology provides a rich analytical framework to move beyond description or prescription of risk management” (p. 314). The risk management practices themselves equate the organization risk management. Through carrying out the risk management practices, the organization’s risk management as a concept becomes fluid in nature.

## 9. Summary, conclusion and research directions

We have performed a systematic literature review on the dynamics of risk management according to the body of literature from an interpretive paradigm. The body of interpretive research on risk management in the field of management accounting underlines the meaning which organization members attach to risk management. This contrasts with the functionalistic view of risk management assuming that risk management equates to an instrument for use by humans such as managers and risk experts. In this view, risk management is a tool in human hands and, accordingly, the risk management implementation in an organizational context is solely the result of human intentions and rational decision-making.

This literature review problematizes these assumptions and demonstrates their shortcomings from the body of literature departing from the interpretive world view. We organized our review by distinguishing a number of non-functionalalist theoretical approaches to risk management: A governmentality approach; a “boundary object” approach; an institutional approach; an actor–network theory approach (ANT) and a practice theory approach.

The Foucauldian papers highlight the concept of governmentality showing how a discourse comes into being. Discourses tend to be authoritative, to a certain extent. In this regard, Hardy & Maguire (2016) outline the dominant discourse of risk. The human risk experts are conditioned in their behavior and decision-making by this dominant discourse. Through this dominant discourse of risk, a shared understanding of risks and risk management emerges within the organizational context. Additionally, three of the selected papers show how risk management tools might become “boundary objects” (Carlile, 2002, 2004) which travel across organizational borders. As such, the risk management tools and risk management approach might become more powerful.

Subsequently, an institutional perspective offers the reasons why organizations introduce an integrated risk management approach for the entire organizations (often referred to as an ERM – enterprise risk management – approach). The body of literature about risk management drawing on New Institutional Theory (NIT) highlights external pressures as reasons for the ERM introduction, and Old Institutional Economics (OIE) highlights the internal dynamics caused by the ERM introduction. Organizations may seek legitimacy and for that reason they introduce an ERM approach. This contrasts with the assumption that organizations implement an ERM approach solely driven by human intentions and rational decision-making in the context of functionality. In short, the literature departing

from an institutional understanding reveals that the ERM implementation is not a seamless introduction of a predefined risk management model initiated and driven by rational decision-making. Drawing on institutional logics, the papers by Arena et al. (2010) and Tekathen & Dechow (2013) emphasize the differences in the way organizations adopt an integrated risk management approach and the differences in the way these risk management approaches are introduced in the organization.

ANT and practice theory both understand risk management in the organizational context as dynamic in nature; risk management does not have a stable meaning, opposing the understanding of risk management as something that is introduced in the organizational context according to its design. The papers about risk management drawing on ANT highlight the limitations of the formal risk management approach within an organizational context. In particular, the studies by Vinnari & Skærbæk (2014) and Themsen & Skærbæk (2018) discuss why the organization's formal risk management approach cannot effectively respond to emergent risks and new uncertainties which arise from the external environment. In essence, the stream of literature drawing on ANT demonstrates that risk management is established in the relationships between non-human and human actors. Additionally, the selected studies drawing on practice theory argue that risk management consists of various risk management practices which are enacted simultaneously.

Following the summary of the review findings, the remainder of this section highlights two key areas of interest for future research. *TABLE 4* presents a summary of the findings, connecting the findings with the key areas of interest for future research.

Essentially, the body of literature drawing on ANT and practice theory demonstrate that risk management cannot be prescribed by humans. However, the two selected studies about risk management drawing on practice theory (Bui et al, 2019; Tekathen, 2019) focus on the risk management practices carried out by risk managers and management accountants. Thus, these studies depart from the understanding that risk management is something which can be organized and arranged within an organizational context. By contrast, we seek to understand risk management practices as open-ended in nature. We understand organizational risk management as something that is established in the enactment of multiple practices simultaneously. By the enactment of practices, risk management takes its meaningful shape.

We advocate a shift in perspective from studying risk management as something which can be arranged and prescribed by humans to studying the unfolding of multiple practices by which risk management is established. Focusing on the

understanding of risk management as something people do instead of something organizations have (Whittington, 2006), future research might understand how risk management meaningfully comes into being in an organizational context through the enactment of risk management practices. Understanding risk management practices as open-ended in nature, this perspective includes the perception that risk management takes shape in the relationship between formal risk management practices and other organizational practices.

*Thus, the first key area of interest refers to the theme of understanding risk management practices as open-ended and interrelated in nature.*

Risk management practices emerge and evolve as a social order. This social order opens up room for a creative search for new risks in the background of unpredictable and dynamic complexities. A creative search to understand the uncertainties to identify and assess new organizational risks might be an adequate response to the complicated externalities surrounding the organization. Tekathen's (2019) case study shows a first glance of how this creative search could look, underlining ERM as a management accounting concept that is fluid in nature. Due to this fluidity, free space occurs in which activities are not fixed or prescribed. Tekathen aims to understand how this free space is enacted by the user. The organization's ERM department in this case study is referred to as the site, and the users in this site are primarily the risk managers and risk assistants as the practitioners in the site.

This thesis challenges the assumption that human rational decision-making is at the core of risk management as a social order. Foregrounding the practices by individual risk experts comes with the implicit assumption that humans are able to manage risks, at least to a reasonable extent. The organization risk management approach then comes to the fore as an existing arrangement, a pre-set order (Schatzki, 2002, p. 150).

The present thesis takes a different perspective. Emphasizing that risk management practices are prior to the meaningful existence of humans, practice theory challenges us to rethink ideas about management (Nicolini, 2012). Thus, a practice theory perspective opens up room for a novel understanding of the social phenomena around us, including risk management.

Opposing the separation between the realms of knowledge and action, we argue that knowledge about risk management emerges through the carrying out of risk management practices. Following Reckwitz (2002) we emphasize that knowledge

refers to “ways of understanding, knowing how, ways of wanting and of feeling that are linked to each other in a practice” (p. 253). As such, tacit knowledge is included. In particular, this applies to knowledge about risks which become manifestable in the future which are not known in the current situation. Against the background of unpredictable and dynamic complexities in contemporary society, these kinds of risks are likely to become more manifestable than they used to be. The present study provides a scientific contribution by showing how the diverse kinds of practitioners draw on different kinds of knowledge, including tacit knowledge. As such, we offer an alternative to merely discussing the risk management practices associated with knowledge from textbooks and guidelines.

This literature review shows that the existing body of literature from an interpretative research paradigm focuses on risk management practices which are associated with the formal organization risk management approach. This point of departure comes with two important limitations: A) it fails to include the practices carried out by professionals outside the circle of risk managers and management accountants; and B) typically, the practices associated with formal risk management are related to risk management tools and other kinds of risk representations. In this sense, the representation becomes important in the space between possible action and real action. As such, the existing body of literature on risk management excludes the actions which are performed intuitively, that is, without a predefined plan or relation to the formal risk management system. These practices are especially relevant against the background of unpredictable and dynamic complexities as practitioners respond to the risks they face; this includes actions which are performed intuitively.

We refer to the various risk management practices which are not directly associated with the formal organization risk management approach as to “the non-official risk management practices”. These include the risk management practices enacted by professionals outside the circle of risk managers and management accountants and the risk management practices which are enacted intuitively. ANT and practice theory emphasize that actions cannot be predetermined. In this regard, future research needs to include the actions which give rise to non-official risk management practices. Understanding that actions cannot be predetermined is key to understanding the non-official risk management practices in full depth.

*We take up the understanding of non-official risk management practices as the second area of interest following this literature review.*

TABLE 4 shows the main findings of this literature review, highlighting the two key areas of interest and the knowledge gap we have identified based on the current literature review. This knowledge gap represents the thesis’ scientific contribution.

TABLE 4: Summary of findings from the literature review

|                                                                                                                                                      | <b>Theme A:<br/>Risk management practices<br/>as open-ended in nature.</b>                                                                                                                                                         | <b>Theme B:<br/>Non-official risk management<br/>practices.</b>                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Findings from the body of positivistic research, following a functionalistic view of risk management                                                 | Risk management is perceived as a stable system.                                                                                                                                                                                   | No emphasis on non-official risk management practices.                                                                                                                                                                                                                                            |
| Findings from the selected papers drawing on the work of Foucault and drawing on the concept of boundary objects. [as discussed in sections 4 and 5] | An authoritative body of knowledge gives rise to the organization risk management, including a given set of risk management practices.                                                                                             | A discourse of risk management is established, by which practices associated with the formal risk management approach prevail.                                                                                                                                                                    |
| Findings from the selected papers drawing on an institutional perspective. [as discussed in section 6]                                               | External pressures are a key reason for the introduction of a risk management approach (New Institutional Theory, NIT); internal dynamics come to the fore in the adoption (Old Institutional Economics, OIE).                     | Focus on the formal risk management approach and how this becomes part of organizational life. Several case studies also pay attention to the knowledge-in-practice which was in use before the ERM introduction.                                                                                 |
| Findings from the selected papers drawing on ANT. [as discussed in section 7]                                                                        | These studies aim to understand how the risk management ideas as displayed by an ERM approach are translated into an organizational context. Risk management comes into being in the relations between human and non-human actors. | The literature based on ANT and the literature based on practice theory posit that actions cannot be predetermined. The selected studies drawing on ANT stress the limitations of an ERM approach to determine which control activities might be appropriate in response to a certain novel risk. |
| Findings from the selected papers drawing on practice theory. [as discussed in section 8]                                                            | Drawing on Schatzki’s site ontology (2002), these papers highlight that risk management within a site emerges and evolves through the enactment of risk management practices                                                       | Highlighting the practices by risk managers and professionals in the field of management accounting. The knowledge associated with the organization’s integrated risk management approach is center-staged. Tacit knowledge is left out of scope.                                                 |

**TABLE 4:** *Continued*

|               | <b>Theme A:<br/>Risk management practices<br/>as open-ended in nature.</b>                                     | <b>Theme B:<br/>Non-official risk management<br/>practices.</b>                                                                                                         |
|---------------|----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Knowledge gap | Studying risk management practices as open-ended in nature which includes the creative search for novel risks. | Including the non-official risk management practices in the future research agenda. Taking into scope the role of tacit knowledge with regard to exploring novel risks. |

## 10. Chapter summary

This chapter presents a systematic literature review on the dynamics of risk management, based on a selection of 24 high-quality papers that move beyond the functionalistic view of risk management. The present study uncovers that this research stream in the field of management accounting challenges the assumption of rational decision-making by humans as this is commonly accepted in the positivistic research paradigm. This chapter shows that the risk management dynamics have been studied from multiple approaches such as the work of Foucault, institutional theory, actor–network theory (ANT) and, more recently, practice theory.

The stream of literature drawing on the work of Foucault reveals how the organization risk management approach unfolds as part of a dominant discourse and as an authoritative body of knowledge. Drawing on institutional theory, the literature shows the role of internal dynamics and external pressures enabling the introduction of an integrated risk management approach covering the entire organization. As such, this review demonstrates that the state-of-the-art literature about the dynamics of risk management highlights risk management firstly as an organizational phenomenon – as something organizations have. The risk dynamics come to the fore as the risk management approach changes in the context of an organization beyond its predefined function.

Typically, the body of literature that draws on the work of Foucault and institutional theory departs from the normative literature about risk management such as the COSO-ERM framework and the requirements issued by the Basel Committee. These normative texts and frameworks provide a risk management prescription.

By contrast, the literature drawing on ANT and practice theory reflects a more relational understanding of risk management in the organizational context. The four selected ANT-oriented papers demonstrate that risk management is established within an organizational context in actor-networks and the relations between non-human and human actors. Subsequently, practice theory posits that the organization risk management emerges and evolves through the simultaneous enactment of multiple practices.

The literature review reveals a knowledge gap which can be reflected by two themes as areas of interest for research. The first area is studying risk management practices as open-ended in nature. This includes risk management practices to explore novel risks. The second area refers to including the non-official risk management practices and taking tacit knowledge in the research scope. In essence, these two themes outline the thesis' scientific relevance.





## Chapter 4

# **Risk management practices serving the security of supply – *a case study drawing on Schatzki's site ontology***

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# 1. Introduction

This chapter presents a case study at TenneT Holding B.V. which is a Dutch state-owned company that is responsible for high-voltage electricity transmission in the Netherlands and in a large part of Germany. We study the TenneT risk management practices surrounding the secure supply of electricity which is TenneT's main regulated task. The study scope is limited to activities in the Netherlands that are part of the activities of TenneT TSO B.V. (Transmission System Operator B.V., hereafter referred to as TenneT). TenneT is owned by TenneT Holding B.V.

Security of electricity supply is crucial to contemporary society. Electricity transmission needs to be reliable 24 hours a day, 365 days a year. Risk management in this sense is highly relevant to the transmission system operator for achieving the objective of the uninterrupted operation of the transmission networks.

Risk management aims to ensure that the TenneT grid capacity is always adequate to serve the actual or expected grid demand at any point in time. Reliable estimations are required to analyze the chance that future grid demand exceeds the available grid capacity. To this end, TenneT utilizes a model with a fixed ten-year timeframe and several scenarios for analyzing future grid demand. The model strives to translate future uncertainties into manageable items. As such, this approach reflects the functionalistic view of risk management, based on the assumption that humans are able to objectively understand and quantify the organization's risks ahead of time.

Moreover, drawing on Hardy et al.'s (2020) literature review, these practices can be considered to be normalizing practices of organizing risks. Hardy et al. outline that normalizing practices have the aim of "transforming future uncertainties into knowable, calculable, and manageable risks through scientific techniques" (p. 1037). The authors have performed a systematic literature review on organizing risks. They highlight that the organization's risk management refers to the practices of organizing in the prospective mode. This mode of organizing risks focuses on "how organizations identify risks that may materialize in the future to prepare for them" (p. 1035). According to Hardy et al., normalizing practices are the predominant practices in the prospective mode.

Typically, normalizing practices are associated with a systematic and model-based risk management approach. Foregrounding human rational decision-making, normalizing risk management practices are the responsibility of management

accountants and risk managers. They identify risks that threaten the organization's objectives and strive to tradeoff these risks with the acceptable efforts to respond to them (Tekathen, 2019). These normalizing practices indicate an underlying social order of stability by which entities such as risks and risk managers have a certain predefined meaning or identity. Accordingly, the organization's risk management approach is assumed to be a stable system. By contrast, this study understands that risk management practices form an open-ended social order. We show how entities such as risks and risk managers receive their meaning and identity through the enactment of practices.

Hardy et al. (2020) reveal a sharp distinction between the literature about organizing risks in the prospective mode on the one hand and in the real-time mode on the other. The latter refers to practices of organizing risks that may materialize in the current situation. For instance, activities in the field of crisis management belong to practices in the real-time mode. In addition to normalizing practices – as these are the predominant practices of organizing risks in the prospective mode – the present case study includes the practices of organizing risks in the real-time mode in the research scope. We do not want to exclude practices that prove to be relevant in the context of the current case study.

Drawing on Schatzki's site ontology, this study seeks to understand actions as the basic building blocks of risk management practices. We highlight these actions as being part of a skillful craft, underlining the richness of human activity (Schatzki, 2019) and the creativity of practitioners (Whittington, 2006).

In addition to the prospective mode and the real-time mode of organizing risks, Hardy et al. (2020) discuss the retrospective mode as the third mode of organizing risks. In the retrospective mode, the practices of organizing risks in the prospective and the real-time mode are held up to scrutiny (p. 1039). The retrospective mode includes practices to evaluate and follow up on incidents, for instance by internal auditors or by the external regulator. TenneT strives to avoid incidents which threaten the security of supply. Consequently, retrospective practices are enacted on a more or less exceptional basis. As a result of enacting retrospective practices, TenneT might be able to improve future risk management practices serving security of supply. However, practices in the retrospective mode do not directly contribute to security of supply. For that reason, practices in the retrospective mode have been left out of the research scope.

Against the background of unpredictable and dynamic complexities, risk management models and their systematic approach fall short of reliably estimating future grid demand at any future moment. TenneT's risk management needs to address the issue that TenneT is not able to meet societal expectations regarding the shift to the use of electricity from renewable sources like wind power and solar energy. TenneT faces severe difficulties in estimating the future grid demand reliably and realizing the appropriate asset base to facilitate the grid demand at any moment in the future. In the past, models were believed to be sufficient to ensure security of supply in the years to come. By contrast, in the current situation, TenneT faces the complication of being uncertain when expected future developments will affect future grid demand. The moment when the TenneT grid needs to be extended and to what extent exactly depends on multiple variables, including the growth of electricity generation and new technological solutions in the field of transmission and electricity storage.

This chapter takes off with a site ontology to demonstrate how practitioners at TenneT respond to the uncertainties which challenge the normalizing practices of organizing risks. A site ontology stresses that practices might be enacted differently, depending on the specific context, which is the site. As such, a site ontology is highly supportive in understanding how practices unfold in diverse ways given the background of dynamic complexities. We find that, in addition to normalizing risk management practices, the risk management practices to ensure the security of supply in the years to come emerge more or less spontaneously, without a predefined model or plan. We cannot limit the scope of the risk management practices to a set of predefined features such as the physical location or the setting in which staff members enact risk management practices.

The site offers a unique context to the practices which are enacted in that very site. Different features of the concept of a site are relevant, including the location and the wider scene. In our site ontology we understand risk management practices as moving beyond the activities by risk experts such as risk managers and management accountants who use predefined models. Things hang together, not driven by human agency, but by a flow in the nexus of practices that form the site.

We cannot determine the entities who enact risk management practices and its scope beforehand. Rather, following Schatzki (2002, 2005, 2006a, 2019), we set out to study how risk management practices produce meaningful entities enacting risk management. Entities, according to Schatzki, refer to humans, artefacts as objects formed by human activity, animals and non-living elements of nature. So, it is the

other way around: It is not that meaningful humans produce risk management practices by using material artefacts and tools, but that entities like humans and artefacts receive their identity and become meaningful through enaction of the risk management practices in a certain site. Through carrying out practices, social orders are established, giving meaning and identity to the different entities.

The chapter's research question is as follows:

*How and why are risk management practices enacted as an open-ended social order and how does this give meaning and identity to multiple entities?*

4

The existing papers about risk management drawing on Schatzki's site ontology (Bui et al., 2019; Tekathen, 2019; Klein & Reilley, 2021; Moschella et al., 2023) focus on normalizing risk management practices. These practices are rooted in the assumption that humans – typically risk managers and management accountants – are able to objectively quantify risks. Tekathen, for instance, describes and studies risk management practices by focusing on the use of enterprise risk management (ERM) as a management accounting technology. In these studies, risk management is systematic and based on a plan and a predefined model. In addition, based on Schatzki's site ontology, this chapter unpacks how risk management practices emerge without a plan or a predefined model; how they emerge spontaneously. These practices are in particular enacted by practitioners outside the circle of risk managers and management accountants.

The remainder of this chapter is organized as follows. Section 2 presents Schatzki's practice theory and the study's sensitizing framework. Section 3 outlines the research methodology and methods. Subsequently, the findings from the TenneT case study are highlighted in section 4. Based on the findings, section 5 contains a discussion and conclusion. This section provides several suggestions for future research.

## 2. Sensitizing framework

This section presents the theoretical ground that frames our study into risk management practices: Schatzki's site ontology (2002, 2005 and 2019). In general, practice theorists start from the position that something called "practice" is central to social life (Schatzki et al., 2001; Reckwitz, 2002; Feldman & Orlikowski, 2011). Practices "are understood as the primary building blocks of social reality" (Feldman

& Orlikowski, p. 1241). Practices give rise to “all the apparently durable features of our world” (Nicolini, 2012, p. 6), including organizations. The section concludes the presentation of the sensitizing framework for the analysis of the risk management practices in the TenneT case study (TABLE 5).

A practice is “a temporally evolving, open-ended set of doings and sayings” (Schatzki, 2002, p. 87). Schatzki (2005) states that practices are organized, open-ended manifolds of actions (p. 471). Multiple practices are linked, they hang together. As Hui et al. (2016) summarize, “practices link to form wider complexes and constellations – a nexus” (p. 1). Deepening the insights in this nexus of practices, Schatzki (2002) draws attention to the concept of “social order” which he understands as “the hanging together of things, the existence of nexuses” (p. 18). Social orders “exist and evolve only in some context encompassing them” (p. 59). This context is the site which is a nexus of social practices.

According to Schatzki (2003), “the site of any aspect of social life is some mesh of human practices and material arrangements” (p. 195). A material arrangement or arrangement refers to “a specific constellation of material entities that gives meaning to the doings and sayings of a practice, while simultaneously providing meaning to the individual entities of the constellation” (Loscher et al., 2019, p. 120). Practices and the site reproduce each other which is illustrated by the following example of the craft of brewing beer in medieval cities. The practice of brewing beer was carried out by the city’s brewing craftsmen who shared a set of specific knowledge and skills. Simultaneously, the group of craftsmen formed a site of specific intelligibility, namely, the site of brewing beer. A practitioner who entered a site, had to adapt to the practices within that site. However, the site might change by consequence of the way the new practitioner carries out the practices; that is brewers may develop their own way of brewing. Thus, practices are fluid in nature and sites might also be subject to change. Existing practices may be extended to brewing new types of beer.

Equally importantly, the context of the city gives rise to the practices. For instance, the availability and the quality of the ingredients in the city surroundings are key for the specific taste of the beer from the city. Without the specific context, which is the site, the practices do not emerge. The concept of a site, firstly, refers to the location where something is or takes place. Secondly, the site is the wider scene in which practices are carried out, for example the history of a certain business. Thirdly, “for something to be or to occur in a site context is for it to be or to occur *as a constituent part of its context*” (Schatzki, 2002, p. 65, italics in the original).

Risk management practices might only be understood within the specific context in which these practices are enacted, which is the site. We draw on Schatzki's site ontology (2002) to understand how risk management practices are carried out in diverse ways, depending on the site in which practices unfold. These sites open up room for a certain intelligibility showing what makes sense for people to do within this specific context. Following Schatzki, this intelligibility renders the specific meaning and identity to the entities in the site. For instance, the man who becomes a professional in brewing beer receives the identity of master brewer in the context of the city. Through this approach we emphasize that the sites produce meaningful humans and artefacts. Thus, we oppose the foregrounding of human rational decision-making and the understanding of risk management as rooted in goal-driven human activities.

How precisely should we understand practices? How are they organized and how do they hang together? And how precisely do practices relate to a site? To begin with, it is human activity, understood as doings and sayings, that composes the practices. Practices hang together by four ordering or organizing principles: teleoaffective structures, rules, general understandings and practical understandings.

*Teleoaffective structures* refer to the specific ends that afford people to perform doings and sayings. The teleos refers to the ultimate goal or the end of a practice, the affectivity refers to some kind of desire or emotion connected to this teleos. Examples include religious convictions and sense of community (Nama & Lowe, 2014, p. 300). *Rules* "are formulated directives, instructions, or remonstrations" (Schatzki, 2019, p. 30). Nama & Lowe summarize that rules "enjoy normative force and can influence the future course of activity" (p. 287). *General understandings* are "practice elements reflecting people's attitudes to performing an action" (Bui et al., 2019, p. 302, citing Schatzki et al., 2001). Following Nama & Lowe and Bui et al., we highlight that the general understandings underpin the practical intelligibility. General understandings direct what makes sense for practitioners to do. General understandings might be expressed in doings and sayings, they are about "the manner in which people carry out projects and tasks" (Schatzki, 2002, p. 86). Drawing on the work of other scholars, Nama & Lowe provide examples such as strategic objectives and the overall concern with profitability. *Practical understandings* "are understandings how to carry out particular intentional actions in particular circumstances through performances of bodily actions" (Schatzki, 2019, p. 30). In contrast to general understandings, practical understandings refer to the level of individuals. Practical understandings are about what makes sense to individual humans to do in a particular situation, which depends on the site in which practices are carried out (Tekathen, 2019). For instance,

an accounting professional might know quite well how to prepare a balance sheet based on the organization’s financial accounts.

Schatzki (2002) underlines that these four ordering principles do “not govern activity in the sense of determining it” (p. 34). However, by these four principles human actions become part of a practice.

Following Schatzki, this study departs from the understanding that risk management is a social phenomenon that evolves in a web of practice-arrangement bundles. In the present case study, we show how risk management practices are enacted, forming practice-arrangement bundles. A practice-arrangement bundle is “a mesh of human practices and material arrangements” (Schatzki, 2003, p. 195).

Similarly, Tekathen (2019) distinguishes several practice-arrangement bundles like “risk reporting practices” and “risk governance practices” to unpack the ERM-site in his case study. Consequently, we need A) to understand the material arrangements as part of the practice-arrangement bundles. These material arrangements include entities, such as risk management systems and tools. Secondly B), we study the organization of the multiple practices, understanding them as a mix of the four organizing principles outlined by Schatzki. Through these principles, multiple actions establish a practice. Doing so, we aim to understand how risk management practices are connected to each other and how they jointly form practice-arrangement bundles.

**TABLE 5:** *The sensitizing framework, for the analysis of the risk management practices*

|                                    | Practice-<br>arrangement<br>bundle 1                                                             | Practice-<br>arrangement<br>bundle 2 | Practice-<br>arrangement<br>bundle 3 | Practice-<br>arrangement<br>bundle 4 |
|------------------------------------|--------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| A – Material<br>arrangements.      | A single set of material arrangements might be part<br>of multiple practice-arrangement bundles. |                                      |                                      |                                      |
| B1 – Teleoaffective<br>structures. |                                                                                                  |                                      |                                      |                                      |
| B2 – Rules.                        |                                                                                                  |                                      |                                      |                                      |
| B3 – General<br>understandings.    |                                                                                                  |                                      |                                      |                                      |
| B4 – Practical<br>understandings.  |                                                                                                  |                                      |                                      |                                      |

### 3. The case study and methods

With regard to methodology, this chapter is an example of a qualitative field study as outlined by Ahrens & Chapman (2006). With this qualitative methodology “goes an acknowledgment that the field is itself not just part of the empirical world but is shaped by the theoretical interests of the researcher” (p. 820). This methodology is appropriate to answer research questions which are about “how” and “why”. In line with a qualitative field study, this chapter presents an in-depth case study as its method. The case study is conducted within TenneT, headquartered in Arnhem, the Netherlands. This section provides detailed information about the data collection and data analysis.

4

#### 3.1 Data collection overview

Starting from February 2019 I received permission to enter TenneT’s buildings and facilities as a regular staff member. During the period until March 2020, I was regularly present at TenneT’s headquarters in Arnhem during many working day. From March 2020, due to COVID-19 restrictions, I was only occasionally able to enter TenneT’s headquarter. During this period, I remained involved with the TenneT organization as much as possible using a remote connection.

For the purpose of collecting data, I conducted nineteen formal interviews with TenneT staff with the aim of understanding the role and meaning of risk management within the TenneT organization. These interviews are referred to as the first wave; these include interviews with TenneT staff positioned in the Corporate Legal, Corporate Audit and Large Projects departments. The latter is the department responsible for building new assets. Additionally, the second wave of interviews consists of eleven formal interviews, focusing on the risk management practices surrounding the investment selection.

Equally as importantly as conducting the interviews, I performed observation studies by attending staff meetings and internal presentations. Whenever appropriate, I introduced myself briefly, explaining the reason for my presence and underlining my role as an observer. I did not actively participate during the meetings and presentations. Moreover, I joined TenneT staff in a one-day visit to a TenneT building site in the south of the Netherlands. During this visit, the local TenneT staff provided a presentation of the building project and they discussed the difficulties they have to overcome in this project. Furthermore, I was offered the opportunity to observe the TenneT station.

In brief, the data collection comprises 30 formal interviews with TenneT employees, completed with observation studies and by studying internal and external documents. Appendix A provides more details on the interviews and Appendices B displays more information about the observation studies.

On top of this, 29 informal meetings with TenneT staff members took place during this period. During these meetings, TenneT employees shared information from internal presentations and e-mails, which was highly valuable and useful to gain a better understanding of diverse kinds of technical issues, for instance. By having lunch with TenneT employees and by engaging in informal chats at the coffee machine, I strived to familiarize myself with TenneT's day-to-day practices.

TABLE 6 provides a detailed overview of the data collection.

**TABLE 6:** *Overview of the data collection*

| <b>Piece of data collection</b>                         | <b>More detailed information</b>                                                                                                                                                    | <b>Focus of the data collection</b>                                                                                        |
|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| 1 <sup>st</sup> wave of interviews                      | 19 formal in-depth interviews, performed during the period from March until May 2019.                                                                                               | Covering the entire TenneT organization in general and the asset management activities in particular.                      |
| 2 <sup>nd</sup> wave of interviews                      | 11 formal in-depth interviews, performed during the period from January 2020, until July 2021.                                                                                      | Focus: Risk management practices embedded in the practices of initiating investments and studying investment alternatives. |
| Observation studies – formal occasions                  | Attending 29 meetings and internal presentations during the period January 2020 to November 2021.                                                                                   | Focus: Risk management embedded in the maintenance and inspection activities.                                              |
| Other kinds of observation studies – informal occasions | Discussing specific topics with TenneT staff members, typically initiated by questions from the researcher, for instance.                                                           |                                                                                                                            |
| Studying internal documentation                         | The internal documentation includes both confidential information (minutes of internal meetings and e-mails) and publicly available information (Investment Plans, Annual Reports). |                                                                                                                            |

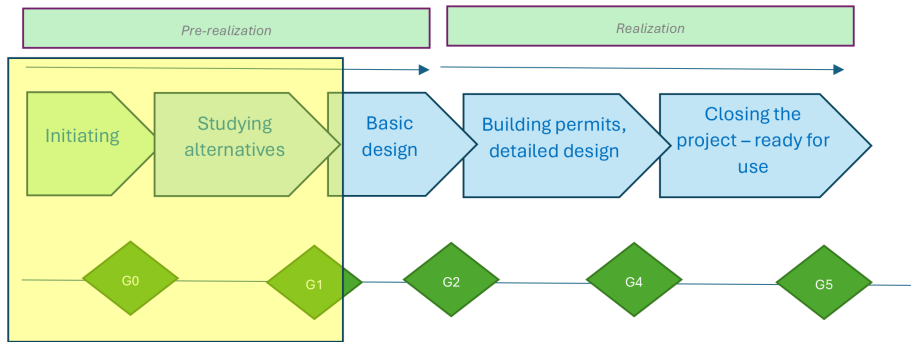
### 3.2 Data collection focus

The present chapter seeks to understand the risk management practices as an open-ended social order; for this reason, we did not limit the data collection to the formal risk management procedures. Moreover, in line with Ahrens (2024), we recognized that “the nexuses of practice do not have neat boundaries” (p. 266). We subscribe to the view that the social is a totality of practices. Following Ahrens, we acknowledge that the researcher draws the borderlines of which practices are taken into scope and which ones are left out of scope. The researcher needs to do this at least for more pragmatic reasons, given the limitations in time and research resources.

Following the switch to the consumption of electricity generated from renewable sources, huge investments are needed in the years to come to grant the security of supply. This chapter highlights how TenneT deals with the uncertainties that emerge in realizing these investments against the background of these unpredictable and dynamic complexities.

In line with legal requirements, TenneT has to publish a forecast of the investments in the timeframe from the present until ten years ahead. This biannual forecast is known as the Investment Plan (IP). The Dutch Law upon Electricity, the so-called Electricity-law (Rijksoverheid, 1998), provides general requirements for TenneT to present the IP. Moreover, the national Dutch government has issued additional legislation providing more detailed instructions concerning the content of the IP. The most relevant requirements are the compulsory use of scenarios and the given timeframe from now until ten years in the future. Consequently, the IP 2020 shows all investments scheduled for the period from 2020 until 2030, applying several scenarios of future developments.

In each investment proposal, TenneT has to assess the acceptable level of risk concerning the security of supply. The key question is: How far-reaching is the investment proposal to secure the future electricity supply at any point in time? *FIGURE 4* shows an overview from the IP of the five stages which are distinguished in pre-realization and realization of an investment project within TenneT. Each stage ends with a gate (marked G0, G1 and so on), usually delivering a Gate-document that demarcates this point.



**FIGURE 4:** The five stages of pre-realization and realization of investment projects according to the IP 2020 (TenneT, 2020)

The focus of our data collection was on the first and the second stage, displayed by the yellow-shaded area in *FIGURE 4*. These stages give direction to the final selection of an investment alternative in the basic design and these give direction to the subsequent stages to realize the investment and to finish the investment project at the moment the asset is ready for regular operation. For this reason, we presumed that the first and second stages are highly relevant to understanding TenneT’s risk management practices concerning the investments.

Firstly, the practices of risk management to grant security of supply in the stages of initiating investments and studying alternatives come to the fore in the activities of prioritizing the investments as presented in the IP. The present case study discusses how the practices of calculating risk scores supports the prioritizing of investments. Calculating risk scores is performed by the TenneT staff of the Risk Management & Portfolio team (the RM&PM team). We might refer to these TenneT employees as the risk managers.

Moreover, the investments are realized to contribute to the existing TenneT grid. As such, secondly, studying the investment alternatives is part of the activities executed by the grid strategists who have the responsibility of ensuring that the TenneT grid remains adequate for its designated function in the years to come. Studying investment alternatives is included in this responsibility and as such, the grid strategists have to consider how these investments serve the security of supply effectively. Notably, security of supply is one aspect of studying alternatives. The grid strategists have to take into account aspects like safety and societal acceptance of realizing investments. We emphasize that the activities which refer

to risk management serving the security of supply are a limited part of the total activities of the grid strategists to ensure that the TenneT grid keeps on functioning.

Both the TenneT employees which form the RM&PM team, the risk managers, and the grid strategists belong to the Asset Management unit (the AM unit). The AM unit director reports to the Chief Operating Officer, who is one of the four members of the TenneT Executive Board (EB). We provide an organizational chart of the AM unit in Appendix D. However, as we acknowledge that the risk management practices are open-ended in nature, we do not limit the data collection to the TenneT staff members within the AM unit beforehand.

The totality of all different kinds of consideration regarding an individual investment is reflected in the Gate1-documents. For that reason, following the research focus we have selected ten Gate1-documents to understand the actions performed by the grid strategists to rank the investment alternatives. A Gate1-document typically presents several investment alternatives for a certain future investment project, limiting the range of possible solutions. We have studied the selected Gate1-documents and discussed them in depth with TenneT professionals in eight formal interviews. These interviews were part of the second wave of interviews.

### 3.3 Data collection and analysis

The interviews were all semi-structured, leaving room for discussion and unexpected comments by the interviewees. Prior to each interview, I sent a topic list to the interviewee to familiarize him / her with the topics I aimed to discuss. With regard to the first wave of interviews, I discussed how TenneT professionals from the various departments identify risks and how they keep track of the risks for the sake of giving an account of these risks. In particular, I asked questions to understand why the interviewee considers a risk as meaningful or not. With regard to the second wave of interviews, the aim of the questions was to understand the considerations made within the selected Gate1-documents. An example of two selected pages from a Gate1-document is included in Appendix F.

To enable an effective data analysis, I have audiotaped all interviews and interview reports were written based on the recordings. I sent an integral interview report or a summary to the interviewees to retrieve their consent. The interview reports, as agreed upon with the interviewees, and the selected Gate1-documents were analyzed via the software tool Atlas TI. With this tool, data analysis has been performed based on an open coding method, utilizing codes from the interviews

like energy transition, security of supply and risk awareness. Moreover, I added codes from the sensitizing framework, like rules and general understandings.

To analyse the data effectively is to focus on several key questions to zoom in on the practices (Nicolini, 2012, p. 235). In particular, the focus of the data analysis was to understand the tension between creativity and normativity and to the practical concerns discussed by interviewees. Practical concerns I frequently discussed include the desired pace to realize investments and the scarcity of qualified staff members. Moreover, the collaboration with the Distribution System Operators (DSOs) comes to the fore as a prominent theme in which creativity and normativity both play their part.

As the data collection includes information regarding multiple investments in different TenneT networks, I was able to compare the information about the risk management practices between different investments. Aiming to understand the patterns in the collected data about risk management practices regarding the security of supply, my goal was to understand similarities and differences over the ten selected investment proposals as displayed in the Gate1-documents. In particular, the various tradeoffs between the security of supply on the one hand and the scarcity of available resources and the sacrifice of financial means on the other hand come to the fore as a pattern in which risk management practices become manifestable. Another theme which was revealed in the data analysis refers to future uncertainties, expressed by wordings such as the energy transition and the societal aspects of building new assets.

### **3.4 Quality criteria**

With regard to the research quality, this section briefly outlines how the researcher has strived to grant the research credibility and the dependability. These two quality criteria are taken from Lincoln & Guba (1985); their work aims to develop quality criteria concerning qualitative research.

With regard to the research credibility, we emphasize the member check I have performed for every interview. This member check means that I have asked each interviewee to confirm whether or not the interview report or the interview summary is a true and fair representation of the interview. On top of this, I arranged three formal occasions to receive feedback and to reflect on my understanding of TenneT's risk management practices (see also Tekathen, 2019, p. 986). These occasions took place following the first interview wave (June, 2019) and at the end of the stage of the data collection within TenneT (May, 2022 and June, 2022). By

doing so, I also strengthened the research confirmability. More detailed information on these occasions can be found in Appendix E.

With regard to the quality criterium of dependability, I underline the use of interviews and observations studies as two different methods which complement each other. This helps to avoid becoming dependable on one source of information. Moreover, working with TenneT staff members and working at the TenneT head quarter for several months, supports to understand that different views exist about the topics we discussed during the interviews. In particular, during the second wave interviews, I explicitly asked the TenneT staff members why alternative solutions have not been selected as the preferred solution. In addition to sharing their arguments in favor of the preferred solution, I encouraged the TenneT interviewees to think about alternative solutions. Doing so, I aim to understand the details and the complexities of the tradeoffs made by the TenneT professionals. This is in line with the goal to come to “an authentic representation” of the risk management practices enacted by TenneT staff members. I would rather consider the thick explanations regarding the difficulties the TenneT staff members were facing, than to draw on one dominant view (Symon et al, 2018).

## 4. Findings TenneT case study

“TenneT is a leading European grid operator. We are committed to providing a secure and reliable supply of electricity 24 hours a day, 365 days a year.” With these words published on the company website, TenneT declares security of supply to be the organization’s most prominent task.

This section presents our findings regarding risk management practices concerning security of supply within TenneT in the Netherlands. Security of supply is crucial for the end-users of electricity. If electricity is not available, even for a single second, this can cause severe difficulties, for example resulting in the unavailability of public transport, financial losses for companies and serious problems for individual citizens. As a result, societal expectations regarding security of supply are extremely high and require considerable effort. This effort is also in line with the goal of “securing Europe’s energy supplies”, set by the European Union (European Commission, 2012).

After a short introduction of the TenneT company (section 4.1), section 4.2 starts to show why we distinguish the IP and the risk matrix template as the material

arrangements amid which the risk management practices concerning security of supply are enacted. Furthermore, these risk management practices are organized by the organizing principles as outlined in the sensitizing framework. The organization of the practices is inherently part of the practices and this organization is not a result of human intentions. Accordingly, the remainder of this section 4 discusses the organization of the practices of calculating risk scores (section 4.3) and the grid planning practices (section 4.4).

We chose to distinguish these two practice-arrangement bundles since the first primarily contains actions by risk managers while the second primarily contains actions by grid strategists. We demonstrate how both practice-arrangement bundles produce risks and how these practice-arrangement bundles render a specific meaning to the TenneT staff as the human entities involved. We provide an overview of the findings in section 4.5.

#### **4.1 TenneT introduction**

TenneT has been appointed by Dutch law as the monopolist for electricity transmission in the nationwide 220kV- and 380kV-network. Equally important, TenneT is the monopolist for electricity transmission through a number of the various 110kV- and 150kV-networks in certain regions in the Netherlands. The 220kV- and 380kV-connections serve the large-scale electricity transmission at the national level and transmission across the borders for the electricity import and export. For the latter, TenneT operates electricity lines connecting the Dutch 220kV- and 380kV-networks with the networks in the surrounding countries. The 110kV and 150kV-networks are mainly utilized for electricity transmission at the regional level.

In addition to TenneT as the national grid operator in the Netherlands, seven other network operators are responsible for electricity supply at the regional level. These organizations are known as the Distribution System Operators (DSOs), showing the contrast with TenneT as the Transmission System Operator (TSO), the system operator at the national level. Similar to TenneT, the DSOs have a regulated task and a monopoly for electricity distribution within a certain region of the country. All electricity transmission and distribution networks are connected with each other and form one integrated grid. Given the vital role of electricity to society, the Dutch government has issued legal requirements concerning electricity transmission and distribution, providing instructions for TenneT and the DSOs to operate the electricity networks.

Ensuring that the organization assets are adequate and suitable for their designated use – serving the organization objectives – is commonly referred to as “asset management”. This applies to maintenance and inspection activities and to investment activities. The chapter focus is the investments which serve the security of supply in the years to come. However, we begin by briefly discussing the inspection and maintenance activities as these are highly relevant for an in-depth understanding of the practices of initiating investments and studying investment alternatives.

### ***Maintenance and inspection activities***

TenneT owns many network connections and components which were built decades ago. The existing asset base is the backbone which grants security of supply today. To grant security of supply in the future, investments are needed. Equally important, TenneT needs to ensure that the existing assets keep functioning smoothly in the meantime. As a result, investments need to be realized while the grid is being operated 24 hours a day. TenneT can only take certain limited parts of the grid out of operation for a limited period of time for the purpose of executing maintenance and inspection activities. TenneT has to carefully schedule both investment and maintenance activities, utilizing the limited grid capacity as effectively as possible. The necessity of executing maintenance and inspection activities is part of the complexities TenneT faces when scheduling investments.

With regard to the grid components which were built decades ago, inspections and maintenance activities are key to ensuring that the assets keep functioning smoothly. TenneT staff members regularly discuss how to keep the existing grid components adequate for their intended use. In particular, we draw attention to the meetings of the Asset Knowledge Groups. TenneT and DSOs representatives from different regions join these meetings in order to share their knowledge and experience of a specific kind of grid component, such as transformers, pylons or lines, throughout the entire country.

During these Asset Knowledge Group meetings, security of supply comes to the fore as a key matter of debate. For instance, meeting attendants aim to determine the time that the grid components are likely to keep on functioning without failure. They strive to optimize the scheduling of maintenance and inspection activities to ensure that grid components will not fail in the near future on the one hand and the efficient execution of maintenance and inspection activities on the other. The limited opportunities to take components out of operation for maintenance and inspection purposes are frequently discussed as well. These meetings reveal the

joint responsibility that TenneT staff members and DSO staff members have to grant the security of supply for the entire country. This shows that the risk management practices are not limited to the TenneT organization.

Given the limitations of taking grid components out of operation as outlined above, and given the shortage of qualified personnel, TenneT is in many situations forced to tradeoff the execution of maintenance and inspection activities with the activities regarding the investments. In this regard, the TenneT EB has set the strategic priority of “safeguarding the grid”, referring to prioritizing the inspection and corrective maintenance activities over the activities of building new assets. This sets the scene for the practices of initiating investments and studying investment alternatives: The opportunities to speed up the realization of investments in line with societal expectations are limited.

Serving the public interest, the Dutch regulator Autoriteit Consument & Markt (ACM), has the responsibility of monitoring the efficient execution of the regulated tasks performed by TenneT and the DSOs. Dutch law provides detailed instructions on how the network operators have to give an account of their activities to the ACM and to the public alike. TenneT needs to give an account of its activities concerning maintenance and inspections and of its activities to extend the grid by realizing investments.

Referring to *FIGURE 4*, we recall that the empirical data collection focuses on the stages of initiating investments (stage 1) and the stage of studying alternatives (stage 2). However, the complexities which emerge from combining maintenance and inspection activities with the activities to extend the existing grid are key to understanding risk management practices regarding the investment realization.

### **Investments**

Initiating investments takes off with identifying the capacity constraints which are the specific spots where security of supply is at stake, now or in the years to come. For instance, one of the TenneT stations in the Amsterdam area was developed to serve the expected grid demand in 2020. However, due to a projected growth of electricity consumption, this station might not be able to deal with the grid demand from 2025 onwards.

The EB is directly involved in decision-making regarding the huge investment projects during the realization stages, which are stages 4 and 5 in *FIGURE 4*. In particular, EB members are regularly informed about the risk that these individual

investment projects get delayed or that these projects cannot be realized within the available financial budget. These project-related risks are included in the TenneT Annual report as the key risks for the entire organization. These stages are outside the case study scope.

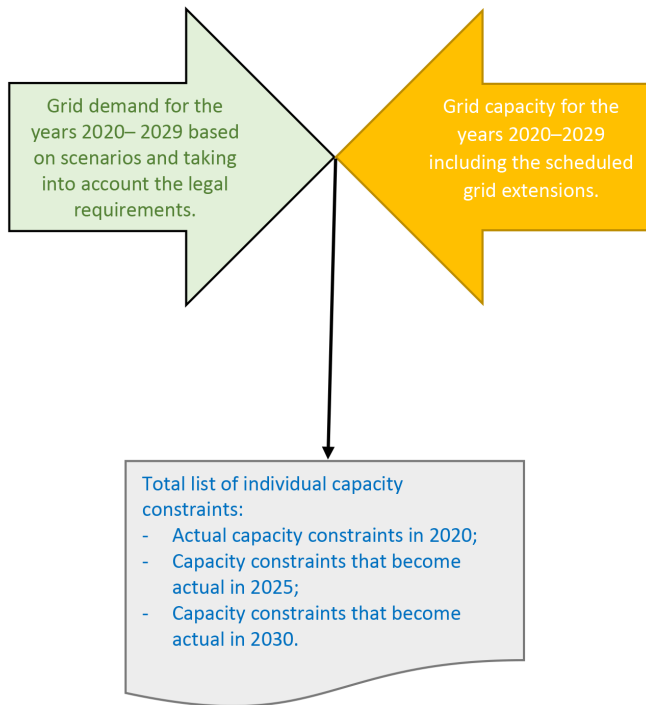
By contrast, we have not come across any indication that the EB is directly involved with the pre-realization stages of individual investments. These stages refer to the stages of initiating investments and studying investment alternatives which are within the case study scope. Instead, the EB aims to direct the effective use of the limited resources as discussed above for the total investment portfolio of the entire organization.

## 4.2 A - Material arrangements

Drawing on the study's sensitizing framework, we argue that risk management practices unfold in practice-arrangements bundles. This section discusses the material arrangements as part of the practice-arrangement bundles of risk management to grant security of supply against the background of unpredictable and dynamic complexities as discussed above.

In the current case study, we distinguish the material arrangements of the investment plan (IP) and the risk matrix template. By the IP and the risk matrix template, capacity constraints receive their meaning as risks. Both arrangements combine the chance that a particular risk becomes manifestable with the effects if this happens. *TABLE 7* provides more information about the way the material arrangements and the practice-arrangement bundles hang together in the TenneT case study.

The grid strategists have the responsibility of identifying the capacity constraints and of presenting them in the investment plan (IP), in order to keep the grid suitable for its designated future use. For the purpose of identifying the capacity constraints, the grid strategists compare the required grid demand with the available grid capacity. *FIGURE 5* provides a summary of this process for the IP 2020, yielding a list of the capacity constraints in the TenneT networks all over the Netherlands.



**FIGURE 5:** Overview showing how capacity constraints are identified

- **Grid demand (green arrow):** The grid demand is derived from scenarios forecasting how much electricity will be used in the various cities and regions in the Netherlands. This yields a detailed overview of how much electricity needs to be transferred by the various TenneT grid components. TenneT has a legal obligation to ensure that in case of an outage, electricity transmission can continue without interruption. For that reason, TenneT needs to take into account that the available capacity from a technical point of view cannot be fully utilized for actual electricity transmission.

As an example, the forecast shows a 25% increase of electricity consumption in the Southern Amsterdam region over the period from 2020 until 2025. Accounting for the peaks in the electricity consumption during the working day and taking into account legal requirements, this forecast yields a maximum grid demand of 4,000 MW.

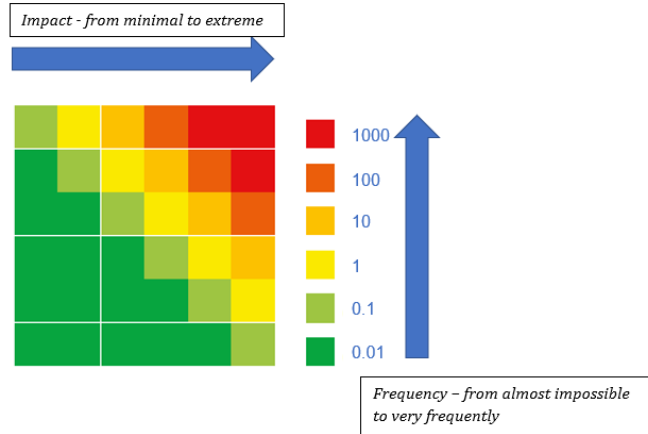
- **Grid capacity (yellow arrow):** The grid capacity refers to the available capacity for electricity transmission taking into account A) the unavailability of grid components if these are taken out of operation and B) the scheduled grid extensions.

Following up on the example above, the grid capacity of the components serving the Southern Amsterdam region throughout the year 2025 varies between 3,800 MW during the period of maintenance and inspection activities and 4,500 MW in the remainder of the year.

- Capacity constraints (grey area): These are the specific spots in which the grid capacity is insufficient or will be insufficient given the grid demand.

Regarding the example outlined above, the capacity constraint will occur in 2025 during the period of maintenance and inspection activities: During these time intervals, the grid demand during peak hours of 4,000 MW exceeds the available grid capacity of 3,800 MW.

The **risk matrix template** is the tool grid strategists use to discuss the severity of the individual constraints with the representatives of the RM&PM team. Referring to the example of the TenneT stations in the southern Amsterdam area as discussed above, the severity of this constraint is discussed by considering the number of people and companies who might be affected by an outage.



**FIGURE 6:** TenneT risk matrix template, according to the IP 2020 (TenneT, 2020, p. 26, adjusted for this study)

The risk score is calculated for each individual constraint by multiplying the impact and the frequency. Concerning security of supply, the impact has been translated as the number of people who do not have access to electricity due to an outage caused by failing network components, like a line or a station. The frequency equates the chance that an outage occurs as the estimated time before the outage

becomes manifestable. For instance, the frequency of a constraint might be once in 1,000 years. Accordingly, the risk related to security of supply with regard to each capacity constraint is made measurable. The TenneT risk matrix template (FIGURE 6) displays various colors to represent the calculated risk score: The two shades of green refer to risks which are neglectable. Yellow means “Medium” and requires mitigation. Risks become more serious moving to orange (High) and red (Very High and Extreme).

By the IP and the risk matrix template, the capacity constraints that threaten security of supply in the years to come receive their meaning as risks. Applying the given ten-year timeframe and the IP scenarios, the scope of the concept of risk is limited to risks which can be quantified. In other words, the enactment of the practices of calculating risk scores utilizing the IP give rise to a limited understanding of the concept of risk. Consequently, the quantitative approach underpinning the risk assessments leaves the risks that move beyond the IP scenarios out of scope. For instance, we refer to the lack of societal support for building new pylons and lines for large-scale electricity transmission.

The risk management practices of calculating risk scores and the grid planning practices are enacted amid both these arrangements. To illustrate this, we provide an example of one of the grid strategists who points to the highly improbable events which might have devastating consequences for the security of supply. She shares her concerns about this topic during one of the second wave interviews [Interview 23]:

*“But we also need to discuss multiple risks which you have not thought of before, for instance developing and building a new city results in many risks to our assets, threatening the security of supply. However, it proves to be hard to include these risks in the risk matrix, in the current situation. Because the chance that such a risk becomes manifestable is very small, though the possible damage is huge. That is what we are struggling with: How do we include this in the risk database? This is about risks which are not attached to one individual constraint.”*

*Grid strategist, May 2020*

These lines provide a first indication that grid planning practices go beyond the capacity constraints which are identified as risks in the IP. Uncertainties as reflected in this quote are not regarded as risks as these uncertainties cannot be translated into quantifiable risks. As such, tension comes to the fore between striving to assess

risks systematically by calculating risk scores and exploring risks TenneT is not familiar with. The latter has become quite relevant in recent years, due to the change processes as a result of the shift to the use of electricity from renewable sources.

TABLE 7 summarizes how these two material arrangements and practices form practice-arrangement bundles by which we can deeply understand the risk management practices serving security of supply in the TenneT case study:

**TABLE 7:** *Applying the sensitizing framework to the TenneT case study*

|                                                 | <b>Sensitizing framework<br/>(section 2)</b>                                                                                                                                                                                       | <b>TenneT case study</b>                                                                                                                                                                                                  |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Material arrangement<br>(arrangement for short) | “a specific constellation of material entities that gives meaning to the doings and sayings of a practice, while simultaneously providing meaning to the individual entities of the constellation” (Loscher et al., 2019, p. 120). | The arrangements we identify within the TenneT case study are the investment plan (IP) and the risk matrix template. By these, the capacity constraints receive their meaning as risks which threaten security of supply. |
| Practices                                       | Nexus of actions, organized by four organizing principles. “a temporally evolving, open-ended set of doings and sayings” (Schatzki, 2002, p. 87).                                                                                  | Zooming in on the stages of initiating investments and studying investment alternatives, we distinguish 1) the practices of calculating risk scores and 2) the grid planning practices.                                   |
| Practice-arrangement bundle                     | “a mesh of human practices and material arrangements” (Schatzki, 2003, p. 195).                                                                                                                                                    | These are the meshes of the material arrangements (IP and the risk matrix template) and the practices of calculating risk scores and grid planning practices.                                                             |

**TABLE 7:** *Continued*

|                       | <b>Sensitizing framework<br/>(section 2)</b>                                                                                                                                                                        | <b>TenneT case study</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Actions               | Understood as doings and sayings.<br>The equivalent of human activities.                                                                                                                                            | <p>Practices of calculating risk scores include the following activities:</p> <ul style="list-style-type: none"> <li>• Calculating risk scores for each individual capacity constraint.</li> <li>• Aggregating and reporting the risk scores, comparing these to the IP.</li> </ul> <p>Grid planning practices include multiple practices which are not associated with the risk management serving security of supply. These are out of scope.</p> <p>In the present case study, we zoom in on the activities to prepare Gate1-documents displaying how each individual investment contributes to the security of supply. These practices include the following activities:</p> <ul style="list-style-type: none"> <li>• Presenting various investment alternatives to solve a certain capacity constraint.</li> <li>• Discussing the investment alternatives with the DSOs to come to a joint effort to solve capacity constraints in various transmission networks effectively.</li> <li>• Determining the technical feasibility of each investment alternative.</li> <li>• Research to ensure the pros and cons of each investment alternative. This includes calculating how each investment alternative affects future grid demand and capacity.</li> </ul> |
| Organizing principles | By these the activities become part of the practice. Schatzki distinguishes the following as the four organizing principles: Teleoaffective structures, rules, general understandings and practical understandings. | With regard to the practices of calculating risk scores and grid planning practices in the TenneT case study, the four organizing principles are discussed in detail in sections 4.3 and 4.4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

The IP and the risk matrix template are part of both the practice-arrangement bundle of calculating risk scores and the practice-arrangement bundle of grid planning practices. However, the organization of the risk management practices proves to be different in both bundles. In particular, rules predominate as an organizing principle in the practice-arrangement bundle of calculating risk scores (section 4.3), while general and practical understandings come to the fore as the most prominent kinds of organizing principle in the practice-arrangement bundle of grid planning (section 4.4).

### 4.3 B - Practices of calculating risk scores

Risk management enters the stage as the grid strategists need to prioritize the investments to solve the most severe capacity constraints first. For this goal, the risks associated with the individual capacity constraints need to be made measurable and comparable. The grid strategists discuss each capacity constraint with the RM&PM team to determine the risk score. Each individual capacity constraint including the calculated risk score is recorded in the risk database. Moreover, based on the risk scores, the RM&PM team presents a portfolio of investments, which is the portfolio that is presented in the IP covering the ten years ahead. Moreover, at a European level, a ten-year network development plan is prepared based on the IPs from the different countries.

#### B1 – Teleoaffective structures

The risk managers in the RM&PM team consider the risk score of each individual capacity constraint carefully. Once again the risk managers emphasize their responsibility to provide a fair risk score for each capacity constraint to keep them comparable to each other. Calculating and classifying risks reveal the end, the *teleos*, of providing a systematic account of the risks associated with the constraints.

The RM&PM team regularly provides an aggregation of the risk scores as an overview to inform TenneT senior management and the EB. This aggregation is internally known as “the asset risk position” (ARP). The RM&PM team includes an update of the ARP in the quarterly report which is denoted to as the CAPEX report (Capital Expenditure Budget). The ARP is supposed to represent reliably the actual risk that TenneT cannot realize the investments serving security of supply in line with the IP.

This *teleos* links up with “quantitative enthusiasm” as Mikes (2009) uncovers in her case study to understand risk management within two large banking organizations. Mikes signals that in this situation the risk management aim is fundamentally to

report about risks. Concerning TenneT, risk managers have a role in the RM&PM team to report about the calculated risk scores caused by individual constraints and about the aggregated risk scores. These reports serve to give an account of the pace of realizing investments compared to the investment portfolio as included in the IP.

## B2 - Rules

Capacity constraints become categorized as medium or more serious if the risk score associated with the constraint exceeds a predetermined value. This rule determines the future course of action because the TenneT guidelines prescribe that these risks need to be addressed. Typically, an investment is needed in order to solve the issue or, at least, action is required to make the risk more acceptable, for example by reducing the most serious negative consequences by additional measures. The calculated risk score is the condition for moving from the stage of initiating investments to the stage of studying alternatives as reflected in *FIGURE 4*. The grid strategists have to demonstrate that the capacity constraint they have identified is associated with a risk that needs to be addressed because it severely threatens security of supply. In this regard, the RM&PM team lead comments on the goal of making risk calculations [Interview 20]:

*"And that is the goal. The first goal of our risk scores is that these reveal 'Medium Risk' or 'High Risk' implying we need an investment project. All the grid strategists know this very well: 'If we want to do something [i.e. to initiate and execute an investment project], we need risk management's consent by showing that there really occurs a risk based on my constraint.'"*

*RM&PM team lead, January 2020*

The rules as displayed in the TenneT guidelines come to the fore as quite dominant in the practice-arrangement bundle of calculating risk scores. Rules are regarded as suitable to adequately facilitate the human decision-making process about which investments need to be prioritized. In particular, this applies to the gate documents which are the preset requirements for moving from one stage of investment realization to the next. According to the schedule of realizing investments, in line with the stages reflected in *FIGURE 4*, completing a gate document is regarded as a meaningful milestone, a result. As such, the risk managers in the RM&PM team monitor the follow-up of outstanding questions which delay the gate document.

### B3 - General understandings

Capacity constraints are understood as risks which can be objectively ranked by multiplying the chance that a constraint becomes manifestable with the impact of the consequences. These practices are rooted in the general understanding to make risks measurable and to translate uncertainties into manageable items (Themsen & Skærbæk, 2018). This general understanding of risk management fits into a regime of quantification in which an accounting logic is dominant (Mikes, 2009). The capacity constraints become *engineered risks* which are quantifiable and objectively observable in nature (see also Miller & Power, 2013). In other words, the practices of calculating risk scores renders the meaning to the capacity constraints as engineered risks.

Notably, with regard to the capacity constraints, the IP 2020 yields 248 capacity constraints, which were included for the first time in the CAPEX report Q1 2020. The management summary of this CAPEX report starts with the following sentences explaining why the ARP has increased over the reporting period:

*“Over the underlying reporting period, the risk score calculations have been actualized. This resulted in a significant increase in the number of risks and an increase in the risk profile. The biggest part of this increase is connected with the capacity constraints; especially in the 110/150kV-network, a significant increase can be observed.”*

CAPEX report Q1 2020

This risk representation gives centerstage to counting and aggregating the risk score calculations for the goal of risk reporting. As such, the actualization of the risk score calculations based on the IP 2020 is presented as the cause of the increased risk profile. We would rather understand that changes in the external environment affect the increasing risk profile. In particular this applies to changes which were not well accounted for in the IP scenarios.

### B4 - Practical understandings

Concerning the practices of calculating risk scores, the practical understandings refer to *knowing how to quantify and aggregate* the risks associated with the various capacity constraints in line with the IP. As such, quantifying risks requires estimations to determine the impact and the frequency associated with each capacity constraint.

### Discussion of the practices of calculating risk scores

Rules prevail in the practices of calculating risk scores, anchored in the quantitative enthusiasm that capacity constraints can be represented as quantifiable risks. Aggregating risk scores is considered as meaningful to understand the total TenneT risk profile with regard to the investment realization. However, discussing the practices of quantifying risks as part of the practice-arrangement bundle of calculating risk scores, tension comes to the fore between the ambitions reflected in the IP and the pace of realizing the investment projects. The members of the RM&PM team understand this quite well. For instance, one of the risk managers draws attention to the dynamics at the demand side, driving the complexity to reliably predict the required grid capacity [Interview 20]:

*“And, in the province of North-Holland, many user requests for connection to the grid need to be realized. In particular, the datacenters located in this region demand a lot of grid capacity. As a result, the grid might be over-occupied. If a connection line fails in this situation... in sum this applies to the whole grid in that region: If only one thing happens, the lines which are still in operation need to deal with a huge grid load because of the grid demand required by the datacenters. This implies a lot of capacity constraints as reflected in the IP.”*

*Risk manager of the RM&PM team, January 2020*

These dynamic complexities in the external environment set the scene; TenneT has to speed up its efforts to strengthen the transmission networks in order to facilitate the shifting and growing grid demand.

## 4.4 B - Grid planning practices

The practice-arrangement bundle of grid planning practices consists of the risk matrix template and the IP as the material arrangements together with the grid planning practices. The grid planning practices explore the uncertainties expected beyond the ten-year timeframe and beyond the given scenarios. This is reflected in a different organization of the practices. In this section we argue and show that practical and general understandings mainly organize the grid planning practices.

The grid strategists have the responsibility of ensuring that the existing grid capacity is able to facilitate the required amount of electricity transmission in the future and in the current situation. These practices refer to both the prospective and real-time mode of organizing risks. The first refers to the future situation, the latter refers to the current situation. Regarding security of supply in the future,

following the practices of calculating risk scores, the grid strategists investigate the thinkable investment alternatives to address the capacity constraints with a risk qualification of medium, high, very high or extreme. Several investment alternatives are presented in a Gate1-document, highlighting one of these alternatives as the preferred option.

Regarding security of supply in the current situation, TenneT and the DSOs share the responsibility of ensuring that connection requests can be realized in time. Connection requests include the requests by large end-users which are connected directly to the TenneT grid, as well as the requests by small end-users which are connected to the grid via the networks owned by the DSOs.

The present section highlights the grid planning practices with regard to security of supply in the current situation and in the future alike. As such, this section includes an example showing the cooperation between TenneT and the DSOs and various examples from the Gate1-documents.

### **B1 – Teleoaffective structures**

The grid strategists pursue the end to grant access to the electricity transmission network for every person and every organization in the country; this ideal is commonly, both inside and outside TenneT, referred to as the “copper plate”. TenneT and the DSOs have an obligation to connect the end-users upon their request. This requirement applies to the situation that an end-user requests to utilize the network to purchase electricity as well as to the situation that an end-user is an energy producer who intends to utilize the network connection for the transition of the electricity produced by wind turbines or solar farms. The grid strategists consider TenneT’s responsibility to connect end-users in cooperation with the DSOs to be their highest priority. One of the grid strategists underlines that connecting end-users is a “must-do” [Interview 27].

The increasing number of connection requests reveals the emerging tension between the required efforts to connect the end-users in time and to extend and strengthen the grid, given the limited capacity of resources [Interview 27]:

*“We are busy due to the point that we need to realize more connection requests that we receive from the DSOs. Yes, you truly feel things are changing and shifting as a result of the energy transition. The growing number of connection requests provides a first indication of this development of change.”*

*Senior grid strategist, January 2021*

This quote reflects how the enactment of grid planning practices is subject to change following the current circumstances. The ideal of the “copper plate” seems to be becoming more and more a subject of debate among politicians and the regulator.

## **B2 - Rules**

With regard to evaluating investment alternatives, the grid strategists execute the first selection of which investment alternatives might be acceptable and realistic to solve a certain capacity constraint. For this end, the grid strategists determine which investment alternatives are to be discussed in the Gate1-document. Rules are missing regarding the question of which and how many investment alternatives should be included in the Gate1-document.

## **B3 - General understandings**

Discussing the selected Gate1-document with the responsible grid strategists, the technical feasibility comes to the fore as a key issue shared by many. The grid strategists underline that each capacity constraint is unique [Interview 22]:

*“The point is... we don’t talk about mass production of biscuits, do we? We want to standardize, but, after being a grid strategist for ten years, I notice that every location is different. Every station is different, even if they have been built around the same time by the same company or according to one design.”*

*Grid strategist, May 2020*

Consequently, completing a Gate1-document might take time as the grid strategists need to ensure the technical feasibility of each investment alternative. Thorough understanding of the investments proposals prevails over delivering Gate1-documents in accordance with preset rules and timelines. The grid strategists refer to the increasing pressure to deliver Gate1-documents in time. As a result, tension emerges, as the grid strategists typically need additional time to understand all uncertainties concerning the capacity constraints in depth.

Pursuing the feasibility of each investment alternative, the grid strategists pay more and more attention to recent trends which threaten the technical feasibility of the investment alternatives. For instance, the grid strategists acknowledge that considering the limited resources to realize an investment has become more impactful over recent years. The increased attention for the availability of scarce resources is not the result of a plan, based on rational human intentions; instead,

this emerges more or less spontaneously, without a plan, as the grid strategists are facing severe difficulties in realizing investments in time. In other words, by enacting the grid planning practices, the meaning of the risks associated with the capacity constraints are stretched beyond the meaning of engineered risks.

These practices unfold organically (see also Miller & Power, 2013). For that reason we call these risks *organic risks*. The word *organic*, in this sense, refers to the point that a capacity constraint cannot be fully understood by separating the constraint into smaller components. In this sense, we have shown that the engineered risks draw attention to risk representations as a result, consisting of calculations based on a limited number of scenarios and the fixed ten-year timeframe. Additionally, the grid planning practices reflect that the nature of capacity constraints has become more complicated. As such, the organic risks give centerstage to the process of exploring risks to understand them against the background of unpredictable and dynamic complexities.

With regard to the grid planning practices, the practical intelligibility first and foremost refers to the technical feasibility of the investment alternatives. The grid strategists share the feasibility theme as a key issue to address, that is a general understanding. In particular, this applies to ensuring that the investment might be realized within an acceptable timeframe. Feasibility in this sense might be at stake due to the limited availability of the workforce and the limitations to receiving adequate building permits. The grid strategists acknowledge during the interviews that concerns about realizing investments in time have become more prevalent in recent years. By enacting the grid planning practices, the feasibility of realizing the various investment alternatives is being explored.

Striving for the feasibility of investment projects is rooted in the general understanding that the TenneT network components are assumed to operate without interruption for a very long period of time. For that reason, the grid strategists frequently consider and discuss the long-term development of the grid demand in order to select the most appropriate investment alternative. In this sense, the grid planning practices do not stick to a fixed and limited time horizon; rather, the grid strategists frequently refer to the consideration of to what extent an investment is “futureproof”. Futureproof does not refer to a specific number of years and, as a result, different practitioners have their own interpretations of this concept.

For instance, the grid planning team manager reveals that for him, futureproof means that the investment would at least be sufficient for the period of the next ten years and maybe more. However, due to the unpredictable nature of future grid demand, the usefulness of a certain investment beyond that timeframe is hard to predict. Other practitioners refer to a horizon of between 40 and 50 years, as new assets are assumed to keep their technical function over such a long period. From a technical perspective and their detailed knowledge of the existing grid, grid strategists tend to prefer investment alternatives which are believed to be robust. Robust in this sense means that the investment alternative is the most appropriate thinkable solution to serving security of supply in the long run, even if future circumstances turn out to be different than currently expected.

However, in many situations these futureproof alternatives imply that additional resources are required. Consequently, tensions might emerge, given that many investments have to be realized in order to achieve the ambitions reflected in the IP. In other words, the timely execution of an investment alternative might be at stake if the grid strategists select a solution which requires a lot of resources. As a result, TenneT might not be able to achieve the investment ambitions reflected in the IP.

In brief, the grid planning practices give rise to a more fluid understanding of risk management with regard to the capacity constraints, moving beyond the conception of risk management as the result of human intentions and rational decision-making. These practices include exploring the uncertainties beyond the preset timeframe and scenarios underpinning the IP.

#### **B4 - Practical understandings**

The practical understandings in the grid planning practices serve the practical intelligibility of technical feasibility. In this regard, *tacit knowledge* about the TenneT grid and the connections with the networks owned by the DSOs come to the fore as highly relevant in the enactment of grid planning practices. This knowledge is shared among the TenneT grid strategists and this knowledge prevails in the cooperation with the DSOs. To illustrate this, we point to the north of the Netherlands. The generation of solar energy has been expanding rapidly in this region in recent years. As a result, the number of requests to be connected to the electricity transmission network is rising as well, resulting in a considerable amount of capacity constraints in the 150/110kV-network. Due to this strong and unexpected growth in the number of solar farms, TenneT and the DSOs face the challenge of how they can realize the customer connections within the legal required term. We illustrate how risk management practices were enacted in

this specific situation from a conversation during a meeting about electricity transmission in this region in March 2020:

*The DSO representatives outline that future capacity demand is also influenced by the demand of their potential customers. They explain that a number of organizations were sent an offer to get connected to the regional network and, consequently, to become a customer of the DSO. One of the DSO representatives comments: "Though, we don't have the information to reliably estimate how many of them would accept the offer." Making things more complicated, the available estimations prove to refer only to organizations which are considered big users. The attendees agree this way of reasoning implies that the network capacity could get under pressure by other kinds of users as families and small organizations. One of the TenneT representatives summarizes: "That is a risk we take."*

4

We observe that the meeting attendants refer to their own experience and their knowledge of the grid. They do not back up the knowledge from scenarios about future grid demand. They would rather point to knowledge as this comes into being through carrying out practices, showing that the challenge of connecting end-users is a key issue to be addressed by TenneT and the DSO. That is to say, the practitioners draw upon the practice memory, connecting the practices carried out in the past with the carrying out of practices in the present situation. The grid planning practices are enacted based on the experiences from earlier executed investment projects. In this regard, Schatzki (2006) points to "practice memory" (p. 1868), as the organization of the practices is persistent over time.

In the TenneT case study, the general and practical understandings in the organization of grid planning practices are persistent over time; these organizing principles are vital to connect the execution of investment projects in the past with the current challenging conditions. Through practice memory, TenneT professionals remember and intuitively know from their experience what makes sense for them to do in the current situation. As such, practice memory does not predetermine actions, but "the organization of past practice continues to circumscribe present practice" (Schatzki, 2010, p. 216, cited by Ahrens & Ferry, 2018, p. 19). The general and practical understanding prevails in the production of organic risks over applying preset rules.

The grid strategists point to the increasing pressure to make sure that the investment projects do not get delayed, even at the cost of additional efficiency losses in some situations. For instance, one of the grid strategists points to a line connection with

a limited capacity which needed to be upgraded. The grid strategist recalls how this came down to the question “how to upgrade the connection capacity with limited adjustments or even without any adjustment?” The grid strategist prefers to avoid a time-consuming procedure of getting a building permit. Ultimately, the grid strategist presents the decision to apply a novel technique in this situation, based on the high temperature of the lines. The grid strategist comments on this [Interview 25]:

*“The higher the temperature, the more the line will bend down. The conductor gets hot, dilates and bends down. That is not permitted. Yes, actually it is permitted to a certain limit. At a certain moment, applying this technique came to the fore as a feasible alternative to solve this constraint. This alternative might cause additional costs, but the advantage is clear: The process of getting building permits will have less influence. The losses due to inefficiency will increase, but we can account if this will really be an issue or not.”*

*Grid strategist, June 2020*

Through the enactment of grid planning practices, this innovative solution is uncovered as the most appropriate investment alternative, in the context of the specific external dynamics and, in particular, the pressure to realize investments without delay. The selection of this investment alternative is developed step-by-step by carrying out the grid planning practices. The grid planning practices move beyond the meaning of engineered risks; instead these practices render a more fluid meaning to the risks associated with the capacity constraints.

## 4.5 Summary of the findings

TABLE 8 summarizes the detailed findings concerning the practice-arrangement bundles of calculating risk scores and grid planning.

**TABLE 8:** *Summary of the findings*

|                           | <b>Practice-arrangement bundle of calculating risk scores</b>                                                                                                                                                                               | <b>Practice-arrangement bundle of grid planning</b>                      |
|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
|                           | <i>Focus: The prospective mode of organizing risks</i>                                                                                                                                                                                      | <i>Focus: The prospective and the real-time mode of organizing risks</i> |
| A – Material arrangements | The biannual investment plan (IP) and the <b>risk matrix template</b> are the material arrangements which are part of both the practice-arrangement bundle of calculating risk scores and the practice-arrangement bundle of grid planning. |                                                                          |

TABLE 8: Continued

|                               | Practice-arrangement bundle of calculating risk scores                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Practice-arrangement bundle of grid planning                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B1 – Teleoffective structures | The <i>teleos</i> of the practices of calculating risk scores is to provide a systematic account of the risks associated with the various capacity constraints. <b>Quantitative enthusiasm</b> (Mikes, 2009).                                                                                                                                                                                                                                                                                           | The various grid planning practices share the aim of granting the connection to the electricity transmission network for every person and organization in the Netherlands. This <i>teleos</i> is known as <b>'the copper plate'</b> .                                                                                                                                                                                                                                      |
| B2 – Rules                    | <p>Calculation rules as part of the <b>TenneT guidelines</b> dominate the practices of calculating risk scores as they determine the future course of action. In this sense, the gate documents represent an important milestone in the investment realization. Consequently, delivering these documents without delay is regarded as a result.</p> <p>By applying the calculation rules, the practices of calculating risk scores scope out the uncertainties which cannot be quantified reliably.</p> | In-depth understanding of the investments alternatives prevails in the grid planning practices over delivering Gate1-documents in accordance with preset rules. Rather than conceiving the timely deliverance of Gate1-documents as a result, the grid planning practices stress the processes of exploring and considering the technical feasibility of each investment alternative. In this sense, risks unfold organically: we refer to these as <b>organic risks</b> . |
| B3 – General understandings   | The general understandings refer to making risks objectively measurable. The capacity constraints receive their meaning as <b>engineered risks</b> .]                                                                                                                                                                                                                                                                                                                                                   | The grid strategists emphasize the technical feasibility of the various investment alternatives as a shared matter of debate. The grid strategists aim to ensure that the TenneT networks can continue to operate for a very long period of time; investments have to be <b>futureproof</b> . As such, the meaning of capacity constraints is stretched beyond the limitations embodied in the IP.                                                                         |
| B4 – Practical understandings | The practical understandings refer to <b>knowing how to quantify</b> the risks associated with the various capacity constraints.                                                                                                                                                                                                                                                                                                                                                                        | Serving the practical intelligibility of technical feasibility, <b>tacit knowledge</b> prevails in the grid planning practices. This tacit knowledge comes into being by enacting the grid planning practices. The practical understandings explore the scope of risks beyond the ten-year timeframe and beyond the scenarios displayed in the IP.                                                                                                                         |

The present case study reveals how the capacity constraints receive their meaning as risks through the enactment of multiple practices. As such, the TenneT case study shows an alternative for conceiving the IP and the risk matrix templates as tools in human hands by which the role of risk management is focused on the question of how TenneT might achieve the IP ambitions. The findings from the TenneT case study show two practice-arrangement bundles which are connected by the IP and the risk matrix template as the involved material arrangements. These two bundles are the practice-arrangement bundle of calculating risk scores and the practice-arrangement bundle of grid planning.

Utilizing the IP and the risk matrix template, the capacity constraints get their meaning as risks. However, this meaning is different in both practice-arrangement bundles. Within these bundles, risk management practices emerge through the enactment of the practices by diverse kinds of TenneT professionals. The present case study reveals how entities such as capacity constraints receive a different meaning as part of the practice-arrangement bundles of calculating risk scores and grid planning. With regard to the organization of the practices of calculating risk scores, the rules are dominant. Applying the ten-year timeframe and the given scenarios from the IP, this practice-arrangement bundle gives centerstage to understanding risks as manageable items. Accordingly, capacity constraints receive their meaning as engineered risks. In this regard, delivering Gate1-documents supports the monitoring of the extent to which TenneT is able to realize the investments in line with the IP portfolio. However, the inherent limitations of understanding risks as manageable items are obvious, both to the risk managers in the RM&PM team as well as to the professionals outside the circle of risk managers and management accountants. Tension emerges as the external circumstances prove to be complicated and have recently turned into a background of unpredictable and dynamic complexities. Reporting on risks as manageable items falls short in these circumstances to faithfully represent the underlying uncertainties.

With regard to the organization of the grid planning practices, the general and practical understandings prevail over the rules. Pursuing the end to grant access to the electricity transmission for every person and organization in the Netherlands, the TenneT professionals do what makes sense for them to do given the background of the unpredictable and dynamic complexities rather than solely applying given rules. As such, the enactment of the grid planning practices increasingly stresses the technical feasibility of the investment alternatives as a key issue among the grid strategists. Accordingly, the Gate1-documents discuss in depth the complications associated with the various investment alternatives, reflecting the

continually unfolding process of exploring uncertainties in the face of the external dynamic complexities.

Risk reporting about the security of supply in the TenneT organization primarily happens for the sake of giving an account to the regulator and the public concerning the question of whether or not TenneT is able to realize the grid investments according to the IP. The tension between the practices of calculating risk scores and the grid planning practices continues to exist; we have not come across any indication that one risk understanding prevails over the other one. We would rather argue that the TenneT case study demonstrates that the risk management practices consist of a totality of different kinds of risk management practices. Both the practices of calculating risk scores and the grid planning practices contribute to the totality of risk management practices.

## 5. Conclusion, discussion and directions for future research

### 5.1 Conclusion

We have demonstrated how risk management as a social phenomenon unfolds in the context of multiple practice-arrangement bundles against the background of unpredictable and dynamic complexities. We have revealed that the practice-arrangement bundles are meshes consisting of material arrangements, such as the risk matrix template and the IP, and practices as organized human activities (Schatzki, 2005).

Moreover, we have uncovered the differences in the organization of the practices as part of two selected practice-arrangement bundles. Firstly, we have discussed the practices of calculating risk scores in which rules prevail in the organization of the practices; this results in the production of engineered risks. Secondly, we shed light on the grid planning practices in which general and practical understandings prevail over the rules in the organization of the practices. These grid planning practices result in the production of organic risks. The TenneT case study reveals how the mesh of material arrangements and grid planning practices render the meaning of organic risks to the capacity constraints. Tacit knowledge comes to the fore as being quite meaningful in the grid planning practices.

The production of the engineered risks is closely related to the identity of risk managers as risk reporters. As such, the risk representation is perceived as a result

to give an account based on a set of predefined features. Additionally, the chapter draws attention to the meaning of organic risks which give centerstage to an in-depth understanding of the complications surrounding the selection of investment alternatives. Tension emerges in the situation that risk managers stress the timely deliverance of risk representations, in line with preset reporting criteria, while the practitioners outside the circle of risk managers and management accountants need additional time to understand the risks in full depth.

Notably, this study sheds light on the meaning of practice memory (Schatzki, 2006a; Ahrens & Ferry, 2018) with regard to risk management. We have shown that the persistence of general and practical understandings connects the enactment of practices in the past with the carrying out of practices in the current situation. Ahrens & Ferry have discussed the role of practice memory in their accounting paper about budget control in a lower governmental organization. This chapter provides a novel contribution extending the role of practice memory to the context of risk management practices. We emphasize that risk management practices unfold to explore new risks based on the tacit knowledge TenneT professionals gain by enacting various risk management practices. We point to the examples provided in section 4, such as the discussion between TenneT representatives and the DSO representatives on how to achieve the objective of security of supply in specific challenging external circumstances. As such, an open-ended social order comes to the fore in the relation between past and present practices as well as in the way knowledge is utilized to explore novel risks. The latter applies in particular to the risk management practices which evolve and emerge outside the circle of risk managers and management accountants.

The current case study uncovers how the totality of risk management practices is carried out in a time of activity (Schatzki, 2006b). Actions cannot be predetermined by the causes preceding the action as if causes and actions happen in a “succession of moments” (p. 159). That view would presume that humans are able to distinguish between now, as the moment in which risks are identified, and the future, as the moment in which risks might become manifestable. This distinction is at the core of the normalizing practices of organizing risks for the sake of management at a distance and for the sake of monitoring the risk management efficiency by the regulator. The TenneT case study indicates the limitations of the normalizing practices and shows how risk management practices emerge through the simultaneous enactment of practices by both risk managers and grid strategists.

## 5.2 Discussion

The existing literature about risk management practices drawing on Schatzki's site ontology (Bui et al., 2019; Tekathen, 2019; Klein & Reilley, 2021) focuses on risk management as a management accounting concept. That is, these studies implicitly assume that humans are able to make a distinction between which activities belong to the area of risk management as part of the organization's management accounting and which do not. Building on these papers, the present case study reveals how multiple risk management practices form an open-ended social order in which the nature of risks is continually drifting and subject to change. Equally importantly, the present study makes a scientific contribution by showing how multiple different practice-arrangement bundles emerge and evolve against the background of unpredictable and dynamic complexities.

The heart of risk management is not the outcome for the sake of giving an account of the risks the organization faces. We would rather understand risk management as a social phenomenon unfolding in the web of interrelated practice-arrangement bundles which gain understanding of uncertainties against the background of unpredictable and dynamic complexities. Consequently, in line with Schatzki (2002), we advocate to understand risk management as "arranging", referring to a bundle of organizational practices instead of "arrangement" as a situation. As such, this study opposes the view of understanding risk management primarily as the result of human intentions and decision-making.

In the current situation, the TenneT EB is deeply involved in assigning the scarce resources, trading off the available resources between the maintenance and inspection activities and the investment activities. Furthermore, TenneT aims to maximize the effective execution of investment realization by introducing standardized solutions which are assumed to be suitable for solving a manifold of different capacity constraints. In doing so, TenneT aims to increase the speed of realizing investments serving the security of supply in the years to come. However, zooming in to the risk management practices, the current case study reveals the shortcomings in applying standardized solutions against the background of unpredictable and dynamic complexities.

Accordingly, we bring the TenneT EB into consideration to understand the risk management practices as the means to explore and understand novel risks. The case study uncovers that understanding the capacity constraints as engineered risks falls short in the current conditions. Perceiving capacity constraints as organic

risks would better facilitate understanding the unpredictable dynamics driving the risks threatening the security of supply.

Furthermore, we emphasize that practices are enacted anyway, both in line with the preset plan and beyond existing plans and prescriptions. The case study clearly shows that the TenneT AM staff acts in response to the new challenges they have to face. Forming an open-ended social order, the risk management practices were not limited to merely physical assets but also affect the societal consequences of the investments. Consequently, the EB needs to continually challenge the AM staff to come up with the adequate investment alternatives and to select the most appropriate alternative given the specific circumstances instead of aiming to direct the outcome of the actions by TenneT staff.

Bui et al. (2019) underline that by changing the general understandings the organization's risk management might be changed as a directional move. The TenneT case study highlights the role of practice memory, in particular with regard to the general and practical understandings as the prevailing organizing principles associated with the grid planning practices. Through practice memory, the general and practical understandings which organize the grid planning practices direct the organization of grid planning practices in the future. The EB might reflect how these general and practical understandings might be supportive for a favorable outcome. How do these understandings prefigure the action's outcome in line with the overall EB vision and in line with societal expectations?

Underlining the interrelatedness of multiple practice-arrangement bundles, we emphasize that the risk management practices with regard to security of supply are likely to be enacted in other practice-arrangement bundles as well. We refer to the maintenance and inspection practices which have been discussed as highly relevant for granting the security of supply. Moreover, we point to practices of analyzing the energy market to forecast the long-term threats to the security of supply. We have briefly discussed the latter kind of practices with a TenneT staff member in one of the second wave interviews [Interview 29]. We underline the interaction between the enactment of these practices and the two practice-arrangement bundles that have been the focus of the current case study.

### **5.3 Directions for future research**

The present chapter emphasizes the practices of understanding novel risks through the ongoing enactment of risk management practices. We would rather say that the security of supply is being unwrapped through the risk management practices than

to understand that all aspects of security of supply are known precisely. Similarly, concepts like the energy transition and sustainability cannot be predefined either way. Instead, these concepts receive their meaning by carrying out multiple practices simultaneously. Future research might include case studies to shed new light on how phenomena such as the energy transition receive their meaning in a specific context.

This chapter questions to what extent risk representations are adequate for giving an account of risk management given the background of unpredictable and dynamic complexities. This is highly relevant in contemporary society with regard to risk representations about issues which emerge against the background of dynamic complexities. The issues and uncertainties surrounding the theme of climate change provide an example. Giving an account of risk management to show how an organization deals with the uncertainties following climate change or the energy transition is a matter of debate for many organizations. This applies both to giving an account to market regulators as well as to the public in general. We challenge future research to explore these questions.

Similarly, the existing stream of literature about risk management drawing on Schatzki's site ontology (Bui et al., 2019; Tekathen, 2019 and Klein & Reilley, 2021) focuses on the normalizing practices in the prospective mode and their emphasis on risk representations to give an account of risk management. By contrast, the TenneT case study displays a more fluid understanding of the risk management practices, including the improvising risk management practices which are enacted in the real-time mode and the normalizing practices which are enacted in the prospective mode (Hardy et al., 2020).

We underline the importance of integrating the study of the practices of organizing risks in the prospective mode, the real-time mode and the retrospective mode as suggested by Hardy et al. (2020). The present chapter follows up on this call, insofar as we have focused on the risk management practices in the prospective and the real-time mode of organizing risks, studying these practices in one organizational context. We suggest future research might deepen our understandings of the regulating practices concerning the prospective, real-time and retrospective mode of organizing risks. Highlighting the latter, studying the practices in the retrospective mode from the context of the regulator might be highly relevant with regard to the electricity market and to numerous other areas in the public sector as well.

## 6. Chapter summary

This chapter presents a case study aiming to understand how risk management practices unfold as an open-ended social order and how this gives meaning and identity to multiple entities. This study draws on practice theory and we acknowledge that entities receive their meaning and identity through the enactment of practices (Nicolini, 2012). This shows a sharp contrast with the functionalistic view of risk management which assumes that risk management in the organizational context is the result of human intentions and decision-making.

The case company TenneT is a large network operator, responsible for the electricity transmission in the Netherlands and a large part of Germany. TenneT is a Dutch state-owned company which has a monopoly for high-voltage electricity transmission in the Netherlands. The study focuses on risk management practices serving the security of supply; these are the risk management practices to grant the uninterrupted electricity transmission now and in the future.

The chapter utilizes Schatzki's practice theory (2002) to set up a sensitizing framework for understanding how risk management practices emerge and evolve. The sensitizing framework structures the findings regarding the practice-arrangement bundles which consist of material arrangements and practices. Based on the sensitizing framework, we demonstrate how risk management as a social phenomenon unfolds in the context of multiple practice-arrangement bundles.

In particular, this chapter highlights the risk management practices to schedule and prioritize the investment in the transmission networks. TenneT has to speed up the investments realization as the capacity of the transmission networks need to be enlarged due to the energy transition. The energy transition in the field of electricity refers to the intended shift to the complete consumption of electricity from renewable sources by the year 2050. To achieve this ambition, the transmission networks need to be extended, however, uncertainties surround the questions exactly when and where these extensions will be required.

The study highlights two different practice-arrangement bundles which are the practice-arrangement bundle of calculating risk scores and the practice-arrangement bundle of grid planning practices. The organization of the practices within these two bundles is different: With regard to the practices of calculating risk scores, the rules come to fore as the most prominent. These practices result in the production of engineered risks. Risk managers receive their identity as risk reporters.

With regard to the grid planning practices, general and practical understandings prevail over rules. Given the unpredictable and dynamic complexities of the energy transition, we highlight that specifically the organization of the grid planning practices prefigure the actions to respond to novel risk intuitively. Within this practice-arrangement bundle, the TenneT professionals include tacit knowledge to make a risk-based tradeoff with regard to individual investment projects.

This case study emphasizes that risk management practices are open-ended in nature: The risk management practices are not limited to the preset borders to understand and record risks. Moreover, the case study includes the risk management practices enacted by TenneT professionals outside the circle of risk managers and management accountants. As such we contribute to the existing literature to understand risk management practices beyond the practices associated with the organization's risk management approach. The TenneT case study extends to the understanding of the organization's risk management approach as a management accounting concept (Tekathen, 2019, for instance).



## Chapter 5

# **Conclusions and discussion**

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This chapter contains our conclusions regarding the thesis' overarching research question: *How and why do risk management practices unfold against the background of unpredictable and dynamic complexities?* In brief, this thesis shows that risk management practices unfold as open-ended in nature; this includes non-official risk management practices. The organization of the risk management practices prefigures the human actions that are performed in response to the risks the organization faces. By prefiguration, certain actions become more intelligible than others. Following the prefiguration, we show that practitioners draw on tacit knowledge to perform the actions that make sense for them to perform in a specific situation. This includes actions that are performed intuitively.

This thesis aims to contribute to the risk management literature as part of the field of management accounting which moves beyond the functionalistic view of risk management. For this aim, we performed a systematic literature review to study the state-of-the-art literature on the dynamics of risk management to oversee the field of risk management research that moves beyond the functionalistic view of risk management (Chapter III).

In order to include recent papers on risk management in the field of management accounting, we performed an additional literature search for risk management papers that challenge the functionalistic view of risk management. To this end, we selected all papers up to November 2023 with the words "risk management" in the selection of journals which contain one or more of the 24 papers that were selected in Chapter III. Drawing on the results of the additional literature search, we report that we did not come across any paper that draws on practice theory and that might shed new light on the risk management practices in addition to the literature review as presented in Chapter III. Besides the selected journals, we include the papers by Klein & Reilley (2021) and Moschella et al. (2023) in this chapter to outline the thesis' scientific contribution precisely.

The remainder of this chapter discusses the conclusion and the thesis' scientific contribution (section 1) in more detail. Subsequently, we give an overview of the thesis' practical implications (section 2). Finally, we present a discussion of the thesis findings and we provide several suggestions for future research (section 3).

## 1. The thesis' scientific contribution

With regard to the thesis' scientific contribution, this thesis first demonstrates that risk management practices unfold as an open-ended social order. As such, risk management moves beyond the notion that risk management is something organizations *have*. We understand risk management as a bundle of practices, thus emphasizing that risk management is something practitioners *do*. In this regard, "open-ended" implies that the enactment of risk management practices cannot be limited to a pre-defined group of practitioners such as risk managers or management accountants. Nor can these practices be limited to the actions which are performed following a given plan or risk management approach. Risk management is not solely the result of human intentions and decision-making. Instead, we argue and illustrate that actions of many different practitioners constitute the social order of risk management practices. It is for this reason that we posit that risk management practices unfold as an open-ended social order.

This insight is highly relevant as this challenges the functionality of risk management. The prevailing risk management perception is anchored in the functionalistic view of risk management. According to this view, functionality in the organizational context refers to a hierarchical approach in which different entities and organization have to give an account of their actions. In essence, this gives centerstage to humans as being rational decision-makers and a systematic risk management approach.

By contrast, the position that risk management practices unfold as an open-ended social order, draws attention to the situated functionality of risk management (Ahrens & Chapman, 2007): The functionality of risk management comes into being through practices, as people perform actions which make sense for them in a specific situation. That is to say that how risk management gets shape in the organizational context cannot be prescribed. Since actions cannot be predetermined, risk management practices can unfold beyond given models and risk management approaches. Actions render fluidity to the risk management practices within an organizational context.

Furthermore, we advocate to understand risk management in an organization as a social phenomenon that affects a manifold of other organizational practices. The TenneT case study shows how risk management practices were intermingled with the various practices in the pre-realization stage of investments in the TenneT organization. So the situated functionality of risk management unfolds in a web

of practice-arrangement bundles. We underline the way how risk management practices associate with diverse kinds of practices in the organization cannot be foreseen. Risk management happens (Schatzki, 2006a).

Drawing on practice theory, this thesis provides a totally different view on risk management than the functionalistic view. We might illustrate this difference by comparing the entity of an organization with the entity of the human body. According to the functionalistic view, risk management can be compared, to a certain extent, to a vital organ, for instance the liver. The liver is regarded as the body's chemical plant whose functions are quite important for many parts of the entire body. However, the liver has a given role in the whole body. Its core functionality is not subject to change and the possibilities to adapt to changing circumstances are quite limited.

According to a practice-based view, risk management might be compared to the person's physical condition. The physical condition gets shape through the practices of exercise and sports. These practices affect multiple other practices like practices of eating and drinking. Through the practices of exercise and sports, the physical condition improves, however, the exact way this works out, highly depends on the kind of exercise. We might think of the differences between a marathon runner and a long-distance swimmer.

Secondly, this thesis shows that actions are prefigured, meaning that the organization of practices provides courses of action that are more intelligible to perform than other courses of action. We argue that the actions as part of the risk management practices cannot be predetermined presuming that these are the result of human intentions or the result of a systematic risk management approach. By contrast, through prefiguration, some actions are more likely or more probable to be performed than other actions, given the practice-arrangement bundle of which the action is a part.

Tekathen (2019) discusses the theme of prefiguration as well; however, Tekathen's case study focuses on actions performed by risk managers and risk assistants. As such, Tekathen yields primacy to the actions associated with the organization's risk management approach. Similar to Tekathen's case study, the TenneT case study shows that the organization of the practices prefigures which courses of actions become intelligible. Extending to Tekathen, we point out this also applies to actions that are performed intuitively. Following the prefiguration of actions, practitioners might draw on tacit knowledge to do what makes sense for them in a specific situation.

Thirdly, we emphasize how practices unfold against the background of unpredictable and dynamic complexities. We demonstrate that risks receive their meaning in the enactment of multiple practices, opposing the view that risks have a stable meaning that is known ahead of time. As such, we include the study of how risk management practices contribute to exploring novel risks. For instance, we refer to how the security of supply in certain regions might be threatened due to the rising number of datacenters which require a lot of electricity.

Referring to the state-of-the-art risk management literature, this thesis delivers a contribution to the papers that study risk management practices based on Schatzki's site ontology. Risk management practices within an organizational context have recently been studied by Tekathen (2019), Bui et al. (2019), Klein & Reilley (2021) and Moschella et al. (2023). Each of these four papers explicitly refers to Schatzki's site ontology as its theoretical underpinning.

Tekathen (2019) and Klein & Reilley (2021) both study an ERM approach within a large profit-driven organization; they understand ERM as something the case organization has. These papers do not discuss the introduction of the ERM approach to the organizational context, but take the existence of the ERM approach as a point of departure. The papers by Tekathen and Klein & Reilley still presume that, utilizing an ERM approach, organizations are – at least to a certain extent – able to manage risks systematically. Due to the research scope, the studies by Tekathen and Klein & Reilley fall short of understanding the actions by practitioners outside the circle of risk managers and management accountants. Tekathen performed “an ethnography of the division's ERM” (p. 984). Klein & Reilley also focused on the practices associated with the organization's ERM approach; the authors mention that all interviewees “positioned themselves as experts in ERM” (p. 7).

Bui et al.'s (2019) paper highlights the risk management practices within two municipalities in New Zealand. The case description begins by describing the organization's risk management from legislation and the ISO regulations. As such, the paper presumes risk management to be a result of human intentions as reflected by normative texts. This thesis extends to Bui et al. by understanding risk management practices beyond human intentions and decision-making.

In this regard, we include the study of the non-official risk management practices. These are the practices which are not associated with the organization's formal risk management approach. We draw attention to the paper by Moschella et al. (2023) who pursue the same point. The authors study risk management practices within

small and medium-sized companies. They emphasize the role of informal risk management practices.

Interestingly, Moschella et al. (2023) report from the interviews with the SMEs owners that they view risk management as a “mindset” rather than a set of formal processes (p. 668). The researchers have deliberately avoided referring to the well-known risk management frameworks explicitly during the interviews. The involved SME owners do not refer to COSO or COSO ERM spontaneously. This clearly shows that risk management practices within an organizational context are not limited to the practices associated with the formal organization’s risk management approach. The present thesis extends to this insight by studying the non-official risk management practices within a large organization in the public domain.

Furthermore, Bui et al. (2019) emphasize that Schatzki’s site ontology provides a rich analytic framework to move beyond the risk management description or prescription. The authors claim that changing the general understandings drives a sustainable risk management change as a directional move. Notably, the authors do not explicitly refer to prefiguration. Extending to the study by Bui et al., this thesis highlights that actions are more or less intelligible depending on the different nature of the practice-arrangement bundles. This is not limited to the general understandings but can also be the case for other organizing principles.

Klein & Reilley (2021) discuss the role of multiple temporalities to shape risk management practices within three different entities which are part of a large Brazilian conglomerate. The authors highlight that in the various entities of the conglomerate, different time horizons shape particular practices of risk management (p. 1). Klein & Reilley report how “one temporal horizon dominates over others” (p. 14) within an organizational entity which is regarded as a site in which risk management practices are enacted. Additionally, the present thesis demonstrates that practitioners take up a particular time horizon following the organization of practices in the various practice-arrangement bundles in one organizational context. This shows a more open perception of the site in which the risk management practices emerge and evolve.

*TABLE 9* provides an overview of the thesis’ scientific contribution.

**TABLE 9:** *The thesis' scientific contribution*

|                                        | <b>The existing papers on risk management drawing on Schatzki's site ontology</b>                                                                                                                                                                                    | <b>The thesis contribution</b>                                                                                                                                                                                                              |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Research direction                     | Risk management is understood as a management accounting concept (Tekathen, 2019).                                                                                                                                                                                   | Risk management practices unfold as an open-ended social order and, consequently, also beyond the scope of management accounting.                                                                                                           |
| Research scope                         | Limited to the practices enacted by risk managers and management accountants (Tekathen, 2019; Klein & Reilley, 2021).                                                                                                                                                | Including the practices enacted by a wide range of practitioners.                                                                                                                                                                           |
| How to understand risk management?     | Understanding risk management as something which is part of the organizational context; this departs from the assumption that humans can draw the borders between which practices belong to the organization's risk management practices and which practices do not. | Risk management unfolds an open-ended social phenomenon. As actions cannot be predetermined, humans cannot determine ahead of time which actions belong to the risk management practices and which actions do not. Risk management happens. |
| Prefiguration                          | Prefiguration is discussed with respect to how it applies to the organization of the practices associated with the organization's ERM approach (Tekathen, 2019; Klein & Reilley, 2021).                                                                              | Showing that prefiguration also applies to the organization of the practices enacted by staff members outside the circle of risk managers and management accountants. This includes actions that are performed intuitively.                 |
| Non-official risk management practices | The non-official or informal risk management practices are discussed briefly, with an exception for Moschella et al. (2023). That paper focuses on studying small and medium sized profit-driven organizations.                                                      | Including the non-official risk management practices in the organizational context of a large organization.                                                                                                                                 |
| The identity of risk managers          | Risk managers receive their identity as being closely related to the organization's ERM approach (Tekathen, 2019; Klein & Reilley, 2021).                                                                                                                            | The identity of risk managers comes into being through the enactment of risk management practices.                                                                                                                                          |
| The meaning of risks                   | Focus on the risks the organization is familiar with (Tekathen, 2019; Bui et al., 2019).                                                                                                                                                                             | The meaning of risks comes into being through the enactment of risk management practices. These include the practices of exploring novel risks.                                                                                             |

## 2. Practical implications

Perceiving risk management practices as an open-ended social order as reflected in section 1, has several practical implications as well. This section starts to highlight the implications for the TenneT organization and for society at large (section 2.1). Subsequently we discuss the practical implications for risk managers in a more general sense and for regulators such as the ACM (section 2.2).

### 2.1 TenneT organization and society

The functionalistic view of risk management presumes an effective plan-based risk management approach, stressing the role of individual responsibility at all different hierarchical levels of the TenneT organization. Ultimately, the TenneT EB can give an account of the risk management at the level of the entire organization over a certain period of time. This account is based on the control activities performed by the professionals at various hierarchical levels. The functionalistic view takes for granted that the TenneT EB and senior management are able to understand the risks ahead of time and that they are able to plan effective control activities accordingly.

By contrast, giving centerstage to the risk management practices, we emphasize that the TenneT EB and senior management need to enable risk managers, management accountants and other staff members to enact the risk management practices that are needed to achieve the TenneT objectives, among which security of supply is the most prominent objective. These practices move beyond the predefined control activities following a plan-based risk management approach. Instead, the practices might affect a wide range of activities.

We encourage TenneT senior management to deliberately influence the organization of the risk management practices in such a way that practitioners have free space to do what makes sense for them to do in the specific situation. This runs counter the approach that management effort should be aimed to direct individuals or departments. In short, TenneT senior management should highlight that the general and practical understandings can in specific situations prevail over the rules. TenneT senior management should promote that TenneT managers and staff members draw on a set of shared understandings about risk management in the era of the energy transition. These shared understandings might include the sense of uncertainty about the required grid capacity. In this way the risk management practices might purposefully associate and intermingle with a multifold of other practices.

As such, TenneT senior management underlines the role of staff members as skillful professionals who are able to make an adequate tradeoff drawing on their intuition and tacit knowledge if applicable in a specific situation. This tradeoff might include risk aspects which cannot be measured or represented objectively.

This practice-based approach is particularly relevant given the background of unpredictable and dynamic complexities as this approach is supportive of the continuous search for novel risks which emerge from the external environment. We emphasize that the activity of identifying and managing risks is performed by practitioners who represent different organizational levels and various departments.

With regard to society at large, this thesis sheds new light on understanding how the energy transition has caused a situation dominated by unpredictable and dynamic complexities. Chapter II demonstrates that the energy transition starts with the ambition of solely consuming electricity that is generated from renewable sources by the year 2050. To achieve this ambition, many different stakeholders are supposed to deliver their own specific contribution. We argue that this perception does not acknowledge the full scope of the unpredictable and dynamic complexities associated with the energy transition. Drawing on our existing study (Ruiter et al., 2024), we point out that this perception is oversimplifying the energy transition.

Moving further, we challenge the implicit assumption that the energy transition is an entity with a stable meaning. Rather, we would understand that many of the complexities associated with the energy transition are being revealed over time. Chapter II underlines this point, highlighting that the effects of the future events that drive the energy transition can manifest in the short run or in the long run or in both. As such, the energy transition receives its meaning by the enactment of practices. We encourage the Dutch government to pay attention to the dynamic nature of the energy transition and to the uncertainties which are an inherent part of striving to achieve the final objective set for the year 2050.

## **2.2 Risk managers in a general sense and the regulator**

The insights from this thesis can be useful for risk managers within other organizations as well; this applies both to organizations in the public domain and to profit-driven organizations. We encourage risk managers to take an open view to explore novel risks, challenging the presumption that risks can be reliably represented as manageable items. Given the background of unpredictable and dynamic complexities, risk managers need to examine the risks beyond the given timeframes and beyond the domain of financial performance.

Regarding the role of the regulator, we signal that the regulation of economic activities seems to be focused on the point that the organizations which are subject to the regulation give an account of their performance over a certain period in the past. In general, the regulator's activities tend to be backward-looking.

This thesis reveals that risk management also exist outside the practices associated with the organization's risk management approach. Understanding that the organization's risk management consists of a manifold of practice-arrangement bundles, we encourage the regulators to focus on understanding the risk management practices. This implies including the non-official risk management practices in the scope of the regulating activities.

Firstly and foremost, we emphasize that practices are prefigured. For that reason the regulator should be concerned about a question like: *"To what extent do we examine how in this organization appropriate risk management practices emerge and evolve to address the known specific risks and to explore novel risks as well?"*

### **3. Discussion and directions for future research**

This section presents several themes for further discussion and we show directions for future research. We start to outline some of the study's limitations and we suggest how future research might follow up on these (section 3.1). Subsequently, section 3.2 highlights how future research might move beyond the understanding of the energy transition as the background against which practices unfold. Moreover, we discuss how research drawing on practice theory might contribute to understanding the concept of "risk talks" (section 3.3) and section 3.4 challenges future research to study the performativity of risk management tools and models.

#### **3.1 The study's limitations**

The TenneT case study highlights a limited number of investments to understand the risk management practices that serve the security of supply. As discussed in Chapter II, these investments mainly serve the security of supply in the long run as many of the TenneT components are supposed to last for a period of 40 or 50 years. In this regard, the study is limited as we did not study how the TenneT components actually contribute to the security of supply as assumed in the selected Gate1-documents.

Moreover, the scope of our interviews and observation studies was limited to the TenneT organization. During the data collection stage as part of our research, we understand more and more that the TenneT investment activities cannot be considered to be separate from the DSOs and the investments realized by these organizations. However, we have not studied the activities performed by representatives of the DSOs to grant the security of supply with regard to specific capacity constraints.

Following up on these limitations, we suggest that a longitudinal ethnographic research approach might deepen our insights into how the TenneT risk management practices are supportive to the security of supply in the long run.

### **3.2 Discussion: The energy transition**

This thesis shows that the intended shift to the generation and consumption of electricity from renewable sources is the main driver for the emergence of the background of unpredictable and dynamic complexities that TenneT has to face. Chapter II of the present thesis contains a deeper discussion of the energy transition and points out how the energy transition deeply affects the TenneT organization and its risk management practices. We have studied the TenneT risk management practices and perceive the energy transition as the background against which the TenneT risk management practices unfold. Alternatively, we could perceive the energy transition as consisting of multiple practices which are enacted simultaneously.

In accordance with that perception, the TenneT risk management practices to schedule and prioritize the investment realization are considered as being an inherent part of the energy transition. As such, in line with Schatzki (2002), we could perceive the energy transition as being the site, that is the context, in which the TenneT risk management practices are enacted. In this view, the TenneT risk management practices are an inherent part of the practices which give rise to the energy transition.

This perception might provide new directions for future research. For instance, future research might study the intra-organizational practices that give rise to the energy transition. These include the practices of cooperation and interaction between TenneT, construction companies, governmental organizations and DSOs. Furthermore, we encourage future research to understand how the organization of the practices that give rise to the energy transition prefigures certain actions.

### 3.3 Discussion: Risk talks

According to Mikes (2016), risk talks are understood as “an organizational discourse about risk issues ranging from task-related problems and perceived organizational weaknesses to concerns about resources planning” (p. 255). Tekathen & Dechow (2020) underline the intention of risk talks to create a reflective space for thinking about long-term risks that might be outside the scope of the organization’s current risk management approach. Risk talks are assumed to overcome both the emphasis on short-term financial performance and the compliance-oriented nature of the existing risk management practices. As such, we discuss how Schatzki’s site ontology might be supportive to understanding how the concept of risk talk enables the exploration of novel risks.

Tekathen & Dechow (2020) foreground the role of communicative practices by discussing “the ways communicative practices constitute organizational risk management” (p. 1). Moreover, the authors draw attention to understanding the drivers of the communication between multiple organizational functions and departments. Their case study shows that an intelligent risk talk would not emerge as long as the communication about risks is understood in terms that solely refer to short-term financial performance. If communication about risks is directed by the borders of pre-defined models, we cannot expect that risk talks would cover the long term issues which reach beyond the model’s boundaries.

We encourage future research to draw on Schatzki’s site ontology (2002) to reveal how risk talks get their meaning through the enactment of multiple practices. These practices include communication practices as well as risk management practices. In particular, we draw attention to the interaction between communication and risk management practices. Drawing on the work of Schatzki, we suggest future research to study these practices within multiple practice-arrangement bundles in one organizational context.

### 3.4 Future research direction: The performativity of risk management models

This study has shown the dynamics of risk management which also apply to risk models and tools, associated with the prevailing risk management approaches. For instance, Jordan et al. (2013) demonstrate how risk maps produce “effects that go beyond the intention of the designer” (p. 168).

As such, we underline that risk management models and tools might come to the fore as performative. Performativity in this regard points to “a power of signs

such as words and numbers to somehow participate in the constitution of the world" (Vosselman, 2022, p. 138). Moreover, Vosselman highlights that "speech acts and models are relational things that may have unexpected performative consequences" (p. 142). Based on the systematic literature review, we might expect that this applies to risk management models as well. In this regard, we argue that the performativity of risk management models remains an interesting theme for future research.

In particular, Vosselman (2022) argues that the performativity of accounting might be understood the performativity of accounting might be understood as an ongoing journey. In this regard, Vosselman draws attention to Busco & Quatrone's case study (2018): These authors claim there is a generative power in the incompleteness of accounting visualizations as this incompleteness pushes professionals to keep on searching for new solutions. This power can be considered to be the performativity of accounting tools as an ongoing journey.

Similarly, this might provide an interesting direction for future research for the area of risk management. Risk management tools and visualizations like traffic lights might leave room to keep on asking questions, striving to understand what is not represented by the visualization. In this sense, the risk management tools or models might be supportive to exploring new risks.



## Thesis summary

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Risk management is often perceived from the functionalistic view, understanding that risk management is a tool in humans hands. According to this perception, risk management is solely a result of human intentions and rational decision-making. The functionalistic view of risk management foregrounds the human ability to analyze risks objectively and ahead of time. Accordingly, many organizations have introduced a systematic and integral risk management approach.

The functionalistic view of risk management can be regarded as the prevailing view in risk management research; however, several authors in the field of management accounting challenge this view. Their contra-arguments refer to the functionalistic view as being too limited to manage novel risks and to include the risk management dynamics that might follow the risk management introduction in an organizational context. This thesis follows up on the stream of research criticizing the functionalistic view of risk management. Moreover, it offers an alternative by yielding primacy to the enactment of risk management practices.

We emphasize that many organizations in contemporary society have to face a background of unpredictable and dynamic complexities. Given this background, humans cannot reliably predict the future events which might cause novel risks. This sheds light on the thesis' societal relevance; in particular, this thesis shows how network operator TenneT has to manage the risk that the reliable electricity transmission fails, now or at any moment in the future. Case company TenneT is a Dutch public company that owns several electricity transmission networks that facilitate reliable electricity provision in the Netherlands and a large part of Germany. The TenneT case study highlights how TenneT needs to predict future events to schedule and prioritize the investments to strengthen the electricity transmission network. Due to the transition to the electricity generation and consumption from renewable sources like wind and solar power, TenneT's activities are performed against the background of unpredictable and dynamic complexities.

With regard to this energy transition in the field of electricity, the thesis firstly draws attention to the dynamics we currently witness as many different stakeholders pursue their own interests. This might affect the pace and direction of the energy transition. Secondly, the thesis points to the uncertainties that surround the future events which might affect the required grid demand. The various dynamics and the potential future events come to the fore as intertwined; they form one integrated whole as a background of unpredictable and dynamic complexities. The present thesis studies the risk management practices serving the security of supply within the TenneT organization against this background.

This thesis contains a systematic literature review to understand the state-of-the-art risk management research as part of the field of management accounting literature. The literature review yields fruitful directions for risk management research to study risk management practices against the background of unpredictable and dynamic complexities. The systematic literature review takes off with the selection of 24 risk management papers from high-quality accounting journals that challenge the functionalistic view of risk management.

The selected papers mainly focus on risk management in an organization as a systematic approach, referred to in many case organizations as an ERM approach (enterprise risk management). By contrast to the view to understand the ERM approach as a stable system, the selected papers reveal the risk management dynamics. For instance, the risk management approach changes over time following the interpretation that risk managers give to the ERM approach and the associated risk management tools.

Stretching further, the selected studies drawing on ANT and practice theory show how risk management in the organizational context is established in the ever-shifting relationships between human and non-human actors (ANT) or how risk management practices constitute the organization's risk management (practice theory). The selected papers that draw on these relational approaches to understanding risk management are valuable to criticize risk management following an ERM approach. In essence, these papers emphasize that risk management cannot be prescribed since human activities cannot be predetermined.

However, the systematic literature review shows a gap in understanding that risk management practices unfold as open-ended in nature. Drawing on the systematic literature review, this thesis highlights that the understanding of risk management practices as open-ended in nature is a fruitful research direction. Humans cannot determine or prescribe which practices and actions belong to the organization's risk management and which do not. Moreover, we encourage scholars to uncover the non-official risk management practices as well. These practices refer to the risk management practices which are not directly associated with the organization's formal risk management approach.

Following up on the research directions from the literature review, this thesis contains an in-depth case study focusing on the risk management practices within network operator TenneT. The case study data collection contains 30 semi-structured interviews with TenneT staff members and observation studies. The

case study focuses on the investments TenneT needs to realize in the years to come to strengthen the transmission networks. Due to the energy transition, the point that the electricity transmission networks need to be strengthened is quite clear; however, TenneT has to tradeoff the risk that the security of supply cannot be granted on the one hand and the scarce resources on the other. Being a public company, TenneT needs to avoid the waste of public money.

The case study utilizes Schatzki's site ontology (2002) to set up a sensitizing framework for understanding how risk management practices emerge and evolve. Drawing on Schatzki (2002, 2005), the case study draws attention to the practice-arrangement bundles which consist of material arrangements and practices. The case study shows how risk management as a social phenomenon unfolds in the context of multiple practice-arrangement bundles.

The TenneT case study details two different practice-arrangement bundles in which risk management practices are enacted to schedule and prioritize investments. We found that the organization of the practices within these two bundles is different: Firstly, in the organization of the practices of calculating risk scores, the rules prove to be important. These rules follow from the regulator and include the mandatory use of scenarios and a fixed ten-year timeframe in the risk calculations. Secondly, in the organization of the grid planning practices, general and practical understandings prevail over rules. As such, the grid planning practices take into account how the investments were still adequate in the decades beyond the ten-year timeframe. Furthermore, the organization of the grid planning practices prefigures the opportunity to respond intuitively to the novel risks TenneT faces. In this regard, TenneT professionals also draw on tacit knowledge to tradeoff risks.

Extending to the existing papers that study risk management drawing on practice research (Bui et al., 2019; Tekathen, 2019; Klein & Reilley, 2021 and Moschella et al., 2023), we present a novel understanding of the risk management practices by showing that the actions in response to risks are prefigured. To say that actions are prefigured is to acknowledge that actions cannot be predetermined. However, actions become more probable or easier to perform if the actions are prefigured by the organization of the practices in a certain practice-arrangement bundle. The TenneT case study reveals that this organization of the practices and the prefiguration of actions vary from one practice-arrangement bundle to the next. Importantly, this thesis demonstrates that prefiguration of actions also applies to actions that are performed intuitively.

This thesis' scientific relevance is to show that, against the background of unpredictable and dynamic complexities, risk management practices unfold as an open-ended social order. That is, the scope of risk management practices cannot be limited to the practices associated with the organization's ERM approach or to the practices enacted by risk managers or management accountants. As such, the thesis presents an alternative to the functionalistic view of risk management and extends to understand risk management as a management accounting concept (Tekathen, 2019).

We underline that risk management practices unfold as an open-ended social order and we argue that this is a key insight to understanding risk management practices as practices that explore novel risks. Against the background of unpredictable and dynamic complexities, practitioners cannot draw upon knowledge based upon what has happened in the past. Rather, risk management practices emerge and evolve to keep on questioning what will happen in the future. In this regard, we encourage the organization's senior management and executive boards to focus on the organization of the practices in order to facilitate knowledgeable professionals to enact the risk management practices that are required in the current circumstances.



# Samenvatting van het proefschrift

## [Summary in Dutch]

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Risicomanagement wordt vaak gepercipieerd vanuit een functionalistische visie waarbij risicomanagement een stuk gereedschap is in de handen van mensen. Volgens deze visie is risicomanagement alleen het gevolg van menselijke bedoelingen en rationele besluitvorming. De functionalistische visie van risicomanagement gaat er vanuit dat de mensen in staat zijn om risico's objectief en vooraf te analyseren. In deze lijn hebben veel organisaties een systematische en integrale risicomanagement benadering ingevoerd.

De functionalistische visie van risicomanagement kan worden gezien als de overheersende visie in onderzoek naar risicomanagement, maar verschillende auteurs in het veld van management accounting bekritiseren deze visie. Hun tegenargumenten betreffen het punt dat de functionalistische visie te beperkt is voor het beheersen van nieuwe risico's en te beperkt om de dynamiek van risicomanagement te begrijpen die kan volgen op de invoering van een risicomanagement benadering in de context van een organisatie. Dit proefschrift bouwt voort op de stroom van onderzoek die de functionalistische visie van risicomanagement bekritiseert. Verder biedt het proefschrift een alternatief door de aandacht te richten op de uitvoering van risicomanagementpraktijken.

Wij benadrukken dat veel organisaties in de huidige samenleving te maken hebben met een achtergrond van onvoorspelbare en dynamische complexiteiten. Gegeven deze achtergrond zijn mensen niet in staat om te komen tot een betrouwbare voorspelling van gebeurtenissen die nieuwe risico's kunnen veroorzaken. Dit laat licht schijnen op de maatschappelijke relevantie van dit proefschrift; in het bijzonder toont dit proefschrift hoe netwerkbeheerder TenneT het risico moet beheersen dat de betrouwbare en zekere elektriciteit transmissie faalt, op dit moment of op enig moment in de toekomst. Casusorganisatie TenneT is een Nederlands overheidsbedrijf dat eigenaar is van verschillende netwerken voor de betrouwbare elektriciteitsvoorziening in Nederland en een groot deel van Duitsland. De TenneT casusstudie laat zien hoe TenneT gebeurtenissen moet voorspellen voor het plannen en prioriteren van de investeringen die nodig zijn om de transmissienetwerken te versterken. Met de transitie naar de opwekking en het gebruik van elektriciteit uit hernieuwbare bronnen, zoals wind en zon, worden deze activiteiten uitgevoerd tegen een achtergrond van onvoorspelbare en dynamische complexiteiten.

Wat betreft de energietransitie in het veld van elektriciteit, wijzen we in de eerste plaats op de dynamiek die we op dit moment waarnemen waarbij de verschillende belanghebbenden elk hun eigen belang nastreven. Dit kan effect hebben op de

snelheid en richting van de energietransitie. In de tweede plaats richt dit proefschrift de aandacht op de onzekerheden rondom de toekomstige gebeurtenissen die effect kunnen hebben op de vereiste capaciteit van de transmissienetwerken. De diverse vormen van dynamiek en de potentiële toekomstige gebeurtenissen blijken met elkaar verweven; ze vormen één geheel als een achtergrond van onvoorspelbare en dynamische complexiteiten. Tegen deze achtergrond presenteert dit proefschrift een studie van de risicomanagementpraktijken binnen TenneT, gericht op de leveringszekerheid.

Dit proefschrift bevat een systematische literatuurreview om een beeld te krijgen van het toonaangevende onderzoek naar risicomanagement als onderdeel van de literatuur op het vakgebied van management accounting. Wat preciezer geldt dat de literatuurreview nuttige richtingen schetst hoe onderzoek de risicomanagementpraktijken kan bestuderen tegen de achtergrond van onvoorspelbare en dynamische complexiteiten. Voor de systematische literatuurreview zijn 24 artikelen geselecteerd uit internationale accounting tijdschriften van hoge kwaliteit; deze artikelen stellen de functionalistische visie op risicomanagement ter discussie.

De focus van de geselecteerde artikelen is vooral risicomanagement in een organisatie als een systematische benadering die in veel casusorganisaties wordt aangeduid als een ERM-benadering (*enterprise risk management*). Tegenover de visie om de ERM-benadering te begrijpen als een stabiel systeem, onthullen de geselecteerde artikelen de dynamiek van risicomanagement. Bijvoorbeeld verandert de risicomanagement benadering over de tijd als gevolg van de interpretatie die risicomanagers geven aan de ERM-benadering en de bijbehorende hulpprogramma's en toepassingen.

De geselecteerde studies die zich baseren op ANT en praktijktheorie gaan verder door te tonen hoe risicomanagement in een organisatie tot stand komt in de altijd-veranderende relaties tussen menselijke en niet-menselijke actoren (ANT) of hoe risicomanagementpraktijken het risicomanagement tot stand brengen (praktijktheorie). Deze relationele benaderingen om risicomanagement te begrijpen, zijn waardevol om het risicomanagement volgens een ERM-benadering kritisch te belichten. In wezen benadrukken deze studies dat risicomanagement niet kan worden voorgeschreven omdat menselijke activiteiten niet vooraf kunnen worden bepaald.

Maar de systematische literatuurreview toont een gebrek in de bestaande literatuur om te begrijpen dat de risicomanagementpraktijken zich ontvouwen als praktijken met een open einde. Vanuit de systematische literatuurreview komt dit als een interessante onderzoeksrichting naar voren. Mensen kunnen niet vooraf bepalen of voorschrijven welke praktijken en acties behoren tot het risicomanagement van een organisatie en welke praktijken en acties daar niet toe behoren. Daarbij moedigen we onderzoekers aan om onofficiële risicomanagementpraktijken te onthullen. Dit betreft de risicomanagementpraktijken die niet zijn geassocieerd met de formele risicomanagement benadering van de organisatie.

Volgend op de onderzoeksrichtingen vanuit de literatuurreview, presenteert dit proefschrift een casusstudie gericht op de risicomanagementpraktijken binnen netwerkbeheerder TenneT. De verzameling van onderzoeksgegevens in de casusstudie bevat 30 semigestructureerde interviews met TenneT personeel en observatiestudies. De focus van de casusstudie zijn de investeringen die TenneT moet realiseren in de komende jaren om de transmissienetwerken te versterken. Door de energietransitie is de noodzaak om de netwerken te versterken zonder meer duidelijk, alleen TenneT moet het risico afwegen dat de betrouwbare elektriciteitsvoorziening niet kan worden gehandhaafd enerzijds en de schaarse middelen anderzijds. Als een publieke organisatie moet TenneT de verspilling van publieke middelen zien te voorkomen.

De casusstudie maakt gebruik van *Schatzki's site* ontologie (2002) om te komen tot een raamwerk waarmee we kunnen begrijpen hoe risicomanagementpraktijken tot stand komen. Gebaseerd op Schatzki (2002, 2005), vestigt de casusstudie de aandacht op de 'praktijk-regelingen bundels' die bestaan uit materiële regelingen / voorzieningen en praktijken. De casusstudie toont hoe risicomanagement zich ontvouwt als een sociaal fenomeen binnen de context van meerdere praktijk-regelingen bundels.

De TenneT casusstudie toont in detail twee praktijk-regelingen bundels waarbinnen de risicomanagementpraktijken plaatsvinden om de investeringen te plannen en te prioriteren. We beschrijven dat de organisatie van de praktijken binnen deze twee praktijk-regelingen bundels verschilt. In de eerste plaats, binnen de organisatie van de praktijken om risicoscores te berekenen, blijken de regels belangrijk. Deze regels vloeien voort vanuit de toezichthouder en de regels betreffen onder andere het verplichte gebruik van scenario's en de verplichte toepassing van een horizon van tien jaar. In de tweede plaats geldt dat binnen de organisatie van de netwerk planningspraktijken, het algemene en praktische begrip voorgaat op regels. Op die manier houden de netwerk planningspraktijken rekening met hoe adequaat de

investeringen zijn voorbij de horizon van tien jaar. Verder geldt dat de organisatie van de netwerk planningspraktijken de mogelijkheid naar voren brengt om intuïtief te reageren op de nieuwe risico's waarmee TenneT te maken heeft. In dit verband geldt dat de TenneT professionals gebruik maken van kennis uit hun persoonlijke ervaring om risico's af te wegen in aanvulling op de kennis die is beschreven en breed geaccepteerd.

In aanvulling op de bestaande artikelen die risicomanagement bestuderen vanuit praktijktheorie (Bui e.a., 2019; Tekathen, 2019; Klein & Reilley, 2021 en Moschella e.a., 2023), presenteren we een nieuw begrip van de risicomanagementpraktijken door te laten zien dat de acties in reactie op risico's zijn geprefigureerd. Als we stellen dat acties zijn geprefigureerd, erkennen we dat acties niet vooraf kunnen worden bepaald. Maar, acties worden wel waarschijnlijker of gemakkelijker om uit te voeren als de acties zijn geprefigureerd door de organisatie van de praktijken in een bepaalde praktijk-regelingen bundel. De TenneT casusstudie laat zien dat de organisatie van de praktijken en het prefigureren van acties tussen praktijk-regelingen bundels verschillend is. Belangrijk is hierbij dat dit proefschrift laat zien dat prefiguratie ook van toepassing is op acties die intuïtief worden uitgevoerd.

Dit proefschrift toont dat tegen de achtergrond van onvoorspelbare en dynamische complexiteiten, risicomanagementpraktijken zich ontvouwen als een samenhang met een open einde. Daarmee geldt dat de scope van risicomanagementpraktijken niet kan worden beperkt tot de praktijken die samenhangen met de ERM-benadering van de organisatie of tot de praktijken die worden uitgevoerd door risicomangers of management accountants. Op deze manier presenteert dit proefschrift een alternatief voor de functionalistische visie op risicomanagement én het proefschrift geeft een uitbreiding aan het begrip van risicomanagementpraktijken als een concept dat is gericht op het besturen van de organisatie door management (Tekathen, 2019).

We benadrukken dat risicomanagementpraktijken zich ontvouwen als een samenhang met een open einde en argumenteren dat dit inzicht cruciaal is om risicomanagementpraktijken te begrijpen als praktijken waarmee nieuwe risico's kunnen worden verkend. Tegen de achtergrond van onvoorspelbare en dynamische complexiteiten kunnen praktijkbeoefenaars niet steunen op de kennis van wat in het verleden gebeurde. Integendeel geldt dat risicomanagementpraktijken tot stand komen om te blijven vragen wat in de toekomst zal gebeuren. In dit verband geven we de aanbeveling aan de raden van bestuur en senior management van organisaties om zich te richten op de organisatie van de praktijken zodat deskundige professionals de ruimte krijgen om de risicomanagementpraktijken uit te voeren die vereist zijn in de huidige omstandigheden.



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# Appendices

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## Appendix A: Data collection – interviews

Formal interviews with TenneT representatives – first wave:

|    | <b>Date</b>    | <b>Department</b>                            | <b>Interviewee(s)</b>                          |
|----|----------------|----------------------------------------------|------------------------------------------------|
| 1  | March 8, 2019  | Treasury                                     | Manager                                        |
| 2  | March 11, 2019 | Internal Audit Corporate                     | Team manager<br>Auditor                        |
| 3  | March 13, 2019 | Legal Affairs Corporate                      | Legal employee<br>Team manager                 |
| 4  | March 15, 2019 | Large Projects NL                            | Financial project lead<br>Project risk manager |
| 5  | March 15, 2019 | Public Affairs Corporate                     | Manager                                        |
| 6  | March 20, 2019 | Large Projects NL                            | Financial project lead<br>Project risk manager |
| 7  | March 20, 2019 | Corporate Risk & Internal Control            | Team manager<br>Consultant                     |
| 8  | March 29, 2019 | Regulations NL                               | Team member                                    |
| 9  | March 29, 2019 | Grid Services NL                             | Manager                                        |
| 10 | March 29, 2019 | Business Control Corporate                   | Team manager                                   |
| 11 | April 5, 2019  | Grid Services NL                             | Manager                                        |
| 12 | April 5, 2019  | Project Control Corporate                    | Coordinator                                    |
| 13 | April 5, 2019  | AM, team Substations & Automation Technology | Team manager                                   |
| 14 | April 9, 2019  | AM, team System Technology & Strategy        | Team manager                                   |
| 15 | April 26, 2019 | AM, Maintenance Standards & Strategy         | Maintenance engineer                           |
| 16 | May 3, 2019    | AM, team System Technology and Strategy      | Team manager                                   |
| 17 | May 3, 2019    | Corporate Risk & Internal Control            | Team manager                                   |
| 18 | May 7, 2019    | AM, team Risk & Portfolio Management (R&PM)  | Team manager<br>Risk manager                   |
| 19 | May 8, 2019    | AM, Maintenance Standards & Strategy         | Maintenance strategist                         |

### Formal interviews with TenneT representatives - second wave:

|    | <b>Date</b>      | <b>Interviewee(s)</b>                                     | <b>Representing</b>                  |
|----|------------------|-----------------------------------------------------------|--------------------------------------|
| 20 | January 6, 2020  | AM, team Risk & Portfolio management                      |                                      |
| 21 | April 28, 2020   | AM, grid strategist                                       | Region A, 110- and 150kV- network    |
| 22 | May 7, 2020      | AM, grid strategist                                       | Region B, 110- and 150kV- network    |
| 23 | May 8, 2020      | AM, grid strategist                                       |                                      |
| 24 | May 15, 2020     | AM, grid strategist                                       | Region C, 110- and 150kV- network    |
| 25 | June 19, 2020    | AM, grid strategist                                       | Nationwide, 220- and 380kV- networks |
| 26 | July 13, 2020    | AM, grid planning team manager                            |                                      |
| 27 | January 27, 2021 | AM, grid planning team manager and senior grid strategist |                                      |
| 28 | April 9, 2021    | Project developer                                         |                                      |
| 29 | May 18, 2021     | Head of Market Analysis in Energy System Planning         |                                      |
| 30 | July 20, 2021    | Analyst Business Guidance                                 |                                      |

# Appendix B: Data collection – observation studies

Details about some of the settings in which observation studies were conducted:

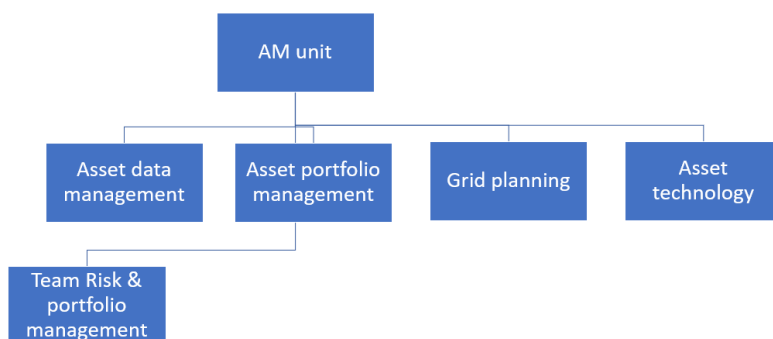
| Date               | Brief discussion with TenneT employee | Details regarding other kind of observation study                                                                                        |
|--------------------|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| June, 2019         | No                                    | Discussing outcomes of the first wave interviews                                                                                         |
| 25 November, 2019  | No                                    | Site visit of a 380kV station in the south of the Netherlands. Day trip to view and learn about a big investment project.                |
| 9 December, 2019   | No                                    | Meeting with the AM staff, about 80 TenneT employees. I attended some presentations covering actual developments concerning the AM unit. |
| 8 January, 2020    | Senior grid strategist                |                                                                                                                                          |
| 10 February, 2020  | Grid strategist                       |                                                                                                                                          |
| 4 March, 2020      | Project risk manager                  |                                                                                                                                          |
| 11 March, 2020     | Team manager resource planning        |                                                                                                                                          |
| 11 March, 2020     | No                                    | Internal lecture about the CSR rollout within TenneT.                                                                                    |
| 11 March, 2020     | Market Development employee           |                                                                                                                                          |
| 18 March, 2020     | Business control manager              |                                                                                                                                          |
| 21 September, 2020 | No                                    | Preliminary discussion of the findings regarding the observation studies within the AM unit.                                             |
| 12 January, 2021   | No                                    | New Year Speech by TenneT's CEO.                                                                                                         |
| 17 March, 2021     | Asset Portfolio Manager               |                                                                                                                                          |

## Appendix C: Detailed information about the selected investments

|    | Date Gate1-document | Number of investment alternatives, discussed in the Gate1-document | Investment amount of the preferred investment alternative                                                                                                          |
|----|---------------------|--------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1  | February 6, 2012    | 4                                                                  | 18.6 M€                                                                                                                                                            |
| 2  | December 14, 2012   | 4                                                                  | 28.9 M€                                                                                                                                                            |
| 3  | July 23, 2013       | 6                                                                  | Three alternatives with investment amounts varying from 10.3 M€ to 28.7M€ need to be studied further.                                                              |
| 4  | June 3, 2014        | 4                                                                  | 6.1 M€                                                                                                                                                             |
| 5  | July 3, 2014        | 5                                                                  | 21.1 M€                                                                                                                                                            |
| 6  | May 26, 2015        | 4                                                                  | 44.6 M€                                                                                                                                                            |
| 7  | April 21, 2016      | 3                                                                  | 23.7 M€                                                                                                                                                            |
| 8  | May 18, 2016        | 3                                                                  | 54.5 M€                                                                                                                                                            |
| 9  | July 20, 2016       | 3                                                                  | 20.7 M€                                                                                                                                                            |
| 10 | October 10, 2018    | 1                                                                  | The document does not contain investment alternatives; the document only shows the reasons for choosing an investment option with an investment amount of 25.2 M€. |

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## Appendix D: Organizational chart of the AM Unit



Based on non-public information provided by TenneT.

# Appendix E: Feedback

Some details about providing feedback and reflections to the TenneT organizations:

| Date          |                                                             | Details regarding other kinds of observation study                                                                                                                                                                                  |
|---------------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| July, 2019    | E-mail and discussion with TenneT staff members in person.  | Sharing some overarching and notable themes from the 1 <sup>st</sup> wave interviews with the interviewees by e-mail. Furthermore, I discussed these themes with the team manager of the RM&PM team and a second AM representative. |
| May 13, 2022  | Presentation to and discussion with the AM staff in person. | Presentations of the preliminary findings to the AM staff.                                                                                                                                                                          |
| June 21, 2022 | Final online presentation, open for all TenneT employees.   | PowerPoint presentation about the study's results including some questions challenging the participants to reflect on the presentation.                                                                                             |

## Appendix F: Selection of pages from the Gate1-document



### GATE 1: SELECTION OF ALTERNATIVES

## 380KV LELYSTAD - ENS UPGRADING TO 2 x 2.633 MVA (4 KA)

Document identifier no PU-AM 16-81

VERSION DOCUMENT 1.2  
21-04-2016

Project no TenneT Portfolio/Annual Investment Plan: *no. 002.800*

Status *Final*

Author *A*

Quality Review  
Asset Management *B*

Discussed and aligned with  
for Control *H*  
for Project organisation *R*  
for SO *L*

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## Appendix F: Continued



### Assessment of business values TenneT

| Assessment Criteria                                                                                                                                                                              | Alternative 0                                            | Alternative 1                      | Alternative 2                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|------------------------------------|----------------------------------|
| <b>Business Values TenneT</b>                                                                                                                                                                    | <b>No proactive investments</b>                          | <b>Traditional 4kA-upgrading</b>   | <b>4kA-upgrading with HTLS</b>   |
| <b>Safety</b> <ul style="list-style-type: none"> <li>Mitigation of asset risks</li> <li>During construction phase</li> <li>During operational life time</li> </ul>                               | <i>0</i><br><i>n.a.</i><br>++<br>-                       | <i>0</i><br><i>n.a.</i><br>-<br>++ | +<br><i>n.a.</i><br>0<br>++      |
| <b>Quality of Supply</b> <ul style="list-style-type: none"> <li>Mitigation of asset risks</li> <li>Robustness major incidents</li> <li>Transmission capacity</li> <li>Voltage control</li> </ul> | <i>0</i><br>--<br>+<br>--<br>+                           | +<br>0<br>+<br>0<br>+              | +<br>0<br>+<br>0<br>+            |
| <b>Financial</b> <ul style="list-style-type: none"> <li>Total Investment (CAPEX)</li> <li>Net present value</li> </ul>                                                                           | <i>0 M€</i><br><i>n.a.</i>                               | 55,55 M€<br>- 5,33 M€              | 23,68 M€<br>- 0,87 M€            |
| <b>Reputation</b>                                                                                                                                                                                | -                                                        | 0                                  | 0                                |
| <b>Customers</b>                                                                                                                                                                                 | 0                                                        | 0                                  | 0                                |
| <b>Environment*</b>                                                                                                                                                                              | -                                                        | 0                                  | -                                |
| <b>Compliance</b>                                                                                                                                                                                | --                                                       | --                                 | --                               |
| <b>Project time line</b>                                                                                                                                                                         | <i>n.a.</i>                                              | +                                  | ++                               |
| <ul style="list-style-type: none"> <li>Final investment decision (gate 2)</li> <li>Start of construction (gate 3)</li> <li>In-service Date (gate 4)</li> </ul>                                   | <i>n.a.</i><br><i>n.a.</i><br><i>n.a.</i><br><i>n.a.</i> | Q2, 2017<br>Q4, 2017<br>Q1, 2019   | Q2, 2017<br>Q4, 2017<br>Q3, 2018 |
| <b>Project risks</b> <ul style="list-style-type: none"> <li>Time related</li> <li>Cost related</li> </ul>                                                                                        | <i>n.a.</i><br><i>n.a.</i><br><i>n.a.</i>                | 0<br>0<br>0                        | -<br>-<br>-                      |
| <b>Preferred Alternative</b>                                                                                                                                                                     |                                                          |                                    | x                                |

\*Overview of grid losses and CO<sub>2</sub> emissions

| 4kA-upgrading LLS - Ens 380      | Alternative 0            | Alternative 1 | Alternative 2 |
|----------------------------------|--------------------------|---------------|---------------|
|                                  | No proactive investments | Traditional   | HTLS          |
| Average grid losses [MWh/year]   | 17.654                   | 9.784         | 19.746        |
| CO2 emission [tons/year]         | 8.262                    | 4.793         | 9.536         |
| Costs grid losses [k€/year]      | 883                      | 469           | 987           |
| Greening grid losses [k€/year]   | 12                       | 7             | 13            |
| NPV grid losses (see app.8) [M€] | 16                       | 9             | 18            |

## Appendix G: Description of the research data management

With regard to the research data management, I briefly provide some explanation:

- Working as a research employee for HAN University of Applied, I was allowed to utilize the technical facilities within the HAN for data storage. These technical facilities include the activities to ensure the data would not get lost. Given the nature of the research data, these technical facilities prove to be adequate.
- Moreover, the HAN provided me a user account to use the software tool Atlas TI as well.

I acknowledge and understand quite well that researchers should strive to make their research data assessable for reuse by other researchers. Though, following the nature of the TenneT case study, the collected data like interview reports need to be treated as confidential. These cannot be reused.



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