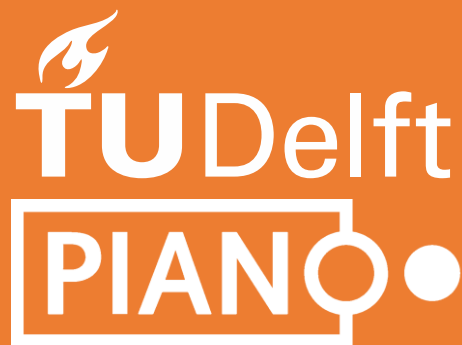


# Buyer groups as catalyst for sustainable procurement

A guideline for (semi-) public clients to implement buyer groups in the pre-procurement process of construction projects to minimise carbon emissions and maximise circularity





TU Delft

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**Master thesis**

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## Abstract

**Background:** The construction sector has a 10-year time span to become 50% circular and to reduce carbon emissions by 49% compared to 1990. This time span is even shorter for public clients, as the Dutch government functions as launching customer, and strives make its own tenders circular in 2023, and carbon neutral in 2030. Utilising public procurement to reduce carbon emissions and increase circularity is not yet common. This is because individual clients have limited buyer power to influence the market, insufficient knowledge or funds, and a lack of ability to take the lead in promoting wanted changes in procurement. Existing concepts and tools to tackle this issue, still have a limited effect on the implementation of sustainable public procurement.

Therefore, the Dutch government proposed buyer groups as a means to harmonise the market demand of public clients, aimed to tackle the existing problems of sustainable procurement. These pilot buyer groups are a relatively new phenomenon in the public pre-procurement process.

**Purpose:** This study is aimed to create insight into how (semi-) public clients can successfully establish or join a suitable buyer group, and how they can successfully cooperate and harmonise demand within buyer groups.

**Research question:** How can (semi-) public clients successfully implement buyer groups in the pre-procurement process of construction projects, to minimise carbon emissions and maximise circularity?

**Methodology:** A dual-method approach is implemented. Firstly, a literature review is conducted to examine relevant existing knowledge related to buyer groups, focusing on aspects of cooperation, legal relationships and legal restrictions. Secondly, case studies are conducted to capture the experience created by pilot buyer groups, focussed on formation, participants, organisational structure, demand harmonisation processes, impact and legal aspects. These case studies are input for a cross-case analysis, which is subsequently used to formulate best practices for buyer cooperation.

**Outcomes:** This research facilitates public clients with two main outcomes. Firstly, clients wishing to join or establish a suitable buyer cooperation, are supported by an overview of existing literature on this topic. Many different forms of buyer cooperation exist, each with different purposes, considerations and limitations. An overview of these forms is briefly visualised into a decision tree. Secondly, clients already participating in a buyer group are supported with best-practices from case studies. These best-practices provide findings and recommendations regarding buyer group cooperation and the demand harmonisation process.

**Limitations:** This research specifically focussing on buyer groups in the pre-procurement process of Dutch (semi-) public clients, that aim to reduce carbon emissions and increase the circularity of construction projects. This research is thus not directly applicable to clients with different context or different characteristics, or to buyer groups in other industries and sectors. Furthermore, this research excludes substantive considerations on actual procurement processes, the content of contracts, theory on circularity or carbon emission reduction, theory on conducting market consultations, the perspective of suppliers and the process of steering innovation.

**Keywords:** Buyer groups, pre-procurement process, public clients, circularity, carbon reduction, construction projects, sustainability

## Structure of the thesis

This graduation research is aimed to gain insight into how (semi-) public clients can successfully implement buyer groups in the pre-procurement process of construction projects, to minimise carbon emissions and maximise circularity. The research is structured into 8 chapters, which are elaborated below:

### **1.0 Introduction**

This first chapter describes the background information of the thesis. Next, a problem statement is formulated, followed by research questions, objectives, research methodology, relevance and the scope of the graduation research.

### **2.0 Literature study**

Provides an overview of existing scientific knowledge related to buyer groups in sustainable procurement. This chapter is aimed to answer the first research question: How can (semi-) public clients successfully establish or join a suitable buyer group?

### **3.0 Decision tree for buyer cooperation**

Operational application of the literature study, which aims to provide a comprehensible overview of all relevant information. Clients wishing to establish or join a buyer group, can use this decision tree to find a suitable form of cooperation.

### **4.0 Case studies**

This chapter contains five case studies aimed to provide insight into how the cooperation and processes of demand harmonisation within buyer groups are organised. Describes the case study methodology, and the findings of case studies in five different buyer groups.

### **5.0 Cross-case analysis**

The chapter answers the second research question: How can (semi-) public clients successfully cooperate and harmonise demand within buyer groups?

### **6.0 Best practices for buyer cooperation**

Provides best practices distilled from cross-analysing the five case studies. Formulated as recommendations for public clients cooperating in buyer groups.

### **7.0 Conclusions**

Conclusions of the graduation research, provides an answer to the main research question: How can (semi-) public clients successfully implement buyer groups in the pre-procurement process of construction projects, to minimise carbon emissions and maximise circularity?

### **8.0 Discussion**

This chapter discusses the research design and findings, states the limitations of the scope, and presents recommendations for further research.

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## Glossary

**Best practices** – Describes the best-evaluated approaches in the analysed case studies, formulated as recommendations.

**Buyer group / Buyer cooperation** – A form of cooperation between clients, which is aimed to bundle different client preferences into a homogeneous demand in order to create more buyer power to influence the market.

**Carbon emissions** – Greenhouse gas emissions caused by humans, which are likely the primary cause of unequivocal global warming likely to have a significant impact on ecosystems and human well-being.

**Circular economy transition** – Transformation aimed to significantly reduce the consumption of resources, by limiting both the input and output (e.g. waste) of materials in the economy.

**Construction sector** – Defined in this thesis as both infrastructure and real estate construction industry.

**Covenant** – Legal relationship between parties, which can include arrangements about intentions, cooperation and shared policies. Legally often limited enforceable.

**Degree of cooperation** – Indication whether cooperating clients share information, processes and/or purchasing volumes.

**Demand harmonisation** – Buyer cooperation to create a common way of working among participating client, with one line of conduct towards suppliers. In this research aimed to formulate a standard for MVI-requirements.

**Dimensions of buyer cooperation** – Classification of buyer cooperation based on three characteristics: Degree of member influence; number of group activities; and degree of cooperation.

**Highway matrix (extended)** – Matrix defined by Schotanus & Telgen (2007) to classify buyer cooperation into 5 typologies, based on two dimensions of buyer cooperation. Extended by the author with a third dimension to indicate the degree of cooperation.

**Impact of the buyer group** – The extent to which the cooperation is able to create buyer power to influence the market. Direct impact: the cumulative effect of buyer group members on the market. Indirect impact: Extent to which the buyer group influences the market together with external clients.

**Launching customer** – Public clients using their procurement spending to set an example, in this research for implementing circularity and reducing carbon emission.

**Legal relationship** – In Dutch: “juridische verhouding”. Relationship concluded between parties (e.g. cooperating buyers) stating their rights and obligations.

**Market vision** - Joint vision of making a product category more sustainable, which is implemented into a market strategy.

**Market strategy** – Implementation of the market vision, by jointly formulating model contracts and model criteria for tenders.

**MVI (Maatschappelijk Verantwoord Inkopen)** – Sustainable public procurement, in this research aimed to increase circularity and reduce carbon emissions.

**Public clients / Public buyers** – Governmental organisations (e.g. provinces, Rijkswaterstaat) or organisations financed and supervised by the government (e.g. Schools).

**Public procurement** – Public clients buying goods, services or works from market suppliers, through a competitive bidding process. Subject to public procurement legislation, which ensures market competition.



# 1.0 Introduction

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### 1.1 Construction sector and climate change

Currently, the construction sector in the European Union accounts for 29% of the total raw material consumption, and creates 36% of all waste generated, as visualised in Figure 1 (Eurostat,2020; European Council, 2019; Material Economics, 2018; Ecorys & Copenhagen Resource Institute, 2014). In addition, the global construction sector has an estimated annual carbon footprint of 3560 megatons in 2019, which is around 10% of the total global carbon emission - as visualised in Figure 2 (United Nations Environment Programme, 2020). The amount of embodied carbon in buildings - which are all non-operational carbon emissions - on average amounts up to 20% of the total lifecycle footprint, and up to 90% for infrastructure projects (Material Economics, 2018; Pomponi & Moncaster, 2016; Huang, Krigsvoll, Johansen, Liu & Zhang, 2018; Ecorys & Copenhagen Resource Institute, 2014). For buildings that are supplied with green low-carbon energy, the embodied carbon amounts up to 50% of the total carbon footprint in fifty years of use (IVA & Sveriges Byggindustrier, 2014; Material Economics, 2018; Ecorys & Copenhagen Resource Institute, 2014). Of the embodied carbon of buildings, around 94% of carbon emission are indirectly emitted during material manufacturing, which means only 6% is emitted directly during on-site construction (Huang et al., 2018; United Nations Environment Programme, 2020).

The mentioned high carbon emissions and high resource usage are causing negative effects on climate change. A synthesis report of IPCC (2014) provides an overview of existing scientific literature on climate change, which states the high greenhouse gas emission caused by humans since the pre-industrial era are likely the primary cause of unequivocal global warming. This observed unprecedented global warming is likely to cause long-lasting changes in the climate system, and to have a significant impact on ecosystems, societal conditions and human well-being (IPCC, 2014). Furthermore, resources and construction materials are becoming more scarce, which is partly caused by inefficient resource usage and the high amount of non-recycled waste (European Commission, 2011a). Limiting both the amount of greenhouse gas emission and the usage of resources, can limit the climate change risks and lead to a sustainable future (European Commission, 2011a; IPCC, 2014).

Therefore, it is vital to reduce carbon emissions in the construction sector (both direct and indirect) and to reduce its resource usage, in order to transform into a sustainable economy.

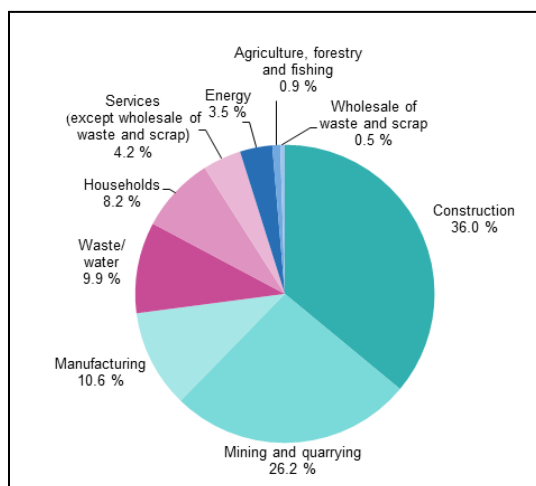


Figure 2: Waste generated by economic activities (Eurostat, 2020)

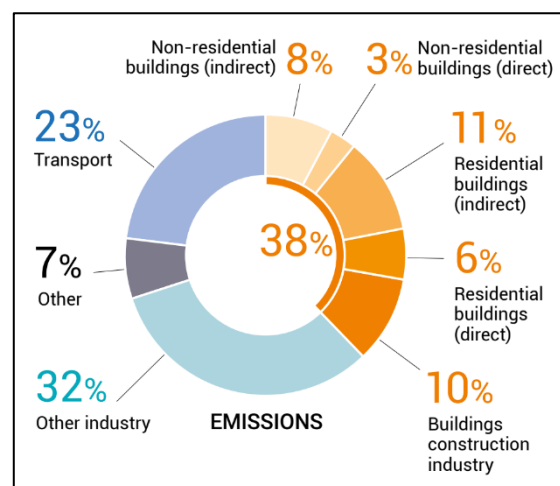


Figure 1: Global emissions generated by buildings (United Nations Environment Programme, 2020)

## 1.2 Role of the Dutch government

In order to make this transformation towards a sustainable economy, the Dutch government aims to reduce carbon emissions and increase circularity. The government pursues this objective with two approaches: Formulating multiple nationwide programs, and utilising its own public procurement spending to set an example. Both approaches are covered below.

The recently formulated nationwide programs are the formalised goals of the Dutch government for the transition towards a sustainable economy. Separate programs were created for reducing carbon emissions and for increasing circularity.

For increasing circularity, the Dutch government in 2016 formulated a first nationwide program towards a circular economy. This 'National Program Netherlands Circular in 2050' stated the goal for the Netherlands to have a fully circular economy in 2050 (Ministerie van Infrastructuur en Waterstaat & Ministerie van Economische Zaken, 2016). The transformation towards a circular economy is aimed to significantly reduce the consumption of resources, by limiting both the input and output (e.g. waste) of materials in the economy (Hanemaaijer et al., 2021). Based on the National Program, a more detailed roadmap towards a full circular construction sector was created: the Transition Agenda for a Circular Construction Economy, which stated a target of 50% circularity in 2030 (Ministerie van Infrastructuur en Waterstaat, 2018).

For reducing carbon emissions, the Dutch government presented the 'Klimaatakkoord' in 2019 (climate agreement), which focussed on becoming climate-neutral and minimising carbon emissions (Rijksoverheid, 2019). This climate agreement stated the goal to reduce carbon emissions by 95% in 2050 compared to 1990, and already with 49% in 2030 (Rijksoverheid, 2019). Moreover, these carbon emission goals are enforced by implementation in Dutch legislation through the 'Klimaatwet' (climate law) and its complementary 'Klimaatplan' (Klimaatwet, 2019; Ministerie van Economische Zaken en Klimaat, 2020b), which also specifically addresses the construction sector.

Summarized, in 2050 the Netherlands should be both fully circular and have minimised the carbon emissions with 95% (Ministerie van Infrastructuur en Waterstaat, 2020; Rijksoverheid, 2019). These goals also apply to the construction sector and in 2030, around 50% of these goals should be already achieved.

Furthermore, the Dutch government uses the national public procurement spending to set an example both for implementing circularity and reducing carbon emission. In the 'National Program Netherlands Circular in 2050', the Dutch government presented itself as the launching customer, and will therefore make its own tenders circular in 2023. Some exceptions are possible, but all public tenders have to be fully circular in 2030 (Ministerie van Infrastructuur en Waterstaat, 2018). The climate agreement also includes objectives for sustainable public procurement: the government will function as launching customer and strives to be carbon-neutral in 2030 (Rijksoverheid, 2019).

This role of public clients as launching customer has a large potential impact: as the annual public procurement spending is 73 billion euros (Ministerie van Economische Zaken en Klimaat, 2016), and e.g. even has a market share of around 100% in infrastructure procurement (Rijksoverheid, 2019).

However, the Dutch national government (in Dutch: "Rijksoverheid") individually only comprises 18% of the national public procurement spending (Ministerie van Economische Zaken en Klimaat, 2016). Therefore, in order to maximise the impact as launching customer, these sustainability objectives should also be implemented in the procurement of decentralised public clients.

Implementing sustainability objectives in (public) procurement is called MVI: socially responsible procurement (Ministerie van Infrastructuur en Waterstaat, 2019). MVI will be explained in the upcoming paragraphs.

### 1.3 MVI: socially responsible procurement

The ambition for MVI (socially responsible procurement) in general is to utilize public procurement spending to implement social objectives, such as decreasing carbon emissions and increasing circularity (Ministerie van Infrastructuur en Waterstaat, 2019). The Dutch national government actively searches for more decentral public clients to pursue shared MVI-ambitions (Ministerie van Infrastructuur en Waterstaat, 2019), as 82% of the national public procurement spending is done by decentral public clients (Ministerie van Economische Zaken en Klimaat, 2016). In 2016, this was formalised in signing the 'MVI manifest', that states the participating client will actively strive for sustainable procurement. The participating clients are supported with shared knowledge and practical tools, in which the national government leads the development (Ministerie van Infrastructuur en Waterstaat, 2019). Of these participating public clients, 45% have already clearly stated their MVI-ambitions, 45% identified opportunities for sustainable procurement, and 52% of clients are pursuing these ambitions with a concrete to-do list (RIVM, 2019a; De Graaff, Kruit & Van de Water, 2018).

The first monitored results are promising, in 2015-2016 79% of all public tenders published in the Netherlands included MVI requirements (RIVM, 2019a). Of these tenders, 48% was focused on climate requirements, 48% on environmental aspects, and 25% included circular specifications (RIVM, 2019a). In total, a reduction of 4.9 megaton CO<sub>2</sub>-equivalent greenhouse gas was monitored during the contract period (RIVM, 2018; RIVM, 2019a). It is observed that MVI-requirements are implemented more often in tender requirements, and with a higher importance weighting (De Graaff, Vergeer, & Van Berkel, 2020). Moreover, within the European Union, the Netherlands is regarded as a frontrunner in the field of sustainable public procurement (Ministerie van Infrastructuur en Waterstaat, 2019; De Graaff et al., 2020).

However, monitoring studies cannot establish a causal relationship between most MVI-ambitions and the gained results (De Graaff et al., 2020). The monitored results of MVI can be largely contributed to the procurement of green energy, whereas the construction sector implemented below-average MVI-ambitions and lacked a clear overview of the achieved results (RIVM, 2019a; Ministerie van Infrastructuur en Waterstaat, 2019).

Furthermore, the level of MVI-implementation differs between the decentral public clients (RIVM, 2018). Some clients have MVI-requirements below the market-average of available supply, or fail to implement the initially desired MVI-requirements in the final contract (RIVM, 2018). For most decentral public clients, this is caused by a lack of knowledge, capacity, budget and support, and unclear organisational responsibilities (De Graaff et al., 2018). In order to tackle these difficulties and to stimulate the implementation of MVI, organisations mostly need more knowledge and clear examples. (Ministerie van Infrastructuur en Waterstaat, 2019). The Dutch government actively addresses these difficulties encountered in MVI by stimulating collecting and sharing knowledge among public clients. Therefore, it has implemented multiple tools and concepts, which will be explained and evaluated in the following paragraph.

### 1.4 Existing concepts for MVI

Multiple tools and concepts to collect and share knowledge regarding MVI have been implemented by the Dutch government. Three relevant examples are the Green Deals, ‘Leernetwerken MVI’, and the pilots in the ‘klimaatenvelpe’ (Ministerie van Infrastructuur en Waterstaat, 2019). These existing concepts are elaborated and evaluated in this paragraph.

Green Deals are groups of (both public and private) organisations, started in 2011, in which all participants are actively experimenting with circular procurements, and sharing the gained experience and knowledge among the other members (Ministerie van Infrastructuur en Waterstaat, 2019). This knowledge and experience are bundled into an instructive roadmap for circular procurement. An evaluation of Green Deals by Ganzevles, Potting & Hanemaaijer (2016), states these groups add value in the process of sustainable innovation, and minimise existing obstacles for organisations (Ganzevles et al., 2016; Kwink Groep, 2016). However, Green Deals do not always create noticeable environmental benefits, because quantifying the results of specifically Green Deals is proven difficult. It is expected Green Deals will only have a small effect on the emission of greenhouse gas by 2020, but the expected long-term results are more promising. The Dutch government can stimulate these long-term effects, such as the development of innovative technologies, by taking a more steering role in Green Deals (Ganzevles et al., 2016; Kwink Groep, 2016).

‘Leernetwerken MVI’ (learning networks for MVI) were created in 2018 and 2019, to share the gained knowledge on MVI with interested public buyers (RIVM, 2019b, Ministerie van Infrastructuur en Waterstaat, 2019). These networks are evaluated positively, as most participating buyers are more confident and have greater knowledge related to socially responsible procurement. In addition, most networks led to products available for external buyers. However, as most pilots were not yet translated into actual procurements during the evaluation, the effects of the networks are very difficult to quantify (RIVM, 2019b, Ministerie van Infrastructuur en Waterstaat, 2019).

The ‘Klimaatenvelpe’ is a governmental investment fund established in 2018, dedicated to starting multiple innovative pilots for sustainable procurement (Ministerie van Infrastructuur en Waterstaat, 2019). Since 2018, Every year new pilots are started, which are subsidised by the Dutch government and are aimed to gather and share knowledge on MVI for public clients. Some initial pilot results are promising, with 0,042 Mton estimated carbon emission reduction (Ministerie van Infrastructuur en Waterstaat, 2019). In 2020, a Klimaatenvelpe pilot is called ‘Buyer Groups’ was started, which is elaborated in the next paragraph.

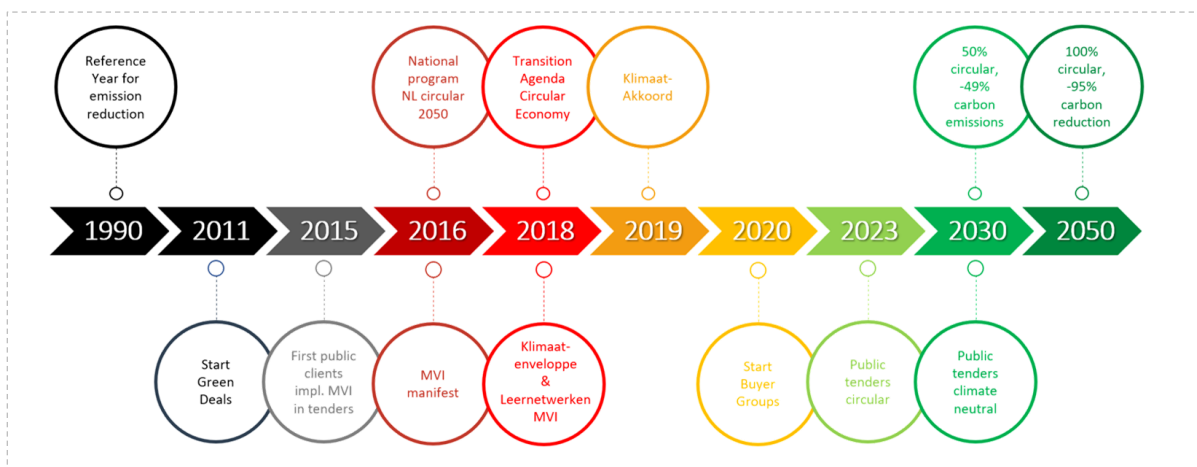


Figure 3: Timeline: Governmental legislation and the government as launching customer (own figure)

## 1.5 Buyer Groups

Buyers groups are a form of cooperation between clients, which is aimed to bundle different client preferences into a homogeneous demand in order to create more buyer power to influence the market (Dana, 2012). This increase in buyer power can also be exercised to demand an increase in product quality (Doyle & Han, 2013), and has the ability to stimulate the development of new products (Carstensen, 2010). Mathewson & Winter (1997) suggests bundling demand in buyer groups enables to put more effort in selecting different options, due to the scale advantages and dedicated research. Furthermore, if a buyer group can credibly pre-commit to an exclusive purchase, this maximises combined buyer power - which can be exercised to negotiate lower prices (Dana, 2012; Jeon & Menicucci, 2019; Mathewson & Winter, 1997).

However, multiple authors state that buyer groups are facing the risk of facilitating collusion (Doyle & Han, 2013; Normann, Rösch & Schultz, 2015; Carstensen, 2010). The open communication between buyers can result in an increase in symmetry between buyers, and exercise of buyer power could potentially result in the exclusion of external buyers or rival buyers being charged higher prices (Doyle & Han, 2013; Carstensen, 2010). However, buyer groups with an open nature for external participants and limited closed intercommunication, seem less prone to collusion and a negative 'waterbed effect' for external buyers (Jeon & Menicucci, 2019; Carstensen, 2010; Doyle & Han, 2013; Normann et al., 2015).

Because buyer groups create strong cooperation capabilities and an increase in buyer power, the Dutch government proposed buyer groups as a possible means to facilitate and accelerate the use of public procurement as leverage to reduce carbon emissions and increase circularity (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat, 2020). In 2020, buyer groups pilots were initiated by the Dutch government, specifically aimed to give substance to the carbon and circularity targets stated in the 'Klimaatakkoord' and National Program Netherlands Circular in 2050. These buyer groups are aimed to invest capacity, knowledge and funds, in order to build upon the progress made with Green Deals and Leernetwerken, and are aimed to deal with specific difficulties encountered by MVI-procurement as mentioned in previous paragraphs (Ministerie van Infrastructuur en Waterstaat, 2020).

Many different forms of buyer groups exist, all differing in centralisation intensity and the number of joint activities (Schotanus & Telgen, 2007). The Dutch government uses the following definition for implementing the pilot buyer groups:

"A buyer group is a practice-oriented partnership of (semi-)public clients. These clients work together on a specific theme to create a joint vision of making a product category more sustainable. The participating clients issue an individual tender based on this uniform market vision and strategy." (TwynstraGudde, Personal Communication, March 5, 2020, p.16; Ministerie van Infrastructuur en Waterstaat, 2020, Bijlage II p. 39).

Based on the shared market vision, the clients in these buyer groups together formulate harmonized MVI-requirements (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat, 2020). This is called market demand harmonisation, and is aimed to give market suppliers a clear signal of MVI-requirements, and use the group scale to make an impact on the market. When the market demand harmonisation is finished, the participating clients individually implement these requirements into a tender. Therefore, most buyer groups are only applied in the pre-procurement process, as the group process is finished before the start of the actual procurement. Among the pilot buyer groups, there are differences in the approach, participants, goals, scope, internal relations, and the level of market demand harmonisation (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat, 2020).

## 1.6 Problem statement

Utilising public procurement to reduce carbon emissions and increase circularity is not yet common, because individual, decentral public clients have limited power to influence the market, insufficient knowledge or funds, and a lack of ability to take the lead in promoting wanted changes in procurement (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat, 2020). Currently, suppliers are not willing to commit research into circularity and CO2 reduction, due to the fragmented market demand. Existing MVI concepts and tools still have a limited effect on the use of public procurement as leverage to reduce carbon emissions and increase circularity (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat, 2020). Green Deals do not always create noticeable environmental benefits (Ganzevles et al., 2016; Kwink Groep, 2016), and the effects of Leernetwerken are very difficult to quantify (RIVM, 2019b, Ministerie van Infrastructuur en Waterstaat, 2019).

The Dutch government initiated buyer groups, as experimental pilots to facilitate and accelerate the utilisation of public procurement to decrease carbon emission and increase circularity (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat 2020). These pilots are implemented in the pre-procurement process of public clients, who jointly formulate both a shared market vision on sustainability and harmonised MVI-demands as preparation for their individual tenders.

However, multiple authors mention legal risks associated with buyer groups collusion (Doyle & Han, 2013; Normann et al., 2015; Carstensen, 2010), and buyer groups having a negative 'waterbed effect' for external buyers (Jeon & Menicucci, 2019; Carstensen, 2010; Doyle & Han, 2013; Normann et al., 2015). These potential negative influences and legal risks are strongly dependent on the form of cooperation within the buyer group (Normann et al., 2015); and many different forms of buyer groups exist, all differing in centralisation intensity and the number of joint activities (Schotanus & Telgen, 2007). Among the pilot buyer groups, there are differences in the approach, participants, goals, scope, internal relations, and the level of market demand harmonisation (TwynstraGudde, Personal Communication, March 5, 2020).

Therefore, further insight is needed in these buyer group pilots, in order to determine whether buyer groups in the pre-procurement process of Dutch (semi-) public clients can contribute to the reduction of carbon emissions and the increase of circularity of construction projects.

## 1.7 Research objectives

This research is aimed to contribute to buyer groups in the pre-procurement process of Dutch (semi-) public clients, that aim to reduce carbon emissions and increase the circularity of construction projects. This is done both empirically and operationally.

Empirically by collecting relevant existing knowledge in literature, and capturing the knowledge generated in pilot buyer groups – in order to gain insight into how buyer groups can successfully create a shared market vision and harmonised MVI-requirements. In order to create a comprehensive overview, this research aims to gain insight on three key aspects: Firstly, insight into the cooperation within buyer groups and the process of harmonising the market demand. Secondly, insight into potential legal hazards of buyer groups for sustainable procurement, and what legal relationships are optimal for buyer groups. Thirdly, insight into whether buyer groups are able to tackle the existing problems for sustainable procurement: whether buyer groups have sufficient knowledge, funds and power to influence the market, the ability to take the lead in promoting changes in procurement; and what factors in the cooperation process determine the (perceived) success of the buyer groups.

Operationally by developing an implementation guideline, which aims to contribute to the successful implementation of buyer groups in the pre-procurement process. The implementation guideline includes a decision tree to successfully establish or join a suitable buyer group, and best practices to successfully cooperate and harmonise demand within buyer groups. Input for the development of this guideline is both captured knowledge in the pilots and existing literature. This guideline is to be used and shared by PIANOo and interested construction clients. The deliverables are aimed to stimulate the transition to sustainable procurement, therefore dissemination among all interested construction clients is highly stimulated.



## 1.8 Research questions

Based on the problem statement, the existing literature and the research objectives, the main research question of this paper is formulated as follows:

How can (semi-) public clients successfully implement buyer groups in the pre-procurement process of construction projects, to minimise carbon emissions and maximise circularity?

In order to answer this main research question, multiple questions are formulated covering the key aspects of buyer groups in sustainable procurement mentioned in the problem statement: Forms of cooperation, legal restrictions, legal relationships, cooperation processes and market demand harmonisation.

### Literature study

Firstly, the relevant existing literature on forms of cooperation, legal restrictions and legal relationships are reviewed. This is aimed to provide a complete overview of the relevant knowledge on buyer groups, and provide insight into how (semi-) public clients can successfully establish or join a suitable buyer group. The literature study answers the following research question, with multiple sub-questions:

1. How can (semi-) public clients successfully establish or join a suitable buyer group?
  - a. What are available forms of buyer cooperation to influence the market?
  - b. How can public clients choose a suitable form of buyer cooperation?
  - c. What are suitable legal relationships for cooperating buyers that aim to influence the market?
  - d. What are relevant legal restrictions for implementing buyer groups in the (semi-) public procurement process?

### Empirical study

Secondly, an empirical study is conducted to analyse the topics of buyer cooperation in practice, aimed to provide insight into buyer cooperation and market demand harmonisation processes. The empirical study answers the following research question, with multiple sub-questions:

2. How can (semi-) public clients successfully cooperate and harmonise demand within buyer groups?
  - a. Formation: How can buyer groups successfully recruit and select participants?
  - b. Participants: What different types of participants exist within buyer groups, and what are differences among these participants, regarding drivers to participate, commitment, mandate and experience?
  - c. Organisational structure: What forms of cooperation within buyer groups are used in practice, and how are their processes organised?
  - d. Demand harmonisation: How can buyer groups successfully organise the demand harmonisation process?
  - e. Impact: How can the (direct and indirect) impact of the buyer groups be calculated and maximised?
  - f. Legal: How do cooperating buyers select a legal relationship?  
What legal aspects influence the buyer cooperation, and how is dealt with legal obstacles?

## 1.9 Type of study

The type of study implemented in this research is qualitative, following the explorative nature of the stated problem. As mentioned in the problem statement, buyer groups are a known phenomenon in Dutch procurement (Schotanus, Telgen & Boer, 2010). However, the current implementation of buyer groups is new, as the current pilots with buyer groups are the first buyer groups to be initiated, facilitated and joined by the Dutch national government (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat, 2020), and are substantially different to most existing buyer groups. The current implementation of buyer groups for sustainable procurement can thus be described as a new phenomenon, and this study is aimed to explore this new phenomenon. The most suitable research is therefore a qualitative study, as qualitative studies allow to explore and understand a new phenomenon (Williams, 2007). Creswell (2014) describes qualitative research as an effective model that allows researchers to collect data themselves from being involved in the actual experiences, and to analyse, review, organise and explain the collected data. A quantitative study is thus not suited for this research, as quantitative studies are most suitable for testing existing theories and objectively quantifying the relation between variables (Creswell, 2014; Williams, 2007).

## 1.10 Research methodology

Due to the early stage and explorative nature of research into buyer groups for sustainable procurement, this study implements a dual-method approach that contains both a literature review and case studies, as visualised in Figure 4.

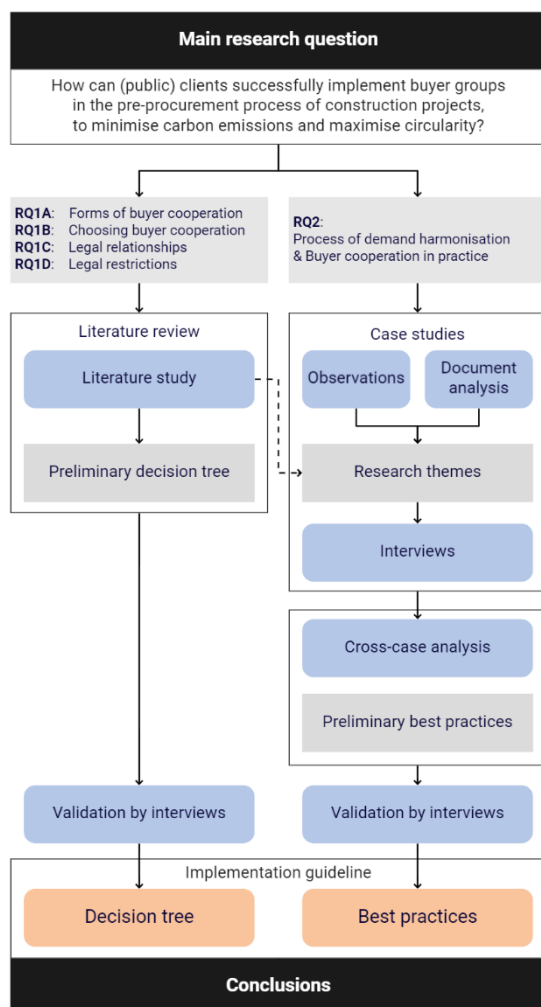


Figure 4: Model research methodology

Firstly, a literature review is conducted to examine the existing scientific knowledge related to buyer groups in sustainable public procurement. This literature review is aimed answer the first research questions, in order to provide a complete overview of existing literature on suitable forms of buyer cooperation, legal restrictions for buyer cooperation, and suitable legal relationships of buyer groups. Based on this literature review, a preliminary decision tree is created for public clients to establish buyer cooperation. The preliminary decision tree is validated through interviews with public client cooperation experts.

Secondly, empirical research is conducted in the form of case studies and related interviews. The case studies are aimed to answer the second research question, and thus gain insight into buyer cooperation in practice and the process of demand harmonisation. According to Creswell (2014), case studies are a viable way to conduct qualitative research, and are designed to develop “an in-depth analysis of a case, often a program, event, activity, process, or one or more individuals” (Creswell, 2014, p. 43). Based on the case studies, best practices for buyer cooperation are established. The empirical methodology is covered in chapter 4.

Both the decision tree and the best practices are combined in an implementation guideline for (semi-) public clients wanting to establish buyer cooperation.

### **1.11 Ethical considerations**

Because the empirical research is conducted in the form of case studies, and is thus aimed to collect data in the forms of participant interviews, (internal) documents, and observations of meetings; possible personal, confidential, or even harmful information could be collected (Creswell, 2014). Therefore, the research is designed and conducted according to the Dutch standard guidelines formulated by the KNAW et al. (2018) and the principles of Creswell (2014), in order to avoid possible ethical issues.

Therefore, the following principles are applied to this empirical research: Fairness, carefulness, transparency, independence, and responsibility (KNAW et al., 2018). Firstly, the analysis and reporting are done striving for fairness: no unfunded claims are made, and not only positive results are disclosed. Secondly, the research is designed carefully and is conducted according to this design, e.g. by using established methods and triangulation. Thirdly, the research is communicated transparently: the methodology is reported in the report, the goal of the research is disclosed to potential participants as well as the data processing – for which the informed consent of participants is provided. Fourthly, the research is done scientifically independent from involved organisations and potential non-scientific goals (KNAW et al., 2018; Creswell, 2014).

Furthermore, the author takes responsibility for processing the data and publishing the report: no personal, confidential or harmful information is disclosed. The data collected during the research is handled following the FAIR guiding principles (Wilkinson et al., 2016), which prescribe the collected data should be findable, accessible, interoperable and reusable. Therefore, the data is anonymised prior to implementation in the thesis, and the personal data is erased once the graduation project was finalised. The final thesis is to be published online on repository.tudelft.nl, provided that no embargo is required by the participating organisations. Participants in this research are informed on the data plan and research objectives (see Appendix H), and have submitted their approval through an informed consent form (see Appendix G). The author can be contacted for further explanation and accountability.

### **1.12 Scientific relevance**

Buyer groups are not a completely new phenomenon, as in 2007 already Schotanus described buyer groups as an ‘emerging concept’, which already had been proven successful in certain sectors. In 2010, around 85% of Dutch public clients had already participated in some sort of buyer group (Schotanus, Telgen & Boer, 2010). Many different forms of buyer groups exist, all differing in centralisation intensity and the number of joint activities; factors that have an influence on the successful implementation of buyer groups (Schotanus & Telgen, 2007). Most existing buyer groups analysed by Schotanus (2007), are focused on financial gains, sharing market information and increasing efficiency; and bundling their volumes by procuring collectively.

However, the current implementation of buyer groups in the (semi-) public pre-procurement process of construction projects is new and substantially different to most existing buyer groups as described above. Firstly, the current pilots with buyer groups are the first buyer groups to be initiated, facilitated and joined by the Dutch national government (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat, 2020). Secondly, the pilot buyer groups are only implemented in the pre-procurement process – and most tenders will thus be conducted individually. Thirdly, the pilot buyer groups are primarily focussed on increasing market sustainability, which in the study of Schotanus (2007) is only mentioned under possible further research.

Therefore, further insight is needed into this relatively new phenomenon of implementing buyer groups in the (semi-) public pre-procurement process of construction projects, aimed to minimise carbon emissions and maximise circularity.

### **1.13 Societal relevance**

The European construction sector is a large contributor to climate change, as it annually emits 250 megatons of carbon and accounts for 50% of all extracted materials in Europe. It is thus vital to minimise the carbon emissions and resource usage of the construction sector, in order to limit its contribution to climate change; and thus limit its negative impact on societal conditions and human well-being. The Dutch government has targeted 2050 for the Netherlands to be both fully circular and to have minimised the carbon emissions by 95% (Ministerie van Infrastructuur en Waterstaat, 2020; Rijksoverheid, 2019). These goals also apply to the construction sector, and in 2030 already 50% of these goals should be achieved.

This gives the construction sector a 10-year time span for achieving the 50% targets, which means existing procurement processes must be quickly adapted to implement circularity and carbon reduction requirements. In order to achieve this, the Dutch government currently functions as a launching customer for sustainable procurement; therefore it aims to make its own tenders circular in 2023 and fully carbon neutral by 2030. This has a large potential market impact due to the large annual government procurement spending, and gives public clients a very short time span. In order to give shape to this role of launching customer, multiple Dutch public clients currently participate in buyer groups pilots, and more could follow in the future. These buyer groups are a powerful means to exert power on the supply market (Doyle & Han, 2013), and are initiated to accelerate the implementation of circular and carbon-free procurement. Due to the strong potential of buyer groups, many potential negative influences and legal risks arise, which are strongly dependent on the form of cooperation within the buyer group (Normann et al., 2015).

The combination of the large market impact of public procurement and the strong potential of buyer groups, are aimed to result in a great catalyst effect on sustainability in construction projects. However, this combination could also result in the mentioned negative side-effects with a 'waterbed-effect' on the market or even collusion cases. Therefore, this research aims to contribute to a quick implementation of both circularity and carbon reduction requirements into existing procurement processes, and to help avoid the mentioned negative side-effects. This is done by providing public clients with an implementation guideline to successfully implement buyer groups in the pre-procurement process of construction projects.

### **1.14 Scope of the graduation research**

In order to keep the scope of this graduation research manageable, this research will only focus on buyer groups in the pre-procurement process of Dutch (semi-) public clients, that aim to reduce carbon emissions and increase the circularity of construction projects.

Therefore, four main limitations of this scope can be established. Firstly, the scope of this research also excludes theory on conducting market consultations, the perspective of suppliers and the process of steering innovation. For these topics, the reader is referred to the parallel graduation research of Georgette van Driesten into 'Buyer Groups and steering market innovation'. Secondly, this research excludes substantive considerations on actual procurement processes, the content of contracts, and theory on circularity or carbon emission reduction. Thirdly, the focus on Dutch (semi-) public clients excludes both private clients and clients from other countries. Fourthly, this research focuses specifically on the construction industry, exclusively covering infrastructure and real estate projects.

## 2.0 Literature study

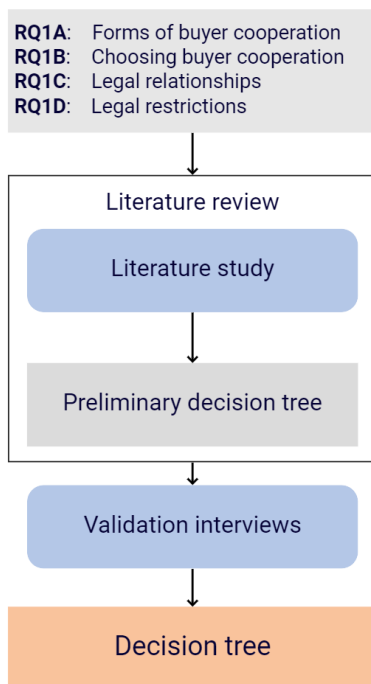
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## 2.0 Literature study

This chapter aims to provide an overview of existing scientific knowledge related to buyer groups in sustainable procurement. This literature study is aimed to answer the first research question:

1. How can (semi-) public clients successfully establish or join a suitable buyer group?

In order to answer this research question, this chapter addresses the four formulated sub-questions. This covers existing forms of buyer cooperation, choosing a form of buyer cooperation, available legal relationships and legal restrictions are reviewed. This is aimed to provide a complete overview of the relevant knowledge on buyer groups, and provide insight into how (semi-) public clients can successfully establish or join a suitable buyer group.



This chapter is divided into four paragraphs, that each addresses one of the four sub-questions:

- 1.A Existing forms of buyer cooperation
- 1.B Choosing a suitable form of buyer cooperation
- 1.C Available legal relationships for buyer cooperation
- 1.D Legal boundaries for buyer cooperation

This literature review is used as input to create a preliminary decision tree for public clients that wish to establish or join a buyer group. This decision tree is validated through interviews with public client cooperation experts, as can be seen in Figure 5. The decision tree will be covered in chapter 3.

Figure 5: Positioning of literature review

## 2.1 Forms of buyer cooperation (RQ1A)

This first section of the literature study aims to answer the sub question: What are available forms of buyer cooperation to influence the market? This is done by analysing existing literature, and by combining different classifications to provide a clear overview of available forms of buyer cooperation.

### 2.1.1 Establishing a boundary

Many different forms exist of buyer cooperation to influence the market. Schotanus (2007) established a systematic overview of different terminology used to describe buyer cooperation in existing literature, which resulted in a list of approximately 170 different terms. Both the Dutch National government and this paper mainly use the terms 'buyer groups' and 'buyer cooperation', but many other names exist; such as purchasing consortia, cooperative purchasing, joint procurement and sourcing coalition. However, some terms are not only used to indicate horizontal buyer-buyer cooperation, but can also be applied to vertical collaborations between buyers and suppliers; such as collaborative procurement, procurement alliances, cooperation or partnerships. This broad and loosely defined terminology hinders providing a relevant overview of existing literature on buyer cooperation.

In order to provide a relevant overview of the available forms of buyer cooperation, it is useful to first establish a boundary for relevant types of buyer cooperation that fit the problem statement. As stated in the problem statement, the need for buyer cooperation originates in the fact that individual clients have limited power to influence the market, insufficient knowledge or funds, and lack the ability to take the lead in promoting wanted changes in procurement (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat, 2020). This has resulted in a fragmented market demand, which makes suppliers unwilling to commit research into circularity and CO2 reduction. Therefore, only forms of buyer cooperation are taken into consideration if they combine knowledge or funds, harmonise the market demand, focus on creating (combined) buyer power and the ability to take the lead in promoting changes. This stipulated description matches the definition given by Schotanus, which will therefore be used as a boundary for relevant forms of buyer cooperation:

“The operational, tactical, and/or strategic cooperation between two or more organizations in one or more steps of the purchasing process by pooling and/or sharing their purchasing volumes, information, and/or resources in order to create symbiosis.” (Schotanus, 2007, p.11)

Within the cited definition of Schotanus, still many different forms of buyer cooperation are available – which can be deduced from the use of the word 'or'. In existing literature, multiple dimensions have been established in order to distinguish these available forms of buyer cooperation. The established dimensions are used to measure and rate the characteristics of different forms of buyer cooperation. For example, these are distinct dimensions in which buyer groups can differ, established by different authors:

- Centralisation, commitment, intensity of communication, permanence of cooperation (Tátrai, 2015);
- Formality, independence of members, hierarchy (Bakker, Walker, Schotanus, & Harland, 2008);
- Size, homogeneity among members, beneficiaries (Nollet & Beaulieu, 2005),
- Influence by all members on the group activities, number of different group activities (Schotanus & Telgen, 2007).
- Operational, tactical, and/or strategic cooperation (Verstrepen, Cools, Cruijssen & Dullaert, 2009; Schotanus & Telgen, 2007)
- Public or private sector (Schotanus, 2007)

## 2.1.2 The highway matrix

Schotanus & Telgen (2007) defined seven characteristic dimensions of buyer cooperation, of which they selected two main dimensions to be able to classify existing buyer groups: the influence by all members on the group activities, and the number of different group activities. These two key dimensions were chosen because they are very specific to the form of cooperative purchasing; the interpretation of these dimensions should not vary significantly across different buyer groups (Schotanus & Telgen, 2007). Based on how different forms of buyer cooperation score on the two key dimensions, they are classified into a typology – called the highway matrix (which is shown in Figure 5).

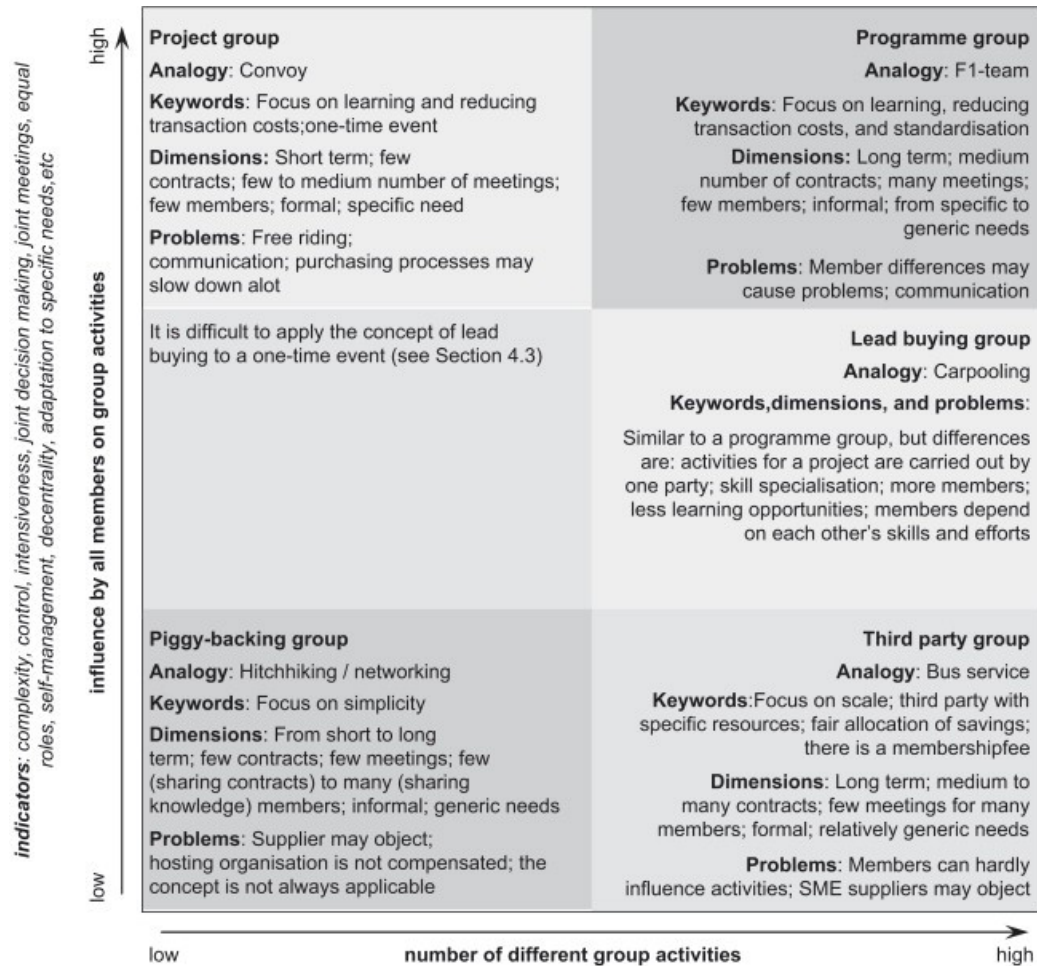


Figure 6: The highway matrix developed by Schotanus & Telgen (2007)

The other five characteristic dimensions defined Schotanus & Telgen are “the extent of the costs and gains for the members, organisational design of the group, member characteristics, size of the group and the life span of the group” (Schotanus & Telgen, 2007, p.61). Within the highway matrix, each typology is classified on all seven dimensions; each typology thus has a unique combination of the seven dimensions.

According to Schotanus & Telgen (2007), this highway matrix is especially useful to clearly define and position available forms of buyer cooperation, which had not been done prior in existing literature. In addition, it can also help clients to select a suitable form of buyer cooperation, as each different form has its own (dis)advantages and critical success factors. This makes the highway matrix and its key dimensions especially useful to provide an overview of different forms of buyer cooperation. Therefore, its two main dimensions are elaborated in the following paragraphs.



### 2.1.3 First dimension: Degree of member influence

The first key dimension defined by Schotanus & Telgen (2007), is the degree of influence buyer group members have on the joint activities. Existing forms of buyer groups can vary between two opposites within this dimension: The participating clients can choose to all have equal roles in the group, a high degree of influence, intensive involvement in the decision process, and high independence from the skills of other members. Alternatively, the participating clients can choose to outsource their individual tasks towards other members or even an external party, and have a low involvement and influence in the decision process (Schotanus & Telgen, 2007).

However, in existing literature, this dimension of member influence is related to multiple other dimensions: centralisation, formalisation, and organisational structure. Tátrai (2015) describes the dimension of centralisation, for which the main distinction is whether buyer groups are centralised procurement organisations, or decentralised joint procurement agreements. The decentralised agreements demand active involvement of all group members, with all members having equal input during the cooperative agreement. The centralised model is more permanent, with a lead authority or organisation taking the lead and responsibility on behalf of the other members (Tátrai, 2015).

Bakker et al. (2008) describe two key forms of buyer cooperation; the virtual network and third-party organisation. The virtual networks are described as an informal and member-owned form of buyer cooperation, which means participating members keep their authority in the decision process. This makes virtual networks best suited for infrequent procurement with a high demand for communication, input and commitment from members. The third-party organisation is a larger, separate organisation, which is more formal and often participating clients give authority to the third-party organisation. This makes the third-party cooperation best suited for uncomplicated, frequent purchasing where little input from participating members is demanded (Bakker et al., 2008).

A similar distinction is described by Walker, Essig, Schotanus, & Kivistö (2007); which ranges from an autonomous, formal, structured organisation towards a small-scale, informal member-owned purchasing cooperative.

Following the above three descriptions in existing literature of available forms of buyer cooperation, it could thus be argued that the degree of member influence on joint activities is closely related to the dimensions of centralisation, formalisation and organisational structure of buyer groups. Schotanus & Telgen (2007) bundled the mentioned dimensions of centralisation, formalisation and organisational structure under one dimension of “organisational design of the group”. They recognised this dimension as a separate dimension of the seven main dimensions of forms of buyer cooperation, but did not describe a relation between this organisational design and the degree of member influence in joint decisions. However, the degree of member influence on joint activities is likely closely related to the organisational structure of the buyer group, based on the mentioned literature.

#### **2.1.4 Second dimension: number of activities / duration**

The second distinguishing dimension defined by Schotanus & Telgen (2007), is the number of different group activities – also described as the diversity of activities for the group. The activities are described as “specifying, selecting, contracting, evaluating, sharing information or knowledge, sharing personnel or other resources, shared policy and procedures, benchmarking, etc” (Schotanus & Telgen, 2007, p.63). This dimension ranges from “undertaking one occasional cooperative activity to continuously undertaking different activities” (Schotanus & Telgen, 2007, p.62). In the highway matrix, this dimension is not explicitly connected to the life-span of buyer cooperation, as duration is mentioned as a separate dimension of buyer cooperation.

However, the highway matrix consequently links the number of shared group activities to the number of shared contracts and whether the cooperation is long or short term. This connection between life-span and the number of shared activities is confirmed by the possibility for project groups to continue after the initial project as a programme group or lead buying group, as described by Schotanus & Telgen (2007). Therefore, although no explicit connection is made in the highway matrix between life-span and the number of shared group activities, it could be argued that these two dimensions are strongly related.

#### **2.1.5 Missing dimension**

A key factor defining the cooperation within buyer groups appears to be missing, when comparing the highway matrix developed by Schotanus & Telgen (2007) to the definition of buyer cooperation by Schotanus (2007). This definition describes buyer cooperation “in one or more steps of the purchasing process by pooling and/or sharing their purchasing volumes, information, and/or resources” (Schotanus, 2007, p.11).

However, neither the matrix nor its seven key dimensions mention anything on the degree of cooperation. It is thus not possible for the existing matrix to indicate the number of shared steps in the procurement process, and not possible to indicate whether information, purchasing volumes and/or resources are shared. The highway matrix therefore lacks the possibility to indicate the degree of cooperation.

Although this degree of buyer cooperation is not included in their seven dimensions, the paper of Schotanus & Telgen (2007) touches lightly upon this dimension, as it states:

“Note that the more integration of the purchasing processes of the members takes place, the more the aspects mentioned in alliance theory apply [...]. This means that if the cooperation is very basic and non-intensive, then alliance theory aspects, such as transparency, trust, and commitment, are less important. Intensive forms of cooperative purchasing ask for more organisational similarities and mutual communication.”(Schotanus & Telgen, 2007, p.60)

Schotanus & Telgen (2007) state in their recommendations for further research, that the matrix can be refined by “adapting the two distinguishing dimensions or by introducing more dimensions” (Schotanus & Telgen, 2007, p.62). Proving such an adaptation and addition of the dimensions is useful, Schotanus collaborated on the research of Waltmans, Reunis, Schotanus & Santema (2006), which added the level of symbiotic relationships in buyer groups to the highway matrix – extending the matrix towards a three-dimensional model. Instead of developing a completely new classification to indicate the degree of symbiosis in buyer cooperation, Waltman et al. (2006) incorporated an existing classification on the symbiosis of buyer cooperation; a classification that already had been applied to buyer groups by Essig (2000).

### 2.1.6 Adding a dimension: the degree of cooperation

Therefore, an additional third dimension can thus be added into the highway matrix, in order to incorporate the degree of buyer cooperation. Instead of developing a completely new classification, the existing classification for the degree of buyer cooperation by Faes, Matthysens & Vandenbempt (2000) could be added to the matrix.

This classification by Faes et al. (2000) categorises buyer groups based on their synergy, which is the degree of cooperation between cooperating purchasers. It classifies these synergies into three categories: the economies of information and learning, the economies of process, and the economies of scale. The economies of information and learning occur when purchasers share their purchasing knowledge on e.g. markets, suppliers and new technologies. The economies of process focusses on creating a common way of working among participating purchasers, with one line of conduct towards suppliers. The economies of scale entail actually pooling procurement volumes in order to enforce buyer power, which requires standardization and synchronization among cooperating purchasers (Faes et al., 2000). This classification of buyer synergies can thus roughly be translated into either sharing information, sharing processes and resources, or sharing purchasing volumes.

Therefore, this classification strongly matches the above-mentioned definition of buyer groups formulated by Schotanus & Telgen (2007), as they both mention sharing information, resources and/or purchasing. The applicability of the classification by Faes et al. to the typology of Schotanus & Telgen, can be confirmed by a more recent publication of Schotanus, Telgen and De Boer (2010). In this publication, buyer groups are defined as aiming for “*lower purchase prices and reduced duplications of efforts and activities due to economies of scale, process, and information (based on Faes et al., 2000).*” (Schotanus et al., 2010, p.51). The reference indicates this definition of buyer groups by Schotanus et al. is based on the classification of Faes et al.

This confirms the classification of Faes et al. is very suitable to fill the missing dimension in the highway matrix. To demonstrate this applicability, Table 1 shows how the classification of synergies can be used to position MVI concepts.

Classification Faes et al. (2000)	Corresponding MVI concepts	Cooperative activities
Economies of information and learning	Leernetwerken MVI & Green Deals	Experimenting with circular procurements, and sharing the gained experience and knowledge among the other members. <i>(Ministerie van Infrastructuur en Waterstaat, 2019)</i>
Economies of process	Buyer Groups	Creating a joint vision and strategy to make a product category more sustainable. Participating buyers issue an individual tender based on this uniform market vision and strategy. <i>(TwystraGudde, Personal Communication, March 5, 2020, Ministerie van Infrastructuur en Waterstaat, 2020)</i>
Economies of scale	Bouwstroom (see case study 5)	Pooling procurement volumes in order to enforce buyer power, which requires standardization and synchronization among cooperating purchasers. <i>(Faes et al., 2000)</i>

Table 1: The classification of Faes et al. (2000) with corresponding MVI concepts

### 2.1.7 Conclusion: Three dimensions for buyer cooperation

The available forms of buyer cooperation to influence the market can be classified based on three dimensions. The original highway matrix already distinguished the two key dimensions of 'degree of member influence' and 'number of group activities', which created five typologies. Adding this dimension of synergy defined by Faes et al. (2000) enables the highway matrix to indicate whether information, purchasing volumes and/or resources are shared. The additional third dimension of synergy results in 15 distinct typologies. The extended, three-dimensional highway matrix is visualised in Figure 7.

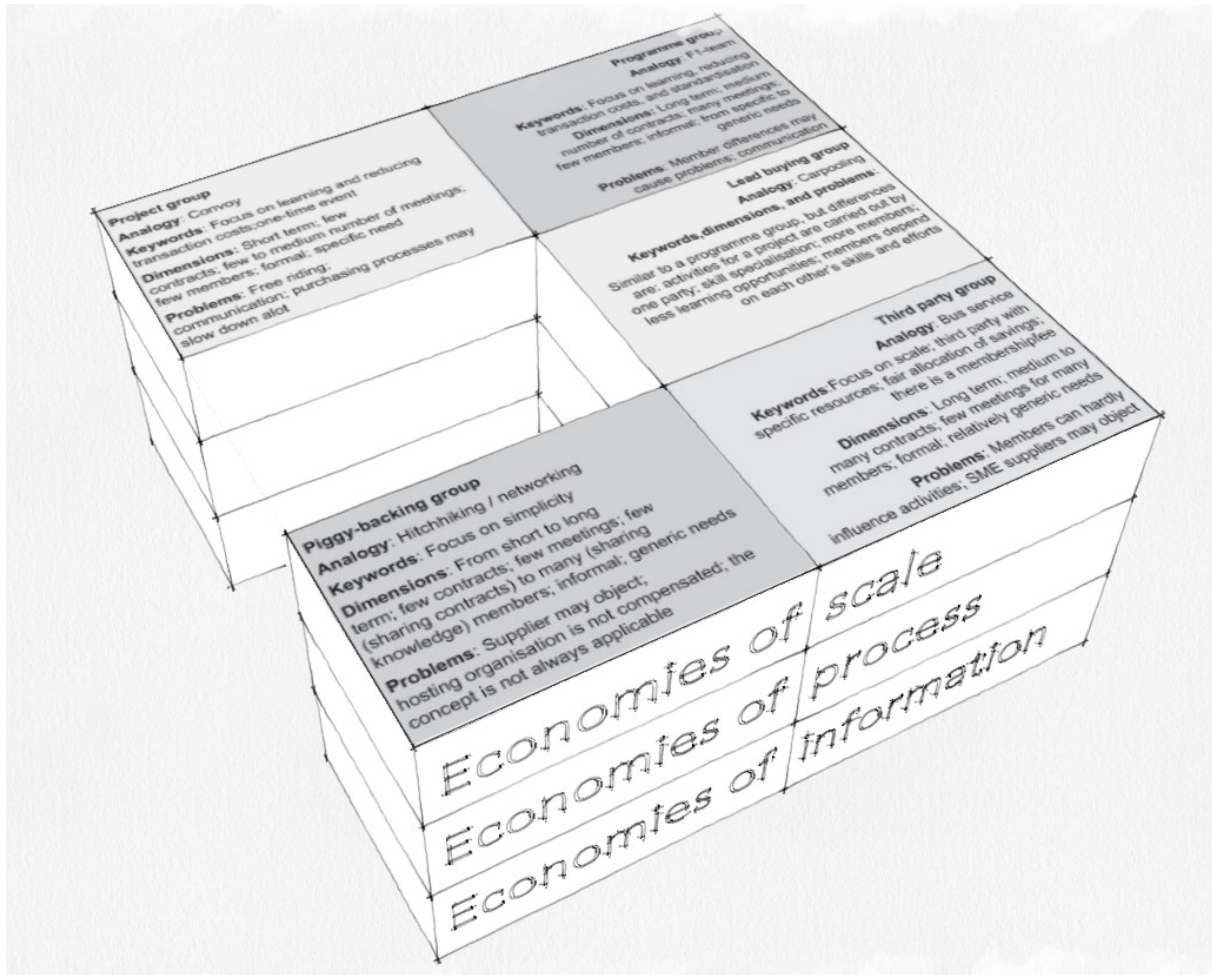


Figure 7: The highway matrix (Schotanus & Telgen, 2007) extended with the dimension of synergy

Each of the resulting 15 typologies within the extended highway matrix has a distinct position along the three key dimensions. Similar to the original highway matrix, the interpretation of these dimensions should not vary significantly across different buyer groups. As shown in Figure 7, the five non-key dimensions of Schotanus & Telgen (2007) also apply to the extended highway matrix.

Nevertheless, the extended highway matrix still does not elaborate on every available dimension of buyer cooperation. Further detailing of the matrix may be possible by adding more dimensions, such as the mentioned dimensions of public vs. private sector (mentioned by Schotanus & Telgen, 2007), and whether the cooperation is operational, tactical or strategic (as defined by Verstrepen et al., 2009). Although the author found no indication of potential benefits of adding more dimensions to the matrix, further research could investigate the usefulness and necessity of adding certain extra dimensions. This paper will not further detail the highway matrix with more dimensions or typologies, in an effort to keep the matrix uncluttered and straightforward.

## 2.2 Choosing a form of cooperation (RQ1B)

This second section of literature study aims to answer the second sub-question: How can public clients choose a suitable form of buyer cooperation?

### 2.2.1 Positioning along dimensions

The highway matrix and its typologies are designed to help to choose a form of buyer cooperation; as Schotanus & Telgen state it can “serve as a guideline for purchasing groups when a suitable organisational form needs to be chosen. In a suitable form, the dimensions of a group fit together. For all groups, it is recommended to find this best fit. This is something in which the typology may help” (Schotanus & Telgen, 2007, p.53).

The highway matrix is thus designed to help buyer groups balance between these dimensions, which will help find a suitable form of cooperation. If balanced, the buyer group minimises disadvantages and fully utilises cooperation advantages.

Moreover, existing buyer groups can change along the dimensions. For example, if a buyer group grows in size and its members become increasingly different, the manager can “decide to change the organisational form to a less intensive form of cooperative purchasing” (Schotanus & Telgen, 2007, p.56). In the highway matrix, this decision entails having less individual input from all members, and shifting influence and decision-making towards certain members or a third-party.

The extended highway matrix is created to serve the same purpose as the original, by providing buyer groups a clear overview of available dimensions along which the cooperation can be balanced. The original highway matrix created five typologies, adding the third dimension of synergy results in 15 distinct typologies. Based on demands from members, managers of buyer groups can position the group cooperation along the three dimensions, in order to select a suitable form of buyer cooperation. The higher number of available typologies could enable a more detailed positioning of existing buyer groups, and provide a more extensive choice for clients to select a suitable form of buyer cooperation. Similar to the original highway matrix, each combination of balancing dimensions results in one of the 15 unique forms of cooperation, with specific (dis)advantages, possible contracts and relevant legal restriction.

The following paragraphs will provide cooperating clients with considerations for positioning their cooperation along these three dimensions, based on the dimensions of Schotanus & Telgen and other existing literature.

### **2.2.2 Choosing the degree of member influence**

For choosing the degree of influence by all group members on the joint activities, four key considerations can be derived from Schotanus & Telgen (2007): the desired involvement of members, the complexity of the procured product, the number of group members and organisational similarities. Firstly, when participating buyers choose to have high involvement in the group, this limits the possibilities of outsourcing their individual tasks towards other members or a third-party. Secondly, when the procured product has a high complexity, this demands a high level of expertise in the buyer group, for which the intensive input of participating group members is required. Thirdly, the more members are joined in the buyer group, the less viable it is to give all members equal influence on the joint activities. Lastly, a low level of organisational similarities among the participating clients hinders the ability to outsource individual tasks towards other members or a third party, as every member will want to have its own unique input in the process (Schotanus & Telgen, 2007).

These considerations find confirmation in existing literature. Firstly, the complexity of the product is also mentioned as a consideration (Nollet & Beaulieu, 2003; Bakker et al., 2008; Walker, Schotanus, Bakker & Harland, 2013). High complexity of the procured product requires an intensive standardisation process; which demands intensive influence of all members. When the complexity is low, a buyer group with low member intensiveness should be adequate (Nollet & Beaulieu, 2003; Bakker et al., 2008; Walker, Schotanus, Bakker & Harland, 2013). Secondly, Bakker et al. (2008) also support the considerations on group size and the desired involvement of members. Bakker et al. stated that in situations with high information exchange and where participating buyers have a high desired involvement due to the importance of the procurement, a small buyer group is more suitable that does not outsource any activities to a third-party. Thirdly, related to the organisational similarities, Schotanus (2007) advises small individual buyers to be cautious for joining in buyer groups with larger contracting authorities. The small clients are vulnerable to lose control, and should thus only outsource their individual tasks to a buyer group for an uncomplicated product, that has a low number of members or has high organisational similarities. The alternative for a small client is to seek a buyer group where it can have high involvement in the shared activities (Schotanus, 2007).

In conclusion, outsourcing individual tasks towards other members or a third-party is a viable option for a high number of group members, an uncomplicated procured product, a low desired member involvement, and high organisation similarities and similar organisation sizes. Otherwise, it is advised for all group members to have equal influence on joint activities.

### **2.2.3 Choosing the number of different group activities**

Choosing the number of different activities for the purchasing group seems to be a logical result of the objectives of the group. This dimension ranges from "one occasional cooperative activity to continuously undertaking different activities" (Schotanus & Telgen, 2007, p.62). Furthermore, Schotanus & Telgen mention that a buyer group that was originally established for a one-time event, can be continued into a more permanent form of buyer cooperation. Based on Schotanus & Telgen (2007), the two main considerations for choosing the number of different group activities can thus be defined as the success of the buyer cooperation and the number of shared procurement needs.

In conclusion, the number of different group activities follows from the group objectives, the number of shared procurement needs, and the success of the cooperation. Short-term buyer cooperation can grow into a more permanent form.

#### 2.2.4 Choosing the degree of cooperation

For choosing the degree of cooperation within a buyer group, Faes et al. (2000) has defined three main typologies: either sharing information, or sharing processes and resources, or sharing purchasing volumes. Buyer groups can thus use these three categories as a guideline for establishing the degree of cooperation among the participating members. Faes et al. do not describe this classification as incremental or cumulative in regards to ambition and requirements. The three individual typologies could thus be seen as separate cases, each applicable in other use cases. Furthermore, Faes et al. explicitly state they “will not further investigate under which conditions companies should go for centralization, coordination or decentralization” (Faes et al., 2000, p.541). Therefore, considerations for choosing a degree of cooperation are provided from external literature in the next paragraphs – focussing on issues related to sustainability and circularity.

##### a. Sharing information: always a good idea

This category of cooperation, Economies of information and learning, is defined by Faes et al. (2000) as buyers sharing their procurement knowledge on e.g. markets, suppliers and new technologies.

According to Tella & Virolainen (2005), sharing information is one of the main reasons for clients to start cooperating. According to Rainville (2021), the often limited knowledge of public agencies can hinder the transition to a sustainable and circular economy. This knowledge can be learned from other public clients or suppliers, and subsequently be implemented in the pre-procurement process; Rainville even mentions a concept of buyer groups for sharing and learning this knowledge. Implementing this shared knowledge in the pre-procurement process helps to formulate more effective award criteria and technical specifications, which can enable leveraging public procurement for a more circular economy (Rainville, 2021).

This connection between the limited knowledge of public clients and the slow implementation of circular procurement is confirmed by Alhola, Ryding, Salmenperä & Busch (2018); who state public clients often lack competence and experience. Alhola et al. suggest to focus on sharing knowledge, communicate and collaborate with both other clients and suppliers, in order to improve their skills and knowledge, to stimulate the creation of end-user value and the implementation of circular procurement.

However, Alhola et al. (2018) suggest this implementation of gained knowledge into award criteria and technical specifications, will only help improve circularity when the “subject matter of the contract does not necessarily require new product development” (Alhola et al., 2018, p. 8).

Therefore, buyer cooperation to share information can stimulate the implementation of circular procurement, as it helps improve the knowledge and competence of clients. Sharing knowledge might not be adequate to stimulate new product development.

b. Sharing processes and resources: to stimulate circularity and innovation

The economies of process are described by Faes et al. (2000) as buyer cooperation to create a common way of working among participating purchasers, with one line of conduct towards suppliers. This degree of synergy is thus a more intensive and integrated cooperation between buyers: not just information, but also processes and resources are shared among participating clients.

Alhola et al. (2018) suggest such an intensive degree of buyer cooperation might be required when new product development is needed. When public clients aim to stimulate innovation and new solutions, it is not sufficient to only share information and implement this gained knowledge into award criteria and technical specifications (Alhola et al., 2018).

This is consistent with Witjes & Lozano (2016), who state circular public procurement needs product innovations. This innovation cannot be achieved by off-the-shelf purchasing, but requires new procurement and cooperative methods. Therefore, not only the sharing of information, but also coordination of procurement and development activities across organisational units is needed (Witjes & Lozano, 2016; Kristensen, Mosgaard, & Remmen, 2021).

Moreover, Alhola et al. (2018) state that current procurement strategies of individual public clients are often causing fragmentation of circular aspects and products, and are not promoting complete solutions. This statement by Alhola et al. confirms the original problem definition; in which it is stated a fragmented market demand is caused by individual clients having insufficient knowledge and buyer power and lacking the ability to take the lead (TwynstraGudde, Personal Communication, March 5, 2020; Ministerie van Infrastructuur en Waterstaat, 2020).

To tackle this fragmentation on the market, Racca & Albano (2013) propose the aggregation of demand of public procuring authorities. A straightforward method suggested for aggregating demand is for contracting authorities to coordinate certain phases of the procurement process, e.g. with shared technical specifications; and to address specific markets with joint contract documents (Racca & Albano, 2013; Racca, 2011; Kristensen et al., 2021).

This is also stated by Edler & Georghiou (2007), who suggest public cooperation to share knowledge on future developments and specifying demands is not sufficient to stimulate innovation. They argue public procurement has to converge towards standards and harmonised regulations. These clear standards will enable suppliers to commit research into new products, confident on the desired direction of developments (Edler & Georghiou, 2007; Racca, 2011). Aggregation of demand is also mentioned by Van Meerveld, Nauta & Whyles (2015) as a means to stimulate suppliers to commit research into innovation. Van Meerveld et al. describe the process of 'signposting' the market potential of innovations to suppliers; informally aggregation of demand among public clients can reduce uncertainty for suppliers by assuring them the innovation will not be limited to a single transaction. Compared to pooling purchasing volumes, this informal approach demands marginal efforts of public clients and avoids the risks of joint procurement actions (Van Meerveld et al., 2015; Racca, 2011).

There are three different ways to implement these sustainability standards into the procurement procedure – applicable to any form of procurement: in the technical specifications of the procured item, in the selection criteria and award criteria of the procurement procedure, and in the performance conditions of the final contract (Uttam, Balfors & Faith-Ell, 2014; Rainville, 2017; Appolloni, Coppola & Piga, 2019; Essers & Lombert, 2017). For establishing minimum sustainability requirements, implementation in the technical specifications and the contractor selection criteria is most suitable; while the award criteria are most suitable to stimulate voluntary improvements and products with limited innovation possibilities (Rainville, 2017; Alhola et al., 2018; Appolloni et al., 2019; Essers & Lombert, 2017).

Therefore, public clients establishing a common line of conduct towards suppliers can stimulate innovation and circular solutions with marginal effort. This can be done by creating sustainability standards and harmonised regulations; enabling suppliers to commit research into new products.



c. Sharing purchasing volumes: to increase savings and buyer power

The third and highest level of synergy in the classification of Faes et al. (2000) is the economies of scale. Buyers with this degree of cooperation are actually pooling procurement volumes in order to enforce buyer power, which requires standardization and synchronization among cooperating buyers. Bundling purchasing volumes requires the other 2 levels of cooperation: sharing information and harmonising demand among the participating clients. This level of buyer synergy is suggested to provide a competitive advantage, and improve buyer power and efficiencies (Faes et al., 2000).

According to Tella & Virolainen (2005), the main motive for clients to pool purchasing volumes, is the expected cost savings. These cost savings can be achieved through increased negotiation power with suppliers and reducing the number of transactions – resulting in bargained lower prices and lower transaction cost (Tella & Virolainen, 2005). This is confirmed by Schotanus (2007), who lists financial gains as the main motive for bundling purchasing volumes. Nollet & Beaulieu (2005) also describe these financial advantages as key determinators for cooperative procurement. They mention multiple advantages of purchasing volume consolidation; reduced prices, reduced administration costs and increased negotiation power.

Furthermore, Racca & Albano (2013) state in particular national-level central purchasing bodies – for pooling purchasing volumes – can use their joint buyer power to raise environmental standards and stimulate innovation. These pooled purchasing bodies have the extensive capabilities to conduct extensive market analysis, to design common standards and to promote competition among suppliers (Racca & Albano, 2013). This process is described by Rolfstam (2013) as consolidation; the process of harmonising the available fragmented market supply – in order for public procurement to stimulate innovation (Rolfstam, 2013). This consolidation can be applied in cooperative procurement, e.g. by purchasing “only technology meeting certain environmental criteria, excluding products that do not meet these standards. This typically creates pressure on suppliers failing to meet the standards to innovate to remain a supplier” (Rolfstam, 2013, p.28; see also Blind, Pohlisch & Rainville, 2019).

However, Nollet & Beaulieu (2005) also state pooled procurement can result in costs to maintain the buyer group together, in reduced supplier service or quality due to the focus on reducing prices, and potentially result in supplier oligopolies aimed to counter the high buyer power (Nollet & Beaulieu, 2005). In addition, Schotanus (2007) mentions more disadvantages for shared procurement from existing literature: longer duration of the tender process, less individual control and flexibility – especially for smaller clients. Furthermore, Van Meerveld et al. (2015) mention that sharing procurement volumes can limit the innovation requirements to the lowest common denominator among participating clients.

Sharing purchasing volumes requires standardization and synchronisation among buyers (Faes et al., 2000; Gobbi & Hsuan, 2014; Johnson, 1999). Racca & Albano (2013) argue this standardisation is most suitable for purchasing common products and services among clients. Schotanus (2007) states a restriction of pooled purchasing is that cooperating clients should have similar needs in a certain time frame. In order to be suitable for pooled purchasing, the procured items should have similar requirements and specifications, a high purchasing frequency and little customization among different clients. Schotanus (2007) even states that in existing literature, selecting suitable products and services is mentioned as the most important success factor for managing purchasing groups. The ability to harmonize requirements among cooperative public clients can influence the success of procuring innovation (Rolfstam, 2013). Based on these requirements for pooled purchasing, it can be stated that products or services with high customizations, different requirements among clients, and a low purchasing frequency are not suitable for pooled procurement.

Therefore, pooling purchasing volumes creates increased buyer power, which can be used for financial gains, and to leverage for raising sustainability requirements and innovations. However, pooling purchasing volumes demands requires standardization and synchronisation among buyers, and might not be applicable for all products and services.

### 2.2.5 Conclusion: Choosing a form of cooperation

Public clients can choose a suitable form of buyer cooperation by positioning along the three identified dimensions. In paragraphs 2.2.2 – 2.2.4, cooperating clients are provided with considerations for positioning along these dimensions. Based on these considerations, Table 2 provides a guideline for cooperating clients to choose a form of buyer cooperation by positioning along the dimensions.

Choosing organisational structure		
←	→	→
Outsourcing individual tasks	Take turns (Lead buying)	Equal influence by all group members
High number of group members Uncomplicated procured product Low desired member involvement High organisation similarities Similar organisation sizes		Low number of group members Complex procured product High desired member involvement Low organisation similarities Different organisation sizes
Choosing number of different group activities		
←	→	→
One occasional cooperative activity		Continuously undertaking different activities
Low group ambition Limited shared procurement needs Unsuccessful cooperation Starting cooperation		High group ambition High shared procurement needs Successful cooperation Continuing existing cooperation
Choosing degree of cooperation		
←	→	→
Economies of information	Economies of process	Economies of scale
Sharing information and learning from other clients	Establishing a common line of conduct towards suppliers	Pooling purchasing volumes maximises buyer power and financial savings
Improve knowledge and competence of clients	Creating sustainability standards and harmonised regulations	Requires standardization and synchronisation among buyers
Not adequate to stimulate new product development	Enabling suppliers to commit R&D with marginal effort	Not applicable for customized products and services.

Table 2: Guideline for choosing a form of buyer cooperation: positioning along dimensions

## 2.3 Legal relationships (RQ1C)

This third section is aimed to provide an overview of available legal relationships for cooperating buyers that aim to influence the market. This provides an answer to the third sub-question: What are suitable legal relationships for cooperating buyers that aim to influence the market?

### 2.3.1 Based on the degree of cooperation

The main consideration for a suitable legal relationship (in Dutch: “juridische verhouding”) between cooperating buyers, is described by the VNG (2015) as the chosen form of cooperation. For each form of cooperation, specific legal relationships are prescribed. Three distinctive forms of cooperation are described: coordination partnerships (“afstemming”), network constructions (“netwerkconstructie”), and creating a separate organisation (“zelfstandige organisatie”). Coordination partnerships are for cooperating buyers to align their individual tasks and procedures – no payments or tasks are shared among participating clients. In network constructions, clients execute certain tasks for other clients. The most intensive form of buyer cooperation is to create a separate organisation, that will execute tasks for all participating clients (VNG, 2015).

The 15 different typologies in the three-dimensional highway matrix can also be classified into these three forms of cooperation; in order to prescribe a suitable legal relationship for each typology. This classification is visualised in Table 3.

First, in the coordination partnership buyers align their procedures and individual tasks, without sharing tasks or payments among clients. This applies to all typologies other than the ‘economies of scale’; as only in the economies of scale payments and tasks are shared among buyers. The majority of the 15 typologies in the extended highway matrix can thus be classified as coordination partnerships. Second, the separate organisations can be directly translated to the third-party buyer groups. The third-party buyer group is an independent organisation, that executes tasks on behalf of the participating clients. Third, the network constructions are for sharing tasks among the buyer group, without establishing a separate organisation. This applies to all typologies within the ‘economies of scale’, except the third-party buying typology. In the four remaining economies of scale typologies, purchasing volumes are shared and procured by one or more of the participating buyers.

Degree of cooperation (Faes et al., 2000)	Typology (Schotanus & Telgen, 2007)	Form of cooperation (VNG, 2015)
Economies of information & Economies of process	All typologies	Coordination partnership
Economies of scale	Piggy-backing group, Lead buying group, Project group & Programme group	Network construction
	Third-party group	Separate organisation

Table 3: The typologies of the extended highway matrix corresponding to forms of cooperation by VNG (2015)

### 2.3.2 Choosing public law or private law relationships

For each form of cooperation, VNG (2015) describes choosing either a public or private law legal relationship (in Dutch: “publiekrechtelijke of privaatrechtelijke rechtsvorm”). The public law relationship can only be chosen by cooperating public clients, and only for their mandatory public tasks and policy-determining tasks (“uitvoeringstaken en beleidsbepalende taken”) – while generic organisational tasks of public clients (“bedrijfsvoeringstaken”) are excluded (VNG, 2015).

Public law relationships are strongly recommended, as they allow for more transparent and democratic processes (VNG, 2015; De Greef, Zijlstra & Theissen, 2015). Despite this strong recommendation, private law and public law relationships are roughly equally popular among cooperating public clients (Theissen, Noordink & Westerbeek, 2017). Reasons for cooperating public clients to choose a private law relationship, are to increase efficiency and flexibility, enable faster decision-making and create a more professional impression as a market party (Provincie Friesland, 2013).

#### Public clients in European procurement legislation

“(1) ‘contracting authorities’ means the State, regional or local authorities, bodies governed by public law or associations formed by one or more such authorities or one or more such bodies governed by public law; [...]

(4) ‘bodies governed by public law’ means bodies that have all of the following characteristics: (a) they are established for the specific purpose of meeting needs in the general interest, not having an industrial or commercial character;

(b) they have legal personality; and

(c) they are financed, for the most part, by the State, regional or local authorities, or by other bodies governed by public law; or are subject to management supervision by those authorities or bodies; or have an administrative, managerial or supervisory board, more than half of whose members are appointed by the State, regional or local authorities, or by other bodies governed by public law;”

(Art. 2(1-4), Consolidated Directive 2014/24/EU on Public procurement, p.9)

When establishing a separate legal entity, public clients can only choose private law legal entities if they can attest it can better serve the public interest (VNG, 2015; De Greef et al., 2015). However, when a private party is included in the buyer cooperation, often a private law relationship is chosen (BMC Advies, 2016). This is because of both legal restrictions and practical advantages. Firstly, private parties are generally excluded from joining public law legal entities, with a few rare exceptions – which must be approved by Royal Decree and published in the Dutch Government Gazette (BMC Advies, 2016; VNG, 2015). In these exceptional cases, the private parties joined in a public law legal entity are not allowed to accept payment for their work for the buyer group (BMC Advies, 2016). Secondly, the participating private parties often prefer less democratic control and bureaucracy, and more flexibility and effective decision-making (BMC Advies, 2016).

In conclusion, cooperating public clients should choose a public law relationship to allow for transparent and democratic processes. Moreover, public clients can only establish a private law separate legal entity if they can attest this private law legal entity can better serve the public interest. However, these private law separate entities are still frequently chosen to enable participation of private parties, and to increase efficiency, flexibility and effective decision-making.

### 2.3.3 Most common legal relationships for structural cooperation

Once cooperating clients have selected the form of cooperation and a public or private law relationship, clients can still choose for multiple legal relationships that differ in degree of formalisation (VNG, 2015). BMC Advies (2016) states most cooperating clients make a straightforward choice for an uncomplicated and efficient legal relationship. Even within the established legal relationship, clients pragmatically search for the most suitable relationship and cooperation (BMC Advies, 2016). VNG (2015) also suggest the actual legal relationship is a logical result of the chosen form of cooperation. The most common legal relationships for each form of cooperation are shown in Table 4 (Based on VNG, 2015; Theissen et al., 2017).

Form of cooperation (VNG, 2015)	Most common public law relationship	Most common private law relationship
Coordination partnership (Agreement)	Covenant	Covenant
Network construction (Contractual relationship)	Centrumregeling	Public service contract
Separate organisation (Legal entity)	Public Body under the Law of Communal Arrangements	Foundation

Table 4: Most common legal relationships for each form of cooperation (Based on VNG, 2015; Theissen et al., 2017)

#### a. Covenant

The covenant is a relationship between parties without a legal personality, which can be both concluded according to public law and private law (VNG, 2013; Provincie Friesland, 2013). Covenants can include arrangements about intentions, cooperation and shared policies. Covenants can range from loosely and informal to specific formal agreements, but legally are often limited enforceable when one of the parties fails to keep its agreements (VNG, 2013; Provincie Friesland, 2013). In most cases, a private law covenant is chosen, as public law covenants do not provide advantages in terms of transparency or democratic control due to the limited legal binding (Theissen et al., 2017). The covenant is not influenced by procurement law, as participating clients do not share tasks or payments (VNG, 2015). Covenants are suggested as a first step in establishing buyer cooperation, and based on these covenants often more shared steps are taken (PIANOo, 2018).

#### b. Centrumregeling

The “centrumregeling” is a public law network construction, in which public clients execute certain tasks for other public clients (VNG, 2013). In the Dutch Law of Communal arrangements (in Dutch: “Wet Gemeenschappelijke Regelingen”, abbreviated “WGR”), the centrumregeling is described as public clients mandating other public clients to execute multiple public tasks. This avoids that every task needs explicit mandating, which makes the centrumregeling an efficient and easily established relationship (VNG, 2013; Provincie Friesland, 2013).

The centrumregeling does not have a legal personality, which makes all participating clients individually legally responsible (Provincie Friesland, 2013). Although municipalities, provinces and municipalities can join a centrumregeling, it is almost only used for municipal cooperation (BMC Advies, 2016).

c. Public service contract

The public service contract (in Dutch: “dienstverleningsovereenkomst”) is a private law network construction, and is legally very similar to the centrumregeling (Theissen et al., 2017; VNG, 2013). The service agreement is mostly used by public clients as an agreement with external parties about outsourcing concrete public tasks. These public tasks can be outsourced both to other public clients or private parties (VNG, 2013). The public procurement legislation applies, as public tasks are outsourced in exchange for public money (VNG, 2015).

d. Public body under the Law of Communal Arrangements

The public body under the Law of Communal Arrangements (in Dutch: “Openbaar Lichaam op basis van de Wet gemeenschappelijke regelingen”) is the most commonly used and most extensive public law relationship (VNG, 2013). The public body is a separate legal entity (and thus has its own legal personality) and is governed by its own two-tier board, in which board members are chosen from the executive boards and councils of participating public clients. Public bodies can conclude their own contracts, hire personnel, control their own funds and can take responsibilities and tasks over from participating clients (VNG, 2013; VNG, 2015; Provincie Friesland, 2013; BMC Advies, 2016).

The public procurement legislation applies, as public tasks are outsourced for public money (VNG, 2015). The public body is often required due to its legal personality, but the high formality and intensiveness of the cooperation are often considered to be disadvantages (VNG, 2013). In rare exceptions, private parties can join a public body when approved by Royal Decree and published in the Dutch Government Gazette, but cannot accept payment for their works for the public body (BMC Advies, 2016).

e. Foundation

The foundation is the most commonly used private law version of a separate legal entity (VNG, 2013; Provincie Friesland, 2013; Theissen et al., 2017). Foundations are not-for-profit, are often used by public clients to efficiently execute specific tasks, and managed by an independent board. Upon establishment, the tasks and procedures of foundations are stated in the articles of association (VNG, 2013; Provincie Friesland, 2013). Compared to coordination partnerships and network constructions, a separate legal entity (such as a foundation) enables better continuation and cost allocation (PIANOo, 2018).

Multiple other private law relationships are available to create a separate organisation, but the foundation is considered the most straightforward and efficient version (BMC Advies, 2016). However, if the cooperating clients want their shared legal entity to be able to disburse its profits, the BV and NV are recommended (Provincie Friesland, 2013, VNG, 2013). These entities are for-profit and the participating clients have to participate in the venture capital of the shared legal entity, and thus have to buy shares of the shared entity (Provincie Friesland, 2013; VNG, 2013). In comparison to the BV, the NV requires a higher input of venture capital by participants, but allows the shares to be easily transferred (VNG, 2015).

Establishing a separate private law entity is only allowed for public clients if they can attest this private law entity can better serve the public interest (VNG, 2015; De Greef et al., 2015). In addition, the public procurement legislation also applies to these private entities, as public tasks are outsourced for public money (VNG, 2015). Democratic control is limited for separate legal entities with independent boards (VNG, 2013). Participating in any private law legal relationship creates a financial risk for clients: The public clients will have to transfer money to the entity in order to execute its tasks, which can be lost if the entity is unsuccessful (Provincie Friesland, 2013).

### 2.3.4 Cooperation without a structural legal relationship

In case public clients want to cooperate without setting up a structural legal relationship, it is possible to limit their cooperation to a single procurement action (European Commission, 2008). The European Commission (2008) mentions two main models in which such non-structural cooperation is commonly implemented: the full joint procurement model and piggy-backing model. This distinction corresponds to the highway matrix of Schotanus & Telgen (2007), who classified short-term buyer cooperation into the typologies piggy-backing and project groups. Therefore, cooperation without a structural legal relationship can be especially useful for these two typologies. This paragraph will cover three forms of cooperation without a structural legal relationship: the joint procurement procedure, framework agreements, and the use of model contracts and model criteria.

#### a. Joint procurement procedure

The most straightforward non-structural buyer cooperation is for “contracting authorities [...] to combine their activities for (initially at least) a one-off procurement action” (European Commission, 2008, p.5). In the Dutch law for public procurement (in Dutch: “Aanbestedingswet 2012”), this process is described in article 2.11a:

“Two or more contracting authorities may agree to jointly carry out specific procurement procedures. If a complete procurement procedure is carried out jointly on behalf and for the account of all the contracting authorities involved, they are jointly responsible for fulfilling their obligations under Part 2 of this Act. Subsection 2 applies mutatis mutandis if a contracting authority manages the procedure and acts on behalf of itself and the other contracting authorities involved. If a procurement procedure is not carried out entirely jointly on behalf and for the account of the contracting authorities concerned, they are solely jointly responsible for the parts performed jointly. In the case referred to in the fourth paragraph, each contracting authority is solely responsible for fulfilling its obligations under or according to part 2 of this Act with regard to the parts that it carries out in its own name and for its own account.” (Aanbestedingswet 2012, 2019, art.2.11a)

#### b. Framework agreements

In case public clients are not willing to commit to contracting the winning supplier of a joint procurement procedure, the framework agreement approach can be used (European Commission, 2008). The framework agreement can be concluded between one or more public clients, with one or more private parties. The framework agreement can be tendered through either the common open or restricted tender method, for which the public procurement legislation applies. However, participating clients are not committed to signing a contract with the winning supplier(s), but can decide this individually. When a participating client establishes a contract with the winning supplier(s) based on the framework agreement, the requirements set in the original framework agreement cannot be changed significantly (Aanbestedingswet 2012, 2019; European Commission, 2008). The tendered framework agreement can either be very loosely defined to allow for flexibility, or very specific and complete to allow for more certainty for suppliers (Racca & Albano, 2013; European Commission, 2008). Around 25% of joint procurement is done through framework agreements, often with a high value and resulting in above-average bids (PWC & Ecorys, 2013).

c. Model contracts and criteria

In case cooperating clients are unwilling or unable to establish a joint tender, they can still cooperate by using the same model contracts, technical specifications and model criteria for selection and awarding (Van Wijk, 2019). Although all procurement procedures and contracts are conducted by individual clients, this still allows public clients to jointly create a standard while no additional public procurement legislation applies (Van Wijk, 2019).

The ability to create a standard, can be very suitable for buyer cooperation that strives for economies of process (as described in paragraph 2.2.4.b), which is aimed to aggregate demand of public clients to stimulate circularity and innovation (Racca & Albano, 2013; Racca, 2011; Kristensen et al., 2021). There are three different ways to implement these sustainability standards into the procurement procedure; in the technical specifications, in the award criteria and in the performance conditions of the final contract (Uttam et al., 2014; Rainville, 2017, Appolloni et al., 2019; Essers & Lombert, 2017).

**2.3.5 Conclusion: Suggested legal relationship for each typology**

The suitable legal relationships for cooperating buyers aiming to influence the market, can be based on the 15 identified typologies. In paragraphs 2.3.1 – 2.3.4, an overview of available legal relationships for cooperating clients is provided, including considerations on their suitability and potential drawbacks. Table 5 provides an overview of suggested legal relationships for each of the 15 typologies in the extended highway matrix, based on the following five considerations:

Firstly, for all forms of buyer cooperation aiming for economies of information, the covenant is sufficient, as no tasks or payments are shared. Secondly, for all forms of buyer cooperation that strive for economies of process, the covenant is suggested together with the use of model contracts and model criteria. These are ‘light’ relationships, with limited legal issues. Thirdly, for temporary buyer cooperation that aims for economies of scale, the framework agreement or joint procurement procedure are suggested. These enable clients to bundle purchasing volumes without setting up a structural legal relationship. Fourthly, for lead buying groups that bundle purchasing volumes, the centrumregeling and public service contract are suggested, which allow public clients to outsource specific public tasks towards other public clients or private parties. Fifthly, for the third-party and programme groups that bundle purchasing volumes, the most extensive and formal legal relationships are suggested.

Typology (Schotanus & Telgen, 2007)	Degree of cooperation (Faes et al., 2000)	Legal relationship
Piggy-backing group	Information	Covenant
	Process	Covenant, model contracts, model criteria
	Scale	Framework agreement / Joint procurement procedure
Project group	Information	Covenant
	Process	Covenant, model contracts, model criteria
	Scale	Framework agreement / Joint procurement procedure
Lead buying group	Information	Covenant
	Process	Covenant, model contracts, model criteria
	Scale	Centrumregeling / Public service contract
Third-party group	Information	Covenant
	Process	Covenant, model contracts, model criteria
	Scale	Foundation / Public body
Programme group	Information	Covenant
	Process	Covenant, model contracts, model criteria
	Scale	Framework agreements / Public body

Table 5: Suggested legal relationships for each typology in the extended highway matrix



## 2.4 Legal boundaries concerning buyer cooperation (RQ1D)

This fourth section is aimed to provide an overview of relevant legal restrictions for implementing buyer groups in the (semi-) public procurement. This provides an answer to the fourth sub-question: What are relevant legal restrictions for implementing buyer groups in the (semi-) public procurement process?

This section will not focus on specific contracts, public procurement law or tender procedures in general, as these topics are widely covered in books (e.g. Essers & Lombert, 2017) and comprehensive guidelines (e.g. PIANOo, 2020). The following paragraphs will cover three topics: legal boundaries concerning joint public procurement, not actively procuring clients bound by procurement laws, and competition legislation.

### 2.4.1 Joint public procurement

In Dutch procurement legislation, public clients are allowed to jointly conduct a procurement procedure, for which they are jointly responsible (Aanbestedingswet 2012, 2019, art.2.11a). The Dutch procurement legislation does not provide the ability for private parties to jointly procure with public parties (Aanbestedingswet 2012, 2019, art.2.11a).

Furthermore, the same law limits unnecessary merging of public tenders, which is aimed to prevent exclusion of SMEs from tenders (Aanbestedingswet 2012, 2019, art.1.5; PIANOo, 2020; Van Wijk, 2019; Essers & Lombert, 2017; Ministerie van Economische Zaken en Klimaat, 2020a).

Merging tenders is only allowed if four requirements are met (Aanbestedingswet 2012, 2019, art.1.5; PIANOo, 2020; Van Wijk, 2019; Essers & Lombert, 2017; Ministerie van Economische Zaken en Klimaat, 2020a): First, merging tenders is only possible if the procuring clients enable SMEs to participate in the tender. Whenever tenders are merged, it is obliged to subdivide these merged tenders into multiple smaller lots (in Dutch: “percelen”), in order to allow SMEs to place bids on these smaller lots. In the tender documents, it should be indicated what combination bids on lots are possible, and how these combinations will be evaluated. If subdivision into lots is deemed inappropriate by the clients, e.g. if the procured items are highly mutually dependent or the subdivision results in a disproportionate administrative burden, this subdivision can be omitted only with explicit argumentation in the procurement documents. Second, merged items should be similar or coherent. Merging tenders from different clients is only allowed if these are homogeneous; e.g. economically or technically similar. Third, the procuring clients consider the market composition, and the risks and organisational consequences arising from merging the tender. The disadvantages of merging the tender should be proportionate to the targeted benefits. Fourth, the decision to merge the tenders should be explicitly explained in the procurement announcement. This explanation should include the considerations on the market composition, the consequences and risks of the merged tender, and the similarity of the procured items (Aanbestedingswet 2012, 2019, art.1.5; PIANOo, 2020; Van Wijk, 2019; Essers & Lombert, 2017; Ministerie van Economische Zaken en Klimaat, 2020a).

Therefore, joint public procurement is very much possible if the mentioned requirements are met and are explicitly substantiated in the procurement documents.

### 2.4.2 Not actively procuring clients bound by procurement laws

In case of joint or outsourced public procurement, the procuring client is obligated to procure on behalf of which other public parties it procures (PIANOo, 2020). If a private party conducts a tender on behalf of any public client, the Dutch legislation for public procurement applies to the tender. The Dutch legislation for public procurement thus also applies to any (private law) cooperation with participating public clients, e.g. a foundation as mentioned in paragraph 2.3.3. This also applies if the tender is subsidised for more than 50% by the state, a province, municipality or any other public client (PIANOo, 2020).

### 2.4.3 Competition legislation

Although buyer cooperation can be used to achieve economies of scale, to stimulate improvement of products and raising environmental standards, it can also lead to a reduction of competition on the market (European Commission, 2011b; Jeon & Menicucci, 2019; Carstensen, 2010; Doyle & Han, 2013; Normann et al., 2015; Van Doorn, 2015; Essers & Lombert, 2017). The European competition legislation prohibits this reduction of effective competition, which covers all three degrees of cooperation:

For the economies of scale, the reduction of competition can have negative effects on either suppliers or other buyers. Negative effects for external buyers can arise when the cooperating buyers are excluding external buyers (Van Doorn, 2015; European Commission, 2011b) or are causing rival buyers to be charged higher prices (Doyle & Han, 2013; Carstensen, 2010). Negative effects for suppliers could arise when the cooperating buyers exclude certain products or suppliers (Tátrai, 2015; European Commission, 2011b; Van Doorn, 2015), or reduce competition among buyers by jointly fixing the input price or making agreements on 'market sharing' – which buyer is buying where (Van Doorn, 2015; European Commission, 2011b). Therefore, cooperating public clients should carefully consider the requirements for joint public procurement described in paragraph 2.4.1, and follow the Dutch 'Aanbestedingswet 2012' which requires public clients to take adequate measures to maximise market competition (Aanbestedingswet 2012, 2019, art.1.10a,b).

For the economies of process, the market demand harmonisation, standardisation and standard contracts are not allowed to reduce market competition (European Commission, 2011b). Therefore, the use of standards is bound to the following principles: the standards should set such detailed technical specifications that they limit innovations and technical development, the standards should not be aimed to limit price competition in markets, and the standard-setting process should be effectively accessible for all companies (European Commission, 2011b). Therefore, technical specifications and standards in public tender documents should always be in proportion to the nature and size of the procured contract, and should be followed with "or equivalent" (in Dutch: "of gelijkwaardig"), in order to maximise market competition (Aanbestedingswet 2012, 2019, art.2.76; PIANOo, 2020; Ministerie van Economische Zaken en Klimaat, 2020a). A comprehensive elaboration on proportionality in public tenders can be found in the 'Gids Proportionaliteit' (Ministerie van Economische Zaken en Klimaat, 2020a).

Regarding the economies of information, although sharing information can benefit both customers and market efficiency, it also faces the risk of facilitating collusion among competitors (European Commission, 2011b). The shared information can be used to constitute market-sharing, fixing prices or quantities, and to check whether colluding parties are still complying with their cartel. Therefore, in order to limit the risk of facilitating collusion, it is advised to avoid sharing strategic (future ambition) company information, individualised data, non-public information, and high-frequency up to date information (European Commission, 2011b).

Private party cooperation resulting in a loss of market competition is illegal and punished with financial penalties under Article 101 TFEU (Mededingingswet, 2021; Van Doorn, 2015; European Commission, 2011b; Essers & Lombert, 2017). However, buyer cooperation with a joint market share of less than 10% has limited negative effects and is therefore generally excluded from European competition legislation (Mededingingswet, 2021; Van Doorn, 2015; European Commission, 2011b).

For public clients, infringement of the procurement legislation can result in an injunction lawsuit (in Dutch: "kort geding"), in which the civil court can order to halt or to redo the procurement procedure, forbid or suspend a contract, or financially compensate aggrieved parties (PIANOo, 2021).

Therefore, in order to limit potential reduction of market competition, buyer groups should prevent exclusion of external participants or suppliers, and aim for maximum transparency (Jeon & Menicucci, 2019; Carstensen, 2010; Doyle & Han, 2013; Normann et al., 2015; Van Doorn, 2015).

#### **2.4.4 Conclusion: Legal boundaries for buyer cooperation**

Three relevant legal restrictions for implementing buyer groups in the (semi-) public procurement process are identified: legal boundaries concerning joint public procurement, not actively procuring clients bound by procurement laws, and competition legislation. This excludes specific contracts, public procurement law or tender procedures in general, as these topics are widely covered in books and comprehensive guidelines.

Firstly, joint public procurement is very much possible, but subject to many requirements and restrictions. Merging tenders from different clients is only allowed if these tenders are homogeneous, and the targeted benefits are proportionate to the disadvantages of merging. When merging, the procuring clients must enable SMEs to participate in the tender by subdividing the tender in smaller lots, which can be omitted only with explicit argumentation in the procurement documents. The choice for merging tenders and how is dealt with the regulations should be explicitly substantiated in the procurement documents.

Secondly, buyer cooperation should prevent potential reduction of market competition. The European competition legislation prohibits reduction of effective competition, which covers all three degrees of cooperation: either sharing information, processes or purchasing volumes. Therefore, buyer groups should aim for maximum transparency and prevent exclusion of external participants or suppliers.

Lastly, the stated public procurement legislation also applies when a private party conducts a tender on behalf of any public client, e.g. in a third-party foundation.

## 3.0 Decision tree for buyer cooperation

### 3.0 Decision tree for buyer cooperation

This chapter provides (semi-) public clients with a decision tree to establish buyer cooperation. A preliminary decision tree is established in order to provide a comprehensible overview of all relevant information from the literature study, as shown in Figure 8. This overview includes the available forms of buyer cooperation (paragraph 2.1), how to choose a form of cooperation (paragraph 2.2), combined with suggested legal relationships (paragraph 2.3) and relevant legal restrictions (paragraph 2.4). The preliminary decision tree is validated through interviews, see paragraph 3.1.

The decision tree is shown in Figure 9. Clients wishing to establish buyer cooperation, can use this decision tree by starting from the top and following the arrows. The decision nodes are visualised through red diamonds, and available options are briefly explained below. For all forms of cooperation, the suggested legal relationships are indicated with dotted arrows. Relevant paragraphs are referenced per node. A detailed user-instruction can be found in paragraph 3.3.

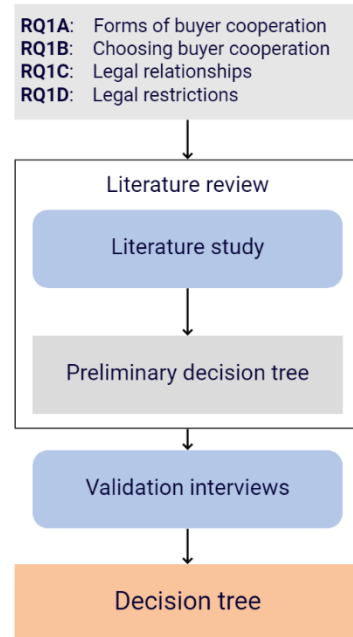


Figure 8: Establishing the decision tree

### 3.1 Validation of the preliminary decision tree

The (preliminary) decision tree is validated through interviews with buyer cooperation experts (see appendix E). Four interviewees have been selected based on their expected experience with buyer cooperation. The first two interviewees are employed at a foundation for municipal procurement cooperation. The third interviewee is a procurement consultant, currently hired to facilitate a joint procurement procedure of social housing associations. The fourth interviewee is a coordinating supervisor for the buyer groups of PIANOo, and has extensive experience in procurement procedures. The input of the interviewed experts is used to both compare the content of the preliminary decision tree to practice, and check the configuration on applicability, comprehensibility and useability. The preliminary decision tree has been updated and modified into a final decision tree, while the preliminary (currently obsolete) decision tree that has been shown to the interviewees can be found in appendix E.

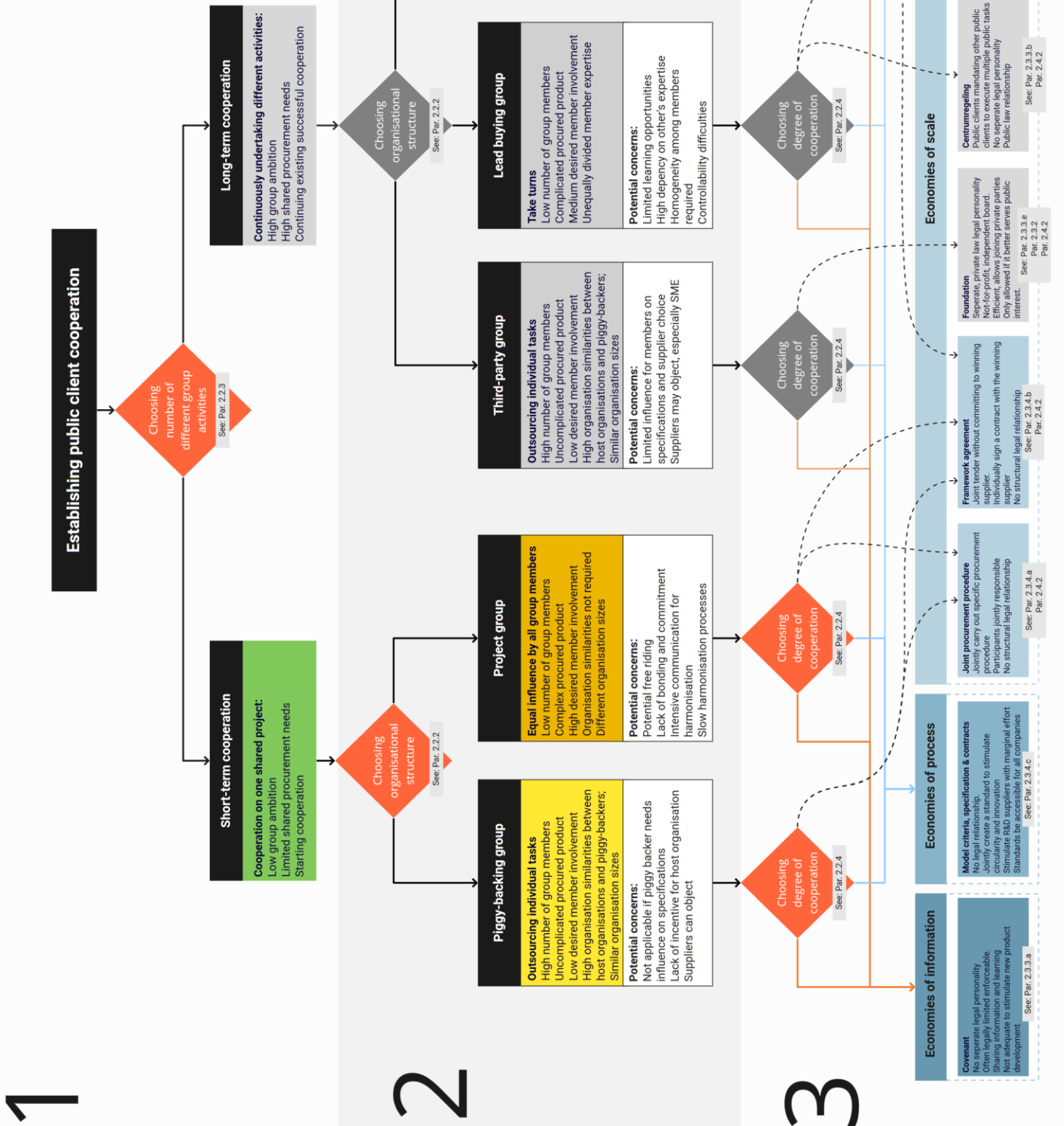
Regarding the content of the decision tree, the interviewed experts generally recognised both the outcome and decisions shown in the decision tree. All interviewees recognised the choice between the economies of information, process and scale (Interviewee 1, 2021; Interviewee 12, 2021; Interviewee 15, 2021; Interviewee 16, 2021), which validates the most uncertain element of the decision tree, as this element was not included in the original highway model of Schotanus (2007). The participants also recognised the possible choices, and most of the stated considerations (Interviewee 1, 2021; Interviewee 12, 2021; Interviewee 15, 2021; Interviewee 16, 2021).

However, the individual participants stated they were inexperienced with the long-term cooperation forms for lead-buying and the programme group – and as these are not the focus of the study, these are displayed in grey, as it might require further validation. Furthermore, it was stated that the borders between the different outcomes are more dynamic as presented, e.g. a foundation will also be used for sharing information besides bundling purchasing volumes (Interviewee 15, 2021; Interviewee 16, 2021).

Regarding the configuration and implementation of the decision tree, most interviewed experts found the preliminary appearance confusing, and suggested a more clear structure of the decision tree with a Dutch translation. (Interviewee 1, 2021; Interviewee 15, 2021; Interviewee 16, 2021). Furthermore, a short user explanation is considered necessary (Interviewee 1, 2021; Interviewee 12, 2021). This expert input is used to update the layout of the decision tree with less visible clutter – without removing any crucial information, as shown in Figure 9.

## 3.2 Validated decision tree

Figure 9: Validated decision tree for (semi-) public clients establishing a buyer cooperation



### 3.3 User instructions decision-tree

Choosing a form of (short-term) buyer cooperation in three steps:

#### 1. Choose between a long-term or short-term cooperation

For starting buyer cooperation, it is suggested to start with short-term cooperation. This is suitable for low group ambitions, and limited shared procurement needs. If this short-term cooperation is proven successful, it can be continued into a long-term cooperation. Long-term cooperation is not the focus of this research, and needs further validation, and thus is greyed out.

#### 2. Choosing the level of member influence

Clients can choose here if all participants want equal input and influence in the group process, or want to outsource their tasks to other (more experienced) clients. All participants having equal influence is only suggested for small groups, with active and committed members. Outsourcing individual input is only recommended for homogenous clients with a similar organisational size, who want to harmonise uncomplicated products. For the long-term cooperation, there is also the possibility to take turns in providing input per project, based on the experience of the participants.

#### 3. Choosing the degree of cooperation

Clients can choose between three degrees of cooperation: sharing information, harmonising demand or bundling procurement volumes. These options are cumulative: for harmonising demand, it is required to share information. For bundling procurement volumes, both sharing information and harmonising demand is required.

First, sharing information is aimed to improve the knowledge and professionalism of individual clients. Based on this information, the clients learn to establish better tenders and contracts, which can result in better price and quality of the procured products. For exchanging information, it is suggested for cooperating clients to sign a covenant. In order to stimulate new product development, only sharing information is probably not sufficient.

Second, through harmonising their demand, cooperating clients can bundle their purchasing power and give a signal towards suppliers. A fragmented market demand limits suppliers to commit R&D into improving products and innovation of new products. Harmonising demand among clients can be done by creating shared specifications of the procured item, shared selection criteria and award criteria of the procurement procedure, and shared performance conditions of the final contract. It is suggested to sign a covenant for the demand harmonisation process.

Thirdly, bundling procurement volumes maximises the purchasing power of cooperating clients, which can be used for financial gains, and to leverage for raising sustainability requirements and innovations. Not suitable for products or services with high customizations, different requirements among clients, and a low purchasing frequency. It is suggested to sign a covenant before starting the process, and establishing shared specifications of the procured item, shared selection criteria and award criteria of the procurement procedure, and shared performance conditions of the final contract.

For bundling procurement volumes, multiple legal relationships and legal entities are possible, depending on the preceding choices: For short-term cooperation, a joint procurement procedure or framework agreement is suggested – the latter allows more customisation. For the long-term cooperation, the suggested legal relationships are displayed in grey (as they need further validation).

## 4.0 Case studies

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## 4.1 Case study methodology

This section 4.1 contains the methodology for case studies aimed to provide insight into how the cooperation and processes of demand harmonisation within buyer groups are organised. First, the selection of case studies is substantiated. Second, the case study design is explained. Third, the data collection is elaborated on. Fourth, the case documentation is explained.

In section 4.2, an overview is provided of input for research themes from both the literature study and the initial observations. The sections 4.3 – 4.7 separately list the case studies.

### 4.1.1 Case selection

As mentioned in the research method, the empirical qualitative research is conducted in the form of case studies, on which the guidelines of Creswell (2014), Williams (2007) and Shenton (2014) are applied. Creswell (2014) prescribes a sample size of four to five case studies, based on his review of qualitative studies. Therefore, this research includes five case studies of different buyer groups.

In order to be able to apply findings from the analysed buyer groups to other (future) buyer groups, the analysed buyer groups are selected to maximise transferability. Shenton (2014) measures transferability on the following subjects: the number of participating organisations, the number of participants involved in the fieldwork, any restrictions on participants, the methods used for data collection, the number, length, and the time period of the data collection.

Therefore, the case studies are conducted considering the following principles: Firstly, the analysed buyer groups are selected from PIANOo and Rijkswaterstaat (the organisations responsible for the pilot buyer groups initiated by the Dutch government) and from an external organisation. Secondly, the buyer groups are selected to fit the problem statement; therefore buyer groups are only selected from the construction sector, and intentionally differentiated in scope, approach, participant goals, centralisation, internal relations and the desired level of market demand harmonisation. Thirdly, because the current buyer group pilots initiated by the Dutch government are still in their start-up phase (TwynstraGudde, Personal Communication, March 5, 2020), any pilot buyer group with insufficient progress for conducting a case study is excluded from this research – buyer groups will only be accepted into a case study when it has reached the market demand harmonisation phase. Fourthly, the data collection is done extensively in multiple sessions and over a longer time period, as prescribed by Williams (2007), and thus exploratory participation sessions are scheduled during the initial phase of the research. Based on these principles, the selection of case studies is shown in Table 6.

Buyer group	Initiator	Scope	Participants	Size (+ indirect)	Degree of cooperation
Circular Schools	PIANOo	Complete schools and schoolyards	Schools and municipalities	10 (+6)	Economies of information
Circular Construction Materials	PIANOo	Specific material groups	Municipalities, housing associations, Private RE investors	8 (+9)	Economies of process
Zero Emission Construction Equipment	Rijkswaterstaat	All construction equipment	Rijkswaterstaat, municipalities, provinces, ProRail, & waterboards	13 (+0)	Economies of process
Sustainable Road Surfacing	Rijkswaterstaat	Asphalt	4 provinces and Rijkswaterstaat	5 (+15)	Economies of process
Social rented apartments	External	Complete apartments	Housing associations	4 (+4)	Economies of scale

Table 6: Overview of case studies

#### 4.1.2 Case study design

Case studies are described as a viable way to conduct qualitative research (Creswell, 2014), but require an extensive data collection from multiple sources, such as “direct or participant observations, interviews, archival records or documents, physical artefacts, and audio-visual materials” (Williams, 2007, p. 68). According to Creswell (2014), these multiple data sources are needed to get a complete and reliable overview of the case, as multiple data sources allow for the triangulation of research findings. Triangulation is cross-checking whether findings can be established based on different data sources, which helps ensure the credibility and confirmability of the research (Shenton, 2014; Creswell, 2014). For data collection within the case studies, Creswell (2014) does not prescribe an ideal sample size, but mentions it ideally stops after the research is saturated, and no new insights arise from collecting new data. Therefore, in order to provide a complete and reliable overview of the cases studied, the data in the case studies are collected from three different sources: interviews, observations, and document analysis.

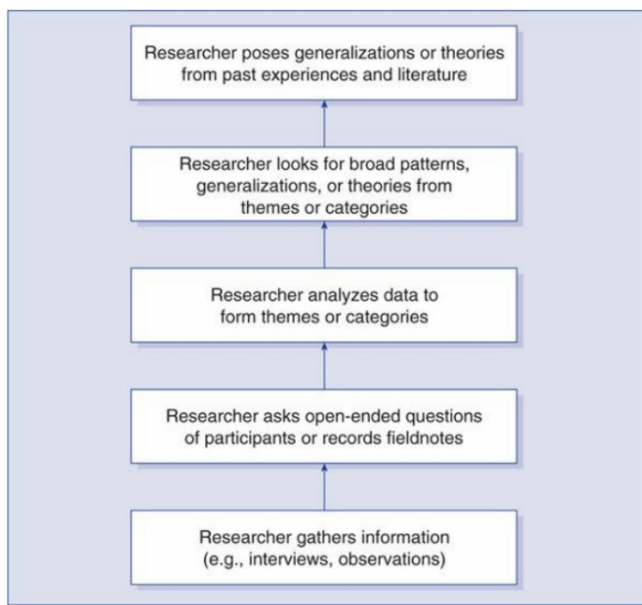


Figure 11: The Inductive Logic of Research in a Qualitative Study (Creswell, 2014)

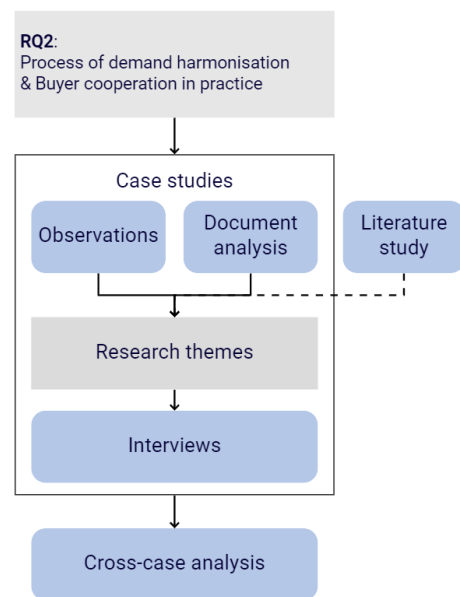


Figure 10: Case study design

Due to the explorative nature of the empirical research into the process of demand harmonisation and buyer cooperation in practice, an inductive approach is used to collect and analyse data, as prescribed by Creswell (2014). The inductive approach is aimed at developing a theory, while a deductive approach is aimed to test existing theories. The inductive approach allows to exploratively collect qualitative data, then analyse this information in order to determine patterns, research themes and develop theory (Creswell, 2014), as can be seen in Figure 10.

Therefore, this empirical research is organised in four steps (see Figure 11). First, data is collected from the observations and document analysis. Second, research themes are established based on the observations, the document analysis and the findings from the literature study. Third, based on these research themes, interview protocols are established. Fourth, the interviews will be conducted according to the established interview protocols. The data collection method from these sources is elaborated on in the following paragraphs.

### 4.1.3 Case data collection

#### a. Exploratory observations & document analysis

In order to create initial insight into the buyer groups, observations are conducted in the selected buyer groups, and relevant output documents of buyer groups are analysed. The observations are done in the form of participating in buyer group meetings, which are aimed to provide (indirect) research themes as input for the interviews. These observations are also meant to establish familiarity and prolonged engagement with the buyer groups, as prescribed by Williams (2007) and Shenton (2014). The researcher participated in multiple group sessions from the analysed buyer groups, in order to become familiar with the concept of buyer cooperation and buyer groups in general.

The approach chosen for the observations, is the complete observer role as defined by Saunders, Thornhill & Lewis (2019), in which the researcher only observes but does not participate in activities of the group. As prescribed by Saunders et al. (2019), the resulting primary observations are documented in the form of a diary, which contains what happened and what was said during the observations. During these observations, multiple research themes were established. However, the observational data is prone to observers error and bias, caused by the subjective view and potential misinterpretations of the researcher; which limits its reliability and validity (Saunders et al., 2019). Therefore, both the observational data and the document analysis are only used as indirect input for the interviews through the established research themes (see Figure 11).

#### b. Interviews

Semi-structured interviews are conducted with coordinators and participants of buyer groups, experts related to buyer groups. As prescribed by Creswell (2014), the participants of the interviews are not randomly selected, but based on their expertise and the expected contribution of participants to the study.

Buyer group	Selected interviewees
Circular Schools	Coordinator Participant/procurement expert
Circular Construction Materials	Coordinator Participant
Zero Emission Construction Equipment	Coordinator Participant Rijkswaterstaat delegate
Sustainable Road Surfacing	Coordinator Participant Rijkswaterstaat delegate
Social rented apartments	Coordinator/participant Procurement expert
Other	2 Supervising coordinators 2 External procurement experts

Therefore, for every case study two or three interviews are conducted, as shown in Table 7. Firstly, the coordinators of all buyer groups are interviewed, as these coordinators are highly involved in the process, and are present during all group meetings. This umbrella role is generally not related to any of the participating clients, and thus expected to be mostly unbiased and well informed on the input of participants. Secondly, for every buyer group, a representative participant or expert related to the buyer group is interviewed. These participants are selected based on their expertise with (joint) procurement and implementing sustainability objectives in procurement. Thirdly, for the two cases initiated by Rijkswaterstaat, the delegate of Rijkswaterstaat is also interviewed - in addition to the representative participant and group coordinator. As these groups are started and supervised by Rijkswaterstaat, their role in the group process could be expected to be different from the average participant.

Table 7: Selection of interviewees

The interviews are conducted in the form of semi-structured interviews, based on the research themes established in the literature study, observations and document analysis. For each different role in the buyer group, a modified interview protocol is used (see Appendixes B, C, D). The interview questions in the protocols are structured according to the research sub-questions: the formation of buyer groups, the organisational structure, participants, the demand harmonisation process, the impact of the buyer groups and dealing with legal aspects.

#### **4.1.4 Case documentation**

The five case studies are individually reported on the six themes established in research question 2. This includes the formation of buyer groups, participants, the organisational structure, the demand harmonisation process, the impact of the buyer groups and dealing with legal aspects.

The case studies function as input for a cross-case analysis. This cross-case analysis is aimed to compare the individual cases, and can be found in chapter 5.

## 4.2 Established research themes

This paragraph provides an overview of research themes established both in the literature review and the initial observations, as shown in Table 8. The research themes are used as input for the case studies listed in the following paragraphs, by implementation in interview protocols (See Appendices B, C, D). The highlighted research themes are based on the observations; an overview of the observations made in individual buyer groups can be found in Appendix A.

Topic	Research questions	Research themes From literature & <u>Observations and document analysis</u>
<b>FORMATION</b>	A. Selection of participating buyers B. What parties decide which buyers can participate? C. Exclusion of buyers from buyer groups?	1. Selection of participants, exclusion of participants 2. Leaving participants 3. <u>Pioneering or overlap with existing networks</u>
<b>ORGANISATIONAL STRUCTURE</b>	D. Forms of cooperation within buyer groups are used in practice E. Organisation of processes	4. Organisational structure group: Degree of individual member influence (Centralisation) 5. Intensity of communication 6. Group size
<b>PARTICIPANTS</b>	F. Different types of buyers exist within buyer groups G. Drivers to participate in a buyer group H. Buyers with the most influence	7. Types client organisation 8. Homogeneity among buyers 9. Drivers to participate 10. Commitment (Free riding & “ <u>interne borging</u> ”) 11. Available expertise
<b>DEMAND HARMONISATION PROCESS</b>	I. Aimed output of the buyer groups J. Ambition for market demand harmonisation, concerning the scope and level of standardisation K. Organisation of market demand harmonisation process within buyer groups L. Dealing with institutional differences and different requirements of individual buyers	12. Scope procured item 13. Complexity procured item 14. Degree of cooperation: information or process or scale 15. Tempo, synchronisation 16. Decision-making 17. <u>Input for demand harmonisation</u> 18. Output demand harmonisation
<b>IMPACT</b>	M. Market impact	19. <u>Consulting external buyers</u> <u>Creating awareness</u> 20. Calculating market impact
<b>LEGAL</b>	N. Legal relationships within buyer group O. Legal boundaries	21. Legal relationship 22. Legal boundaries

Table 8: Overview of research themes established in the literature study, observations and document analysis

## 4.3 Case study 1: Circular Schools

### 4.3.1 Case description

The first case study is the buyer group 'Circular Schools'. This buyer group is aimed to integrate sustainability aspects and qualitative criteria into the construction and renovation of school buildings. The sustainability aspects include circularity, material, reducing energy usage, climate adaptation, and future-proofing. In addition, also soft, qualitative aspects are included, such as the health and wellbeing of students and teachers.

This case study is selected based on meeting the three case selection criteria. Firstly, the group is initiated by PIANOo in cooperation with Cirkelstad, a platform for frontrunners in a circular construction sector. Secondly, the buyer group fits the problem statement. Its topic is in the construction sector, and it has a large scope – it includes the whole school and schoolyard. The group has a relatively large size of 11 members in the project group, with participants from either relatively small one-off procuring schools or larger municipalities. The group has reached the market demand harmonisation phase, and is working on an ambition framework.

For this case study, two semi-structured interviews were conducted. Firstly, the coordinator of the buyer group has been interviewed, which has been closely involved with the formation and processes of the group. This interviewee is expected to provide a neutral, umbrella perspective on the group and the participants, and therefore provide useful insights into the group processes. Secondly, an active member of the project group with expertise in procurement processes and procurement cooperation has been interviewed. This member represents a small-sized school, which outsourced the procurement process to the interviewee. This interviewee is selected because its role combines both procurement expertise and the perspective of small one-off procurers.

### 4.3.2 Formation

The buyer group Circular Schools can be seen as a sequel to a similar project subsidised by the Province Zuid-Holland (Interviewee 8, 2021). This project was aimed to create awareness and knowledge on the topic, and resulted in a joint manifest: this manifest stated the group would investigate the creation of new standards and bundling demand to create market impact (Cirkelstad, 2020). The coordinator of the buyer group also led the previous initiative, and also multiple participants from this initiative are currently members of the buyer group (Interviewee 8, 2021). In addition, external non-related public clients were actively approached to join the group (Interviewee 8, 2021; Interviewee 3, 2021)

The formation of the buyer group was led by the current coordinator. Initially, the goal was to primarily recruit schools for the buyer group, with a minimum of active three schools in the project group (Interviewee 8, 2021). Recruiting participants was hindered by the covid19-pandemic, as the intended participants among schools were fully focussed on adapting or digitalising education. Therefore, the scope for intended participants was widened, and also municipalities were actively approached to participate in the buyer group. The input of municipalities was deemed valuable, as these often provide budgets, schedules and requirements for the renovation and construction of schools (Plan van Aanpak, personal communication, 2020; Interviewee 8, 2021).

The interested parties were asked about their ambitions and expectations of the buyer group (Interviewee 8, 2021). The scope of the group is relatively large and specifically focuses on circularity, and potential participants were asked whether they had the same ambitions. The interested parties individually decided whether they had matching ambitions, and were able and willing to invest the necessary time and input necessary. The only lock-out criterium implemented for participating in the project group, was whether participants had a relevant pilot project in the oncoming two years. If this requirement was not met, the interested clients could only join the piggy-backing group (Interview 8,

2021). Later in the project, two additional clients joined the project group, for which the existing participants gave their approval (Interviewee 3, 2021).

At the official kick-off moment, the composition of the project group participants was fixed (Plan van Aanpak, personal communication, 2020). However, if a participant is no longer actively contributing to the group process, or does not provide constructive input, the group could decide to move this participant towards the piggy backing group (Interviewee 8, 2021). However, this has not happened yet and is unlikely to happen in the future (Interviewee 3, 2021), as already an exception was made for one of the participants (Interviewee 8, 2021). Participants are free to leave the group if desired, as participation is fully voluntary and based on willingness (Interviewee 8, 2021; Interviewee 3, 2021).

### **4.3.3 Participants**

The participating public clients in the buyer group are both schools and municipalities (Plan van Aanpak, personal communication, 2020; Interviewee 8, 2021; Interviewee 3, 2021). This group composition is said to match reality, as these clients both partly responsible for the procurement of schools. The municipalities often provide budgets, schedules and requirements for the renovation and construction of schools. The boards of the school are tasked with the actual procurement (in Dutch: “Bouwheerschap”), creating a mutual dependency. Circularity and sustainability requirements are often only implemented in schools if both the school and the municipality share these ambitions (Plan van Aanpak, personal communication, 2020; Interviewee 8, 2021; Interviewee 3, 2021).

The schools and municipalities differ considerably in terms of their focus of ambitions (Interviewee 8, 2021; Interviewee 3, 2021). The schools are often looking for specific branding and customisation of the building based on their organisation. Schools also individually differ significantly, e.g. some schools focus on student health, while others could prioritise reducing energy usage. On the other hand, municipalities are often more focussed on affordability, and therefore often are more open towards modularity or standardisation. However, the shared ambition creates bonding among the participants. The schools and municipalities educate each other on how to address their ‘own’ counterparts in practice, as only in one instance both the school and its responsible municipality are participants in the group. (Interviewee 8, 2021; Interviewee 3, 2021). This diversity of the group makes the concept more powerful – having only homogeneous clients would have a limited, one-sided output (Interviewee 3, 2021).

Most schools and some municipalities have very limited expertise on implementing sustainability requirements in procurement, and specifically lack knowledge on circularity (Interviewee 8, 2021; Interviewee 3, 2021). In order to tackle this knowledge gap, some schools are represented by an external expert, both in their procurement process and in the buyer group. Overall, the combined group has sufficient expertise to make decisions – which might be helped by its large size. Sometimes external experts are hired by the group to help create the group output (Interviewee 8, 2021; Interviewee 3, 2021). Having both inexperienced and experts in the group, allows creating an output suitable for both (Interviewee 8, 2021).

The commitment of the participants both personally and in their organisation are perceived as satisfactory (Interviewee 8, 2021; Interviewee 3, 2021). Although a limited amount of available time causes peaks and dips in the input of members, they are perceived as committed to the group and members are content with the current distribution of work. The organisational commitment is not yet tested, this will be proven later during the implementation of output (Interviewee 8, 2021). However, no obstacles are expected from organisational commitment, as the mentioned inter-organisational dependency between schools and municipalities is expected to be a bigger barrier (Interviewee 3, 2021).

#### **4.3.4 Organisational structure**

The group tasks are centralised, but all members on paper have equal voting rights (Plan van Aanpak, personal communication, 2020; Interviewee 8, 2021). The groups were promoted to facilitate the participating clients, and are organised in a way that the coordinator and secretary are taking the initiative and perform the majority of the group tasks outside the group sessions. No group tasks are outsourced to the individual participants (Plan van Aanpak, personal communication, 2020; Interviewee 8, 2021).

Although all project group members can have equal influence on the group process, in practice this influence is dependent on the amount of available expertise and time of participants (Interviewee 8, 2021; Interviewee 3, 2021). The individual influence of participants differs per meeting, as they might have limited time and or lack expertise on the discussed certain topics. However, this balances out over all meetings, and is seen as a choice of the participants (Interviewee 8, 2021; Interviewee 3, 2021).

The group size is perceived as large, enlarging it could make the group process too complex and cumbersome (Interviewee 3, 2021). The large size could also result in a disbalance of the workload, and currently the input of participants shifts over time (Interviewee 8, 2021).

The workload for the group is generally seen as high, and adds up the normal workload of participants (Interviewee 8, 2021; Interviewee 3, 2021). The group meetings are limited to once a month, in order to keep the workload doable and maintain group progress. Additionally, during important phases of the project, multiple short meetings called 'sprints' are scheduled, aimed to speed up the process and elaborate specific topics (Plan van Aanpak, personal communication, 2020; Interviewee 8, 2021).

In addition to the project group, a piggy-backing group was formed of interested clients (Interviewee 8, 2021; Interviewee 3, 2021). These clients either could not introduce a pilot project into the buyer group and were thus excluded, or were unwilling to join the project group. This piggy-backing group was established as a sparring partner for the project group, in order to evaluate and improve the group output. However, the perceived added value of this piggy-backing group so far has been minimal (Interviewee 8, 2021; Interviewee 3, 2021). This might be caused by the large size of the project group, which could limit the added value of an extra advisory group.

#### **4.3.5 Demand harmonisation process**

The scope of the buyer group is perceived as both large and complex (Interviewee 8, 2021; Interviewee 3, 2021). The scope covers both the whole school and schoolyard (Plan van Aanpak, personal communication, 2020). The group is aimed to integrate both sustainability aspects and qualitative criteria into the construction and renovation of school buildings, resulting in a long list of possible ambitions. The sustainability aspects include circularity, material, reducing energy usage, climate adaptation, and future-proofing. In addition, also soft, qualitative aspects are included, such as the health and wellbeing of students and teachers (Plan van Aanpak, personal communication, 2020). These soft aspects are hard to quantify and measure, which makes it difficult to prove its added-value (Interviewee 8, 2021). As the municipal budgets for schools are often limited, often not all ambitions can be included in projects, and tension arises between the stakeholders and individual ambitions (Plan van Aanpak, personal communication, 2020). Furthermore, the schools as public clients have high demands for customisation – all aiming for specific branding and customisation of the building based on their organisation (Interviewee 8, 2021; Interviewee 3, 2021).

As a result, harmonising the demand among all participating clients is regarded impossible, and no longer pursued as objective by the group (Interviewee 8, 2021; Interviewee 3, 2021). The group unsuccessfully explored the possibilities to create a collective minimum for each objective, as even establishing a distinction between mandatory and optional sustainability topics proved impossible



(Interviewee 8, 2021). Each school has its own preferences and each municipality enforces other requirements – which makes harmonisation impossible (Interviewee 8, 2021; Interviewee 3, 2021). Reducing the scope was not seen as an option, as the participants meet the same complexity in practice, and are not helped with ‘sub-solutions’ (Interviewee 8, 2021).

Instead of demand harmonisation, the group aims to create an ‘ambition framework’, which provides clients with an overview of relevant information, possibilities and considerations to make choices (Interviewee 8, 2021; Interviewee 3, 2021). The goal of this ambition framework, is to organise the currently incoherent data overload on sustainability, and make sustainability aspects accessible and comprehensible for all clients. This framework does not enforce a minimum per sustainability topic, as clients can select or exclude specific topics, and subsequently establish their level of ambition per sustainability topic (Interviewee 8, 2021; Interviewee 3, 2021). In order to create a coherent output, circularity is chosen as the pivotal point for all ambitions, which also forces clients to thoroughly consider circularity possibilities (Interviewee 8, 2021).

In order to guarantee the applicability of the output, the group aims to make the framework as complete as possible (Interviewee 8, 2021; Interviewee 3, 2021). The input of all members is cumulatively added, and no decisions are made by the group as a whole. This way all different preferences in the group can coexist, and the output is made suitable for any school and municipality: the actual decisions are made later by the individual clients. The framework is based on existing documentation and standards that have been generally accepted, such as ‘Ruimte OK’ and ‘Frisse Scholen’. New outputs are only created to fill omissions, mainly on circularity. Furthermore, the output is specified on an abstract level. It both facilitates innovative procurement with functional requirements, and traditional procurement with technical specifications. The final output is very extensive and aimed to suit all public clients, to ensure every client can use the ambition framework (Interviewee 8, 2021; Interviewee 3, 2021). Functionally specifying to stimulate innovation is regarded more important than market demand harmonisation, as many initiatives exist in the market, which means the uptake by public clients is the bottleneck, not the R&D of market parties (Interviewee 8, 2021).

During the group process, synchronisation problems arise among participants (Interviewee 8, 2021; Interviewee 3, 2021). Although all participating clients have a pilot project in a 2-year timespan, the planning of this project differs from client to client – and projects often only occur once in 30 or 40 years (Interviewee 8, 2021). As a result, the group process cannot match the desired tempo of all individual participants. This is solved by sharing intermediate, preliminary products with the clients further in their process. These frontrunners can use the preliminary products to explore possibilities in their pilot projects, and at the same time evaluate and provide feedback on the preliminary products. Based on this feedback, the group has improved the final output (Interviewee 8, 2021). Solving the synchronisation issues among participants is thus not seen as a priority, as it would only make the group process more complex (Interviewee 3, 2021)

#### **4.3.6 Impact of the buyer group**

The direct impact of the group is hard to quantify, due to the non-committal nature of the ambition framework (Interviewee 8, 2021; Interviewee 3, 2021). Although the combined group represents the procurement of 14-20 new schools in a 2-year timespan, it is unknown how ambitious the participating clients will commit to sustainability measures, as no minimum sustainability requirements are formulated (Interviewee 8, 2021; Interviewee 3, 2021). Furthermore, the soft qualitative aspects are hard to quantify – e.g. the health of students – and often compete with sustainability ambitions for the same budget (Interviewee 8, 2021). An estimation of the group impact can be made when comparing three scenarios: the current baseline scenario, a no-regret scenario, and a high ambition scenario. The estimate is likely between no-regret and high ambition, as the ambitious participants will likely not settle for the current baseline in their projects (Interviewee 8, 2021).

The group mainly focuses on the indirect impact of the group, to create awareness and action among external clients (Interviewee 8, 2021; Interviewee 3, 2021), as the combined market share of the group is expected to be only 5% (Interviewee 3, 2021). Any step taken by any client above the legal minimum or current standards leads to impact, and expanding this to all external clients maximises the potential impact (Interviewee 8, 2021). Therefore, the group focuses on proving the added value of the ambitions such as circularity, and strives to make the output very user-friendly and suitable for levels of expertise. Communication towards external clients is seen as a priority, and is done by presentations and publishing papers to disseminate knowledge and awareness (Interviewee 8, 2021).

#### **4.3.7 Legal aspects**

The participating clients in the project group signed a covenant that describes intentions and commitment of the participants (Interviewee 8, 2021). In each participating organisation, the covenant is signed by someone with the mandate to sign. For the schools, the school directors signed. In case of the municipalities, an alderman or department manager signed the covenant (Interviewee 8, 2021).

The signed covenant is based on a template provided by PIANOo (Template Plan van Aanpak, personal communication, 2020). This template prescribes the suggested content for the individual plans per buyer group. The Plan of approach covers all relevant aspects of the group process: group ambitions, member composition, method of cooperation (the organisational structure of a project group and piggy-backers), organisational commitment (approval from mandated managers per client), targeted individual pilot projects, market consultations, openly sharing knowledge within the group, communication outside the project group, hiring external experts, how the available budget is spent (mostly on the coordinator and hiring external experts), a planning and how the impact will be assessed (Plan van aanpak, personal communication, 2020).

The signed covenant has strong similarities to with the provided template, but extra elements are added that mostly focus on the dilemma of harmonisation vs customisation (Plan van Aanpak, personal communication, 2020).

The individual goals of participants are highlighted, which includes their projects, priorities and bottlenecks: e.g. “Key aspects for the assignment [of a specific client] are that the building must serve the educational concept of the school [...] There is currently no additional money available for the realization of extra aspects” (Plan van Aanpak, personal communication, 2020, p.7).

Moreover, concrete targets are formulated, stipulating the challenge between customisation and generalisation; “Each school has its own individuality, based on the city, village or neighbourhood. [...] However, every school also has generic characteristics. [...] It is possible to mention generic points that characterize each school and to describe them functionally. [...] In this project we explore how far we can go with this” (Plan van Aanpak, personal communication, 2020, p.8).

The signed covenant is said to create organisational binding, awareness and commitment (Interviewee 8, 2021). It still provides manoeuvrability and safety to discover the group process, as the output is not fully specified or committed to – and no penalties or consequences are specified (Plan van Aanpak, personal communication, 2020; Interviewee 8, 2021). No other legal relationship is expected to improve the group process (Interviewee 3, 2021).

The public procurement law is perceived as a small obstacle, as it could limit certain standardisation possibilities and selection freedom of clients (Interviewee 8, 2021; Interviewee 3, 2021). Not all legal boundaries are yet fully investigated or evaluated (Interviewee 8, 2021). However, due to the functional and abstract demand harmonisation, procurement law is not expected to conflict with the group output (Interviewee 3, 2021); individual municipal requirements is expected to provide larger limitations on the applicability of the group output (Interviewee 8, 2021).

## 4.4 Case study 2: Circular Construction Material

### 4.4.1 Case description

The second case study is the buyer group 'Circular Construction Materials'. This buyer group is targeted at real estate owners and asset managers, and has the key objective to jointly enlarge the market of construction materials and thus help upscale these product markets (Plan van Aanpak, Personal communication, 2020). The main focus of the buyer group is not creating awareness or sharing information, but specifically stimulating specific projects and the uptake among clients (Plan van Aanpak, Personal communication, 2020).

This case study is selected based on meeting the three case selection criteria. Firstly, the group is initiated by PIANOo in cooperation with Cirkelstad, a platform for frontrunners in a circular construction sector. Secondly, the buyer group fits the problem statement. Its topic is in the construction sector, and it has a relatively large scope – as its name suggests, it covers a wide range of construction materials. The group has a medium size of 8 members in the project group, with participating clients that are either public or private real estate asset managers. The group has recently started the market demand harmonisation phase, and is working on creating specific standards in procurement for multiple material groups, such as kitchens and boilers.

For this case study, two semi-structured interviews were conducted. Firstly, the coordinator of the buyer group has been interviewed, which has been closely involved with the formation and processes of the group. This interviewee is expected to provide a neutral, umbrella perspective on the group and the participants, and therefore provide useful insights into the group processes. Secondly, an active member of the project group representing the procurement department of a municipality has been interviewed. This interviewee is selected based on its expertise in procurement procedures, legal aspects and sustainability, and is expected to provide insight into the perspective of an average municipality.

### 4.4.2 Formation

The buyer group can be seen as a pioneering group, as it is not based on an existing network and the participants mostly did not know each other (Interviewee 9, 2021; Interviewee 4, 2021). The participants were selected and contacted by the coordinator of the group, who formed the project group from scratch based on his own network and contacts. Because of the new group composition, a relatively long introductory process was needed to create familiarity and bonding among the participants (Interviewee 9, 2021; Interviewee 4, 2021).

Initially, finding intrinsically motivated participants was challenging, as the coordinator especially did not want to convince participants to join – intrinsic motivation was a requisite for participation, as the project was expected to be too challenging for unmotivated clients (Interviewee 9, 2021). The coordinator discussed with potential participants whether their ambitions matched the concept of the buyer group, and if they were able to put in a pilot project and personnel. If the potential participants were not fully committed, they were classified into the piggy-backing group. This filtering is still applied during the group process, which is elaborated in the paragraph 'organisational structure'.

### 4.4.3 Participants

The project group has highly diverse participating clients, including municipalities, semi-public social housing associations and private real estate investors (Plan van Aanpak, Personal communication, 2020; Interviewee 9, 2021; Interviewee 4, 2021). This differentiated composition is evaluated positively, as it enables sharing knowledge and best practices. Despite being different, the shared ambitions and intrinsic willingness creates bonding between the different participants (Interviewee 9, 2021; Interviewee 4, 2021).

The different types of clients are perceived as complementary to each other, as they all have a different approach and expertise on sustainability topics (Interviewee 9, 2021; Interviewee 4, 2021). The private clients are considered the most confident and intrinsically bottom-up motivated. However, they are the most often absent due to internal emergencies and priorities, and are heavily dependent on creating a feasible financial business case for the group output. The social housing associations are seen as experimental and hands-on, despite having limited budgets and a small tolerance for risks. However, these participants are only interested in very relevant and concrete group outputs, as multiple housing associations dropped out during a brainstorming process on the direction and scope of the group. The public clients are perceived as the most loyal to the group. However, they are also seen as mostly top-down obliged committed, without having a clear direction or focus, and sometimes lack intrinsic motivation to implement the group output. Municipalities are regarded as the most risk-averse and reserved, and because their real estate exploitation and maintenance is often outsourced they have a limited direct impact on their real estate (Interviewee 9, 2021; Interviewee 4, 2021).

The commitment of individual participants is perceived as good, considering the generally high workload (Interviewee 9, 2021; Interviewee 4, 2021). The attendance of participants is good, while the meeting frequency is considered the maximum of what is possible for participants. However, individual (small) tasks get neglected, and need active persuasion and input by the coordinator. No group tasks are distributed to individual participants, most group tasks are done by the coordinator and hired external experts. Once the group process started progressing and became less abstract, the participants became more committed and gave more input. Keeping the group process relevant for all participants is regarded as a requisite to keep all participants involved (Interviewee 9, 2021; Interviewee 4, 2021).

The expertise in the project group is shattered among the participants (Interviewee 9, 2021; Interviewee 4, 2021). The expertise is not even among participants, but they supplement each other and are individually motivated to gain insight and expertise. In the project group, all members together generally have sufficient expertise combined, and often hire external experts. However, gaining expertise is not regarded as the most important: stimulating internal mandate is perceived as more important (Interviewee 9, 2021; Interviewee 4, 2021).

The internal mandate in the participating organisations is considered an uncertain factor and needs significant effort (Plan van Aanpak, Personal Communication, 2020; Interviewee 9, 2021; Interviewee 4, 2021). For all different types of clients, almost all participants in the group feel hindered in implementing their ambitions by a lack of internal mandate in their organisations. And even if the client organisation has committed to implementing sustainability, the actual implementation in projects is based on the individual persons in charge per project. Furthermore, most housing associations and municipalities have outsourced their maintenance and exploitation of real estate to an intermediate organisation, which creates an extra barrier for implementing sustainability aspects. Moreover, participating clients in the buyer group are regarded as the frontrunners among their peers, outside the group the motivation and mandate are considered worse. Once the group outputs are being finalised, the internal mandate of both participating and external clients will be actively stimulated (Plan van Aanpak, Personal Communication, 2020; Interviewee 9, 2021; Interviewee 4, 2021).

#### **4.4.4 Organisational structure**

The organisational structure of the buyer group is unique in including multiple roles per participating client in the project group (Interviewee 9, 2021). Clients were asked to create a triangle of representatives of the departments of strategy, procurement and project management. This combination of roles is aimed to create internal mandate in organisations and diffuse the initiatives of the buyer group through the organisations (Plan van Aanpak, Personal communication, 2020; Interviewee 9, 2021).

The group has a relatively large size in order to incorporate different types of clients, and multiple roles of participants (Interviewee 9, 2021). This size is perceived as suitable for the topic, and enables more input from different perspectives and experiences (Interviewee 9, 2021; Interviewee 4, 2021). A larger group is expected to water down ambitions, while a smaller group could enable shorter meetings (Interviewee 4, 2021). The large size is thus associated with longer meetings, which might be explained that having more participants requires more time to gather the input of all participants and make decisions. Initially, the meetings were perceived too long, and have been shortened and more breaks have been included (Interviewee 9, 2021). The current frequency and length of meetings are considered as a balance between minimum group progress and maximum workload of participants (Interviewee 4, 2021).

The coordinator of the group has a large and important influence on the buyer group (Interviewee 9, 2021; Interviewee 4, 2021). The coordinator has an influential role in steering the direction of the group, and initiating and coordinating group activities. The coordinator frequently speaks to individual participants outside of the group meetings, to get input from all participants, motivate and influence them, and to stimulate creating mandate in their organisations (Interviewee 9, 2021; Interviewee 4, 2021). The group structure can thus be seen as relatively centralised, as the coordinator takes the initiative, and individual clients rarely actively perform group tasks (Interviewee 9, 2021). However, on paper all members have equal influence and voting rights (Plan van Aanpak, Personal communication, 2020; Interviewee 9, 2021).

In addition to the project group, a piggy-backing group was formed of interested clients without the ability to provide a pilot project or the personnel, and a focus group of market suppliers and industry associations (Plan van Aanpak, Personal communication, 2020; Interviewee 9, 2021). The borders between the project group and piggy-backing group are dynamic, as participants can shift from one to the other based on their available time and interest, and thus 'pause' their participation in the project group (Interviewee 9, 2021). The piggy-backing group is actively involved in the project group process by the coordinator, who regularly informs the piggy-backers individually and asks for their input. During the process, new participants can still join both the project group and piggy-backing group (Interviewee 9, 2021) and participants are free to leave the group (Interviewee 4, 2021). This dynamic, voluntary nature of the group is expected to result in a group of motivated participants (Interviewee 9, 2021).

#### **4.4.5 Demand harmonisation process**

The project group has chosen to considerably slim down the scope of harmonisation towards a selection of product groups (Interviewee 9, 2021; Interviewee 4, 2021). The down-scoping was done to reduce complexity, and simplify the harmonisation process. As a result, the topic of harmonisation can now be seen as fully isolated product groups from context, such as kitchens and boilers, but these could later also be integrated into the complete building. This process required multiple selections to be made, which took a lot of time during the initiation phase of the group (Interviewee 9, 2021; Interviewee 4, 2021). The invitation towards potential participants already explicitly mentioned this focus on single product groups, aiming to make implementing circularity accessible for organisations unable to make their whole construction process circular (Invitation, Personal Communication, 2020).

The harmonisation process currently targets product groups in undeveloped and inexperienced markets regarding circularity (Interviewee 9, 2021; Interviewee 4, 2021). Therefore, the buyer group aims to start with low ambitions, that should be accessible for all market parties and clients. This is branded a 'viral market approach', starting with simply requiring suppliers to describe their waste processing procedure. This is aimed to consult all different stakeholders, and eventually diffuse the concept of circularity through the market, and address the parties that can make the most impact. This is where the second focus group ('schil') comes in, for sparring with interested suppliers and industry associations (Plan van Aanpak, Personal Communication, 2020; Interviewee 9, 2021; Interviewee 4, 2021).

The process of harmonisation has been outsourced by the participants to the coordinator and the hired experts (Interviewee 9, 2021; Interviewee 4, 2021). The input for the market demand harmonisation has mainly been provided by the external experts, who also formulate draft versions of the group output. The participants are then asked to check and evaluate these outputs, which limits the workload for the participants. The evaluation by participants is often done organically and individually with the coordinator, resulting in a relatively centralised group process with a key role for the coordinator and hired experts (Interviewee 9, 2021; Interviewee 4, 2021).

Because of this individual harmonisation process, the limited available input of participants, the long time to recruit intrinsically motivated participants, the extensive scope reduction and consulting stakeholders in undeveloped and inexperienced markets, the group process has been lengthy and time-consuming before reaching the demand harmonisation phase (Interviewee 9, 2021; Interviewee 4, 2021).

The desired group output is a uniform procurement method, applicable to as many product groups as possible (Plan van Aanpak, Personal Communication, 2020). In order to achieve this, the output will be specified as functionally as possible, based on the Nordic Five Structure (Interviewee 9, 2021). Moreover, the group output is not desired to be obligatory, but provide different levels of ambitions and different aspects of sustainability – e.g. lifespan, reusability, biobased – allowing clients to make their own decisions based on their ambitions and on how far the market has progressed (Interviewee 9, 2021; Interviewee 4, 2021).

#### **4.4.6 Impact of the buyer group**

Due to the longer start-up phase, the buyer group is currently not focused on maximising its direct or indirect impact (Interviewee 9, 2021; Interviewee 4, 2021). The first priority of the group is to create consensus in the group, to finish the harmonisation phase and evaluate the output in pilot projects. Next, the participants should be educated and convinced of the added value of the group output, before the group will start maximising impact (Interviewee 9, 2021; Interviewee 4, 2021).

Eventually, promoting the group output among external clients is expected to become the most important challenge to maximise group impact (Interviewee 9, 2021; Interviewee 4, 2021). Key prerequisites for a large scale uptake of the group output, are making the output concrete, accessible for all clients and scalable based on ambitions of clients and progress of the market. The diversity and size of the group are expected to help make the output applicable for all clients, as the group output will be tested and aligned with a range of different clients. Especially aligning the output with the private real estate investors has a major influence on the impact, as these private investors generally have far greater quantities in their portfolio. Furthermore, good communication towards external clients is perceived as vital for making the group output standard in the market. To achieve this, the current participants should be educated and motivated to convince their professional contacts, following the viral approach of the market (Interviewee 9, 2021; Interviewee 4, 2021).

#### 4.4.7 Legal aspects

The participants of the project group signed a covenant, stating their role and commitment (Interviewee 9, 2021; Interviewee 4, 2021). This is considered a very soft legally relationship, but it is regarded to create security and bonding among participants, without pressure or consequences. A more committed relationship is regarded as undesirable due to the uncertainty of the process. Commitment is mostly pursued by making the process and outputs relevant and concrete, not through legal relationships (Interviewee 9, 2021; Interviewee 4, 2021).

The signed covenant is based on a template provided by PIANOo (Template Plan van Aanpak, personal communication, 2020). This template prescribes the suggested content for the individual covenants per buyer group. The plan of approach covers all relevant aspects of the group process: group ambitions, member composition (including market parties as a sparring board), method of cooperation (a project group and piggy-backers), organisational commitment, the process of (exploratively and iteratively used) market consultations, sharing knowledge within the group, communication outside the project group, hiring external experts, how the available budget is spent (mostly on hiring the coordinator and external experts), a (very limited) planning and how the impact will be assessed (Plan van aanpak, personal communication, 2020).

The signed covenant has strong similarities to with the provided template, but some differences are visible that mostly are related to organisational commitment and the uncertainty of the outcome (Plan van Aanpak, personal communication, 2020).

The organisational commitment has been given a more prominent place compared to the template, stating: "Participants notice that efforts are especially needed on behavioural change internally, [...] in order to be able to permanently convert the objective into concrete and lasting actions. The goal is to get each organization involved with the departments policy/strategy, purchasing and project management. Cooperation within this triangle is crucial for safeguarding and scaling up circular procurement" (Plan van Aanpak, personal communication, 2020, p.9).

Furthermore, the signed covenant is reluctant with stating specific outcomes of the buyer group (Plan van Aanpak, personal communication, 2020). This buyer group has left out the suggested paragraphs of contracting and pilot projects – which means the group has not formulated the implementation of the group outputs. With regards to calculating the expected impact of the group, the group aims to outsource this responsibility, stating in the covenant: "RIVM has the responsibility to report on the progress and the impact achieved by the Buyer Group" (Plan van Aanpak, personal communication, 2020, p.14). This further emphasises the uncertainty of the group outcome, as the template suggests the group is responsible for reporting the impact.

No legal barriers are encountered yet, and are not expected to hinder the group output in the future due to the functional specification. The municipalities are most bound by legislation, but are actively stretching and fully utilizing the available possibilities in procurement legislation (Interviewee 9, 2021; Interviewee 4, 2021).

## 4.5 Case study 3: Zero-Emission Construction Equipment

### 4.5.1 Case description

The third case study is the buyer group 'Zero-Emission Construction Equipment'. This buyer group has the objective to jointly create a shared roadmap for the procurement of construction equipment, which should be fully emission-free in 2030.

This case study is selected based on meeting the three case selection criteria. Firstly, the group is initiated by Rijkswaterstaat. Secondly, the buyer group fits the problem statement: Its topic is in the construction sector, and it has a large scope – it targets all forms of construction equipment, such as front loaders, excavators, trucks and even dredging equipment. The group has a large size of 13 members in the project group, with participants from municipalities, provinces, water authorities, expertise partners, ProRail, Rijksvastgoedbedrijf together with Rijkswaterstaat. Thirdly, the group has recently reached the market demand harmonisation phase, after having reached an agreement on the direction and scope of the buyer group, and alignment with the Transitiepad of Rijkswaterstaat.

For this case study, three semi-structured interviews were conducted. Firstly, the coordinator of the buyer group has been interviewed, who has been closely involved with the formation and processes of the group. This interviewee is expected to provide an umbrella perspective on the group and the participants, and therefore provide useful insights into the group processes. Secondly, an active member of the project group with expertise in managing contracts and tenders of infrastructure projects, who also participates in a second buyer group. This member represents a province that is regarded as a frontrunner in implementing sustainability in procurement, and is selected to provide insight into the perspective of a participating province and in differences between buyer groups. Thirdly, the Rijkswaterstaat chairman of the project group is interviewed, who played an important role in initiating the buyer group and leads group meetings. This interviewee is selected based on his expertise in implementing sustainability measures, and to provide insight into the perspective of Rijkswaterstaat.

### 4.5.2 Formation

The buyer group was initiated by Rijkswaterstaat, as a means to amplify its Transitiepad with the concept of buyer groups (Plan van Aanpak, Personal Communication, 2020; Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). Rijkswaterstaat reached out to other clients with experience in the procurement of zero-emission construction, based on their expected contribution. The willing clients all joined the project group, as no piggy-backing group was created. Participation in the group is seen as voluntary and informal, and thus leaving the group is possible at any moment. During the group process, new clients were still joining the project group (Plan van Aanpak, Personal Communication, 2020; Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021).

The strong connection with the Transitiepad 'Sustainable Construction Sites & Construction Logistics' requires active alignment and coordination between the buyer group and Transitiepad (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). There is a strong overlap between both concepts, as the scope and leading organisation are the same, and both are led by the same chairman. This overlap makes it prone to unclear borders, double work and a loss of commitment of buyer group members when their input feels unimportant (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). Furthermore, the mentioned Transitiepad was paused to await the completion of other Transitiepaden, which caused the same delay for the buyer group due to their intertwining (Interviewee 6, 2021). In order to create alignment, Rijkswaterstaat needs clearly communicate on the progress and specifics of its Transitiepad, while preventing their input creates dominance in the group (Interviewee 6, 2021; Interviewee 11, 2021).



### 4.5.3 Participants

The participating clients in the buyer group are considered highly diverse, all with specific knowledge and struggles (Interviewee 10, 2021; Interviewee 11, 2021). The composition of municipalities, water authorities, municipalities, expertise partners, ProRail, Rijkswaterstaat and Rijkswaterstaat is considered to be a good representation of all public clients involved in the construction sector. These participating clients have the same ambition in common of having zero-emission construction in 2030, and are intrinsically motivated to contribute to this transition (Interviewee 10, 2021; Interviewee 11, 2021). The individual participants are also perceived as intrinsically committed to the group, as participation is fully voluntarily and attendance rates are evaluated positively (Interviewee 10, 2021).

The buyer group is perceived as a platform to combine knowledge and experience, with significant differences in knowledge among clients (Plan van Aanpak, Personal Communication, 2020; Interviewee 6, 2021; Interviewee 10, 2021). Rijkswaterstaat and some municipalities are considered the most experienced with the topic, and thus provide more input in the group process. The smaller clients are in the group to learn, and are content with giving less input. The total group has sufficient experience, and aims to diffuse this knowledge among all participants and external clients (Interviewee 6, 2021; Interviewee 10, 2021). Outside the buyer group, in general the provinces are considered the most experienced, followed by water authorities, while municipalities are perceived as the most inexperienced (Interviewee 10, 2021).

The organisational mandate of participating clients is not tested yet (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). Due to the voluntary nature and knowledge-sharing approach of the buyer group, organisational mandate for the group process is considered unnecessary (Interviewee 10, 2021). Once the outputs of the group are finalised, these will be presented for approval to the individual clients (Interviewee 6, 2021; Interviewee 10, 2021). Participating clients are hesitant to preapprove these outputs, as the content is yet uncertain (Interviewee 10, 2021).

### 4.5.4 Organisational structure

Although on paper all members of the buyer group have equal influence, in practice the level of input is different per client (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). Participants can take as much influence as they want, resulting in participants with more expertise having more input in the group process, while the inexperienced participants have a more passive, learning role in the group (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). Some clients have already made progress and strategy concerning procurement of zero-emission construction equipment, and are not willing to commit to a group output significantly different from their own strategy (Interviewee 11, 2021). This also applies to Rijkswaterstaat, as it coordinates both the Transitiepad and the buyer group, and will thus steer the buyer group to have a similar scope, direction and outputs (Plan van Aanpak, Personal Communication, 2020; Interviewee 10, 2021; Interviewee 11, 2021).

The group is large and diverse, in order to represent all relevant types of public construction clients (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). The thirteen clients in the project group are municipalities, water authorities, municipalities, expertise partners, ProRail, Rijkswaterstaat and Rijkswaterstaat. No piggy-backing group was created, as it is considered to provide no added value due to the large project group and other existing networks. The large size of the project group is considered suitable for the large scope and complexity of the buyer group (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). The size also guarantees continuity in the group meetings, as the absence of individual clients is not perceived as a problem (Interviewee 10, 2021). However, this large size results in many different visions, which makes it prone to slow decision-making and progress (Interviewee 6, 2021). This inertia is tackled by creating temporary committees for specific topics, that execute the group work outside plenary meetings (Interviewee 10, 2021; Interviewee 11, 2021). The project group has monthly meetings, which is considered a good frequency (Interviewee 10, 2021).

#### 4.5.5 Demand harmonisation process

The demand harmonisation output is aimed to be a widely accepted roadmap towards 2030, generally applicable for any construction equipment and any public client (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). This output will likely provide incrementally increasing ambitions and intermediate goals for emission-free construction equipment. This should provide individual clients and market parties a clear perspective and establish the pace of the transition towards emission-free construction equipment client (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021).

As a result, the scope of the buyer group is very large and diverse, as it includes all sizes and sorts of construction equipment (Interviewee 6, 2021; Interviewee 10, 2021). Included in the scope are all forms of construction equipment, such as front loaders, excavators, vibratory rammers, trucks and even dredging equipment. The smaller construction equipment is mostly readily available on the market. However, the medium and large construction equipment is produced on an international scale, and currently has a very limited supply. International innovation is thus needed, on which the buyer group is considered to have limited influence. Moreover, sustainable electricity on construction sites to charge the vehicles is considered a prerequisite, but is also not yet available. On national scale agreements and standards will have to be established, adding a layer of complexity to the scope of the buyer group (Interviewee 6, 2021; Interviewee 10, 2021).

Therefore, in order to apply on all equipment, the market strategy will be formulated mostly functionally (Interviewee 6, 2021; Interviewee 10, 2021). As the public clients not directly procure the construction equipment, but always as part of a construction project, the desired level of customisation is low. The clients will not directly specify requirements for the equipment itself, but always for the project as a whole. The market parties can individually give substance to these functional requirements, and are free to buy any construction equipment – as long as it can meet the requirements on zero-emission construction. (Interviewee 6, 2021; Interviewee 10, 2021).

The group output will have incrementally increasing steps in implementing zero-emission construction equipment, in synchronisation with the market (Interviewee 6, 2021; Interviewee 10, 2021). As soon as possible, the elements that are considered essential for the rest of the transition will be pursued, such as enabling charging points with sustainable energy on construction sites. In the initial phase, the frontrunners will be rewarded in specific ‘koploper’ projects, giving them a competitive advantage (Interviewee 6, 2021; Interviewee 10, 2021). Towards 2030, these requirements will be incrementally increased, for which possibly intermediate solutions will be included, such as hybrid vehicles (Interviewee 11, 2021). Once the zero-emission equipment is widely available and standardised, this will probably be formulated as minimum requirements or exclusion requirements for contractors, implemented in contracts, and eventually possibly be implemented in national legislation (Plan van Aanpak, Personal communication, 2020; Interviewee 10, 2021). Individual clients are not obliged to directly follow these incremental steps, but can implement higher or lower ambitions than the roadmap (Interviewee 10, 2021).

The decision-making in the group is only recently started, and can be slow due to the input of the many and diverse participating clients in the group (Interviewee 6, 2021; Interviewee 11, 2021). As the topic of emission-free equipment is relatively new, the input for harmonisation is mainly the experience of participants in the group (Plan van Aanpak, Personal communication, 2020; Interviewee 6, 2021; Interviewee 11, 2021). Harmonisation is done through discussion, and first hearing all different perspectives of clients before decision-making in order to reach a joint consensus (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). The large group and the relatively new phenomenon can cause slow decision-making (Interviewee 6, 2021; Interviewee 11, 2021). This is tackled by establishing small sub-committees, which collect and prepare input outside the plenary meetings. However, the speed of the process is also dependent on other developments, such as the necessary innovation in the

supply market, and the development of an Environmental cost index ('MKI') specifically targeted at construction equipment. Furthermore, the speed is considered relatively unimportant due to the long timespan, and the group rather focuses on the completeness of the output (Interviewee 6, 2021; Interviewee 11, 2021). No synchronisation problems are expected, as the participating clients have many construction projects that can be selected as a pilot (Plan van Aanpak, Personal communication, 2020).

#### **4.5.6 Impact of the buyer group**

The biggest objective for the buyer group is to provide the market with a clear roadmap towards emission-free construction equipment in 2030 (Plan van Aanpak, Personal Communication, 2020; Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). Currently, the market cannot supply the complete potential demand for all public clients, hindered both by a complete lack of available large construction equipment, and a lack of sustainable charging facilities on construction sites. Therefore, quick direct impact of the group is no key objective, as the participating clients probably even will make agreements to limit their procurement volumes to not overstretch the available supply. The impact calculating method of the RIVM is thus considered unsuitable for this buyer group (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). Moreover, the calculating method does not include the effects of zero-emission construction equipment in other areas, such as a lower environmental impact of asphalt production and transportation (Interviewee 10, 2021; Interviewee 11, 2021).

The group aims to maximise the long-term indirect impact of the group, striving to make the group output a widely accepted roadmap towards 2030 (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). The output will have to be as complete as possible; suitable both for all clients and for any construction equipment. The roadmap will likely provide incrementally increasing ambitions and intermediate goals for emission-free construction equipment. This should provide individual clients and market parties with a clear perspective and establish the pace of the transition (Interviewee 6, 2021; Interviewee 10, 2021; Interviewee 11, 2021). To stimulate market parties, frontrunners will be rewarded in specific 'koploper' projects, giving them a competitive advantage (Interviewee 6, 2021; Interviewee 10, 2021). In order to maximise market impact, as many external clients as possible will be convinced to implement the group output (Interviewee 10, 2021; Interviewee 11, 2021). This will likely be done with a national presentation moment, a central communication platform or website, or implementation into existing nationwide standards (Interviewee 10, 2021; Interviewee 11, 2021). Despite having the indirect impact as the main objective, this will probably not be measured or calculated by the buyer group, but rather be formalised into legislation upon reaching sufficient implementation (Plan van Aanpak, Personal Communication, 2020; Interviewee 10, 2021).

#### 4.5.7 Legal aspects

In accordance with the informal, voluntary nature of the process, the group has formulated a plan of approach, but not signed a covenant (Interviewee 6, 2021; Interviewee 10, 2021). The participants thus have no formal requirements, and therefore also no potential sanctions. The group is now focused on creating a roadmap, which will need to be approved by participating clients (Interviewee 6, 2021; Interviewee 10, 2021).

The (not signed) plan of approach is based on a template provided by PIANOo (Template Plan van Aanpak, personal communication, 2020). This template prescribes the suggested content for the individual plans per buyer group. The Plan of approach covers all relevant aspects of the group process: group ambitions, member composition, method of cooperation (the organisational structure of steering group + project group but no piggy-backers), implementing the buyer group outputs in pilot contracts, market consultations, openly sharing knowledge within the group, communication outside the project group, hiring external experts (briefly), on what items the available budget is spent – without mentioning any concrete numbers, a very detailed planning and how the impact will be assessed (Plan van aanpak, personal communication, 2020).

The plan of approach has strong similarities to with the provided template, but some differences are visible that mostly are related to organisational commitment and the relation to the Transitiepad (Plan van Aanpak, personal communication, 2020).

In contrast to the template, nothing is mentioned on organisational commitment (Plan van Aanpak, personal communication, 2020). Currently no formal organisational mandate is given, but this will likely be requested once the group outputs are finished (Interviewee 6, 2021). This organisational mandate is not regarded necessary nor desirable. The outcomes are still uncertain, and thus the participating clients are reluctant to sign a covenant or make agreements about its implementation (Interviewee 6, 2021). The plan of approach thus also mentions no explicit projects to implement the outputs, but states: “Since the joint market strategy and vision is not yet known, it is not possible to indicate which contracts will be involved” (Plan van Aanpak, personal communication, 2020, p.10).

Moreover, the plan of approach highlights the overlap and required alignment with the Transitiepad Bouwplaats en Bouwlogistiek (Plan van Aanpak, personal communication, 2020). The buyer group is stated to be part of the Transitiepad, with shared tasks, e.g. “The buyer group together with the Transitiepad Bouwplaats en Bouwlogistiek is responsible for monitoring the process and the results achieved” (Plan van Aanpak, personal communication, 2020, p.11).

Currently, the group cannot fully oversee potential legal issues as the harmonisation phase recently started, but these will be investigated together with the Transitiepad (Interviewee 6, 2021).

## 4.6 Case study 4: Sustainable Road Surfacing

### 4.6.1 Case description

The fourth case study is the buyer group ‘Sustainable Road Surfacing’. This buyer group has the objective to jointly create a shared vision and strategy for structural procurement of sustainable asphalt.

This case study is selected based on meeting the three case selection criteria. Firstly, the group is initiated by Rijkswaterstaat. Secondly, the buyer group fits the problem statement: Its topic is in the infrastructure construction sector, and it has a small scope – it specifically targets sustainable asphalt. The group has a relatively small size of 5 members in the project group, with participants from four provinces together with Rijkswaterstaat. Thirdly, the group has reached the market demand harmonisation phase, already formulated criteria for tenders and contracts, and is now working on a market vision and procurement strategy.

For this case study, three semi-structured interviews were conducted. Firstly, the coordinator of the buyer group has been interviewed, who has been closely involved with the processes of the group. This interviewee is expected to provide a neutral, umbrella perspective on the group and the participants, and therefore provide useful insights into the group processes. Secondly, an active member of the project group with expertise in managing contracts and tenders of infrastructure projects, who also participates in a second buyer group. This member represents a province that is regarded as a frontrunner in implementing sustainability in procurement, and is selected to provide insight into the perspective of a participating province and in differences between buyer groups. Thirdly, the Rijkswaterstaat delegate in the project group is interviewed. This interviewee is selected based on his expertise in implementing sustainability measures, and to provide insight into the perspective of Rijkswaterstaat.

### 4.6.2 Formation

The buyer group Sustainable Road Surfacing was initiated by Rijkswaterstaat, which also selected four provinces as partners (Plan van Aanpak, Personal communication, 2020; Interviewee 7, 2021; Interviewee 11, 2021). Rijkswaterstaat itself has a transition program towards sustainable road surfacing, called the ‘Transitiepad Duurzame Wegverharding’. As part of this Transitiepad, the initiative of forming a buyer group was launched, based on the concept of PIANOo. Rijkswaterstaat contacted the participating provinces to join this initiative, selecting these based on their expertise, enthusiasm and available resources. The four provinces and Rijkswaterstaat came to a shared agreement on participation, and jointly submitted their group to PIANOo for assistance in terms of budget and guidance (Plan van Aanpak, Personal communication, 2020; Interviewee 7, 2021; Interviewee 11, 2021).

This composition of the project group is fixed, as no other participants are able to join the project group to prevent slowing down the group process (Interviewee 7, 2021; Interviewee 11, 2021). Other public clients which later became interested and wanted to get involved with the buyer group, were classified into the piggy-backing group, which now consists of both municipalities and provinces. Leaving the group is possible (Interviewee 7, 2021; Interviewee 11, 2021).

The relation between the buyer group and the Transitiepad requires actively aligning the scope and output of the buyer group (Interviewee 2, 2021; Interviewee 7, 2021; Interviewee 11, 2021). The similarity of the concepts makes the buyer group prone to overlap or conflict with the Transitiepad. Rijkswaterstaat sees these different networks not as conflicting, but as serving the same purpose in other areas of industry. Moreover, the goal of Rijkswaterstaat is not to develop new tools, but to combine existing knowledge and best practices into a standard, and diffuse this through the industry. Alignment between the buyer group and the Transitiepad requires active communication, which is ensured by both concepts having the same chairman from Rijkswaterstaat, and having the same delegate in both project groups (Interviewee 2, 2021; Interviewee 7, 2021; Interviewee 11, 2021).

### 4.6.3 Participants

The participating clients are considered relatively homogeneous both in expertise and preferences (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). The project group consists of four provinces and Rijkswaterstaat. Municipalities are not included, although representing around 50% of the total road surfacing market share. Due to their market share, the municipalities are considered the biggest target client group, which often have a very limited implementation and expertise of sustainable procurement. Not having municipalities in the project group, is regarded to the group process less interesting, more prone to omissions and smaller applicability. In the piggy-backing group municipalities are included, and actively asked to evaluate the usability and accessibility of the group output for municipalities (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021).

Regarding the drivers to participate, roughly a three-way division can be made among the participating clients (Interviewee 2, 2021; interviewee 7, 2021). Firstly, Rijkswaterstaat is regarded to be a unique client with a lot of experience in sustainable procurement. Rijkswaterstaat already creates and implements sustainability standards independently, and has a high internal commitment and ambition to implement sustainability in procurement. Rijkswaterstaat joined the buyer group not to gain knowledge, but to share knowledge. Rijkswaterstaat is thus perceived not influenceable by the buyer group, but participates to efficiently approach the market with a shared approach. Furthermore, due to their large, complex projects and small risk acceptance, they can be seen as a unique client, not representative for the other (smaller) clients. Secondly, two of the provinces are experienced in sustainability and have more active input in the group. These joined to share their knowledge, and want the group output to align with their individual progress on sustainable procurement. Thirdly, the other two provinces are considered less experienced with sustainable procurement, and participate to gain knowledge (Interviewee 2, 2021; interviewee 7, 2021). Combined, the participants in the group have sufficient experience, and external expertise is only hired for external communication (Plan van Aanpak, personal communication, 2020; Interviewee 7, 2021).

The project group participants are perceived as very committed (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). Despite the high workload participants experience on top of their regular tasks, the participants are committed and almost always present, and group tasks are shared evenly among participants (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021).

The individual client organisations have committed to the process of the buyer group, giving their delegates mandate to complete the process (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). This was formalised by signing the formulated plan of approach (Plan van Aanpak, personal communication, 2020). This plan of approach specifically mentions the mandate is limited to the group process, as the outcome of the group outputs is still uncertain e.g. in terms of costs, and additional approval is needed for the market vision and procurement strategy. The organisational commitment to the group outputs thus cannot be evaluated yet, but is considered vital for the success of the buyer group (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). In order to get approval on the group output, the steering group is tasked with creating internal commitment by guaranteeing the group output aligns with the 'mother organisations' (Interviewee 2; 2021).

### 4.6.4 Organisational structure

Although the buyer group is initiated and coordinated by Rijkswaterstaat, the buyer group is relatively decentralised with all participating clients having equal influence (Plan van Aanpak, personal communication, 2020; Interviewee 2, 2021; interviewee 7, 2021). Rijkswaterstaat is the biggest player in the group which represents the Transitiepad, and thus has an important role of giving practical substance to the group output, but is not perceived as dominant in the group. Rijkswaterstaat specifically aims to make the group output suitable for smaller external clients, and thus a dominant input is considered unwanted (Interviewee 2, 2021; interviewee 7, 2021). Rijkswaterstaat first had two

participants in the project group, but after realizing this caused unequal input, the second person thus exited the project group (Interviewee 7, 2021). Moreover, the coordinator of the group is thus not a Rijkswaterstaat employee, but a hired expert with a neutral perspective (Interviewee 2, 2021; interviewee 7, 2021). However, in practice the less experienced participants sometimes have a more passive role and outsource their input to the experienced participants (Interviewee 2, 2021; interviewee 7, 2021).

The project group is organised to enable an efficient, high-pace process (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). Therefore, the project group is small with 5 participants, who have been selected based on their extensive expertise with sustainable procurement. This makes the group process easy to manage and allows for efficient decision-making, while still getting sufficient input and expertise process (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). This composition of participants in the group might change in the next phase of the buyer group, if other expertise is required (Interviewee 2, 2021). However, having five group members is considered the minimum, as it is prone to cancelling participants and might lack diversity among clients (Interviewee 2, 2021; Interviewee 11, 2021). Furthermore, the group meetings are relatively high-frequent with plenary sessions every two weeks to keep a high rate of progress. In between, the coordinator prepares the upcoming meeting with a volunteering project group member. The group tasks are rarely outsourced to hired external experts, but are mostly executed by the coordinator with individual participants taking turns (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021).

The project group is supervised by a steering group, consisting of the managers of the participants in the project group (Plan van Aanpak, personal communication, 2020; Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). This steering group is initiated to create internal mandate in their individual organisations for the buyer group, to monitor project group progress and to check whether the group output meets the set requirements (Plan van Aanpak, personal communication, 2020; Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). The latter is perceived as important in guaranteeing whether the group output aligns with the requirements of the individual clients, as the participating clients individually made progress in implementing sustainability in procurement (Interviewee 7, 2021; Interviewee 11, 2021). The individual participants aim to sustain and incorporate their individual experience and sustainability roadmap in the group output, the buyer group should thus align with their individual requirements (Interviewee 7, 2021; Interviewee 11, 2021).

#### **4.7.5 Demand harmonisation process**

The buyer group aims for economies of scale, by tendering a shared 10-year framework agreement that will be awarded to two or three suppliers (Interviewee 5, 2021; Interviewee 12, 2021). The joint tender is aimed to increase influence on sustainability, speed and affordability of industrial construction. Winning suppliers will be selected based on KPI's, used to evaluate the submissions on the mentioned objectives. Based on the framework agreement, the individual clients will conclude a contract with one of the winning suppliers for each project (Interviewee 5, 2021; Interviewee 12, 2021). The joint tender entails a long procedure, which makes the participants perceive the buyer group as a long-term solution (Interviewee 5, 2021). Therefore, a high pace group process is not considered a key objective. Clients have many similar construction projects, so no synchronisation problems are expected, the group output can be implemented at any moment (Interviewee 5, 2021).

The demand harmonisation process is considered straightforward, but outsourced due to the high workload of participants (Interviewee 5, 2021; Interviewee 12, 2021). The scope contains the whole apartment building, which is perceived as large, but necessary in the procurement of industrial construction. The participants statements of requirements (in Dutch: 'Programma van Eisen') served as input for harmonisation, which had very similar requirements due to the homogeneity of clients. A hired external expert analysed these requirements for differences, and discussed these with the participants

1-on-1. Finally, plenary discussions were held to find the argumentation behind these differences, to unanimously select the most suitable requirements. In a similar buyer group for social rented single-family houses, the group output only refers to the existing standard 'Woonstandaard' (Interviewee 5, 2021; Interviewee 12, 2021). This is regarded as a future possibility for social rented apartments too, to further stimulate increasing sustainability and speed of industrial construction with minimal effort (Interviewee 12, 2021).

The group output is functionally specified, which is considered a requisite for industrial construction (Interviewee 5, 2021; Interviewee 12, 2021). Technical specifications are regarded unsuitable for industrial construction, as a few specific technical requirements can exclude manufacturers who cannot easily change specific details of their production process (Interviewee 5, 2021; Interviewee 12, 2021).

#### **4.6.5 Demand harmonisation process**

The scope of the buyer group is intentionally made small, to enable a fast and uncomplex process (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). The buyer group only covers asphalt, without the foundation. This is the highest volume road surfacing with unique characteristics, and its high climate impact makes fast implementation of sustainability in procurement urgent. The participating clients also mainly procure asphalt, and all procure asphalt in a similar way. Furthermore, there is already basic experience in the asphalt industry with calculating the environmental impact of projects with the MKI, which allowed the buyer group to start at a high level. Making the scope wider is considered to be necessary in the future, in order to be applicable for different types of road surfacing and for public clients not procuring asphalt. However, this would now make the group process too complex, and could result in an unusable group output. Asphalt is regarded as a short-term problem, and thus needs to be addressed as soon as possible, the other types of road surfacing can wait (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021).

This focus on a quick implementation seems to be successful, as the tempo of the group is evaluated positively (Interviewee 2, 2021; interviewee 7, 2021). The project group directly started on a detailed level of criteria for tenders and contracts, while later the more general market vision and strategy were initiated. The project group has a lot of consensus on direction and output, and is considered very productive. No synchronization problems are expected, as all participants in the group are high-frequency clients and can easily select a pilot project (Interviewee 2, 2021; interviewee 7, 2021).

The harmonisation is mainly bundling the existing knowledge and practices into one 'best-practice' (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). The input for harmonisation is existing documentation both from participants and existing concepts. The decision-making is done by discussing in the group until a compromise is reached, but the participants are relatively harmonious and have a focus on keeping the feasibility high for all clients (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021).

The output of the demand harmonisation is aimed to be flexible and suitable for all external clients (Interviewee 2, 2021; interviewee 7, 2021). This is done by differentiating in three levels of ambition: creating minimum demands, awarding based on sustainability aspects, and aiming all-in for the innovators in the industry. Furthermore, the output is both technically specified to suit the smaller municipalities, and functionally specified to suit the larger clients (Interviewee 2, 2021; interviewee 7, 2021). The participating clients can also apply the three different ambition levels for different projects (Interviewee 7, 2021).



#### 4.6.6 Impact of the buyer group

The biggest challenge for the buyer group is to create and promote a standard among external, smaller clients (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). The clients participating in the buyer group already are actively implementing sustainability in their own tenders, before entering in the buyer group. However, most municipalities – with a combined market share of 50% in road surfacing – are still mostly procuring asphalt according to the thirty-year-old ‘RAW-bestedsystematiek’, without implementing any sustainability aspects. The buyer group sees it as their goal to make sustainable procurement accessible for all small clients, in order to transition the whole asphalt industry towards sustainable producing methods. This potential indirect impact is considered far greater than the direct impact of the clients in the buyer group; eventually asphalt producers might cease the production of the old unsustainable version (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021).

Although the buyer group is confident their output will be suitable for all smaller clients, the biggest uncertainty yet is how well these external clients can be reached and convinced (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). The buyer group is currently exploring three methods to stimulate diffusion among external clients. Firstly, the participants both in the project group and the piggy-backing group will be recruited as ambassadors, and use their network to convince acquainted clients. Secondly, almost the full buyer group budget is spent to hire an external communications expert. Thirdly, the group aims to implement their tender and contract documentation into nationwide standards, such as the ‘moederbestek’ and the “Kennisbank CROW”, and align the group output with other sustainability concepts as the ‘Asfaltimpuls’ and ‘BouwCirculair’; aimed to result in one coherent sustainable asphalt procurement standard amongst all clients (Interviewee 2, 2021; interviewee 7, 2021; Interviewee 11, 2021). However, individual clients still make their own decisions, and cannot be forced to use the created standard. Therefore, the indirect impact is still uncertain and depends on many factors; such as available budgets, resources, risks, and a potential lack of knowledge (Interviewee 7, 2021).

#### 4.6.7 Legal aspects

For each participating client in the project group, the responsible department director or manager signed a jointly formulated plan of approach (Plan van Aanpak, personal communication, 2020; Interviewee 2, 2021; Interviewee 7, 2021). This signature is considered to safeguard organisational commitment to the group process, as participants state they are committed to learn from the buyer group, and apply the output on at least 1 project. Its legal binding is very limited, but a more legally binding relationship is undesired, as clients are not willing to commit to a still uncertain group output (Interviewee 2, 2021; Interviewee 7, 2021).

The signed plan of approach is based on a template provided by PIANOo (Template Plan van Aanpak, personal communication, 2020). This template prescribes the suggested content for the individual plans per buyer group. The Plan of approach covers all relevant aspects of the group process: group ambitions, member composition, method of cooperation (the organisational structure of steering group, project group and piggy-backers), organisational commitment (approval from mandated managers per client), how the buyer group outputs can be implemented in pilot contracts, market consultations, openly sharing knowledge within the group, communication outside the project group, hiring external communication experts, how the available budget is spent (fully on stimulating communication), a planning and how the impact will be assessed (Plan van aanpak, personal communication, 2020).

The plan of approach has strong similarities to with the provided template, but some differences are visible that mostly are related to the uncertainty of the outcome and the influence of the participating clients on the group process (Plan van Aanpak, personal communication, 2020).

The plan of approach explicitly states it only covers the group process, not the implementation of the outputs due to the uncertainty of the outcome: “An additional approval per client is required for the execution of the tender based on the joint market vision and strategy that has yet to be formulated. After all, the consequences (e.g. in terms of costs) of this market vision and strategy that have yet to be formulated cannot yet be determined” (Plan van Aanpak, personal communication, 2020, p.2).

Furthermore, the influence of client organisations is captured in multiple ways in the document (Plan van Aanpak, personal communication, 2020). The group has established a steering group, which supervises the project group. The representatives in the project group can change per phase, as deemed suited by the mother organisations. Multiple Go-NoGo moments are scheduled in the group planning, for which all participating organisations have to give approval (Plan van Aanpak, personal communication, 2020).

The participants in the project group are very experienced with procurement laws, enabling them to prevent legal conflicts and to utilize the full available space in legislation (Interviewee 2, 2021; Interviewee 7, 2021). No legal barriers are expected, although sometimes procurement legislation hinders including very ambitious sustainability exclusion criteria and project procedures. For example, the Aspari Process Quality Improvement Assessment could help to stimulate a longer lifecycle of asphalt, but these tools likely cannot be enforced on contractors as its use is not yet verifiable. The group is more hindered by differences in individual legal preferences of organisations, with participating clients having strict legal procedures. Initially, the legal issues were checked at every project group meeting, but as this slowed the group process down too much, now only the group outputs are legally evaluated (Interviewee 2, 2021; Interviewee 7, 2021).

## 4.7 Case study 5: Social Rented Apartments

### 4.7.1 Case description

The fifth case study is the buyer group 'Social rented apartments'. This buyer group is aimed to generate economies of scale in industrially manufactured apartment buildings. The cooperating clients not only aim for price leverage, but also want to exert shared influence on manufactures regarding sustainability, delivery times and quality.

This case study is selected based on meeting the three case selection criteria. Firstly, the group is not initiated by PIANOo or Rijkswaterstaat, but by external social housing associations. This is aimed to serve as an external reference for the other four case studies. Secondly, the buyer group fits the problem statement. Its topic is in the construction sector, and it has a large scope – it includes complete apartment buildings. The group has a small size of 4 members in the project group, with participants only from housing associations. The group has reached the market demand harmonisation phase, and aims to jointly tender a framework agreement.

For this case study, two semi-structured interviews were conducted. Firstly, the coordinator of the buyer group has been interviewed who also represents a housing association. This interviewee has been closely involved with the formation and processes of the group, and takes the lead in the group process. This interviewee is expected to provide useful insights into the perspective of a social housing association on the buyer group. Secondly, a hired external expert with expertise on procurement processes and procurement cooperation has been interviewed. This interviewee is selected because its role combines both procurement expertise and a neutral, umbrella perspective on this buyer group and equivalents.

### 4.7.2 Formation

The buyer group for Social rented apartments is a pioneering coalition of motivated housing associations in the region (Interviewee 5, 2021). A director of a housing association initiated the buyer group, and reached out to other housing associations in the region. The interested clients had warm-up meetings to become familiar with the topic of conceptual buildings, and to discuss the goals and expectations for the buyer group. Based on these sessions, only the intrinsically motivated clients joined the project group (Interviewee 5, 2021). Clients unwilling or unable to put time and effort into the buyer group, could join a piggy-backing group in which they are informed and are allowed to free ride on the project group output (Interviewee 5, 2021; Interviewee 12, 2021). The combination of warm-up sessions and the ability to piggy-back has resulted in only intrinsically clients in the project group (Interviewee 5, 2021).

### **4.7.3 Participants**

The participating clients in the buyer group are all social housing associations in the same province, with highly homogeneous ambitions and requirements (Interviewee 5, 2021; Interviewee 12, 2021). These social housing associations are not bound by procurement legislation, and see each other not as competition, but as colleagues. Adding other types of clients, such as private real estate investors, is considered to add unnecessary complexity to the group process (Interviewee 5, 2021; Interviewee 12, 2021).

The organisational mandate of participants in the project group is high (Interviewee 5, 2021; Interviewee 12, 2021). All clients have specifically chosen to participate in the project group, whilst being able to free-ride in the piggy-backing group (Interviewee 5, 2021; Interviewee 12, 2021). The goal of a shared tender guarantees commitment, as participating clients want this tender to suit their individual requirements (Interviewee 5, 2021). Furthermore, most participants in the project group have a managerial function in their 'mother organisation', which is expected to help get approval on the group output. For the only participant without a management role, its organisation is very committed to industrial building construction, so managerial mandate is not considered a requisite (Interviewee 5, 2021). Having sufficient internal mandate is considered most important for the group coordinator, as this could hinder its role of steering the buyer group (Interviewee 12, 2021). However, the participating organisations are large and independent organisations, which is considered to make the approval on the group outputs uncertain (Interviewee 12, 2021). This is stimulated by keeping the individual organisations updated with presentations of the intermediate group outputs (Interviewee 5, 2021).

Participants are considered individually committed to the buyer group and motivated to expand their knowledge (Interviewee 5, 2021; Interviewee 12, 2021). Participating in the buyer group adds up to their regular tasks, which is also considered to be a long-term project. As a result, participants often have to give priority to (short-term) organisational emergencies, causing them to skip individual tasks or group meetings. In order to reduce the workload for the group, the group work is mostly outsourced to hired external experts in supervision by the group coordinator. Although the participants are perceived as highly experienced in procurement, their knowledge of industrial buildings is limited. Industrial buildings are considered a relatively new field of expertise, and participants are eager to increase their knowledge in this area (Interviewee 5, 2021; Interviewee 12, 2021).

### **4.7.4 Organisational structure**

The project group is informal and decentralised, with all four participating clients having equal influence (Interviewee 5, 2021; Interviewee 12, 2021). The organisational structure is perceived as organic, with individual member input changing per meeting based on active participants are. The project group has a short meeting of sixty minutes every two weeks, while the group work is done outside the plenary meetings by the coordinator and hired external participants. The piggy-backing also has four members, but these have zero influence on the output or process of the project group (Interviewee 5, 2021; Interviewee 12, 2021).

The coordinator has an important role in safeguarding the group process and keeping the other participants involved and motivated (Interviewee 5, 2021; Interviewee 12, 2021). In a similar buyer group, a coordinator with insufficient input and vision limited the group progress, after which the coordinator was replaced with another employee of the same client (Interviewee 12, 2021).

#### **4.7.6 Impact of the buyer group**

In contrast to the other case studies, this buyer group is not aimed to convince external buyers, but specifically focuses on direct impact (Interviewee 5, 2021; Interviewee 12, 2021). Consulting external buyers is thus no key objective of the buyer group, but it could increase the group impact on the market. This is also considered the biggest profit of the piggy-backing group, to make the shared tender more interesting for suppliers and increase competition. In addition, housing associations are generally willing to support each other, and therefore in the tender documents specifically mention the possibility for other housing associations to join the framework agreement – although this will not create more leverage at the moment of procurement (Interviewee 5, 2021; Interviewee 12, 2021). The current size of the 10-year framework agreement is expected to have a total volume larger than 400 million euro, which is considered sufficient to be able to influence suppliers and prices (Interviewee 12, 2021).

#### **4.7.7 Legal aspects**

The participating clients in the buyer group did not sign a legal agreement or covenant (Interviewee 5, 2021; Interviewee 12, 2021). This lack of a covenant means it cannot be guaranteed that the group members will remain in the buyer group and participate in the shared tender (Interviewee 12, 2021). However, the shared tender – that will be signed and approved by all participants – is expected to provide enough incentive and commitment for group members, a covenant is thus considered unnecessary (Interviewee 5, 2021).

No legal barriers are expected, as the participants are not subject to (European) procurement legislation for public clients (Interviewee 5, 2021; Interviewee 12, 2021). However, the participating clients aim to stimulate competition among suppliers, and thus follow transparent and objective procedures (Interviewee 12, 2021). Moreover, the clients are unwilling to deceive or discriminate suppliers, and thus the group principles can be seen as similar to public procurement legislation. The clients are mostly unwilling to give up their freedom of choice and their independence, e.g. to keep the possibility for other housing associations to join the framework agreement after the tender (Interviewee 12, 2021).

# 5.0 Cross-case analysis

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## 5.0 Cross-case analysis

This chapter provides clients with a cross-case analysis on how the cooperation and processes of demand harmonisation within buyer groups are organised. The chapter answers the following research question:

2. How can (semi-) public clients successfully cooperate and harmonise demand within buyer groups?

In order to answer this research question, six sub-questions are answered. This covers the following topics: formation of the buyer groups, participants, organisational structure, the process of demand harmonisation, the impact of the group and legal aspects of buyer cooperation.

The cross-case analysis is conducted among all five case studies. This cross-case analysis is used to distil the findings of the individual case studies into coherent and compact findings, generally applicable to all investigated groups. These findings are input for preliminary best practices (as visualised in Figure 12), which are formulated in chapter 6.

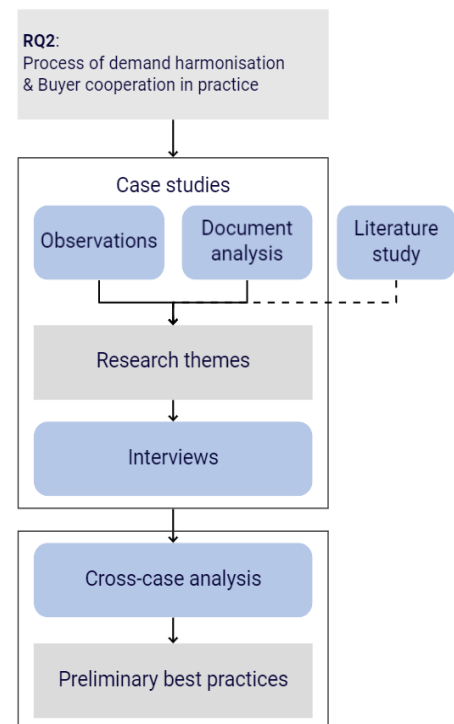


Figure 12: Positioning cross-case analysis

The chapter is divided into six paragraphs, that each addresses one of the six sub-questions:

- 2.A Formation: How can buyer groups successfully recruit and select participants?
- 2.B Participants: What different types of participants exist within buyer groups, and what are differences among these participants, regarding drivers to participate, commitment, mandate and experience?
- 2.C Organisational structure: What forms of cooperation within buyer groups are used in practice, and how are their processes organised?
- 2.D Demand harmonisation: How can buyer groups successfully organise the demand harmonisation process?
- 2.E Impact: How can the (direct and indirect) impact of the buyer groups be calculated and maximised?
- 2.F Legal: How do cooperating buyers select a legal relationship?  
What legal aspects influence the buyer cooperation, and how is dealt with legal obstacles?

## 5.1 Formation of the buyer group (RQ2-A)

This first section of the cross-case analysis answers the sub question: How can buyer groups successfully recruit and select participants?

### 5.1.1 Recruiting participants (RQ2-A1)

For all cases, the recruitment of participants for the buyer group is done by a single person (Interviewee 13, 2021). This can either be a bottom-up approach by an ambitious client reaching out to its contacts and colleagues (Case 3, 4, 5), or an appointed coordinator in a more top-down approach (Case 1, 2). The top-down approach of recruiting participants is prone to result in a relatively long recruitment period (Case 1, 2; Rebel, Personal Communication, December 9, 2020). On the other hand, the bottom-up approach is likely to result in a group of participants that already experienced with implementing sustainability aspects in procurement and have their own organisational sustainability strategy (Case 3, 4). These participants mostly join the buyer groups to share their experience and generally have above-average input in the group, as they often want to maintain their own sustainability strategy, which makes them less flexible or influenceable by the buyer group (Case 3, 4). This is covered in more detail under research question 2B.

Existing client networks and sustainability concepts can be a good starting point to recruit participants, as this allows for a quicker recruitment period and a shorter introductory period (Case 1, 4; Interviewee 13, 2021; TwynstraGudde, Personal Communication, March 5, 2020; Rebel, Personal Communication, December 9, 2020). When starting recruitment from scratch, this can result in a longer process to recruit participants and create familiarity (Case 2, 5; Rebel, Personal Communication, December 9, 2020). However, when establishing a buyer group based on an existing network or concept – such as the Transitiepad from Rijkswaterstaat – it is important to define clear, distinctive boundaries for the buyer group, and actively align and coordinate both groups (Case 3, 4). Overlapping scopes, a lack of alignment or communication with the Transitiepad could potentially result in delays, loss of member commitment or double work (Case 3). When the buyer group has its own clearly defined scope, which is actively aligned with the related Transitiepad, these conflicts can be prevented (Case 4).

The recruitment and selection of participants often later has an influence on the process of the group. Selecting a small group of homogenous and experienced participants, likely results in a fast and efficient group process, with straightforward harmonisation (Case 4, 5). Recruiting a diverse group of participants, is considered to result in very complete and widely applicable outputs, and expected to stimulate diffusion among external clients (Case 2, 3). Establishing a large project group is considered to help with continuity (Case 2, 3), and to compensate for inexperienced participants by combining everyone's individual knowledge into a complete whole (Case 1, 3). However, large project groups can also slow down the process and decision-making (Case 2, 3). In large groups, individual participants rarely execute group tasks, but these are often outsourced to hired experts or done by a dedicated committee within the project group (Case 1, 2, 3). This influence of the selection of participants on the process of the group, should be considered during the recruitment of new groups.



### 5.1.2 Selection of participants (RQ2-A2)

Once having a group of potential participants, it is positively evaluated to organise warm-up sessions (Case 1, 2, 5; Rebel, Personal Communication, December 9, 2020). These warm-up sessions are aimed to discuss ambitions and expectations for the buyer group, to probe the intrinsic motivation, available time, organisational mandate and available resources of the potential participants, and to provide participants with the voluntary choice on whether and how to participate in the buyer group. Based on these warm-up sessions, the buyer group can be established with motivated participants, who have matching ambitions for the buyer group and sufficient organisational mandate (Case 1, 2, 5; Rebel, Personal Communication, December 9, 2020).

Intrinsic motivation is considered a key requirement for participants; as “the group process is considered difficult enough, so we did not persuade participants to join [without intrinsic motivation]” (Interviewee 9, 2021). In order to achieve this, all case studies focus on the voluntary nature of participation and always allow participants to leave the buyer group. When joining the buyer groups, all participants were given the possibility to choose their own role in the group, either actively contributing or piggy-backing (TwynstraGudde, Personal Communication, March 5, 2020; Rebel, Personal Communication, December 9, 2020). Potential participants were never fully excluded from the buyer groups, but always provided the possibility to piggy-back (TwynstraGudde, Personal Communication, March 5, 2020).

Providing potential participants to choose their own role in the buyer group, is evaluated positively (Case 1, 2, 3, 5). In these cases, letting participants voluntarily select their role mostly resulted in an overall motivated group and a feasible workload for each participant. Therefore, in order to stimulate intrinsic motivation, it is suggested that (potential) participants are able to choose their role in the buyer group.

In some groups, the project group was frozen during certain phases in order to maintain progress, whilst potential participants were still provided with the option to join the piggy-backing group (Case 1, 4). Cases that do not freeze the project group during certain phases of the process are prone to lose momentum, as new participants need to be brought up to speed (Case 2, 3). Therefore, it is suggested to freeze participation to the project group during certain phases of the process.

## 5.2 Participants (RQ2-B)

This second section analyses the different types of participants within buyer groups, and the differences among these participants, regarding drivers to participate, commitment, mandate and experience.

### 5.2.1 Types of participants (RQ2-B1)

Generally, three types of participants can be identified in the buyer groups: public clients, private clients and knowledge partners (TwynstraGudde, Personal Communication, March 5, 2020). These three participant types will be covered below.

#### Public clients

The public clients can be divided into three categories: national governmental organisations such as Rijkswaterstaat and Rijksvastgoedbedrijf (Case 2, 3, 4); decentral governments such as provinces, municipalities and water authorities (Case 1, 2, 3, 4); or non-governmental public clients such as schools (Case 1).

Firstly, the national governmental organisations are considered to be very formally committed to the 2030 sustainability goals as formulated by the national government, likely due to the close relation with ministries (Case 3, 4). These are large high-frequency buyers, that are already experienced with implementing sustainability aspects in procurement and have their own organisational sustainability strategy. They mostly join the buyer groups to share their experience with other clients in order to make their market approach more effective, and therefore generally have above-average input in the group. However, they often want to maintain their own sustainability strategy, which makes them less flexible or influenceable by the buyer group (Case 3, 4).

Secondly, the decentral governments participating in the buyer groups are considered the most ambitious and experienced among their peers in terms of sustainability (Case 2, 3, 4). In general, the provinces are considered the most experienced, followed by water authorities, while municipalities are perceived as the most inexperienced (Case 2, 3, 4). These decentral governments are considered top-down obligated to implement sustainability in procurement by the National governmental goals for 2030 and 2050 (Case 2, 3). This often results in a lack of an integral uniform strategy and ambition for sustainability within the client organisations, with insufficient communication between the separate departments Procurement, Strategy, and Project Management & Maintenance (Case 2, 3). While the participating decentral governments are considered motivated, it is generally seen as a major challenge to involve and convince the external clients – which is considered crucial for maximising indirect impact (Case 1, 2, 4).

Thirdly, the non-governmental public clients – such as schools – are differentiated in ambitions and limited in expertise (Case 1). These public clients are funded with public money, but not directly linked to a (decentral) government. They are regarded as non-homogeneous and looking for customisation, while being limited in their sustainability ambitions by the availability of public funding. Harmonisation among these clients is perceived as difficult (Case 1).

#### Private (and semi-public) clients

The private clients joined in the buyer groups are either social housing associations (Case 2, 5) and private real estate investors (Case 2). These two types have a similar role of operating a large real estate portfolio of rented properties, mostly housing. This large real estate portfolio enables a large potential direct impact, as these clients own or exploit thousands of real estate properties. These clients are seen as confident and experimental, although often having a limited possibility to take risks. The private clients have a limited amount of available time, and thus are mostly interested in concrete processes and outputs, not in abstract brainstorming sessions. As a result, they are more likely to give

organisational emergencies priority over the buyer groups, causing more absences. For private clients, implementing sustainability is always coupled with making a financially solid business case, limiting their sustainability ambitions by a focus on financial feasibility (Case 2, 5).

#### Knowledge partners

In most buyer groups knowledge partners joined, either voluntarily (Case 3) or hired for their expertise (Case 1, 2, 5). These knowledge partners actively support the buyer groups with their expertise and help diffuse the outputs generated by the groups. Mostly the large groups with inexperienced participants hire these experts, both to supplement group expertise and reduce the workload (Case 1, 2). The experts never procure themselves, but are experienced in assisting procurement processes. This gives the experts a neutral perspective, and a key role in the demand harmonisation process (Case 1, 2, 5).

### 5.2.2 Differences among participants (RQ2-B2)

The participants not only differ in their type of organisation, but also differ in commitment, drivers to participate, mandate and experience. These differences are explained below.

#### Drivers to participate

Despite potential differences, all participants generally have one key driver in common: the ambition to contribute to the transition towards a sustainable future (Case 1, 2, 3). This shared ambition creates bonding among the participants, as they are often the most motivated among their peers (Case 2, 3).

First, this ambition of participants can either be bottom-up or top-down. This could potentially result in conflicts, and should be taken into consideration during the group process.

Firstly, the most bottom-up motivated are the private clients, as they are not legally obligated to implement sustainability – but joined the buyer group fully voluntary (Case 3, 5). These are followed by the non-governmental public clients such as schools, which all also voluntarily joined in a buyer group, based on a bottom-up motivation (Case 1). As the sustainability ambitions of these bottom-up motivated participants are often limited by financial considerations, buyer groups aimed at these participants should give extra attention to the financial feasibility of outputs.

Second, a more top-down approach can be found in decentral governments and national governmental organisations. The decentral governments such as municipalities and water authorities, are considered top-down obligated to implement sustainability in their tenders, and sometimes lack an individual organisational strategy and vision for implementing these goals (Case 2, 3, 4). These clients often need help in creating organisational mandate and diffusing group outputs in their organisation.

Last, the national governmental organisations such as Rijkswaterstaat, are committed mostly very formally to implementing the sustainability measures due to their close connection to the national government, and have elaborated sustainability strategies incorporated in their organisation (Case 3, 4). Buyer groups with these clients should be aware these existing strategies do not dominate the group.

Therefore, it is suggested to combine these different clients in the buyer groups, because these different participants are representative of different groups of clients, and all have unique experience, ambition and perspectives.

#### Available expertise

All buyer groups are considered to have sufficient combined expertise in their project group, but the level of expertise of individual participants differs significantly. An important distinction can be made of participant that joined to share knowledge or to gain knowledge (Case 1, 4). In general, the larger the client, the more expertise it has: the most experienced public clients are considered Rijkswaterstaat, the larger provinces and the larger municipalities (Case 2, 3, 4). These clients already have extensive experience and knowledge on sustainable procurement, and joined the buyer groups to diffuse their knowledge towards other (smaller) clients. The experienced clients often are committed to their individual sustainability strategy, and are perceived as less flexible or influenceable by the buyer group (Case 3, 4). The smaller clients often joined a buyer group to be facilitated and to learn in sustainable procurement (Case 1, 3, 4).

Generally, inexperienced clients have less influence in the group than experienced clients, but this is not perceived as a problem (Case 1, 3, 4). Buyer groups consisting of mostly inexperienced clients, are often larger and hire external experts to guarantee sufficient expertise in the group (Case 1, 2). Diversity in the experience of participants is considered to make the group outputs more complete and applicable, as this enables to tailor the group outputs to both experienced and inexperienced clients (Case 1, 4).

### Organisational mandate (“interne borging”)

For most buyer groups, the mandate of individual organisations is considered uncertain and still needs active stimulation (Case 2, 3 4). In most cases, only participation in the group process is mandated – often by signing a covenant (Case 1, 2, 4), but the outputs will need separate approval (Case 3, 4, 5). Client organisations are hesitant to pre-approve these outputs, as the content and consequences of these outputs are still unknown (Case 3, 4). Moreover, some participants in the buyer group often feel limited in their ambitions due to a lack of organisational mandate (Case 2).

However, organisational approval on the group outputs is crucial in order to implement the group outputs in the individual organisations. In order to stimulate getting this approval, buyer groups can take multiple measures to stimulate the organisational mandate for the group outputs. In most groups, participants actively inform their mother-organisation by giving presentations and sharing the intermediate outputs, which should prevent potential conflicts between the client organisations and the group process (Case 1, 2, 4, 5). Sometimes a separate steering group is established, which supervises the group process and aligns the group outputs with the organisational requirements (Case 3, 4). In one case, the majority of participants have a management function in their organisation, which increases mandate (Case 5). In another case, the public clients are requested to participate in the group with employees from three departments: project management, procurement and strategy (Case 2). These employees are expected to internally collaborate, in order to accelerate the organisational transition by combining the input of these three departments and diffusing group outputs among them (Case 2).

Therefore, because the organisational approval is required to eventually implement the group outputs, it is suggested participants actively stimulate their organisational mandate by all mentioned measures – until the organisational mandate has reached a sufficient level of certainty.

### Commitment

In all cases, the workload and available time of participants is considered a major challenge. Although all participants have the ambition to contribute to the transition towards a sustainable future, their commitment is often limited by their existing workload. Surprisingly, all cases also report a satisfactory attendance and commitment of participants to the buyer group. This is stimulated in three different ways among the cases, which are elaborated below.

First, the commitment of participants is stimulated by keeping participation in the project group completely voluntary. In all cases, potential participants were given the possibility to choose their own role in the group, either actively contributing or piggy-backing (TwynstraGudde, Personal Communication, March 5, 2020; Rebel, Personal Communication, December 9, 2020). Letting participants voluntarily select their role mostly resulted in an overall motivated group and a feasible workload for each participant (Case 1, 2, 3, 5). Furthermore, participants can vary in their input per meeting, based on their available time (Case 1, 2, 5), skip meetings without hindering the group process (Case 3), or even pause their membership of the project group (Case 1, 2).

Moreover, in order to reduce the workload of participants, some group tasks are outsourced to hired external experts (Case 1, 2, 5). These hired experts create and write proposals for the group output and harmonise the demand of participants. As a result, the participants in the group only need to evaluate and approve the proposed outputs (Case 1, 2, 5).

Lastly, some group coordinators actively aim to keep the group process relevant for participants to stimulate commitment (Case 2, 3). More abstract meetings such as brainstorm sessions, can cause lower attendance among participants (Case 2), which was restored once the group started working on concrete outputs. When individual participants feel their input is important and influences the outcome of the buyer group, they are more likely to actively contribute to the group process (Case 3, 4).

### 5.3 Organisational structure (RQ2-C)

This third section of the cross-case analysis aims to answer the sub question: What forms of cooperation within buyer groups are used in practice, and how are their processes organised?

The organisational structures of all buyer groups have in common that participants are given a certain role – based on experience, the possibility of providing a pilot project, and the desired input of the client (TwynstraGudde, Personal Communication, March 5, 2020; Rebel, Personal Communication, December 9, 2020). This division in roles is enabled by making three different groups of clients; which are called the ‘kerngroep’ (project group), the first ‘schil’ (piggy-backing group) and second ‘schil’ (TwynstraGudde, Personal Communication, March 5, 2020). Providing potential participants to choose their own role in the buyer group, is evaluated positively (Case 1, 2, 3, 5). In these cases, letting participants voluntarily select their role mostly resulted in an overall motivated group and a feasible workload for each participant.

However, the implementation of this structure is different for each buyer group. With large and diverse project groups, the added value of the piggy-backing group is considered limited (Case 1, 2). In one case, no piggy-backing group was established, but all different types of clients were represented in the project group – while establishing a consultation group for market parties and branch organisations (Case 3). However, this large project group size resulted in many different visions, making it prone to slow decision-making and slow group progress. This inertia was tackled by establishing committees within the project group to execute group tasks, which could be considered similar to the ‘standard’ organisational structure (Case 3). The remaining two cases both have a relatively small and dominant project group, with the piggy-backing groups mostly used for maximising the group impact (Case 4, 5). Most buyer groups do not use the secondary piggy-backing group, but rather organise separate consultation sessions (Case 1, 3, 4, 5).

Despite these different implementations, three distinctive roles of participants can be established among the different cases. First, participants that are actively involved in executing group tasks, and joined to share knowledge from own experience (Case 3, 4). Second, participants that joined the group to learn from the experienced participants, and involved to discuss and evaluate group outputs with a limited workload (Case 1, 2, 3, 4). Third, participants who stay informed on the group process, and piggy-back on the buyer group process, without having input in the group process unless specifically asked (Case 1, 5). In some groups, participants are able to ‘pause’ their active contribution or dynamically switch roles between active participation or piggy-backing (Case 1, 2).

#### Project group size

Regarding the organisational structure, a distinction can be made between large project groups and small project groups. In the large project groups, most of the group tasks are outsourced to external experts (Case 1, 2) or dedicated committees (Case 3). The large groups all have very diverse clients, and thus representing more clients, which is considered to make the group output more complete and applicable for more clients (Case 1, 2, 3). In these cases, this also results in a longer and more complex harmonisation process. Furthermore, the large size of the project groups guarantees continuity, the individual attendance might be low, but this does not hinder the group process as this is compensated by the other clients (Case 1, 2, 3).

The participants in a small project group actively execute group tasks (Case 4). In the smaller project groups, clients are also very homogeneous and experienced, which allows for an efficient harmonisation process (Case 4, 5). However, this size also makes it more prone to omissions and smaller applicability – as the perspective of other clients might be omitted. Furthermore, the small group size makes it more prone to cancelling participants, as individual absence has a significant impact on the group process (Case 4, 5).

### Member influence

In all cases, the participants of the project group on paper have equal input in the group process. However, in practice the input of participants correlates with their experience, with experienced clients providing more input in the group process (Case 2, 3, 4). However, in these cases this unequal input is not considered a negative aspect, as the inexperienced clients are mostly content with learning from in the background. In groups with many inexperienced clients, the group process is outsourced to external experts (Case 1, 2).

The role of the coordinator also is different based on the level of participant expertise. In project groups with mostly inexperienced clients, the coordinator is more influential and steering (Case 1, 2). In these groups, the coordinator keeps the participants motivated, individually collect their input, steers on progress and painting the dot on the horizon. In project groups consisting of mostly experienced clients, the coordinator has a more neutral role of facilitating the group process (Case 3, 4).

In groups where participating clients have already committed to their individual sustainability strategies, a steering committee is established (Case 3, 4). In these cases, the steering committee – consisting of the managers of the members of the project group – supervise the project group, and guarantee alignment with the organisational strategy and potentially overlapping networks, such as the Transitiepad. These steering groups are mostly initiated in buyer groups with participants that are less flexible or influenceable by the buyer group (Case 3, 4).

### Intensity of communication

The frequency of the group sessions is in all cases considered balancing between the desired group pace and available workload of participants. Most groups organise a meeting roughly every four weeks (Case 1, 2, 3). Groups aiming for a high-speed group process organise a meeting every two weeks (Case 4, 5). In one case, the group meetings are more frequently clustered around important moments (Case 1). In between these meetings, the coordinator prepares the upcoming meeting either with a volunteering project group member (Case 4), or with the hired experts (Case 1, 2, 5), or with the established committee (Case 3).

## 5.4 Demand harmonisation process (RQ2-D)

This fourth section of the cross-case analysis aims to answer the sub question: How can buyer groups successfully organise the demand harmonisation process?

### Aimed output

The aimed output of the demand harmonisation differs per group. Among the case studies, four different output objectives can be established. These four are covered below.

Firstly, two case studies aim to establish economies of process by creating a universal procurement strategy (Case 2, 4). Both groups start by making a procurement strategy for specific product categories – asphalt, boilers and kitchens. In the future, the groups will research whether it is possible to make this procurement strategy generally applicable to other product categories – but this is not considered an urgent group priority (Case 2, 4).

Secondly, case study 3 aims for a comparable output, but mainly focuses on the pace of transition with a ‘Roadmap to 2030’. The group has no focus on specific product categories, but aims to first resolve existing limitations, such as the lack of equipment supply and the lack of charging points on construction sites, which are seen as prerequisites for the transition. The participants jointly agree on how they will incrementally increase their demand for zero-emission construction equipment (Case 3).

Thirdly, case study 1 aims to establish an ‘ambition framework’ in which all input of individual participants is accumulatively added. No harmonisation is done, as it is regarded impossible to create a universal procurement strategy due to the very different preferences of the participating clients. Instead, the individual preferences are bundled into the ambition framework, in which the eventual end-user can make its own selection of topics to address and ambition levels for these topics (Case 1).

Fourthly, case 5 is unique in aiming for economies of scale with a joint procurement procedure. In this case, the buyer group jointly tenders a 10-year framework agreement, for which they have to establish shared requirements. The harmonisation here is thus more extensive, as the individual clients will be buying the same procured items (Case 5).

### Scope of harmonisation

The topic of the procured item can generally vary in two variables. Firstly, the size of the scope of the group can either be very large or small. A large scope can contain all construction equipment (Case 3), a complete school and schoolyard (Case 1), or a complete social rented apartment (Case 5). A small scope can focus only on asphalt (Case 4) or on specific construction product categories (Case 2). Secondly, the items that will eventually will be procured, significantly differ in complexity. Highly complex topics can be very distinctive product categories, such as boilers and kitchens (Case 2), a complete school and schoolyard – with very different ambition topics as health and circularity (case 1), or asphalt with its specific characteristics (Case 4). Uncomplex topics are considered construction equipment – as the actual implementation will be done by market parties (Case 3), or the social rented apartments – which are already very standardised and matured (Case 5).

The harmonisation is perceived as extremely difficult if the group scope is both large and complex (Case 5). Therefore, it is suggested to either focus on an uncomplex product (Case 3, 5), or to make the group scope small if the procured item is complex (Case 2, 4). In the case of both a large and complex scope, the demand harmonisation was deemed impossible and dropped (Case 1).

### Process of harmonisation

In all cases, the harmonisation is done by exploring and discussing available options, until a shared consensus is reached. In this process, often the more experienced participants have a prominent role (Case 1, 2, 3, 4). This process is often partly outsourced to external experts, who have a high level of expertise, a neutral perspective and help reduce the group workload (Case 1, 2, 5).



Whenever reaching a shared consensus is difficult, the groups often split their output into multiple levels of ambition (Case 1, 2, 4). This is perceived to both provide inexperienced clients with an accessible level to directly implement in their procurement, whilst also providing alternatives for more ambitious clients. In the case where the harmonisation was deemed impossible, all different ambitions were combined without making a selection, but all provided as a possibility for the eventual end-user (Case 1).

The feasibility of harmonisation is also strongly influenced by the willingness of clients to make concessions. In groups where clients are strongly aiming for customisation and specific branding, reaching a shared agreement is difficult (Case 1). In groups where the eventually procured items are not subject to personal preferences, the harmonisation is more straightforward (Case 3, 5). For example, in case of zero-emission construction equipment, the specific branding of the equipment is regarded as irrelevant – as long as the machinery does not emit greenhouse gasses (Case 3).

Furthermore, in groups with clients whose sustainability ambitions are limited by financial considerations – e.g. private real estate investors and schools – harmonisation is generally more difficult (Case 1, 2). These clients are likely to have different financial business cases, and harmonising the demand thus has an additional focus on the financial feasibility of different option. This additional focus on financial feasibility is expected to make the harmonisation more complex (Case 1, 2), or prohibits focussing on all different sustainability aspects (Case 1).

To increase process efficiency, in all cases existing documents of individual participants or existing standards are used as input for this harmonisation (Case 1, 3, 4, 5). Groups are hesitant to write new documents, as already a lot of information is available – and generally there is a need for a clear overview in this information overflow. Using the existing documentation as input, is considered to make the harmonisation process straightforward and less complex (Case 1, 3, 4, 5). New documentation is often only be written to fill the omissions in existing documentation (Case 1, 4). In most cases, the input of suppliers is only asked at specific consultation moments to evaluate specific elements of the group outputs, in order to make sure these outputs are feasible (Case 1, 4, 5). However, in underdeveloped markets suppliers and their branch organisations are actively involved and included in a dedicated consultation group, who actively share the current limitations of the market (Case 2, 3).

#### Tempo of the harmonisation process

Regarding the tempo of harmonisation, roughly three different paces can be recognised. Firstly, one buyer group is aimed to implement their outputs as quickly as possible (Case 4). This group has designed their processes to enable a high pace, as the current emissions during the production of asphalt roads is seen as an urgent problem. The project group is small, with homogenous and experienced clients. The scope of the group is small, and immediately the project group could start working on formulating tender and contract criteria (Case 4).

Secondly, the two slowest groups are both involved in an underdeveloped market, with limited supply (Case 2, 3). These groups aim to address the market in a viral approach, and start by addressing limiting bottlenecks. The completeness and applicability of group outputs are regarded as more important than the speed of the process. These groups thus take extra time to collect input from many different perspectives, both clients and suppliers. These groups also allow new participants to enter the project group, despite this slowing down the group process (Case 2, 3).

Thirdly, in between are the more average buyer groups (Case 1, 5). These cases do not have a specific focus on either speed or completeness, but aim to balance these aspects.

In one case, the speed of the group provided synchronisation problems for individual clients (Case 1). Unlike most participants in the buyer groups, this buyer group contains one-off procurers who cannot choose from different projects to implement the group outputs. Solving this was not considered a priority, as the group process already was rather complex. Moreover, the clients aiming for a faster group process used the intermediate outputs of the group in their procurement process, which helped increase the quality of the final outputs by immediate testing and feedback (Case 1).

## 5.5 Impact of the group (RQ2-E)

This fifth section of the cross-case analysis answers the sub question: How can the (direct and indirect) impact of the buyer groups be calculated and maximised?

Buyer groups can make impact both directly with the participating buyers implementing the group output in their procurement processes, and indirectly by convincing external clients to implement the group outputs. As mentioned in the problem statement, measuring the specific impact is a challenge for currently existing MVI-concepts – and thus can be used as indicator for the successfulness of buyer groups.

### Calculating impact

The direct impact can be calculated by establishing the difference between the current market standard and the aimed goal of the buyer group (RIVM, 2020). This difference can be expressed in the amount of reduction of material consumption and greenhouse gas emission, for all items procured by group participants based on the buyer group outputs. Therefore, the direct impact becomes larger when the established group output is much more sustainable than the market standard, and when larger quantities are procured by participants based on the buyer group output (RIVM, 2020).

However, calculating this impact is considered a major struggle among most buyer groups (Case 1, 2, 3; Rebel, Personal Communication, December 9, 2020). The provided calculating method is considered not directly applicable in most cases (Case 1, 2, 3; Rebel, Personal Communication, December 9, 2020). Some buyer groups have a large scope focus on multiple aspects – e.g. health, wellbeing, climate adaptation; which are hard to quantify and thus need a different calculation method (Case 1, 3). For buyer groups without an established minimum, it is unclear to what degree the participants will individually implement the group outputs (Case 1, 2, 4). In one case, the short-term direct impact is even considered irrelevant, as this group is focussed on the long-term indirect impact of creating a transition in the whole industry (Case 3).

Moreover, calculating the indirect impact is even a larger struggle. This indirect impact is highly uncertain, as it is not only based on the applicability of the group outputs, but mostly on the willingness and uptake of external clients. This amplifies the struggles for calculating the direct impact, as the indirect impact depends on even more uncertain factors. For group outputs without an established minimum, the eventual implementation in external clients cannot be predicted (Case 1, 2), and thus no reliable prediction of indirect impact can be provided.

### Maximising the impact

Among the different buyer groups, multiple measures are taken to maximise the direct impact. Most groups aim to enhance the applicability of the group outputs, by creating multiple levels of ambition (Case 1, 2, 4). These different levels of ambition are expected to both provide inexperienced clients with an accessible level to directly implement in their procurement, whilst also providing alternatives for more ambitious clients. Furthermore, clients can apply these different levels of ambition on different individual projects, which in principle makes the group outputs applicable to all organisational projects (Case 4). To further increase the applicability of group outputs, often multiple versions are made for different clients, tender procedures and contracts, to remove any potential objections (Case 1, 4).

Furthermore, to make sure all individual participants will not back out of their ambitions based on organisational bottlenecks, buyer groups can establish a feasible minimum to be applied by participants – the so-called ‘no-regret’ ambition level (Case 4). In another buyer group, the focus is on resolving multiple restrictions before clients can start a large scale implementation (Case 3). This group aims to address these limitations as soon as possible, e.g. a lack of sustainable energy charging points at construction sites, by rewarding the early market suppliers with a competitive advantage (Case 3).

Lastly, one buyer group has included private clients to enhance the direct impact, as these real estate investors jointly have an enormous portfolio of real estate (Case 2). Involving these private clients means creating much larger quantities.

More importantly, all buyer groups focus on maximising their indirect impact, which can be stimulated in multiple ways. Among all cases, communication to external clients is considered the most important factor in convincing them to implement the buyer group outputs in their procurement (Case 1, 2, 3, 4). To stimulate this communication, buyer groups can hire an external communications expert (Case 4), and give presentations or publish papers (Case 1). In addition, the buyer group participants can be educated and commissioned to function as ambassadors (Case 2, 4). These ambassadors can reach out to their own network and peers, and convince them to use the group outputs by presenting themselves as an example (Case 2, 4). Some groups aim to imbed their created outputs in existing nation-wide standards (Case 3, 4). These standards are used by many clients – embedding group outputs here thus could potentially reach all these clients at once. Furthermore, to help small inexperienced clients, the group outputs can be made fully ready-to-use and with an included argumentation – and can thus be implemented by any client (Case 4).

Moreover, for maximising the indirect impact, many measures for maximising direct impact can be seen as preconditions. In order to be applicable for most external clients, creating different levels of ambition are important (Case 1, 2, 4), whilst being applicable for any contract or tender procedure (Case 1, 4). The lack of an established minimum makes the eventual implementation level of external clients unpredictable (Case 1, 2). Lastly, resolving the restrictions is crucial before external clients can start a large scale implementation (Case 3).

## 5.6 Legal aspects (RQ2-F)

This section provides insight in how do cooperating buyers select a legal relationship, what legal aspects influence the buyer cooperation, and how is dealt with legal obstacles.

### Legal relationships

In most buyer groups, the participating clients signed a covenant, which is evaluated positively (Case 1, 2, 4). This covenant is considered a very soft legal relationship, but regarded to create organisational commitment and awareness among participants. It is considered to provide manoeuvrability and safety to discover the group process, as no penalties are formulated. In all cases, group outputs will need separate approval later. No other legal relationship is expected to improve the group process (Case 1, 2, 4).

In some cases, no covenant was signed as participants were hesitant to formalise the group process due to its uncertainty (Case 3, 5). In these cases, organisational approval will be requested for group outputs.

The (in most cases signed) plans of approach are strongly based on a Template Plan of Approach provided by PIANOo (Personal communication, 2020). This template prescribes the suggested content for the individual plans per buyer group. The template covers all relevant aspects of the group process: group ambitions, member composition, method of cooperation, organisational commitment, targeted individual pilot projects, market consultations, sharing knowledge within the group, communication outside the project group, hiring external experts, how the available budget is spent, a planning and how the impact will be assessed (Template plan van aanpak, personal communication, 2020).

The individual buyer groups have formulated their own versions of a Plan of approach, each with some differences that reflect the nature of their group. Some buyer groups focussed on uncertainty of the outcome – limiting the commitment of participating clients (Case 2, 4). Organisational commitment was highlighted in some other buyer groups (Case 2, 3). One buyer group added extra elements that mostly focus on its dilemma of harmonisation vs customisation (Case 1). Another group highlighted the influence of participating clients on the group process, with establishing a steering committee and establishing Go-NoGo moments on which all clients have to give approval (Case 4). Lastly, one buyer group focussed on the overlap and alignment with its related Transitiepad, even formulating shared goals (Case 3). No buyer group mentioned penalties or consequences of not fulfilling the covenant.

In conclusion, the cooperation in buyer groups can be stimulated by signing a covenant tailored to the nature of the group. This covenant should focus on creating organisational commitment among participants, and be signed by a department manager. In order to provide manoeuvrability and a safe place to discover, the covenant should not include penalties, as the outcomes of the group is uncertain.

### Legal boundaries

Although most legal boundaries are not yet fully investigated, public procurement law is generally perceived as only a small obstacle. In some cases, it could limit certain standardisation possibilities (Case 1), implementing certain quality inspection tools (Case 4) and freedom in selecting the most sustainable supplier (Case 1, 4). Local legislation could also provide limitations on the demand harmonisation (Case 1, 5), just like different organisational legal preferences (Case 4, 5). Due to these different organisational legal preferences, it is suggested to only check the group outputs on legal issues; as also checking the input is perceived as significantly slowing down the harmonisation process (Case 4).

However, due to the early phase of harmonisation, most legal boundaries are not yet fully investigated, and could thus arise in the future (Case 1, 2, 3). In some cases, the group outputs are mostly functionally specified, which is expected to avoid potential conflicts with procurement legislation (Case 1, 2). The participants in the project groups are often considered experienced with procurement law and tenders, and are aiming to utilize the full available space in the legislation (Case 2, 4).

## 6.0 Best practices for buyer cooperation

## 6.0 Best practices for buyer cooperation

This chapter provides clients with best practices distilled from the findings of the cross-case analysis, on how the cooperation and processes of demand harmonisation within buyer groups are organised. The chapter operationalises the answer to the following research question (which has been answered in chapter 5):

2. How can (semi-) public clients successfully cooperate and harmonise demand within buyer groups?

Based on the cross-case analysis of chapter 5, preliminary best practices have been formulated (as visualised in Figure 13). These preliminary best practices are subsequently validated by interviewing coordinators of other buyer groups (see Appendix F). These validation interviews are used to validate the applicability, completeness and comprehensibility of the best practices – as can be read in paragraph 6.1.

In order to provide a comprehensive overview of best practices for cooperation in buyer groups, the following topics are covered: formation of the buyer groups, participants, organisational structure, the process of demand harmonisation, the impact of the group and legal aspects of buyer cooperation.

The best practices are divided in three sections, that each address a phase of the buyer groups process:

### Phase 1 – Exploring cooperation

- Formation: How buyer groups can successfully recruit and select participants.
- Participants: The different types of participants that exist within buyer groups.

### Phase 2 – Establishing cooperation

- Participants: The differences among these participants, regarding drivers to participate, commitment, mandate and experience.
- Organisational structure: The forms of cooperation within buyer groups are used in practice, and how are their processes organised.
- Legal: How cooperating buyers can select a legal relationship.

### Phase 3 – Demand harmonisation process

- Demand harmonisation: How buyer groups can successfully organise the demand harmonisation process.
- Impact: How the (direct and indirect) impact of the buyer groups can be calculated and maximised.
- Legal: Legal aspects that influence the buyer cooperation, and how is dealt with legal obstacles.

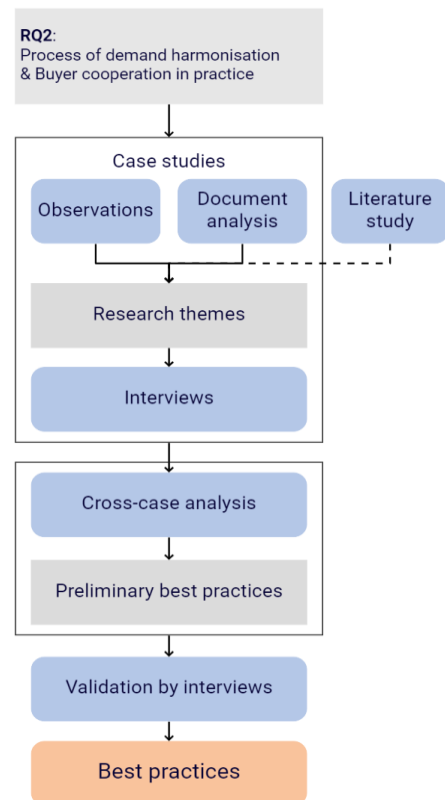


Figure 13: Input for best practices

## 6.1 Validation of the best practices

These findings of the cross-case analysis are validated by conducting two validation interviews with the coordinators of other buyer groups (see Appendix F). The two interviewees have been selected based on their buyer groups. The interviewees represent buyer groups that have already reached the harmonisation phase, and have either a large or a small scope, and focus either on the infrastructure or construction sector. This suits the original selection criteria established for the case studies (see paragraph 4.1.1).

The input of the interviewed coordinators is used to check whether the recommendations and conclusions of the cross-case analysis are also applicable to unanalysed buyer groups. These unanalysed buyer groups can be seen as the control-group for the research, without the potential interference or bias of the researcher. The interviewed coordinators are also asked whether the best-practices are complete and comprehensible.

### Validation feedback and implemented changes

Overall, the interviewed coordinators recognised the findings and recommendations of the cross-case analysis (Interviewee 17, 2021; Interviewee 18, 2021). However, both interviewees explicitly focussed on creating organisational mandate – which is subsequently emphasised in the final recommendations. Sometimes the interviewees focussed on different specific elements of findings or recommendations, without contradicting the other findings. This might be related to personal preferences or specific details of their groups, but both fit perfectly in the overall painted picture of buyer groups. The detailed feedback on the specific topics is elaborated below.

Regarding the recruiting process for the buyer groups, both interviewees recognised the top-down and bottom-up approach (Interviewee 17, 2021; Interviewee 18; 2021). One coordinator who implemented a top-down approach, opposed against the bottom-up approach, as it could potentially result in uninfluenceable groups that mostly joined for subsidy and facilitation (Interviewee 17, 2021). Both interviewees confirm that seeking connection to existing networks helps quicker recruitment and introduction, but also requires active alignment between both (Interviewee 17, 2021; Interviewee 18; 2021).

Regarding the selection of participants, both interviewees mainly focus on requiring organisational commitment, and clearly stating the group goals a priori (Interviewee 17, 2021; Interviewee 18; 2021). Both see warm-up sessions or selection interviews as necessary to test whether participants have that commitment and match the group ambitions.

Regarding types of participants and dealing with their differences, both interviewees recognised the different roles suitable for different levels of expertise, and validated the suggestion to supplement group expertise with hired experts (Interviewee 17, 2021; Interviewee 18; 2021). However, one coordinator did not recognise the statement that decentral governments are considered top-down obligated to implement sustainability which limits organisational ambition, especially not for water authorities (Interviewee 18, 2021). With the input of the other coordinator, this is rephrased into “lacking an integral uniform strategy and ambition for sustainability within the client organisations, with insufficient communication between the separate departments Procurement, Strategy and Project Management”, which was also explicitly stated in Case 2 & 3. In order to tackle this, the different departments should all be involved in the buyer group process (Interviewee 17, 2021; Case 2).

Furthermore, one coordinator was confused by the statement “Attendance and commitment of participants can be stimulated by keeping participation completely voluntary”; which is resolved by rephrasing the statement into “Attendance and commitment of participants can be stimulated by allowing participants to voluntarily choose their own role in the group” (Interviewee 18, 2021). Furthermore, the other coordinator focussed on not fully outsourcing the group process to external experts (Interviewee 17, 2021). Hiring experts should only be done to complement the group and with

a very concrete task, the focus should be on internalising this experience into the participating clients (Interviewee 17, 2021). This recommendation is included in the conclusion and recommendations, and in the suggested organisational structure.

Regarding the organisational structure, both participants endorsed the suggested changes in structure and approved the selection of the coordinator role based on the goal and participants of the group (Interviewee 17, 2021; Interviewee 18, 2021). Both interviewees recognise these interventions can stimulate group effectiveness and efficiency.

Regarding the demand harmonisation process, both coordinators approved the suggestions for functional requirements, minimum requirements, differentiating the group outputs, the scope choice, and using existing documents as input (Interviewee 17, 2021; Interviewee 18, 2021). Nevertheless, both coordinators emphasise on creating organisational commitment for the harmonisation process. Regarding this required organisational commitment, both interviewees fully agree that all participants should commit to a minimum ambition level as described in the suggestion. Furthermore, both coordinators state they first focus on creating a learning curve among participants, before creating a standard for external clients. This statement correlates with the suggested participant role of 'Learning and discussing' of inexperienced clients, which is confirmed by the interviewees stating they have groups of inexperienced clients (Interviewee 17, 2021; Interviewee 18, 2021).

Regarding the impact of the buyer groups, both interviewees recognised the suggested measures to increase both the direct and indirect impact, such as the required minimum ambition, making it readily applicable and including the elaboration for inexperienced clients (Interviewee 17, 2021; Interviewee 18; 2021). They both focus first on the direct impact, as they see it as a requisite and necessary example before approaching external clients. However, they both also see the indirect impact as the eventual end-goal, as it is considered much larger than the indirect impact (Interviewee 17, 2021; Interviewee 18; 2021). This corresponds directly with the findings and recommendations.

Regarding the legal aspects of buyer cooperation, they both agree on formulating functional requirements, and stimulating organisational commitment by signing a covenant (Interviewee 17, 2021; Interviewee 18; 2021). One coordinator strongly emphasised the need for organisational commitment for the buyer group, as he sees this as requisite for significant implementation of sustainability aspects in tender criteria of future projects – which is considered the final goal of the buyer groups (Interviewee 17, 2021).





#### Validation conclusion

In conclusion, the 2 interviewees and the 3 buyer groups they represent, perfectly fit in the established range of buyer groups, despite individual preferences, a different context, scope and topic. This confirms the applicability of the findings and recommendations of the cross-case analysis for external buyer groups. Moreover, the input of the interviewed coordinators has helped to better formulate the findings and recommendations, increasing the overall quality and comprehensibility of the output.







## 6.2 Phase 1 – Exploring cooperation






### Best practices for recruiting participants

-  Base recruitment (and selection) of participants based on the desired group process. E.g. when the goal is a high-pace project, recruit a small group of experienced clients. For a focus on completeness and continuity: recruit a large group of diverse clients.
-  A bottom-up recruitment approach (an ambitious client reaching out to its peers) is likely to result in shorter recruitment periods, than a top-down approach.
-  Recruiting from existing client networks or concepts allows for a quicker recruitment and introductory period.
-  For buyer groups based on an existing network or concept, it is important to define clear distinct boundaries a priori, and during the process actively align with the related network

### Best practices for selecting participants






-  Before selection, organise warm-up sessions with potential participants to find motivated participants who match the buyer group ambitions and have sufficient organisational mandate.
-  Intrinsic motivation of participants is crucial, which can be stimulated by voluntary joining and providing participants a voluntary choice of role within the group.
-  Provide (potential) participants the possibility to choose their role in the buyer group, in order to get a motivated group and a feasible workload for each participant
-  Freeze participation to the project group during certain phases of the process, to maintain momentum.

### Best practices for different participants






-  Roughly 4 different types of clients exist in buyer groups. It is pay suggested to pay attention to these differences and their influence on the group process.
-  National governmental organisations are already experienced with implementing sustainability aspects in procurement and are committed to their own organisational sustainability strategy – limiting the influence of the Buyer group on these clients.
-  Decentral governments are considered top-down obligated to implement sustainability in procurement. This can result in the lack of a uniform integral strategy and ambition within these client organisations regarding sustainability, with insufficient alignment between the separate departments of Procurement, Strategy and Project Management.
-  Non-governmental public clients – such as schools – are differentiated in ambitions and limited in expertise, have limited funding and focus on customisation.
-  Participating semi-public (and private) clients are bottom-up motivated, and have a large potential impact. Implementing sustainability is always coupled with making a financially solid business case, limiting their sustainability ambitions by a primary focus on financial feasibility.

## 6.3 Phase 2 – Establishing cooperation

### Best practices for dealing with differences

-  Participants are often bonded by their shared ambition to contribute to the transition towards a sustainable future. It is suggested to combine both clients with a top-down and bottom-up ambition.
-  Expertise differs per organisation, larger (national-governmental) organisations often are more experienced, often join a buyer group to share knowledge, and thus are considered less influenceable by the buyer group.
-  The level of expertise in a buyer group can be stimulated by making a large project group of inexperienced clients, selecting the (larger) experienced clients, and hiring external experts.
-  Organisational mandate is considered crucial, and can be stimulated by actively informing the client organisations on group progress, creating a steering group, selecting participants with a management function, and establishing representation from the department: project management, procurement and strategy.
-  Attendance and commitment of participants can be stimulated by allowing participants to voluntarily choose their own role in the group, or reducing the workload by outsourcing tasks to hired experts, and making the group process concrete and relevant.

### Best practices for organisational structure

-  In order to complement expertise and available workload, participants can be provided three roles: contributing and experienced, learning and discussing, or piggy-backing without effort.
-  Project groups differ in size: making a group larger usually results in having more differentiated clients, making the group output more complete and widely applicable, and enabling continuity in the group process. However, this also results in a longer and more complex harmonisation process.
-  Experienced clients have more input in the buyer groups. Groups with mostly experienced clients generally require a coordinator with a neutral role and a steering group to align organisational strategies.
-  Groups with mostly inexperienced clients often outsource group tasks to hired external experts, and require a more influential and visionary role of the coordinator.
-  The meeting frequency can be based on the desired group pace and available workload, but normally is once every four weeks, or every two weeks for a high-pace process.

### Suggested organisational structure

As the suggested organisational structure is rarely fully used, a change in the organisational structure is suggested. This suggested organisational structure is based on the three roles generally seen in buyer groups: contributing and experienced, learning and discussing, or piggy-backing without effort.

Suggested groups		Suggested tasks, participants, structure
<b>Werkgroep</b> Contributing & sharing knowledge	Tasks:	Actively contribute, share knowledge. Prepare plenary meetings. Execute group tasks.
	Participants:	Around 4 actively contributing participants Requirement: pilot project in 2 years, and experience with previous projects. Supplemented with <b>hired experts</b> in an inexperienced group
	Structure:	High-frequency meetings. Longer meetings to jointly write/create. High workload.
<b>Projectgroep</b> Learning & evaluating	Tasks:	Important role in discussing, evaluating, diffusion Focus on learning and developing.
	Participants:	Group size above 8 participants. Requirement: pilot project in 2 years. Diversity in clients, roles, and perspectives.
	Structure:	Frequency: monthly. Plenary meetings prepared by werkgroep. Short meetings (max 2h). Any size above 10 participants. Limited workload.
<b>Schil</b> Piggy-backing without effort	Tasks:	Non-committal, piggy-backing. Stay informed.
	Participants:	Any group size Any interested client
	Structure:	Frequency: when presented (intermediate) outputs. No influence/input in group output unless specifically asked No workload.

Table 9: Suggested organisational structure of buyer groups

### Best practices for Legal relationship










It is suggested to sign a covenant with the responsible department managers of the participating clients, to stimulate a safe learning place and organisational mandate.





This covenant describes the goals and effort to which the participants are committed – tailored to the nature of the buyer group. The covenant should not include penalties or consequences if goals are not achieved.

## 6.4 Phase 3 – Harmonising demand process




### Best practices for demand harmonisation

-  Buyer groups are suggested to establish either a wide scope or a complex scope; having a wide and complex scope is expected to provide serious difficulties in harmonisation.
-  If the participants have conflicting ambitions, the group output can be differentiated in multiple ambition levels: a no-regret minimum level, plus level and maximum ambition level. However, concessions have to be made, as there is limited room for customisation.
-  Functional requirements are suggested for buyer groups with a wide scope, in pioneering markets, when innovation is needed and for complex products.
-  Once the supply market becomes more matured and products are more standardised, it is advised to incrementally increase minimum requirements to enforce further increase.
-  For an efficient demand harmonisation process, existing (individual) documents and standards are suggested as input for the harmonisation process.
-  Harmonisation is best done outside the plenary meetings with a small group of participants or experts, to be discussed and evaluated in the plenary meetings.
-  Synchronisation problems among procurement processes of clients mostly occur in groups with smaller clients, but is not considered an important issue.

### Best practices for impact of the group

-  Calculating both the direct and indirect impact is often considered a challenge, but can be facilitated by establishing a smaller group scope and a shared minimum (no-regret).
-  The direct impact can be maximised by including more (private) clients in the buyer group, and creating outputs with different ambition levels – but with an established shared minimum level (no-regret) – which can be applied to all their different projects. These measures are also considered requisites for maximising the indirect impact.
-  Most buyer groups focus on the indirect impact, which is considered uncertain: based on the applicability of the group outputs, but mostly on the willingness of external clients. The indirect impact can be maximised by individually convincing external clients by their peers. This can be further stimulated with giving presentations, hiring a communications expert, implementing the group outputs in nation-wide standards, and publishing papers.
-  In order to make the outputs accessible for small clients, the market vision and procurement strategy should be readily applicable, contain a thorough elaboration on content, and provide a feasible and accessible entry ambition level.

### Best practices for legal aspects

-  No conflicts with procurement law are expected. The participants are generally experienced with procurement legislation, are aiming to use all available space in procurement legislation. However, due to the early phase of harmonisation, most legal boundaries still have to be investigated.
-  Functional requirements are expected to provide less conflicts with legislation.
-  It is suggested to only check the group outputs on legal issues, as clients have different legal preferences which could significantly slow down the harmonisation process.

# 7.0 Conclusions

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## 7.0 Conclusions

This chapter summarises the findings of this graduation research, providing an answer to the main research question: How can (semi-) public clients successfully implement buyer groups in the pre-procurement process of construction projects, to minimise carbon emissions and maximise circularity?

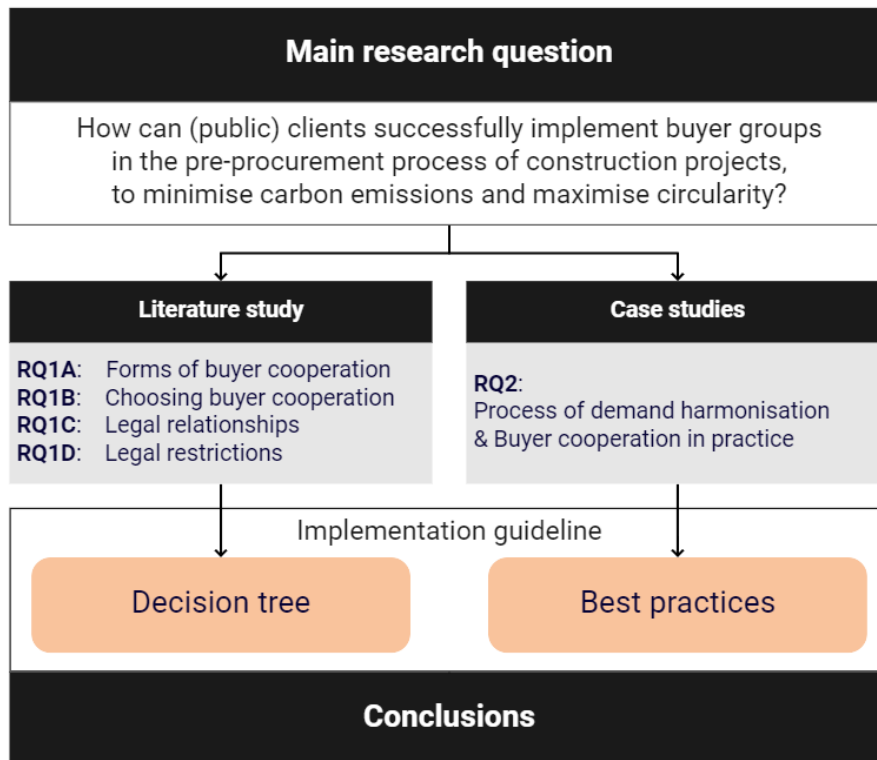


Figure 14: Brief overview of graduation research

In order to successfully implement buyer groups in the pre-procurement process, this research facilitates public clients with two main contributions, as visualised in Figure 14. Firstly, clients wishing to join or establish a suitable buyer cooperation, are supported by an overview of existing literature on this topic. Many different forms of buyer cooperation exist, each for different purposes, considerations and limitations. An overview of these forms is briefly visualised into a decision tree. Secondly, clients already participating in a buyer group, are supported by findings and recommendations from case studies. Best-practices are formulated regarding buyer group cooperation and the demand harmonisation process.

These two key aspects are briefly summarised in the two paragraphs below, corresponding to the two research questions.

### **How can (semi-) public clients successfully establish or join a suitable buyer group?**

Regarding establishing or joining a buyer group, this thesis has highlighted four crucial aspects of buyer cooperation. These four aspects of buyer cooperation are elaborated on below: types of buyer cooperation, choosing a type of cooperation, suggested legal relationships and relevant legal boundaries.

Forms of cooperation: The available forms of buyer cooperation are presented, based on the classification in the highway matrix of Schotanus & Telgen (2007). This highway matrix is extended with the degree of cooperation, as the original could not indicate whether information, purchasing volumes or resources are shared. This has resulted in 15 distinctive buyer group typologies, each with specific characteristics.

Choosing buyer cooperation: Public clients are supported in choosing a form of cooperation. This choice is mainly focussed on stimulating sustainable procurement, and for that purpose any cooperation can be regarded better than no cooperation – as just sharing information can already stimulate sustainable procurement. In order to select one of the 15 distinctive typologies, clients can base their choice on the desired duration of cooperation, their desired level of input and the desired level of cooperation.

Legal relationships: For each form of buyer cooperation, this thesis has suggested a suitable legal relationship. The choice of legal relationship is mostly based on specific requirements of the clients. However, this choice is supported with considerations on the chosen degree of cooperation, whether a public law or private law relationship is desired, and the duration of cooperation.

Legal boundaries: Regarding the legal boundaries of buyer cooperation, the rule of thumb is that it should not limit competition among buyers or suppliers. Regardless of the degree of cooperation, buyer cooperation can have negative effects on either suppliers or other buyers. When sharing information, creating a joint standard, and bundling purchasing volumes, the clients should thus be aware not to exclude any suppliers or buyers.

In order to provide a comprehensible overview of the existing literature, these considerations are visualised into a decision tree. This decision tree is aimed to facilitate clients in establishing or joining a suitable buyer group, as it helps choosing a type of cooperation, and suggests a suitable legal relationship.

### **How can (semi-) public clients successfully cooperate and harmonise demand within buyer groups?**

For clients already participating in a buyer group, this thesis has formulated best-practices for six important aspects for buyer cooperation and demand harmonisation. The recommendations on these six aspects of buyer cooperation are elaborated below, in the following order: formation, participants, organisational structure, demand harmonisation process, impact, and legal aspects.

Formation: For the formation of a buyer group, multiple recommendations have been formulated. For a shorter recruitment period, a bottom-up approach or seeking connection to an existing sustainability network. However, for the latter it is important to define clear distinct boundaries and actively align the buyer group with the related network. Before selecting participants, it is recommended to organise warm-up sessions with potential participants to find motivated participants who match the buyer group ambitions and have sufficient organisational mandate. The selection of participants will influence the speed, completeness, continuity and available expertise of the group process. Providing participant the possibility to choose their role in the group, is likely to result in an intrinsically motivated group and feasible workload. Freeze participation to the project group during certain phases of the process, to maintain momentum.

Participants: Four main types of participants are identified, with significant differences among each other. National governmental organisations are already experienced with implementing sustainability aspects, but are little influenceable by the buyer group. Decentral governments are considered top-down obligated to implement sustainability, which can result in insufficient alignment between the separate organisational departments. Non-governmental public clients are limited in experience and funding, and often focus on customisation. Private clients are bottom-up motivated and have a large potential impact, but can be limited in their sustainability ambitions by a focus on financial feasibility. The participants differ in expertise, with (national-governmental) organisations often having more experience and more influence in the group. The level of expertise in a buyer group can be stimulated by making the project group larger, setting experience as selection criteria, or external experts. Organisational mandate is considered crucial, which can be stimulated by actively informing the client organisations on group progress, creating a steering group, selecting participants with a management function, and establishing representation from the different organisational departments. Attendance and commitment of participants can be stimulated by allowing participants to voluntarily choose their own role in the group, or reducing the workload by outsourcing tasks to hired experts, and making the group process concrete and relevant.

Organisational structure: Regarding the organisational structure, a change in the organisational structure is suggested. This suggestion is aimed to provide clients a role based on their experience and ambition: actively contributing and experienced clients in a 'werkgroep', learning and discussing clients in the project group, and piggy-backing clients in the 'schil' without effort or influence. Furthermore, a larger buyer group usually results in differentiated clients, making the group output more complete and widely applicable, and enabling continuity in the group process – but also results in a longer and more complex harmonisation process. For groups with inexperienced clients, the coordinator should have a more influential and visionary coordinator, and need to hire more external expertise.

Demand harmonisation: In order to successfully harmonise the demand, multiple recommendations are made for the process. The harmonisation process is best done outside the plenary meetings with a small experienced group, while using existing documents as input. Buyer groups are advised to choose between a wide or a complex scope, both is expected to provide serious difficulties in harmonisation. It is recommended to create an output with different ambition levels, to formulate functional requirements, and to establish a shared minimum level that can be increased once products become more standardised.

Impact: Regarding the impact of the buyer groups, multiple recommendations have been formulated both for calculating and maximising direct and indirect impact. To streamline the calculation of the impact, buyer groups can establish a smaller scope and create a shared minimum level. To maximise the direct impact, buyer groups can include more clients and stimulate applicability of the output with different ambition levels – but with a shared minimum level. To maximise the indirect impact, the same recommendations apply, but also actively focus on communication to external clients, making the outputs readily applicable with a thorough elaboration, and provide a feasible and accessible entry ambition level.

Legal aspects: Multiple recommendations are formulated regarding the legal aspects of buyer groups. It is suggested to jointly sign a covenant to create a safe learning place and stimulate organisational mandate. Generally, no conflicts with procurement legislation due to the experience of participants, but these legal boundaries should still be fully investigated. See the literature study on legal aspects for a more detailed elaboration on legal aspects of buyer cooperation, with a rule of thumb that it should not limit competition among buyers or suppliers. It is recommended to create functional specifications to prevent potential conflicts with legislation, and only check group outputs on legal issues to streamline the harmonisation process.



# 8.0 Discussion

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## 8.0 Discussion

This chapter discusses scope limitations, research design, research outcomes, the relation between findings and problem statement, and the relation between literature and case study findings. Lastly, recommendations for further research are presented. Practical implications will not be covered separately in this chapter, as these have been already extensively covered and operationalised in the decision tree and best-practices.

### 8.1 Scope limitations

For this graduation project, significant scope limitations have been imposed. The research is specifically aimed to help (semi-) public clients successfully implement buyer groups in the pre-procurement process of construction projects, to minimise carbon emissions and maximise circularity. Firstly, this research excludes substantive considerations on actual procurement processes, the content of contracts, and theory on circularity or carbon emission reduction. Secondly, this also excludes theory on conducting market consultations, different types of supply markets, the perspective of suppliers and the process of steering innovation. For these topics, the reader is referred to the parallel graduation research of Georgette van Driesten into 'Buyer Groups and steering market innovation'.

Furthermore, the focus on Dutch (semi-) public clients excludes both private clients and clients from other countries. In addition, this research focuses specifically on the construction industry, exclusively covering infrastructure and real estate projects. The research is thus not directly applicable to buyer groups outside this scope.

### 8.2 Discussion on research design

The research design contains two main research methods: a literature study and case studies. According to Creswell (2014), both are common and viable research methods. These methods and their implementation in this research are discussed below.

#### Discussion on the literature study (Ch. 2)

A literature study is used to provide an overview of existing literature on buyer groups. Here the literature study bundles different theories on forms of cooperation (e.g. Schotanus & Telgen, 2007), the degree of cooperation (by Faes et al., 2000), legal boundaries (e.g. Essers & Lombert, 2017) and legal relationships (e.g. VNG, 2015) – and specifically links it to theory on green public procurement (e.g. Appolloni, Coppola & Piga, 2019). By connecting these topics, this literature study provides public clients a complete overview of relevant knowledge to successfully establish or join a suitable buyer group. Therefore, this literature study could be seen as a 'Getting Started Guide', providing background information to the empirical research on the relatively new phenomenon of buyer groups to stimulate sustainability in construction projects.

The literature study can be evaluated based on how it deals with 8 common pitfalls of literature reviews defined by Haddaway et al. (2020). Although Haddaway et al. have defined these problems for systematic literature reviews, these pitfalls can also provide some insight into the reliability of the literature study in this graduation project. Two of the eight defined pitfalls are handled well in this graduation research: clearly stating the relevance and stakeholders (helping public clients to successfully establish or join a suitable buyer group to stimulate sustainable procurement), and including the grey literature (e.g. BMC Advies, 2016; TwynstraGudde, Personal Communication, March 5, 2020; Rebel, Personal Communication, December 9, 2020).

However, two of the defined pitfalls are not specifically addressed. Firstly, the selection bias is not compensated by the use of an bibliographic specialist or protocol. Secondly, the included literature is not individually appraised on validity – all evidence is treated as equally valid. This could potentially result in the included literature not being fully representative or comprehensive (Haddaway et al.,

2020). Therefore, a formalised systematic literature review into buyer groups aimed to stimulate sustainable procurement is recommended for further research.

#### Discussion on the case studies (Ch 4)

Case studies can be evaluated based on four quality criteria: construct validity, internal validity, external validity and reliability (Beverland & Lindgreen, 2010; Gibbert & Ruigrok, 2010). According to Gibbert & Ruigrok (2010), a priority ordering should be implemented in these criteria: the internal and construct validity should be prioritised over external validity, although they cannot be seen fully independent. Beverland & Lindgreen (2010) have bundled these four quality criteria for case studies together with the required operationalisation to fulfil these criteria, which allows to check whether this graduation research has implemented the required operationalisation.

Regarding construct validity, this is pursued by triangulation of multiple sources, differentiating interviewee perspectives and including validation interviews. However, the chain of evidence could be improved by including more quotes, and allowing the interviewees to review the draft case.

Regarding the internal validity, this is achieved by implementing 5 different cases, each with different participants, topics, initiators, sizes and desired outputs. These five cases are then cross-analysed, to find patterns among the different cases. This could be further improved by searching for negative cases, and conducting a time series analysis.

Regarding the reliability, this is emulated by demonstrating the findings can be replicated: the input for research themes is thoroughly elaborated, the interview protocols are standardised, and the transcripts and individual case studies with coding are included in the report or appendices. This could be improved by specifically defining and grounding constructs in existing literature.

Regarding the external validity, this is pursued by differentiating the case studies, clearly specifying the population (buyer groups) of interest, and including validation interviews with external coordinators.

Therefore, despite multiple potential refinements, each of the four quality criteria is addressed with operational measures. The case study quality can thus be labelled satisfactory.

### **8.3 Discussion on operationalised outcomes**

This graduation research has resulted two main operationalised outcomes: a decision tree and best-practices. Both outcomes are directly based on the literature study and case studies respectively. Therefore, the credibility and validity of these products is strongly related to their related research methods. The two outcomes are discussed below.

#### Discussion on the decision tree (Ch. 3)

Regarding the decision tree, generally the same considerations apply as to the literature study, but the translation into the tree provides additional considerations. A decision tree is aimed to provide a brief, comprehensible overview – and thus a selection has to be made in the data provided in the literature review. This results in aggressive summarisation of the literature study, severely reducing the substantiation and nuances. Furthermore, the visualisation of the decision tree suggests hard borders between the different degrees of cooperation, while interviews and literature study have indicated these degrees of cooperation are cumulative; e.g. for the economies of process it is required to share information between participants.

However, in order to increase the validation of the decision tree, four buyer cooperation experts have been interviewed to validate its contents and visualisation. Through these validation interviews, the content of the decision tree has been validated, and the visualisation has been updated. However, further validation could further improve the reliability of the decision tree, as the long term cooperation was not validated due to lack of expertise interviewees, and the edited version was not re-validated.

#### Discussion on the best-practices (Ch. 6)

Translating the case studies into the best-practices also creates extra considerations, as generalisation is required. Creswell (2014) states this qualitative generalisation is not often conducted, as “the intent of this form of inquiry is not to generalize findings to individuals, sites, or places outside of those under study [...] the value of qualitative research lies in the particular description and themes developed in context of a specific site. Particularity rather than generalizability” (Creswell, 2014, p.253). This creates a dilemma, as the stated objective of the research is to learn lessons from the case studies, and operationalising these into a guideline aimed to facilitate public clients participating in (future) buyer groups. This dilemma is partially tackled by choosing for best-practices, that cumulatively add positively evaluated elements of individual cases. Furthermore, the small scope of the research also helps contain the particularity, as it is only aimed for the Dutch context of public clients that aim to increase sustainability in procurement of construction projects. However, generalisation always results in a loss of detail (particularity) and nuance. In order to comprehend the complete picture, the reader is suggested to always read the individual case studies, and if possible the corresponding interview transcripts.

However, in order to increase the validation of the best-practices, two external buyer group coordinators have been interviewed to validate the contents and comprehensibility. Through these validation interviews, the applicability of the findings and recommendations of the cross-case analysis for external buyer groups is confirmed.

#### **8.4 Relation between findings and problem statement**

The problem statement focusses on gaining more insight into the ‘new’ phenomenon of Dutch public clients cooperating in buyer groups, aiming to reduce carbon emissions and to increase circularity. This research has covered two main aspects of these buyer groups: how to establish or find a suitable buyer group, and how to cooperate and harmonise demand within a buyer group. For all (sub) questions, this graduation research has formulated extensive (and validated) answers.

However, the extent to which the case studies provide a definitive answer to the problem statement, is largely limited by the limitations encountered in time. An apparently straightforward way to conduct case studies, could be to include all activities conducted by a specific buyer group – starting and ending the research in parallel with the buyer group. However, the empirical data collection of this graduation project only lasted 4 months (see the graduation planning in the reflection), while the investigated pilot buyer groups already exist for over a whole year – without a clear ending visible yet. As a result, major parts of the process were not included in this research: the formation, the delivery of final group outputs, the impact assessments of groups, and the eventual dismissal and evaluation of the buyer groups.

Therefore, these case studies can be seen as a snapshot or sample of the buyer groups – not the whole buyer group process is included in this research. This is partly solved by the use of semi-structured interviews, that allow to ask for historical information (Creswell, 2014) on the formation of the groups. However, the topics of demand harmonisation, impact and legal issues are currently not completely finished among the cases, and thus merely contain a prognosis or projection of the future, based on the current situation. The eventual final group outcome could be different from the present, and might even influence the findings on the formation, participants and organisational structure of buyer groups.

To provide a final answer to the problem statement, revisiting and updating the case study findings is strongly suggested for further (future) research – possibly combined with the above suggested comparing and contrasting the studied buyer groups with ‘standard’ buyer groups.

## 8.5 Relation between literature and case study findings

Due to the exploratory nature of the case studies, its relation to the literature study be described as building further upon the existing (literature) knowledge. This ‘building further upon relation’ is manifested by the literature study providing a basis (on which can be built further), and more importantly: steering the direction in which the case studies are executed.

The literature study serves as influential input for research themes for the case studies, through the established research themes. The interviews within the case studies have been conducted based on research themes. These research themes functioned as leads, starting points to conduct the case studies. As shown in paragraph 4.2, the majority of these research themes are based on the literature study - the literature study thus has significantly steered the direction of the case study research.

### Similarities literature and case study findings

The findings of the case studies show strong similarities with the earlier established literature study. This is likely caused by the steering influence of the literature and the explorative nature of the case studies. Strong similarities are found regarding the degrees of cooperation, legal relationships, and organisational structure.

All three degrees of cooperation were found in the case studies, together with the corresponding legal relationships. Economies of information is found in Case 1, which aims to share knowledge and learn from other clients. As suggested in the decision tree, the cooperating clients have established a covenant – which in practice also is deemed legally limited enforceable. Economies of process is found in the cases 2, 3 & 4, which are focussed to establish a sustainability standard – specifically aimed to enable suppliers to commit R&D with limited effort. As suggested in the decision tree, these groups have both signed a covenant and are establishing model criteria, model specifications and model contracts. Economies of scale is found in case 5, which is aimed to pool purchasing volumes to maximise buyer power and financial savings. This requires standardization among buyers, which is achieved by establishing conceptual (standardised) dwellings. As suggested in the decision tree, this buyer group aims to tender a framework agreement, and established model specifications, contracts and criteria. However, did group not sign a covenant, which interviewee 12 (personal communication, 2021) explained is typical for the private clients in the group – and stated public clients would indeed have signed a covenant.

The organisational structure in the studied cases mostly matched findings of the literature, with the common distinction between a project group and piggy-backing group (“schil”). In practice, the characteristics of these groups also matched the literature. The project group usually had a low number of group members, with high desired member involvement, and intensive communication and slow processes. The piggy-backing group usually had a high number of group members, with low desired member involvement, limited influence on the specifications of the product – and outsourcing the majority of tasks to the (host) organisations in the project group.

### Uncharted territory

Despite the strong similarities, the explorative nature of the research also resulted in many new aspects of buyer cooperation, that were not previously encountered in literature. Here paragraph 4.2 again can be used to indicate the amount of new research themes. New research themes have arisen mostly regarding the impact of the buyer groups, the psychology behind harmonising demand with other clients, the influence of a coordinator, the overlap with existing networks, and the input for- and process of demand harmonisation. For example, the aim to maximise and calculate indirect impact of the buyer cooperation was not encountered before in the literature.

The findings for these ‘new’ research themes are fully based on the findings in the case studies. Within these case studies, semi-structured interviews play an important role in the collection of data. These semi-structured interviews are specifically suggested for “examining uncharted territory with unknown but potential momentous issues and your interviewees need maximum latitude to spot useful leads and pursue them” (Adams, 2015, p.494). This strongly corresponds to how the semi-structured interviews are used in this research: examining the relatively new phenomenon of buyer groups, based on the potential issues established in the research themes – confirming the reliability and validity of the case study design. However, regarding these explorative findings it is recommended for further research to cross-check these findings with (e.g. psychological) literature and to verify in other case studies.

## **8.6 Recommendations for further research**

Recommendations for further research arise both from the scope restrictions, and from the discussion stated above. The recommendations are covered below.

Firstly, further research could widen the scope – transcending the strict scope limitations of this graduation project. This could include research into buyer groups outside the Dutch context, include private clients or suppliers, and focus on groups outside the context of construction projects in other industries and sectors. Furthermore, future research could combine the topics of buyer groups with substantive considerations on actual procurement processes, the content of contracts, theory on circularity or carbon emission reduction, conducting market consultations, the perspective of suppliers and the process of steering innovation.

Secondly, comparing and contrasting the studied buyer groups with other industry buyer groups could provide useful insights. For example, negative case studies could be done in the buyer groups for ‘AI-drones’ and ‘circular clothing’, both recently launched by PIANOo. This could highlight the differences, and potentially create ‘cross-pollination’ among the different types and stimulate learning from each other’s best-practices. This could be implemented in further research both with a literature study or with case studies.

Thirdly, it is suggested to conduct a dedicated, formalised systematic literature review into buyer groups aimed to stimulate sustainable procurement. Due to time and scope limitations this cannot be addressed in the current graduation project, but this recommended for further research in order to create a representative and comprehensive overview of existing literature. This extensive literature review could also include the ‘new’ topics discovered by the exploratory case studies, as described in paragraph 8.5.

Fourthly, further research could revisit and update the case study findings once the buyer groups are reaching completion. This could be specifically targeted at the topics of demand harmonisation, impact and legal aspects – as these currently are not finished yet during this graduation research. This could be combined with the above suggestion of comparing and contrasting the studied buyer groups with ‘other industry’ buyer groups.

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# Appendices

## Appendix A: Observations & document analysis

This appendix gives a brief overview of the reflective observations done through participation in the buyer groups and document analysis. The observations are conducted in the complete observer role as defined by Saunders, Thornhill & Lewis (2019), in which the researcher only observes but does not participate in activities of the group. As prescribed by Saunders et al. (2019), the observations are documented in the form of a diary, which contains what happened and what was said during the observations.

Buyer group	Reflective observations
Umbrella meetings	<ul style="list-style-type: none"> <li>Measuring impact is difficult</li> <li>Circularity is a complex concept, loosely defined terminology</li> <li>Many different measurement methods for sustainability</li> <li>Overlap with other sustainability concepts and networks</li> <li>Differences in pace</li> </ul>
Circular Schools (PIANOo)	<ul style="list-style-type: none"> <li>The market consultation resulted in self-promotion of market parties</li> <li>Synchronisation challenge among projects, little repetition in procurement</li> <li>High complexity procured item</li> <li>Large scope procured item</li> <li>Large differences in participants; role, experience, priorities, ambition.</li> </ul>
Circular Construction Materials (PIANOo)	<ul style="list-style-type: none"> <li>Large group, multiple participants per public organisation</li> <li>Differences in experience per participant</li> <li>Large scope challenge</li> <li>Researches into scope and measuring methods</li> <li>Passive role of participants</li> </ul>
Zero Emission Construction Equipment (Rijkswaterstaat)	<ul style="list-style-type: none"> <li>Large scope challenge</li> <li>Participants leaving buyer group</li> <li>Overlap with other sustainability concepts and networks</li> <li>Resulting in less commitment participants?</li> </ul>
Sustainable Road Surfacing (Rijkswaterstaat)	<ul style="list-style-type: none"> <li>Small group, transparent working method</li> <li>Experienced participants, equal active input</li> <li>Overlap with other sustainability concepts and networks</li> <li>Market consultation; how specific to get desired input?</li> <li>Input for market demand harmonisation is collected from multiple (individual) sources. Best input is selected and finetuned.</li> <li>Limited enthusiasm from external (small) buyers</li> <li>Legal consultant delays harmonisation process</li> <li>Challenge to create exposure</li> </ul>
Standardised social rented apartments (External)	<ul style="list-style-type: none"> <li>Small group, high frequency short meetings</li> <li>Equal active input per participant</li> <li>Multiple external experts involved</li> <li>Input for market demand harmonisation is collected from multiple (individual) sources. Best input is selected and finetuned.</li> <li>Legal harmonisation challenging; each legal expert has personal preferences</li> <li>Challenge to create exposure</li> <li>Harmonisation includes more than sustainability requirements</li> <li>Goal is shared procurement of framework agreement</li> <li>More commitment caused by shared procurement?</li> </ul>
Stichting RIJK (External)	<ul style="list-style-type: none"> <li>Challenge to create commitment within public client ('interne borging')</li> </ul>

## Appendix B: Interview protocol – coordinating supervisor

### Introductie

- Bedankt voor uw deelname!
- Onderzoek: Naar samenwerking publieke opdrachtgevers in buyer groups, om samen de duurzaamheidsaspecten van de uitvraag te uniformeren. Duidelijk signaal aan de markt, impuls geven aan duurzame investeringen.
- Rechten, vragen, informed consent ondertekend.

### Professionele achtergrond

- Wat is uw huidige functie, welke werkzaamheden/taken horen daarbij?
- Wat is uw ervaring met aanbesteden en duurzaamheidsaspecten?

### Oprichting van de buyer group

- Hoe zijn bij de oprichting deelnemers gekozen en ingedeeld in kern en schil? Konden er ook deelnemers uitgesloten worden?
- Kunnen (of hebben) deelnemers de groep verlaten, of uit de groep gezet worden?
- Ziet u verschil in hoe de buyer groups aansluiten bij bestaande duurzaamheidsconcepten en netwerken in de sector, of is het een pionierende groep?

### Organisatiestructuur van de buyer group

- Ziet u verschil in hoe de buyer groups zijn georganiseerd? Formalisatie?
- Ziet u verschil in hoeveel invloed individuele deelnemers hebben, iedereen evenveel?
- Ziet u verschil in hoe intensief de onderlinge communicatie is?

### Deelnemers van de buyer group

- Ziet u verschil in welke verschillende soorten deelnemers in de groepen deelnemen?
- Wat zijn de belangrijkste drivers om deel te nemen?
- Hoe gelijk/homogeen zijn deelnemers onderling en hun verwachtingen/doelen?
- Hoe is de interne borging bij deelnemers?
- Zijn deelnemers gecommitteerd aan de groep? Is er sprake van verzuim of meeliftersgedrag?
- Is er voldoende expertise beschikbaar bij de deelnemers in de groep?

### Proces harmonisatie uitvraag

- Ziet u verschillen in hoe groot de scope van de buyer groups is?
- Ziet u verschil in hoe complex de items zijn die geharmoniseerd/aanbesteed worden?
- Ziet u verschillen in de intensiviteit van de samenwerking? Collectief inkopen, inkoopstrategie, raamovereenkomsten, standaardcontracten en eisen?
- Ziet u verschillen in het tempo van de groepen? Hoe worden processen gesynchroniseerd?
- Wat is de input voor de uniformering van de duurzaamheidsambities en eisen? Eigen documenten, bestaande concepten, volledig nieuw?
- Ziet u verschillen in hoe de eisen en wensen van deelnemers worden geharmoniseerd? Op welk niveau: KPI's, functionele specificaties, technische specificaties, beschrijvende eisen?
- Hoe worden besluiten genomen? Unaniem, zwakste schakel, compromis?

### Impact van de buyer group

- Ziet u verschil in hoe groot de impact van de buyer groups is, direct en indirect? Is dit te berekenen?
- Hoe worden externe opdrachtgevers benaderd en betrokken? Hoe wordt gezorgd dat dit de nieuwe standaard wordt in duurzaam aanbesteden? Welke factoren?



### **Juridische aspecten van samenwerking publieke opdrachtgevers**

- Welke juridische verhouding hebben deelnemende opdrachtgevers? Hoe is deze gekozen?
- Welke juridische randvoorwaarden belemmeren de buyer group?

### **Afronding**

- Is er nog iets overgeslagen met betrekking tot de buyer groups, verduurzaming of samenwerking van publieke opdrachtgevers, wat u nog wilt delen?
- Hartelijk bedankt voor uw deelname!

## Appendix C: Interview protocol – coordinator buyer group

### Introductie

- Bedankt voor uw deelname!
- Onderzoek: Naar samenwerking publieke opdrachtgevers in buyer groups, om samen de duurzaamheidsaspecten van de uitvraag te uniformeren. Duidelijk signaal aan de markt, impuls geven aan duurzame investeringen.
- Rechten, vragen, informed consent ondertekend.

### Professionele achtergrond

- Wat is uw huidige functie, welke werkzaamheden/taken horen daarbij?
- Wat is uw ervaring met aanbesteden en duurzaamheidsaspecten?

### Oprichting van de buyer group

- Hoe zijn bij de oprichting deelnemers gekozen en ingedeeld in kern en schil? Konden er ook deelnemers uitgesloten worden?
- Kunnen (of hebben) deelnemers de groep verlaten, of uit de groep gezet worden?
- Sluit de buyer group aan bij bestaande duurzaamheidsconcepten en netwerken in de sector, of is het een pionierende groep?

### Organisatiestructuur van de buyer group

- Hoe is de buyer group georganiseerd? Formalisatie? Hoe beoordeelt u deze opzet?
- Hoeveel invloed hebben individuele deelnemers, iedereen evenveel? Hoe beoordeelt u deze verdeling?
- Hoe intensief is de onderlinge communicatie? Hoe beoordeelt u deze intensiteit?
- Hoe groot is de groep? Hoe beoordeelt u de grootte?

### Deelnemers van de buyer group

- Welke verschillende soorten deelnemers zitten in de groep? Hoe beoordeelt u deze samenstelling?
- Wat zijn de belangrijkste drivers om deel te nemen, zijn er verschillen?
- Hoe gelijk/homogeen zijn deelnemers onderling en hun verwachtingen/doelen?
- Hoe is de interne borging bij de deelnemers?
- Zijn deelnemers gecommitteerd aan de groep? Is er sprake van verzuim of meeliftersgedrag? Hoe beoordelen deelnemers de werklust?
- Is er voldoende expertise beschikbaar bij de deelnemers in de groep?

### Proces harmonisatie uitvraag

- Hoe groot is de scope van de buyer group? Hoe beoordeelt u deze scope?
- Hoe complex is het item dat aanbesteed wordt? Hoe beoordeelt u de complexiteit?
- Wat is de ambitie van de harmonisatie? Hoe intensief is de samenwerking? Collectief inkopen, inkoopstrategie, raamovereenkomsten, standaardcontracten en eisen? Hoe beoordeelt u deze intensiteit?
- Hoe ver is het proces gevorderd? Hoe is het tempo van de groep? Hoe worden processen bij individuele deelnemers gesynchroniseerd? Hoe beoordeelt u het tempo?
- Wat is de input voor de uniformering van de uitvraag? Eigen documenten, bestaande concepten, volledig nieuw?
- Hoe worden eisen en wensen van deelnemers geharmoniseerd? Op welk niveau: KPI's, functionele specificaties, technische specificaties, beschrijvende eisen?
- Hoe worden besluiten genomen? Unaniem, zwakste schakel, compromis? Hoe beoordeelt u de besluitvorming?

- Hoe beoordeelt u (de opzet voor) de inkoopstrategie? En marktvisie?

#### **Impact van de buyer group**

- Hoe groot is de impact van de groep, direct en indirect? Is dit te berekenen? Hoe beoordeelt u deze impact en de berekening?
- Hoe worden externe opdrachtgevers benaderd en betrokken? Hoe wordt gezorgd dat dit de nieuwe standaard wordt in duurzaam aanbesteden? Welke factoren?

#### **Juridische aspecten van samenwerking publieke opdrachtgevers**

- Welke juridische verhouding hebben deelnemende opdrachtgevers? Hoe is deze gekozen? Hoe beoordeelt u deze verhouding?
- Welke juridische randvoorwaarden belemmeren de buyer group? Hoe gaat u hiermee om?

#### **Afronding**

- Is er nog iets overgeslagen met betrekking tot de buyer groups, verduurzaming of samenwerking van publieke opdrachtgevers, wat u nog wilt delen?
- Hartelijk bedankt voor uw deelname!

## Appendix D: Interview protocol – Participant buyer group

### Introductie

- Bedankt voor uw deelname!
- Onderzoek: Naar samenwerking publieke opdrachtgevers in buyer groups, om samen de duurzaamheidsaspecten van de uitvraag te uniformeren. Duidelijk signaal aan de markt, impuls geven aan duurzame investeringen.
- Rechten, vragen, informed consent ondertekend.

### Professionele achtergrond

- Wat is uw huidige functie, welke werkzaamheden/taken horen daarbij?
- Wat is uw ervaring met aanbesteden en duurzaamheidsaspecten?
- Wat is de houding/ambitie/rol van uw organisatie ten opzichte van duurzaam aanbesteden, en ten opzichte van samenwerken met andere opdrachtgevers?

### Oprichting van de buyer group

- Hoe zijn bij de oprichters deelnemers gekozen en ingedeeld in kern en schil? Konden er ook deelnemers uitgesloten worden?
- Kunnen (of hebben) deelnemers de groep verlaten, of uit de groep gezet worden?
- Sluit de buyer group aan bij bestaande duurzaamheidsconcepten en netwerken in de sector, of is het een pionierende groep?

### Organisatiestructuur van de buyer group

- Hoe is de buyer group georganiseerd? Formalisatie? Hoe beoordeelt u deze opzet?
- Hoeveel invloed hebben individuele deelnemers, iedereen evenveel? Hoe beoordeelt u deze verdeling, heeft u voldoende invloed?
- Hoe intensief is de onderlinge communicatie? Hoe beoordeelt u deze intensiteit?
- Hoe groot is de groep? Hoe beoordeelt u de grootte?

### Deelnemers van de buyer group

- Welke verschillende soorten deelnemers zitten in de groep? Hoe beoordeelt u deze samenstelling?
- Wat zijn de belangrijkste drivers om deel te nemen bij uw organisatie? Rest van de groep?
- Hoeveel gelijk/homogeen bent u met de andere deelnemers en hun verwachtingen/doelen?
- Hoe is de interne borging bij uw organisatie? Andere deelnemers?
- Zijn deelnemers geëncouraged aan de groep? Is er sprake van verzuim of meelifersgedrag? Hoe beoordeelt u de werklust?
- Is er voldoende expertise beschikbaar bij de deelnemers in de groep? Heeft u voldoende expertise?

### Proces harmonisatie uitvraag

- Hoe groot is de scope van de buyer group? Hoe beoordeelt u deze scope?
- Hoe complex is het item dat aanbesteed wordt? Hoe beoordeelt u de complexiteit?
- Hoe intensief is de samenwerking? Collectief inkopen, inkoopstrategie, raamovereenkomsten, standaardcontracten en eisen? Hoe beoordeelt u deze intensiteit?
- Hoe ver is het proces gevorderd? Hoe is het tempo van de groep? Hoe worden processen bij individuele deelnemers gesynchroniseerd? Hoe beoordeelt u het tempo?
- Wat is de input voor de uniformering van de uitvraag? Eigen documenten, bestaande concepten, volledig nieuw?
- Hoe worden eisen en wensen van deelnemers geharmoniseerd? Op welk niveau: KPI's, functionele specificaties, technische specificaties, beschrijvende eisen?

- Hoe worden besluiten genomen? Unaniem, zwakste schakel, compromis? Hoe beoordeelt u de besluitvorming?
- Hoe beoordeelt u (de opzet voor) de inkoopstrategie? En marktvisie?

#### **Impact van de buyer group**

- Hoe groot is de impact van de groep, direct en indirect? Is dit te berekenen? Hoe beoordeelt u deze impact en de berekening?
- Hoe worden externe opdrachtgevers benaderd en betrokken? Hoe wordt gezorgd dat dit de nieuwe standaard wordt in duurzaam aanbesteden? Welke factoren?

#### **Juridische aspecten van samenwerking publieke opdrachtgevers**

- Welke juridische verhouding hebben deelnemende opdrachtgevers? Hoe is deze gekozen? Hoe beoordeelt u deze verhouding?
- Welke juridische randvoorwaarden belemmeren de buyer group? Hoe gaat u hiermee om?

#### **Afronding**

- Is er nog iets overgeslagen met betrekking tot de buyer groups, verduurzaming of samenwerking van publieke opdrachtgevers, wat u nog wilt delen?
- Hartelijk bedankt voor uw deelname!

## Appendix E: Interview protocol – Validating decision tree

*The presented decision tree is shown on the next page.*

### Introductie

- Bedankt voor uw deelname!
- Onderzoek: Naar samenwerking publieke opdrachtgevers in buyer groups, om samen de duurzaamheidsaspecten van de uitvraag te uniformeren. Duidelijk signaal aan de markt, impuls geven aan duurzame investeringen.
- Rechten, vragen, informed consent ondertekend.

### Verifiëren strategie

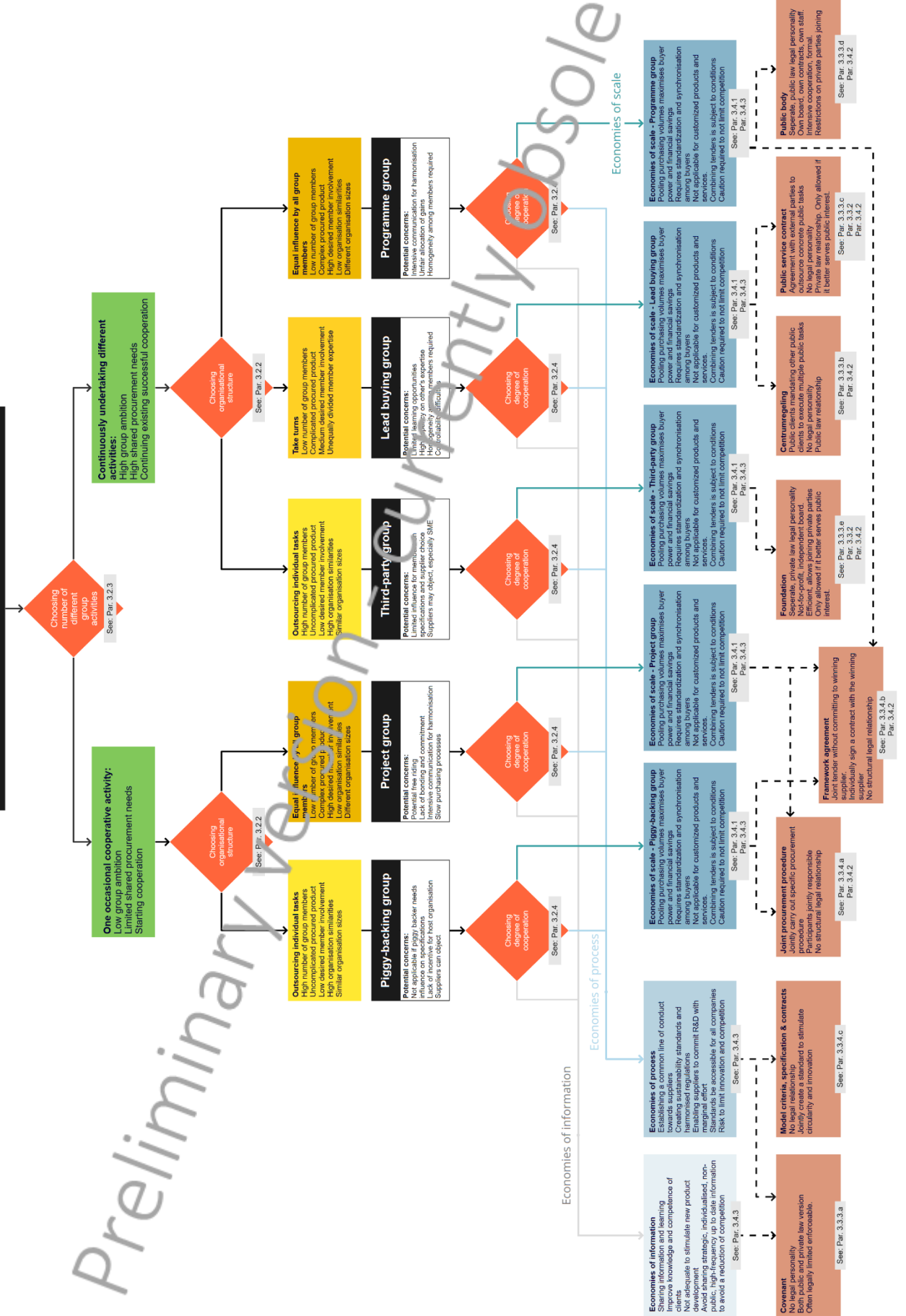
- Komen de beschreven typologieën overeen met de praktijk?
- Komen de beschreven juridische verhoudingen overeen met de praktijk?
- Komen de beschreven beslissingsmogelijkheden overeen met de praktijk?
- Is de beslisboom bruikbaar /toepasbaar? Hoe kan dit beter?
- Is de beslisboom begrijpelijk? Hoe kan dit beter?
- Is de beslisboom gebruiksvriendelijk? Hoe kan dit beter?

### Afronding

- Hartelijk bedankt voor uw deelname!

*The presented decision tree is shown on the next page.*

# Establishing public client cooperation



## Appendix F: Interview protocol – Validating best-practices

### Introductie

- Bedankt voor uw deelname!
- Onderzoek: Naar samenwerking publieke opdrachtgevers in buyer groups, om samen de duurzaamheidsaspecten van de uitvraag te uniformeren. Duidelijk signaal aan de markt, impuls geven aan duurzame investeringen.
- Uw input in deze enquête wordt anoniem verwerkt in het afstudeeronderzoek naar buyer groups.

### Validation best practices

- Komen de beschreven conclusies en aanbevelingen overeen met de praktijk?
- Zijn de beschreven conclusies en aanbevelingen volledig? Hoe kan dit beter?
- Zijn de beschreven conclusies en aanbevelingen bruikbaar en begrijpelijk? Hoe kan dit beter?

### Afronding

- Hartelijk bedankt voor uw deelname!

### Preliminary best practices:

#### **Key recommendations recruiting participants**

- The bottom-up recruitment approach (an ambitious client reaching out to its peers) is likely to result in shorter recruitment periods.
- Recruiting from existing client networks or concepts allows for a quicker recruitment and introductory period.
- For buyer groups based on an existing network or concept, it is important to define clear distinct boundaries and actively align with the related network.
- Base recruitment and selection of participants on the desired group process (Speed, completeness, continuity, available expertise).

#### **Key recommendations selecting participants**

- Before selection, organise warm-up sessions with potential participants to find motivated participants with matching ambitions.
- Intrinsic motivation of participants is crucial, which can be stimulated by voluntary joining and always providing the possibility to leave the group.
- Provide (potential) participants the possibility to choose their role in the buyer group, in order to get a motivated group and a feasible workload for each participant
- Freeze participation to the project group during certain phases of the process, to maintain momentum.

Preliminary version



### Key recommendations Different participants

- National governmental organisations are already experienced with implementing sustainability aspects in procurement and are committed to their own organisational sustainability strategy – limiting the influence of the Buyer group on these clients.
- Decentral governments are considered top-down obligated to implement sustainability in procurement, which often results in a limited organisational ambition and strategy
- Non-governmental public clients – such as schools – are differentiated in ambitions and limited in expertise, have limited funding and focus on customisation.
- Participating private clients are bottom-up motivated, and have a large potential impact. Implementing sustainability is always coupled with making a financially solid business case, limiting their sustainability ambitions by a focus on financial feasibility.

### Key recommendations Dealing with differences

- Participants are often bonded by their shared ambition to contribute to the transition towards a sustainable future, which can be either top-down or bottom-up.
- Expertise differs per organisation, larger (national-governmental) organisations often are more experienced, often join a buyer group to share knowledge, and thus are considered less influenceable by the buyer group.
- The level of expertise in a buyer group can be stimulated by making a large project group of inexperienced clients, selecting the (larger) experienced clients, and hiring external experts.
- Organisational mandate can be stimulated by actively informing the client organisations on group progress, creating a steering group, selecting participants with a management function, and establishing representation from the department: project management, procurement and strategy.
- Attendance and commitment of participants can be stimulated by keeping participation completely voluntary, reducing the workload by outsourcing tasks to hired experts, and making the group process concrete and relevant.

### Key recommendations organisational structure

- In order to complement expertise and available workload, participants can be provided three roles: contributing and experienced, learning and discussing, or piggy-backing without effort.
- Project groups differ in size: making a group larger usually results in having more differentiated clients, making the group output more complete and widely applicable, and enabling continuity in the group process. However, this also results in a longer and more complex harmonisation process.
- Experienced clients generally have more input in the buyer groups, often requiring a neutral role of the coordinator and establishing a steering group to align organisational strategies.
- Groups with mostly inexperienced clients often outsource group tasks to hired external experts, and require a more influential and visionary role of the coordinator.
- The meeting frequency can be based on the desired group pace and available workload, but normally is once every four weeks, or every two weeks for a high-pace process.

Suggested groups	Suggested tasks, participants, structure	
<b>Werkgroep</b> Contributing & experienced	Tasks:	Actively contribute, share knowledge. Prepare plenary meetings. Execute group tasks.
	Participants:	Around 4 actively contributing participants Requirement: pilot project in 2 years, and experience with previous projects. Supplemented with <b>hired experts</b> in an inexperienced group
	Structure:	High frequency meetings. Longer meetings to jointly write/create. High workload.
<b>Projectgroep</b> Learning & evaluating	Tasks:	Important role in discussing, evaluation, diffusion Focus on learning and developing.
	Participants:	Group size above 8 participants. Requirement: pilot project in 2 years. Diversity in clients, roles, and perspectives.
	Structure:	Frequency: monthly. Plenary meetings prepared by werkgroep. Short meetings (max 2h). Any size above 10 participants. Limited workload.
<b>Schil</b> Piggy-backing without effort	Tasks:	Non-committal, piggy backing. Stay informed.
	Participants:	Any group size Any interested client
	Structure:	Frequency: when presented (intermediate) outputs. No influence/input in group output unless specifically asked No workload.

#### Key recommendations demand harmonisation

- Functional specifications are suggested for buyer groups with a wide scope, in pioneering markets, when innovation is needed and for complex products.
- Once the supply market is matured and products are standardised, the sustainability objectives can be enforced as minimum requirements.
- Buyer groups are suggested to establish either a wide scope or a complex scope; having both a wide and complex scope is expected to provide serious difficulties in harmonisation.
- For an efficient demand harmonisation process, existing (individual) documents and standards are suggested as input for the harmonisation process.
- Harmonisation is best done outside the plenary meetings with a small group of participants or experts, to be discussed and evaluated in the plenary meetings.
- If the participants have conflicting ambitions, the group output can be differentiated in multiple ambition levels: a no-regret minimum level, plus level and maximum ambition level.

**Key recommendations impact of the group**

- Calculating both the direct and indirect impact is often considered a challenge, especially with a large group scope and without an established shared minimum level (no-regret).
- Most buyer group focus on the indirect impact, which is considered uncertain: based on the applicability of the group outputs, but mostly on the willingness of external clients.
- The indirect impact can be maximised by individually contacting and convincing external clients by their peers. This can be further stimulated with giving presentations, hiring a communications expert, implementing the group outputs in nation-wide standards, and publishing papers.
- In order to make the outputs accessible for small clients, the market vision and procurement strategy should be readily applicable, contain a thorough elaboration on content, and provide a feasible and accessible entry ambition level.
- The direct impact can be maximised by including more (private) clients in the buyer group, and creating outputs with different ambition levels – but with an established shared minimum level (no-regret) – which can be applied to all their different projects.

**Key recommendations Legal aspects**

- In order to create a safe learning place for clients without pressure, it is suggested to jointly sign a covenant. No other legal relationship is expected to improve the group process.
- No conflicts with procurement law are expected, but due to the early phase of harmonisation, most legal boundaries are not yet fully investigated.
- The participants are generally experienced with procurement legislation, are aiming to use all available space.
- Functional specifications are expected to provide less conflicts with legislation.
- It is suggested to only check the group outputs on legal issues, as clients have different legal preferences, which could significantly slow down the harmonisation process.

## Appendix G: Informed consent form interview

**Research:** MSc thesis on Public client cooperation to stimulate sustainable procurement  
**Institution:** Delft University of Technology  
**Interviewer:** Lennart van de Vliert

*Please tick the appropriate boxes*

**Taking part in the research** **Yes** **No**

1. I have read and understood the information sheet dated [08/03/2021], or it has been read to me. I have been able to ask questions about the research and my questions have been answered to my satisfaction.

2. I consent voluntarily to be a participant in this research and understand that I can refuse to answer questions and I can withdraw from the research at any time, without having to give a reason.

3. I understand that taking part in the research involves an audio-recorded interview that will be transcribed.

**Usage of data during the research**

4. I understand that information I provide will be used for the writing of a thesis for the MSc Management in the Built Environment.

5. I understand that personal information collected about me that can identify me, such as my name, will not be shared beyond the research team.

6. I agree that my information can be quoted in research outputs.

**Future use and reuse of data by others**

7. I give permission for this thesis – containing the information that I provide – to be published and archived in the TU Delft education repository so it can be used for future research and learning.

**Signature participant**

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Name of participant

---

Signature

---

Date

*For participants unable to sign their name, mark the box instead of sign*

For any questions and further information, please send an e-mail to

**Lennart van de Vliert**

M.L.vandevliert@student.tudelft.nl

## Appendix H: Information sheet interview

**Research:** MSc thesis on Public client cooperation to stimulate sustainable procurement  
**Institution:** Delft University of Technology  
**Interviewer:** Lennart van de Vliert

This information sheet dated [08/03/2021], explains relevant aspects of participating in this research as an interviewee. After reading this sheet or being read the information, please fill out the informed consent form. For any questions or further information, please contact the researcher through the email address provided below.

### Taking part in the research

The purpose of this interview is to contribute to graduation research for the MSc track Management in the Built Environment at the Delft University of Technology. By participating in this interview, you contribute with data, experiences and knowledge, aimed to gain insight into the implementation of buyer cooperation in the pre-procurement process of Dutch (public) clients, and whether this buyer cooperation can successfully create harmonised sustainability requirements and aggregation of demand. You are currently involved in a form of public client cooperation (buyer group), and therefore I would like to ask you questions on the following subjects:

1. Your professional background
2. Organisational structure of the buyer group
3. Formation & participants of the buyer group
4. The demand harmonisation process
5. Impact of the buyer group
6. Legal aspects of public client cooperation

Your participation is completely voluntary, and you are not obliged to answer the questions. In case you want to withdraw from this research at any moment during the interview or after the interview has been conducted, please contact the researcher through the email address provided below.

### Usage of data during the research

This interview will be audio recorded. This recording will be transcribed after the interview. Your input during the interview will be used to analyse public client cooperation, which will be included in a thesis for the MSc Management in the Built Environment. Your input can also be directly quoted in the thesis. Personal information that could identify you will not be shared beyond the research team. The research team consists of myself (Lennart van de Vliert), my two TU Delft mentors/supervisors (Dr. ir. Ad Straub & Prof. mr. dr. Evelien Bruggeman) and the mentor from the graduation organization PIANOo – Kenniscentrum Aanbesteden (drs. ir. Floris den Boer).

In the research outputs, any personal information will be anonymised: you will not be identifiable. You have the right to request access to and rectification or erasure of personal data.

### Future use and reuse of data by others

Once the graduation research is finalised, the recordings and any personal data will be erased. The final research products will be published and archived in the Education Repository of the Delft University of Technology. Through the repository, this graduation thesis will be publicly accessible, to be used for future research and learning.

Thank you very much for your contribution to this research!

**Lennart van de Vliert**

M.L.vandevliert@student.tudelft.nl