

# Understanding the adoption of nonfinancial reporting in the Dutch infrastructure sector: a system dynamics approach

A study into the feedback processes driving Dutch infrastructure organizations to adopt nonfinancial impact measuring, reporting, and steering standards

**Master's thesis**  
**European Master in System Dynamics**

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*Nijmegen, 22 July 2020*

**Radboud Universiteit**



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<b>Date</b>	Nijmegen, 22 July 2020

## Acknowledgements

Dear reader,

In front of you lies my master's thesis: *Understanding the adoption of nonfinancial reporting in the Dutch infrastructure sector: a system dynamics approach*. This thesis is my final achievement in completing the European Master in System Dynamics. Writing this thesis has been an educational and challenging process and has taught me to be adaptive to unexpected situations. I would like to thank my supervisor Vincent de Gooyert for his guidance and critical thinking throughout this process and Birgit Kopainsky for taking the time for the examination of my thesis during the System Dynamics Conference. Last, I would like to thank Koen Eising for providing such an interesting research opportunity at Alliander.

With this thesis, not only EMSD, but an incredible journey of 8 years of studying comes to an end. More than the achievements and degrees, this era gave me the most meaningful experiences and dearest friends. These years have taught me valuable life lessons in gratitude, privilege, and happiness.

I would like to thank Ema and Yoshi, my fellow EMSD students, for the amazing journey we have been on together. Spending the last two years together has been wonderful and I am grateful I got to share it with you. Also, I would like to thank my dear friends Imke, Mirthe and Sabien for encouraging me to start EMSD, and for supporting and visiting me wherever I was. I thank my parents for their constant care, their help for moving me around Europe more than a few times, and for always supporting my decisions. Last, I would like to thank Kevin for his love and support, and for going on this journey with me to share some of the best experiences.

I hope you enjoy reading this thesis.

*Giulietta Quast*

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# 1 Introduction

First, nonfinancial reporting is introduced. Second, the prevailing literature is briefly discussed, and the theories that are used in this research are indicated. Then, I describe the relation of nonfinancial reporting to the infrastructure sector and introduce system dynamics. Further, the relevance of the research, the objective, and the research questions are described. Finally, I conclude by giving an outline for this thesis.

## 1.1 Nonfinancial reporting

Scholars have been studying the adoption of nonfinancial reporting practices for over half a century (Bowen, 1953) but organizations still predominantly disclose financial information in annual reports (Montesinos & Brusca, 2019). However, transparency on nonfinancial information gained importance over the last decades due to the economic crises, the climate crisis, and other events. These events have emphasized the importance of organizations' contribution to society beyond the economic value (Montesinos & Brusca, 2019). In particular, the infrastructure sector – which differs from other sectors due to their critical and vital position in society – has increasingly become aware of the importance of their nonfinancial impact on society (Next Generation Infrastructures, 2020). Therefore, this study researches the adoption of nonfinancial impact measuring, reporting, and steering in the Dutch infrastructure sector.

Many terms exist in literature to describe an organization's disclosure of nonfinancial information, e.g. social audits sustainability reports, corporate social responsibility reports, and value reports (Montesinos & Brusca, 2019; Gray, Dey, Owen, Evans & Zadek, 1997). These reports have been useful for disclosure beyond the financial perspective since they allow organizations to address environmental and social issues that traditionally have no place in an annual report (Montesinos & Brusca, 2019). The different terminology for nonfinancial reporting has many similarities in the central ideas but allows organizations to refrain from disclosing information in certain areas they prefer to keep private (Gray et al., 1997). This research uses the term *nonfinancial reporting* to describe the disclosure of an organization's nonfinancial impacts in an integrated report (IR). The integrated report contains the financial and nonfinancial information of the organization. The financial information is based on the financial and manufactured capital, and the nonfinancial information is based on the impact on natural, human, intellectual, and social capital (De Groot Ruiz, 2019). The International Integrated Reporting

Council considers integrated reporting the next step in the evolution of corporate reporting (IIRC, 2015).

Besides researching the various reports to disclose nonfinancial information, scholars have been studying adoption rationales for nonfinancial reporting practices for many years. Many perspectives have been adopted, varying from philanthropic (Maas, 2011; Boatright, 1996), to economic/rationalist (Gray, Owen, & Adams, 2010; Fernando & Lawrence, 2014), strategic importance (Dentchev, 2004; Frooman, 1999; Burke & Logsdon, 1996), and social/political (Garde Sánchez, Bolívar & Hernández, 2017; Fernando & Lawrence, 2014; Velte & Stawinoga, 2017; DiMaggio & Powell, 1983). This research focuses on the adoption of nonfinancial reporting from the perspective of legitimacy and institutional theory.

According to legitimacy theory, an organization acknowledges that it is linked to society in which it operates through an implicit social contract (Velte & Stawinoga, 2017; Garde Sánchez et al., 2017). The organization and society do not exist and operate in isolation but are part of the same social system (Deegan, 2002). For example, Fernando and Lawrence (2014) describe how an organization acquires human resources and materials from society, and the organization provides the goods and services to society. The social contract refers to the norms, values, and boundaries set by the society and motivates organizations to comply by implementing adequate structures and processes (Shocker & Sethi, 1973; Dowling & Pfeffer, 1975). Thus, the organization's legitimacy depends on its ability to meet the expectations that are set by society through appropriate systems.

Various studies on legitimacy theory have shown that nonfinancial reporting has been employed as a strategy for obtaining and managing organizational legitimacy (Fernando & Lawrence, 2014; Velte & Stawinoga, 2017; Garde Sánchez et al., 2017). Legitimacy theory considers the organization as a part of the wider social system (i.e. the organization's impacts on society and nature are considered) and linked with society through a social contract. Therefore, organizations must operate in a manner that adds social value in order to be considered legitimate. Nonfinancial reporting can be used as a mechanism to show the organizations' nonfinancial impact on society and to manage the legitimacy (Garde Sánchez et al., 2017).

This perspective fits with the position the infrastructure sector has in society: infrastructure organizations manage the critical parts of Dutch infrastructure, and their main objective is to serve a public cause. Besides, Dutch infrastructure organizations are semi-government organizations,

indicating that the Dutch government partially owns or is significant shareholder of various infrastructure firms (Chi, 2018) and that infrastructure organizations are operating with taxpayers' money to provide social added value to society. Nonfinancial impact measuring and reporting facilitate the organization in showing the social added value to society and thereby increases the organizational legitimacy. Thus, obtaining and maintaining organizational legitimacy is vital for infrastructure organizations and adopting nonfinancial reporting can help infrastructure organizations to be considered legitimate by society.

Institutional theory suggests that organizations prefer to adopt practices and structures previously adopted or socially accepted by the organizational field rather than on adopting practices and structures based on the associated benefits for the organization (Velte & Stawinoga, 2017; Deegan, 2009; Fernando & Lawrence, 2014). Institutional theory is relevant to this research since it provides rationales for the different infrastructure organizations to conform to the same standards of nonfinancial impact measuring, reporting, and steering. In this research, the infrastructure sector is defined as the organizations providing essential services of critical importance for the functioning of Dutch society and economy (Paul & Van der Bend, 2017), e.g. flood protection and water management, energy (electricity, heat, transport and heating fuels), transport of people and goods (overland, by air, sea and rail), information and telecommunications, including digital communications (fixed and mobile), provision of safe drinking water, and sanitation and solid waste management.” (Weijnen, 2019: 1). Besides, these organizations all make substantial long-term capital investments for the implementation of new systems (plant, property, and equipment) that adapt to future needs and demands. Examples are investments in the energy transition (Alliander, 2020; Enexis, 2020; Gasunie, 2020; TenneT, 2020) and improvement of water, aviation, rail, and road infrastructure (Vitens, 2019; Rijkswaterstaat, 2019; Schiphol, 2020; ProRail, 2019). Thus, the infrastructure organizations are operating in one organizational field, and by adopting nonfinancial reporting, their reporting practices become more homogeneous.

This study is conducted on behalf of the Dutch network organization Alliander. Alliander started measuring and reporting on impacts in 2015 (Alliander, 2016). The CSR director at Alliander indicated that he was interested to know what was needed for other infrastructure organizations to adopt nonfinancial impact measuring, reporting, and steering. For this research, the Dutch infrastructure is specified as the organizations in the infrastructure coalitions Green Networks and Next Generation Infrastructures (NGInfra). I chose these coalitions since these



organizations are collaborating with the aim to adopt nonfinancial impact measuring for the nonfinancial capitals described by the IIRC (Green Networks, n.d.; Next Generation Infrastructures, 2020). Alliander resides in both coalitions.

This study separates the adoption of nonfinancial reporting in the Dutch infrastructure sector into three phases in order to explain the adoption process per phase. The three phases are: (1) measuring nonfinancial impacts, (2) reporting on nonfinancial impacts in the integrated report, and (3) steering on nonfinancial impacts. Alliander specified the aims for nonfinancial impact measuring as: (1) to understand and control their nonfinancial impacts, (2) to obtain a more accurate picture of the social and environmental performance and the achievement of objectives, and (3) to use nonfinancial impacts to support decision-making on projects and activities (Alliander, 2018). However, analysis of the annual reports shows that only 4 out of 11 infrastructure organizations adopted impact measuring and reported on the impacts since 2015<sup>1</sup>. The adoption curve is depicted in Figure 1. The curve raises the question of why the number of adopters has been stagnating since 2017. If these organizations find nonfinancial impact measuring important, then why is the adoption process slow?

As mentioned before, the literature on nonfinancial reporting has a broad foundation in many theories (Gray et al., 2010). Hence, the inability to explain the adoption of nonfinancial reporting, as depicted in Figure 1, does not result from a lack of theory. Although legitimacy theory and institutional theory pose relevant reasons for organizations to start nonfinancial reporting (as will be explained further in Chapter 2), the theories approach the adoption of nonfinancial reporting as a static decision. In other words, the organization detects a legitimacy gap and responds to this by disclosing nonfinancial information (Fernando & Lawrence, 2014). Thus, the reasons for a decision taken at a *specific moment* are studied rather than how nonfinancial reporting is adopted over *time*. Also, legitimacy theory and institutional theory do not consider the dynamic nature of the problem when explaining the

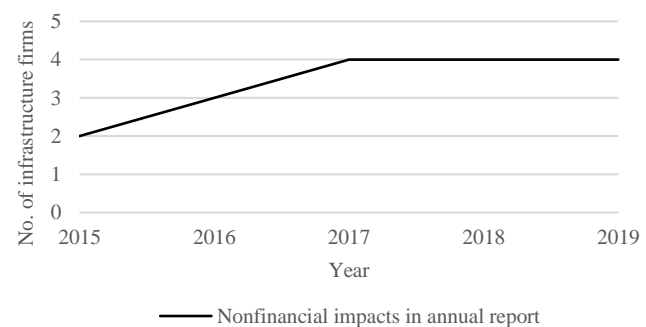


Figure 1: Reference mode adoption of nonfinancial impact in IR infrastructure sector

<sup>1</sup> Figure 1 shows the reference mode of behavior for adoption of reporting on nonfinancial impacts in the annual report. Alliander and Schiphol started reporting on their nonfinancial impact in the annual report in 2015 (Alliander, 2016; Schiphol, 2016), followed by TenneT in 2016 (TenneT, 2017), and Enexis in 2017 (Enexis, 2018).

adoption rationales even though these theories do acknowledge the complexity of the problem (Fernando & Lawrence, 2014). Therefore, the adoption of nonfinancial reporting needs to be researched further through a perspective that accounts for the complexity and dynamic nature of the problem.

System dynamics (SD) is an appropriate method to approach complex and dynamic problems such as the adoption of nonfinancial reporting. System dynamics is a modelling approach for understanding and managing dynamic problems arising in complex systems (e.g. problems in managerial or social systems). A dynamic system is “characterized by interdependence, mutual interaction, information feedback, and circular causality” (System Dynamics Society, 2020). In particular, the adoption process of nonfinancial reporting is associated with complex interactions and (information) feedbacks between departments within the organization (e.g. the CSR department, finance department, and board) and between the organization and external parties (e.g. organizations in the infrastructure sector). Furthermore, Figure 1 shows that the problem is dynamic, meaning that the number of adopters, albeit slowly, increases over time. Also, system dynamics has been successfully applied to explain various practical problems in situations where current theories are failing to explain the observed behaviour, including problems in supply chain management, innovation diffusion, organizational growth, and project management (Sterman, 2000). Especially relevant for this research are the successful applications of SD for the explanation of adoption dynamics (e.g. Mutingi, 2013; Groesser & Jovy, 2015; Sterman, 2000; Repenning, 2002).

Considering the characteristics of the problem and the successful and widespread practical applications of SD for modelling adoption dynamics, system dynamics is a suitable tool for modelling the adoption of nonfinancial reporting in the infrastructure sector.

## **1.2 Relevance**

This research provides insight into the feedback processes of the three adoption phases that infrastructure organizations move through when adopting nonfinancial reporting (adoption of measuring, reporting, and steering). This insight facilitates and expedites the adoption of nonfinancial impact measuring, reporting, and steering in their organizations. These insights are relevant for the infrastructure sector because by knowing the barriers and enablers in the adoption process, the organizations can move through the adoption process more smoothly and reach the desired aims more quickly, as described in the previous section. The higher the number of

organizations measuring their nonfinancial impact, the more knowledge and experience can be shared to create a standard for measuring nonfinancial impact that is widely supported by, and standardized for, the infrastructure sector. Thus, the more organizations start measuring their nonfinancial impact, the quicker the methodology of nonfinancial impact measurement matures, and the sooner the organizations can use the nonfinancial impact for steering.

The relevance of this research for literature is that it reveals the interrelatedness of legitimacy and institutional theory in the context of the adoption of nonfinancial reporting by approaching it from a system dynamics perspective. Forrester (1968) states that the mode of behaviour, as showed in Figure 1, is created by the interaction of system components. Thus, when researching legitimacy and institutional theory in a system, the interaction between the theories is revealed and can show that the theories have a synergetic effect on each other (Vennix, 1996). Synergetic effects are effects which are not occurring in the individual theories can arise when the theories are combined in one system that shows circular feedback (Vennix, 1996).

### **1.3 Objective and research questions**

This research tries to accomplish two objectives. First, it aims to provide insight into the adoption dynamics of measuring, reporting and steering on nonfinancial impacts in the organizations in Green Networks and NGInfra coalitions. Second, this research aims to identify enablers and barriers in the adoption process in order to give practical recommendations to the infrastructure sector to accelerate this process.

This study answers the following research question: *Which feedback processes drive organizations in Green Networks and Next Generation Infrastructures to shift from measuring to reporting, and to steering on both financial and nonfinancial impacts?*

In order to be able to answer this research question, the following sub-questions are to be answered:

1. Which feedback processes relate to the adoption of measuring nonfinancial impact?
2. Which feedback processes relate to the adoption of reporting on nonfinancial impact in an integrated report?
3. Which feedback processes relate to the adoption of steering on nonfinancial impact?

#### **1.4 Outline**

This thesis is structured as follows. First, the theoretical background is described in chapter two. After that, I elaborate on the methodology of this research in chapter three. Subsequently, chapter four presents the results of empirical research. In the last chapter, chapter five, I start with a conclusion and a discussion of the research. Finally, I end this thesis by stating practical recommendations, the theoretical contribution of this research, the limitations, and suggestions for future research.

## 2 Theoretical background

In the introduction, the concept of nonfinancial reporting was introduced. Also, I touched upon various existing theories on the adoption of nonfinancial reporting and explained legitimacy and institutional theory in some more detail. In this chapter, nonfinancial impact and adoption dynamics are explained in more detail. Furthermore, the relevant literature for the adoption of nonfinancial reporting are described, and I explain why I use legitimacy and institutional theory in this research.

### 2.1 Nonfinancial impact

When organizations wish to steer on nonfinancial impact, a first step is measure nonfinancial impacts in order to determine the organizational social added value.

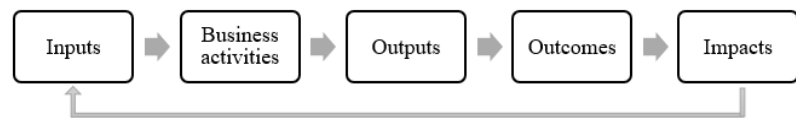


Figure 2: Impact value chain (modified from Alliander, 2019)

Organizations nowadays make use of standardized measurement and reporting guidelines to disclose financial information in the annual report, e.g. the profit and loss statements, balance sheets, and cash flow statements (Maas, 2011). However, measurement of nonfinancial capitals is less specified, and a nationally accepted, or even sector standard is yet to be developed.

Output and impact are often confused and used interchangeably. A shift from output thinking (a focus on financial and produced capital) to impact thinking (a focus that includes nonfinancial capitals) is necessary to measure, for example, an organization's performance on social and natural capital (Alliander, 2019). The impact value chain, as visible in Figure 2, visualizes the differences between impact and other elements of the stream. According to Alliander (2019), input refers to the resources for the execution of the activities that are at the core of an organization's business model. The activities create outputs, the direct tangible and intangible products that result from the activity. Outcomes are the benefits that the business activities are designed to achieve, and impacts are the broader changes that occur relating to the six capitals. Specifically, "impact comprises all the effects that an organization's activities have on society" (Alliander, 2016: 6). Impacts can be both positive and negative, can have intended and unintended effects, and can have short- and long-term effects (Wainwright, 2002).

Once an organization has determined which nonfinancial indicator(s) need to be measured to determine the impact, they start with quantifying the impact of that indicator. Finally, they give

that indicator a monetary value. For example, Alliander indicated a negative impact of €282 million on climate change due to CO<sub>2</sub> emissions (Alliander, 2020). Koen Eising explained that this impact price can be considered within the organization when making decisions. However, it is not an actual price the organization has to pay. In this way, the organization can take nonfinancial impacts into account when making decisions rather than making decisions based on financial information only. However, there is no indication of whether this monetary value of the impact is appropriate which makes the monetary value ambiguous, what they aim to achieve for the impact next year, and what actions they will take to achieve this objective.

When an organization starts measuring nonfinancial impacts with the intention to report and steer on it, the organization must know what they aim to achieve with that impact (Kroese & Hillen, 2018). Otherwise, organizations keep focusing on what their impact is without any direction to steer on. It needs to be clear which nonfinancial issue they want to improve and what monetary values lie within the acceptable boundaries for the impact. A sector standard that indicates which price is used for a certain quantity of impact could help to determine these boundaries. With set and accepted boundaries, organizations can plan their actions to achieve that impact.

The shift from output to impact thinking results in more uncertainty for the organization. The outputs are directly related to the activity of the organization, and the organization has control over these activities; thus, outputs are considered certain. Impacts, on the other hand, are uncertain. During meetings, CSR director Koen Eising explained that the impact of the activity lies within the entire value chain and does not only have to come from the organization itself. For example, suppliers or manufacturers make decisions that have a positive or negative impact that is outside of the organization's control. Throughout the value chain, it needs to be clarified which impact can be attributed to the organization and which impacts lie outside the organization's influence (Kroese, 2015). However, this is not always a clear distinction, making it more uncertain for the organization to steer on the impact.

## **2.2 Adoption and diffusion**

In the introduction, I explained why system dynamics is an appropriate tool to model the adoption of nonfinancial reporting in the infrastructure sector. In this section, I describe the theory of adoption and diffusion and the relation to system dynamics.

Rogers (1962) discussed the theory of adoption and diffusion of new ideas or products by a social system. This theory indicates five categories of adopters, starting with the (1) innovators who decide “to adopt an innovation independently of the decisions of other individuals in a social system” (Bass, 2004: 1825). The group of imitators follows the innovators, and these are classified as the (2) early adopters, (3) early majority, (4) late majority, and (5) laggards. Unlike innovators, imitators “are influenced in the timing of adoption by the pressures of the social system” (Bass, 2004: 1825). The pressure for these adopters increases as the number of previous adopters increases.

Approaching this theory from a system dynamics perspective, Sterman (2000: 325) depicts a stock and flow diagram to explain the adoption and diffusion of products. This model shows a stock of potential adopters, an adoption rate flowing from the potential adopters to the adopters, and a stock of adopters. In addition, a contact rate, total population, and adoption fraction were part of this model. Research showed that adoption usually follows a pattern of S-shaped growth over time. The S-shaped curve indicates that the successful adoption of a product or innovation is initially driven by a positive feedback loop that reinforces growth and is followed by a balancing feedback loop which constraints the growth. In this adoption and diffusion model, the reinforcing feedback loop is driven by word of mouth and the constraining balancing feedback loop is caused by market saturation (Sterman, 2000).

However, this original model is mainly aimed at the adoption and diffusion of new products and ideas for consumers, e.g. mobile phones and cable tv, and this research applies to the adoption dynamics of nonfinancial reporting, i.e. a new practice that needs to become a standard in a sector. Therefore, the feedback loops from the adoption and diffusion model cannot directly be used to model the adoption process. To illustrate the adoption of nonfinancial reporting in a qualitative SD diagram, I use the assumptions of this theory that there is a group of adopters and a group of imitators that will follow the adoption and that the adoption develops over time and is subject to time delays. For the infrastructure sector, Alliander and Schiphol can be indicated as innovators who individually decided to measure and report on nonfinancial impacts in the annual reports of 2015 (Alliander, 2016; Schiphol, 2016). The other organizations in Green Networks and NGinfra belong to the category of imitators and are potential adopters of nonfinancial reporting. Thus, four infrastructure organizations are measuring and reporting on nonfinancial impact, and no organization is explicitly steering on nonfinancial impact yet. Besides, the assumption is made that

an organization intends to adopt all phases and once an organization has adopted nonfinancial reporting, it will not discontinue the practice.

### **2.3 Perspectives on the adoption of nonfinancial reporting**

In the previous section, I explained that innovating organizations make decisions to adopt a new practice individually and that imitating organizations generally feel pressured by the adopters to imitate their behaviour. In this section, I review the literature on rationales for organizations to adopt nonfinancial reporting as an individual decision and the rationales for organizations following what similar organizations are adopting.

Gray et al. (2010) categorized theories on nonfinancial reporting on the level of the theory (system, subsystem, organizational, internal, and individual) and four types of metaphors. Through this categorization, I reasoned which theories are most useful in this research. The objective of this research is to provide insight into the adoption of nonfinancial measuring, reporting, and steering in infrastructure organization. Therefore, I only use theories that describe the adoption of nonfinancial reporting on an organizational level. On the organizational level, various theories provide different perspectives on why organizations did or did not decide to disclose nonfinancial information. The main categories or metaphors for these theories can be classified as the political/sociological strand of theory and the economic/rationalist strand (Gray, Kouhy & Lavers, 1995).

The economic/rationalist perspectives, with theories such as decision usefulness, signalling, principal-agent, and transaction costs theory, only consider the economic aspects when an organization decides to adopt nonfinancial reporting (Fernando & Lawrence, 2014). In other words, this strand of theories describes the market outcomes an organization benefits from when adopting nonfinancial reporting. Moreover, these theories have a strong focus on the financial stakeholders of the organizations (Fernando & Lawrence, 2014). These theories assume that the decision for nonfinancial reporting can be refined to any short-term and self-interested motivation (Gray et al., 1995). The focus on financially benefiting from nonfinancial reporting is in contrast with the aim of the infrastructure organizations. The primary purpose of these organizations is to fulfil public policy objectives (e.g. providing water and energy to society) rather than to achieve financial returns (Garde Sánchez et al., 2017). Infrastructure organizations aim to add social value to society with the adoption of nonfinancial impact measuring. There is no indication that they



want to gain financially from it as an organization. Therefore, the economic/rationalist perspectives are not suitable to include in this research.

Gray et al. (1995) state that political/sociological theories such as legitimacy theory, stakeholder theory, and institutional theory provide more insightful perspectives on the adoption of nonfinancial reporting than the economic theories. These theories are more insightful due to the perspective of these theories on, and the inclusion of, stakeholders, other organizations, and society. Organizations function within a social system, and especially for infrastructure organizations who have a critical function in society, the relation to other organizations and society is essential. To determine which theories are most appropriate in this research, I further elaborate on these three theories.

Following the definition of legitimacy, an organization is motivated to operate in a manner that meets the criteria of the society to oblige to the social contract. For nonfinancial reporting, this indicates that organizations want to adopt structures and processes that legitimize their existence. Organizations use the annual report as an instrument to communicate their nonfinancial impact and to manage their legitimacy (Garde Sánchez et al. 2017). In the context of this research, legitimacy theory is relevant since infrastructure organizations use impact measuring and reporting to obtain an accurate picture of the organizations social added value and to set objectives to improve this accordingly. Thereby, the organization legitimizes its position in society. For these reasons, legitimacy theory is an appropriate theory for this research. I discuss legitimacy theory and the rationales it offers for nonfinancial reporting in more detail in section 2.4.

Stakeholder theory focuses on the relationship between an organization and its stakeholders (Lawrence and Fernando, 2014; Gray et al., 2010; Mitchell, Agle & Wood, 1997). Concerning nonfinancial reporting, stakeholder theory considers what effect the disclosure of nonfinancial impacts has on stakeholders. This theory has two perspectives (Lawrence and Fernando, 2014; Gray et al., 2010). The first perspective considers nonfinancial reporting as a reaction to managing the needs of the stakeholders for the interest of the organization. The organization determines the importance, defined as salience by Mitchell et al. (1997), of the relationship with the stakeholders. Based on the salience of the stakeholder relationship, the organization determines how much effort needs to be put into nonfinancial reporting to manage that relationship.

The second perspective claims that organizations owe responsibility and “accountability to all its stakeholders” (Gray et al., 2010: 25). In this perspective, an organization must prove its

responsibility, and owes accountability, to all stakeholders. In other words, the stakeholders hold power, and they determine the nature of the accountability the organization has to provide. A perspective in which an organization is subject to its stakeholders proved to have little explanatory power in the context of nonfinancial reporting (Gray et al., 1997). Thus, stakeholder theory emphasizes the importance of nonfinancial reporting in relation to managing stakeholder needs for the interest of the organization. Whereas in legitimacy theory, the organization wants to engage in nonfinancial reporting to improve the nonfinancial impact they exert on society. There is no indication in the annual reports that nonfinancial impact measuring and reporting is to be adopted in order to respond to stakeholder pressures. However, there is an indication that the organizations do this to improve their relationship with society. In conclusion, there is no clear evidence that infrastructure organizations are pressured by stakeholders to adopt nonfinancial reporting practices. Hence, stakeholder theory is not included in this research.

The adoption of nonfinancial reporting by organizations within a sector is considered an institutional practice (Deegan, 2009; Fernando & Lawrence, 2014). Deegan (2009) explains that, in institutional theory, institutional practices can be diffused in an organizational field through three isomorphic processes: coercion, imitation, and normative pressures. This theory has a close relationship to the notion of Rogers (1962), namely that the group of imitators will adopt practices due to the pressure they feel by similar organizations that have adopted the practice. Considering the similarities of the infrastructure organizations, as described in the introduction, it is very likely that the infrastructure organizations will follow some isomorphic process to adopt nonfinancial reporting once the innovators have adopted the practice. For these reasons, institutional theory is relevant in this research.

## **2.4 Legitimacy theory**

Research by Aguilera, Rupp, Williams & Ganapathi (2007) states that an organization's legitimacy suffers if society suspects a lack of transparency. A gap in transparency can arise due to changing societal values and norms which change over time (Deegan, 2002). Over the last decades, societal values and norms have changed concerning environmental and social matters. Simultaneously, society's pressure on firms to disclose nonfinancial information has been increasing (Del Mar Alonso-Almeida et al., 2014; Kolk & Van Tulder, 2010; Velte & Stawinoga, 2017). If organizations refrain from disclosing nonfinancial information while society demands this, a legitimacy gap can arise. A legitimacy gap indicates that there is a discrepancy between the desired

legitimacy and the actual legitimacy. Organizations will employ legitimizing strategies to avoid a legitimacy gap (Fernando & Lawrence, 2014; Lindblom, 1994).

Lindblom (1994) proposed four legitimizing strategies an organization can implement: (1) educating society about the actual performance of the organization; (2) changing society's perceptions about the issue without changing the organization's behaviour; (3) distracting the society or drawing the attention away from the issue to a more favourable issue; and (4) changing society's expectations about the organization's performance. These strategies to close a legitimacy gap can all be employed by adopting nonfinancial measuring, reporting, and steering. The disclosure of nonfinancial information in the integrated report is considered an "effective tool for communicating an organization's legitimizing actions" (Velte & Stawinoga, 2017: 281). Not only does this legitimizing action result in an increased quality of the integrated report (Ministry of Economic Affairs and Climate Policy, n.d.), it also results in positive market reactions (Bernardi & Stark, 2015; Martinez, 2015), and improves the organization's image (O'Donovan, 1999).

Furthermore, Fernando & Lawrence (2014) argue that organizations make deliberate decisions about the information they disclose depending on how it would improve the organization's legitimacy. For example, organizations may choose to refrain from disclosing nonfinancial information if this information puts them in harmful daylight. On the other hand, organizations may choose to disclose more nonfinancial information if they consider this helpful for the organization's legitimacy. Thus, in legitimacy theory, improving the organization's legitimacy through nonfinancial reporting practices is considered the primary motivation for disclosing nonfinancial impacts. In other words, organizations might adopt nonfinancial reporting practices "in order to retain, gain, and regain their legitimacy" (Fernando & Lawrence, 2014: 156).

## **2.5 Institutional theory**

DiMaggio and Powell (1983) describe two dimensions in institutional theory: isomorphism and decoupling. The authors describe isomorphism as "a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions" (DiMaggio & Powell, 1983: 149) and state that isomorphism captures the process of homogenization best. Further, they distinguished competitive and institutional isomorphism. Competitive isomorphism relates to an open and free market in which competition exists and this drives organizations to adopt the least cost and efficient practices and structures. Being semi-government organizations, infrastructure organizations are not fully part of the competitive market. Deegan (2009) states that,

in institutional theory, other organizations are the primary factor that organizations must consider. Moreover, structures and practices are adopted through three mechanisms: coercive, mimetic, and normative pressure. Nonfinancial reporting practices are considered part of institutional practice (Deegan, 2009).

Coercive isomorphism stems from external factors, e.g. influences from politics, employees, government policy, or shareholders (Fernando & Lawrence, 2014) and the problem of legitimacy (DiMaggio & Powell, 1983). So, the coercive process arises due to the pressure organizations experience from salient stakeholders to change an organization's institutional practices such as nonfinancial reporting (Deegan, 2009). This process is related to stakeholder theory which focuses on the salience of stakeholders and the actions that are taken accordingly. Following the reasoning for the relevance of stakeholder theory, coercive pressures are expected to be less compelling and present in this research.

Mimetic isomorphism, the second process, “involves organizations trying to emulate or copy other organizations’ practices” (Fernando & Lawrence, 2014). This imitation process is related to a sense of uncertainty: if an organization fails to follow the practices that have been adopted by the innovators (in the same organizational field), then the organization would risk losing legitimacy in comparison to other organizations in the sector (Unerman & Bennett, 2004; DiMaggio & Powell, 1983). In this context, adopting nonfinancial reporting is the innovative practice that has been adopted by a few organizations and could be mimicked by other organizations to help to maintain and enhance organizational legitimacy.

Last, organizations can respond to normative pressures and thereby become more homogenous. Normative isomorphism is a process that stems from professionalization. Professionalization implies that people in a particular professional occupation feel pressured to comply with standards (DiMaggio & Powell, 1983). For nonfinancial reporting, this indicates that accountants feel pressured to work according to emerging reporting trends and standards, e.g. integrated reporting (IIRC, 2015). In conclusion, all isomorphic pressures can drive organizations to conform to socially accepted and “normal” practices or standards in the organizations. All organizations in a sector are motivated to adopt nonfinancial measuring and reporting by their drive to conform (Velte & Stawinoga, 2017).

The other dimension of institutional theory is decoupling. Decoupling “relates to the separation between the external image of an organization and its actual structures and procedures

or practices. An organization's actual practice need not necessarily comply with the external expectations" (Fernando & Lawrence, 2014: 163). In other words, organizations may adopt nonfinancial impact measuring and reporting to improve their organizational image and legitimacy while the actual steering practice of the organization, to better its nonfinancial impact, has not changed.

### 3 Methodology

In this chapter, the methodological choices that I made are explained. First, the research design is discussed. Second, the plan of data collection is described, and the procedure for data analysis follows this section. Finally, I describe the research ethics of this study.

#### 3.1 Design

This research aims to provide insight into the adoption dynamics of measuring, reporting and steering on nonfinancial impacts in the organizations in Green Networks and NGinfra. In order to achieve this aim, this research takes an explanatory approach. An explanatory research approach is used when the researcher can “build on a well-developed body of knowledge” (Denscombe, 2012: 102) and aims “to explain why things happen and what their underlying causes are” (Denscombe, 2012: 102). This approach fits this study since researchers have been studying the adoption of nonfinancial reporting practices over half a century (Bowen, 1953). Nevertheless, the literature does not suffice to explain the adoption dynamics of nonfinancial reporting in the infrastructure sector. In other words, explanatory research is needed to explain how the adoption process in the infrastructure sector is structured. I accomplish this objective by following a deductive research approach (Bleijenbergh, 2015). In the deductive approach, the researcher departs from existing theory in order to gather relevant data that are aimed at testing or refuting these theories (Bleijenbergh, 2015). The deductive approach is suitable since existing literature provided a broad basis to start from and allowed me to narrow down towards infrastructure sector data to explain the observed phenomenon.

A qualitative research approach is used to answer my research question. Qualitative research concerns all research focused on collecting and interpreting linguistic data in order to make statements about a social phenomenon in reality (Bleijenbergh, 2015). Since the aim of the research is to provide insight into how nonfinancial reporting practices are adopted in the Dutch infrastructure sector, qualitative research is appropriate for this study.

Also, a modelling method called system dynamics is applied (Sterman, 2000) as described in the introduction. When using system dynamics qualitatively, the feedback structure of a system is often represented through a causal loop diagram (CLD) (Forrester, 1992). Forrester (1992) recognizes qualitative data as the primary source of information to develop system dynamics models and describes how “effective model building must draw on the mental data base”

(Forrester, 1992: 56). This quote indicates that the information in people's heads provides the most information about how social phenomena are structured. Through interviewing people working in the infrastructure sector, I draw on their mental database in order to explain how variables are connected, and which feedback processes underly the adoption.

The counterpart of the causal loop diagram is a quantitative stock-and-flow diagram (SFD). An SFD is more detailed than a CLD since SFDs differentiate between different parts of the system by defining stocks, flows, and additional variables (Sterman, 2000). The main difficulty with a causal loop diagram is that the behaviour of the problem can only be analysed through feedback loops. In contrast, a quantitative stock and flow diagram can be analysed through computer simulations to show accumulations and delays (Richardson, 1986).

For this research, I chose to develop a CLD instead of an SFD to answer the research questions. First, the background of the audience must be considered when choosing between a CLD and SFD. The results of this research are particularly relevant for people working in the infrastructures sector. In comparison to SFDs, CLDs are easily understandable for people who have little background in system dynamics due to the level of detail (Aronson & Angelakis, n.d.). Also, I chose to develop a CLD as it allows me to describe the causes of dynamics and to communicate the important feedback loops that are responsible for the adoption of nonfinancial reporting to the infrastructure sector (Sterman, 2000). Since this research aims to provide insight into the feedback processes for the adoption of nonfinancial reporting and to provide practical recommendations for the infrastructure sector, the development of a CLD is not a less accurate manner than a quantitative stock and flow diagram to answer the research questions (Barlas, 1996).

## **3.2 Data collection**

The data collection consists of document analysis and open interviews. The documents are company-specific documents for the infrastructure organizations in this research. The open interviews were conducted to obtain more specific and nuanced data to answer the research questions.

### ***3.2.1 Document collection***

Documents add value to qualitative studies, as Merriam (1988: 188) described: "Documents of all types can help the researcher uncover meaning, develop understanding, and discover insights relevant to the research problem". Document collection is appropriate in this study since

documents were used to get a sense of the status of nonfinancial reporting in the infrastructure sector and to establish a reference mode of behaviour as described in the introduction (Figure 1). Documents are particularly suitable for establishing a reference mode of behaviour since they form a reflection of what is said or decided at a specific moment, generally without the inclusion of (individual) opinions (Bowen, 2009). Hence, documents can present an objective picture of the disclosure of nonfinancial impacts in the annual reports in the last years.

I used the following selection criteria for the documents: (1) relevance of content, (2) interrelated cohesion, (3) time period, and (4) sector. The content is deemed relevant when the organization uses the document to disclose their financial or nonfinancial information, e.g. annual reports, integrated reports, value creation documents, and annual statements. I analysed the publicly online available annual reports (IRs or annual statements) of all infrastructure organizations in Green Networks and NGinfra from 2015 to the present. Alliander started measuring nonfinancial impact in 2015 and has been reporting upon the impact in the annual report since 2015 (Alliander, 2015). Therefore, 2015 is chosen as the lower bound for the year of publication in the collection of annual reports. The upper bound is the present. Furthermore, some interviewees provided me with value creation documents and parts of unpublished annual reports. I included a list of these documents in the analysis, see Appendix A.

### *3.2.2 Open interviews*

Interviews are the source of primary data in this research. The interviews that I conducted were open, meaning that the interviews are not dictated by a predetermined set of questions (Corbin & Strauss, 2008). This form of interviewing is appropriate because it allows the interviewees to express their mental models (Forrester, 1992) which is relevant to answer the research question. On the other hand, open interviews without structured questions result in less uniformity, causing credibility to decrease and replication to become more difficult (Bleijenbergh, 2015).

An interview guide was drawn to ensure uniformity across the interviews. Three basic questions were drawn up per phase (measuring, reporting, and steering) to provide a basis to depart from, e.g. questions regarding the adoption of measuring impacts are: “Can you explain what made you start measuring impacts?”, “What were enablers in this process?”, and “What kind of barriers did you experience in adopting impact measuring?”. For the adoption of reporting and steering on nonfinancial impacts, similar questions were drawn up. These questions were specified for these two phases. Follow up questions were determined by the answer of the interviewee. In case the



interviewee did not bring up all dimensions of the coding tree her/himself during the interview, more specific questions about the missing dimensions were asked. The dimensions of the coding tree are described in section 3.3 Data analysis. Hence, I was able to go through all dimensions and ask focused questions to increase validity.

Open interviews entail the issue of the interviewer- and respondent induced bias (Andersen, Luna-Reyes, Diker, Black, Rich, & Andersen, 2012). The first issue regards trust: unless the interviewees trust the interviewer, the responses can become less valid. The validity can decrease since interviewees possibly feel the need to answer a “sanitized version of the “truth” for fear that more controversial responses might somehow be made public with the respondent’s name attached” (Andersen et al., 2012: 258). A sanitized version of the truth indicates that the interview is not focused on providing a truthful answer but on providing a socially desirable or acceptable answer. For example, when posing the question about barriers for adopting impact measuring, the interviewees might avoid telling the real reasons they have not adopted it yet, because it could put their organization in unfavourable daylight. When asking the interviewees about steering on impact measuring, they might be more careful in phrasing their answers, since this relates to the board of an organization. Interviewees might prefer to refrain from commenting on the board, as it could be considered a sensitive topic. To avoid this bias, I interviewed no more than two persons from the same organization together.

Further, while I ask the interviewees open questions, the interviewees can answer based on their current perception consisting of past occurrences. This bears the risk of the forgetting effect and must be considered in the validation of the causal loop diagram (Andersen et al., 2012). Since I am both the interviewer and the coder in this process, I researched the intent and meaning of the interviewee’s statement leading to reduced bias (Eker & Zimmermann, 2016).

As this research is conducted on behalf of Alliander, the CSR director provided me with contacts from NGinfra and Green Networks to approach for interviews. For research question 1 and 2, interviews were conducted with one or two interviewees from the same infrastructure organization. The sample will be further explained in the next section.

The open interviews were conducted via a video call<sup>2</sup>, and the answers were captured through voice recording, allowing the researcher to focus on the conversation instead of taking

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<sup>2</sup> Due to the Dutch governmental regulations (e.g. to practice social distancing and self-isolation) (Government of the Netherlands, 2020) concerning the coronavirus disease (COVID-19) outbreak (World Health Organization, 2020), I have

notes. The video calls impact the observations I can make before, during, and after the interview. If the interviews were conducted at the interviewee's office, then I could have analysed further whether the surroundings match the interviewees answers. For example, if the interviewee says that the organization is open and transparent, but I would have to go through security checks and all the offices were locked, then that mismatch could be an interesting observation. Due to the video calls, I was only able to observe what was showed on my screen.

Since the mother tongue of both the interviewees as the researcher is Dutch, the interviews will be conducted and transcribed in Dutch. I interviewed multiple people with different positions within the same organization. The resulting data triangulation from different people acting as multiple data sources can increase the robustness of data (Hussein, 2009). The interview guide can be found in Appendix B.

For research question 3, I intended to find top managers willing to participate in open interviews. However, in the current situation, I regarded asking top management for their time inappropriate since their attention is urgently needed to cope with COVID-19 matters. Excluding top management from the sample negatively affects the amount of data for identifying the feedback processes related to strategic decision-making based upon nonfinancial impact. To absorb this loss, I conducted two open interviews with professors who are researching topics related to strategic decision-making based upon nonfinancial impact, e.g. value creation and corporate governance, in order to collect information for research question 3. Alliander provided these contacts. Also, I asked the interviewees from the sample for research questions 1 and 2 for their experiences with decision-making regarding nonfinancial impact at top management level. The interview guide can be found in Appendix C.

### *3.2.3 Sample*

Interviews were conducted in organizations who are united in the coalitions Green Networks and NGinfra. Specifically, the persons who are engaged with nonfinancial impact measurement within the organization were included in the sample. A specified list of the organizations is enclosed in Appendix D. The contacts have been acquired through the business network of Koen Eising, the CSR director at Alliander. These firms form a homogenous group as they all operate in the

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changed the manner of interviewing from face-to-face interviews to video calls in order to ensure safety and continuity of the research process.

infrastructure sector. Moreover, the organizations have been working on, or will start to work on, nonfinancial impact measuring and reporting. Therefore, they know what feedback processes drive the adoption of nonfinancial impact measurement and the adoption of nonfinancial impact measurements in IRs. Twenty potential interviewees were invited to participate in the interview via an email. In this email, I also asked the addressee whether they have suggestions for colleagues who are engaged with social impact measurement to widen my sample and to help me find other relevant interviewees. Eventually, this snowballing method has proven worthwhile since some provided me with referrals within their firm. I interviewed 17 people, of which two interviews were held with duo's, resulting in 15 interviews.

Before the interviews, I asked the interviewee to describe their organization's situation regarding the adoption of nonfinancial reporting via email. Consequently, I was able to focus on the interview questions that applied to their situation. Their situations were fit into four categories: (1) the firm recently started measuring nonfinancial impact, (2) the firm measures nonfinancial impact to some extent, (3) the firm measures nonfinancial impact and wishes to report upon the impact in the IR, and/or (4) the firm measures nonfinancial impact and reports upon the impact in the IR. Organizations in situation 1 and 2 contribute with their knowledge to answering research question 1. If a firm is in situation 3, their knowledge provides data for research questions 1 and 2. Last, organizations in situation 4 can elaborate on the feedback processes contributing to research questions 1 and 2.

Furthermore, the interviewees can share (second hand) experiences and information regarding research question 3. Hence, the interviewee might not be involved in feedback processes relating to the adoption of nonfinancial impact into corporate strategic decision-making but has knowledge on the phenomenon through experiences and information of others who are involved. This information is not as reliable as information from board members. However, it can provide preliminary insight into the feedback processes related to steering on nonfinancial impact.

Alliander is in contact with a professor from the University of Groningen and a professor from Erasmus University. I interviewed both professors about their knowledge and experience with nonfinancial impact measurement, nonfinancial reporting and steering upon it in organizations.

### 3.3 Data analysis

Based on the literature review, I determined which dimensions for the adoption of nonfinancial reporting are most clearly described and supported in legitimacy and institutional theory. Next, I looked for specific indicators for each dimension. For example, in institutional theory, I identified the dimension ‘willingness to conform’ and defined ‘willingness to measure nonfinancial impact’, ‘willingness to report on nonfinancial impacts’, and ‘willingness to steer on nonfinancial impacts’ as indicators. I repeated this until I identified all relevant dimensions and indicators for each theory. This iteration led to the development of a tree structure that provided guidelines for open interviews. The concepts of the tree structure are legitimacy theory and institutional theory. Legitimacy theory has the following dimensions:

- Quality integrated report;
- Organizational legitimacy;
- Transparency;
- Pressure; and
- Image.

For institutional theory, the following dimensions were identified:

- Pressure;
- Willingness to conform;
- Social acceptance of practice; and
- Adoption of practice.

During the coding process, the tree structure proved insufficient, and I added dimensions and indicators as needed. The following dimensions and indicators were added to the tree structure:

- Collaboration with the sector (sharing knowledge and sharing experiences);
- Resources (time and people);
- Nonfinancial objectives (setting objectives and achieving objectives);
- External pressures (Transparency Benchmark and financial agencies); and
- Strategic emphasis on nonfinancial reporting from the board (awareness of nonfinancial impact and perceived importance of nonfinancial impact).

The complete coding tree can be found in Appendix E.

### *3.3.1 Document analysis*

The analysis of the selected documents has been done through an iterative process of content analysis and thematic analysis by skimming, reading, and interpreting the data. Content analysis entails a general document review to identify meaningful and relevant (textual) data (Bowen, 2009). Specifically, I focused on whether the organization included both financial and nonfinancial impact measurement in the annual report, and whether this was described qualitatively, quantitatively, and/or monetized. Besides skimming through the text, I searched for specific words, such as impact measurement, impact(s), value creation, share value, stakeholders, materiality, and monetization of impact. Then, during the thematic analysis, I looked for patterns within the data. By coding the documents, pertinent data were uncovered to construct a reference mode of behaviour for the infrastructure sector (Bowen, 2009; Corbin & Strauss, 2008).

### *3.3.2 Interview analysis*

I approached the interview data from a positivistic paradigm, meaning that “a single external reality can be known/accessed by an objective observer.” (Pruyt, 2006: 9). Moreover, this paradigm believes that the data provides real and knowable causes and effects (Pruyt, 2006). This paradigm is relevant and fitting for this research since the research questions demand an objective display of feedback processes in order to explain the adoption of nonfinancial reporting in the infrastructure sector. When adopting a positivistic paradigm, a comment needs to be made about subjectivity concerning the results. Interviewees’ answers are construed of their knowledge and experiences, and this bears the risk of subjectivity. Thus, this research attempts to provide insight into the adoption dynamics as an objective reality but can be subject to some degree of subjectivity.

The transcribed interviews form the qualitative textual data in the deductive coding process. The coding process is executed through the coding software ATLAS.ti, since this software enables combining specific data from different interviews and helps to differentiate between the vertical hierarchy of the codes. Furthermore, the software makes the coding process highly transparent and imitable for other researchers. Hence, using ATLAS.ti increases reliability.

I followed four steps to analyse the data and to turn it into a causal loop diagram (Turner, Kim & Andersen, 2014; Eker & Zimmermann, 2016). First, I coded the data along with the concepts, dimensions, and indicators of the tree structure. Second, I identified variables and causal relationships in the codes. The relationships between variables and their polarities (positive or negative) were presented in a table. For example, the relationship “*Maturity and Uniformity of*

*Nonfinancial Impact measuring* → + *Willingness to Steer on Nonfinancial Impacts*” is derived from, among others, the following data sections:

*“And then it is still a long road before we will say: this is how we will steer from now on. This is a complete change in how you strategically steer all key processes in your organization. Much more certainty about the method than we currently have is needed for this to happen.” (Interviewee from Enexis)*

*“If you want to steer based on these numbers, then it needs to be crystal clear how you acquired these numbers. Otherwise, we will not steer upon it, because then the methodology is not airtight. Then why would you use this as a component in making decisions?” (Interviewee from Stedin)*

Third, I visualized and connected the individual causal relations into a causal loop diagram and identified positive and negative feedback loops. These steps have been repeated for all interviews individually in order to obtain insight into the different mental models. In this way, I refrained from the assumption that a collective mental model for all interviewees exists and gave voice to all perspectives on the problem. By obtaining multiple perspectives or realities on the dynamics of the phenomenon, differences and similarities in the mental models of the interviewees were identified. Three interviews were held in duos with people from the same organization, and no CLDs were made for the professors as their mental model was not specific for the infrastructure sector. These steps resulted in 13 different CLDs.

Finally, all CLDs were laid out, and the variables were colour-coded to distinguish to which adoption phase the variable primarily belonged (blue for measuring, green for reporting, and pink for steering). For example, “Willingness to Measure Nonfinancial Impacts” was labelled blue. When I labelled all CLDs, all the variables for the measuring phase were merged into one collective CLD. Then, I extended the CLD repeating this process for the reporting phase and finally for the steering phase. Following these steps resulted in one collective CLD that allowed me to explain the adoption of nonfinancial impact measuring, reporting, and steering.

### *3.3.3 Model validity*

Model validation regards building confidence in the model. Model confidence has been established through a structure confirmation test. Structure confirmation tests do not involve simulation but focus on comparing each relationship with available knowledge (Barlas, 1996). By continuously

corroborating the literature and documents against the interview data, I established theoretical structure confirmation.

### **3.4 Research ethics**

The research has been conducted in accordance with the Ethical Principles of Psychologists and Code of Conduct (American Psychology Association, 2017). Before the interviews, the interviewees were well informed about the purpose, goal, method, and accessibility of this research. Participation in the research was entirely voluntary. Moreover, the interviewees were informed that they are under no obligation to take part in the research. Furthermore, the interviewees had the right to withdraw from the interview at any time and knew that the interviews were recorded with a voice recorder. In the report, the interviewees have been treated with the anonymity they desire to assure confidentiality. Only those who sign the form were included in the research. The consent form can be found in Appendix F. The transcribed interviews were shared with the interviewees for them to assess, and they were allowed to give feedback on their data. Also, they were allowed to change their data, and to omit certain parts if desired. This review ensured consent on the data before the analysis phase commenced. Upon finishing the research, the thesis was shared with the interviewees, and the recordings were deleted.

During data collection and analysis, I was aware of the contribution my perspective had to the interpretation of data and how my role as researcher influenced the research (Bowen, 2009; Corbin & Strauss, 2008). Generally, reflexivity is less of an issue in document collection and analysis and more important during interviews, since documents are non-reactive (Bowen, 2009). My feelings or responses can be conveyed to participants and can alter the interviewees' responses and views (Corbin & Strauss, 2008). Since many decisions are taken unconsciously, it is difficult to account for my role as a researcher completely. Reflexivity is essential to consider in qualitative research, as this describes the possible influence I have as a researcher on this study (Bowen, 2009). I dealt with the issue of reflexivity by writing memos during the data collection process. The memos were coded to identify information beyond the use of language (Bleijenbergh, 2015). For example, I paid attention to nonverbal communication. Furthermore, self-reflection was practised while collecting and analysing data in order to assess whether my role as researcher remained as objective as possible. During and after interviews, I examined the impact of my position, perspective, and presence, and I scrutinized personal responses and interpersonal dynamics (Finlay, 2002).

The research was conducted under the guidance of Vincent de Gooyert from Radboud University and is examined of Birgit Kopainsky from the University of Bergen. Moreover, I was guided by Koen Eising, CSR director at Alliander, throughout this process. For all parties, there is no conflict of interest concerning the objective and impartial treatment of the data (Denscombe, 2012).



## 4 Analysis

This chapter describes the results and is divided into three sections: measuring, reporting, and steering on nonfinancial impact. Per section is described which feedback processes apply and to what degree consensus exists among the interviewees. In general, no clear disagreement is found between the interviewees. However, some interviewees only identified a part of the feedback process. In other words, usually the interviewee had knowledge of a part of the feedback loop and the convergence of the different views resulted in the feedback loops as presented in this chapter.

### 4.1 Measuring nonfinancial impacts

Four feedback loops have been identified that drive the adoption of measuring nonfinancial impacts; two balancing and two reinforcing loops. Balancing loop 1 (see Figure 3) describes how collaboration between the infrastructure organizations in NGinfra and Green Networks helps to improve the method for measuring nonfinancial impacts. Collaboration in the context of improving impact measuring is mentioned in 8 out of 13 CLDs. An increase in collaboration leads to an increase in sharing knowledge and experiences. Sharing knowledge and experiences improves the method of nonfinancial impact measuring, resulting in a more mature and uniform nonfinancial impact measuring method. The more mature and uniform the method is, the less collaboration is needed between the organizations. Various interviewees indicate that they much appreciate the collaboration between the organizations, an interviewee from ProRail says:

*“I think we can learn a great deal from each other. We might pay attention to impacts which others pay less attention to, or the other way around. Collaborating improves the method.”*

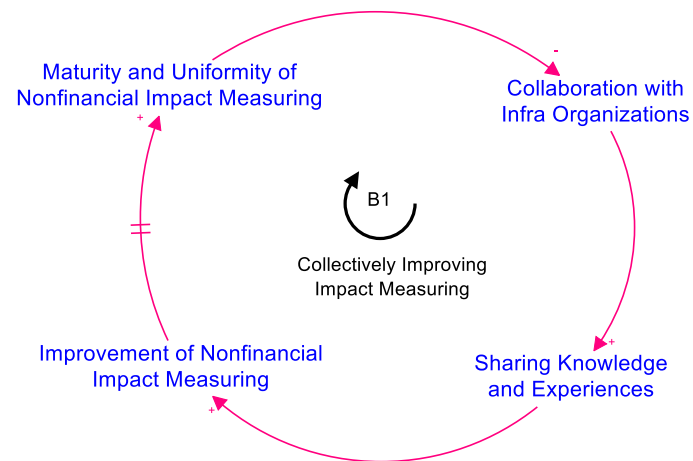


Figure 3: B1 Collectively Improving Impact Measuring

Further, the development of the method depends on the adoption, as depicted in reinforcing loop R1 (see Figure 4). The maturity of and uniformity of nonfinancial impact measuring is mentioned in 10 out of 13 CLDs. If an organization adopts impact measuring, the more nonfinancial impact measuring improves. The more it improves, the more mature and uniform the method will be. An interviewee from Alliander expects that it will take approximately three more years for the method to reach maturity and uniformity, hence the delay mark on the arrow. The more maturity and uniformity, the less difficulty of measuring nonfinancial impacts which leads to an increase in the adoption of nonfinancial impact measuring in the organization.

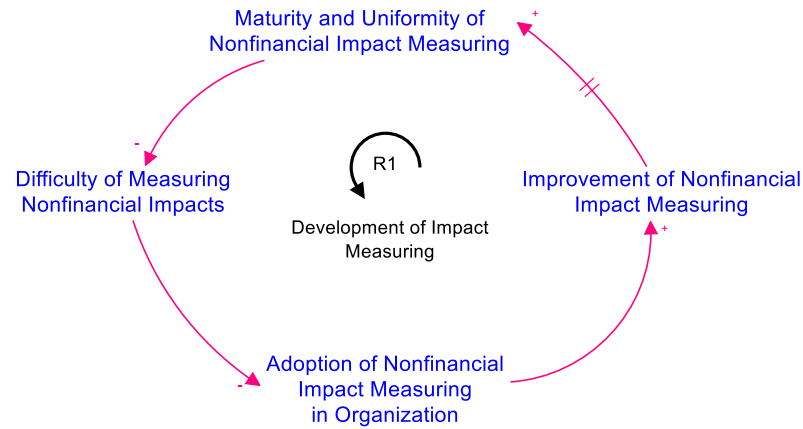


Figure 4: R1 Development of Impact Measuring

Infrastructure organizations indicate that they feel some pressure to follow each other due to benchmarking, which will become clearer in the section on reporting (e.g. feedback loop R5). In this case, more pressure from infrastructure organizations to measure increases, although delayed, the willingness to measure nonfinancial impacts. More willingness to measure nonfinancial impacts increases the adoption of nonfinancial impact measuring in the organization which lowers the pressure. This balancing feedback loop (B2) (see Figure 6) describes how infrastructure organizations respond to pressure they experience from other organizations. Closely related to this loop is reinforcing feedback loop R2 (see Figure 5) which describes an increase (or decrease) in the number of adopters. The more infrastructures measure nonfinancial impacts, the more pressure other infrastructure organizations feel to follow their lead. Thus, the willingness to measure nonfinancial impacts increases, causing the adoption of nonfinancial impact measuring in an

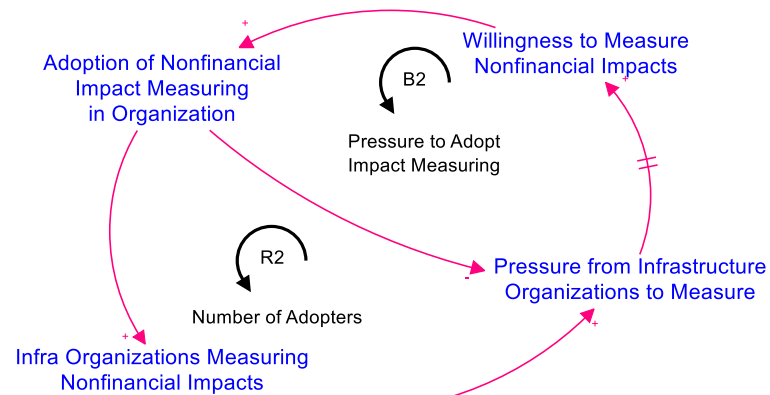


Figure 5: B2 Pressure to Adopt and R2 Number of Adopters

organization to increase as well. This results in a larger number of infra organizations measuring nonfinancial impacts.

#### 4.2 Reporting on nonfinancial impacts

Once the infrastructure organizations are measuring the nonfinancial impact their organizations have on society; the next step is to get the finance department willing to write about the impacts in the integrated report. The importance of the finance department is mentioned in 6 CLDs. The finance department feels pressure from the number of other infrastructure

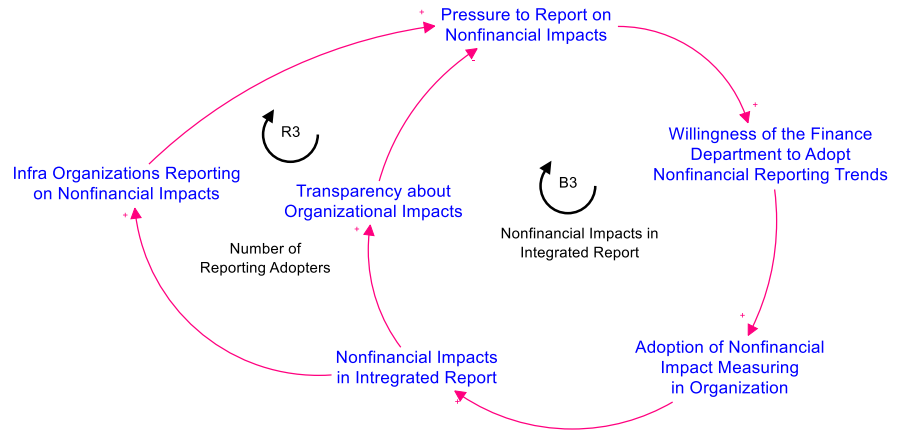


Figure 6: R3 Number of Reporting Adopters and B3 Nonfinancial Impacts in Integrated Report

organizations reporting on nonfinancial impacts but also from society to be transparent about their social added value since they are a social organization. An interviewee from Enexis explains that reporting on nonfinancial impacts is another way to explain the organizations right to exist in society. In other words, nonfinancial reporting can be used to explain that the organization is adding value to society. Also, more transparency enhances the organization's image (supported by 6 CLDs) and therefore makes it a more attractive organization for job hunters (supported by 2 out of the former 6 CLDs).

Balancing feedback loop 3 (B3) (see Figure 6) describes the adoption of nonfinancial impacts in the integrated report. The more pressure the finance department experiences, the more willing the finance department is to adopt nonfinancial reporting trends such as nonfinancial impact measuring. The more willing the finance department is, the more nonfinancial impact measuring will be done. This leads to an increase of nonfinancial impacts in the integrated report. This leads to more transparency about the organization's impact on society, relieving the pressure they experienced.

The number of infrastructure organizations reporting on nonfinancial impacts increases the pressure for an organization to report on nonfinancial impacts. This increases the willingness of the finance department to adopt to nonfinancial reporting trends causing the adoption of nonfinancial impact measuring to increase. This will lead to an increase of reporting on

nonfinancial impacts which increases the number of organizations reporting further. Thus, reinforcing feedback loop 3 (R3) describes how the infrastructure organizations feel group pressure to do what similar organizations are doing, and the more organizations report, the higher the pressure to follow. The similarity in organizations is vital in this aspect. All organizations are infrastructure organizations; however, an interviewee from Enexis indicated that they experience more pressure when Alliander reports on impacts than another infrastructure organization since Enexis and Alliander are both energy network organizations:

*“Because Alliander does it, we get a feeling that we cannot stay behind. ... Even though for example, ProRail has a similar organizational structure to us, I think it was important for us that Alliander was the front runner and not ProRail.”*

Similarly, an interviewee from ProRail said the following:

*“I think that it is also a sort of pressure coming from the NS reporting on nonfinancial impacts. We cannot stay behind. ... According to my feeling, it has more impact on us if NS reports on nonfinancial impacts than when Alliander reports on it.”*

Thus, the pressure has two layers: (1) is the organization is part of the infrastructure sector or not and (2) if so, how similar is that organization to my own organization.

Since organizations do not have insight into their impacts yet, they are afraid of finding impacts they were not aware of before or having a larger (negative) impact on society than expected. An interviewee from Stedin says:

*“People fear it because something new will be measured of which they do not know how they will score. And that is a lot of insecurity. Because giving insight into impacts also means you can be held accountable for it. That is one of the reasons why people are hesitant to go along with a new trend. If you are at the bottom of the class, then you do not want to show what your nonfinancial impact is.”*

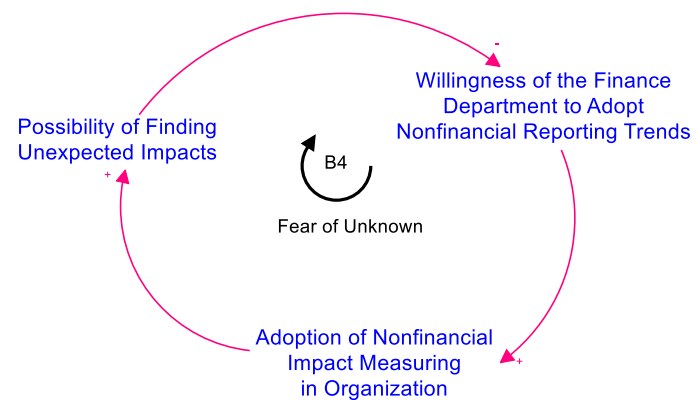


Figure 7: B4 Fear of Unknown

Therefore, the possibility of finding unexpected impacts makes the finance department less willing to adopt nonfinancial reporting trends. A decrease in willingness leads to less adoption of nonfinancial impact measuring in the organization, which results in a lower possibility of finding unexpected impacts. So, by not adopting nonfinancial

reporting trends, the organizations can stay in their comfort zone where they have control. This fear of the unknown is illustrated by balancing feedback loop 4 (see Figure 7).

Furthermore, the willingness of adopting nonfinancial reporting trends is related to fear of the reaction of the public when the finance department reports on nonfinancial impacts. An interviewee from Rijkswaterstaat says:

*“We struggle with finding the right way to show our nonfinancial impacts to the outside world. ... Currently, it is more of an anecdote and hardly any numbers. We fear the scrutiny and accountability.”*

Reinforcing loop 4 describes these dynamics (see Figure 8). An increase in the adoption of nonfinancial impact measuring in the organization leads to further improvement of the method. The more the method improves, the more mature and uniform nonfinancial impact measuring is in the sector, which results in a higher degree of sector-wide acceptance and assurance of the method. If the method has more sector-wide acceptance and assurance, the fear of public scrutiny decreases,

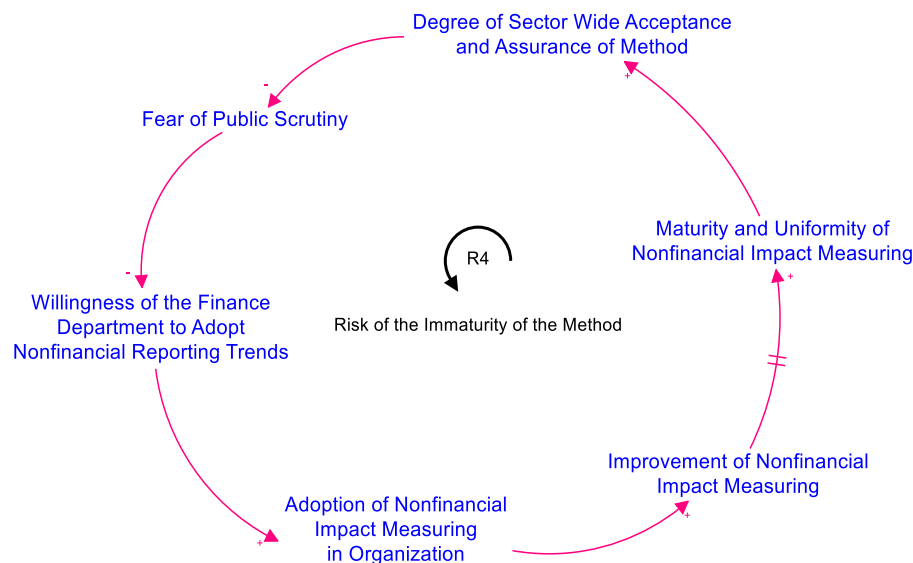


Figure 8: R4: Risk of the Immaturity of the Method

leading to an increase in willingness from the finance department to adopt nonfinancial reporting trends and to more adoption of nonfinancial impact measuring. When describing it from a negative perspective of a less mature and uniform method, it explains why only little organizations are currently reporting on nonfinancial impacts. The fear of public scrutiny, when the organization reports, is dampening the willingness of the finance department to adopt the nonfinancial reporting trend. An interviewee from ProRail explains about how the maturity of the method can be a barrier:

*“Because it is a new methodology, and we are organizations who tend to control and avoid risks.”*

Interviewees from Enexis and Rijkswaterstaat also indicated that traditionally infrastructure organizations are risk-averse organizations who prefer to have control. This fear fits the risk-averse

character of the organizations where they are interested in what is happening but waiting on the bold moves of the innovators to see what is happening and to start once it is widely accepted. The assurance on the nonfinancial impacts in the report from an accountant is vital for many of the interviewees since this substantiates their statements and public scrutiny will be less likely:

*“We often experienced difficulties because we could not get assurance from an accountant. What standard do you measure with, that other organizations are working with too, to get assurance?”*

Reinforcing feedback loop 5 (see Figure 9) describes the development of uniformity in reporting on nonfinancial impacts due to the Transparency Benchmark. A uniform reporting standard for nonfinancial impact is according to Vitens necessary because of the following:

*“It is important when making decisions. If financial terms are mentioned in our organization, everyone knows what you are talking about. ... The next challenge is to develop this for nonfinancial information, so that reporting will become more uniform. Now, we are comparing apples and oranges.”*

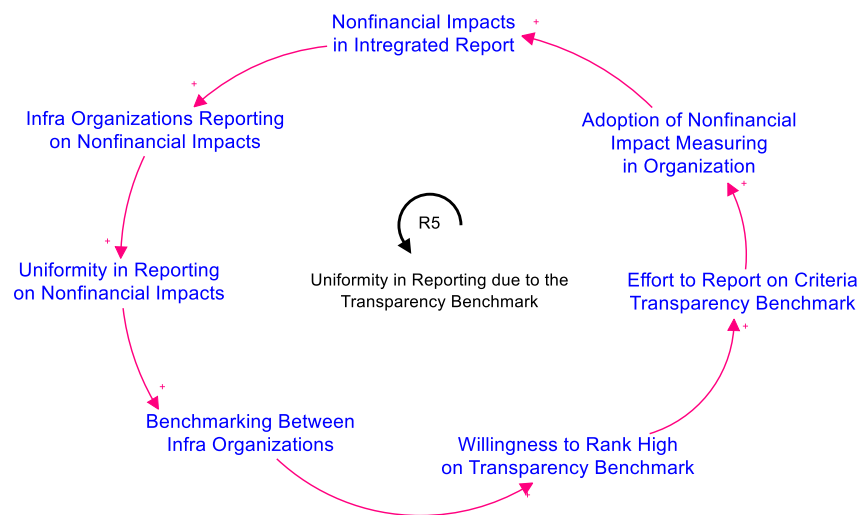


Figure 9: R5 Uniformity in Reporting due to the Transparency Benchmark

The more an organization adopts nonfinancial impact measuring, the more the organization reports on nonfinancial impacts. This increases the number of infrastructure organizations reporting on nonfinancial impacts which results in a more developed and uniform reporting standard for reporting on nonfinancial impacts. An increase in uniformity causes benchmarking between the sector organizations to increase since more uniform reports are easier to compare. The more organizations can compare themselves with one another, the more willing they are to rank high on the Transparency Benchmark. An interviewee from Stedin mentions:

*“As network organizations, we are compared through the Transparency Benchmark. And you do not want to be too far apart. ... So, it has to do with the fact that you want to be on a similar performance level.”*

Interviewees indicated that the Transparency Benchmark is setting more and more criteria for nonfinancial impacts each time, the more effort they put in on meeting the criteria for the Transparency Benchmark, the more they will adopt nonfinancial impact measuring. These dynamics were indicated in 7 CLDs. Alliander says:

*“I think you get points on the Transparency Benchmark if you define your nonfinancial impact through business cases. That is why we always have nonfinancial business cases in our report; then we can get the most points.”*

Further, the benchmarking between infrastructure organizations is connected to reinforcing feedback loop 6 (see Figure 10). An increase in benchmarking between infrastructure organizations leads to more willingness to rank high on the Transparency

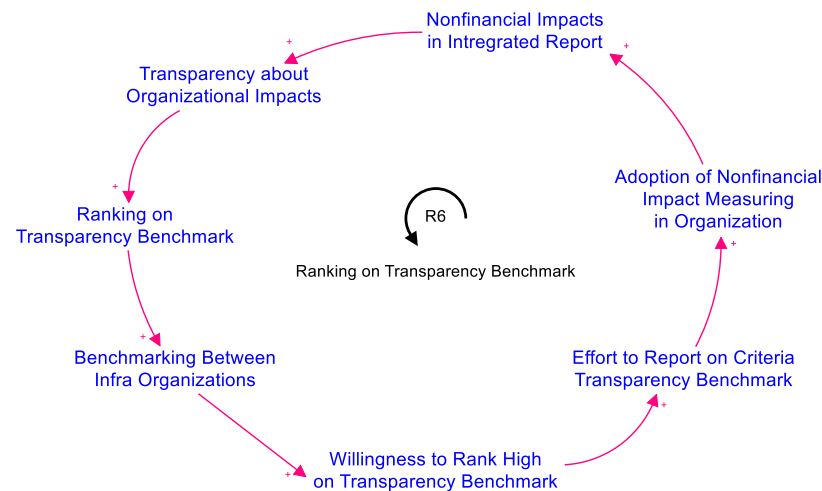


Figure 10: R6 Ranking on Transparency Benchmark

Benchmark. The more willing they are to rank high, the more effort they put in to report on criteria that are set for the Transparency Benchmark. This increased effort leads to more adoption of nonfinancial impact measuring, resulting in more nonfinancial impacts in the integrated reporting. An increase in nonfinancial impact in the integrated report leads to more transparency about organizational impacts and thus increasing the chance to rank higher on the Transparency Benchmark. The Transparency Benchmark is perceived as important, and multiple interviewees stated that they always wish to be in the top 10 or top 20 because the other organizations are ranked in those regions as well. An interviewee from the Port of Rotterdam explains:

*“The Transparency Benchmark does help. We do not have the ambition to be number one and therefore, to do everything in our power. But we do have the ambition to be the front runner. This means that we do want to rank in the top 20 ... And it does help if you can say, we can score a few extra points on this on the Transparency Benchmark if we do this.”*

As a result of the higher ranking, they will compare themselves with other infrastructure organizations even more. Thus, the desire to have a high ranking on the Transparency Benchmark

reinforces the adoption of nonfinancial impact measuring and reporting. An interviewee from Stedin says:

*“If we can score higher on the Transparency Benchmark if we take this indicator into account, then it is likely that we will put more effort on that particular indicator than on another one which does not help us score high on the Benchmark.”*

Finally, three infrastructure organizations describe how they feel pressure from investors to be transparent about organizational impacts. An interviewee from TenneT describes the following:

*“And if you look at the investors, you can see it is a growing trend to have more insight into the nonfinancial impacts, and nonfinancial risks and chances to assess the organization.”*

Further, an interviewee from Alliander says:

*“How is the position of the organization towards the climate? How do they work? Do they contribute to avoiding scarce resources? The financial feasibility of organizations is being considered in a more integrated way in the assessment of an organization.”*

This balancing behaviour is depicted in feedback loop B5 (see Figure 11). Increased pressure from investors to be transparent results in an increase of the adoption of nonfinancial impact measuring which on its turn increases reporting on nonfinancial impacts. The more an organization reports on nonfinancial impact, the more transparency they provide about the organization's impact. This leads to a higher ranking of the organization at financial agencies and thereby obliges to and relieves the pressure they experience from investors to be transparent.

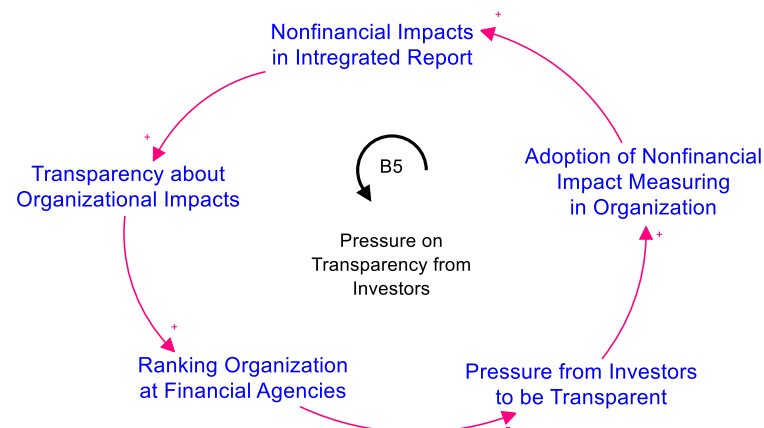


Figure 11: B5 Pressure on Transparency from Investors



### 4.3 Steering on nonfinancial impacts

The third step in this process is for the management board to steer on nonfinancial impacts. Before the management board can steer on nonfinancial impacts, they need to be aware of the existence of measuring and reporting on nonfinancial impacts. An interviewee from TenneT says:

*“I can imagine that if you walk into a board room and mention nonfinancial impact measuring, this is not well-known in every board room. And unknown makes it undesired. This can be a barrier to reporting. You need to pay attention to it.”*

An interviewee from Alliander described how they started with measuring and reporting on nonfinancial impacts and then got questions from the management and supervisory board about the contents of nonfinancial impact measuring. These dynamics are depicted through reinforcing feedback loop R7 (see

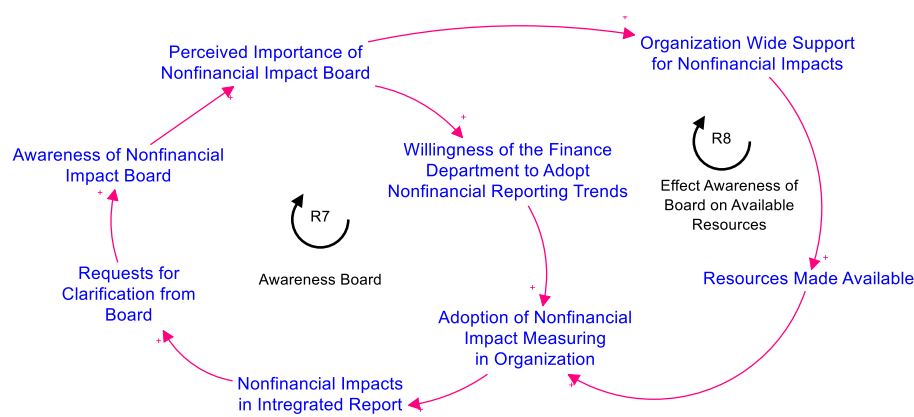


Figure 12: R7 Awareness Board and R8 Effect Awareness Board on Available Resources

Figure 12). Starting from a place of increased willingness of the finance department to adopt nonfinancial reporting trends, more adoption of nonfinancial impact measuring will take place. An increase in the adoption of nonfinancial impact measuring results in an increase of nonfinancial impacts in the integrated report. This increase leads to more requests for clarification about nonfinancial impacts from the management and supervisory board. In the case of Alliander, reporting on nonfinancial impacts was done in concordance with the management board, and after that, the supervisory board asked the management board about clarification regarding nonfinancial impact measuring and three people were invited to give a workshop to the supervisory board to explain nonfinancial impact measuring. This led to increased perceived importance. An interviewee from TenneT and a professor from Erasmus University both describe how a good line of reasoning is essential to clarify what nonfinancial impact measuring is and why is it essential to the organization. More requests for clarification lead to an increase in awareness of nonfinancial impact at both boards, causing the perceived importance of nonfinancial impact to rise too. If the perceived importance of nonfinancial impact at the board is higher, then the finance department

will be even more willing to respond to this by adopting more to nonfinancial reporting trends. Since the effect is reinforcing itself, if the willingness of the finance department to adopt nonfinancial reporting trends is low to begin with, the awareness of the board will not increase.

Further, the perceived importance of nonfinancial impact at the board is essential for the adoption of nonfinancial impact measuring. Reinforcing feedback loop 8 describes how an increase of perceived importance of nonfinancial impact at the board increases organization-wide support which increases available resources for impact measuring and reporting. An interviewee from TenneT says:

*“A barrier is time and resources to measure and report on impacts. ... I am only one person working on it; if I wanted to report as much on it as Alliander does, I would need the equivalent in people for it.”*

The more resources available for impact measuring, the more nonfinancial impact measuring will be adopted in the organization. Loop R8 then follows the same path as loop R7, and thus the reinforces the perceived importance. The need for resources is described in 6 CLDs. Multiple interviewees indicate that the more impact measuring is perceived as solely a CSR activity, the organization-wide importance decreases. Whereas one interviewee says that when it is more perceived as a reporting activity, the organization-wide support increases.

Balancing feedback loop 6 (see Figure 13) explains how the maturity of the nonfinancial impact measuring method affects the willingness of the management board to steer the organization based on nonfinancial impacts. An interviewee from Enexis thinks that the method needs to be “rock solid” for organizations to be willing to steer on nonfinancial impacts. The more pressure the organization experiences to report on nonfinancial impacts, the more willing the finance department is to adopt nonfinancial reporting trends. However, since only approximately a third of the organizations of NGinfra and Green Networks is reporting on nonfinancial impacts, the experienced pressure is not significant yet. Thus, currently, we have low pressure to report on nonfinancial impacts, making the finance department less willing to adopt nonfinancial reporting trends. The less willing the finance department is, the less they will adopt impact measuring leading to less improvement of the method. Less improvement of the method results in less maturity and uniformity of impact measuring, which lowers the management board’s willingness to steer on nonfinancial impacts. Less willingness leads to less actual steering on nonfinancial impacts, resulting in less transparency about the organizational impact on society. Less transparency will lead to more pressure to report on impacts. This process takes time and interviewees indicated that daring and visionary leadership is needed to speed up this process: A barrier to steering, according to Alliander:

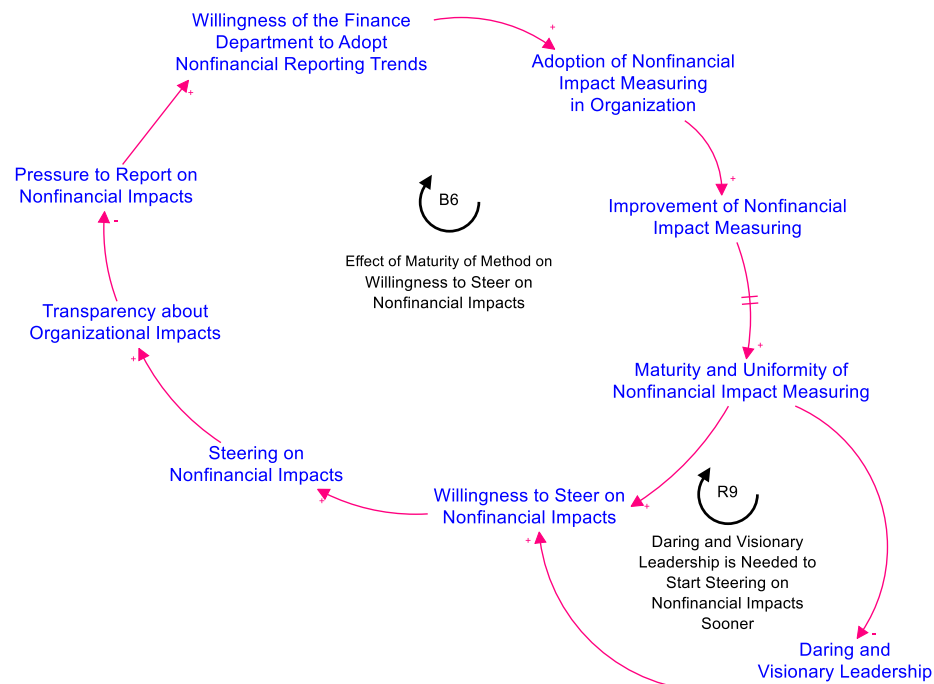


Figure 13: B6 Effect of Maturity Method on Willingness to Steer on Nonfinancial Impacts and R9 Daring and Visionary Leadership is Needed to Start Steering on Nonfinancial Impacts

*“It is more on the soft side. To what extent does the director understand this? This is leadership. Do you have a director who is willing to take risks? Who says: I am not here for the best financial performance, I dare to take a risk, I aim for the best nonfinancial performance.”*

Starting again from low pressure, the same effects will be noticeable for reinforcing feedback loop 9 (R9) as for balancing feedback loop 6 (see Figure 14). However, when maturity

and uniformity are low, more daring and visionary leadership needs to be shown. More daring and visionary leadership leads to an increase of the willingness to steer on nonfinancial impacts, and thus to more steering on nonfinancial impacts. This results in more transparency about organizational impacts and less pressure to report on nonfinancial impacts. In conclusion, in the current situation of a not fully mature impact measuring method, daring and visionary leadership is needed to take the risk of steering on the nonfinancial impacts regardless.

Last, two reinforcing feedback loops regarding steering on nonfinancial impact relate to motivation employees experience from it (see Figure 14). First, reinforcing feedback loop R10 explains how an increase in steering on nonfinancial impacts increases the transparency about organizational impacts. An interviewee from ProRail indicates that more transparency of the organizational impacts increases employee motivation to work based on nonfinancial impacts:

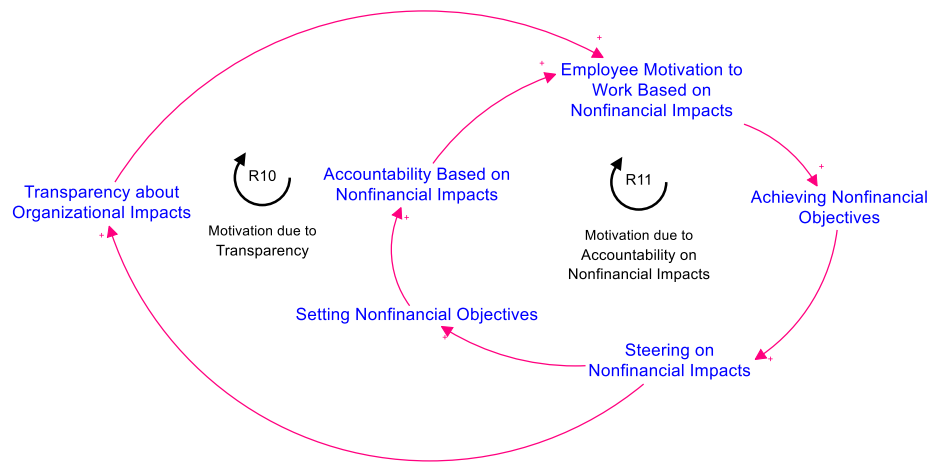


Figure 14: R10 Motivation due to Transparency and R11 Motivation due to Accountability on Nonfinancial Impacts

*“Showing your performance, also the nonfinancial side, is very motivating for employees. ... We are getting some questions from employees, if we contribute to something, to what is that specifically? People want to know what they are working for and will make decisions accordingly”*

The applicability of working based on nonfinancial impacts will vary per position but is, for example, for an employee to make investment decisions based on nonfinancial impacts. More employee motivation results in achieving more nonfinancial objectives and causes the board to steer on nonfinancial impact even more.

In feedback loop R11, the reinforcing effect relates to employees being held accountable based on nonfinancial impacts. The more an organization is steering on nonfinancial impacts, the more the organization will set nonfinancial objectives for it to achieve. If more nonfinancial objectives are set, employees will be held accountable for their actions based on nonfinancial impacts increasingly. An increase in accountability increases employee motivation which leads to

an increase of achieving nonfinancial objectives, and finally increases steering on nonfinancial impacts.

The complete model in which all loops are visible is depicted in Figure 15. The model validation is included in Appendix G.



## 5 Conclusion and discussion

This chapter starts with a conclusion to answer the main research question. Next, the discussion starts with a reflection on nonfinancial reporting. Then, the theoretical contribution is described, which is followed by practical recommendations. I conclude this chapter by analysing the limitations of this research and providing suggestions for future research.

### 5.1 Conclusion

In this thesis, I have examined the nonfinancial reporting journey of infrastructure coalitions Green Networks and NGinfra to improve their understanding of the adoption process of nonfinancial reporting practices in their organizations in order to find a solution to accelerate the adoption process. Accordingly, the main research question was: *which feedback processes drive organizations in Green Networks and Next Generation Infrastructures to shift from measuring to steering on both financial and nonfinancial impacts?*

The findings show that many feedback processes are in place for adopting measuring, reporting and steering on nonfinancial impacts. A structure for memetic isomorphism (Fernando & Lawrence, 2014) is found for both measuring and reporting nonfinancial impacts. However, the desired positive reinforcing behaviour, that is: organizations are copying what other organizations are doing, is not happening yet. It appears that the mimetic processes remain in a vicious cycle because the number of adopters that is needed for organizations to feel mimetic pressure is currently too small.

In other words, organizations in the infrastructure sector would consider copying measuring and reporting on nonfinancial information from similar organizations, if the number of adopters reaches a particular value. It is unclear how many adopters are needed for this value to be met. Nevertheless, if this value is reached, organizations will experience pressure from the number of other organizations who are adopting a trend and want to follow this lead in order to maintain organizational legitimacy. Thereby, the virtuous reinforcing mimetic processes begin. As a semi-governmental organization, legitimacy is essential as this endorses their social added value to society. Thus, the structure for mimetic isomorphic processes is part of the system; however, it is currently in a vicious cycle.

Currently, external influences from investors and the pressure organizations put upon themselves through the Transparency Benchmark, make infrastructure organizations more willing to adopt nonfinancial impact measuring and reporting.

The maturity of the impact measuring method appears to be an important variable in the adoption process since many feedback processes related to the willingness to adopt measuring nonfinancial impact stem from the maturity and uniformity of the method. This desire for maturity matches the risk-averse nature of these organizations. However, there is strength in numbers when it comes to the maturity of the method. Thus, if the infrastructure organizations want to start measuring and reporting on nonfinancial impacts, they must adopt nonfinancial impact measuring in an underdeveloped stage to help to reach maturity sooner through collaboration with the sector.

The willingness of the finance department to adopt nonfinancial reporting trends seems to be a vital link moving on with the adoption process and is a normative isomorphic process. If organizations place more focus on informing the board about nonfinancial impacts and reporting, the increased perceived importance of the board will ensure a quicker adoption process. Also, increased perceived importance at the board will increase the resources available for impact measuring, which is currently a significant constrain for many organizations.

Opposed to measuring and reporting, mimetic isomorphism is not found for steering on nonfinancial impacts. These findings are not surprising since no other infrastructure organization indicates that they are steering on nonfinancial impacts, and organizations must first measure and report on impacts before they are willing to steer on nonfinancial information. Besides, these risk-averse organizations will refrain from steering on nonfinancial information as long as it comes from an *immature* measuring method. So, if organizations wish to move to steer on nonfinancial impacts quickly, a mature and uniform method is needed. Only visionary and daring leaders will take the risk of steering on a method that is not fully developed yet. Placing visionary and daring people in board management positions will allow steering on nonfinancial impacts to happen more quickly.



## 5.2 Discussion

### 5.2.1 Reflection on nonfinancial reporting

Although it is evident that organizations have a negative nonfinancial impact on society, and that it would be beneficial for society if organizations improve their impact, nonfinancial impact reporting must be placed in a broader perspective to reflect on it.

Throughout this study, I indicated that the adoption process of nonfinancial reporting follows the phases of measuring, reporting, and steering. These phases were based on the premise that Alliander begun with measuring, then started reporting, and currently, they strive for steering. Although these phases appear to be logical and sequential, these phases are not the only possible option. It could be possible that not all infrastructure organizations will follow these steps and that, for example, some organizations will never steer on nonfinancial impacts. These steps must be considered in the light of the normative discussion on nonfinancial reporting. Over the last decades, the disclosure of nonfinancial information has gained importance. However, as nonfinancial reporting is a normative discussion, the importance of nonfinancial reporting can change in the future. Thus, by the time organizations start impact measuring and reporting, nonfinancial impact reporting might not be considered as important as it currently is. Consequently, an organization can choose to refrain from adopting steering on nonfinancial impact.

Furthermore, I indicated that organizations will not discontinue nonfinancial impact reporting once adopted. This assumption limits the possibility that organizations can adopt new or other methods for nonfinancial reporting or steering. Other methods will likely gain importance in the future. For example, an organization can choose to switch from nonfinancial impact measuring to a social/environmental cost-benefit analysis as a basis for decision-making in organizations. In that case, an organization, for example, measures the social and environmental cost and benefit per project and steers on the option with the most benefits. Thereby, the reporting phase is ignored while the organization still measures and steers on nonfinancial information.

Currently, only a few organizations are measuring and reporting on nonfinancial information, and a sector-wide accepted standard does not exist. The absence of a sector standard indicates that nonfinancial impact measuring and reporting is still in a grey area. Without a sector standard, organizations are missing the foundation to base decisions on, to steer towards a better nonfinancial impact. Also, the lack of a sector standard allows organizations to narrate their

impacts in the reports as they perceive beneficial to their organization. Consequently, organizations can create the image of being an organization that steers towards low environmental or social impact without any premise to substantiate this.

In conclusion, although the adoption of nonfinancial impact measuring, reporting, and steering can impact society positively, organizations must be cautious in making decisions based on an undeveloped method and society must be cautious in accepting the claims that organizations make. Nonfinancial impact reporting is not the only method to improve an organization's impact on society, and the emphasis on nonfinancial reporting can shift.

### **5.2.2 Theoretical contribution**

The dynamics in feedback loop B2 (pressure to adopt impact measuring) and R2 (number of adopters) resemble a mimetic isomorphic process. Once the number of organizations that have successfully adopted nonfinancial impact measuring increases, other organizations in the sector feel pressured to adopt the same practice. However, institutional theory does not account for the maturity of nonfinancial impact measuring and the implications that has on the adoption as described in feedback loop R1. The adoption of nonfinancial impact measuring is highly dependent on the maturity and uniformity of the measuring method. Uniformity and maturity of the method need to be acquired for the organizations to adopt nonfinancial impact measuring. Hence, the mimetic isomorphic process will not be set in motion until the method is close to maturity.

Similarly, a mimetic isomorphic process is found in the adoption of nonfinancial impact in the integrated report as described in feedback loop R3. Namely, an organization can feel pressured by the number of other organizations in the sector that have adopted nonfinancial reporting. As mentioned before, the number of adopters is currently too little to start the virtuous adoption feedback loop.

This research specifies the mimetic isomorphic process by introducing the finance department as a critical link in this process. Organizations are dependent on the finance department for nonfinancial reporting, and this is connected to a normative isomorphic process. If finance departments are insensitive to the normative pressures from their field to adopt nonfinancial reporting trends, the number of nonfinancial reporting adopters will not increase. This indicates that once the finance department responds to normative pressures, the process of adoption is reinforced, and due to the increasing number of adopters, the mimetic process is set in motion. The normative process cascades throughout the adoption phases, since it connected to several feedback

loops, namely feedback loop B3, B4, B6, R4, R7, and R9. Thus, this research shows that isomorphic processes are highly connected and can constrain and enable another.

Interestingly, in four out of the six feedback loops that portray a normative process, support for legitimacy theory was found (feedback loop B3, B4, B6, and R4). Specifically, the connection is made between the adoption of nonfinancial reporting and organizational transparency. Thus, the normative isomorphic process influences, and is influenced by, the organization's transparency about organizational impacts.

Furthermore, both feedback loop B4 (Fear of unknown) and R4 (Risk of the maturity of the method) have some ground in legitimacy theory. Legitimacy theory indicates that organizations prefer to disclose positive rather than negative findings. Similarly, the feedback loops show that organizations prefer not knowing their impacts over finding unfavourable impacts that will become public to society. Thus, organizations prefer to remain passive in adopting nonfinancial impact measuring and reporting to avoid risks.

The dynamics in feedback R5 (Uniformity due to Transparency Benchmark) and R6 (Ranking on transparency benchmark) describe new relationships that were not specified in institutional theory and legitimacy theory. However, feedback loops R5 and R6 have some foundation in mimetic isomorphism and legitimacy theory since infrastructure organizations want to copy sector organizations' practices to compete with sector organizations on the Transparency Benchmark and to obtain legitimacy through organizational transparency.

Moreover, this research shows that the sector benefits from collaboration to develop impact measuring. Nevertheless, an organization is constrained by the available resources in terms of time and people when adopting nonfinancial reporting. The perspective of the board on nonfinancial reporting is essential in this sense since their perceived importance of nonfinancial reporting enables or constrains the available resources. Last, this research contributes a specification for the image, a dimension that is part of legitimacy theory. Organizations specifically want to improve their image to be more attractive on the job market for new talent. Thus, nonfinancial reporting goes beyond managing a good or bad image. Organizations use nonfinancial reporting as a tool to improve their image for recruiting new talent.

In conclusion, this research has uncovered more specific, and new, relationships that were not stated by legitimacy theory and institutional theory. Also, it shows the interrelatedness of the normative isomorphism, mimetic isomorphism, and legitimacy theory. Where rationales from

legitimacy and institutional failed to explain the adoption dynamics of nonfinancial reporting in the infrastructure sector, this research filled this gap by applying a system dynamics approach.

### **5.2.3 Practical recommendations**

This research has several recommendations for the infrastructure sector to accelerate the adoption process. Most recommendations can be transferred to other sectors as well. First, in the theoretical contribution, it showed how the willingness of the finance department to adopt nonfinancial reporting trends could set the normative and mimetic isomorphic process in motion. Therefore, the finance department should be included in the adoption process of nonfinancial measuring and reporting in an early stage. Thereby, measuring and reporting can become an integral aspect of the organization and will enable the adoption process. An approach to make the finance department more willing to adopt nonfinancial reporting trends can be informing them through lectures or webinars from the field. When prominent people from the finance field explain that reporting on nonfinancial impacts is relevant and considered as the next step in the evolution of reporting, finance departments can be convinced to conform to those norms. It is more likely that finance departments adopt nonfinancial reporting if the relevance is explained through their field rather than from, for example, the CSR department. This recommendation is not specific to the infrastructure sector and can apply to other sectors as well.

Furthermore, infrastructure organizations are sensitive to external pressures. The sensitivity to external pressures does not lie within the sphere of influence of the organizations itself but implies the importance of the role external parties can play. The more the Transparency Benchmark set nonfinancial impacts as criteria, the more organizations will adopt nonfinancial impact measuring and reporting. Similarly, the importance investors place on the transparency of these social organizations can expedite the adoption process. External parties must realize the importance of their perspective on nonfinancial impacts. These pressures are mainly applicable to the infrastructure sector. Most private organizations do not have to disclose their annual reports and the size investments of their investments is generally smaller. Therefore, most of these organizations are not included in the Transparency Benchmark or pressured by investors.

The results show that organizations in a sector continuously compare themselves to each other and developing a method that is accepted throughout the sector enables benchmarking. However, organizations are hesitant to adopt nonfinancial impact measuring while the method is not fully developed. On the other hand, the method develops through adoption. Thus, the group of

imitators will adopt nonfinancial impact measuring once there is no longer a risk to be scrutinized on transparency. In order to break this tension, the coalitions can decide to adopt impact measuring while refraining from reporting on nonfinancial impacts immediately. In this way, the organizations can develop the method by sharing knowledge and experiences, and work towards a level of maturity that is sufficient to form a uniform and accepted a sector standard. Once this standard has been achieved, the organizations can decide to include the nonfinancial impacts in the report. Disclosing nonfinancial impact simultaneously along a sector standard ensures fair benchmarking between the organizations. Other sectors can follow this procedure by seeking collaboration with organizations in the same sector to develop an impact measuring standard that is appropriate for their sector.

Moreover, the board can best be informed once the method can prove its value to the organization. If the board is included early in the process while it is unclear what added value nonfinancial impact measuring and reporting have for the organization, the board can be put off. Consequently, resources for impact measuring may be withdrawn, and all efforts for nonfinancial impact measuring must be discontinued. On the other hand, when nonfinancial impact measuring is introduced at the right time, with a line of reasoning that underlines the importance of nonfinancial impact for the organization, the board can make resources available to facilitate the adoption process. This recommendation applies to other sectors as well, as, in most organizations, the board has significant power over the allocation of resources.

Last, relating to the impact value chain, organizations are not using information from impacts yet to relate these to the input for the value chain. If organizations want to steer on nonfinancial information, they need to plan what nonfinancial impact objectives they wish to achieve and steer on. Nonfinancial objectives should be presented in a similar form as the financial objectives, e.g. in the form of KPIs, in order to show that both components are of equal importance. The organizations need to set baselines to provide a range of accepted values for draw up nonfinancial KPIs. However, baselines can only be established once the method reaches a certain maturity and uniformity in the sector. Thus, first, the method needs to be developed further. Other sectors can follow this recommendation, as most organizations work with predetermined goals to achieve organizational objectives.

If the infrastructure organizations follow these recommendations, the number of adopters, as portrayed in Figure 1, can increase.

#### 5.2.4 Limitations

The findings of this research are subject to several limitations. First, the presented causal loop diagram must be seen in the light of “all models are wrong” (Sterman, 2002: 521). This quote indicates that the diagrams are a representation of the mental models of the interviewees. I recognize that the interviewees' knowledge is limited and that the information they provide is their reality. As a result, the models are subject to a degree of subjectivity. In order to ensure practical relevance, I focused on creating a *useful* model rather than a *truthful* model for the infrastructure sector.

Next, based on the relatively small sample size ( $n = 18$ ), I can only theoretically, and not statistically, generalize the findings to the entire infrastructure sector. Not all organizations in the Green Networks and NGinfra coalitions were interviewed, and not all organizations in the infrastructure sector reside in these coalitions. This implies that other mental models in the infrastructure sector can exist. Based on the characteristics of the infrastructure sector, I determined which findings are specific to the infrastructure sector and which findings can be expected to be found in other sectors.

Furthermore, a limitation regarding research question 3 must be considered. Most interviewees only had first-hand experience with the feedback processes related to measuring and reporting on nonfinancial information. The information for steering on nonfinancial impact were expectations and second-hand experiences the interviewees had. None of the interviewees was in a top management position and could not speak for the mental models of board members. The causal loops diagrams for steering on nonfinancial information must, therefore, be considered less useful.

Last, the interviews were held via video call. During video calls, it proved difficult to observe the interviewer and its organizational environment. Hence, it was difficult to assess whether contradictions existed between the language and environment of the interviewer. Besides, due to a frozen video connection during multiple interviews, recognizing nonverbal communication was impossible. Therefore, it was more difficult to sense whether the respondent was answering the questions with a sanitized version of the truth, and as a researcher to appropriately respond to it.

### 5.2.5 Future research

This research raises some relevant suggestions for future research. First, due to the relatively small sample size of this research –  $n = 18$  of which two interviewees were professors and not employees in the infrastructure sector – and the fact that not all organizations of NGinfra and Green Networks are interviewed, findings are only theoretically generalizable to the entire infrastructure sector. A larger sample size would be needed for analytical generalizability.

Further, all information on the feedback processes related to steering comes from the expectations or experiences that the interviewees have on that aspect. However, none of the interviewees in this research were in management boards or supervisory boards. An opportunity for future research is to interview people in management board positions to get insight into their mental models and to test whether their mental models match the proposed feedback processes.

Moreover, a possibility for future research lies in researching “open ends” of the model. It remains unclear which feedback processes are related to the image and the chance of recruiting new talent of the organization in the context of the adoption of nonfinancial reporting. Also, it is uncertain why the perceived importance of impact measuring of the interviewees differs when it is regarded as a CSR or reporting activity.

Finally, future research can focus on constructing a quantitative stock-and-flow diagram from the qualitative CLD in this research. Constructing an SFD helps to gain detailed insight into the model and allows for simulation runs and model sensitivity testing. Sensitivity analysis gives insight into high leverage points in the system and can help with effective policy implementation.

## References

- ABN AMRO Bank N.V. n.d. *Downloadpagina*. Accessed online <https://www.abnamro.com/nl/over-abnamro/jaarverslag/downloadpagina/index.html>. Viewed March 3, 2020.
- Aguilera, R., Rupp, D., Williams, C., & Ganapathi, J. 2007. Putting the S back in CSR: a multi-level theory of social change in organizations. *Academy of Management Review*, 32: 836–863.
- Alliander. 2016. *Without energy, nothing works, annual report 2015*. Annual report. Accessed online [https://2019.jaarverslag.alliander.com/FbContent.ashx/pub\\_1008/downloads/v171003094303/Alliander\\_Annual\\_Report\\_2015.pdf](https://2019.jaarverslag.alliander.com/FbContent.ashx/pub_1008/downloads/v171003094303/Alliander_Annual_Report_2015.pdf). Viewed March 23, 2020.
- Alliander. 2016a. *Without energy, nothing works*. Annual report. Accessed online [https://werkenbij.alliander.com/content/uploads/dotcom/Alliander\\_Annual\\_Report\\_2015.pdf](https://werkenbij.alliander.com/content/uploads/dotcom/Alliander_Annual_Report_2015.pdf). Viewed February 24, 2020.
- Alliander. 2017. *Switch together, annual report 2016*. Annual report. Accessed online [https://2019.jaarverslag.alliander.com/FbContent.ashx/pub\\_1017/downloads/v170322083200/Alliander\\_Annual\\_Report\\_2016.pdf](https://2019.jaarverslag.alliander.com/FbContent.ashx/pub_1017/downloads/v170322083200/Alliander_Annual_Report_2016.pdf). Viewed March 23, 2020.
- Alliander. 2018. *Annual report 2017, shaping the transition together*. Annual report. Accessed online [https://2019.jaarverslag.alliander.com/FbContent.ashx/pub\\_1025/downloads/v180403103540/Alliander\\_Annual\\_Report\\_2017.pdf](https://2019.jaarverslag.alliander.com/FbContent.ashx/pub_1025/downloads/v180403103540/Alliander_Annual_Report_2017.pdf). Viewed March 23, 2020.
- Alliander. 2019. *Moving forward together*. Annual report. Accessed online [https://2019.jaarverslag.alliander.com/FbContent.ashx/pub\\_1030/downloads/v190321144050/Alliander\\_Annual\\_Report\\_2018.pdf](https://2019.jaarverslag.alliander.com/FbContent.ashx/pub_1030/downloads/v190321144050/Alliander_Annual_Report_2018.pdf). Viewed March 23, 2020.
- Alliander. 2020. *Working together on transition*. Annual report. Accessed online [https://2019.jaarverslag.alliander.com/FbContent.ashx/pub\\_1037/downloads/v200320083558/Alliander\\_Annual\\_Report\\_2019.pdf](https://2019.jaarverslag.alliander.com/FbContent.ashx/pub_1037/downloads/v200320083558/Alliander_Annual_Report_2019.pdf). Viewed March 23, 2020.
- American Psychology Association. 2017. *Ethical principles of psychologists and code of conduct*. Viewed online <https://www.apa.org/ethics/code/>. Accessed February 24, 2020.



- Andersen, D. L., Luna-Reyes, L. F., Diker, V. G., Black, L., Rich, E., & Andersen, D. F. 2012. The disconfirmatory interview as a strategy for the assessment of system dynamics models. *System Dynamics Review*, 28(3): 225–275.
- Aronson, D. & Angelakis, D. n.d. *Step-by-step stocks and flows: improving the rigor of your thinking*. Viewed online <https://thesystemsthinker.com/step-by-step-stocks-and-flows-improving-the-rigor-of-your-thinking/>. Accessed July 20, 2020.
- Barlas, Y. 1996. Formal aspects of model validity and validation in system dynamics. *System Dynamics Review*, 12(3):183–210.
- Bass, F. M. 2004. A product growth for model consumer durables. *Management Science*, 50(12): 1825–1832.
- Bernardi, C, Stark, A. W. 2015. *The transparency of environmental, social and governance disclosures, integrated reporting, and the accuracy of analyst forecasts*. Working paper: Rome.
- Bleijenbergh, I. L. 2015. *Kwalitatief onderzoek in organisaties*. (2). Den Haag: Boom Lemma.
- Boatright, J. R. 1996. Business ethics and the theory of the firm. *American Business Law Journal*, 34(2): 217–238.
- Bowen, G. A. 2009. Document analysis as a qualitative research method. *Qualitative Research Journal*, 9(2): 27–40.
- Bowen, H. R. 1953. *Social responsibilities of the businessman*. New York: Harper & Row.
- Burke, L. & Logsdon, J. M. 1996. How corporate social responsibility pays off. *Long range Planning*, 29(4): 495–502.
- Chi, G. 2018. *Wat rekent het CBS tot de sector overheid?* Paper. Accessed online [https://www.cbs.nl/-/media/\\_pdf/2018/31/wat-rekent-het-cbs-tot-de-sector-overheid.pdf](https://www.cbs.nl/-/media/_pdf/2018/31/wat-rekent-het-cbs-tot-de-sector-overheid.pdf). Viewed March 14, 2020.
- Corbin, J. & Strauss, A. 2008. *Basics of qualitative research: Techniques and procedures for developing grounded theory*. (3). Thousand Oaks, CA: SAGE Publications.
- De Groot Ruiz, A. 2019. *Framework for impact statements beta version (FIS beta)*. Accessed online <https://www.impactinstitute.com/framework-for-impact-statements/>. Viewed March 4, 2020.
- Deegan, C. 2002. The legitimizing effect of social and environmental disclosures: a theoretical foundation. *Accounting, Auditing & Accountability Journal*, 31(8): 282–311.

- Deegan, C. 2009. *Financial accounting theory*. McGraw-Hill Australia: North Ryde.
- Del Mar Alonso-Almeida, M., Llach, J., & Marimon, F. 2014. A closer look at the 'global reporting initiative' sustainability reporting as a tool to implement environmental and social policies: a worldwide sector analysis. *Corporate Social Responsibility and Environmental Management*, 21: 318–335.
- Denscombe, M. 2012. *Research Proposals: A practical guide*. Maidenhead Berkshire: McGraw-Hill Education.
- Dentchev, N. A. 2004. Corporate social performance as a business strategy. *Journal of Business Ethics*, 55: 697–412.
- DiMaggio, P. J. & Powell, W. W. 1983. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. *American Sociological Review*, 48: 147–160.
- Dowling, J. & Pfeffer, J. 1975. Organizational legitimacy: social values and organizational behavior. *The Pacific Sociological Review*, 18, 122–136.
- Eker, S. & Zimmermann, N. 2016. Using textual data in system dynamics model conceptualization. *Systems*, 4(28): 1–14.
- Enexis. 2016. *Combining reliability and agility. For a sustainable tomorrow*. Annual report. Accessed online [https://www.enexisgroep.com/media/1388/enexis\\_holding\\_nv\\_annual-report\\_2015.pdf](https://www.enexisgroep.com/media/1388/enexis_holding_nv_annual-report_2015.pdf). Viewed March 23, 2020.
- Enexis. 2017. *Energy to change*. Annual report. Accessed online <https://www.enexisgroep.com/media/1499/enexis-annual-report-2016.pdf>. Viewed March 23, 2020.
- Enexis. 2018. *Energy that moves you*. Annual report. Accessed online [https://www.enexisgroep.com/media/1985/enexis\\_holding\\_nv\\_annual-report\\_2017.pdf](https://www.enexisgroep.com/media/1985/enexis_holding_nv_annual-report_2017.pdf). Viewed March 23, 2020.
- Enexis. 2019. *The certainty of today the energy of tomorrow*. Annual report. Accessed online <https://www.enexisgroep.com/media/2436/enexis-holding-nv-annual-report-2018.pdf>. Viewed March 23, 2020.
- Enexis. 2020. *Energy in a new reality*. Annual report. Accessed online <https://www.enexisgroep.com/media/2696/enexis-holding-nv-annual-report-2019.pdf>. Viewed March 23, 2020.

- Fernando, S. & Lawrence, S. 2014. A theoretical framework for CSR practices: integrating legitimacy theory, stakeholder theory and institutional theory. *Journal of Theoretical Accounting Research*, 10: 149–178.
- Finlay, L. 2002. Negotiating the swamp: the opportunity and challenge of reflexivity in research practice. *Qualitative Research*, 2(2); 209–230.
- Forrester, J. W. 1968. Industrial dynamics—after the first decade. *Management Science*, 14(7): 398–415.
- Forrester, J. W. 1992. Policies, decisions, and information sources for modeling. *European Journal of Operational Research*, 59: 42–63.
- Frooman, J. 1999. Stakeholder influence strategies. *Academy of Management Review*, 24(102): 191–205.
- Garde Sánchez, R. G., Bolívar, M. P. R., & Hernández, A. M. L. 2017. Corporate and managerial characteristics as drivers of social responsibility disclosure by state-owned enterprises. *Review of Managerial Science*, 11: 633–659.
- Gasunie. 2016. *Jaarverslag 2015*. Annual report. Accessed online [https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/\\$902/\\$883](https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/$902/$883). Viewed March 23, 2020.
- Gasunie. 2017. *Jaarverslag 2016*. Annual report. Accessed online [https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/\\$900/\\$892](https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/$900/$892). Viewed March 23, 2020.
- Gasunie. 2018. *Gasunie in beweging, jaarverslag 2017*. Annual report. Accessed online [https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/\\$899/\\$2506](https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/$899/$2506). Viewed March 23, 2020.
- Gasunie. 2019. *Netwerken voor verduurzaming, jaarverslag 2018*. Annual report. Accessed online [https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/\\$215/\\$896](https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/$215/$896). Viewed March 23, 2020.
- Gasunie. 2020. *Jaarverslag 2019*. Annual report. Accessed online [https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/\\$3569/\\$4544](https://www.gasunie.nl/over-gasunie/investor-relations/financiele-informatie/$3569/$4544). Viewed March 23, 2020.
- Government of the Netherlands. 2020. *COVID-19: additional measures in schools, the hospitality sector and sport*. Accessed online <https://www.government.nl/latest/news/2020/03/15/additional-measures-in-schools-the-hospitality-sector-and-sport>. Viewed March 19, 2020.

- Gray, R., Dey, C., Owen, D., Evans, R., & Zadek, S. 1997. Struggling with the praxis of social accounting: stakeholders, accountability, audits and procedures. *Accounting, Auditing & Accountability Journal*, 10(3): 325–364.
- Gray, R., Kouhy, R., & Lavers, S. 1995. Corporate social and environmental reporting: a review of the literature and a longitudinal study of UK disclosure. *Accounting, Auditing & Accountability Journal*, 8(2): 47–77.
- Gray, R., Owen, D., & Adams, C. 2010. Some theories for social accounting?: a review essay and tentative pedagogic categorization of theorisations around social accounting. *Advances in Environmental Accounting and Management*, 4: 1–54.
- Green Networks. n.d. *Wat wij doen*. Accessed online <https://groenenetten.org/nl/#aboutus>. Viewed February 25, 2020.
- Groesser, S. N. & Jovy, N. 2015. Business model analysis using computational modeling: a strategy tool for exploration and decision-making. *Journal of Management and Control*, DOI 10.1007/s00187-015-0222-1.
- Hussein, A. 2009. The use of triangulation in social sciences research: can qualitative and quantitative methods be combined?. *Journal of Comparative Social Work*, 1: 1–12.
- IIRC. 2015. *The International Integrated Reporting Council*. Accessed online <http://integratedreporting.org/>. Viewed May 3, 2020.
- Kolk, A., & van Tulder, R. 2010. International business, corporate social responsibility and sustainable development. *International Business Review*, 19: 119–125.
- KPN. 2016. *Connected. By KPN. Integrated annual report 2015 in facts, figures and people*. Annual report. Accessed online <https://ir.kpn.com/download/companies/koninkpnnv/Quarterly%20Reports/KPN%20Integrated%20Annual%20Report%202015.pdf>. Viewed March 23, 2020.
- KPN. 2017. *KPN integrated annual report 2016*. Annual report. Accessed online <https://ir.kpn.com/download/companies/koninkpnnv/Quarterly%20Reports/KPN%20Integrated%20Annual%20Report%202016.pdf>. Viewed March 23, 2020.
- KPN. 2018. *Everyone connected, KPN integrated annual report 2017*. Annual report. Accessed online [https://ir.kpn.com/download/companies/koninkpnnv/Quarterly%20Reports/KPN\\_Integrated\\_Report\\_2017\\_final.pdf](https://ir.kpn.com/download/companies/koninkpnnv/Quarterly%20Reports/KPN_Integrated_Report_2017_final.pdf). Viewed March 23, 2020.

- KPN. 2019. *KPN integrated annual report 2018, the power of connection*. Annual report. Accessed online [https://ir.kpn.com/download/companies/koninkpnnv/Quarterly%20Reports/8\\_Integrated\\_Annual\\_Report\\_2018.pdf](https://ir.kpn.com/download/companies/koninkpnnv/Quarterly%20Reports/8_Integrated_Annual_Report_2018.pdf). Viewed March 23, 2020.
- KPN. 2020. *KPN integrated annual report 2019, the network of the Netherlands*. Annual report. Accessed online [https://ir.kpn.com/download/companies/koninkpnnv/Results/Integrated\\_Annual\\_Report\\_2019.pdf](https://ir.kpn.com/download/companies/koninkpnnv/Results/Integrated_Annual_Report_2019.pdf). Viewed March 23, 2020.
- Kroese, E. & Hillen, M. 2018. *Impactmanagement. Van meten naar maximaliseren!* Viewed online [https://www.archief.social-enterprise.nl/files/2615/3725/7609/Publicatie\\_Impactmanagement.pdf](https://www.archief.social-enterprise.nl/files/2615/3725/7609/Publicatie_Impactmanagement.pdf). Accessed July 20, 2020.
- Kroese, E. 2015. *Impact fist. Waarom meten moet, en hoe je dat doet*. Viewed online [https://www.social-enterprise.nl/application/files/5215/5006/6796/Impact\\_First\\_longread-definitief-bijgewerkte\\_afbeelding.pdf](https://www.social-enterprise.nl/application/files/5215/5006/6796/Impact_First_longread-definitief-bijgewerkte_afbeelding.pdf). Accessed July 20, 2020.
- Lindblom, C. K. 1994. The implications of organizational legitimacy for corporate social performance and disclosure. *Paper presented at the Critical Perspectives on Accounting Conference*, NY: New York.
- Maas, K. E. H. 2011. Maatschappelijke prestaties van organisaties: van outputmeting naar impactmeting. *MAB*, 85(11): 563–572.
- Martinez, C.R. 2015. *Integrated reporting and information asymmetry*. Working paper: without place.
- Merriam, S. B. 1988. *Case study research in education: A qualitative approach*. San Francisco: Jossey-Bass.
- Ministry of Economic Affairs and Climate Policy. n.d. *Transparency benchmark*. Accessed online <https://www.transparantiebenchmark.nl/en>. Viewed February 24, 2020.
- Mitchell, R. K., Agle B R. & Wood, D. J. 1997. Toward a theory of stakeholder identification and salience: defining the principle of who and what really counts. *Academy of Management Review*, 22(4): 853–886.

- Montesinos, V. & Brusca, I. 2019. Non-financial reporting in the public sector: alternatives, trends and opportunities. *Spanish Accounting Review*, 22(2): 122–128.
- Mutingi, M. 2013. Understanding the dynamics of the adoption of renewable energy technologies: a system dynamics approach. *Decision Science Letters*, 2: 109–118.
- Next Generation Infrastructures. 2020. *Over ons*. Accessed online <https://www.nginfra.nl/over-ons/>. Viewed July 9, 2020.
- O'Donovan, G. 1999. Managing legitimacy through increased corporate environmental reporting: an exploratory study. *Interdisciplinary Environmental Review*, 1: 63–99.
- Paul, R. & Van der Bend, A. 2017. *Toegevoegde waarde van infrastructuur voor de Nederlandse economie 1995-2015*. Memorandum. Accessed online [https://www.nextgenerationinfrastructures.eu/system/files/documents/2017\\_24\\_10\\_oplegnotitie\\_studie\\_toeg\\_waarde\\_van\\_infra.pdf](https://www.nextgenerationinfrastructures.eu/system/files/documents/2017_24_10_oplegnotitie_studie_toeg_waarde_van_infra.pdf). Viewed April 3, 2020.
- Port of Rotterdam. 2016. *Koers houden in een veranderende omgeving. Make it happen*. Annual report. Accessed online <https://www.portofrotterdam.com/sites/default/files/havenbedrijf-rotterdam-jaarverslag-2015.pdf?token=8FHxIk8A>. Viewed March 24, 2020.
- Port of Rotterdam. 2017. *Bouwen aan een duurzame toekomst. Make it happen*. Annual report. Accessed online <https://www.portofrotterdam.com/sites/default/files/jaarverslag-2016-havenbedrijf-rotterdam.pdf?token=4AEzXkdM>. Viewed March 24, 2020.
- Port of Rotterdam. 2018. *Samenwerken aan de haven van morgen. Make it happen*. Annual report. Accessed online <https://www.portofrotterdam.com/sites/default/files/havenbedrijf-rotterdam-jaarverslag-2017.pdf?token=2HNsHvIq>. Viewed March 24, 2020.
- Port of Rotterdam. 2019. *Ruimte voor vandaag en morgen. Make it happen*. Annual report. Accessed online <https://www.portofrotterdam.com/sites/default/files/jaarverslag-2018-havenbedrijf-rotterdam.pdf?token=m8JSvg13>. Viewed March 24, 2020.
- Port of Rotterdam. 2020. *Blijvend werken aan de toekomst. Make it happen*. Annual report. Accessed online [https://jaarverslag2019.portofrotterdam.com/download\\_pdf](https://jaarverslag2019.portofrotterdam.com/download_pdf). Viewed March 24, 2020.
- ProRail. 2016. *Jaarverslag 2015*. Annual report. Accessed online <https://www.prorail.nl/sites/default/files/jaarverslag-prorail-2015.pdf>. Viewed March 23, 2020.

- ProRail. 2017. ***Jaarverslag 2016***. Annual report. Accessed online [https://www.prorail.nl/sites/default/files/pr\\_jv2016\\_jaarverslag\\_web.pdf](https://www.prorail.nl/sites/default/files/pr_jv2016_jaarverslag_web.pdf). Viewed March 23, 2020
- ProRail. 2018. ***Verbindt. Verbetert. Verduurzaamt***. Annual report. Accessed online [https://www.prorail.nl/sites/default/files/prorail\\_jaarverslag\\_2017\\_def\\_0.pdf](https://www.prorail.nl/sites/default/files/prorail_jaarverslag_2017_def_0.pdf). Viewed March 23, 2020.
- ProRail. 2019. ***Verbindt. Verbetert. Verduurzaamt***. Annual report. Accessed online [https://www.jaarverslagprorail.nl/FbContent.ashx/pub\\_1000/downloads/v191212105237/ProRail\\_Jaarverslag\\_2018.pdf](https://www.jaarverslagprorail.nl/FbContent.ashx/pub_1000/downloads/v191212105237/ProRail_Jaarverslag_2018.pdf). Viewed March 23, 2020.
- Pruyt, E. 2006. What is system dynamics? A paradigmatic inquiry. *Proceedings of the 2006 Conference of the System Dynamics Society*. System Dynamics Society Nijmegen.
- Repenning, N. P. 2002. A simulation-based approach to understanding the dynamics of innovation implementation. *Organizational Science*, 13(2): 109–127.
- Richardson, G. P. 1986. Problems with causal-loop diagrams. *System Dynamics Review*, 2: 158–170.
- Rijkswaterstaat. 2016. ***Jaarbericht Rijkswaterstaat 2015***. Annual statement. Accessed online <http://publicaties.minienm.nl/download-bijlage/83374/jaarbericht-2015.pdf>. Viewed March 23, 2020.
- Rijkswaterstaat. 2017. ***Jaarbericht Rijkswaterstaat 2016***. Annual statement. Accessed online <http://publicaties.minienm.nl/download-bijlage/92313/jaarbericht-2016.pdf>. Viewed March 23, 2020.
- Rijkswaterstaat. 2018. ***Jaarbericht Rijkswaterstaat 2017***. Annual statement. Accessed online <http://publicaties.minienm.nl/download-bijlage/92657/jaarbericht-2017.pdf>. Viewed March 23, 2020.
- Rijkswaterstaat. 2019. ***Jaarbericht Rijkswaterstaat 2018***. Annual statement. Accessed online <http://publicaties.minienm.nl/download-bijlage/109212/jaarbericht-2018.pdf>. Viewed March 23, 2020.
- Rogers, E. M. 1962. ***Diffusion of innovations***. New York: The Free Press.
- Royal Schiphol Group. 2016. ***Annual report 2015***. Annual report. Accessed online <https://www.schiphol.nl/en/download/b2b/1551779320/6HbokVdTbcbf5AQcQRfPumo.pdf>. Viewed March 24, 2020.

- Royal Schiphol Group. 2017. *Annual report 2016*. Annual report. Accessed online <https://www.schiphol.nl/en/download/b2b/1583491422/2h5EgiXOt1Qx93tGQowl.t.pdf>. Viewed March 24, 2020.
- Royal Schiphol Group. 2018. *Annual report 2017*. Annual report. Accessed online <https://2017.annualreportschiphol.com/pdfondemand/printpdf?docId=135374>. Viewed March 24, 2020.
- Royal Schiphol Group. 2019. *Annual report 2018*. Annual report. Accessed online <https://2018.annualreportschiphol.com/pdfondemand/printpdf?docId=192807>. Viewed March 24, 2020.
- Royal Schiphol Group. 2020. *Annual report 2019*. Annual report. Accessed online [https://www.annualreportschiphol.com/xmlpages/resources/TXP/Schiphol\\_web\\_2019/pdf/Schiphol\\_Annual\\_Report\\_2019.pdf](https://www.annualreportschiphol.com/xmlpages/resources/TXP/Schiphol_web_2019/pdf/Schiphol_Annual_Report_2019.pdf). Viewed March 24, 2020.
- Shocker, A. & Sethi, P. 1973. An approach to incorporating societal preferences in developing corporate action strategies. *California Management Review*, 15: 97–105.
- Stedin Group. 2017. *Annual update 2016*. Annual report. Accessed online <https://www.stedingroep.nl/eng/~media/files/stedin/stedin-groep/investor-relations/annual-update-2016-stedin-group.pdf?la=nl-nl>. Viewed March 23, 2020.
- Stedin Group. 2018. *Energy through cooperation*. Annual report. Accessed online <https://www.stedingroep.nl/eng/~media/files/stedin/stedin-groep/investor-relations/annual-report-2017-stedin-group.pdf?la=nl-nl>. Viewed March 23, 2020.
- Stedin Group. 2019. *The world we live in, annual report 2018*. Annual report. Accessed online <https://www.stedingroep.nl/eng/~media/files/stedin/stedin-groep/investor-relations/annual-report-2018-stedin-group.pdf?la=nl-nl>. Viewed March 23, 2020.
- Sterman, J. D. 2000. *Business dynamics. Systems thinking and modeling for a complex world*. Boston, MA: McGraw-Hill Higher Education.
- Sterman, J.D. 2002. *All models are wrong: reflections on becoming a systems scientist*. System Dynamics Review 18(4): 501–531.
- System Dynamics Society. 2020. *What is system dynamics?* Accessed online <https://www.systemdynamics.org/what-is-sd#approach>. Viewed July 8, 2020.
- TenneT. 2016. *Enabling the change, integrated annual report 2016*. Annual report. Accessed online



- [https://www.tennet.eu/fileadmin/user\\_upload/Company/Investor\\_Relations/Annual\\_Report/TenneT-AR15\\_UK.pdf](https://www.tennet.eu/fileadmin/user_upload/Company/Investor_Relations/Annual_Report/TenneT-AR15_UK.pdf). Viewed March 23, 2020.
- TenneT. 2017. *Empowering society, integrated annual report 2016*. Annual report. Accessed online  
[https://www.tennet.eu/fileadmin/user\\_upload/Company/Investor\\_Relations/Annual\\_Report/Integrated\\_Annual\\_report\\_2016\\_TenneT\\_Holding\\_BV.pdf](https://www.tennet.eu/fileadmin/user_upload/Company/Investor_Relations/Annual_Report/Integrated_Annual_report_2016_TenneT_Holding_BV.pdf). Viewed March 23, 2020.
- TenneT. 2018. *Integrated annual report 2017*. Annual report. Accessed online  
[https://www.tennet.eu/fileadmin/user\\_upload/Company/Investor\\_Relations/AR\\_2017/TenneT\\_holding\\_BV\\_Integrated\\_Report\\_2017.pdf](https://www.tennet.eu/fileadmin/user_upload/Company/Investor_Relations/AR_2017/TenneT_holding_BV_Integrated_Report_2017.pdf). Viewed March 23, 2020.
- TenneT. 2019. *Integrated annual report 2018*. Annual report. Accessed online  
[https://www.tennet.eu/fileadmin/user\\_upload/Company/Profile/2018\\_pic/TenneT-Integrated-Annual-Report-2018.pdf](https://www.tennet.eu/fileadmin/user_upload/Company/Profile/2018_pic/TenneT-Integrated-Annual-Report-2018.pdf). Viewed March 23, 2020.
- TenneT. 2020. *Integrated annual report 2019*. Annual report. Accessed online  
[https://www.tennet.eu/fileadmin/user\\_upload/Company/Investor\\_Relations/AR\\_2019/TenneT-Integrated-Annual-Report-2019\\_Def.pdf](https://www.tennet.eu/fileadmin/user_upload/Company/Investor_Relations/AR_2019/TenneT-Integrated-Annual-Report-2019_Def.pdf). Viewed March 23, 2020.
- Tuner, B. L., Kim, H. & Andersen, D. F. 2013. Improving coding procedures for purposive text data: researchable questions for qualitative system dynamics modeling. *System Dynamics Review*, 29: 253–263.
- Unerman, J. & Bennett, M. 2004. Increased stakeholder dialogue and the internet: towards greater corporate accountability or reinforcing capitalist hegemony? *Accounting, Organizations and Society*, 29(7): 685–707.
- Velte, P. & Stawinoga, M. 2017. Integrated reporting: the current state of empirical research, limitations and future research implications. *Journal of Management Control*, 28: 275–320.
- Vennix, J. A. M. 1996. *Group model building. Facilitating team learning using system dynamics*. Chichester: Wiley.
- Vitens. 2016. *The value of water, now and in the future*. Annual report. Accessed online  
<https://2015.vitensjaarverslag.nl/wp-content/uploads/2016/07/Vitens-JV2015-UK-COMPLETE.pdf>. Viewed March 24, 2020.

- Vitens. 2017. *Het verschil dat Vitens maakt*. Annual report. Accessed online <https://2016.vitensjaarverslag.nl/wp-content/uploads/2017/03/Vitens-JV2016-NL.pdf>. Viewed March 24, 2020.
- Vitens. 2018. *Terug naar de bron*. Annual report. Accessed online <https://2017.vitensjaarverslag.nl/wp-content/uploads/2018/04/2017-VIT-jaarverslag-PDF-2.pdf>. Viewed March 24, 2020.
- Vitens. 2019. *Managing water together*. Annual report. Accessed online [https://www.vitensjaarverslag.nl/FbContent.ashx/pub\\_1000/downloads/v190701131034/Vitens-JV2018-UK-v7003.pdf](https://www.vitensjaarverslag.nl/FbContent.ashx/pub_1000/downloads/v190701131034/Vitens-JV2018-UK-v7003.pdf). Viewed March 24, 2020.
- Wainwright, S. 2002. *Measuring impact: A guide to resources*. London: NCVO Publications.
- Weijnen, M. P. C. 2019. *The contribution of infrastructure to the value added of the national economy: an international comparison over the years 1995-2016*. Cover article. Accessed online [https://www.nextgenerationinfrastructures.eu/system/files/documents/290829\\_cover\\_article\\_contribution\\_of\\_infrastructure\\_final.pdf](https://www.nextgenerationinfrastructures.eu/system/files/documents/290829_cover_article_contribution_of_infrastructure_final.pdf). Viewed April 3, 2020.
- World Health Organization. 2020. *Coronavirus*. Accessed online <https://www.who.int/health-topics/coronavirus>. Viewed March 19, 2020.

## Appendices

### Appendix A: Documents

#### Document analysis

Annual reports/annual integrated reports/annual statements 2015 – 2020

*Table A1: Documents*

<b>Infrastructure firms</b>	<b>Annual reports</b>	<b>Sources</b>
<b>Enexis</b>	2015-2019	Enexis, 2016; 2017; 2018; 2019; 2020
<b>ProRail</b>	2015-2018, and unpublished value creation model	ProRail, 2016; 2017; 2018; 2019
<b>KPN</b>	2015-2019	KPN, 2016; 2017; 2018; 2019; 2020
<b>Stedin</b>	2016-2018 (2015: Eneco)	Stedin, 2017; 2018; 2019
<b>Alliander</b>	2015-2019	Alliander, 2016; 2017; 2018; 2019; 2020
<b>Gasunie</b>	2015-2019	Gasunie, 2016; 2017; 2018; 2019
<b>Rijkswaterstaat</b>	Annual statements: 2015-2018	Rijkswaterstaat, 2016; 2017; 2018; 2019,
<b>TenneT</b>	2015-2019	TenneT, 2016; 2017; 2018; 2019; 2020
<b>Port of Rotterdam</b>	2015-2019	Port of Rotterdam, 2016; 2017; 2018; 2019
<b>Schiphol</b>	2015-2019	Royal Schiphol Group, 2016; 2017; 2018; 2019; 2020
<b>Vitens</b>	2015-2018	Vitens, 2016; 2017; 2018; 2019

## **Appendix B: Interview guide research question 1 and 2**

### **Interview guide**

Welcome [name interviewee], I am Giulietta Quast. First, I would like to thank you for participating in this interview. As I mentioned before, this research is part of my master thesis at Radboud University. I am doing my research at Alliander and I focus on adoption processes regarding nonfinancial reporting in the infrastructure sector.

As prior discussed via email, this interview will be voice recorded and I will send you the transcribed interview afterwards. If you wish to make any changes to what you have said or omit certain parts, please let me know. The total interview will take about one hour. Do you have any questions before we get started?

### **In case of situation 1: the firm recently decide to start measuring nonfinancial impact**

Can you explain what caused your firm to start measuring nonfinancial impact?

What enablers did you experience in the adoption process?

What barriers did you experience in the adoption process?

Why did you start measuring nonfinancial impacts now and not before?

### **In case of situation 2: the firm measures nonfinancial impact to a greater or lesser extent**

Can you explain what caused your firm to start measuring nonfinancial impact?

What enablers did you experience in the adoption process?

What barriers did you experience in the adoption process?

Why did you start measuring nonfinancial impacts now and not before?

### **In case of situation 3: the firm measures nonfinancial impact and wishes to report upon the impact in the IR**

Can you explain what caused your firm to start measuring nonfinancial impact?

What enablers did you experience in the adoption process?

What barriers did you experience in the adoption process?

Why did you start measuring nonfinancial impacts now and not before?

Can you explain what caused your firm to want to start reporting on nonfinancial impact?

What enablers did you experience in the adoption process?

What barriers did you experience in the adoption process?

### **In case of situation 4: the firm measures nonfinancial impact and reports upon the impact in the IR**

Can you explain what caused your firm to start measuring nonfinancial impact?

What enablers did you experience in the adoption process?  
What barriers did you experience in the adoption process?  
Why did you start measuring nonfinancial impacts now and not before?

Can you explain what caused your firm to start reporting on nonfinancial impact?  
What enablers did you experience in the adoption process?  
What barriers did you experience in the adoption process?

Since you are reporting on nonfinancial impacts, can you explain what you think would be necessary for your organization to start steering on nonfinancial impacts?

**End**

Thank you for your cooperation. You can expect to receive the transcribed interview within a week and the thesis early July. If you have any questions after the interview, please feel free to contact me by email.

## **Appendix C: Interview guide research question 3**

### **Interview guide**

Welcome [name interviewee], I am Giulietta Quast. First, I would like to thank you for participating in this interview. As I mentioned before, this research is part of my master thesis at Radboud University. I am doing my research at Alliander and I focus on adoption processes regarding nonfinancial reporting in the infrastructure sector.

As prior discussed via email, this interview will be voice recorded and I will send you the transcribed interview afterwards. If you wish to make any changes to what you have said or omit certain parts, please let me know. The total interview will take about one hour. Do you have any questions before we get started?

### **Questions**

- Based on your experience, what drives organizations to start measuring nonfinancial impact?
- Based on your experience, what drives organizations to start reporting upon nonfinancial impact in IRs?
- Based on your experience, can you explain what would be needed for top management to incorporate both financial and nonfinancial information into strategic decision-making?

### **End**

Thank you for your cooperation. You can expect to receive the transcribed interview within a week and the thesis early July. If you have any questions after the interview, please feel free to contact me by email.

## Appendix D: Sample

*Table D1: Sample*

Organization	Coalition
<b>Port of Rotterdam</b>	NGinfra
<b>Vitens</b>	NGinfra
<b>Anonymous</b>	Anonymous
<b>Alliander</b>	Green Networks & NGinfra
<b>ProRail</b>	Green Networks & NGinfra
<b>Rijkswaterstaat</b>	Green Networks & NGinfra
<b>Stedin</b>	Green Networks
<b>TenneT</b>	Green Networks
<b>Enexis</b>	Green Networks

## Appendix E: Coding tree

Table E1: Coding tree

Concept	Dimension	Indicator
<b>Legitimacy theory</b>	Quality (O'Donovan, 1999; Velte & Stawinoga, 2017)	Quality of method
		Quality of integrated report
	Legitimacy (O'Donovan, 1999)	Legitimacy of method
		Legitimacy of reporting
	Transparency (Aguilera, Rupp, Williams, & Ganapathi, 2007)	Legitimacy of organization
		Nonfinancial reporting
		Financial reporting
		Pressure from society
	Image (Aguilera, Rupp, Williams, & Ganapathi, 2007)	Good organizational image
		Bad organizational image
<b>Institutional theory</b>	Pressure (DiMaggio & Powell, 1983; Fernando & Lawrence, 2014; Deegan, 2009)	Number of sector organizations measuring nonfinancial impacts
		Number of sector organizations reporting on nonfinancial impacts
	Willingness to conform (Deegan, 2009; Del Mar Alonso-Almeida et al., 2014; Fernando & Lawrence, 2014)	Willingness to measure nonfinancial impact
		Willingness to report nonfinancial impacts
		Willingness to steer on nonfinancial impacts
	Social acceptance of practice (DiMaggio & Powell, 1983; Fernando & Lawrence, 2014)	Widely accepted measuring standard
		Widely accepted reporting standard
		Widely accepted steering standard



Adoption of practice (Deegan, 2009; DiMaggio & Powell, 1983; Fernando & Lawrence, 2014)	Adoption of nonfinancial impact measuring
	Adoption of nonfinancial impact reporting
	Adoption of nonfinancial impact steering
Collaboration with sector	Sharing knowledge Sharing experiences
Available resources	Time People
Nonfinancial objectives	Setting objectives Achieving objectives
External pressure	Transparency Benchmark Financial Agencies
Strategic emphasis on nonfinancial reporting board	Awareness of nonfinancial impact Perceived importance of nonfinancial impact

## Appendix F: Consent form

### Toestemmingsformulier (informed consent)

Betreft: onderzoek naar corporate social performance in de infrastructuur sector

Ik verklaar hierbij op voor mij duidelijke wijze te zijn ingelicht over de aard, het doel, de methode en de toegankelijkheid van het onderzoek.

Ik verklaar dat ik:

- ☐ Geheel vrijwillig bereid ben om aan dit onderzoek mee te doen
- ☐ De uitkomsten van dit interview verwerkt mogen worden in een master scriptie
- ☐ Toestemming geef om het interview op te laten nemen door middel van een voice-recorder

Ik begrijp dat:

- ☐ Ik mijn medewerking aan dit onderzoek kan stoppen op ieder moment en zonder opgave van reden
- ☐ De opname vernietigd wordt na de uitwerking van het interview

Ik wens dat mijn gegevens als volgt worden benoemd in het onderzoek:

- ☐ Met naam en bedrijfsnaam
- ☐ Met naam, zonder bedrijfsnaam
- ☐ Zonder naam, met bedrijfsnaam
- ☐ Volledig anoniem (zonder naam en bedrijfsnaam)

Handtekening:

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Naam:

---

Datum:

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## Appendix G: Model validation

Table G1: Model validation

Feedback loops	Relationship(s) supported	Legitimacy or institutional theory	Source
	Not supported		
	<p>B2/R2: the dynamics resemble a mimetic isomorphic process.</p> <p>Pressure from infrastructure organizations to measure willingness to measure → +</p>	Institutional theory (mimetic isomorphism)	<p>Fernando &amp; Lawrence, 2014; DiMaggio &amp; Powell, 1983; Gray et al., 2010</p>

	nonfinancial impacts		
	<p>B3: the dynamics describe legitimizing actions.</p> <p>Nonfinancial impacts in integrated report →+ transparency about organizational impacts</p>	Legitimacy theory	Deegan, 2002; O'Donovan, 2002; Garde Sánchez et al., 2017
	<p>R3: Pressure to report on nonfinancial impacts →+ adoption of nonfinancial impact measuring (literature does not specify for the finance department)</p>	Institutional theory (mimetic isomorphism)	Fernando & Lawrence, 2014; DiMaggio & Powell, 1983; Gray et al., 2010
	<p>Willingness of the finance department to adopt nonfinancial reporting trends →+ adoption of impact measuring in organization</p>	Institutional theory (normative isomorphism)	Deegan, 2009; DiMaggio & Powell, 1983; Gray et al., 2010

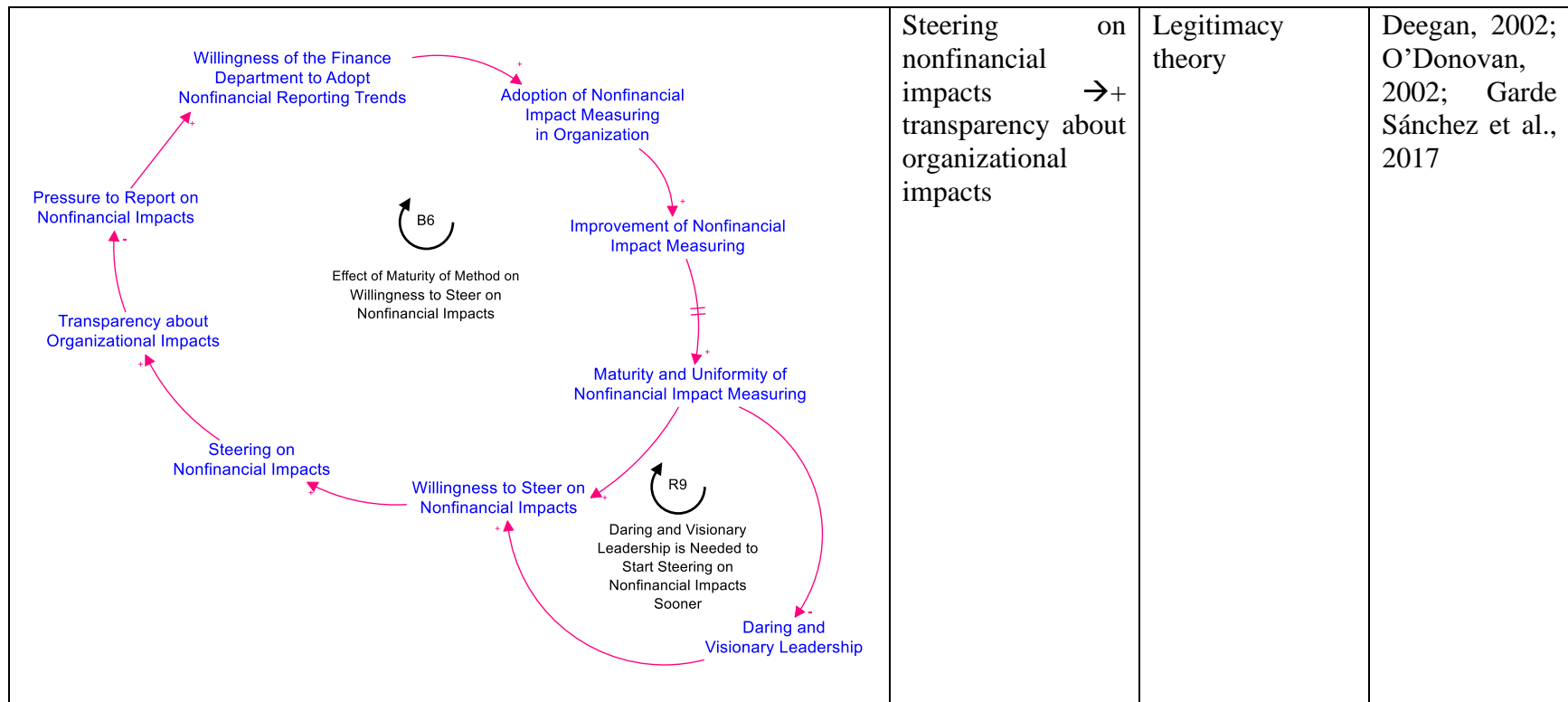
	<p>Relationships are not directly supported but find some ground in legitimacy theory. Legitimacy theory indicates that organizations prefer to disclose positive rather than negative findings.</p>	<p>Legitimacy theory</p>	<p>Gray et al., 2010; Garde Sánchez et al., 2017</p>
	<p>Willingness of the finance department to adopt nonfinancial reporting trends →+ adoption of impact measuring in organization</p>	<p>Institutional theory (normative isomorphism)</p>	<p>Deegan, 2009; DiMaggio &amp; Powell, 1983; Gray et al., 2010</p>

<p>Diagram illustrating Loop R4: Risk of the Maturity of the Method. The loop shows a cycle of factors influencing the adoption and maturity of nonfinancial impact measuring methods.</p>	<p>Willingness of the finance department to adopt nonfinancial reporting trends  →+ adoption of impact measuring in organization</p>	<p>Institutional theory (normative isomorphism)</p>	<p>Deegan, 2009; DiMaggio &amp; Powell, 1983; Gray et al., 2010</p>
<p>Diagram illustrating Loop R5: Uniformity in Reporting due to the Transparency Benchmark. The loop shows a cycle of factors influencing the adoption and reporting of nonfinancial impacts.</p>	<p>Loop R5 is not specifically supported by literature but has some foundation in mimetic isomorphism. Infrastructure organizations want to copy sector organizations' practices to obtain competitive advantage.</p>	<p>Institutional theory (mimetic isomorphism)</p>	<p>Fernando &amp; Lawrence, 2014; DiMaggio &amp; Powell, 1983; Gray et al., 2010; Gray et al., 2010</p>

<p>Nonfinancial Impacts in Integrated Report</p> <p>Adoption of Nonfinancial Impact Measuring in Organization</p> <p>Effort to Report on Criteria Transparency Benchmark</p> <p>Willingness to Rank High on Transparency Benchmark</p> <p>Benchmarking Between Infra Organizations</p> <p>Ranking on Transparency Benchmark</p> <p>Transparency about Organizational Impacts</p> <p>Ranking on Transparency Benchmark</p>	<p>Nonfinancial impacts in integrated report →+ transparency about organizational impacts</p>	<p>Legitimacy theory</p>	<p>Deegan, 2002; O'Donovan, 2002; Garde Sánchez et al., 2017</p>
<p>Nonfinancial Impacts in Integrated Report</p> <p>Adoption of Nonfinancial Impact Measuring in Organization</p> <p>Pressure from Investors to be Transparent</p> <p>Ranking Organization at Financial Agencies</p> <p>Transparency about Organizational Impacts</p> <p>Pressure on Transparency from Investors</p>	<p>Nonfinancial impacts in integrated report →+ transparency about organizational impacts</p>	<p>Legitimacy theory</p>	<p>Deegan, 2002; O'Donovan, 2002; Garde Sánchez et al., 2017</p>

	<p>Willingness of the finance department to adopt nonfinancial reporting trends  →+ adoption of impact measuring in organization</p>	<p>Institutional theory (normative isomorphism)</p>	<p>Deegan, 2009; DiMaggio &amp; Powell, 1983; Gray et al., 2010</p>
	<p>Willingness of the finance department to adopt nonfinancial reporting trends  →+ adoption of impact measuring in organization</p>	<p>Institutional theory (normative isomorphism)</p>	<p>Deegan, 2009; DiMaggio &amp; Powell, 1983; Gray et al., 2010</p>





<pre> graph TD     T[Transparency about Organizational Impacts] --&gt; R10((R10))     R10 --&gt; A[Accountability Based on Nonfinancial Impacts]     A --&gt; R11((R11))     R11 --&gt; E[Employee Motivation to Work Based on Nonfinancial Impacts]     E --&gt; O[Achieving Nonfinancial Objectives]     O --&gt; S[Setting Nonfinancial Objectives]     S --&gt; Ste[Steering on Nonfinancial Impacts]     Ste --&gt; T     T --&gt; E     A --&gt; O     </pre> <p>The diagram illustrates a process model for nonfinancial impacts. It starts with 'Transparency about Organizational Impacts', which leads to 'Accountability Based on Nonfinancial Impacts' through a feedback loop labeled R10, with the note 'Motivation due to Transparency'. From 'Accountability', it moves to 'Employee Motivation to Work Based on Nonfinancial Impacts' via a feedback loop labeled R11, with the note 'Motivation due to Accountability on Nonfinancial Impacts'. This leads to 'Achieving Nonfinancial Objectives', which then leads to 'Setting Nonfinancial Objectives', and finally to 'Steering on Nonfinancial Impacts'. There are also direct arrows from 'Transparency' to 'Employee Motivation' and from 'Accountability' to 'Achieving Nonfinancial Objectives'. A large curved arrow connects 'Steering on Nonfinancial Impacts' back to 'Transparency about Organizational Impacts'.</p>	<p>Steering on nonfinancial impacts → + transparency about organizational impacts</p>	<p>Legitimacy theory</p>	<p>Deegan, 2002; O'Donovan, 2002; Garde Sánchez et al., 2017</p>
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