Condominium associations in the energy transition

Research into how municipalities can enhance their approach to stimulate condominium association to renovate their dwelling



Stijn Olthof Master Thesis Technical University of Delft MSc Architecture in the Built Environment

Colophon.

Student: Name: Stijn Olthof Student number 4489519 University: Delft University of Technology Faculty Architecture and the Built Environment

Graduation

Supervisors

Graduation organisation





Preface.

In front of you is my thesis on the 'Energy transition for condominium associations', which focuses on how municipalities can enhance their approach to stimulate them better. For the past year, I have been occupied with writing this thesis as part of the graduation of the master 'Management in the Built Environment' of the Faculty of Architecture at the Technical University of Delft.

Throughout my bachelor study of Architecture and my master programme, the sustainability of buildings and the built environment was central. This fascinated me, and when I needed to choose a subject for my graduation, I decided to focus on the energy transition in the built environment. During my research, that fascination grew and showed the necessity of the energy transition. Moreover, it showed what this means for the building stock and the renovation wave that must happen. Furthermore, during the research, the barriers I encountered with condominium associations showed me how complicated it could be to come to a renovation. Therefore, this sustainability challenge for the built environment will keep on fascinating me.

This thesis would not be the same without my supervisors, for which I would like to thank them. First of all, Queena Qian, for her positivity and enthusiasm, helped me to keep going. She kept me sharp and helped me to understand my ideas through our discussions better. I would also like to thank my second supervisor Erwin Mlecnik for his critical view on a detail level and on the overall research. This helped me a lot during my research. Furthermore, he provided me with much extra helpful information and links. Through Queena, it was also possible to get an internship at the municipality of Amsterdam, which has proven to be very fruitful for my research. From the municipality of Amsterdam, I would like to thank Else Veldman and Richard Ruitenbeek for the opportunity and the connections to interview people and further develop my research. Moreover, I would like to thank everyone I interviewed for this research as writing my thesis would not have been possible without them. A special thanks to Walter van Steenis, Bouke Staphorst and Baudouin Knaapen for their additional insights and help outside of their interviews. Last but not least, a word of gratitude to my family and friends who have helped me relax during my graduation period.

I hope you enjoy reading my thesis.

Stijn Olthof November 2021

Abstract.

Following the Paris agreement and the agreements with the EU, the Dutch government has made their climate agreement with the goal for the whole built environment to be energy-neutral and free of natural gas by 2050. The Dutch government has tasked the municipalities to lead this process as they are the most suited party. The Dutch building stocks for housing consist of a substantial part of condominium associations where only 25% scores an energy label B. Especially in the bigger cities, the building stock consists of a large part out of condominium associations. As municipalities can not force them to renovate, they have a slow decision-making process, and there are complex ownership situations, the energy transition for condominium associations is a big challenge. This research focuses on the larger associations (6+ members) as group dynamics also start to play a role. This research aims to advise the municipalities on their approach and position in the energy transition for condominium associations. To achieve this goal, the research focuses on the following main research question:

'How can municipalities enhance their approach for stimulating condominium associations to renovate their dwelling for the energy transition?'

First, to answer this question, a literature review was carried out to create the theoretical framework. The literature review looked at public policy, energy-efficient governance and different types of policy instruments governmental bodies can use to stimulate people. In addition to that, the literature review also looked at the customer journey of condominium associations. The review on the customer journey also includes transaction costs, collective decision-making processes and stakeholder analysis. With this literature review, two frameworks have been created. First, one framework has been created to study the approaches of different municipalities and one to discover the different barriers that condominium associations encounter in their process. Second, with the framework for the customer journey as a basis, the first round of interviews was held with actors close to condominium associations. This discovered where the barriers lie for condominium associations and what municipalities could do about that. This focuses on the three different types of barriers that condominium associations can encounter: transaction cost barriers, collective decision-making barriers, and barriers to comprehending and applying for the help of municipalities. Third, the second round of interviews was held with representative stakeholders to study Amsterdam, Rotterdam and Utrecht approaches. By looking at the research variables of the framework, it was possible to compare and analyse the approaches. From this analysis, lessons were drawn about the approaches of the municipalities and the barriers. Fourth, the barriers encountered by the condominium associations in Amsterdam were compared with the analysis of the approaches of the different municipalities to see if the approach of the municipality of Amsterdam could be enhanced. This piece of advice was generalized to enhance the approach of municipalities for stimulating condominium associations for the energy transition which states that:

The municipalities should become the facilitator of the energy transition, and condominium associations should be assisted wherever they can be in the customer journey. Municipalities should look for ways to make this possible. Five tasks are given to do this;

Instigating.

Municipalities should raise awareness and engage condominium associations to stimulate more condominium associations to renovate their building.

Teaching.

More adequate boards and well-functioning condominium associations must be created by ensuring basic understanding with condominium associations of what it means to be one.

Guiding ans assisting.

Municipalities must assist and help condominium associations in their customer journey to help them overcome barriers to ensure that more condominium associations finish their journey.

Take away barriers.

The municipalities should look for general barriers for all condominium associations and see if there are ways to make this process easier.

Communication and Collaboration.

To prevent them from all inventing the wheel, municipalities must start working together with market parties and each other. This collaboration helps with sharing and understanding the problems and barriers better.

The full advice, together with practical recommendations, answers the main research question.

Table of content.

Chapter 1 - Introduction	11
1 The Energy transition	12
LLL The world and Europe.	12
1.1.2 Situation in the Netherlands.	12
1.2 Renovating dwellings in the built environment.	
1.3 Condominium Associations.	-1
1.3.1 The role of condominium associations.	-5
1.3.2 Barriers in the decision-making process of condominium associations.	-7
1.4 Problem Statement.	18
1.5 Research goal and questions.	18
1.6 Outline.	19
1.7 Relevance.	20
1.7.1 Societal relevance.	20
1.7.2 Scientific relevance.	21
Chapter 2 - Research design	22
2.1 Research structure.	23
2.2 Methodology.	25
2.3 Case studies.	27
2.3.1 Municipality of Amsterdam.	27
2.3.2 Municipality of Rotterdam.	27
2.3.3 Municipality of Utrecht.	28
2.3.4 Reigersbos.	28
2.3.5 Venserpolder.	29
2.3.6 Lucellestraat	30
2.3.7 Comparison of case studies.	31
2.4 Research flow.	31
Chapter 3 - Literature study and theoretical framework.	33
3.1 Condominium associations.	34
3.1.1 Size.	34
3.1.2 Owner situation.	34
3.1.3 Building year.	36
3.1.4 WOZ-value.	37
3.1.5 Income level.	38
3.1.6 Deed of division.	38
3.1.7 Sleeping condominium association.	39
3.1.8 Concluding remarks on condominium associations.	40
3.2 Public policy.	41
3.2.1 Public policy.	41
3.2.3 Governance Assessment Tool and Contextual Interaction Theory	42
3.2.4 Levels and scales.	44
3.2.5 Actors and networks.	46
3.2.6 Problem perspectives and goal ambitions.	47
3.2.7 Strategies and policy instruments.	49
3.2.8 Responsibilities and resources.	53
3.2.9 Descriptive questions and research variables from GAT	54
3.3 The customer journey of condominium associations.	55
3.3.1 Customer journey.	55 -8
2×2 Type of Barriers in the customer journey	50
2.2.4 Transaction costs barriers	59
2 2 5 Collective decision-making process harriers	00 62
3.3.6 Barrier arising from comprehending and applying for incentives	64 64
3.3.7 Actors alleviating barriers.	64 64
3.4 Barriers for each different step of the customer journey.	65
3.4.1 Step 1: the reason to start the journey	66

3.4.2 Step 2: Orientating and researching different options.	67
3.4.3 Step 3: Vote concerning feasibility study.	68
3.4.4 Step 4: Requesting quotes and setting up the business case.	69
3.4.5 Step 5: Vote concerning the execution of the measure(s).	70
3.4.6 Step 6: Finalising and financing.	71
3.6.7 Overview of barriers per step.	71
3.5 Conclusion on the literature study.	72
Chapter 4 - Barriers encountered by condominium associations.	74
4.1 Step 1: Reason to start the journey.	75
4.2 Step 2: Orientating and researching the different possibilities.	75
4.3 Step 3: Vote concerning the feasibility study.	77
4.4 Step 4: Requesting quotes and setting up the business case.	78
4.5 Step 5: Voting about the execution of the renovation.	79
4.6 Step 6: Finalising the finances and requesting subsidies.	80
4.7 Overarching barriers.	80
4.8 Conclusion on barriers in case studies.	81
Chapter 5 - Approaches of the municipalities.	84
5.1 Levels and scales	85
5.2 Actors and networks.	87
5.3 Problem perspective and goal ambitions.	90
5.4 Strategies and policy instruments.	92
5.5 Resources and responsibilities	96
5.6 Drawing lessons from the approaches of municipalities.	98
Chapter 6 – Discussion part I on the results.	101
6.1 Barriers in the customer journey.	102
6.2 Approaches of the municipalities.	106
Chapter 7 - Discussion part II on enhancing the approach of the municipality of Amsterdam.	110
7.1 Comparison of barriers and approaches.	111
7.1.1 Problems condominium associations.	111
7.1.2 Goals and problems of the municipality.	111
7.1.3 Two routes as a solution for renovation.	112
7.2 Swot analysis on the approach of the municipality of Amsterdam.	112
7.2.1 Opportunities.	112
7.2.2 Threats.	113
7.2.3 Strengths.	114
7.2 Recommendations for the municipality of Amsterdam	115
7.3 recommendations for the mainteparty of misteredam.	116
7.3.2 Instigating.	117
7.3.3. Teaching.	118
7.3.4 Guiding and assisting.	118
7.3.5 Take away barriers.	119
7.3.6 Communication and collaboration.	120
7.4 Generalising recommendation approach municipality of Amsterdam.	121
7.5 Limitations of the research.	122
Chapter 8 – Conclusion.	123
8 Answer to the main research question	124
o. Answer to the main research question.	
8.2 Further research possibilities.	125
8.2 Further research possibilities.	125 127
 8.2 Further research possibilities. Chapter 9 – Reflection. 9.1 Product. 	125 127 128
Chapter 9 – Reflection. 9.1 Product. 9.2 Process.	125 127 128 128
Chapter 9 – Reflection. 9.1 Product. 9.2 Process. 9.3 Planning.	125 127 128 128 129

Appendix	137
Appendix I	138
Appendix II – Questionnaire for the board of condominium associations.	139
Appendix III – Interview quotes	146
Appendix III.1 - Quotes interview with Project Leader condominium associations Amsterdam.	146
Appendix III.2 – Quotes from an interview with employee innovation department in Amsterdam.	146
Appendix III.3 – Quotes from interview with Project leader climate and innovation in Rotterdam.	147
Appendix III.4 – Quotes from interview with the Director of VvE010.	149
Appendix III.5 - Quotes from the interview with project leader condominium associations approach and	
energy in Utrecht.	150
Appendix III.6 – Quotes from interview with program officer for development districts and natural gas fre	e
from Stitching!Woon.	151
Appendix III.7 – Quotes from interview with Spatial and strategic advisor from Klimaatmissie.	155
Appendix III.8 - Quotes from an interview with a board member of the condominium association of the	
Lucellestraat	156

List of figures

Figure 1.1 – the process of designing a transition vision heat document (PAW, n.d.)	13
Figure 1.2 – Labels of the housing stock in the Netherlands (CBS et al., 2020)	14
Figure 1.3 – Energy Labels and amount of $kWh/m2$ per year (Rijksoverheid Voor Ondernemend Nederland, 2020)	14
Figure 1.4 - Different sizes of condominium associations in the Netherlands (CBS, 2016a)	16
Figure 2.1 – Overview of research flow (own image)	23
Figure 2.2 – Street level view of Reigerbos (Oba, n.d.)	28
Figure 2.3 – Bird level view of Reigersbos (Klimaatmissie, 2020)	29
Figure 2.4 – Bird level view of Venserpolder (Het Parool, 2009)	29
Figure 2.5 – Street-level view of courtyard garden of Venserpolder (Otten, 2014)	29
Figure 2.6 – Street-level view of the Lucellestraat (Oozo, n.d.)	30
Figure 2.7 – Research flow with output and input of the chapters (own figure)	32
Figure 3.1 - Condominium with mixed ownership situations (CBS, 2016a)	35
Figure 3.2 – Condominium associations with social housing corporations (Gemeente Amsterdam, 2018)	35
Figure 3.3 – Building year of condominium associations in the Netherlands (CBS, 2016a)	36
Figure 3.4 - Dwellings of condominium associations with their size and building year in Amsterdam (Gemeente Amste	2r-
dam, 2018)	36
Figure 3.5 – The WOZ-value of condominium associations (CBS, 2016a)	37
Figure 3.6 – Income of members of condominium associations in the Netherlands (CBS, 2016a)	38
Figure 3.7 – Number of required things present (Ministerie van Algemene zaken, 2020)	40
Figure 3.8 – Actor characteristics with interaction processes influenced by the different layers of context (Bressers, 2000	9)
	43
Figure 3.9 – Energy efficiency governance systems (Jollands et al., 2011)	45
Figure 3.10 - Government coordination mechanisms (Jollands et al., 2011)	45
Figure 3.11 – Possible concerns for web portals of local authorities at different stages in the process (Mlecnik, Meijer and	d
Bracke, 2018)	48
Figure 3.12 – Four different types of policy instruments (Adams and Tiesdell, 2012)	49
Figure 3.13 – customer journey condominium association for a renovation (translated from Paradies et al., 2017)	55
Figure 3.14 – Customer journey for condominium association with energy (Stroomversnelling & Platform 31, 2018)	56
Figure 3.15 – Comparison of different customer journeys (own image)	57
Figure 3.16 - Different stages of decision-making where members of a condominium association can be (Paradies et al.	.,
2017	63
Figure 3.17 – Process of poor decision making through group think (Stragnor, 2021)	63
Figure 3.18 – Barriers that must be overcome during one step of the customer journey (own image)	65
Figure 3.19 – Customer journey of the collective decision-making process of a condominium association (own image)	66
Figure 5.1 – Vertical organisation for the energy transition (own image)	86
Figure 5.2 – Stakeholders networks of the municipalities of Amsterdam, Rotterdam and Utrecht (own image)	88
Figure 6.1 - Modified customer journey for condominium associations (own image)	102
Figure 7.1 – Two routes towards an energy-neutral building that is free of natural gas (own figure)	112
Figure 7.2 – Recommendation for enhancing the approach of municipality of Amsterdam (own figure)	116
Figure 7.3 – Concept of information window as a machine that keeps itself going (own image)	119
Figure 8.1 - Recommendation for enhancing the approach of municipalities (own figure)	124
	•

List of tables.

Table 1.1 – Addresses with a residential function belonging to condominium associations and their energy label (own	
table, data from CBS, 2016b)	16
Table 1.2 – Outline of the report (own image)	20
Table 2.1 - First round of interview (own table)	26
Table 2.2 - Second round of interviews (own table)	26
Table 2.3 - Third round of interviews (own table)	26
Table 2.4 - Overview of the municipalities (own table)	27
Table 2.5 – Comparison of different case studies (own table)	31
Table 3.1: Percentage of condominium associations that belong to the different sizes in apartment rights (CBS, 2016a)	34
Table 3.2: condominium associations in Amsterdam (Baas, 2019)	34
Table 3.3 - Dwellings of condominium associations with their size (number of apartment rights) and WOZ-value (Ge-	
meente Amsterdam, 2018)	37
Table 3.4 – Governance dimensions and descriptive questions (Bressers, 2016)	44
Table 3.5 – Descriptive questions for the levels and scale governance dimension (own table)	46
Table 3.6 – Descriptive questions for the actors and network governance dimension (own table)	47
Table 3.7 – Descriptive questions for the problem perspective and goals ambitions governance dimension (own table)	49
Table 3.8 – Descriptive questions for the strategies and policy instruments dimension (own table)	52
Table 3.9 – Descriptive questions for the responsibilities and resources dimension (own table)	53
Table 3.10 – Governance dimensions with research variables (own table)	54
Table 3.11 – Actors involved in the decision-making process of condominium associations (own table)	58
Table 3.12 – Different transaction costs barrier for condominium associations (own table)	61
Table 3.13 – Expected barriers for the customer journey of condominium associations (own table)	72
Table 3.14 - Governance dimensions with summarized research variables (own table)	72
Table 4.1 – (Expected) barriers from the interviews with condominium associations (own table)	82
Table 4.2 – Barriers encountered by the condominium associations from the case studies (own table)	83
Table 5.1 – Research variable of the levels and scale dimension (own table)	86
Table 5.2 – Research variable of the actor and network dimension (own table)	88
Table 5.3 – Research variable of the problem description and goal ambitions (own table)	91
Table 5.4 – Research variable of the strategies and policy instruments (own table)	93
Table 5.5 – Research variable of the resources and responsibilities (own table)	97
Table 5.6 – Summary of the lessons learned by the approaches of the municipalities per governance dimension (own ta	l-
ble)	99
Table 6.1 – Comparison of barriers from literature and case studies per category (own table)	106
Table 6.2 - Matrix of barriers for the different steps of the customer journey for large condominium associations (own	
table)	107
Table 7.1 – SWOT analysis of the approach of the municipality of Amsterdam (own table)	113

Chapter 1 - Introduction

This chapter introduces the energy transition and the current problems for municipalities in achieving an energy-neutral built environment free of natural gas. First, it focuses on the difficulties with condominium associations and how municipalities struggle before introducing the problem statement and research questions. The chapter ends with the research relevance and the outline of the report.

1.1 The Energy transition.

1.1.1 The world and Europe.

In 2015, almost all countries signed the Paris Agreement (United Nations, 2015). This agreement was a landmark to fight climate change and accelerate actions and investments for a sustainable future (European Commission, 2021). The goal of the Paris Agreement was to minimize global warming to only 2 degrees Celsius above the pre-industrial and pursue efforts to reduce this even further to 1,5 degrees Celsius (United Nations, 2015). Furthermore, the Paris Agreement requires all involved parties to put their best efforts and regularly report on their progress, emissions and implementation efforts (European Commission, 2021).

The built environment and the building sector are crucial for the European Union (EU) to achieve these sustainability goals (EPBD, 2019). Therefore, technical support standards have been established to measure and support energy performance, called the Energy Performance of Buildings standards (EPB). These standards play a crucial role in supporting the Energy Performance Building Directive (EPBD) of the European Union, as member states are encouraged to use the applicable standards (European Commission, 2021).

The energy performance of buildings is not performing well enough in the EU as the built environment is responsible for around 40% of the energy consumption and 36% of the countries' greenhouse gas emissions (European Commission, 2021a). This shows the enormous potential to save energy. Moreover, around 75% of the building stock is energy inefficient, and 85-95% of the buildings will still be used in 2050 (European Commission, 2021b). Moreover, only about 1% of the buildings are renovated each year, making effective action crucial as these numbers should be closer to 2,5% (European Commission, 2021b). Therefore, the EU (European Commission, 2021a) has established a legislative framework to:

- Achieve a highly energy-efficient and decarbonised building stock by 2050
- Create a stable environment for investment decisions

- Enable consumers and businesses to make more informed choices to save energy and money Following these amendments from the EU, several measures have been taken, including all EU countries, to establish long-term renovation strategies with goals from miles for 2030, 2040 and 2050 (European Commission, 2021). Examples from measures from the EU include that EU countries are required to set cost-optimal minimum energy performance requirements for new and existing buildings and that all newly constructed buildings should be nearly zero-energy buildings (European Commission, 2021a). Moreover, the European Commission started the Renovation Wave for Europe to boost building renovation for climate neutrality and recovery aimed to green our building, create jobs, and improve lives (European Commission, 2020). The strategy aims to double the energy-efficiency renovations in the next ten years. To accomplish this, the European Union must adopt an integrated strategy while incorporating a wide range of actors and sectors (European Commission, 2020).

1.1.2 Situation in the Netherlands.

These problems, plans and ambitions require all EU countries to draw up their plans and approaches. The result for the Netherlands was the Dutch Climate Agreement (Ministerie van Economische Zaken en Klimaat, 2019). This agreement was presented in 2019 and had over 600 concessions to reduce the emission of greenhouse gases (Ministerie van Ecomische Zaken, Landbouw en Innovatie, 2020). The Dutch government divided the society into five different sectors and set goals and requirements for the different sectors. The sectors are as follows:

- Built environment
- Mobility
- Industry
- Agriculture & land use
- Electricity

This research focuses on the built environment sector. A transition needs to establish a built environment free of natural gas and energy-neutral by 2050 (Ministerie van Economische Zaken en Klimaat, 2019). This means that the Dutch built environment must emit 3.4 million tons of CO2 less by 2050. Moreover, an intermediate goal has been set for 2030 as the emission must be reduced by 49%. The Dutch government has chosen a district-orientated approach where municipalities take on a leading role (Ministerie van Economische Zaken en Klimaat, 2019). This approach was chosen as there is no blueprint for the energy transition, and almost every situation is different.

Furthermore, the wide range of different building types, building functions and ownership situations require the same wide range of approaches. Local governance is better suited to deal with these challenges as they are closely connected to the problems. The same goes for finding sustainable heat sources and setting up heat grids as local municipalities better determine the barriers, problems and solutions on that scale.

A complicating factor for the plans of municipalities lies with the property right of homeowners in the Netherlands. It does not allow government institutions to force residents to renovate their dwellings (Nieboer and Straub, 2018). Therefore, municipalities should search for solutions to stimulate homeowners to do this themselves and facilitate them in that process.

1.1.3 Approaches of municipalities.

To hit the ground running, the Dutch government wants all municipalities to draw up their approach for the transition by the end of 2021 (Ministerie van Economische Zaken en Klimaat, 2019). The basis of the approach of the municipalities for the energy transition is formed with the transition vision heat document and the execution plan (PAW, n.d.). The transition vision heat provides insight into how municipalities are going to organise and execute the district-orientated approach. The program provides a plan of action for coming up with the transition (figure 1.1). Following this process, municipalities will end up with a document describing the number of dwellings that should make the step to an alternative resource, at what time, the alternative sources for heat, the costs and how to involve residents in this process. This vision needs to have an integral view but with attention to the different scale levels since the participation of residents is required to make the transition possible.

Moreover, from these visions, plans should follow with projects to ensure the participation of residents (PAW, n.d.). To use the alternative heat sources and use them efficiently, renovations to the dwellings are required. These renovations consist of a connection to the grid and the energy performance of the dwelling. The municipalities can not execute the renovations for all the dwellings by themselves, which is why the participation of residents is so meaningful. The execution plan of municipalities describes how the transition vision heat comes to execution for different neighbourhoods.



Figure 1.1 – the process of designing a transition vision heat document (PAW, n.d.)

Not all knowledge, technologies are available yet to make the energy transition and the plans and approaches for the transition are not finished and final yet. This is why there is special attention in the Dutch Climate Agreement for learning and development programmes (Ministerie van Economische Zaken en Klimaat, 2019). Programma Aardgasvrije Wijken is one of these programmes where municipalities can share their experiences and find new knowledge concerning (PAW, n.d.). The plans and approaches for the energy transition need to be updated when new knowledge is available. Many municipalities have started developing and presenting their plans (Gemeente Amsterdam, 2020a; Gemeente Rotterdam, 2020a; Duurzaam Den Haag, 2019; Gemeente Utrecht, 2021a). In addition to that are several policy instruments in place to help and facilitate homeowners. Logically and unfortunately, these plans and approaches are not complete yet. The Dutch Climate Agreement (Ministerie van Economische Zaken en Klimaat, 2019) accounted for this and saw the transition with a learning curve where results from projects can be used to strengthen other approaches and projects. There are already results coming in that (can) help municipalities. The municipality of Amsterdam and Rotterdam have appointed several neighbourhoods to become free of natural gas by 2030 (Gemeente Amsterdam, 2021a; Duurzaam 010). These first neighbourhoods will help in discovering problems and finding solutions. As described in the last paragraph, municipalities can not force homeowners to renovate their dwellings and should look for ways to stimulate them. As no blueprint has been developed for the best way to do this, municipalities have to explore this for all types of homeowners and dwellings. They have to determine what type of renovations work and can be feasible for a larger scale and test these renovations. After that, they have to stimulate and convince the other homeowners to execute such a renovation. In this process, many municipalities are still struggling to find the right way.

1.2 Renovating dwellings in the built environment.

Since most current occupied buildings will still be in use in 2050, those buildings' current energy efficiency level is essential. For dwellings in the Netherlands, this image does not look so well as over 60% does not have energy labels A or B (CBS et al., 2020), which are required for the energy transition (figure 1.2). The energy label only tells us about the energy efficiency of the dwelling but not about the total energy use of the building as it does not account for household appliances (Rijksoverheid Voor Ondernemend Nederland, 2021). To establish this, severe renovations to the housing stock are required. Reducing the energy use by 90 kWh/m2 would turn an Energy Label C into an Energy Label B



Figure 1.2 – Labels of the housing stock in the Netherlands (CBS et al., 2020)

G	F	Е	D	С	В	Α	A ⁺	A ⁺⁺	A ***	A ⁺⁺⁺⁺
	380	335	290	250	190	160	105	75	50	0

Figure 1.3 – Energy Labels and amount of kWh/m2 per year (Rijksoverheid Voor Ondernemend Nederland, 2020)

To become energy-efficient, the behaviour of residents also plays an important role and changing this can help reduce the energy demand. Next to the changing behaviour of residents to become more sustainable, different interventions can help make dwellings more sustainable. Three steps in this process are important following the Trias Energetica (Rijksdienst voor Ondernemend Nederland, 2013), namely:

- Step 1: Limit energy demand.
- Step 2: Use energy from renewable sources.

- Step 3. Use finite (fossil) energy sources only when necessary and as trim and efficient as possible Next to providing municipalities with information about communication and participation, PAW (n.d.) also provides technical information about technical solutions.

For changing these Energy Label levels, serious renovations could be necessary, and the Rijksoverheid gives some examples of this (Ministerie van Economische Zaken en Klimaat, n.d.):

- Better insulation of the roof, facades, cavity wall, floor and windows;
- solar water heaters;
- heat pumps;
- ventilation with heat recovery;
- solar panels.

These interventions are not cheap and not decided on in a couple of minutes, as homeowners must consider the different options when choosing and see what fits their house best. This is even more difficult when a whole group decides and everyone must be on board with the decision.

Renovating dwellings and ensuring them free of natural gas is not the only step that must be considered to have a sustainable and energy-neutral built environment. It is an important step but not the whole process. Municipalities and the Dutch government should also pay attention to the heat sources for heat networks to become sustainable. This is, however, not the focus of this research.

1.3 Condominium Associations.

1.3.1 The role of condominium associations.

Part of the building stock of the Netherlands consists of condominium associations. A condominium is a living space where several apartments are located in one building but are independently sellable. CBS (2016a) defines this further as follows;

'An owner can split a plot or building through a deed of division into different apartment (condominium) rights that can be sold separately.'

When this happens, a condominium association is automatically constructed and when dwellings are split and resold, new condominium partners are automatically part of the associations. If an apartment is sold and bought by a new owner, that owner buys the exclusive right of use of the apartment and becomes co-owner of the whole building (VvE Belang, n.d.). This shared ownership of the building comes with shared responsibility for the management and maintenance of the property and some legal regulations (VvE Belang, n.d.). All condominium association members together are obligated to maintain the property and a fund for future maintenance (VvE Belang, n.d.). These associations are constructed to deal with the maintenance of the shared parts of the property, including the roof, windows, heating system, outer walls, shared stairwell, shared spaces, cleaning and lightning for the shared spaces, and insurance.

Condominium associations take up a big part of the Dutch building stock, especially in the larger cities. In 2016, there were 143.835 condominium associations with a total of 1.317.475 addresses with apartment

rights and a residential function (CBS, 2016a). Condominium associations make up a significant part of the housing stock in the Netherlands (table 1.1). Especially in the bigger cities, they form a large part of the housing stock which sometimes rises to around half of the addresses with a residential function (Gemeente Amsterdam, 2020a). Table 1.15 shows the number of addresses with a residential function that belongs to condominium associations. This table uses numbers from Allecijfers (Allecijfers, 2021) and the research from CBS (2016b) into condominium associations. Even though the address numbers and numbers about the condominium associations are not from the same year, it shows how essential condominium associations are in the housing stock of the Netherlands but especially in the big cities.

Table 1.1 – Addresses with a residential function belonging to condominium associations and their energy label (own table, data from CBS, 2016b)

Municipality	Addresses	CA	Energy	Energy	Energy	Energy	Energy Label
		addresses	Label A	Label B/C	Label D/E	Label F/G	Unkown
Amsterdam	471.535	191.715	4.580	35.210	17.710	5.255	128.960
Rotterdam	316.727	121.060	1.880	26.365	18.810	5.370	68.635
Utrecht	162.923	41.900	1.805	7.050	5.110	1.340	26.595
Netherlands	7.795.595	1.173.890	38.350	191.540	137.945	42.800	763.255

Moreover, condominium associations can vary from just two members in one building to big apartment buildings with over 500 apartments and members (CBS, 2016a). Figure 1.3 shows how many of the different sizes of condominium associations there are. When the energy efficiency of dwellings was compared by Companen (2015), there were not many differences between dwellings that belonged to condominium associations and those that did not. These numbers show that condominium associations form a big part of the energy transition challenge for the built environment. This is echoed by the numbers in table 1.1, which shows that most condominium associations know that their energy labels must undergo renovations for the energy transition.



Figure 1.4 – Different sizes of condominium associations in the Netherlands (CBS, 2016a)

In 2019, all sectors in the Netherlands together used 2354 PJ (659 TWh), and the built environment was responsible for 28% (654 PJ) of this (Energie in Nederland, 2020). The housing stock is responsible for around two-thirds of this, around 400 PJ (Rijksoverheid Voor Ondernemend Nederland, 2019). With the ratio (0,15) of the numbers of addresses of condominium associations (table 2.5) and the number of dwellings from 2015 (CBS, 2021), condominium associations have an energy use of 60 PJ. Considering 60% of the energy use of the built environment comes from natural gas (Energie in Nederland, 2020), this calculation shows the necessity to renovate the dwellings of condominium associations.

When looking at the city of Amsterdam, this challenge is also evident. The city of Amsterdam produces 5.000 kilotons of greenhouse gases, of which the building stock produces 14% (Gemeente Amsterdam, 2020a). The building stock in Amsterdam consists of 441.000 dwellings, of which 53% belongs to a condominium association (Gemeente Amsterdam, 2020a). This means that condominium associations responsible in Amsterdam account for around 7% of the greenhouse gases of the city, which is 350 kilotons (7% of the 5.000 kilotons of Amsterdam). This number can be lower as apartments use less energy than other building types (Rijksoverheid, 2019). Amsterdam plans to have a building stock free of natural gases by 2040 and be energy neutral by 2050 (Gemeente Amsterdam, 2020b), which leaves an immense challenge for condominium associations.

1.3.2 Barriers in the decision-making process of condominium associations.

The tenure situation in the Netherlands consists of three different categories, namely owner-occupied, private rent and social rent. Condominiums associations are subject to division as almost half of them are mixed, consisting of owner-occupied and rental dwellings (Duffhues, 2019). The different tenure situations have different rights and obligations following Dutch law. This complicates the condominium associations regulations resulting in various decision-making processes that usually have a slow pace (Companen, 2015). For example, when a condominium association wants to decide on a renovation, use of reserve fund or extraordinary maintenance, at least two-thirds or three-quarters of the members must agree with the decision depending on the model agreement used (MR, 2017).

The process that a condominium association goes through is comparable with that of other condominium associations. All associations must orientate on the possibilities, vote on the execution of the renovation and do feasibility studies (Paradies et al., 2017). Moreover, they encounter the same barriers that result in their slow decision-making processes, such as a lack of knowledge about the possible measures, involvement of residents with the condominium associations and lack of financial resources (Paradies et al., 2017).

To help condominium associations, it is essential to understand that there is a wide range of different condominium associations, which is not strange as the numbers of members can vary from 2 to over 500 (CBS, 2016a). To conduct policy on such a wide range of condominium associations, it is essential to distinguish different types of condominium associations. Therefore, a distinction must be made on the size, owner situation and division of private and shared property of the building of condominium associations. This research focuses on the larger condominium associations (6+ members) with a mixed type of ownership. The situation with larger and mixed condominium associations is different from the smaller ones as the group decision-making process starts playing a role, and more motives must be considered.

As described in the last paragraph, condominium associations have a slow decision-making process in general situations. When it comes to sustainable renovations, this is not different and sometimes even worse. Paradies et al. (2017) researched the influencing factors concerning the customer journey of a condominium that wants to execute an energy-efficient renovation. When making a decision does not happen at one fixed moment in time but rather a whole process, that process can be seen as a customer journey. This process starts with an initial interest in a good of service and can turn into a concrete purchase or its evaluation (Nieboer and Straub, 2018). This research only looks at the decisionmaking process for the renovation of a dwelling of a condominium association and does not consider the renovation itself. This concept can be used to see where pitfalls lie and how a willingness to invest does not turn into an actual investment. In deciding to invest, several steps are taken that form the basis of customer journey models. For condominium associations, this process consists of their collective decision-making process. From the moment one of the members shows interest in an energy-efficient renovation to the vote about executing the proposed renovation measures, many barriers must be overcome (Paradies et al., 2017). Many condominium associations do not have all the knowledge about the possibilities and struggle with convincing other members about the renovations. All these different barriers together make the process challenging to finish for condominium associations.

1.4 Problem Statement.

Condominium associations must go through an intensive decision-making process to decide on a renovation (Paradies et al., 2017). These decision-making processes usually take long as an agreed majority must support the decision (MR, 2017; Companen, 2015). This is a problem as condominium associations form a substantial part of the built environment that must be renovated to meet the sustainability goals of the Dutch government by 2050. The energy efficiency level of dwellings of condominium associations is alarming as only 25% score an energy label B (Companen, 2015). There is a wide range of different types of condominium associations, following from their size, ownership and other attributes that all encounter barriers they must overcome to execute an energy efficiency renovation. These renovations are needed to meet the goals of the energy transition.

Dutch municipalities have the lead in this process. Following the Dutch Climate Agreement (Ministerie van Economische Zaken en Klimaat, 2019), they are tasked with the energy transition in the built environment. While technological innovations are available for energy renovations, policies and approaches should mainly focus and financial and social acceptance (Rose et al., 2021). Dutch municipalities are drawing up/have drawn up their plans and approaches for the transition towards a built environment that is energy-neutral and free of natural gas (Gemeente Amsterdam, 2020b; Gemeente Rotterdam, 2020a; Gemeent Utrecht, 2021a). As municipalities do not have the forcing power to establish this, they should find ways to help condominium associations with their process. Municipalities should look for ways to better stimulate and facilitate the associations in this process as this is in their power and possibilities.

To meet the goals of the Paris agreement and the European Union, the Dutch municipalities and the municipality of Amsterdam must meet the goals of the Dutch Climate Agreement. Therefore, this research aims to help with enhancing the approach of the municipalities in the Netherlands.

1.5 Research goal and questions.

This research aims to help the municipalities with the energy transition. Especially in big cities, condominium associations form a substantial part of the building stock. Therefore, this research aims to give some recommendations to municipalities in the Netherlands on better assisting and stimulating condominium associations in their decision-making process for the energy transition. Therefore it focusses on the following main research question (RQ):

How can municipalities enhance their approach to stimulate condominium associations to renovate their dwellings for the energy transition?

This research question aims to help condominium associations to renovate their dwelling. A wellworking approach for condominium associations is essential for municipalities as they take up a large part of the dwelling stock in the Netherlands, which must be energy neutral and free of natural gas by 2050. Renovating the dwellings of condominium associations, therefore, has a vital role in this process. To answer the main research question, this research has several sub research questions. The research starts with a literature study of the state of the art to get some background and to create a theoretical framework with and answers the first sub research question (SQ1): How can relevant literature give more background to the research question and create a theoretical framework to answer the main research question? (SQ1)

The second step of the research uses the relevant literature and the created theoretical framework to identify the barriers encountered by condominium associations in their decision-making process. For this, the customer journeys of several condominium associations in Amsterdam are studied. This part aims to answer the following question (SQ₂):

What barriers are encountered by condominium associations in Amsterdam during their collective decision-making process? (SQ2)

The second step of the research has a bottom-up approach to look at the situation, the third step has a top-down approach. It focuses on the approaches different municipalities have chosen for the energy transition. It compares the approaches of different municipalities and analyses them to answer the following sub research question (SQ₃):

What lessons can be drawn from the differences and similarities from municipalities' approaches to stimulate condominium associations? (SQ₃)

The fourth and fifth sub research questions (SQ4 & SQ5) aim to compare the results from the previous questions and analyse the differences between the approaches of the municipality and the barriers of the condominium associations. They try to answer the following questions:

Is the approach of the municipality of Amsterdam in line with the barriers encountered by the condominium associations? (SQ4)

How can the municipality of Amsterdam enhance its current policy instruments or strategy to stimulate condominium associations to renovate their dwellings for the energy transition? (SQ5)

Together these sub research questions can answer the research question. The answer to that question is advice for municipalities to enhance their approach for stimulating condominium associations for the energy transition. This can help the municipalities with meeting their goals for the energy transition. This can, in addition, help the Dutch government with its sustainability goals.

Section 1.6 outline the rest of the report and describes where and how these sub research questions are answered.

1.6 Outline.

This chapter described the current situation with the energy transition for condominium associations, the problems municipalities face in this process, and the research questions to help find an answer to this problem. This section describes the other chapters and sections of this report and how they help answer the research question.

Chapter 2 concerns the research design, which describes the research setup. The chapter describes the design of the sub research questions from section 1.5. It also describes how the data is collected and analysed and how to find answers for the. Moreover, the choice for the case studies is discussed in this chapter. Chapter 3 consists of a literature review to give the subject more background and set up the theoretical frameworks. To create these frameworks, the literature study concerns the following concepts:

- Condominium associations;
- Public policy;
- Energy-efficiency governance;
- Governance Assessment Tool;
- Customer Journey;
- Collective decision-making;
- Transaction costs.

The study concerning the literature is used to create a framework that helps study the municipalities' approaches and discover the barriers encountered by condominium associations. Chapter 4 shows the first results of the research and analyses the different barriers encountered by condominium associations in their decision-making process. The chapter gives an overview of the different barriers condominium associations encounter in their collective decision-making process and highlights the problem from a bottom-up. Chapter 5 has a top-down approach, describes several municipalities' approaches, and analyses the differences and similarities. The results of chapters 4 and 5 are compared with the literature in chapter 6 as it consists of the discussion. The interpretation of these results and analyses form the basis for chapter 7, where advice is given to Amsterdam's municipality. Chapter 8 consists of the conclusion of the research. Finally, the report ends with a reflection on the process and the product.

Content	Research flow activities	Results
Chapter 1: Introduction.	Introducing the topic, defining the problem and research question.	Problem sta
Chapter 2: Research Design.	Describing the research questions and identifying how to answer the research questions.	Research de
Chapter 3: Literature study and theoretical frameworks.	transition for condominium associations and creating theoretical frameworks.	Framework municipalit
Chapter 4: Barriers for condominium associations.	Discovering barriers encountered by condominium associations in their collective decision-making process.	Overview o condominiu
Chapter 5: Approaches of municipalities.	Analysing the approach of different municipalities and drawning lessons.	Overview o
Chapter 6: Discussion part I on the results.	Reflecting on the results of emperical research.	Lessons on Chapter 4 a
Chapter 7: Discussion part II on the municipality of Amsterdam.	Analysing approach of municipality of Amsterdam by using results and discussion.	Advice for 1 limitations
Chapter 8: Conclusion.	Conclusion and advice for the municipalities.	Conclusion
Chapter 9: Reflection.	Refelction on process and product.	Reflection

Table 1.2 – Outline of the report (own image)

Problem statement and research question
Research design and method
Framework to study approaches of the municipalities and discover barriers of CA's
Overview of barriers encountered by condominium associations
Overview of approaches of municipalities
Lessons on barriers and approaches from Chapter 4 and 5
Advice for municipality of Amsterdam and limitations of research
Conclusion
Reflection

1.7 Relevance.

1.7.1 Societal relevance.

All municipalities in the Netherlands are now dealing with the energy transition and how to create an energy-neutral built environment that is free of natural gas. The same goes for the municipality of Amsterdam that wants to be free of natural gas by 2040 (Gemeente Amsterdam, 2020a). They are all encountering problems with stimulating condominium associations to renovate their dwelling for the energy transition. Municipalities are interested in stimulating condominium associations better to renovate and where the barriers lie for these associations. Moreover, municipalities are interested in how their strategy and approach can better help them. This research helps to identify these barriers for condominium associations and analyse if Amsterdam's approach is in line with the problems.

1.7.2 Scientific relevance.

Difficulties with the decision-making process for renovation of condominium associations in the Netherlands have been known and described (Paradies et al., 2017; Companen, 2015). In response to this, this research aims to use theory about collective decision-making and transaction costs to identify the problems of condominium associations. In addition to that, this study use literature concerning local energy-efficient governance to analyse the approach and possibilities for municipalities. Therefore, this research uses existing literature. The outcome of the research adds to the knowledge and literature concerning the energy transition and condominium associations.

Chapter 2 - Research design

The previous chapter introduced the problem for condominium associations in the energy transition and how municipalities should stimulate them to renovate. Moreover, it discussed the research questions and the sub research questions. This chapter focuses on describing how the main research question and sub research questions are answered. First, the structure of the research and research questions are discussed. Then the methodology with the data collection and the case studies are further elaborated. Finally, the chapter ends by showing the different outputs of the chapters.

2.1 Research structure.

The introduction described the problem statement of this study. Condominium associations form a large part of the Dutch building stock and do not score high considering the energy labels. As it is impossible to force them to renovate their dwelling, municipalities should find ways to stimulate them to renovate their building to meet the energy transition goals. Although Dutch municipalities already have designed approaches for condominium associations to stimulate them, renovations are not fast enough. This research aims to tackle this problem by answering the following main research question:

RQ: How can municipalities enhance their approach to stimulate condominium associations to renovate their dwelling for the energy transition?

This chapter describes the research design of the research. Figure 2.1 shows the action plan to answer the different (sub) research questions and the different methods for each question.



Figure 2.1 – Overview of research flow (own image)

After this research design chapter, the research starts with answering SQ1:

*SQ*1: How can relevant literature be used to create a theoretical framework to answer the main research question?

This literature study reviews relevant literature for the study to create theoretical frameworks. First, literature about public policy, local governance, and energy-efficient governance is described to discover state of the art concerning this subject and later used to create a theoretical framework to analyse the approaches of municipalities for the energy transition. Moreover, literature about the customer journey of the decision-making process of condominium associations for an energy-efficient renovation is discussed. Finally, literature about collective decision-making and transaction costs is outlined to identify and analyse the barriers that condominium associations encounter.

The literature study was a continuous explorative process where new concepts were added to understand the subject. The literature review aimed to find theoretical linkages between energy-efficiency governance and the process of condominium associations. To understand the approaches of municipalities for the energy transition, concepts like 'energy efficiency governance', 'governance assessment tool', 'contextual interaction theory' and 'renovations on district level' and combinations of these concepts were searched. To understand the process of condominium associations, concepts like 'customer journey', 'transaction costs', 'group decision-making', 'barriers' and combinations of these concepts were searched. Relevant hits were scanned by analysing their abstract, table of content and/ or summary to see if they could be helpful and add something to the research. Moreover, the literature review developed further with the references of the found literature.

The literature and framework about barriers in the customer journey of Chapter 3 are used for Chapter 4 and answering SQ2:

SQ2: What barriers are encountered by condominium associations in Amsterdam during their collective decision-making process?

To answer this questions, the barriers that condominium associations encounter during their collective decision-making process are mapped. The theoretical framework of the customer journey for the collective decision-making process, which is a result of SQ1, is used to study the condominium associations' barriers. That customer journey consists of several steps. For each step of the customer journey, the different type barriers are mapped which must be overcome to complete the journey and include:

- Transaction costs barriers
- Collective decision-making barriers
- Comprehending and applying for help barriers

These different types of barriers are further defined in section section 3.3. By mapping and identifying the barriers that condominium associations encounter, it is possible to see where they are struggling and require help. Interviews with the board of condominium associations and actors close to them function as the input for the data. The board of a condominium association is responsible for the working of the association. What this means is described in more detail in section 3.3.2. Through these interviews, a high level of detail can be gathered on the barriers of condominium associations. Why the municipality of Amsterdam and the different condominium associations are chosen can be found in section 2.3. SQ2 results in an overview of the different barriers encountered by condominium associations in their decision-making process.

After answering SQ₂, Chapter 5 uses the literature and framework to study approaches to answer SQ₃:

SQ3: What lessons can be drawn from the differences and similarities from the approaches of the municipalities to stimulate condominium associations to renovate their dwelling?

Chapter 3 created a theoretical framework is created to study the approaches of the municipalities. With the research variables of this theoretical framework, the key elements of the approaches of the municipality are described to create an overview. The overviews of the different municipalities are used to point at the differences and similarities of the chosen approaches. The similarities and differences are used to draw lessons from the approaches. The analysis focuses on the approaches of the municipality of Amsterdam, Rotterdam and Utrecht. Section 2.3 gives more information about chose on these municipalities.

SQ3 is answered using policy and vision documents and interviews with representatives of the different municipalities and actors from the field. The documents include the different road maps, transition vision heat and other documents aimed at stimulating condominium associations. Appendix I shows an overview of these documents.

The answers to SQ₂ and SQ₃ form the basis of the discussion. In the discussion, the results are interpreted and reflected on to see how they can help municipalities. The second part of the discussion focuses on answering SQ₄ and SQ₅:

SQ4: Is the approach of the municipality of Amsterdam in line with the barriers encountered by the condominium associations?

SQ5: How can the municipality of Amsterdam enhance their current policy instruments or strategy to stimulate condominium associations to renovate their dwellings for the energy transition?

The chapter compares the results on SQ₂, SQ₃ and the first part of the discussion to answer these questions. This comparison is made by looking if the approach, the problem perspective, goal ambitions and chosen strategy of the municipality of Amsterdam are in line with the barriers that condominium associations encounter during their collective decision-making process. The result of this comparison forms the basis for the rest of this part of the research. The outcome is used to make assumptions for how the policy instruments or strategy of the municipality of Amsterdam can be enhanced. This concept/idea is then tested using semi-structured interviews to determine if this could help with the encountered problems. Chapter 8 consists of the conclusion of the research and possible future studies. This chapter answers the main research question and advises on how the municipalities can enhance their approach for condominium associations for the energy transition. Finally, chapter 9 consists of a reflection on the product, process and planning of the thesis.

2.2 Methodology.

This research has adopted a qualitative research methodology as it focuses on gathering in-depth insights into a problem by collecting non-numerical data. The aim is to determine whether and how the approach of the municipality of Amsterdam for the energy transition can be enhanced.

The previous section showed the structure and the design of the research and the different sub-research questions that must be answered to answer the main research question. This section describes how data is collected to answer the different research questions. The method for the five sub research questions differs as well as the nature of the different parts.

Data collection

The data for the research is collected in three different rounds. Table 2.2, 2.3 and 2.4 show the interviewed actors for each of the rounds.

The first round consists of interviews on discovering the barriers encountered by condominium associations. This round aims to investigate the perspective of the condominium associations to see what barriers they struggle with, whether they need help and whether the help that is being offered is the right help. This is done through interviews with relevant stakeholders. In section 2.3 show a description of the choice of these condominium associations. The questionnaire shown in appendix I forms the basis for these interviews.

The second round of data collection investigates the approach that the municipalities of Amsterdam, Rotterdam and Utrecht have chosen. In section 2.3 describes the choice for these municipalities. These interviews are held with various representatives of the municipalities and other involved actors in the process. These interviews aim to discover how the municipalities have organised themselves for the transition, how they see the problems, their strategies and how they will learn during this process. The descriptive questions created to analyse the approaches of municipalities in section 3.3 are used as a basis for these interviews.

The third round of data collection consists of another round of interviews. These interviews are aimed to discuss the differences between the approach of the municipality of Amsterdam and the problems encountered by the condominium associations. In addition, these interviews discuss the different possibilities to stimulate renovations better and guide them through the process. These interviews are held with several involved actors to get a view from different perspectives.

Table 2.1 - First round of interview (own table)

Stakeholder	Function	Date	Appendix Code
Municipality of Amsterdam	Project leader condominium associations (CA) approach	19-3-2021	А
Municipality of Amsterdam	Department employee Innovation	14-4-2021	В
Municipality of Rotterdam	Project lead climate and innovation	26-4-2021	C
VvE010	Director	15-7-2021	D
Municipality of Utrecht	Project leader CA approach and energy	8-5-2021	E
Municipality of The Hague	Account manager CA	7-5-2021	F

Table 2.2 - Second round of interviews (own table)

Stakeholder	Function	Date	Appendix Code
Stichting !Woon	Program officer for development districts and natural gas-free	16-8-2021	G
Klimaatmissie	Spatial and strategic advisor	18-8-2021	Н
CA Lucellestraat	Board of CA	15-7-2021	Ι

Table 2.3 - Third round of interviews (own table)

Stakeholder	Function	Date	Appendix Code
Municipality of Amsterdam	Project leader CA approach	28-5-2021	J
Woonlasten Neutraal Renoveren	Director	7-5-2021	K
Klimaatmissie	Spatial and strategic advisor	18-8-2021	L

Processing and analysing of the data

Before the interviews are taken, the interviewee is asked for permission to be recorded and for the interview to be used in the research. Interviewees have the right to pull out of the research at all times. Due to the COVID19 pandemic, almost all interviews were held online and recorded on the computer. When the interviews are done, they are transcribed so that they can be used for the research. From the transcribed interviews, quotes are taken to shed light on the aim of the interview.

The theoretical frameworks created in chapter 3 are used as a basis for the interviews. The frameworks are used to form guiding questions for the interviews. After the interviews are recorded and transcribed, the analysis of the interviews can start. The interviews are scanned with the variables of the framework to see what relevant data can be retrieved from them. This is done by considering the theoretical frameworks and discovering the interviewee's relevant concepts and problems.

For the first round of interviews, data is collected about the different dimensions of the governance approach. Once the data is collected from all the interviews, they are compared to see if there are any similarities or differences. Once this is done, an answer is given to the sub research question of that part of the research. Thus, the data forms the core of the answer to the research questions.

The same happens in the second round of interviews, focusing on the barriers with condominium associations. Again, the developed framework for the decision-making process is used as the basis for the interview questions to collect data about all the different steps of the process. Once the data is collected and transcribed, it is scanned with the research variables to see what the interviewee expressed for relevant information about the process. When this is done with all the transcribed data, the data is compared to see if the same barriers and problems arise. This analysis is used to answer the sub research question of that part.

For the third round of interviews, the results of the first two rounds are first analysed to better understand the relevant struggles with the approach of the municipality and the barriers of the condominium associations. Then, those findings are used as the basis of the third round of interviews. After these interviews, the transcribed interviews are scanned to find relevant data related to the discovered issues in the approach. Finally, when that data is analysed and compared, conclusions are drawn to answer the sub research questions of that part.

When all the sub research questions are answered, the results are analysed with the literature. Moreover, the results are generalized so that they are not just usable for the municipalities of Amsterdam but also for other municipalities. This allows the main research question to be answered. The goal of the gathered data is to give substance to the answers to the research questions. Thereby, it helps to give a piece of advice to the municipality of Amsterdam to enhance their approach.

2.3 Case studies.

For this research, different municipalities (Amsterdam, Rotterdam and Utrecht) and different condominium associations have been chosen to study. The bigger municipalities in the Netherlands are more interesting to study for this research. This is because they have the most condominium associations in their area and are doing the most compared to other municipalities. This paragraph explains further the choice to study them.

Table 2.4 - Overview of the municipalities (own table)

Attributes	Municipality of Amsterdam	Municipality of Rotterdam	Municipality of Utrecht
Percentage of condominium associations	~40%	~40%	~25%
Transition vision heat	Present	Expected this year	First part present, second expected this year
Policy instruments	Several present to help CA's	Several present to help CA's	Several present to help CA's

2.3.1 Municipality of Amsterdam.

Amsterdam is the capital of the Netherlands and the biggest city in the country. The municipality wants to take responsibility to meet the goals of the climate agreement. It has set out to be free of natural gas by 2040 and (almost) energy neutral by 2050 (Gemeente Amsterdam, 2020a). It already has presented its plan with the roadmap towards an energy-neutral Amsterdam (Gemeente Amsterdam, 2020a) and the transition vision heat (Gemeente Amsterdam, 2020b) for becoming free of natural gas. Several neighbourhoods have been appointed to become free of natural gas by 2030 following the plans. In addition to that, the municipality already has several policy instruments in place to stimulate condominium associations to renovate their dwelling. Moreover, Amsterdam is interesting to study due to the Energy Lab Zuidoost, where much research is being done for the energy transition. Another essential factor lies with the number of condominium associations situated in Amsterdam. The municipality of Amsterdam has a total of 471.535 addresses with a living function in 2021 (Allecijfers, 2021), and in 2015, there were 191.712 in Amsterdam part of a condominium association (CBS, 2016b). From these addresses, only 4580 scored an energy label A (CBS, 2016b).

The number of dwellings that must be renovated in Amsterdam, together with the city's plans, make it an interesting municipality to study.

2.3.2 Municipality of Rotterdam.

Rotterdam is the second-largest city in the Netherlands. As well as the municipality of Amsterdam, the municipality of Rotterdam has created the 'sustainability compass Rotterdam' (Gemeente Rotterdam,

2020a), which serves as the basis of an integrated approach for the energy transition. The municipality of Rotterdam is expected to present their transition vision heat this year. It has already several neighbourhoods in mind to become the first neighbourhoods to be free of natural gas (Gemeente Rotterdam, n.d.). Moreover, it has an active condominium association information window and several other policy instruments that help guide and stimulates the associations (VvE010, n.d.; Duurzaam010, n.d.). In Rotterdam, more than one-third of the addresses belong to a condominium association (2.5). However, only a tiny part scores energy label A of these condominium associations, showing why energy-efficient renovations are necessary.

As with Amsterdam, the number of dwellings that must be renovated in Rotterdam, together with the city's plans, make it an interesting municipality to study.

2.3.3 Municipality of Utrecht.

After Amsterdam, Rotterdam and The Hague, Utrecht is the fourth biggest city in the Netherlands and the other big cities actively working on the energy transition. It has created the first part of two parts of its vision transition heat plan (Gemeente Utrecht, 2021a) and presents the second part at the end of the summer. The municipality of Utrecht also has several policy instruments in place to stimulate condominium associations to renovate their dwellings in the form of subsidies and its condominium associations information frame (Gemeente Utrecht, 2021b). In Utrecht, around a quarter of the addresses with a living function is part of a condominium association and only a tiny percentage scores an energy Label A.

As with Amsterdam and Rotterdam, the number of dwellings that must be renovated in Utrecht, together with the city's plans, make it an interesting municipality to study.

2.3.4 Reigersbos.

Reigersbos is a shopping centre located in the Gaasperdam neighbourhood, which is in the South-East of Amsterdam. The shopping centre includes 280 apartments/residences with ten condominium associations situated above shops and built in the early 1980s (Klimaatmissie, 2020). The average WOZ house value of dwellings in Gaasperdam was around ϵ 200.000,- and the Reigersbos dwellings are around that same value. The income level of the residents is expected to be around ϵ 22.300,- (Allecijfers, 2021). Gaasperdam is a diverse neighbourhood with residents from Turkey, Maroc, Suriname, and more (Allecijfers, 2021). The municipality of Amsterdam has appointed Reigersbos as a development neighbourhood, meaning it was to freshen up the area by making people feel safer in certain areas (Stichting !Woon, 2019a). The project of Reigersbos is seen as a project to learn from for the rest of the transition of that area. There are a couple of different types of apartments ranging from 50 m2 up to around 70 m2. Most apartments of the Reigerbos condominium associations have an energy label C or D (Rijksoverheid, n.d.). Together with the maintenance state of the dwellings, this shows the necessity to renovate the buildings. Several building components must be renovated to get the dwellings back to standard and meet the transition goals. The walls, windows, roofs and floor can be better insulated. The heating system must be replaced, and solar panels can be added.



Figure 2.2 – Street level view of Reigerbos (Oba, n.d.)

The ten condominium associations have contacted the municipality and Klimaatmissie for assistance with the affordability and feasibility study of the project (Klimaatmissie, 2020). Klimaatmissie is an organisation that offers the total solution energy-efficient renovation (Klimaatmissie, n.d.). The current state of the condominium associations is not good as renovations to different apartments are needed to make them future proof and the long-term maintenance budget is incorrect in many terms. Four scenarios have been developed so far according to the current condition of the residences, technical possibilities and financial feasibility. These scenarios differ in how much is renovated and how much the energy performance can be improved. For all scenarios, the condominium associations must go through their collective decision-making process. The ownership situation and composition differ for each condominium association as private homeowners, social housing corporations, tenants, and private investors are all present.



Figure 2.3 – Bird level view of Reigersbos (Klimaatmissie, 2020)

Through my internship with the municipality of Amsterdam, it was easier to come in contact with actors close to the project. This case study is studied to discover what barriers are encountered in the process, the difficulties of getting people with different motivations onboard and how this prevents the execution of a renovation. Moreover, the project functions as a learning curve for the transition of the rest of the neighbourhood.

2.3.5 Venserpolder.

Venserpolder is a neighbourhood in the South East of Amsterdam with 5070 addresses with a residential function (Allecijfers, 2021). The building stock primarily consists of 4 or 5 story high apartments buildings with an average WOZ home value of ϵ 186.000,- in 2019. Around 80% of the building was built between 1980 and 1990 (Allecijfers, 2021). The 5070 addresses form the 19 condominium associations of the neighbourhood. There is mixed ownership as housing corporations, private ownership, and private rent are all present (Allecijfers, 2021). The municipality of Amsterdam has designated Venserpolder as a development neighbourhood. It describes it as a nice neighbourhood to live in but has its problem as there is a lot of poverty and criminality (Gemeente Amsterdam, 2021b). Moreover, this is shown when looking at the average income of the residents, which is just above ϵ 20.000 (Allecijfers, 2021). Venserpolder is a diverse neighbourhood with native people and many residents with migration backgrounds from Turkey, Marocco, Suriname, the Dutch Antilles and more (Allecijfers, 2021).



Figure 2.4 – Bird level view of Venserpolder (Het Parool, 2009)



Figure 2.5 – Street-level view of courtyard garden of Venserpolder (Otten, 2014)

Being a development neighbourhood means that the municipality of Amsterdam will put its resources to work to freshen up the area. This includes public places such as streets, parks, and building stock (Stichting !Woon, 2019b; Gemeente Amsterdam, 2021c). This led to the municipality taking the initiative and sending questionnaires to residents concerning living free of natural gas with a shallow response rate (G1). Furthermore, due to the building year, many of the dwellings are ready for bigger maintenance. Many condominium associations have recently replaced their smoke and drains and their heating system (G2). Moreover, some condominium associations already have made sustainable renovations such as filling the cavity walls. A large part of the associations is in the beginning phase of the decision-making process. Social housing corporations all have a significant stake in the condominium associations in Venserpolder as they own around half of the dwellings. Most apartments in Venserpolder have an energy label C or D (Rijksoverheid, n.d.). Most of the dwellings are not insulated well enough to meet the goals of the energy transition. To accomplish this, renovations to multiple building components such as the walls, floor, windows and roof are needed.

This case study is studied to discover what such a process means for condominium associations that need to pay attention to every dollar and with a low quality of living and what that means for the long term maintenance plan of a condominium association. Moreover, this project gives insight into what happens when a municipality starts and allows room for upscaling as the renovation process can be repeated multiple times.

2.3.6 Lucellestraat

The condominium association on the Lucellestraat consists of 62 dwellings. The associations primarily consist of 4 stories high apartment buildings. The association is located in neighbourhood Bosleeuw, which is in Landlust in the North-West of Amsterdam. The worth of the average dwelling in Bosleeuw is just over $\epsilon_{283,000,-}$ in 2019 (Allecijfers, 2021), and the average income is $\epsilon_{22.700,-}$. The building was built in the early 1940s. For the residents of Bosleeuw, 25% has a Western background, while other residents have backgrounds from Turkey, Suriname, Marrocco and the Dutch Antilles and more (Allecijfers, 2021).

The condominium association has social housing corporations present in their association. The housing corporation owns a lot of the dwelling but not so much that it can make all renovations decisions by itself.



Figure 2.6 – Street-level view of the Lucellestraat (Oozo, n.d.)

The condominium association contacted Woonlasten Neutraal Renovaren (WNR) to help them with their renovation. WNR is a non-profit organisation specialising in energy-efficient renovations for condominium associations to make dwellings (almost) energy neutral while keeping living cost neutrality as a core value (WNR, 2021). This shows interest in energy-efficient dwellings and intention to renovate, making the situation more interesting to study. The condominium association is now in their decision-making process and occupied with deciding what renovations to execute. The dwellings of the associations average an energy label of Most of the dwellings of the condominium associations have an energy label of D or E. To get the dwellings back to standard and meet the transition goals, several building components must be renovated. The walls, windows, roofs and floor can be better insulated. The heating system must be replaced, and solar panels can be added.

This case study is studied to discover other motivations, next to the necessity of maintenance, that condominium associations might have. This project has no additional assistance or attention from the municipality, making it interesting to see if the barriers here differ from the other ones. Moreover, as WNR has joined this project, their role and meaning for a condominium association can be studied.

2.3.7 Comparison of case studies.

The three different case studies all have larger condominium associations, are not the most expensive dwellings in the city and mainly inhabit people with a lower income (table 2.5). The lower income can put pressure on the long term maintenance plan and afford a renovation. Even though all associations have social housing, there is still a difference between the ownership situations and the dynamics that follow from that. Moreover, the different stakeholders involved in the different case studies can be studied for their influence.

Factor	Reigersbos	Venserpolder	Lucellestraat
Number of associations	10	19	1
Amount of dwellings	280 (average 28)	5070 (average 265)	62
Building year	Early 1980's	1980-1990	1942
Average WOZ-value	€200.000,-	€186.000,-	€283.000,-
(neighbourhood)			
Income level	€22.300,-	€20.000,-	€22.700,-
(neighbourhood)			
Ownership situation	Social housing and	All around 50% of	Around 50% of social
	private investors	social housing	housing
Stakeholders involved	Municipality &	Municipality	WNR
	Klimmaatmissie		
Energy Label	C/D	C/D	D/E

Table 2.5 – Comparison of different case studies (own table)

2.4 Research flow.

This research aims to provide advice on how the municipality of Amsterdam can enhance its approach for condominium associations for the energy transition. This advice intends to describe how condominium associations can be better stimulated. By comparing the current approach of municipalities with the barriers encountered by condominium associations, that approach can be enhanced. This research should help condominium associations with a more energy-efficient dwelling and the municipalities meet the energy transition goals of the Dutch government.

Figure ?? shows the flow with the outputs of the different chapters. In Chapter 3, with the help of the literature review, a theoretical framework has been created to analyse the approaches of the municipalities and barriers encountered by condominium associations. First, Chapter 4 uses the theoretical framework about the barriers in the customer journey of the condominium associations to identify the different barriers encountered by the condominium from the case studies by use of interviews. Secondly, Chapter

5 uses the frame about the governance dimension to order and analyse the data about the approach of the municipalities. That data follows from the second round of interviews with actors that play a role in the energy transition for condominium associations. These two chapters are the empirical results of this research. Thirdly, Chapter 6 interprets and discusses these two chapters' results to use them as input for Chapter 7. Chapter 7 advises the municipality of Amsterdam on their approach to the energy transition for condominium associations. Lastly, a conclusion is written to advise the Netherlands municipalities on enhancing their approach to the energy transition for condominium associations.



Figure 2.7 – Research flow with output and input of the chapters (own figure)

Chapter 3 - Literature study and theoretical framework.

This chapter starts with giving more background to the subject through literature study and describing the state of the art before answering SQ1.

How can relevant literature give more background to the research question and create a theoretical framework to answer the main research question? (SQ1)

This is done first by laying out what types of condominium associations are and what problems they encounter. Then, a closer look is taken at public policy and what the approach of a municipality (should) look(s) like using the Contextual Interaction Theory (CIT) and the Governance Assessment Tool (GAT). The key elements of these theories combined with literature about energy efficiency governance and policy instruments form the basis of the theoretical framework to study the approaches of municipalities. After that, the customer journey of the collective decision-making process of a condominium association is discussed to see what type of barriers can be expected to be encountered by condominium associations. This results in a framework to study the barriers of the case study condominium associations.

3.1 Condominium associations.

This section looks at condominium associations, how they work, their different attributes, and some of their problems. As discussed earlier in the introduction, different types of condominium associations can be distinguished following their size and ownership. However, these are not the only attributes that make a condominium association, as more attributes distinguish them from each other. This paragraph highlights more of these differences.

3.1.1 Size.

Condominium associations exist in many different sizes. The size of condominium associations ranges from just one or two apartment rights up to large apartment buildings with a couple of hundred apartment rights (CBS, 2016a). Municipalities distinguish condominium associations in their sizes for their approaches as the needs of different sizes differ. Members often have more informal social contacts with smaller condominium associations and know each other better (Baas, 2019). There is often less personal contact with larger condominium associations, but there is an increase in how professional the board of the condominium associations is (Baas, 2019). To conduct proper governance, municipalities have made distinctions in condominium associations' sizes like Amsterdam's municipality (Baas, 2019). Table 3.1 the different sizes of the types in the Netherlands for the different cities following CBS (2016a). In total, there were 143.835 condominium associations in the Netherlands in 2015 (CBS, 2016a).

Table 3.1:	Percentage	of condominium	associations	that	belong	to the	different	sizes i	n apartment	rights ((CBS,
2016a)											

Area	Small (1-5)	Medium (6-20)	Large (20+)
Netherlands	65%	20%	15%
Amsterdam	75%	15%	10%
Utrecht	78%	10%	12%
Rotterdam	65%	20%	15%
The Hague	81%	14%	5%

Amsterdam's municipality made this distinction and calculated how many addresses belonged to the numbers of condominium associations (table 3.2). The table shows that most people who are members of a condominium association in Amsterdam are part of a larger condominium association. Due to their size, the collective decision-making progress becomes more complicated as more members are involved. Paradies et al. (2017) named the difference in phases in the decision-making process as one of the more critical influencing factors, which becomes more complicated when more members are involved.

 Table 3.2: condominium associations in Amsterdam (Baas, 2019)

	Small (1-5)	Medium (6-50)	Large (50+)
Condominium associations	15.811	4.400	1069
Percentage of condominium associations	75%	20%	5%
Adressess with residential function	55.403	69.943	120.740
Percentage of accommodation objects	23%	28%	49%

3.1.2 Owner situation.

Not everyone living in an apartment that belongs to a condominium association is the owner of that apartment. Roughly three types of owner situation can be distinguished: a private owner who lives in the apartment, a private owner who rents out the apartment, and housing corporations who rents out the apartment (CBS, 2016a). A private individual can buy an apartment in a condominium association

and decide to start living there. Another possibility is that he decides not to live there and rent out the apartment to a third party. In this case, the owner remains responsible for the maintenance of the dwellings and keeps his voting right during meetings of the association. An individual may own more apartments rights in one building. This individual can also be an investor or a company. Another possibility comes from social housing corporations that own apartments that are part of a condominium association. These different types of ownership result in different interests and goals.

Another type of condominium association is the cooperative operating associations (coöperative exploitatieverenigingen). With cooperative operating associations buying a membership comes with the right to use living space. In this case, you do not buy an apartment right. A disadvantage of this condominium association is that it is more challenging to get a mortgage for the living space. Examples of cooperative operating associations are senior apartments and residential parks.

Figure 3.1 shows the number of condominium associations with mixed ownership, and over 40% of the associations have a mixed ownership situation. A mixed ownership situation exists when there are both tenants and sale dwellings in the association. In Amsterdam, this image a similar image is found as half as also over 40% of the dwellings belong to condominium associations that have social housing corporations dwellings in their building.



Figure 3.1 – Condominium with mixed ownership situations (CBS, 2016a)

In Amsterdam, the condominium associations with social housing corporations present are often part of larger condominium associations (figure 3.2). On the other hand, condominium associations that do not have social housing present in their building are usually smaller. Over 40% of them do not have more than six members in their association. Nevertheless, almost all condominium associations of the case studies of this research have a substantial part of their association consisting of social housing.



Figure 3.2 – Condominium associations with social housing corporations (Gemeente Amsterdam, 2018)

3.1.3 Building year.

Not all dwellings of condominium associations in the Netherlands or Amsterdam are built in the same year. The building year can differ from before World War II until buildings that only recently have been delivered. Figure 3.3 shows the building year for all condominium associations in the Netherlands, where most condominium associations dwellings were built before the Second World War, and over 75% were built before 1985. CBS (2016a) notes that, especially in the big cities, a larger part of the dwellings was built before the second world war than the average of the Netherlands. In Amsterdam, only 10% of the buildings of condominium associations are built after 1985, making it likely that energy-efficiency renovations are required as before those elements were not considered that much.



Figure 3.3 – Building year of condominium associations in the Netherlands (CBS, 2016a)

When looking more closely at the building years of the dwellings in Amsterdam, it is evident that condominium associations with up to 6 members are almost all built before the end of the Second World War (figure 3.4). These dwellings are, however, not in the scope of this research. The other sizes of condominium associations are built later, but most classes were built before 1990 (Gemeente Amsterdam, 2018). When looking at the building year, it is clear that a substantial part of the dwellings of the larger condominium associations was built before 1990, meaning that building elements are likely to be up for maintenance and the energy labels are less likely to be of an acceptable level.



Figure 3.4 – Dwellings of condominium associations with their size and building year in Amsterdam (Gemeente Amsterdam, 2018)
3.1.4 WOZ-value.

The WOZ-value (Wet waardering onroerende zaken; Real Estate Valuation Act) determines the value of Real Estate for taxation (CBS, 2016a). The average WOZ value in the Netherlands in January 2020 was $\epsilon_{270.000,-}$ (CBS, 2020). The largest condominium associations fall into the same category as that (figure 3.5) in 2016. However, the WOZ value has been rising in the last years due to the rising prices on the housing market, so the average WOZ value is precisely the same (figure 3.5 & 3.6). Figure 3.5 clearly shows differences between the four big cities in the Netherlands as Rotterdam has almost 70% of the dwellings of condominium associations costing less than $\epsilon_{150.000,-}$ which is only around 5% in Amsterdam.



Figure 3.5 – The WOZ-value of condominium associations (CBS, 2016a)

When only looking at Amsterdam itself and the different sizes of condominium associations, the numbers of members grow in an association when the WOZ value drops. The smaller condominium associations (up to six members) make up a large part of the more expensive buildings. With smaller condominium associations, the average WOZ value is higher than with the larger associations (table 3.3).

Table 3.3 – Dwellings of condominium associations with their size (number of apartment rights) and WOZ-value (Gemeente Amsterdam, 2018)

Number of members	to €200.000	€200.000 to €300.000	€300.000 to 400.00	€400.000 to €500.000	€500.000 or more	Unknown	Total
1 to 3	707	3101	2843	2741	7197	45	16634
4 to 6	3178	16555	8909	3920	4527	52	37141
7 to 15	3271	6774	3969	2162	2827	29	19032
16 to 50	9201	16743	8912	3915	3570	16	42357
51 to 100	12828	16500	7083	2602	1937	9	40959
101 or more	36193	21048	9304	3033	2380	6	71964
Total	65378	80721	41020	18373	22438	157	228087

3.1.5 Income level.

The income levels from members of condominium associations are not much lower than the average income of Dutch citizens (figure 3.7). There are fewer people with a high income, but the group with a low income is not more present either. When looking at the large cities in the Netherlands, the image stays practically the same as for the whole country's image.



Figure 3.6 – Income of members of condominium associations in the Netherlands (CBS, 2016a)

3.1.6 Deed of division.

To better understand how condominium associations function, it is essential to understand where their rules come from and their differences. With the acquisition of an apartment that belongs to a condominium association, in addition to the title deed, comes the deed of division (VvE Belang, n.d.). The deed of division consists of the division regulations (het splitsingsregelement), the division drawing (de splitsingstekening), the household regulations and the notarial deed (de notariële akte) that divides the building and associated land into several apartment rights. Due to differences in the deed of division, several types of condominium associations can be distinguished.

The type of division regulations

Differences between the condominium associations can arise from the division regulations. The division regulation is part of the deed of division and is based on one of the five model agreements (VvE Belang, n.d.). These agreements include a description of (VvE Belang, n.d.):

- the rights and obligations of apartment owners;
- the rights during the voting procedure to make decisions;
- the share that owners must contribute to the debts and costs of the associations
- the arrangement for the use, management and maintenance of the common spaces

The various model agreements have many similarities and only have small differences between them. One crucial difference, however, lies in the voting procedure during meetings of the condominium association. When deciding on major maintenance, expenditure charged to the reserve fund and entering into obligations with a financial interest greater than an agreed amount, the decision must be supported by a determined majority (VvE Belang, n.d.). During the voting procedures of the oldest three model agreements, a majority of three-quarters of the members present is required. During these meetings, at least three-quarters of the members must be present for these voting procedures to be eligible. Using the model agreement of 2006 and 2017, these numbers change into two-thirds of the votes and members present.

An additional rule in the voting procedure appears when owners are renting out their apartments. From the people renting an apartment, 70% must agree with the proposed measures (VvE Belang, n.d.).

Division regulations drawings

Differences between condominium associations can arise from the division drawings. These drawings show the division between private and common areas of the building and who is responsible for the maintenance of the different parts. The division between private and common areas can happen in many different ways and change resulting in a wide range of possibilities. For example, the building envelope usually belongs to the maintenance of the condominium association. However, the situation becomes more complex when an association has decided that the maintenance of the windows belong to the individual.

An important factor in renovations for the energy transition is whether the heating is arranged centrally or per apartment. When this is arranged per apartment, some apartment owners may already have invested in a more sustainable heating system and may be more reluctant to invest more in it since they already have it fixed. Therefore, it is essential to know about the different possibilities. The different types of situations can be distinguished:

- 1. Heating is done centrally, and the condominium association owns the installation.
 - a. There is a heat distribution system and a cost distribution system.
 - b. There is an individual connection with a measurement instrument.
- 2. Heating is done centrally, and a third party owns the installation.
 - a. There is a heat distribution system and a cost distribution system.
 - b. There is an individual connection with a measurement instrument.
- 3. The installation is part of the apartment right
 - a. The installation is part of the condominium associations.
 - b. Part of the installation is of the condominium association (for instance, the flue gas discharge, the central heating boiler, or the delivery system of the radiators).

The choice of a new heating source also plays a role in determining the impact of the renovation on the building and what must be replaced.

Another distinction that can be made is the use of condominium associations and whether this is only living. There are stacked condominium associations where shops and business premises belong to the associations. This can happen if there is any living above shops or when apartments are situated above a shopping strip. In that case, the shopping strip usually has its condominium association, and the homes also have their association. Together these two associations form the main association where the joint parts are housed. The division between the collective and the individual areas and responsibilities must be described well so that reservations, costs of regular and planned maintenance end up with the right person.

3.1.7 Sleeping condominium association.

With an active condominium association, property maintenance is taken care of, owners pay a monthly contribution for minor maintenance and joint costs, and a reserve fund is present (Ministerie van Algemene Zaken, 2021). Moreover, active condominium associations meet at least once a year for an annual meeting, and the board meets more often. When these things do not happen, the associations are called sleeping condominium associations. Half of all the condominium associations in the Netherlands do not function as they are supposed to (VvE Belang, n.d.) and belong to sleeping condominium associations (figure 3.8). The image shows if the attributes to be an active condominium association are present. For the bigger condominium associations, the image of active condominium associations is better but far from optimal (figure 3.8).

The attributes of an active condominium association include:

- Presence of a long term maintenance plan (MJOP);
- Presence of a reserve fund;
- Having annual meetings;
- Being registered to the Chamber of Commerce (KvK).



Figure 3.7 – Number of required things present (Ministerie van Algemene zaken, 2020)

Moreover, an essential part of the functioning of a condominium association lies with the quality of the long term maintenance plan (MJOP). Therefore, the long term maintenance plan should describe (Ministerie van Algemene Zaken, 2020):

- Which maintenance and recovery work and sustainability measures should take place.
- When these works and measures should take place.
- What are the costs of these works and measures?

However, developing a good long-term maintenance plan is not as easy as just following these points. Determining the state of components of the property should be done by professionals on-site for a good result (VvE Belang, n.d.). Moreover, having all building components and their lifetime is another essential item for a good working maintenance plan. In addition to that is the monthly contribution of the members that cover these costs. This was not the case with many condominium associations, so the Dutch government introduced a law that obligates condominium associations to set at least 0,5% of the rebuilt value of the property present (Ministerie van Algemene Zaken, 2021). The rebuilt value of a property is the amount of money needed to rebuild it back to the same conditions and follow the current requirements should it be lost totally (Verbond van verzekeraars, 2021).

3.1.8 Concluding remarks on condominium associations.

There are a lot of different types of condominium associations following the number of attributes they can have. This section discussed the differences that arrive from the size, ownership situation, building year, the WOZ value and the many differences from the deed of division. These many differences bring along many types of different condominium associations. However, many share the same problems, like not being an active condominium association and not having a well-working long term maintenance plan. Since many are dealing with the same type of problems that arrive from their size and ownership situation, those are two attributes the associations are selected on and studied in this research. In Amsterdam, the bigger condominium associations (6+ members) make up a large part of the addresses that belong to condominium associations are present in many of them. The average WOZ-values of the case studies condominium associations are in line with the WOZ-value that belong to most condominium associations. Moreover, most buildings in Amsterdam are more likely to be up for maintenance, and energy-efficiency renovation as almost 90% of them was built before 1985. In addition to that are the energy performance of the three cases as all three case studies have the potential

of becoming much more energy efficient. The three chosen case studies described in section 2.3 have these attributes (table 2.5). Not all condominium associations are ready to start their decision-making process at this moment. This process starts with the case study condominium associations meaning the intention to renovate is present. This, together with the representative attributes, make the case study associations interesting to study.

3.2 Public policy.

The last section reviews literature and concepts that have to do with condominium associations. This section focuses on public policy and policy instruments that can help municipalities with energy-efficient governance.

The last section gives a background to condominium associations in the Netherlands. This section focuses on public policy and why governments should intervene in the energy transition in the built environment. Moreover, this section investigates what the key elements of an energy efficiency approach are of a municipality and how this can be used to study the approaches of Dutch municipalities

3.2.1 Public policy.

Public policy concerns the decisions and actions of governments to deal with the matter of public concern. It comprises the decision made for implementing programs where governments hope to achieve their goals with. Public policy plans and programs outline the necessary process to achieve the objectives (Cochran & Malone, 2005). However, good public policy is hard to realise. Good working policies require an understanding of the problems, clear ambitions, goals and objectives, the proper measures, and a well-planned implementation process (Plettenburg, 2019).

Government should not control everything as markets usually organise economic activities to provide goods and services better than governments (Cochran & Malone, 2005). However, there are some cases where governments need to intervene. For example, sometimes, the market forces do not act as the theory suggests and does not allocate their resources efficiently. This is called market failure (Cochran & Malone, 2005).

A market failure where governments might intervene is externalities, which are social costs borne by individuals external to the transactions that caused them (Cochran & Malone, 2005). An example of this is when people who drive cars do not pay the total cost of pollution created by their cars. Governments can intervene and improve the outcome through regulations. In addition to market failures, governments intervene to distribute wealth fairly. The market does not do this and can not guarantee this (Cochran & Malone, 2005). The capitalist market distributes more wealth to the successful, and therefore the goal of many public policies is closer related to the ideas of social justice than capitalism (Cochran & Malone, 2005).

Another area where the market fails is with providing public goods. Markets are better fit to profit private goods, a good or service whose benefits are confined to a single consumer and whose consumption excludes consumption by others (Cochran & Malone, 2005). Some products or services never enter the market and are not distributed by the market as they do not have the properties of private goods or services. These are public goods that are indivisible and nonexclusive. An example of a public good is the national defence network. If the defence system work, it defends everyone under its umbrella whether they have contributed to its purchase or not. This is also the category of the environment and why the Dutch government is responsible for having a suitable environment for its people. The energy transition for the built environment must be made part of this.

The government has several ways of intervening, but the policy instruments may be the government's most important tool for public policy. This concerns the tangible aspects of the daily government action and are very visible elements of the governmental policy (Fobe et al., 2014). In addition, these policy instruments are part of a larger strategy and reflect the goals and ambitions of the government. Together, these elements form the approach of the government. The next section uses the Contextual Interaction Theory (CIT) and Governance Assessment Tool (GAT) to see how an energy efficiency approach looks for the built environment.

3.2.3 Governance Assessment Tool and Contextual Interaction Theory

The last paragraph has shown why municipalities should have an approach for the energy transition in the built environment. The Contextual Interaction Theory (CIT) and the Governance Assessment Tool look at the implementation processes of policy instruments and strategies but are here used as an instrument to create an overview of such an approach. This approach concerns the energy transition of condominium associations in the Netherlands. This paragraph describes some basics of these two theories but mainly focuses on how they can be used to study and describe the different elements of the approaches of municipalities.

Contextual Interaction Theory.

According to the CIT, policy instruments can not be seen isolated from their context. Therefore, the theory discusses the involved actors and their interaction processes with the implemented instruments. Bressers (2009) has defined eight assumptions where the theory rests on:

- 1. Policy implementation processes are multi-actor processes where an actor can consist of one individual or a group of persons with the same interests.
- 2. Many factors may influence the process but only as they change relevant characteristics of the involved actors.
- 3. These relevant characteristics consist of their motivation, cognition and resources, which provides them with power and capacity.
- 4. The three characteristics influence each other, but one cannot be omitted without losing insight.
- 5. The characteristics of the actors shape the process and can change during the process. Thus, a dynamic interaction between the key actor characteristics drives social interaction processes and is reshaped by the process.
- 6. The specific contexts of the implemented policies influence the characteristics of the actors. The context characteristics are the geographical place and previous decisions that set the stage of the process.
- 7. The specific context is within another contextual layer, which is the structural context layer of the governance regime. This is the context layer where the Governance Assessment Tool concentrates on, which is used to create an overview of the approach of the municipalities for the first sub research question.
- 8. Around the structural context, another layer considers aspects such as the political system, social-cultural -, economic- and technological problems. The influence of this contextual layer can be direct and indirect through the governance regime.

Figure 3.8 shows the different layers and characteristics of the actor.



Figure 3.8 – Actor characteristics with interaction processes influenced by the different layers of context (Bressers, 2009)

The characteristics of an actor consist of their motivation, cognition and resources. The motivation of an actor describes what drives him or her (Bressers, 2009). Essential to understanding someones motivation is the question of whether the application and implementation are perceived as helping with the goals and interests of the involved actors (Bressers, 2004). These goals or interests do not necessarily have to come from within the actor. External forces also form an essential factor in the motivation of an actor (Plattenburg, 2018). Another aspect of the motivation of an actor lies with how that actor sees its capabilities. According to Hoppe (2009), an actor can only be motivated enough to take action if he or she thinks she can realise the task.

Cognition is the subjective filtering of observations of an actor (Hoppe, 2009). It is the information held to be true to a specific actor (Plettenburg, 2018). Actors can have different opinions about specific measures as they can view things differently. For example, one actor might see subsidies as a necessary instrument for the energy transition while others view it as one drop in the ocean (Hoppe, 2009). Another aspect of an actor's cognition lies with the actor being adequately informed about the consequences of the policy instrument. Otherwise, an actor can not commit himself to the policy instrument (Bressers, 2004).

The resources of an actor consist of his or her power and capacity (Bressers, 2009). It can affect the interaction in two ways. First, it provides the capacity to act as the resources of an actor to determine what he or she can do in the process. Moreover, resources are the power source for the relational setting between the different actors involved in the interaction process (Plettenburg, 2018). The balance of power is determined by how much power is different in the interaction process. Power can come from formal resources such as legislation or informal resources such as money and knowledge (Bressers, 2009). In addition, some interpersonal relations, such as having a central position in a social surrounding with high respect and trust, can also function as power (Hoppe, 2009).

Together, these characteristics define the role of an actor in policy implementation.

Governance Assessment Tool.

The GAT focuses on the structural context of the CIT. It assesses the different dimensions of governance formed by the descriptive model, which checks the relevant aspect of the governance context (Bressers, 2016). The governance dimensions are assessed by examining their extent, coherence, flexibility and intensity (Bressers, 2016). The four criteria form the basis of the evaluative questions, but the descriptive questions can be used to describe form an in-depth picture of the governance setting (Bressers, 2016). Furthermore, these descriptive questions can be modified and used to describe the approach of municipalities for stimulating condominium associations to renovate their dwellings. Bressers (2016) describes the structural context of policy implementation with five different governance dimensions.

- Levels and scales

- Actors and networks
- Problem perspectives and goal ambitions
- Strategies and instruments
- Responsibilities and resources

Bressers (2016) wrote the descriptive questions for the in-depth picture of the governance setting for water management. Therefore, the questions cannot directly be used to describe the approach of the municipalities and energy-efficient governance. However, the questions and the line of thinking can be used as a basis for the descriptive model when complemented with literature on energy efficiency and local governance. Table 3.3 shows the descriptive questions of Bressers (2016).

	Table 3.4 – Governance dimensions and descriptive questions (Bressers, 2016)
--	--

Dimension	Descriptive questions
Levels and scales	Which administrative levels are involved and how? Which hydrological scales are considered and in what way? To what extent do they depend on each other or can they act productively on their own? Have any of these changed over time, or are they likely to change in the foreseeable future?
Actors and networks	Which actors are involved in the process? To what extent do they have network relationships also outside of the case under study? What are their roles? Which actors are only involved as affected by or beneficiaries of the measures taken? What are the conflicts between these stakeholders? What form of dialogues between them? Are there actors with a mediating role? Have any of these changed over time, or are they likely to change in the foreseeable future?
Problem perspectives and goal ambitions	Which various angles doest the debate of public and stakeholders take towards the problem at hand? What levels of possible disturbance are current policies designed to cope with? What level of disturbance of normal water use is deemed acceptable by different stakeholders? What goals are stipulated in the relevant policy white papers and political statements? Have any of these changed over time, or are they likely to change in the foreseeable future?
Strategies and instruments	Which policy instruments and measures are used to modify the problem situation? To what extent do they reflect a certain strategy of influence (regulative, incentive, communicative, technical etc.)? Have any of these changed over time, or are they likely to change in the foreseeable future?
Responsibilities and resources	Which organisations have responsibility for what tasks under the relevant policies and customs? What legal authorities and other resources are given to them for this purpose, or do they possess inherently? What transparencies are demanded and monitored regarding their use? Is there sufficient knowledge on the water system available? Have any of these changed over time, or are they likely to change in the foreseeable future?

For the descriptive questions of the GAT to be used to analyse the approach of municipalities for stimulating condominium associations instead of water management, some modifications have to be made. This is done by looking at the different governance dimensions and describing what relevant literature says about the dimensions. Then, this information is used to create questions and research variables to analyse the approaches of municipalities.

3.2.4 Levels and scales.

The levels and scales dimension describes the different levels and scales of the governance regime. It

pays attention to the number of levels involved, dealing with the issue, and if these levels work together and trust each other. In addition to that, a closer look is taken at the possibility of moving between scales.

Jollands et al. (2011) focus on energy efficiency governance as they did extensive research to gather experience in energy-efficient governance throughout the whole world. The goal was to provide guidelines for improving energy efficiency governance systems by categorising different themes and related subjects (figure 3.9).



Figure 3.9 – Energy efficiency governance systems (Jollands et al., 2011)

In these systems, governmental coordination influence the effectiveness and quality level of the governance. Jollands et al. (2011) have defined two levels of coordination, namely:

- Intra-governmental (horizontal) coordination between national government ministries and agencies
- Inter-governmental (vertical) coordination across various levels of government such as national, regional and local governments.

Moreover, Jollands et al. (2011) designed figure 3.11 as a spectrum of functional horizontal and vertical coordination approaches depending on the number of levels of government. For district-scale renovations, well-working organisations and public bodies are essential, and that process requires strong leadership to coordinate (Rose et al., 2021).



Figure 3.10 – Government coordination mechanisms (Jollands et al., 2011)

Institutional arrangements are needed as they provide practical instruments which allow for the implementation and mobilisation of energy efficiency governance (Jollands et al., 2011). To do this effectively, the approach should:

- Be linked to an energy-efficient law or legislative framework;
- Reflect the countries context and sectoral issues;
- Be comprehensive and sector-specific;
- Be linked to broader national development policies.

This research concerns the different levels of government in the Netherlands and how they interact with each other. The actions of the different governmental bodies must reflect the country context and sectorial issues in the same way (Jollands et al., 2011). The vertical and horizontal organisations described in section sss are also relevant for the organisation's structure. Considering the descriptive questions from the GAT and the literature of Jollands et al. (2011), three variables to research have been found, namely:

- Levels and scales of governance;
- Dependency of levels;
- Reflecting countries and municipal issues.

Table 3.5 shows the different descriptive questions that follow from the different research variables and can be used to study the approaches of municipalities.

Table 3.5 – Descriptiv	e questions for the	levels and scale governance	dimension	(own table)
------------------------	---------------------	-----------------------------	-----------	-------------

Governance dimension	Research variable
Levels and scales	Levels and scales of governance;
	Which levels are levels of the government are involved, and do they
	follow a logical structure? (Bressers, 2016; Jollands et al., 2011)
	Dependency of levels;
	How do they depend on each other, communicate with each other
	and are they able to act on their own? (Bressers, 2016)
	Reflecting countries and municipal issues;
	Do the different governmental bodies reflect the country context and
	sectorial issues in the same way (Jollands et al., 2011)?

3.2.5 Actors and networks.

The descriptive questions for the actor and network dimension for water management look at the actors involved in the process, their relationship, and how they communicate with each other. This is relatively similar for water management and stimulating condominium associations as the same questions can be asked about the actors that play a role in the energy transition. The literature study, however, provides also more information about the communication with other actors.

For participation and communication, a guide for districts' participation has been created to help Dutch municipalities with their approach (PAW, n.d.). This guide provides information concerning policy choices, organising, a democratic collaboration, stakeholder engagement, types of residents, residents' communication, influence of behaviour, and district processes. The program provides insights into these subjects and acknowledges that several options are possible for the participation of residents. The guide has been designed to help municipal employees inform and involve residents in the process. The proposed district-orientated approach from the Climate Agreement (Ministerie van Economische Zaken en Klimaat, 2019) is custom for every district. However, it has no ready-to-go blueprint, which emphasises the communication and participation of residents in the process. Municipalities must set up these processes themselves and see what is needed in the different neighbourhoods. As no neighbourhood, street, person or condominium association is the same and thinks differently about the future, a one-fits-all approach will not work. Therefore, it is essential to know the specifics of the

neighbourhood where plans are being made (PAW, n.d.). Knowing a neighbourhood does not just consist of knowing the hard data about the dwellings, such as energy labels but also concerns its residents and how they want to live there. To get to know the neighbourhood and its residents, the program provides several insights (PAW, n.d.):

- Let it grow. Significant changes happen with smaller changes.

- Everything is already there. Aim to find out how to use the knowledge, hobby's, entrepreneurship, desires, and irritations.

- Do not only focus on the transition but listen to what is happening more in the neighbourhood.
- A human approach to deal with emotions such as anger as curiosity

- From getting to know each other to starting a relationship

To gather that information about the neighbourhood, other departments of the municipality that are not focused on the energy transition but that are working with or in that neighbourhood can work as a source. Organisations outside of the municipality such as schools, religious organisations, and associations can also help with gathering such information.

When looking at the communication with residents, Meer met Minder (2010) also has some advice:

- Develop policies and communication from the perspective that money and environment are not always the deciding factor.

- To increase the success of communication, focus on personal gains instead of the common benefits. For this, abandon 'one-size-fits-all' communication and develop approaches based on target groups.

- Persistently use the fascinations of the homeowners as a basis for communication. Start with small requests to acquire interest for more extensive actions.

- Offer security of success to gain customer confidence. Offer choices and feasible deadlines.

- Simplify communication according to action. For example, allow communication with trusted parties.

Municipalities should map the actors involved in the process, their role, and their relations. This gives an overview of the actors that municipalities should take into account. An aspect of the actors and network dimension is how they are engaged in the process. Moreover, communication with stakeholders is essential. Together, this results in the research variables and descriptive questions of 3.6.

Governance dimension	Research variable
Actors and networks	Involved actors, their roles and; Which actors are involved in the process, and what is their role? (Bressers, 2016)
	Network relations and relationship between actors; What relationships are between actors, and what is their role in the network of relations? Are these relations likely to change, and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.; Meer met minder, 2010)

Table 3.6 – Descriptive questions for the actors and network governance dimension (own table)

3.2.6 Problem perspectives and goal ambitions.

The descriptive questions concerning problem perspectives and goal ambitions frame the problem. Where the focus for water management lies on possible disturbance for water management, the focus of the municipalities lies with the energy transition and how to stimulate condominium associations.

For any organisation, it is essential to have targets, monitor the process and evaluate if targets are being met to reach the goals that a governmental body aspires to reach (Jollands et al., 2011). Moreover, the approach should be well connected with the country's legislative framework, the government's

overall approach, allow for learning in the process, and be sector-specific. The different bodies of the government work together to meet the governance targets. Just having targets is, however, not enough, as that does not mean they are functional. For these targets to be functional, they should (Jollands et al., 2011):

- Be supported by resources and enabling networks
- Have a medium-term relevance
- Be substantiated by analysis and experts
- Be straightforward to monitor and not overlap other targets
- Be communicated and documented

Targets are helpful to monitor the progress and provide a base to organise projects (Jollands et al., 2011). This monitoring or evaluating of the targets is critical to good energy-efficient governance. It is something that should be incorporated into the design, implementation and oversight of energy efficiency governance. Moreover, they should be comprehensive and sector-specific (Jollands et al., 2011). Together with the enabling networks (figure 3.9), these targets form the basis of the legal basis and ambitions for the strategy and execution of the approach of the municipalities. They form energy efficiency strategies and actions plans.

Next to the goals, ambitions and targets that form the approach of a municipality are the problems that the approach must deal with. It is essential to understand the problems that prevent the goals from being achieved. Figure 3.11 shows possible concerns of homeowners in the process towards an energy-efficiency renovation. These barriers must be overcome in their process, and municipalities should have instruments to answer those concerns. A more detailed description of the barriers that condominium associations can encounter and municipalities should help them with can be found in section 3.3. The barriers of the customer journey of the collective decision-making process of a condominium association are described in that section.



Figure 3.11 – Possible concerns for web portals of local authorities at different stages in the process (Mlecnik, Meijer and Bracke, 2018)

By answering these different aspects and barriers, local authorities take on a frontrunner role and create more awareness for energy-efficient renovations, which, together with access, leads to the adoption of low-carbon technologies. This helps with stimulating residents to renovate their homes to become energy-neutral and free of natural gas.

The problem perspective and goal ambitions dimension frames how municipalities see the problem and what their goals are. Moreover, municipalities should have clear how they aim to monitor and evaluate their targets. This results in the following research variables with corresponding descriptive questions (table 3.7):

- Goals and ambitions;
- Problem description;
- Targets and evaluation.

Table 3.7 – Descriptive questions for the problem perspective and goals ambitions governance dimension (own table)

Governance dimension	Research variable
Problem perspective and goal ambitions	Goals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies, and is it sector-specific? (Jollands et al., 2011)
	Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)
	Targets and evaluation; What targets have been set, and how is this monitored? Is this connected to a legislative framework or overall approach of the country? (Jollands et al., 2011)

3.2.7 Strategies and policy instruments.

The strategies and policy instruments dimension describes the chosen strategy of the municipalities and the different instruments that form that strategy. The descriptive questions and the research variables that follow from it for water management of Bressers (2016) differ from those for municipalities in the energy transition as different strategies are required. The municipalities have created an approach for the whole energy transition. However, not the whole strategy and all policy instruments for the energy transition help with stimulating condominium associations to renovate their dwellings. The strategy and policy instruments should focus on overcoming the barriers in the customer journey of the collective decision-making process. This process is described in more detail in sections 3.3 and 3.4.

Type of policy instruments

Adams and Tiesdell (2012) divide policy instruments into four categories defined by how municipalities or governments can steer with them. Figure 3.9 shows the four categories of policy instruments where the axes determine the type of policy instrument. Adams and Tiesdell (2012) defined the policy instruments by whether steering at a distance or through consultation was used and whether the steering is relational or instrumental. The categories of policy instruments are shaping -, regulating-, capacity building-, and (financial) stimulating instruments.



Steering through consultation Figure 3.12 – Four different types of policy instruments (Adams and Tiesdell, 2012)

Shaping policy instruments allow policymakers to shape the decision environment of actors by adjusting the broad context for actions and transactions (Adams & Tiesdell, 2012). Examples of shaping policy

instruments are structure visions, city policy documents, and non-binding master plans. Regulating policy instruments as opposed to shaping policy instruments are used as hard-steering instruments. They are defined as the constraints and regulations to the decision environment of development actors where actors operate (Adams and Tiesdell, 2012). Zoning plans, permits, pre-emption rights, and covenants are examples of regulating instruments. Stimulating policy instruments try to facilitate actors and market actions and transactions by lowering the threshold to take part (Adams and Tiesdell, 2012). Examples of stimulating instruments are subsidies, tax breaks, funds or infrastructure investments. The stimulating instruments of Adams and Tiesdell are focused on financial stimulation. The final type of instrument of Adams and Tiesdell (2012) is capacity-building which focuses on enabling actors to operate more effectively in the decision environment. Examples of capacity-building instruments are public-private networks, city district municipal managers, and dialogues between actors.

Van der Heijden (2016) tried to understand new governance trends for low carbon building development and transformation and to categorize these. Moreover, he tried to bring together insights from newgovernance instruments from all around the world. As a result, the new instruments were divided into four categories.

The first and most dominant category is certification and classification. Instruments such as benchmarking, rating, and labelling allow buildings to be assessed against several criteria to see if they comply with a certificate. These instruments appear to be working best for high-profile new commercial development where a high return on investments can be expected. However, the classification and certification instruments are less effective in changing the market for residential and existing buildings.

The second type of instrument seeks to generate and disseminate knowledge on how to construct and renovate low-carbon buildings and how the behaviour of people can be changed to reduce energy consumption. An example of this is Green Lights in the United States, which focused on more energy-efficient lightning and showed users their energy consumption and how to reduce it and save costs. These instruments can also help members of condominium associations get more familiar with their costs for electricity and gas and how to become more energy-efficient. These second types of instruments are most promising in two situations. They provide significant gains for participants with low and easy requirements or if they provide considerable collective gains when challenging requirements with elite instruments are set.

The third type of instrument that Van der Heijden (2016) described concerns financing instruments which come in many different forms. Revolving loans are an example of an often-used instrument. The assumption is that operation costs can be reduced with an energy-efficient renovation so that the saved money can be used to pay the loan. A concern with loans for low-carbon buildings revolves around the future financial gains of those buildings. Banks and other fund providers are concerned with the extra cost of such projects and lenders not paying back the loans. This is also happening in the Netherlands as living costs neutrality (woonlastenneutraliteit) can not always be reached with private homeowners (Schilder & Van der Staak, 2020). With condominium associations, this appears to be easier, and here revolving loans could be an option.

The fourth group of instruments of Van der Heijden (2016) aims to accelerate the earlier discussed instruments and bridge multiple low-carbon building instruments that make the whole larger than the sum of parts. An example of such an accelerator is a range of incentives that seek to speed up the process of the first instruments in acquiring labels such as BREEAM and LEED.

Van der Heijden (2016) discovered an important shortcoming of these instruments. What the instruments failed to do, is think beyond attracting leaders and explore how they can reach other players in the construction and property sectors. Van der Heijden (2016) sees multiple paths for how

new-governance instruments can be used to accelerate a large-scale transition to low-carbon buildings. The first is to rethink the purpose of the instruments as they are now preoccupied with generating and showcasing leadership. Thus, the focus of the next generation of policy instruments might focus on other players instead of the leaders. A second option might be to change the voluntary nature of most policy instruments into a more mandatory space. The final path concentrates on thinking more carefully about the interaction between new-governance instruments and existing policies and how these can both exist without replacing each other.

So when comparing the different classifications of policy instruments of Adams and Tiesdell (2012) and Van der Heijden (2016), two types of policy instruments can be distinguished that can help stimulate condominium associations. Since municipalities can not force condominium associations to renovate their dwelling, they can not use all types of policy instruments. From both classifications, two of the four types of instruments can be used reasonably similarly to each other. These policy instruments aim to steer through consultation instead of from a distance and assist condominium associations in their process. The four types of instruments that they can use can be divided into two categories:

- Financial stimulating instruments

This category consists of instruments that lower the financial burden, making it more attractive to execute an energy-efficient renovation. These include instruments such as revolving loans, subsidies and tax breaks. As we are still in the early stages of the energy transition, these instruments can help and convince condominium associations to decide on executing an energy-efficiency renovation. This is useful as so the process is started of condominium associations that start renovating their dwellings, which must happen to meet the energy transition goals. It also allows municipalities to gain more insight into the process, which can be helpful later on.

- Capacity building instruments

This category focuses on enabling actors to take part in the decision-making environment. Moreover, these instruments generate and disseminate knowledge and thereby assist the user. Examples of this type of instrument include attributes that teach people things, make them aware of what they are doing and help them understand things. For example, condominium associations may lack knowledge about certain parts of the process they must go through. The capacity building instruments can help with that as it aims to create a better understanding by them of the process.

Strategies

Policy instruments do not make up the whole strategy of a municipality, as stakeholders must use them. So how municipalities communicate and activate people and condominium associations is also relevant. Stakeholder engagement is an essential factor in this process (Rose et al., 2021). For the strategy and approach to work, stakeholder engagement and management throughout the whole process is required (Jollands et al., 2011). Stakeholder engagement is a crucial component of a government energy efficiency approach as it helps build a consensus and ensures broad support for the policy implementation (Jollands et al., 2011). Stakeholders engagement should be an ongoing process and should aim for diversity in both interests and concerns. Even though there is no best method for stakeholders engagement, it is clear that mechanisms that ensure ongoing stakeholders engagement and legislative framework that make stakeholders engagement mandatory help (Jollands et al., 2011).

Part of the participation and communication guidance of Programma Aardgasvrije Wijken revolves around communicating with citizens and engaging them. The program describes six lessons which are drawn from testing ground neighbourhood projects and states the following (PAW, n.d.):

- Define a clear point of view
- Use one frame, concept, or one phrase for recognizability
- Mind the fact that residents are likely to see the barriers first before starting to believe in the

project

- Show how serious the municipality is taking it
- Make it clear that there is support among other residents

- Make it visible to the residents and let them experience it (for instance, by a model or example home)

Rose et al. (2021) highlight the importance of having meetings in the early stages of the projects. They give several options for citizen or stakeholder engagement with creating a citizen service point, professional relocation service if necessary and holding workshops. Moreover, implementing a pilot project can help homeowners decide on the renovation (Rose et al., 2021).

Part of engaging stakeholders happens through awareness-raising. Pop-up consultancy centres and web portals are efficient instruments to do this (Kwon & Mlecnik, 2020). These pop-up centres allow local authorities to inform homeowners and residents in specific target areas with helpful information for them on a neighbourhood level. It can be seen as a policy instrument for municipalities that can communicate its mix of incentives and an organisational instrument (Kwon & Mlecnik, 2021). The pop-up centres can be used for:

- Stimulating application of low carbon technologies such as thermal insulation window replacement, ventilation, building airtightness, renewable energy systems, smart meters and home energy monitoring systems.

- Making homeowners aware of the problem and possibilities
- Making homeowners aware of their energy use

Mlecnik et al. (2021) concluded that pop-up centres could help with these things and work especially well as a local node for awareness-raising. It allows visitors to experience, see and ask their questions which helps them continue their sustainability choices. The pop-centres are a very effective tool for communicating, especially when combined with personal coaching and collaboration with local partners. Local authorities see opportunities with the pop-up consultancy centres and even sustain them once they are developed to continue the process (Mlecnik et al., 2021).

Research variables

The strategies and policy instruments dimension and descriptive questions differ from the water management as they are focused on a different goal. To stimulate condominium associations to renovate their dwellings, other instruments are needed. The literature review gave two different types of instruments that can help with stimulating condominium associations. Moreover, stakeholder engagement is an essential aspect of the strategies of municipalities. Table 3.8 shows the different descriptive questions and research variables for the strategies and policy instruments.

Governance dimension	Research variable
Strategies and policy	Financial stimulating instruments;
instruments	What financial stimulating instruments are used? Are they focused on the
	long term or short term, and how do they help condominium associations
	(Adams & Tiesdell, 2012; Van der Heijden, 2016)
	Capacity-building instruments;
	What capacity building instruments are used? How are they helping
	condominium associations to take part in the market processes better?
	(Adams & Tiesdell, 2012; Van der Heijden, 2016)
	Stakeholder engagement and awareness creating;
	What strategy or resource is chosen to engage people? Is attention paid to
	how stakeholders should be engaged? (PAW, n.d.; Rose et al., 2021;
	Jollands et al., 2011)

Table 3.8 – Descriptive questions for the strategies and policy instruments dimension (own table)

3.2.8 Responsibilities and resources.

With the responsibilities and resources, the focus is on describing who is responsible is for what part of the governance and what resources are available and needed as accountability needs to be established. The descriptive questions for water management are pretty general and are likely to look similar to the approach of municipalities for the energy transition. However, the extra literature gives some nuance to the questions.

For the coordination mechanisms to work (3.10), accountability must be established so that different governmental bodies know what their task is (Jollands et al., 2011). The strategies and actions plans should make clear who does what for them to work properly. Assigning responsibility and creating accountability occur with laws and decrees, strategies and actions plan, implementing agencies and the targets (Jollands et al., 2011).

Establishing accountability is not enough for the municipalities to start doing their work. The government must give municipalities enough financial and human resources for their energy transition approaches (Jollands et al., 2011). Moreover, governments and municipalities' targets should be backed up with the correct resources to prevent them from giving a false impression and actors not acting on them.

For the energy transition, not all knowledge and solutions are available at this time. Therefore, it is crucial to understand how new information is created and distributed to the actors who need it. The approaches of municipalities should allow for a learning approach in it (Jollands et al., 2011). Programma Aardgasvrije Wijken is a Dutch program that tries to help Dutch municipalities to become free of natural gas. The program was initiated after the Climate Agreement in 2019 and provided help for municipalities in setting up policies and their approach. It has a knowledge and learning program with seven themes ranging from technical solutions to governance solutions and stakeholder management. Form the participation and communication-, the direction and organisation-, and the linking tasks theme lessons can be drawn for stimulating the process of homeowners and condominium associations renovating their dwellings (PAW, n.d.). Next to creating this new knowledge, the means must be available to distribute this to other stakeholders. In this process, stakeholder engagement and awareness-raising such as described in section 3.2.7 are essential aspects.

Descriptive questions and research variables.

The responsibility and resources dimension looks at who is accountable for the different parts of the approach and whether the resources are there to act upon it. Moreover, new knowledge must be created and distributed as not everything is known about the energy transition. Table 3.9 shows the descriptive questions and research variables of this dimension.

Table 3.9 – Descriptive questions for the responsibilities and resources dimension (own table)

Governance dimension	Research variable
Responsibilities and resources	Responsibility for the ambitions and accountability; Who is responsible and be held accountable for the ambitions? (Bressers
	2016; Jollands et al, 2011)
	Are the resources there to respond to the ambitions? (Bressers, 2016)
	Development and distribution of new knowledge
	How is new information created and distributed to the people who need
	it? (Bressers, 2016)

3.2.9 Descriptive questions and research variables from GAT

The descriptive questions from the GAT gave a basis to look at the approaches of municipalities. Together with the literature study, a framework with descriptive questions and research variables (table 3.10) has been created to study the approaches of municipalities for stimulating condominium associations in the energy transition to renovate their dwelling. The framework is used to understand, analyse and draw lessons from the approaches of the municipalities of Amsterdam, Rotterdam and Utrecht. Chapter 5 describes these results.

Levels and scalesLevels and scales of government; Which levels are levels of government are involved, and do they follow a logical structure? (Bressers, 2016)Dependency of levels; How do depend on each other, communicate with each other and are they able to act on their own? (Bressers, 2016)Reflecting countries and municipal issues; Do the different governmental bodies reflect the country context and sectorial issues in the same way (Jollands et al., 201)?Actors and networksInvolved actors, their roles and; Which actors are involved in the process and what is their role? (Bressers, 2016)Network relations and relationship between actors; What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.)Problem perspective and goal ambitionsGoals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016)Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)	Governance dimension	Research variable
Levels and scalesWhich levels are levels of government are involved, and do they follow a logical structure? (Bressers, 2016)Dependency of levels; How do depend on each other, communicate with each other and are they able to act on their own? (Bressers, 2016)Reflecting countries and municipal issues; Do the different governmental bodies reflect the country context and sectorial issues in the same way (Jollands et al., 2011)?Actors and networksInvolved actors, their roles and; Which actors are involved in the process and what is their role? (Bressers, 2016)Network relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.)Problem perspective and goal ambitionsGoals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016)Problem description; What problems do the municipalities see that nevernt them from achieving the goals? (Bressers, 2016)		Levels and scales of government;
Levels and scalesDependency of levels; How do depend on each other, communicate with each other and are they able to act on their own? (Bressers, 2016)Reflecting countries and municipal issues; Do the different governmental bodies reflect the country context and sectorial issues in the same way (Jollands et al., 201)?Actors and networksInvolved actors, their roles and; Which actors are involved in the process and what is their role? (Bressers, 2016)Network relations and relationship between actors; What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.)Problem perspective and goal ambitionsGoals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities set that prevent them from achieving the goals? (Bressers, 2016)		Which levels are levels of government are involved, and do they follow a logical structure? (Bressers, 2016)
Levels and scalesHow do depend on each other, communicate with each other and are they able to act on their own? (Bressers, 2016)Reflecting countries and municipal issues; Do the different governmental bodies reflect the country context and sectorial issues in the same way (Jollands et al., 2011)?Actors and networksInvolved actors, their roles and; Which actors are involved in the process and what is their role? (Bressers, 2016)Actors and networksGoals and relationship between actors; What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.)Problem perspective and goal ambitionsGoals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Problem description; What problems do the municipalities set that prevent them from achieving the goals? (Bressers, 2016)		Dependency of levels;
2016) Reflecting countries and municipal issues; Do the different governmental bodies reflect the country context and sectorial issues in the same way (Jollands et al., 201)? Actors and networks Involved actors, their roles and; Which actors are involved in the process and what is their role? (Bressers, 2016) Network relations and relationship between actors; What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.) Problem perspective and goal ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 201) Problem description; What problems do the municipalities set that prevent them from achieving the goals? (Bressers, 2016)	Levels and scales	How do depend on each other, communicate with each other and are they able to act on their own? (Bressers,
Reflecting countries and municipal issues; Do the different governmental bodies reflect the country context and sectorial issues in the same way (Jollands et al., 201)?Actors and networksInvolved actors, their roles and; Which actors are involved in the process and what is their role? (Bressers, 2016)Actors and networksNetwork relations and relationship between actors; What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.)Problem perspective and goal ambitionsGaals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)	Levels una scules	2016)
Do the different governmental bodies reflect the country context and sectorial issues in the same way (Jollands et al., 2011)?Actors and networksInvolved actors, their roles and; Which actors are involved in the process and what is their role? (Bressers, 2016)Network relations and relationship between actors; What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.)Problem perspective and goal ambitionsGoals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016)Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)		Reflecting countries and municipal issues;
Image: set of the		Do the different governmental bodies reflect the country context and sectorial issues in the same way (Jollands et
Involved actors, their roles and; Which actors are involved in the process and what is their role? (Bressers, 2016)Actors and networksNetwork relations and relationship between actors; What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.)Problem perspective and goal ambitionsGoals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016)Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)		al., 2011)?
Actors and networks Which actors are involved in the process and what is their role? (Bressers, 2016) Network relations and relationship between actors; What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.) Problem perspective and goal ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016) Pressers, 2016)		Involved actors, their roles and;
Actors and networks Network relations and relationship between actors; What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.) Broblem perspective and goal ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016) Pressers, 2016)		Which actors are involved in the process and what is their role? (Bressers, 2016)
Problem perspective and goal ambitions What relationships are between actors and what is their role in the network of relations? Are these relations likely to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.) Problem perspective and goal ambitions: Goals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)	Actors and networks	Network relations and relationship between actors;
Problem perspective and goal ambitions Goals and ambitions; What relations have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)		What relationships are between actors and what is their role in the network of relations? Are these relations likely
Problem perspective and goal ambitions Goals and ambitions; What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)		to change and in what way? (Bressers, 2016) How is the communication with them? (PAW, n.d.)
Problem perspective and goal ambitions Goals and ambitions; Problem perspective and goal ambitions What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)		
Problem perspective and goal ambitions What goals have the municipalities set for the energy transition and the condominium associations? (Bressers, 2016) Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)		Goals and ambitions;
Problem perspective and goal ambitions Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011) Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)		What goals have the municipalities set for the energy transition and the condominium associations? (Bressers,
Problem perspective and goal ambitions What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)		
ambitions Problem description; What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)	Problem perspective and goal	Is this linked to broader national policies and is it sector-specific? (Jollands et al., 2011)
What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)	ambitions	Problem description;
interference and the mainterparties see that prevent them nom demonstrating the goalst (pressens) 2010)		What problems do the municipalities see that prevent them from achieving the goals? (Bressers, 2016)
Targets and evaluation;		Targets and evaluation;
What targets have been set and how is this monitored? Is this connected to a legislative framework or overall		What targets have been set and how is this monitored? Is this connected to a legislative framework or overall
approach of the country? (Jollands et al, 2011)		approach of the country? (Jollands et al, 2011)
Financial stimulating instruments;		Financial stimulating instruments;
What financial stimulating instruments are used? Are they focused on the long term or short term and how do		What financial stimulating instruments are used? Are they focused on the long term or short term and how do
Consister heilding in struments:	Strategies and policy instruments	Consister building in struments.
Strataging and policy instruments. What sees its building instruments are used? Here see they below and policy instruments.		Capacity-building instruments;
strucegies and poincy instruments what capacity building instruments are used? How are they helping condominium associations to better take		what capacity building instruments are used? How are they helping condominium associations to better take
Stakeholder engagement and avareness staating		Stakeholder ongagement and awarenees creating:
What strategy or resource is chosen to engage needle? Is attention paid to how stakeholders should be engaged?		What strategy or resource is shown to angage people? Is attention paid to how stakeholders should be engaged?
(PAW n d : Rose et al. 2021; Iollands et al. 2021)		(PAW n d · Rose et al. 2021; Iollands et al. 2021)
Responsibility for the ambitions and accountability		Responsibility for the ambitions and accountability:
Who is responsible and be held accountable for the ambitions? (Bressers, 2016; Iollands et al. 2011)		Who is responsible and be held accountable for the ambitions? (Bressers, 2016; Iollands et al. 2011)
Responsibilities and resources Are the resources there to respond to the ambitions? (Bressers, 2016)	Responsibilities and resources	Are the resources there to respond to the ambitions? (Bressers, 2016)
Development and distribution of new knowledge		Development and distribution of new knowledge
How is new information created and distributed to the people who need it? (Bressers, 2016)		How is new information created and distributed to the people who need it? (Bressers, 2016)

Table 3.10 – Governance dimensions with research variables (own table)

3.3 The customer journey of condominium associations.

The last section gave an overview of the different dimensions of the approach of a municipality to stimulate condominium associations for the energy transition. With its policy instruments and strategies, municipalities should help condominium associations with the barriers that they encounter. This section takes a closer look at these barriers as it describes the customer journey of the collective decision-making process of condominium associations. It starts with describing the different phases of the customer journey by looking at different models. After that, the different involved actors and what type of barriers can be encountered are described. At the end of this section, the different barriers and actors for each step of the customer journey are described.

3.3.1 Customer journey.

Condominium associations have a slow decision-making process in general situations. When it comes to sustainable renovations, this is not different and sometimes even worse. Paradies et al. (2015) researched the influencing factors concerning the customer journey of a condominium that wants to execute an energy-efficient renovation. A customer journey is the decision-making process from an initial interest in a good or service towards its purchase (Nieboer and Straub, 2018). This concept can be used to see where pitfalls lie and how a willingness to invest does not turn into an actual investment. Moreover, it can be used to understand a customer's decision-making process (Kwon & Mlecnik, 2020). In deciding to invest, several steps are taken that form the basis of customer journey models. Customer journeys are usually portrayed as linear processes. However, a customer does not necessarily experience or go through the journey linearly but may jump forward and backwards during the process (Richardson, 2010).

Figure 3.13 shows the customer journey of the collective decision-making process of a condominium association for an energy-efficient renovation of Paradies et al. (2017). They defined six steps in this journey that happen in every customer journey but not necessarily in that exact order. There has to be a reason for the journey to start. This reason can vary from a big maintenance moment to an external party offering their services or a member of the association who comes with the idea. The second step is orientating, where one of the members researches the possibilities for the renovation. The third step consists of further developing the possibilities and making a decision. The fourth step consists of voting about the feasibility study. After the feasibility study, there is a go – or no-go moment since there is a possibility the renovation plan does not acquire the votes. A well-executed feasibility study is therefore essential as this determines the count of the vote. The next step of the journey consists of requesting offers and setting up a business case. When the condominium association board sees this as an appealing plan, it can be put to the vote during a members meeting. This voting procedure is the sixth step in the process, and here, the association decides if the renovation takes place. This only happens when the minimum amount of votes is met. Each step consists of different barriers that must be overcome to complete the different steps and the whole process.



Figure 3.13 – customer journey condominium association for a renovation (translated from Paradies et al., 2017)

To help condominium associations and organisations that want to stimulate condominium associations, TNO (2020) also created a customer journey with similarities and some differences. Their first step in the customer journey is to start the journey and orientate about the possibilities. This step is about collecting information concerning the building, arguments to renovation, energy use and wishes of the residents to come proposal for the renovation. The second step consists of doing a feasibility study for the proposal of the residents. The results from the feasibility study form the decision on the execution of an in-depth technical analysis and the appointment of a process guide (TNO, 2020). The third step of selecting a party that is going to execute the in-depth technical analysis. This choice also determines the next step of the customer journey. This can either be a construction company (step 4a) they are already working with or an architectural consultancy company (step 4b). Step 4 of the customer journey consists of executing the in-depth technical analysis, which results in the association's decision about setting up a well-defined plan for the renovation done by the construction company. If only an architectural consultancy company is chosen as a start, a construction company also must be sought in this step (TNO, 2020). Step 5 consists of working on a detailed plan of the approach of the renovation. This consists of a plan about the financing, permits, changes to the division deed and communication. Then, the members of the condominium association decide the proposed measures of the renovation. The sixth and final step of the decision-making process consists of finalising and financing. Here requests for permits and subsidies are permitted, and changes to the division deed are made.

Stroomversnelling and Platform 31 (2018) have done multiple projects where they tried to make condominium associations more sustainable. The goal was to guide the association through the process and learn from their experiences to fuel innovations. After recruiting condominium associations willing to participate in the project, they needed to complete three steps in the process (figure 3.14) (Stroomversnelling & Platform 31, 2018). The first step consists of organising the process and setting up an inquiry for the renovation. This step focuses on determining the residents' demands and wishes and translating that into a proposition sent to suppliers. The second step is designed to select a market party that could further develop the proposal. Here the proposals of different contractors are compared and selected to develop further and specify his proposal. The final step of this customer journey consists of creating an inventory of the different financing possibilities, the different terms and conditions, and the effects this has on housing costs?



Figure 3.14 – Customer journey for condominium association with energy (Stroomversnelling & Platform 31, 2018)

In their research into more sustainable condominium associations, Companen (2015) did not necessarily follow a customer journey for decision-making but distinguished four different phases of barriers. The first phase consists of awareness which looks at resident initiatives, orientation, awareness-raising, energy - and sustainability advice and process guiding. The second phase describes obstacles that arise from plan elaboration, including developing an integral plan to create a good business case and a sustainable long-term maintenance plan. The third phase tackles financial obstacles. This includes creating an inventory of the financial opportunities of the association, subsidies and external finance possibilities (Companen, 2015). The final phase deals with decision-making obstacles which include obstacles about decision-making, execution and monitoring.

The three different customer journeys describe the same process, but some steps overlap or have not mentioned certain parts explicitly (figure 3.15). The customer journey of Paradies et al. (2017) mention all critical steps and pay attention to the decision-making process but do not necessarily go in-depth about certain parts of the journey. This becomes evident when comparing it to the customer journey of TNO (2020), where setting up the business case is split up, selecting a party for the in-depth analysis, executing it and partly step 5 with developing the plan. The most significant difference between Paradies et al. (2017) and TNO (2020) opposed to the journey of Stroomversnelling and Platform 31 (2018), is that Stroomversnelling and Platform are mostly setting up condominium associations to get help from other stakeholders. VvE Belang (2015) does not have a straightforward process to follow but describes the different barriers that can appear in the different steps of the journey.



Figure 3.15 – Comparison of different customer journeys (own image)

To incorporate the different elements of the customer journey, a new one has been created. It begins with a reason to start the journey where the focus is on raising awareness of condominium associations. As opposed to the version of TNO (2020), the reason to start the journey and orientating is split up as it concerns two different activities. In the second step, the associations must orientate on the possible measures and research the different possibilities. This step comes back in all the different described customer journeys, with some having the step split up into two different parts. The third step consists of a feasibility study and a vote about the different options. Here the members of the associations choose what they want from the different possibilities so that the process can be continued. With the fourth step, the plan is further developed, possibly with the help of an outside party, the business case is set up, and quotes are requested. When this step is finished, a vote about the execution of the renovation must take place. This vote must meet the requirements of the act of division. When the plan is finalised.

The different phases are described in more detail in section 3.4, where the actors and the barriers for the different steps are elaborated.

3.3.2. Actors in the decision-making process.

During the collective decision-making process, several actors can be defined. To grasp the different actors, this research distinguishes three categories of actors. These are public parties, private parties and condominium associations. Table 3.6 shows the different actors. This research focuses on the relationship between the municipality and the condominium associations and how municipalities can better stimulate condominium associations. However, after the different types of barriers are discussed, it focuses on how other actors can alleviate barriers for condominium associations

Condominium associations	Public parties	Private parties
CA members	National government	One-shop-stops suppliers
CA board	Municipalities	Construction company
CA management	Programma Aardgasvrije Wijken	Architects or consulting company
Housing corporations		Process guides
Private landlords		Grid operator

Table 3.11 – Actors involved in the decision-making process of condominium associations (own table)

Condominium associations

Condominium associations do not merely consist of their members. As discussed in section 3.1, the ownership situation of condominium associations can differ as housing corporations, and private landlords can own apartments and rent them out. Their wishes and intentions can differ from owner residents as they may see the dwelling as an asset and do not directly gain the benefits from the energy-efficient renovation (Paradies et al., 2017). Their presence may positively affect the process due to their added professional knowledge but could also negatively affect their attitude towards the renovation.

Condominium associations can vary in size and organise themselves as condominium associations have boards. The board represents the members and is responsible for (VvE Belang, n.d.):

- The finances of the associations and the long term maintenance plan (MJOP) that follows with it.
- The annual meetings.
- Executing maintenance and other decisions made during the annual meetings.
- Insurance and registration of the associations

When the board's tasks get too complicated for the board and can use some support, it can hire a professional condominium association management to help them with their tasks. The management then becomes responsible for executing (some of) the board's tasks (VvE Belang, n.d.). This can be helpful as additional knowledge and experience are brought on board, and work is taken off the plate of the condominium association's board. In 2016, around 550 management offices managed around 400.000 dwellings that belonged to condominium associations (Bouwkennis, 2016). However, bringing on a management office can also have disadvantages as some can be unreliable (VvE Belang, n.d.). Moreover, when the management does all the tasks, it can become an accounting job where no one pays close attention to what is happening to the building and what is needed.

Public parties

In the Netherlands, public parties play an essential role in the energy transition as they have tasked themselves with the energy transition goals described in section 1.1.2. The national government has set the goals and ordered municipalities to draw up their plans for the end of 2021 to get the built environment to become free of natural gas (Ministerie van Economische Zaken en Klimaat, 2019). In addition to that, the national government has set up several projects, such as Programma Aardgasvrije Wijken, and several subsidies in place to reach these goals. However, these parties are not directly involved in the process of stimulating condominium associations as they can only influence the whole

market from a higher level.

On the other hand, the Dutch municipalities are directly involved as they are tasked with the execution of the goals of the Climate Agreement for the built environment. Therefore, they have better insight into the problems on a local level and are better capable of setting up projects on such a level (Ministerie van Economische Zaken en Klimaat, 2019). Municipalities have set up their transition vision heat for becoming free of natural gas and energy neutral. These plans affect condominium associations since they are part of the scope of it. From these plans, strategies and policy instruments follow to stimulate condominium associations to renovate their dwellings. Municipalities take on a facilitating and stimulating role as they can not force condominium associations to start their collective decision-making process for an energy-efficient renovation. Municipalities have different types of policy instruments which they can use that were described in section 3.2.

Private parties

Condominium associations can not execute their renovation or finish their collective decision-making process without the assistance of private parties. They do not possess the knowledge and skills for this (Paradies et al., 2017). At several places in the process, market parties can come in to help. Suppliers of sustainable goods or services and process guides can provide the necessary information and guidance to make decisions. There are several information steps in the customer journey where extra knowledge and expertise is needed. There are different options to choose from as help during the process. Parties like Klimaatmissie Nederland (n.d.) and Woonlasten Neutraal Renoveren (WNR) (n.d.) offer an one-stop-shop and provide a service for the decision-making and the renovation process. As they offer to take care of the whole process and a large part of the work, they become very influential in the process. Moreover, they (aim to) guarantee the quality of the building components and secure the living cost on the same level. WNR offers assistance during the decision-making process and is also there during the execution of the renovation and the operating period of the building component (WNR, n.d.). Their involvement and expertise go further than only the customer journey studied in this research.

Condominium associations are not restricted to a one-stop-shop offer and can select the different stakeholders for themselves. To help with this process, it is possible to make use of an external process guide. They can help with keeping an overview, directing, guarding the process, helping with communication with other members, supporting the board, executing decisions from agreements (TNO, 2020).

To execute the proposed renovation, a construction company is needed. When selecting a construction company, it is possible to select a company that does both the design and the construction (TNO, 2020). However, it is also possible to first select an architect or other type of consulting party that makes the design. Next, a construction party that will execute the plans must be sought (TNO, 2020).

Another actor that is frequently present in these types of renovations is the grid operator. The grid operator plays a role in the transition towards a built environment free of natural gas as they must eventually provide all dwellings with sustainable heat sources. Moreover, the current grid is not suited for everyone to happen, solar panels and return energy. This problem might lead grid operators to change their investments (Paradies et al., 2017).

3.3.3 Type of Barriers in the customer journey

Many energy-efficient programs aim and are designed to reduce or remove barriers for energy-efficient renovations and facilitate that process (Ebrahimigharehbaghi et al., 2019; Hoppe, 2009). However, for these programs and approaches to work, the barriers must be known. For the customer journey of the decision-making process of condominium associations, the barriers are split into three different categories. These include barriers concerning the collective decision-making process and barriers

concerning the renovation process (the different transactions costs and in comprehending and applying for the incentives by municipalities). The following sections describe what the different barriers entail and how these play out for the different steps of the customer journey.

3.3.4 Transaction costs barriers.

Several factors affect energy-efficient renovations. Björkqvist and Wene (1993) distinguish two different classes of factors. They have two types, namely:

- External constraints on the decision-maker.
- Factors affecting individual investments in energy-efficient technology

External constraints include barriers such as price distortions and legal and administrative obstacles, which require collective efforts from the actors in the process (Björkqvist & Wene, 1993). The second type of factor affects individual investments and can be overcome by the individual decision-maker. However, sometimes help is required to overcome these barriers. These barriers include factors such as:

- Lack of information.
- Lack of capital.
- Uncertainty of the performance of the equipment.

- The division of responsibility for energy efficiency among building contractors, owners and renters.

- The decision-making process.

The decision-making process is special with condominium associations, and the barriers that follow from that are further described in section 3.3.5. Most of the other factors do not necessarily influence the prices of the energy-efficient renovations but remain barriers that must be overcome. These barriers can be seen as transaction costs of the decision-making process.

Ebrahimigharehbaghi et al. (2019) see transaction costs (TCs) as non-monetary costs associated with different phases of the renovation process of homeowners and regard them as one of the main barriers in meeting targets for the energy transition. Transaction costs are the indirect cost in a transaction that affects the customer. These transaction costs are unpredictable and inevitable and can have different forms, including time, effort, complexities in renovations, hassle factors, mess and nuisance, and uncertainties (Ebrahimigharehbaghi et al., 2019). Transaction costs are part of the hidden costs of building projects and renovations (Ostertag, 1999). They are the costs not directly involved in producing goods or services but arise from activities that are essential for the trade of goods and services (Mundaca et al., 2013).

Ebrahimigharehbaghi et al. (2019) found transaction costs for different stages of the renovation process from a literature review. These stages include consideration, planning, decision, executing and experiencing. This research focuses on the decision-making process of condominium associations, including the consideration, planning, and decision phase of Ebrahimigharehbaghi et al. (2019). In the consideration phase, the transaction costs consist of determining the costs and benefits of the renovation and determining the available and appropriate measures. The causes for these transaction costs are asset specificity and uncertainty. In the planning phase, the transaction costs consist of receiving essential permits for major renovations, understanding the process, finding experienced people and planning. Finally, during the decision phase, the transaction costs consist of finding reliable experts, findings subsidies and benefits and the uncertainties of expected benefits. These transaction costs are caused by asset specificity in physical assets and knowledge and skills. From their research, Ebrahimigharehbaghi et al. (2019) discovered the following barriers:

- Finding a good professional or contractor
- Maintenance states of the house
- Determining the best way to carry out the renovations
- Complexities in determining the ways to increase the energy efficiency

- Finding financial support

In another research, Ebrahimigharehbaghi et al. (2020) looked at the different barriers for renovators and potential renovators. The most significant barrier lies with the costs of energy savings measures. Other barriers consist of finding reliable information, experts and time and effort.

Even though it is sometimes difficult to draw a line between different sources and types of transaction costs, Mundaca et al. (2013) have created a taxonomy of five different transaction costs for policy instruments. Logically these are not the same for transaction costs of condominium associations but can help with categorising them. The five types are:

- Search for information costs.

These include transaction costs for gathering information and research about and analysis of the relevant technology. Information is collected about the instruments' policy, financial, technical, and legal aspects (Mundaca et al., 2013). Condominium associations also need to deal with the search for information as they usually do not have all the information concerning the different measures (Paradies et al., 2017).

- Negotiation costs.

This is the part of the process where the parties agree on the contract terms, and the costs include time spent negotiating, subcontracting of consultants, or lawyers fees, bargaining costs and decision costs (Mundaca et al., 2013). Paradies et al. (2017) concluded that knowledge about requesting quotes and selecting a contractor and other parties is an essential barrier in the decision-making process.

Approval and certification costs.

These costs include the transaction that needs to be approved by an institutional body before it is implemented (Mundaca et al., 2013). These transaction costs are out of the scope of this research as it only focuses on the decision-making process, which does not include requesting permits. Requesting subsidies and loans could be classified in this category but are their own type of barrier (section 3.3.6) - Monitoring and verification costs.

These transaction costs include monitoring the policy compliance, the environmental outcome, contractual agreements and implementation or management systems (Mundaca et al., 2013). For condominium associations, this consists of the costs for monitoring during the operation phase, which is not part of the scope of this research.

- Trading costs.

These costs occur in markets where quotas, allocations or certificates are traded. Examples of these categories include brokerage fees, contraction negotiation with certificate trading partners and liability risks. These transaction cost barriers do currently not apply to the process of this decision-making process of condominium associations. Energy use - or CO₂ quota per household could be more forcing instruments to stimulate energy-efficiency renovations. This is, however, not part of the scope of the research but further discussed in section 8.2 about possible future research options.

These different types of transaction costs form barriers in the customer journey of condominium associations in their collective decision-making process. Table 3.12 shows the different types of transaction costs and examples of barriers for condominium associations

TRANSACTION	TYPE OF TRANSACTION COST	BARRIER EXAMPLES
COSTS BARRIERS	Search for information costs	Lack of information concerning measures,
		lack of information concerning building
CONDOMINIUM		status and components, not enough
ASSOCIATIONS		knowledge concerning the business case,
		fear of renovation process, lack of
		knowledge about requesting quotes
	Negotiation costs	Not familiar with the process of
		negotiating with market parties
	Monitoring and verification costs	Out of the scope of the research
	Approval and certification costs	Section 3.3.6
	Trading costs	Not applicable

Table 3.12 - Different transaction costs barrier for condominium associations (own table)

Municipalities can help condominium associations to overcome these transaction cost barriers with their strategies and policy instruments. Most of the barriers come from a lack of knowledge and understanding. The capacity building instruments from section 3.2.7 can help with this and help actors participate in the market processes. Moreover, financial stimulating instruments can help hear with making the business case more attractive or allow outside help to step in and help to overcome the barriers.

The literature about transaction cost barriers gives the following variables to research with the condominium associations from the case studies:

- Knowledge about sustainable measures;
- Knowledge about the state of the building;
- Knowledge about setting up a business case;
- Knowledge about requesting quotes;
- Knowing how to acquire information;
- Knowing how to judge information;
- Knowledge about the market process and negotiating with market parties.

3.3.5 Collective decision-making process barriers.

In addition to the transaction cost barriers, there are also barriers in the collective decision-making process that a condominium association goes through. This paragraph further elaborates on that process and the barriers.

The board can not choose to renovate the building of a condominium association alone. According to which model agreement an association uses, at least two-thirds of three quatres of the members must agree with the decision (VvE Belang, n.d.). The decision is, therefore, a collective decision-making process. Blunden (2016) describes collective decision making as the determination by a group of individuals of their collective will and its subject forming process. This process is formed by the social groups and individuals who participate and further develops their subjectivity, understanding and acting in that process or project (Blunden, 2016). However, the same conditions do not always lead to the same outcome, and there is no causal relationship between social conditions and collective response. For the process of condominium associations, this means that no process will be the same, and no exact path to follow can be created. On the other hand, barriers encountered by on associations are likely to be encountered by other associations as it concerns the same customer journey.

In condominium associations, members (per apartment right) are mutually independent and morally equal individuals with an equal stake in what they do together. When a consensus can not be found, a majority vote makes a decision (Blundel, 2016). These votes happen during associations meetings for condominium associations, and the quota and quorum for a decision such as renovations are described in the division regulation. When one of the oldest three model agreements is used, three quatres of the members must be present, and three quatres of the people must vote in favour of the decision. With the model agreement of 2006 and 2017, this changes into two-thirds of the members and votes (VvE Belang, n.d.).

Deciding with a group instead of an individual has some advantages. The idea of synergy states that decisions made by individuals are less effective than when they are made collectively (Human interest, 2020). Moreover, an organised whole is perceived as more than the sum of its parts (Human interest, 2020). In addition to that, groups tend to make less biased decisions (Quinn, 2008) and have the advantage of drawing from the experiences and perspectives of more people than one individual (Human interest, 2020). However, some situations make collective/group decision-making more difficult. The rest of this paragraph focuses on these difficulties and barriers that arise from collective decision-making.

The members of the group and the qualities they possess influence the collective decision-making process. Usually, the board or sustainability commission is appointed to research the different possible measures. Their personal qualities influence the decision of the group (Quinn, 2008). The presence of a leader is an influencing factor in the process and can positively affect the process (Paradies et al., 2017). Leaders that emphasize the process tend to have better quality decisions than leaders who focus on the outcome. The focus should be on how the group makes decisions and how information is gathered (Quinn, 2008).

This is echoed by Paradies et al. (2017), who emphasize the members' decision-making process position. To make a well-informed decision, everyone must be in the correct phase of the process (figure 3.16). From figure 3.16, only person B can make a well-informed decision while the others struggle to comprehend the presented information. Gregory et al. (2012) highlight the common understanding of the participants of the process they use to make a decision and how and why they make a decision.



Figure 3.16 – Different stages of decision-making where members of a condominium association can be (Paradies et al., 2017

Problem with groups decision making

When groups make use of the advantages of being a group, they can make effective decisions. There are, however, conditions that need to be met as it otherwise may lead to poor group decisions. One of these that can lead to poor group decisions is groupthink. According to Stragnor (2021), this occurs when:

'a group that is made up of members who may actually be very competent and thus quite capable of making excellent decisions nevertheless ends up making a poor one due to a flawed group process and strong conformity pressures.'

Figure 3.17 shows the causes and processes for how groupthink leads to poor decision-making. Several conditions make it more likely for groupthink to occur. This again shows the importance of a good leader that not be focused on the outcome with a directive and authoritative style but the process.



Figure 3.17 – Process of poor decision making through group think (Stragnor, 2021)

One of the other conditions which may lead to groupthink comes from isolation from other sources of information, which is also key to the shared information bias. Stangor (2021) defines the shared information bias as the problem that:

'group members tend to discuss information that they all have access to while ignoring equally important information available to only a few of the members'.

This may lead to poor decision-making as not all available information is discussed. The shared information is strengthened when unshared information is not brought to the discussion. This process leads the discussed information to be seen as more valid (Stangor, 2021). Groups can work hard and together towards their goal but still fail to reach them when they have poor information and are not sharing that information well. These risks can be reduced by creating situations where information are shared and discussions are held.

Another key element with sharing the information lies with the process and the continuation of the discussion by the group's leader (Stangor, 2021). This has been shown earlier with Quinn (2008) and Paradies et al. (2017), who point out the importance of leadership. Therefore, the group leader, or in this case the condominium association's board, plays a vital role as he leads the discussion and the decision-making process. With condominium associations, the leadership usually consists of the board, which is described in section 3.3.2.

Collective decision-making barriers

This paragraph discussed the advantages and disadvantages of collective decision-making processes as opposed to an individual decision-making process. The idea of synergy states that decisions made by individuals are less effective than when they are made collectively. However, collective decision-making processes also add extra barriers to the customer journey of condominium associations. The paragraph described these barriers which are summarized in the list below as variables to study with the case studies:

- Communication in the condominium association;
- Involvement of the members in the process;
- Leadership or person to the lead process;
- Positions in the decision-making process;
- Process of agreeing with each other;
- Amount of people present for the voting procedure;
- Groupthink.

The strategies and policy instruments of municipalities should be equipped to help condominium associations with these barriers. As municipalities have resources and usually (and should) have more knowledge about these processes and barriers, they can help condominium associations know how to overcome these barriers or teach them how to deal with such group processes.

3.3.6 Barrier arising from comprehending and applying for incentives.

The third type of barrier encountered during the customer journey of the condominium associations is the difficulties comprehending and applying for incentives and help of the municipalities. Municipalities have multiple instruments with incentives and help in place to support associations in the process. For example, the municipality of Amsterdam (Gemeente Amsterdam, 2021d) offers different types of financial incentives and advice and support during the process. The barrier in this process lies in comprehending what is being offered and how easy it is to apply for the different instruments. For each step in the customer journey, these barriers might be different. Municipalities should help condominium associations with these barriers as there are the ones that possibly make the barriers.

3.3.7 Actors alleviating barriers.

As described in section 3.3.2, there are several actors present in the decision-making process. This section takes a closer look at how some of these actors can help overcome the barriers.

The management of condominium associations can be helpful with overcoming some basic barriers that condominium associations can encounter, including the finances of the association, communication with the members, and help with requesting and judging quotes. These management offices do, however, do what they are paid for, so the question is what happens with the things that are beyond their task list. Moreover, it can be questioned how much knowledge these offices have about sustainable measures as this is not something they have dealt with earlier.

The one-stop shop should be able to help the condominium associations with all of the barriers they could encounter as they promise to set them up with a building that should work for the next 30 years. This sounds promising, but the question is if they can help all the condominium associations and guarantee living cost neutrality. Moreover, not all condominium associations need such major renovations. The question is whether such parties are a good fit for a condominium association or should look for process guides, architects, or consulting companies that can help with these smaller or specific barriers they must overcome.

Actors such as grid operators, Programma Aardgasvrije Wijken and the Dutch government do not necessarily seem fit to help directly with alleviating barriers encountered by condominium associations in their decision-making process but more on a larger scale. However, these parties are necessary for the bigger scale of the energy transition and for making condominium associations' heat sources sustainable.

3.4 Barriers for each different step of the customer journey.

The previous sections described the different actors and barriers. Each step (figure 3.18) has different barriers that must be overcome, which can be divided into three categories, namely:

- Transaction costs barriers
- Collective decision-making barriers
- Comprehending and applying for help barriers

5: Barriers overcome (with help form municipality) move to next step

2: Transaction costs barriers

4: Comprehending and applying for hulp of municipality

3: Collective decision-making barriers

1: Step of customer journey

Figure 3.18 – Barriers that must be overcome during one step of the customer journey (own image)

The customer journey of the condominium associations has been divided into six different steps following. Figure 3.18 shows the process of one step of the customer journey and the different barriers that must be overcome. Once the barriers of the step are overcome, the condominium associations can move on to the next step of the customer journey. When all the different steps (figure 3.19) have been completed and the whole customer journey is finished, the condominium association can execute the renovation. The actual renovation is not part of the scope of this research as it focuses on the moment of initial interest until a decision has been made concerning the execution of the chosen measures. A detailed description of the different steps, actors and barriers per step is given in this section.

With the frameworks described in this section and the detailed description of the different steps in the following sections, it is possible to study the case study condominium associations that encounter barriers. Municipalities can help them overcome these barriers with their policy instruments and strategies if they understand the problem correctly. Furthermore, they can play a role in alleviating these barriers by using their financial stimulating – and capacity building instruments.



Figure 3.19 – Customer journey of the collective decision-making process of a condominium association (own image)

3.4.1 Step 1: the reason to start the journey

The journey's first step is different from the others as it focuses only on the reason to start the journey. Someone from the condominium association needs to start thinking about sustainability measures since their usually not on the agenda (Companen, 2015). The reason to start the journey can be internal as well as external. An example of an internal reason is someone that does work for the energy transition and think he/she should take part in the process. External reason can vary from a condominium association manager, a consultancy firm, a supplier of sustainable goods or services, or a success story from friends (Paradies et al., 2017). This peer to peer communication is echoed by recommendations for local authorities from Kwon and Mlecnik (2020), who see the homeowner renovation journey as a continuous process. After the journey of homeowners, or for this research, condominium associations, they can serve as an external reason for other condominium associations/homeowners to start the journey.

This shows that next to the members of the condominium associations, more actors are involved and can function as the reason to start the journey. Next to the interest of a member of the associations or through peer to peer communication, municipalities can function as that reason and local initiatives and suppliers of sustainable goods or services.

When taking a closer look into the internal process of the condominium associations at the start of the journey, there are several essential factors. Important factors include having someone who takes the lead or if the building requires significant renovations.

Barriers

In the first step of the customer journey, there are no collective decision-making process barriers, transaction costs barriers or comprehending and applying barriers. The only barrier in this part of the

journey is finding the opportunity to start the journey.

3.4.2 Step 2: Orientating and researching different options.

In the second customer journey, the condominium associations start orientating on the possibilities and researching them. This is done by acquiring information through acquaintances, the internet or suppliers of goods and services of sustainable measures (Paradies et al. 2017). This information is acquired through the management, board or assigned commission. Municipalities can have a facilitating role in this phase by providing information about the different options. They can set up pop-up consultancy centres or through their web portals (Kwon & Mlecnik, 2020). The different options are further researched, and a decision is made for which measure(s) best seem to fit the building and the wishes of the condominium association management and members. In this phase, setting up the business case is very important and, therefore, an understanding of the different measures, knowing how the business case works and the state of the building (Paradies et al., 2017). The board usually does this part of the journey, the sustainability commission or the management. It is possible to get assistance in this part of the process by a process guide or someone who gives a piece of energy advice.

Transaction cost barriers.

Up-to-date knowledge concerning the possibilities is essential in this step of the process as it allows the associations to orientate about possibilities. However, this results in several transaction cost barriers, namely not having the knowledge and not knowing where to find information concerning the different possible measures. Moreover, a business case for which time, effort and possibly money is needed to acquire the correct information concerning the different possibilities. In addition to those come barriers that make orientating and researching the different options about possible measures more difficult and result in the following variables:

- Knowledge about sustainable measures;
- How to search for information about different measures;
- Financial possibilities from within the condominium association;
- Finding out the state of the building;
- Knowledge of how to set up a business case;
- Fear for the actual renovation process.

Collective decision-making barriers

Even though no decisions concerning the measures or the execution are made, collective decisionmaking barriers can still arise. Someone of more people must be in charge of researching the possibilities and take the lead in the process. Without anyone taking the lead and ensuring progress, it is challenging to finish the customer journey.

In this phase, essential factors that should not be overlooked include clear communication with the other members of the associations and the involvement of the members in the process. When these factors are overlooked in the earlier stage of the process, they become more significant when decisions must be made. In the later stages, pressure can arise to make a decision and when members are not involved early enough, they cannot decide, as explained in section 3.3.5. When this is not happening, these factors can become real barriers and harm the process. The variables to study the barriers for this of the process include:

- Communication in the condominium association;
- Involvement from the members of the condominium association;
- Leader in the process.

Barriers in comprehending and applying for incentives

In this phase, it is possible to receive help from the municipality for advice about the state of the building, the different possibilities for the renovation or help in the form of a subsidy. However, it can

be challenging for condominium associations to understand what type of help is being offered and how they can apply. The variables to study the barriers for this step of the process include:

- Comprehending what the municipality is offering
- Applying for the help of the municipality

3.4.3 Step 3: Vote concerning feasibility study.

The third step consists of a vote concerning the feasibility study. A feasibility study is required to see if the proposed measures can be implemented in the building. When the feasibility study surpasses the amount of money the board can spend freely, a vote is required to continue. When the feasibility study does not surpass the amount of money required for a vote, the condominium association board is free to continue. However, to keep the members' trust, the decision to continue is still put to the vote. Here, how well the board communicates with the other association members or the sustainability commission will show. As members are needed to vote, they must be involved in the process and told about their options. All members must be at the same place in the decision-making process as described in 3.3.5.

The vote is a go/no go moment during the journey since without a negative result, the process is stopped. Therefore, a good feasibility study and business case are required at this stage. Not only for this process to continue but to keep confidence in the board for later meetings.

Transaction costs barrier.

This part of the journey has fewer transaction cost barriers than the previous steps. However, understanding the process that happens with condominium associations during a vote is essential. The members of the associations must be informed correctly. Therefore, understanding how to communicate and involve the members is essential. This is to keep the process going well, so professional support or an external process guide can help. The variables to study the barriers in this phase can include:

- Knowledge about sustainable measures;
- How to search for information about different measures;
- Financial possibilities from within the condominium association;
- Knowledge of how to set up a business case.

Collective decision-making process barriers.

The fourth step of the journey has a go or no-go decision moment. The condominium associations decide with the feasibility study if they want to continue with the process. The main barrier is meeting the minimum amount of votes in favour of continuing, but this is influenced by – and built up from several smaller barriers. The up-to-date knowledge of the members and their place in the phase in their decision-making process are important factors and barriers for this step. For every member to make a calculated vote, they must be aware of the choices, the cost and the benefits of the project. This shows how the other smaller barriers in the previous steps are essential as well. The communication and involvement of residents in the earlier steps make the steps towards a calculated vote smaller. The variable to study these barriers include:

- Communication in the condominium association;
- Involvement of the members in the process;
- Leadership or person to the lead process;
- Positions in the decision-making process;
- Process of agreeing with each other;
- Amount of people present for the voting procedure;
- Groupthink.

Barriers in comprehending and applying for incentives

In this phase, it is possible to receive help from the municipality for advice about setting up a business case, the state of the building, the different possibilities for the renovation or help in the form of a

subsidy. However, it can be for condominium associations challenging to understand what type of help is being offered and how they can apply for it. The variables to study the barriers for this step of the process include:

- Comprehending what the municipality is offering
- Applying for the help of the municipality

3.4.4 Step 4: Requesting quotes and setting up the business case.

The fourth step concerns designing the plan, requesting quotes and setting up the actual business case. The business case concerns the question of what the proposed measures earn the condominium associations. With the results from the feasibility study and quotations for the execution, the business case for a specific condominium association can be set up. When the board of the condominium association thinks one of these offers is favourable and fits the renovation wishes of the association, they move on to the next step of the journey and put the plan for execution to a vote.

For this step, setting up the business case and up-to-date knowledge for requesting quotes is essential. As the business case built in this part of the journey will be used to execute the measure(s), a well-worked out business case is required. Moreover, this requires the associations to draw up their plan and demands for the renovation. Therefore, factors such as up-to-date knowledge of the board and available financial resources also play an essential role.

Here the condominium association comes in contact with private parties such as a contractor that can execute the renovation. The municipality also plays a role in this part of the journey as subsidies may be needed to make the business feasible. Comprehending what they are offering and how to apply for it is therefore essential.

Transaction costs barriers

This phase has many transaction cost barriers. In this part of the journey, much specific knowledge is required to complete this step. First, the business case must be worked out in detail, and quotes must be requested. To finish the business case, the costs and benefits of the proposed measures must be worked out in detail and which subsidies and benefits can be used should be determined. If the board cannot do this, reliable experts must be found. When the business case is finished, quotes must be requested from constructers. The variable to research the barriers for this phase include:

- Knowledge about sustainable measures;
- How to search for information about different measures;
- Financial possibilities from within the condominium association;
- Finding out the state of the building;
- Knowledge on how to set up a business case;
- Knowledge about requesting and judging quotes;
- Fear for the real renovation process.

Collective decision-making barriers

This step has the lowest collective decision-making barriers since it further develops the business case and requests quotations. However, in this part of the journey, it is again essential to have either a leader or someone guiding the process to continue the journey. In addition, communication with association members remains vital to prevent upsets later on in the process. The variable to study these barriers include:

- Communication in the condominium association;
- Involvement of the members in the process;
- Leadership or person to the lead process;

Barriers in comprehending and applying for incentives

In this phase, the help of subsidies can make or break the business case. Understanding what the municipality is offering and how to apply for it is therefore essential. This also goes for other forms of help that municipalities might be offering. The variables to study the barriers for this step of the process include:

- Comprehending what the municipality is offering
- Applying for the help of the municipality

3.4.5 Step 5: Vote concerning the execution of the measure(s).

This step of the customer journey of the decision-making process of condominium associations consists of a vote concerning the execution of the measure. To ensure that chosen measures can be executed, a vote must take place. Otherwise, the measure(s) can not be executed. For this vote to be eligible, the rules and preconditions of the model agreement that the condominium association is using must be followed.

In this last step of the journey, it is again that all the members are at the same stage of the decisionmaking process, just as in step four. When not everyone is ready to make an informed, it can negatively affect the process. To help with that, the presence of a leader is essential as that is the one who can help with that in the process.

Transaction costs barriers

This step of the journey has no new transaction cost barriers as it focuses on the vote of the associations. The vote concerns the business case made for the different chosen measures. This entails how well the barriers have been overcome in the previous steps of the journey as the results of that concern the vote. The variables to research the barriers for this phase, therefore, include:

- Knowledge about sustainable measures;
- How to search for information about different measures;
- Financial possibilities from within the condominium association;
- Knowledge on how to set up a business case;
- Knowledge about requesting and judging quotes;

Collective decision-making barriers

This part of the journey contains the second and last go or no go moment. For this decision to be a go, the quorum and quotum following from the model agreement of the condominium associations must be met. This vote happens during a members meeting. The numbers for this can vary for different condominium associations depending on the model agreement that has been used (VvE Belang, n.d.). It can be two-thirds or three-quarters of the votes, and at least two-thirds or three-quarters of the members must be present.

To be able to meet the voting requirements, there are some smaller barriers to overcome. First, all members must be in the same phase of the decision-making process and can make a well-informed decision on the renovation. Therefore, the presence of a leader or someone who guides the associations through the process helps. This person helps with the communications with the members, their involvement and providing them with up-to-date knowledge. The variable to study these barriers for this phase include:

- Communication in the condominium association;
- Involvement of the members in the process;
- Leadership or person to the lead process;
- Positions in the decision-making process;
- Process of agreeing with each other;
- Amount of people present for the voting procedure;
- Groupthink.

Barriers in comprehending and applying for incentives

In this phase, a process guide can help prepare for the voting procedure and help the board inform the other members of the condominium association. Moreover, the help of subsidies can make or break the business case. Understanding what the municipality is offering and how to apply for it, is, therefore, essential. This also goes for other forms of help that municipalities might be offering. The variables to study the barriers for this step of the process include:

- Comprehending what the municipality is offering
- Applying for the help of the municipality

3.4.6 Step 6: Finalising and financing.

The final step of the customer journey of the decision-making process of condominium associations consists of finalising the plan and the finances. Here, the final details of the plan are taken care of to be ready for execution. Moreover, the condominium associations must apply for subsidies or special (revolving) loans they are planning to use.

Transaction costs barriers

This step does not pressure the most on the transaction cost barriers as not much new information is needed. Most of the work is already done in the previous steps. Some of these barriers do still come back. The variable to research these barriers include:

- Knowledge about sustainable measures;
- How to search for information about different measures;
- Knowledge on how to set up a business case;
- Knowledge about requesting and judging quotes;

Collective decision-making barriers

This part of the journey does not have much influence from the rest of the condominium association. It remains, however, important that attention is paid to the smaller barriers. The variable to study these barriers include:

- Communication in the condominium association;
- Involvement of the members in the process;
- Leadership or person to the lead process;

Barriers in comprehending and applying for incentives

In this phase, applying for subsidies or loan makes or break this step of the journey. Therefore, a process guide can help prepare for applying them and comprehend what is needed to deliver for the application. This also goes for other forms of help that municipalities might be offering. The variables to study the barriers for this step of the process include:

- Comprehending what the municipality is offering
- Applying for the help of the municipality

3.6.7 Overview of barriers per step.

The different steps of the customer journey all have different types of barriers that make it more difficult. Table 3.13 shows what type of barrier can be expected the most in which actors are likely to be present from outside the association. Moreover, it shows where outside help is expected to be required to overcome the barriers for that phase. Municipalities can help here with alleviating the barriers with their policy instruments. Moreover, they can play a big role in starting the journey of condominium associations by engaging stakeholders and raising awareness. The results from chapter 4 show how these barriers per phase are experienced by condominium associations that are going through their collective decision-making process.

Table 3.13 – Expected barriers for the customer journey of condominium associations (own table)

Step of step journey	Transaction cost barriers	decision-making barrers	Comprehending/ applying for help	Actors	Outside help required
Step 1	N/A	N/A	N/A	Neighbours, municipality	+
Step 2	+	-	±	Process guide or consulting party	±
Step 3	±	+	±	Process guide or consulting party	±
Step 4	+	-	±	Process guide or consulting party	+
Step 5	+	+	±	Process guide or consulting party	±
Step 6	±	-	+	Municipality, process guide, appointed contractor or consulting party	±

3.5 Conclusion on the literature study.

This chapter aimed to give background to the research and create a theoretical framework from relevant literature that could answer the main research question and help municipalities in the Netherlands enhance their approach to stimulate condominium associations to renovate their dwelling. This review has led to two frameworks, one to study several municipalities' approaches and one to create an overview of the barriers encountered by condominium associations in their decision-making process.

The literature review about condominium associations showed their significance in the Dutch building stock and low energy performance. There are fewer larger condominium associations (6+ members), but they make up a larger part of the apartment rights that belong to condominium associations. The condominium associations of the case studies (section 2.4) represent many condominium associations in Amsterdam that have a similar WOZ-value, owner type situation and size. Moreover, they are ready to start- or occupied with their customer journey.

Table 3.9 summarises the research variables of table 3.5 and shows the key variables that summarize the questions of governance dimensions for energy governance from the GAT. The literature about public policy, energy-efficiency governance and policy instruments led to the adapting descriptive questions of the GAT to study the approaches of municipalities. With these variables for the different dimensions, it is possible to create an overview of the approach of the municipalities of Amsterdam, Rotterdam and Utrecht. Moreover, it allows to compare them with each other and analyse the different municipalities' approaches, draw lessons from them, and compare them with the literature.

Table 3.14 - Governance dimensions with summarized research variables (own table	- Governance dimensions with summar	rized research variables	(own table)
--	-------------------------------------	--------------------------	-------------

Governance dimension	Research variable
Levels and scales	Levels and scales of government;
	Dependency of levels;
	Reflecting countries and municipal issues.
Actors and networks	Involved actors, their roles;
	Network relations and relationships between actors.
Problem perspective and goal	Goals and ambitions;
ambitions	Problem description;
	Targets and evaluation.
Strategies and policy	Financial stimulating instruments;
instruments	Capacity-building instruments;
	Stakeholder engagement and awareness creating;
Responsibilities and resources	Responsibility for the ambitions and accountability;
	Development and distribution of new knowledge.
Table 3.14 focuses on the whole approach of municipalities to stimulate condominium associations to renovate their dwelling. This framework is, however, not enough to understand all the barriers and issues for condominium associations. Figure 3.19 (section 3.4) shows the customer journey for the collective decision-making process of condominium associations for an energy-efficient renovation. From the literature, three different types of barriers have been distinguished. Therefore, this figure can be used to create an overview of the barriers encountered by the condominium associations. When this overview is created, it can be:

- Analysed to see what the differences and similarities are with the literature.

- Analysed to which barriers condominium associations can not cope with by themselves and assistance is needed.

- Compared with the approach of the municipality of Amsterdam to see if it is in line with each other.

These two figures form the basis for analysing the gathered data in different interviews and answering the following research questions.

Chapter 4 - Barriers encountered by condominium associations.

This section describes and analyses the barriers encountered by condominium associations in their decision-making process. For each step of the customer journey (figure 3.19), the different types of barriers are analysed using the three case studies described in section 2.3. Thus, the data gathered about the case studies from the interviews serves as the basis to describe the different types of encountered barriers. Moreover, it gives insight into the parts of the customer journey that condominium associations all still struggling with and need help with to overcome. Overall, this chapter aims to answer the following question:

SQ2: What barriers are encountered by condominium associations during their collective decisionmaking process?

At each step of the customer journey, the barriers and how to overcome them are considered with the data from the interview as a source. This analysis also allows comparing it with the barriers found in the literature and described in the previous chapter.

4.1 Step 1: Reason to start the journey.

As described during the literature review, different reasons to start can be distinguished. Therefore, this section discusses the different reasons to start the journey of the condominium associations from the case studies.

For the Lucellestraat, different reasons to start the journey can be distinguished. The first reason comes from the interest of the residents in the condominium association to become more sustainable (I1). As it is a hot topic in the Netherlands, members of the associations started asking questions about the options to become more sustainable (I2). Moreover, the social housing corporation, Stadgenoot, has many dwellings in the associations and has also started pushing to become more sustainable (I3). This process goes hand in hand with the plan of the municipality to apply Stadswarmte in that area of Amsterdam. Stadgenoot supports this (I4). The plan to use Stadswarmte has been there for multiple years but has not come to execution.

With the condominium associations at Reigersbos, the reasons to start are different. For a large part of the dwellings, renovating the façade is necessary as it is leaking and not waterproof anymore (G₃). The condominium associations have tried earlier to arrange renovations to address these fundamental problems but failed (H₁). Since then, Reigersbos has become a developing neighbourhood for the municipality of Amsterdam and one of the neighbourhoods to become free of natural gas (G₄). Therefore, the municipality of Amsterdam sees the condominium associations as an opportunity to start the developments in the area and discover the best possibilities for the neighbourhood (G₅). Furthermore, the municipality of Amsterdam introduced Klimaatmissie as a partner for the project in the hope that a new look at the situation would give a new solution (H₂). These reasons together form the basis of the start of the process of condominium associations.

Venserpolder is also a development neighbourhood and set to become free of natural gas early on in the process. The municipality did research together with the different actors such as Liander, Vattenfall and Warmtenet to see what the possibilities were in the neighbourhood (G6). The municipality of Amsterdam wants to introduce Stadswarmte as a solution for the area and the condominium associations. It hopes the condominium associations make use of this opportunity and start renovating. There are 16 condominium associations in Venserpolder and some additional building blocks that the social housing corporations own entirely and around 5000 apartments (G7). These numbers mean that all the condominium associations have a vast group of members. In many condominium associations, housing corporations own around 50% of the apartments(G8).

All three condominium associations have started the journey for different reasons. In Reigersbos, the journey started of necessity as something needs to happen with the façade. The Lucellestraat started with the interest of the residents and the housing corporation being there. With Venserpolder, it was a plan from higher up for the neighbourhood that started it. This high number of reasons to start the journey complies with the literature. It shows the many departure points that the municipality of Amsterdam can use to stimulate the condominium associations to renovate. The discussion describes whether all reasons to start the journey work.

4.2 Step 2: Orientating and researching the different possibilities.

During the second step, the condominium associations orientate about - and research the different possibilities. In this process step, transaction cost barriers are the most likely barriers to be encountered following 3.6.2. The results of the case study back this up in several forms.

For the boards or sustainability commissions of condominium associations, understanding what the measures mean for their building and the best options is sometimes challenging (I5). The board of Lucellestraat has no starting knowledge about buildings (I6) and has difficulties finding out what measures work best and what they should do first. Whether it is better to start with new isolation or adding solar panels (I5). As Stadgenoot is pushing Stadswarmte, questions about Stadswarmte arise as:

- Is it really a sustainable heat source?
- Is it worth the investment?
- Is this not creating a monopoly for the supplier?

These questions and the low speed of getting answers make the doubt grow about Stadswarmte for the Lucellestraat (I7). Understanding all these questions, what must be done and in what order can be a challenging task (I8). Whether it is wiser to go along with the presented plans of the municipality or revise the long term maintenance plan. Both in the Lucellestraat and with the condominium associations in Venserpolder, these questions arise. In addition to that is the question of what condominium associations want for the renovation and their program of requirements. Many questions arise about what the options are, what is the best order to do things, and if it is wise to change the planning of the long term maintenance plan. Following the literature study, a lack of knowledge about sustainable measures could form a barrier to these questions. How and where to get answers to these questions brings the next barrier.

Condominium associations must acquire information to get answers to these questions. There are different options to do this: talking to friends, reading and searching online, or even watching a television show (I9). However, the questions about what works best for a specific case and where to start remain from those sources. Examples of these questions include (I10):

- How to filter the opinions of family members as they are no experts either?
- How to filter the received information?
- What information applies to my own situation?

To deal with these questions, the condominium association of Lucellestraat came in contact with WNR through a neighbouring condominium association that was doing the same thing (I11). The promise of the whole package of information about the measures, guidance, subsidies, and looking at the living costs neutrality is what makes actors such as WNR so appealing (I12 & I13). WNR offers more than a municipality can offer as they can also help out with the actual renovation. When many questions cause doubt, it is comforting when an actor or market party can offer an answer to many of these questions (I14). However, the municipality can help as an information distributor and answer questions that condominium associations have about the process and the advantages and disadvantages of specific options (I15). Since the municipality has no alternative motive besides helping the condominium associations decide on a renovation (as this helps meet their goals), it can be valuable information.

The condominium associations in Reigersbos have to deal less with these types of struggles in the step of the process as Klimaatmissie is involved. As with WNR for the Lucellestraat, they can offer many answers to the questions condominium associations might have. They provide the condominium associations with information about their different scenarios and corresponding measures they can choose from (Klimaatmissie Nederland, 2021; H3). Klimaatmissie uses the principle of living cost neutrality, meaning that it should be affordable for everyone (H4). During their annual meetings of the condominium associations, Klimaatmissie was introduced to them with the message that they had a plan to renovate their building (G9). This part of the process requires no financial contribution from the condominium associations in Reigersbos. As no financial contribution was needed, the condominium associations thought it exciting to follow and get something of quality in return (G10). The plan to let Klimaatmissie help came from the municipality of Amsterdam, and without the financial barrier, all condominium associations agreed to let Klimaatmissie work out their plans further (H5). Klimaatmissie would come with several options to renovate based on the long term maintenance plans of the associations and made a rough sketch of the financial situation (G1). This seemed like a good plan at the start of this

project, as steps could be taken immediately to give the plan substance. However, this has made them go through their program of requirements quite fast, which is something they started to struggle with later on (G12).

For the condominium associations in Venserpolder, the situation is again a bit different than with the others. The municipality of Amsterdam came up with a plan to connect the neighbourhood to Stadswarmte, for which a subsidy is currently available (G13). However, the situation was more complex than anticipated as all dwellings have individual heating systems where the municipality expected there was a central heating system. Moreover, all condominium associations had recently replaced their heating system with the oldest installed in 2017 (G14). Therefore, replacing the heating system again would be a divestment and mean that the old heating system is replaced long before it is written off (G15). Furthermore, additional investments to better isolate the buildings for the Stadswarmte to work is required for the new heating system to be fully functional (G16). The condominium associations are now debating over the best option for them to become free of natural gas. This also needs to fit in the long-term maintenance plan of the associations (G17). Moreover, they are considering what should be in their program of requirements (G18) and whether they can pull things forward in their long term maintenance plan. Fitting the plans and their personal requirements into the long term maintenance is a struggle for the condominium associations from Venserpolder and Reigersbos.

From the case studies, it becomes clear that this step requires a lot of the board of condominium associations. To move on in the process, they must overcome several transaction cost barriers. The boards lack the knowledge about the possible sustainable measures, which burdens them with figuring out what they want, what the best possibility is for that plan, where to find information and how to judge and filter the information. Without professional help or an experienced board with expertise, this becomes a challenging task. WNR and Klimaatmissie have helped the condominium associations in Reigersbos and the Lucellestraat in this step of the customer journey. The municipality of Amsterdam could also help in this process as an actor who could help with finding and giving the answers to these transaction costs barriers.

4.3 Step 3: Vote concerning the feasibility study.

The third step of the process consists of deciding which measures to further research. This step mainly focuses on the collective decision-making process and the process in the association. Issues described in the literature also come back from the case studies.

In a condominium association, especially when their size grows, not all people are interested in a renovation for the same reason. Some might do it because they are interested in the financial benefits or from a more principled point to become more sustainable. The same goes for why people are against it and must be convinced in the voting procedure. This problem becomes apparent in both Reigersbos and the Lucellestraat (II, II6 & H6). The challenge is to get these people on the same line of thinking and towards the same goal. A condition for keeping people thinking about the goal is a necessary commitment to the condominium associations and a sense of co-responsibility for the building (G19). Otherwise, it is more challenging to get them on board with the process.

To tackle this problem, members of the associations must be well informed. Therefore it is required to keep in touch with the other association members and send them updates about what is happening (I17). This communication makes things easier during meetings but is not enough for all collective decision-making barriers to be overcome as the other members still must be convinced about the plans. Convincing them can be a difficult task for the board when they are not necessarily equipped for this. Convincing a large group of people with any presentation skills, natural prevalence or field

related knowledge can be a tough assignment (I18). When the board has managed to give a successful presentation, it must know the plan's details well enough to answer questions from the board (I18)). The municipality could play an assisting role in this process. The municipality is selfless in this process and can, therefore, provide the condominium associations with information that is not biased. Examples and content of presentations and focus points could help condominium associations prepare (I19 & I20).

There should be clear communication between the board and its members for this whole process to work and get ahead of members' questions. However, that clear communication is not necessarily always present and can be why people become more involved and join the board (I21). A good connection and communication with neighbours can also help in this process. Moreover, it can be the reason to join the board or a condominium association (I22). When a member is interested in becoming more sustainable, this can help with the decision-making process. This step not necessarily requires putting the board's decision to a vote, but it is wise to make sure enough people are on board. Otherwise, the plan can not come to execution later on. The difficulties with meeting the quorum are further discussed in section 5.6. An actor that should not be forgotten to get on board is the social housing corporation. In the Lucellestraat, they own many dwellings but are not necessarily convinced about going with WNR (I23).

After a long struggle, the condominium associations in Reigersbos have signed an intention agreement with Klimaatmissie to execute the renovations. The concept version of the plans was enough for almost all condominium associations to sign the intention agreement, leading to the model house being built (G20). Even though this took quite some time, they have moved on to the next process step. The condominium associations Venserpolder and Lucellestraat are still researching their options, choosing one and voting about the feasibility study.

To finish this step, the condominium associations face several barriers that focus on the collective decision-making process. The board of the condominium associations must have informed their members, presented their plan, answered questions about it and convinced their members while considering the different motives and conceptions of the rest of their association. This process requires specific skills and knowledge for which the municipality of Amsterdam can provide the basics. Moreover, all these small collective decision-making barriers can complicate the customer journey as the members must be kept on board for the rest of the process.

4.4 Step 4: Requesting quotes and setting up the business case.

This step focuses on designing the plan, setting up the business case and requesting quotes and requires much specific knowledge from the condominium associations, just as in step 2 of the customer journey. In this part of the process, knowledge about financial help from the municipality and government also becomes more critical as it can make or break the business case.

With some struggles, Klimaatmissie, the municipality of Amsterdam and (almost) all condominium associations from Reigersbos signed the intention agreement. As mentioned earlier, up to this point, there was no financial burden to stop the condominium associations from taking part in the process provided by Klimaatmissie. After signing the intention agreement, it would be fair to assume that the decision-making process would continue steadily. Unfortunately, the project has reached an impasse which has several reasons. From the start, the condominium associations were being led through the process instead of leading the project themselves (G21 & G22). Therefore, they were not necessarily invested in the project and understanding what it would mean for them. Moreover, when looking at the plans and the model apartment, they started considering if it was right for them and whether the

proposed heating and cooling system was what they wanted (G23). The condominium associations started doubting whether they needed the proposed amount of insulation if all-electric with a low-temperature heating system was the right choice and what this would mean for them (23). This problem of not knowing what their wishes are and not having told them can be led back to the set-up of the project. The condominium associations have not started orientating and researching the different possibilities as Klimaatmissie gave them some options leading their wishes to snow under (G24). The condominium associations were given certain levels for the renovations of what elements would be renovated but not about completing those elements. Only later, they started realising what some of these choices would mean for them (G25). This has resulted in the condominium associations taking a step back and discussing their options (G26). The condominium associations started discussing again with each other what their wishes are and how they see the program of requirements (G27).

These problems also highlight another struggle in condominium associations that comes back in other parts of the industry. If clients, or in this case condominium associations, do not have to pay beforehand, but everything is brought to them, they are less committed and demanding to see what happens (H7). On the other hand, if they are paying, they do not have anything to hide behind and must take action for themselves (H8 & H9).

The second and the fourth step require much specific knowledge from the condominium associations. Maybe even more in the fourth step as the level of detail of the plan becomes bigger. The questions about what type of heating system, what type of isolation they should choose and how thick this should arise. More specific information is required to make the plan and set up the business case. Certain choices about the heating system can bring consequences, and new information, more detailed than anticipated before, can lead to reconsideration (G28). The board of the condominium associations again must find out what they need to know, where and how to acquire it and how to use it as described in section 4.2. Moreover, setting up the business plan can become very complicated, leading different people to see the business plan differently.

These are usually questions and barriers a condominium association can not answer by themselves and for which it requires help. There are multiple options besides consulting a market party, with some already in the circle of condominium associations themselves. For example, the associations ask the management of their associations and the social housing corporation to see how they look at the plans they are drawing up (I24). Seeking help with other market parties can also help as actors such as WNR and Klimaatmissie, who have a complete image of the process's needs (I12).

This step is relatively similar to the second step as again a plan must be made. However, the plan needs to be more detailed as the plan and the business case must be created, and quotes must be requested. These tasks ask for more specific knowledge of the boards of the condominium associations, which can be challenging to do without any help. Another problem that became apparent with the case studies is that when steps in the process are rushed, it can lead to problems later on, as was shown in the Reigersbos case when the program of requirements of the condominium associations was not given the necessary importance. As the transaction cost barriers in the second step of the customer journey, the municipality can help find and answer the barriers.

4.5 Step 5: Voting about the execution of the renovation.

This step concerns the vote about the execution of the renovation, which must meet the quorum from the deed of division to be eligible. The literature review expects that most barriers come from the collective decision-making process. The three processes of the different case studies have not reached this vote yet, but some trouble is expected.

The same barriers arise as did during the third step of the process. This leads to the same barriers as in step 3. This again means that the different types of members but be convinced. The information must be presented well, questions must be answered, and the communication throughout the process must be well to prevent the task from becoming even more difficult. It is crucial to pay attention to all association members and keep their minds on track and set towards the goal. This requires some additional management skills of the board (G29).

In addition to the vote of the third step of the process are the regulations concerning this vote. For the vote to be eligible, the quorum must be met, which can be challenging for the condominium associations, especially when the associations get bigger and less personal. However, meeting the quorum does not always have to be a problem. This is the case in the Lucellestraat, where they have a reasonably good turnout (I25). However, in Venserpolder and Reigersbos, there are difficulties with meeting that quorum and during meetings as other members must sometimes be called to meet the quorum (G₃o). This challenge is not strange when some condominium associations can sometimes have 500 individual homeowners who must vote (G₃1).

During step 5 of the customer journey, many collective decision-making barriers can be expected. The case studies showed the difficulties for the third step of the process with getting everyone on board and the barriers that can give trouble. It does not necessarily have significant consequences for that step of the journey, but it can for the fifth step. This becomes an even bigger problem when meeting the quorum to decide at the meeting is a problem.

4.6 Step 6: Finalising the finances and requesting subsidies.

The final step of the journey consists of finalizing the finances and requesting the required subsidies for the renovation. The most significant barriers here lie in understanding the subsidies and applying for them. This is echoed in practice as many questions arise in the process that are difficult to understand and make it a complex that include (I26):

- What kind of subsidies are there?
- What are the chances of getting the subsidy?
- How does is it work?
- Who is supposed to request these subsidies?

These questions are tricky for condominium associations to answer but are required to round up their finances. Understanding what subsidies or other help means must happen at some point to make the business case and is likely to be figured out before this step. Applying for it, however, happens here as the plans are clear from here. An advantage of actors such as WNR and Klimaatmissie is that they are aware of the different subsidies in place, know how to apply for them, and help get them (I12).

Another problem with the subsidies is that most of them only come when the investment is already made at the end of the process. Thus, it works more like a reward for finishing the process than an incentive during the process (H10). Moreover, this often helps people who are already capable of finishing the process instead of those who struggle even to begin (H11).

4.7 Overarching barriers.

Besides the barriers noticed during the process, some barriers are overarching the different steps in the process. One of these barriers does not necessarily lie with the condominium associations that can participate in a collective decision-making process like this but with the associations that can not. For example, condominium associations that are sleeping are not in the position to start the process but

should not be forgotten to include in the approach of municipalities.

One of the most critical barriers lies with something that already became apparent from the literature. A substantial part of the condominium associations does not have a working long-term maintenance plan or one that does not cover the costs. The case studies show similar results in situations where long-term maintenance plans are present and follow the law for saving money (H12), which is insufficient. Therefore, attention must be paid to how much these savings are behind and if this can be compensated by paying more. Moreover, the cycles of these long term maintenance plans might not cover all of the necessary maintenance. It is obliged by law for the MJOP to cover at least ten years. However, not all elements must be renovated within these years, resulting in many condominium associations not saving enough money (H13). An important position from Amsterdam's municipality and market parties such as WNR and Klimaatmissie is the neutrality of the living costs for the energy transition, which can be proven for many scenarios and buildings. However, a prerequisite for living cost neutrality is an MJOP that covers all the necessary maintenance. Otherwise, the living costs should be raised, which can put the affordability for some members under pressure.

Another barrier that comes back with many condominium associations is the level of thinking required to understand the plans presented to the associations' members (G32). For example, understanding the design from floor plans and cross-sections is challenging to imagine how that can improve a dwelling. However, by showing the members what their dwelling could look like, their level of ambition can be raised. In Reigersbos, a model home was made as a solution by showing what their dwelling could turn into to members of the different condominium associations.

4.8 Conclusion on barriers in case studies.

This chapter has given insight into the different barriers encountered by the condominium associations of the case studies. Table 4.1 shows different barriers for the case studies that became apparent from the interviews. Not all condominium associations have gone through the customer journey yet and are still occupied with the process. Therefore, barriers that are likely to be expected from the interviews have been added to table 4.1. The rest of this paragraph draws some conclusions about the barriers and some first insights into overcoming them.

Reason to start and success rate

All three of the condominium associations had different reasons to start the process (table 4.2). These reasons lead to different motivations of the condominium association. For example, in Venserpolder, the municipality of Amsterdam came in with a plan that did not necessarily fit the condominium associations, which led to some bumps in the process. If the municipality of Amsterdam wants to start a project in this way, they must be up-to-date with the details of the project so they can propose the best option. The other case studies show that good experiences from neighbours can convince others to do the same, as happened in the Lucellestraat. The necessity to renovate also works as an excellent reason to start the customer journey.

Barriers comparison

The barriers described in the literature and encountered with the case studies are relatively similar. However, the barriers encountered with the case studies make it more explicit what the consequences of the barriers are and what it means to overcome them (table 4.2). Table 4.2 summarises the barriers encountered to be encountered by the condominium associations of the case studies.

Convincing the other members consists of several steps: being well informed, communicating to the residents, presenting the plans, and answering questions about the plans while keeping them in line

Table 4.1 – (Expected)	barriers f	from the	interviews	with c	condominium	associations	(own table)
---------------	-----------	------------	----------	------------	--------	-------------	--------------	-------------

Step of the journey	Type of barrier	Venserpolder	Reigersbos	Lucellestraat
Step 1: Reason to start		Plan from the municipality of	Necessity to renovate and model	Sustainability interest and plans from
the journey		Amsterdam	project of the municipality	Stadgenoot
Step 2: Orientating and researching possibilities	Transaction cost	Determining what the condominium association requires; How to judge information; Judging long term maintenance plan	Lack of knowledge about sustainable measures; How to judge information; Where to find informaiton.	Lack of knowledge about buildings; Lack of knowledge about sustainable measures; Where to find information; How to judge information.
	Collective decision-making	Communication with other members	Communication with other members	Communication with other members
	Comprehending and applying for help	Determining what the municipality is offering; Applicability for help	Determining what the municipality is offering; Applicability for help	Determining what the municipality is offering; Applicability for help
	Transaction cost	-	-	Lack of knowledge about sustainable measures;
Step 3: Vote concerning feasibility study *Venserpolder has not reached this phase for the customer journey	Collective decision-making	Communicating with the other members of the association; How to convince people of the plan; How to be prepared for the question that members might have; Difficulties with getting members on the same page.	Communicating with the other members of the association; How to convince people of the plan; How to be prepared for the question that members might have.	How to convince people of the plan; Difficulties with getting members on the same page; How and what to present for the other members; How to be prepared for the question that members might have.
	Comprehending and applying for help	Determining what the municipality is offering; Applicability for help.	-	Determining what the municipality is offering; Applicability for help.
Step 4: Requesting quotes and setting up the business case *The Lucellestraat has	Transaction cost	Similar barriers can be expected as in the second step of the journey.	How to filter information; Lack of knowledge about sustainable measures; How to judge information and decide on order of importance; How to determine what is needed for the building; What does the condominium association require/want; Has the right decision been made earlier:	Similar barriers can be expected as in the second step of the journey when the condominium association does not decide to partner up with WNR.
of the customer journey	Collective	How to keep the other members up to	How to keep the other members up to	How to keep the other members up to
	decision-making Comprehending and applying for help	date. -	date. -	date. -
	Transaction cost	What does the condominium association require/want.	What does the condominium association require/want.	Lack of knowledge about sustainable measures; What does the condominium association require/want.
Step 5: Vote concerning the execution of the renovation *Reigersbos has not reached this phase for the customer journey	Collective decision-making	Communicating with the other members of the association; How to convince people of the plan; Difficulties with getting members on the same page; How to keep the other members on track; How to meet the quorum for the voting procedure.	Communicating with the other members of the association; How to convince people of the plan; Difficulties with getting members on the same page; How to keep the other members on track; How to meet the quorum for the voting procedure.	Communicating with the other members of the association; How to convince people of the plan; Difficulties with getting members on the same page; How to keep the other members on track; How and what to present for the other members; How to be prepared for the question that members might have;
	Comprehending and applying for help	-	-	-
	Transaction cost	-	-	-
Step 6: Finalising and financina	Collective decision-making	Communicating with the other members of the association.	Communicating with the other members of the association.	Communicating with the other members of the association.

and focused on the end goal. When not everyone can be kept on board with the plan, it becomes tough to continue and prevent severe delay. This can happen when the social housing corporation does not get on board with the condominium's WNR plan (see Lucellestraat case).

Next to convincing the members to vote in favour of the proposed renovations, the board of the condominium associations must deal with many transaction cost barriers. Once information about different sustainable measures is found, there is still a long way to figure out the best option for the dwelling. The literature could summarize this into the phrase 'lack of knowledge about sustainable measures, for the board member of a condominium association, this can turn them not seeing the forest for the threes. These transaction cost barriers and the struggle to understand everything come back throughout the whole process and maybe the part where most condominium associations need help.

In addition to the barriers related to specific parts of the customer journey of the collective decisionmaking process, barriers overarch this process. For example, sleeping condominium associations are not capable of taking part in this process. Moreover, when the long term maintenance process is not in order, the financial side of the plan can come under severe pressure.

Table (2 –	Rarriers	encountered b	w the	condominium	associations	from	the	case studies	(own	table)
1uble 4.2 -	Durners	encountereu l	y the	condominium	ussociutions	jrom	the	cuse studies	Uwn	<i>tuble</i>)

Step of the journey	Transaction cost barriers	Collectvice decision making barriers	Comprehending and applying for help barriers	Outside help required
Step 1	N/A	N/A	N/A	+
Step 2	++	-	+	±
Step 3	±	+	-	±
Step 4	++	-	+	+
Step 5	+	++	-	±
Step 6	-	-	++	±

Role of the municipality

Many condominium associations need assistance to finish their customer journeys as they can not do this by themselves. If they do not get the required assistance, they can get stuck in a step when they can not answer the questions. The municipality of Amsterdam could be of real help here for the condominium associations. As the municipality will always play a central role in the energy transition and with condominium associations, they can help a lot with providing this assistance and required information. The municipality is an excellent option to provide this information as they do not have a financial motive but are there to assist. Chapters 5 and 6 describe this further.

This chapter has given an overview of the different barriers encountered by condominium associations in their decision-making process. Together with the overview of the approaches of municipalities (chapter 5), this forms the basis for chapter 6.

Chapter 5 - Approaches of the municipalities.

This chapter answers SQ3 and aims to describe and analyse the different approaches the municipality of Amsterdam, Rotterdam and Utrecht have chosen. This is done by using the modified descriptive questions of the Governance Assessment Tool described in section 3.2. By comparing the differences and similarities between the approaches and answer is given to SQ3:

What lessons can be drawn from the differences and similarities from municipalities' approaches to stimulate condominium associations? (SQ3)

This is done by looking at the different dimensions and analysing them for each of the different municipalities. The data to answer these questions comes from the interview with representative actors from the field (section 2.2), different policy documents from the municipalities and documents sent by the interviewed actors. At the end of the section, the different approaches are given, and the results are summarized.

5.1 Levels and scales

This section focuses on the level and scales dimension of the GAT and describes the following research variables from table 5.1. Section 3.2 already give some insight into how and what levels are of the government take part in the energy transition.

Governance dimension	Research variable
Levels and scales	Levels and scales of government;
	Dependency of levels;
	Reflecting countries and municipal issues.

Table 5.1 – Research variable of the levels and scale dimension (own table)

Following the Climate Agreement (Ministerie van Economische Zaken en Klimaat, 2019), the municipalities in the Netherlands are tasked with the energy transition of the built environment of their area. Despite this, the national government is also involved in the process. This is more on a higher level than the municipalities and with much less direct contact to the condominium associations. An example of this is the Warmtefonds which offers specific financing possibilities for dwellings in the Netherlands for energy-efficient renovations commissioned by the Dutch government (Warmtefonds, n.d.). Another example is Programma Aardgasvrij Wijken (PAW, n.d.), the national learning and knowledge program that can help municipalities.

The Dutch Climate Agreement stated that municipalities should take on a district-orientated approach. This is supposed to work better to develop heat grids and renovations and select the new heat distributor. This is what the municipality of Amsterdam, Rotterdam and Utrecht have been doing. The municipality of Amsterdam designed their route map towards an energy-neutral Amsterdam by 2050 (Gemeente Amsterdam, 2020a) and their transition vision heat Amsterdam Gemeente Amsterdam, 2020b). The municipality of Utrecht already started with this in 2017 with their vision on heat supply Utrecht where the boundary conditions were set (Gemeente Utrecht, 2017). In 2020, the first transition vision heat part 1 was created and published, describing the different possible heat sources for different neighbourhoods. Later in 2021, transition vison heat part 2 draws more attention towards the execution and the timing (Gemeente Utrecht, 2021). The municipality of Rotterdam has not presented their transition vision heat yet. However, it does have a sustainability compass, and multiple projects and plans have been set up for the energy transition. The sustainability compass (Gemeente Rotterdam, 2020a) focuses on four subjects, namely the energy transition, circularity, a healthy living environment, and climate-proof.

All the municipalities have organised themselves and have part of their organisations dedicated to the energy transition. Moreover, the municipalities have initiated several projects that help with the energy transition. For example, the municipality of Rotterdam has asked VvE010 to broader their scope to help with the sustainability challenges of condominium associations in the city (D1). In addition to that is the municipality of Amsterdam has created its City Deal (Gemeente Amsterdam, 2020a) and Energy Lab Zuidoost (AMS Institute, n.d.). Section 5.2 further describes these different actors.

The useful vertical coordination described by (Jollands et al., 2011) can be recognized in the approach for the energy transition. The levels of governments grow when looking down the ladder (figure 5.1). From one national government steering the different municipalities to the municipalities all steering their own organisation and initiatives. Here, the municipal organisation stands for the different municipality departments who are working on the energy transition and initiatives supported by the municipality. Municipalities can learn about what works and does not work from these initiatives and use these lessons in new initiatives. Moreover, the municipalities can pass this information and lessons on to other municipalities and the Dutch government, who can make national regulations if they consider the problems big enough. In the next section, there is more attention to different initiatives supported by the municipalities.

The coordination and communication between the national, however, can be improved. All three municipalities try to use and follow the national government's plan as much as possible (A1 & E1). The Dutch government provides several financial stimuli - and capacity building instruments for the energy transition. The approach of the municipality of Utrecht, Rotterdam and Amsterdam is formed around what the Dutch government is not offering (E2). It can be seen as an addition to their approach and the people that are being overlooked with the national government's plans and should get local attention. This is necessary as condominium associations do not get the attention needed in every new regulation. As a result, they are not applicable for them, meaning the municipalities have to form their own policies (C1). For the plan of the national government to work better, closer attention should be paid to the people who are encountering the problems and can see what the actual barriers and struggles are of the condominium and how these fit in.



Figure 5.1 – Vertical organisation for the energy transition (own image)

The coordination and communication between the national, however, can be improved. All three municipalities try to use and follow the national government's plan as much as possible (A1 & E1). The Dutch government provides several financial stimuli - and capacity building instruments for the energy transition. The approach of the municipality of Utrecht, Rotterdam and Amsterdam is formed around what the Dutch government is not offering (E2). It can be seen as an addition to their approach and the people that are being overlooked with the national government's plans and should get local attention. This is necessary as condominium associations do not get the attention needed in every new regulation. As a result, they are not applicable for them, meaning the municipalities have to form their own policies (C1). For the plan of the national government to work better, closer attention should be paid to the people who are encountering the problems and can see what the actual barriers and struggles are of the condominium and how these fit in.

To deal with this, the municipalities of the four biggest cities of the Netherlands (Amsterdam, Rotterdam, The Hague, and Utrecht) are also setting up a project together when they are encountering the same problem (A2 & E3). This collaboration has as a goal that these cities can share their information, learn from each other and do not have to go through the same problem by themselves. Furthermore, the knowledge gained can also be helpful for other bigger municipalities with condominium associations (A3).

These changes can sometimes be quite radical because of the political situation in Rotterdam. For example, when Leefbaar Rotterdam came out on top of the elections, the expenses for the energy transition were severely cut (C₂). In addition, Leefbaar Rotterdam is still the biggest party in the municipality, which puts pressure on the continuation of the energy transition plans.

There are different actors involved at the different governmental levels. The national government, the Warmtefonds and PAW play at a national level, and the municipalities are tasked with and focus on the condominium associations. They can make their own plans but use national policies that exist and aim to offer what those policies are missing. This results in the (studied) municipalities and the national government not being entirely on the same line for helping condominium associations. This division of roles and dependency is not likely to change as the climate agreement proposed this method to meet the goals for the energy transition. However, the G4 (the four biggest cities in the Netherlands) is looking to start partnering up more to tackle problems they all encounter when dealing with condominium associations. This type of collaboration can help to address barriers that condominium associations encounter on a larger scale. Moreover, these types of collaborations between municipalities can help with preventing every municipality from inventing the wheel.

5.2 Actors and networks.

This section focuses on the actor and network dimension of the GAT and describes the following research variables from table 5.2. Section 3.3.2 already described which actors are likely to play a role and help alleviate barriers. This section looks at this again with the data from the interviews.

Table 5.2 – Research variable of the actor and network dimension (own table)

Governance dimension	Research variable
Actors and networks	Involved actors, their roles;
	Network relations and relationships between actors.

The most important actors in all three municipalities are the municipality and the condominium associations since they are at the core of the analysed situation. In Amsterdam, Rotterdam, and Utrecht, over half of the addresses are registered to a condominium association, making it an important part of their city (CBS, 2016a). All three municipalities have spoken out a desire to have an energy-neutral built environment in 2050 (Gemeente Amsterdam, 2020a; Gemeente Utrecht, 2021a; Gemeente Rotterdam, 2020), and Amsterdam desires to be free of natural gas in 2040 (Gemeent Amsterdam, 2021a). However, as explained in the problem statement, municipalities can not force condominium associations to renovate their dwellings but must stimulate them. The municipality requires the participation and help of condominium associations in this process and relies on them to make their transition goals. The municipalities have a real objective with the energy transition, but condominium associations do not necessarily. They need a liveable house and are tasked as a group with its maintenance (VvE Belang, n.d.).

As described in section 3.3.2, condominium associations cannot be seen as one actor as the bigger condominium associations consist of their members, the board, and the management. The board plays an important role here as they are tasked with the maintenance of the building. The internal struggles and barriers of condominium associations have been described in the previous chapter. The situation with condominium associations in Rotterdam is even more difficult due to overdue maintenance and poverty in several parts of the city (C₃).

Different roles and tasks of the municipality

However, the role of the municipalities differs from each other since part of the tasks have been allocated to others (figure 5.2). All three municipalities function as policymakers meaning that they create policies and awareness for the energy transition. Within the municipality, there are often multiple departments working on the energy transition. For example, in Amsterdam, the departments of Living, Space and Sustainability, Innovation and maybe more are all working on the heat dossier, which gives some struggles (AL₃). Section 5.5 explains this further.

In addition to their role as policy, the municipality of Utrecht also functions as the information window (VvE loket) for condominium associations, on the other hand (Gemeente Utrecht, 2021c). Furthermore, the information window of the municipality of Utrecht informs condominium associations on activating their associations, maintenance and renovations and making the dwellings more sustainable (Gemeente Utrecht, 2021c; E4).

This is different from the municipality of Rotterdam, where VvEo10 is appointed as the information window. VvEo10 is a partner of the municipality of Rotterdam and arose from housing corporations after many condominium associations were founded (C4). Vveo10 works as an information window for condominium associations. It can be contacted for advice on a wide range of topics, including activating the association, the long-term maintenance plan, general meeting, and sustainability (VvE010, n.d.). VvE010 is a well-recognized actor in Rotterdam and can therefore inform and educate condominium

associations about energy transition opportunities. In addition to being there for questions, VvE010 also gives information night (webinars in COVID-19 times) to inform associations about these subjects.

In Amsterdam, this is different as it functions as a policymaker but currently houses no information window in the city. The municipality, however, is closely working together with Stichting !Woon (Slauerhoff et al., 2021). Stichting !Woon offers advice and helps owners and tenants in Amsterdam (Sticting !Woon, n.d.). The municipality of Amsterdam is looking for ways to incorporate an information window, possibly with Stichting !Woon. This is one of the parties the municipality of Amsterdam is working closely with (Slauerhoff et al., 2021). Stichting !Woon offers advice and help to owners and tenants in Amsterdam. Moreover, they already have considerable brand awareness in the city and multiple fixed locations where people can come to for questions.

Figure 5.2 shows how the different municipalities have organised themselves and their relation to the other stakeholders. The small arrows show the interactions between the different parties, and the big arrow from the municipality of Rotterdam to VvE010 suggests the funding of the information window. In the future, the municipality of Amsterdam likely will look like the one of Rotterdam, with the information window becoming a fundamental part of Stichting !Woon.



Figure 5.2 – Stakeholders networks of the municipalities of Amsterdam, Rotterdam and Utrecht (own image)

For the function of the information window, it can be questioned whether it should be inside or outside the organisation of the municipality. When it is part of the organisation, the municipality can easier decide the direction of the information window and be more directly involved in its strategy. Moreover, it does not have to deal with all kinds of procurement rules when more money is needed, only between the ranks it must be decided (C5). Suppose it is part of the municipal organisation. In that case, the budget can be cut, leading to a downscaling of the organisation when the leading parties in the municipality do not care about the sustainability goals. Another critical factor is brand awareness and findability around the municipality. So, looking in the area and seeing which organisation is suited to be an information window is wise. VvE010 is picking the cherries from a large vast base of clients (D2). Stichting !Woon has a lot of brand awareness and findability in Amsterdam for questions from tenants and condominium associations and would be a logical option for it. Moreover, with the information window being outside of the organisation of the municipality, members of condominium associations blame the information window less for flaws in the approach of municipalities (D3).

Overstrung market

All three municipalities offer assistance and try to stimulate condominium associations in their renovation – and decision-making process. However, they do not have the capacity and know-how to guide them through the whole process. For example, in Utrecht and Rotterdam, the information window of the municipality and VvE010 can not do everything for the condominium associations and requires the assistance of market parties to give advice and execute the renovations (C6 & E5). Therefore, they

rely on help from market players for advice and the execution of renovation. Condominium associations can not and should not have to do this on their own.

However, for the help and information that condominium associations are getting, it is essential who gives it to them. When a condominium association contacts a market party for advice about- or execution of the renovation, it asks a party with a profit motive. Independent advice is something that condominium associations need but is not necessarily a given (A4). Municipalities and their related information window are suited for this. They are tasked with the well-being of their residents and do not have that profit motive.

As with the rest of the Netherlands, the construction and installation markets are overstrung, making it difficult for condominium associations to find the right one. This problem becomes more significant when taking the slow decision-making process from condominium associations into account (C6 & E6). In all three of the municipalities, this problem comes back. It is difficult to find a contractor who is willing to do the work. This becomes even more difficult following the complex situations of condominium associations. With the slow decision-making process of condominium associations, the offers from contractors could become outdated and not valid anymore, and the process must start again. This is when there even are offers to choose from.

Research parties

Next to the market parties, condominium associations and governmental bodies are actors that are researching the energy transition and condominium associations. A good example of this is Energy Lab Zuidoost which brings together governmental bodies, residents, companies and researchers. With 'Living Labs', new innovations are tested in a real-life environment which helps to understand what works in Amsterdam and how these innovations can be scaled up and implemented (AMS Institute, n.d.). Vveoio, in coordination with the municipality of Rotterdam, is also researching relevant subjects about condominium associations (D4). Since they are only occupied with condominium associations, they are aware of the problems and can, therefore, focus their research on the relevant problems. Incorporating this into the information window is something that could also happen in Amsterdam with Stichting !Woon and Utrecht.

Conclusion

In all three municipalities, the present actors are relatively similar, with the municipalities' roles differing the most. The municipality works in all three cases as the instigator of the process. However, they all need help from the others to meet its goals. To meet these goals, the condominium associations and market parties are needed to do their part. The municipalities help in this process by creating policies, raising awareness and taking on the role of an information window. For the set up of an information window, it can be discussed what the best way is to arrange that. However, findability, brand awareness, and answering the questions of the condominium associations are important aspects of an information window. With the role of the information window, municipalities can assist condominium associations during their customer journey and help them overcome barriers. This is, however, will not enough to give all the specific knowledge to condominium associations. Municipalities also can look for ways to further partner up with private parties that are specialised in assisting condominium associations in their decision-making process, the renovation or both. For the most part, the involved actors and their roles are not likely to change. However, as the energy transition is also a learning process, it is not strange if relationships between actors change to understand and help each other better. To further develop their approach, municipalities could find ways to start working together with private parties to help them with the parts they lack knowledge of and to execute the renovations.

5.3 Problem perspective and goal ambitions.

This section focuses on the problem description and goal ambitions dimension of the GAT and describes the following research variables from table 5.3.

Governance dimension	Research variable
Problem perspective and goal	Goals and ambitions;
ambitions	Problem description;
	Targets and evaluation.

Table 5.3 – Research variable of the problem description and goal ambitions (own table)

The Dutch Climate Agreement set the goal for the built environment to be free of natural gas and energy-neutral by 2050 (Ministerie van Economische Zaken en Klimaat, 2019). Therefore, it is logical that the municipalities are following this. The municipality of Rotterdam and Utrecht are following this directly (Gemeente Rotterdam, 2020a; Gemeente Utrecht, 2021a), and the municipality of Amsterdam has sharpened this by the desire to be free of natural gas in 2040 (Gemeente Amsterdam, 2020b). All three municipalities have drawn up their first plans on how to accomplish this.

This research focuses on how the dwellings of condominium associations become free of natural gas and energy neutral. There is, however, more necessary than just the dwellings of the condominium associations. For the energy transition to work, municipalities must also fix sustainable heat sources connecting to the grid. With their transition vision heat, municipalities aim to describe how this process will look in their city.

As condominium associations form a large part of the housing stock, they are critical to the energy transition goals and the problem of the municipality of Amsterdam. Following the energy road map and transition vision heat, condominium associations should all be free of natural gas and (almost) energy neutral (Gemeente Amsterdam, 2020a; Gemeente Amsterdam, 2020b). The first goals have been set for 2030 to see the results of the neighbourhoods that have made the transition, and in 2040, the municipality wants to be free of natural gas (Gemeente Amsterdam, 2020b). It can be questioned if this is a just goal to strive towards as this does not necessarily mean that the energy consumption shrinks or the heat sources are sustainable. Transitioning to an all-electric dwelling does meet the goal for 2040 but can become very expensive for a homeowner when this dwelling is not well insulated. This goes against the municipality's preconditions to reach these goals: affordability, working together and aligning with the neighbourhood (Gemeente Amsterdam, 2020b). The transition should be possible to make for everyone with everyone. However, not the whole city can make the transition simultaneously as there are not enough construction companies available to do this and not for all buildings. It is clear what the best option for the renovation is. To guide this process, the municipality of Amsterdam has designed their transition vision heat (Gemeente Amsterdam, 2020b). The planning has been done for when the different neighbourhoods change to a new source of heating. For some neighbourhoods, this source has already been defined (Gemeente Amsterdam, 2020b).

The municipality of Rotterdam wants the city to be energy neutral and free of natural gas by 2050 and has intermediate goals for 2030 (Gemeente Rotterdam, 2020). Renovating the building stock of condominium associations form a critical task in this process as over 40% of the addresses in Rotterdam is part of a condominium association (CBS, 2016a; Allecijfers, 2021). From the sustainability compass, several preconditions have been set for how this process should take place with affordability and reliability as two of them. Moreover, the municipality of Rotterdam wants to do it with its residents and look for pairing opportunities (Gemeente Rotterdam, 2020a). Moreover, the municipality of Rotterdam has appointed six neighbourhoods as pilot areas that will be the first neighbourhoods to become free of natural gas. In addition, the municipality of Rotterdam appointed another sixteen neighbourhoods as

exploration areas to see where the opportunities lie for these neighbourhoods to become free of natural gas by 2030 (Duurzaamoio, 2021). In the process of making these pilot areas free of natural gas, the municipality also wants to improve the rest of the area and make it greener and safer (Duurzaamoio, n.d.).

As almost half of the building stock of Utrecht consists of condominium associations (CBS, 2016a), they form an important factor in meeting the energy transition goals of the municipality of Utrecht. For these goals, the municipality follows the goals stipulated by the Dutch government to be free of natural gas and energy-neutral by 2050 (Gemeente Utrecht, 2021a.) For 2030, the municipality of Utrecht has set its first goals with aiming for 40.000 gas connections less in the city. Affordability for the residents, sustainability of the energy and heat supply and trustworthiness of the heat supply systems are set as boundary conditions to reach these goals (Gemeente Utrecht, 2021a; E7). An essential step in this process is for the municipality of Utrecht to decide which sustainable heat systems and infrastructure will be used for each neighbourhood. Transition vision heat part 1 proposes the different heat sources for the different neighbourhoods. The second part of the transition vision heat will contain the district-orientated approach and when and how the different districts will transition (Gemeente Utrecht, 2021a).

Problems for the condominium associations

However, determining when the switch to a sustainable heating source should happen and finding the right new source of heating is not the only challenge for the municipalities with the energy transition for condominium associations. The condominium associations themselves must participate in this process and can not be forced to do so. The municipalities should look for ways to engage them in the process and help them overcome the different types of problems (C7).

Many problems arise from the fact that condominium associations are no professional clients who have all the knowledge about these renovations (A5 & C8). This is recognized in all three municipalities. Condominium associations may lack knowledge about the measures that could be taken, whether the long-term maintenance plan is working well, and how to request quotes and work with market parties (E8 & E9). When missing this knowledge, it is difficult to go through the decision-making process of energy-efficient renovation. The fact that long-term maintenance plans might not be working comes from them being correct and not covering the costs, which makes situations even more complicated (A6). Most studied condominium associations are not likely to know what different sustainable measures entail, what it means for them or how to judge offers to renovate their building (A7). Moreover, condominium associations do not have all the time and money to be busy with maintaining their buildings (C9). This is not strange when realizing the maintenance of the property is something that happens on top of the regular workweek members of the condominium associations have. All these aspects together show why condominium associations are no professional clients and why it is so difficult for them to do this without any help.

On top of the condominium association or the board not being a professional client and having to understand everything (not always) from scratch, the associations must agree as a group with the proposed measures. Then, these association members decide if the renovation should take place, which requires a supporting base. For this supporting base, is safe environment is needed where members can cast their concerns and feel heard (Slauerhoff et al., 2021). For example, an association could have members interested in the energy transition and want to join in. However, one enthusiastic member is not enough as the whole association decides whether to execute the renovation, meaning that the whole group must be on board with the decisions. Creating that supporting ground is one of the barriers for condominium associations in the municipality of Utrecht and where they are occupied with how to realise it (E6, E9 & E10).

Following the Dutch climate agreement, all three municipalities want an energy-neutral built environment by 2050. Only the municipality of Amsterdam has set a more ambitious goal with the desire to be free of natural gas by 2040. Moreover, all three municipalities have set intermediate goals for 2030, allowing them to evaluate their approach and process at large. The municipalities encounter similar problems with condominium associations which can be led back to them not being a professional client and their group process to form a decision. The type of problems that the municipalities encounter can come up during all stages of the customer journey of condominium associations. Many of the barriers encountered with the case study condominium associations can also be led back to them not being professional clients. To meet their goals, the municipalities must deal with these problems. Municipalities must find ways to help condominium associations overcome these barriers and finish their collective decision-making process to execute a renovation. Moreover, they should address the other barriers that hold back condominium associations, such as the issues with their long term maintenance plan and engage them in the process. To do this, municipalities must make use of their policy instruments.

5.4 Strategies and policy instruments.

This section focuses on the strategies and policy instruments of the GAT and describes the following research variables from table 5.4. Section 3.2 described some of the policy instruments. This section focuses on the different instruments and strategies being deployed and how well they are working to help condominium associations in their customer journey.

Governance dimension	Research variable
Strategies and policy	Financial stimulating instruments;
instruments	Capacity-building instruments;
	Stakeholder engagement and awareness creating;
	Responding to problems;

Table 5.4 – Research variable of the strategies and policy instruments (own table)

The energy transition did not start yesterday, and several policy instruments have been in place for a longer period. However, all three municipalities already have instruments in place and ways to promote them. Through their websites, all of them showcase the different types of help they are offering. This varies from financially stimulating instruments to capacity building instruments to places where residents can find information independently (Gemeente Amsterdam, n.d.; Duurzaamoio, n.d.; Gemeente Utrecht, 2021b).

The municipality of Amsterdam has already several policy instruments in place to help condominium associations. On their website (Gemeente Amsterdam, n.d), there is an overview of the different types of help the municipality offers. The municipality of Amsterdam has several stimulus instruments in place, which include loans and subsidies for sustainable renovations. There are loans from a national and municipal level (Gemeente Amsterdam, n.d.). In addition to that, there are several capacity building instruments in place. These include various ways to get advice for the possibilities of sustainable renovations, energy use and living free of natural gas. It also offers links to several other places to find information concerning the energy transition and initiatives (Gemeent Amsterdam, n.d.).

As well as the municipality of Amsterdam, the municipality of Rotterdam has several policy instruments in place to help. In addition to the national financial stimulating policy instruments, there are several different instruments for condominium associations in Rotterdam (Duurzaamoio, n.d.).

As well as the municipality of Rotterdam and Amsterdam, the municipality of Utrecht already has some policy instruments in place to stimulate condominium associations to renovate their dwelling. There are several subsidies and loans available for condominium associations to make it more appealing to execute a sustainable renovation which can be found on their website or the page of Jouw huis slimmer (n.d.). Jouw Huis Slimmer also functions as one of the capacity building instruments as it provides information about the different subsidies available (Jouw huis slimmer, n.d.). In addition to that is information concerning local initiatives in Utrecht and about how to save energy.

Financial stimulating

The Dutch government offers several options in the form of subsidies and favourable loans (Rijksdienst voor ondernemen Nederland, n.d.; Warmtefonds, n.d.). These arrangements are also available for condominium associations. Unfortunately, condominium associations often do not meet the requirements of these policy instruments and can, therefore, not make use of them (C10). This results in the problem landing on the lap of the municipalities. Several policy instruments seem to help individual households and forget to include condominium associations in this process (C11). Moreover, these policy instruments from the national government usually are financial stimulating instruments. Even though a discount or cheaper rate always helps with the business case, condominium associations do not necessarily need the most (C1). Condominiums also can profit a great deal from the professional guidance and explaining them, for instance, how to judge quotes, what should be renovated now and what could wait until later (C12). As described earlier, the municipalities also focus on what the national government failed to offer and aim to help there (C1 & E2).

Not all financial stimulating instruments will be there forever to make it more attractive to make the transition. Some of the policy instruments that municipalities are currently using are likely to change as subsidies are usually available for a limited time. A financial stimulating instrument that could be kept for a longer period is a revolving loan for condominium associations. These allow condominium associations to invest much money and pay it back over a longer time (D5). Here the same described struggle come back with the national regulations not fitting with the condominium associations. This is now being fixed in Rotterdam with a special revolving loan for condominium associations from the city, but this only concerns a budget that can help a small group.

Capacity building

The municipalities are not only throwing money at energy transition and condominium associations in the hope that it will fix the problem. Through their websites, they offer information about possibilities to become more sustainable (Gemeente Asmterdam 2021d; Duurzaamoio, n.d.; Gemeente Utrecht, n.d.). Through the website, interested people can find options to consider, places to visit and initiatives to take part in. The Woonwijzerwinkel and the Duurzaamheidswinkel in Rotterdam are linked to the municipality. Both have several sustainable renovation options such as new isolation materials, solar panels and heating systems (Woonwijzerwinkel, n.d.; Duurzaamoio, n.d.). Through the website, the municipality of Utrecht links people through to Jouwhuisslimmer (Jouw huis slimmer, n.d.), where all types of local initiatives can be found and that people can join. The approaches of the municipalities show more capacity-building instruments which can be used.

More specific information for condominium associations can be found through the information window (described in section 5.2). These information windows are specially made to help condominium associations. For example, VvE010 is the information window in Rotterdam and is financed mainly by the municipality (D6). VvE010 can essentially help with two things, namely activating them and helping them become more sustainable (D7). They do this by giving a presentation, setting up events, giving personal advice to condominium associations and giving courses (VvE010, n.d.). Moreover, they are always available for questions from condominium associations. They can ask questions or help about all issues and phases related to condominium associations. Since their foundation in 2006,

they have grown a lot and are a widely recognized party to consult for condominium associations and have a prominent brand name in Rotterdam (D₂). This helps them a lot with the acquisition of new condominium associations that need help. In addition, there also occupied with researching and discovering the status of condominium associations in Rotterdam. This happens in dialogue with the municipality of Rotterdam to see what they think is worth researching.

The municipality of Utrecht also has an information window called VvE Loket Utrecht. The VvE Loket is there for all types of questions that condominium associations can have, varying from organisational, sustainability problems, maintenance plans, and more (E4). When associations meet the VvE Loket for the first time, an intake conversation takes place, and a file about the association is started. The different problems and concerns an association, such as the maintenance plan, troubles with the roof, or the windows, may have been mapped. Together with the employee of the VvE Loket, the different steps towards a more energy-neutral are discussed. This usually results in getting a piece of professional energy advice about the dwelling (E11, E12 & E13). After this advice, the municipality of Utrecht and the VvE Loket trusts the working of the market to help the condominium associations. The VvE loket in Utrecht focuses on the first steps of the decision-making process for the energy transition. They are, however, always welcome back later with questions (E14).

As of right now, the municipality of Amsterdam has no information window for condominium associations. In the following years, the municipality of Amsterdam wants to make more use of this as it aims to set up create general support, inform, advice and accompaniment for condominium associations (Slauerhoff, 2021). Stichting !Woon will give the general support as a condominium association window is created. Here members can come for knowledge, support and (legal) advice.

Process guides

In addition to supplying condominium associations with information, the municipality of Amsterdam wants to guide more associations through the process and train process guides to do this. In the following years, the municipality wants to develop this by practice. By guiding different condominium associations, the municipality of Amsterdam wants to help them and learn from them to see what type of barriers they are encountering. Then, with the lessons they have learned, they want to develop their approach further (A8).

This is also happening in Rotterdam, the municipality that might be doing the most for condominium associations in the Netherlands (C13). In September, the municipality of Rotterdam is starting with a new policy instrument that will help condominium associations by guiding them through the decision-making process (C14). Through VvE010, advisors are selected to guide the condominium associations through several steps of the decision-making process and teach them how to take these different steps and make decisions. In addition, to help condominium associations that have a slightly different process, there is another option to give them advice. This can happen when they just need judicial advice or are a monument and should visit Welstand (C15).

Stakeholder engagement

As discussed in section 3.2.3, stakeholder engagement is a vital part of the approach of municipalities. Municipalities should look at ways to make condominium associations interested in the energy transition or energy-efficient renovations.

In addition to being there as general support, the municipality of Amsterdam wants to start with actively informing condominium associations with independent information (Slauerhoff et al., 2021). The municipality of Amsterdam wants to do this by giving webinars/information meetings, network meetings and classes. With these events, the municipality of Amsterdam wants to address subjects concerning sustainability and the energy transition. These include subjects such as (Slauerhoff et al.,

2021):

- future-oriented maintenance
- chance for sustainable measures with lagging maintenance
- sun on the roof of condominium associations
- how to become more sustainable
- training the coach
- training the management

To engage the residents of Utrecht, the municipality of Utrecht started organising information nights per neighbourhood this year (E15). These nights want to inform their residents about what is happening in their neighbourhood with the energy transition. There is a general presentation during these evenings first and after the group is split up into different categories (companies, individual homeowners & tenants, and condominium associations) to give more specific information to the different groups. These information nights are held once a year per neighbourhood to describe what is and will be happening with the energy transition, their options and what it means for the residents (E15). By doing this on a neighbourhood level, it is possible to give precise information and answer specific questions, for instance, about what type of renewable energy will be used instead of natural gas. Moreover, by doing this annually, it is easier to update the residents and not tell the whole story from scratch (E16).

In Rotterdam, VvEo10 has information nights to inform condominium associations and topics that are interesting to tell them about the energy transition. Moreover, to help with the described problem at problem perspectives, the strategies behind the policy instruments sometimes miss the point and focus on the short term. To help condominium associations, the policy instruments should not focus on individuals but the neighbourhood processes and setting up networks where associations can profit from (C16). With the information nights and process advice, condominium associations have more opportunities to do this and strengthen themselves.

Two routes

Two different routes towards an energy-efficient building can be distinguished, requiring a different approach from municipalities. First, condominium associations can renovate their dwelling in small steps towards an (almost) energy-neutral building free from natural gas by doing it component for component. In Amsterdam and Rotterdam, the process guides from the previous paragraph can assist condominium associations in this process. However, next to this, another path can develop as well (Slauerhoff, 2021). Some companies offer to renovate the dwelling, look at the process and the finances. For example, WNR (Woonlasten Neutraal Renoveren) is a company that offers an energy-neutral renovation and guarantees the finances (WNR, n.d.). Klimaatmissie is doing something similar but giving condominium associations the option to choose their renovation scenario as well (Klimaatmissie Nederland, n.d.). This type of one-stop shop could be an alternative for condominium associations where they are taken through the process and taken care of.

The municipality of Rotterdam wants to use pairing opportunities in their approach and policy instruments (Gemeente Rotterdam, 2020a). This comes back when designing the policy instruments, as this allows for pairing opportunities. People can only make use of the subsidies arrangements of the municipality when they meet specific requirements. These requirements can include using natural and sustainable materials to tackle problems at once (C17). These pairing opportunities can also come back in how to motivate condominium associations to renovate their dwellings. As municipalities require the help of condominium associations, they should also look at what moves them. The energy transition is not necessarily their concern as the association is founded to maintain the building, increase livability, and improve health and comfort (C18). When condominium associations decide to renovate a part of their dwelling, that should be done sustainably to meet the energy transition requirements.

Concluding

All three municipalities use the national financial stimulating instruments for which links can be found on their websites and consist of some subsidies and favourable revolving loans. These instruments, however, do not always fit the condominium associations, which is a shame as they could be beneficial in the future. Revolving loans for condominium associations could be a solution to also help condominium associations in the long term. Some of the policy instruments that municipalities are currently using are likely to change as subsidies are usually available for a limited time. It is crucial that when the subsidies fall away, there are enough reasons and assistance to execute an energy-efficient renovation. This is where the variety of capacity building instruments can help municipalities. There are many possibilities for guiding, teaching and assisting condominium associations through their decision-making process. With or without an information window, it is possible to give advice to them, hold presentations to teach things, or guide condominium associations through the whole process. Stakeholder engagement also takes place in various options, from information nights for a specific neighbourhood organised by the municipality itself or about certain energy transition topics. These instruments seem to fit with the problem the municipalities described themselves, see section 5.3.

5.5 Resources and responsibilities

This section focuses on the resources and responsibilities dimension of the GAT and describes the following research variables from table 5.5. In addition, this section focuses on how the responsibilities of the municipalities and the distribution and development of new knowledge.

Table 5.5 – Research variable of the resources and responsibilities (own table)

Governance dimension	Research variable
Responsibilities and resources	Responsibility for the ambitions and accountability;
	Development and distribution of new knowledge.

As described in the introduction, which also became evident with the problem perspective and goal ambitions, municipalities do not have much legal power to force condominium associations to renovate their building. However, the responsibility for the energy transition is given to the municipalities (Ministerie van Economische Zaken en Klimaat, 2019), who have accepted it. The municipality of Amsterdam even took on more responsibility by sharpening the ambitions and the desire to be free of natural gas by 2040 (Gemeente Amsterdam, 2020b). As the municipalities have no(t much) forcing legal power, they must find ways to stimulate and seduce the condominium associations to participate in the process. The studied municipalities have an advantage in this process over other municipalities in the Netherlands as they belong to the largest municipalities in the country. This makes it more likely that they have the resources to support their goals and their approach. This can become more difficult for smaller municipalities in the Netherlands that do not possess the same resources. The lessons the bigger municipalities learn and share become very important for these municipalities as they can use their resources more efficiently.

New knowledge

Not all knowledge for the energy transition has been developed so far, which has been known since the Climate agreement (Ministerie van Economische Zaken en Klimaat, 2019). Therefore, new knowledge must be created, and innovations must be done. This happens on a national level but also municipal level. Moreover, the new knowledge should also be available to the rest of the country and be distributed to them.

The municipality of Amsterdam has taken a leading role in creating some of this knowledge and in

the innovation part of the energy transition. A good example of this is Energy Lab Zuidoost which brings together governmental bodies, residents, companies and researchers. With 'Living Labs', new innovations are tested in a real-life environment which helps to understand what works in Amsterdam and how these innovations can be scaled up and implemented (AMS Institute, n.d.). Creating, innovating and implementing in Zuid Oost is only the first step in the process as it should be implemented through the whole city. However, the implementation and collaboration within the different departments of the municipality of Amsterdam are still shaping up and not fully operable. Energy Lab Zuid Oost is discovering and learning about new situations concerning the energy transition. A step that must be made lies with the transferability of the experiments to other parts of the city and other municipalities.

Rotterdam may be the city doing the most for condominium associations in the Netherlands (C19). It should therefore take on a leading role in distributing the acquired knowledge to the other municipalities. In addition to distributing the knowledge to other municipalities, it is distributing it to the condominium associations. VvEo10 can inform and teach the associations about new problems and solutions they could use for the energy transition. Moreover, Vveo10, in coordination with the municipality of Rotterdam, is also researching relevant subjects about condominium associations (D4). Since they are only occupied with condominium associations, they are aware of the problems and can, therefore, focus their research on the relevant problems.

As with the other municipalities, not all knowledge is available for the energy transition for the municipality of Utrecht. Therefore, this information must reach the residents of the municipality and the condominium associations, with the information nights for the different neighbourhoods and the VvE Loket. Through this, innovations and new knowledge can be distributed and used by condominium associations. With these capacity-building instruments, condominium associations can be reached quickly and with the correct information. Furthermore, these local initiatives can also be promoted and incorporated as an option for condominium associations.

The three municipalities and the municipality of the Hague are also working together to see if they come across the same problems for condominium associations and if they can find solutions for that together. These problems and solutions could also occur in smaller municipalities that could benefit from these lessons (C19).

Transferability

A problem with creating this new knowledge, however, lies with its transferability. Knowledge gained from the 'Living Labs' should be transferred to other neighbourhoods in the city and other cities to prevent them from learning the same lessons and losing time. These learned lessons about different options, participation, financial and technical solutions should be used to make a blueprint so that it can be used at other places (B1). The goal of these 'Living Labs' should be to develop a code that is also scalable in other neighbourhoods and cities (B2). This is, however, not happening enough, which is partly the result of communication between the different departments of the municipality of Amsterdam. When the communication internally is lacking, the communication to external actors will also be lacking (B₂ & B₃). The energy transition is a department transcending problem which is new and requires a different way of thinking (B₄). A switch should be made from the small projects within a department to a mission way of thinking. Here, all the projects are used to meet the goals of that mission (B₅). This requires a different way of working for the departments of the municipality of Amsterdam. If you want to do these innovative projects right, the working method should be changed from the current way of working from the organisation's different departments. These innovations projects should become more multidisciplinary and focussed on the problem (B6). Setting up projects like this will not be an easy task as it goes against the current, and it requires determining again who is accountable for the project, both in leadership and payroll wise. The municipality of Amsterdam is actively working on creating new knowledge and paths for the energy transition. However, it should

also pay close attention to how this can be transferred and how to organise the municipality for this new task.

Concluding

All three municipalities have gotten the responsibility for the energy transition of the built environment and, therefore, the responsibility to make the housing stock that belongs to condominium associations energy-neutral by 2050. To establish this, they almost have no legal authority or forcing power. Moreover, they also do not have all the knowledge yet to decide on the energy transition. Options such as VvE010 and the Energy Lab Zuid Oost can help to provide this type of new information. This new information could also come from private parties such as Klimaatmissie and WNR when a municipality chooses to partner with them. Municipalities must learn from their projects to scale up and speed up the energy transition. Attention must be paid to the internal organisation of the municipalities to ensure that they can cope with this new type of task and lessons can be passed through the organisation. All three municipalities have shown means to distribute the newly created information in different forms, which can be helpful for other municipalities to stimulate condominium associations and distribute that knowledge.

5.6 Drawing lessons from the approaches of municipalities.

This chapter looked at the different approaches the municipality of Amsterdam, Rotterdam and Utrecht have chosen so far for the energy transition and stimulating condominium associations to renovate their dwelling and aimed to answer SQ3:

What lessons can be drawn from the differences and similarities from the approaches of the municipalities to stimulate condominium associations to renovate their dwelling?

This section gives an overview of that for the different dimensions of the approaches of the municipalities. An overview of these lessons is given in table 5.6.

Table 5.6 – Summary of the lessons learned by the approaches of the municipalities per governance dimension (own table)

Governance Dimension	Municipality of Amsterdam	Municipality of Rotterdam	Municipality of Utrecht			
Levels and scales	Condominium associations fall by the states. Communication and coordination betw Municipalities are partnering up to loo	wayside as instruments do not apply to ween the national government and mun k at matching problems.	them, municipalities are focussing on icipalities can improve to address this.			
Actors and networks	The municipality's role is not similar for The condominium associations consist The market is overstrung, but market p incorporate this. The function of information window is Stichting !Woon	or all municipalities, but it functions as a cof their members, board and managem players are needed in the process, and m c different for each municipality (see bel	a policymaker for all three. eent. nunicipalities can look for ways to ow). Municipality as information window			
Problem perspectives and goal ambitions	All municipalities want to be energy nergy hereighbourhood. The main problems lie with the condor finding supporting ground in their asso	All municipalities want to be energy neutral by 2050 and have a similar approach to the transition happening per heighbourhood. The main problems lie with the condominium associations not being professional clients resulting in difficulties inding supporting ground in their associations and a lack of knowledge.				
Policy instruments and strategies	Financial stimulating instruments seer condominium associations can be help Capacity building instruments that hel A variety of options for stakeholders er	n to overlook condominium association ful in the long term. p with guiding, teaching and assisting c ngagement and awareness-raising is used	s. Special revolving loans for an help condominium associations. d. Information night for different neighbourhoods.			
Resources and responsibilities	There is no legal power for municipalit challenging for municipalities with sm New knowledge can be spread through The new type of task is asking a new w Energy Lab Zuid Oost	ies to force things. Find ways to stimula aller resources. pop-up centres, information windows a ay of thinking which can be difficult for Pop-up centres	ite them, which can be more and information nights. departments within municipalities.			

Levels and Scales

There are three different levels of governmental bodies which can be distinguished in the energy transition, namely the Dutch government, the municipalities and their organisation. The municipalities have the lead in this and have presented their plans for reaching an energy-neutral built environment free of natural gas. However, the Dutch government has several forms of financial instruments in place, which are often not applicable for condominium associations, making them fall by the wayside. The coordination and communication between the Dutch government and the municipalities can and should be improved to help condominium associations in the energy transition better. The municipalities, therefore, focus on the areas where the approach of the national government lacks to assist the condominium associations. The three studies municipalities and the municipality of The Hague are partnering up to prevent them from all going through the same process. The lessons they learn can be helpful for other smaller municipalities in the Netherlands.

Actors

When looking at the actors present with the different municipalities, it stands out that all three have a different role in what they are doing and their relation to their information window. The information window is a vital part of the approaches of the municipalities as this interacts the most with the condominium associations. An information window that offers the complete support package that can operate outside of the municipality, like in Rotterdam with VvEoio, seems to be the most promising way to interact with condominium associations. This becomes even stronger when the organisation of the information is a known name in the market. Stichting !Woon could be this for the municipality of Amsterdam. The market is overstrung, but market players are needed to assist condominium associations in their process. Municipalities should look for possibilities to further incorporate this.

Problem description and goal ambition

All three municipalities have stipulated their ambitions and described their paths towards an energyneutral built environment. Different neighbourhoods have been appointed to become free of natural gas first. The process for this is starting. The results will determine whether the plans are correct and might be missing when looking at preciseness, stakeholder engagement, and feasibility. The municipality of Amsterdam has an additional aim of becoming free of natural gas. However, it can be questioned whether this is smart as it does not necessarily promote becoming more energy-efficient and can cost residents much money.

A few problems stand out when taking a more direct look at the problems with condominium associations themselves. Most of the problems can be led back to the fact that the board of condominium associations are not professional clients. This results in them not having the required knowledge about the possible measure, business case or requesting quotes and talking with market parties. On top of this, the long-term maintenance plan of many condominium associations does not cover everything it should cover, leaving the board to work with a wrong budget. Besides this, the municipalities also recognize that the collective decision-making process can be difficult for condominium associations. The communication must be good, and there needs to be a supporting base. These barriers prevent condominium associations on Zuid with a low income and overdue maintenance in Rotterdam. The municipality of Utrecht must deal with many small condominium associations. If municipalities want condominium associations to renovate, they should address these issues with their policy instruments and find ways to overcome these barriers.

Strategies and policy instrument

All three municipalities are using financial stimulating instruments also from a national level, but these sometimes seem not very useful for condominium associations. Special revolving loans seem to be a solution for the long term that allows condominium associations to invest. Capacity building

instruments can help condominium associations in the process, and the capacity building instruments differ more per municipality. The municipality of Rotterdam has a complete information window to assist condominium associations with the opportunity to advise them, guide them, inform them and do research about relevant topics for them. Vveoio offers a complete package than what is available in Amsterdam and Utrecht, allowing them to facilitate their process better. They facilitate condominium associations in the process, from the first activating steps to questions during an energy-efficient renovation. As municipalities can not force condominium associations to renovate, capacity building instruments assist them in that process. The municipalities are also using different tools for awareness-raising and stakeholder engagement. For example, the municipality of Utrecht uses information evenings for specific neighbourhoods to give them helpful information.

Responsibilities and resources

The studied municipalities or other municipalities in the Netherlands have no forcing legal power but are responsible for the condominium association's energy transition. Therefore, they must find other ways to stimulate the process. This can become difficult for smaller municipalities that have fewer resources. Part of this process consists of creating new knowledge done by actors such as VvE010 and the Energy Lab Zuid Oost can help provide this type of new information while all three municipalities have the means to distribute this. Moreover, national orientated actors such as PAW also help in this process of creating new knowledge. It is for municipalities vital that they have the means to pass the information on to the condominium associations with information evenings, pop-up centres and information windows. The energy transition for the built environment is a new task for municipalities that requires a new way of thinking and working that can result in difficulties within municipalities with accountability and communication.

Chapter 6 – Discussion part I on the results.

This chapter consists of an interpretation of the results of chapters 4 and 5 and comparing them with the results from the literature review. It starts with comparing the literature about the customer journey and barriers with the barriers encountered by the condominium associations in their decision-making process. Secondly, the literature about public policy is compared with the approaches of the municipalities. This is done on a general level for municipalities in the Netherlands. The conclusion from this chapter is used in the next chapter to see how Amsterdam's municipality's approach can be enhanced.

6.1 Barriers in the customer journey.

This section looks at barriers encountered by the condominium associations from the case studies and the literature from chapter 3 about these barriers. Moreover, it pays attention to where the municipality can help and where not.

With the literature, a customer journey was created for the collective decision-making process. This customer journey consisted of six different steps to decide on the execution of an energy-efficient renovation. The literature review also discussed some barriers to sleeping condominium associations (Ministerie van Algemene Zaken, 2020). These were, however, not added to the theoretical framework of the customer journey. During the interviews and writing the results, it became evident that sleeping condominium associations must overcome even more barriers to come to a decision. Without a proper long term maintenance plan where people are paying enough money for every month (H12) and an annual meeting to discuss the plan of the condominium associations, it becomes almost impossible to finish the process. Therefore, an additional step (step o) is added to the customer journey of the collective decision-making process (figure 6.1). For condominium associations to start their customer journey, they must overcome several barriers. These consists of activating condominium associations, ensuring they are registered at the KvK, have annual meetings and have a correct long term maintenance plan. These are the minimum requirements for a condominium association to start their customer journey. During the literature study, it became apparent that around half of the condominium associations in Amsterdam do not have all four attributes to be active. For these condominium associations, it is difficult to start the customer journey. Municipalities should and can help these types of condominium associations. Several possibilities to do this followed from the literature review and chapter 5. Capacity building instruments, stakeholder engagement and raising awareness can help these condominium associations to become active. The approaches of the municipalities showed several options for how to do this, such as the information evenings by the municipality of Utrecht, courses by VvE010, Stitching !Woon and the municipality of Amsterdam (section 5.4).



Figure 6.1 - Modified customer journey for condominium associations (own image)

Step 1: Reason to start the journey.

As the first step of the customer journey only consists of starting the process, there are no barriers from either the literature or the results. The case studies showed that concerns about sustainability could be a reason to start the journey, but many reasons can fulfil this function. Municipalities can help with showing and providing these reasons to condominium associations. The municipality of Amsterdam worked as the instigator for two of the case studies processes. When being the instigator of such dwelling projects, the municipality must watch its role as it can not become the project's client. Moreover, they need to know what the situation is before making plans for the neighbourhood. From the literature, peer-to-peer communication (Kwon & Mlecnik, 2020) and pop-up centres were named as instigators for the process. Reigersbos and Lucellestraat's case studies validated this with the model house and hearing from WNR as an option from another condominium association.

Step 2: Orientating and researching different options.

The literature review expected that most of the barriers in the second step of the customer journey would be transaction cost barriers. The condominium association struggled to orientate because of their lack of knowledge and information (section 3.6.2). The case studies showed that for this step of the process, the transaction cost barriers could become immense as the board of the condominium associations must account for a large number of issues. This can lead to them not seeing the forest for the threes as there are so many smaller barriers for the boards to consider in this phase (section 4.1). It is also crucial that condominium associations form the program of requirements in this phase to know where they are working towards.

It is understandable if condominium associations can not figure out all these steps by themselves. Help or at least a place to go with their questions seems vital for condominium associations to overcome the barriers of this step of the journey. Municipalities have several instruments to provide this. Right now, several subsidies can help condominium associations give energy advice to help them with this step. Moreover, VvE010 and the information window are equipped to help condominium associations to answer these questions. When municipalities do not have the tools to help condominium associations to overcome these barriers, they should be able to provide them with a direction to further look at or a market party that can help them further. One-stop shops such as WNR and Klimaatmissie help condominium associations in this step process by providing them with different options.

Step 3: Vote concerning the feasibility study.

For the third step of the customer journey, it was expected from the literature review that most barriers would lie with the collective decision-making process. Attention still needed to be paid to understanding the plan, which brought some smaller transaction cost barriers. The case studies validated this image in the many small barriers that come with a collective decision-making process. Members must get a feeling of co-responsibility for the associations (G19) and have different reasons to take part in the process (section 4.3). The board of the condominium associations must deal with these different motives and opinions while convincing them, which can also be another barrier. Presenting plans where you maybe do not know everything about can be challenging.

Municipalities can help in this process by creating tools that can assist condominium associations in this process. For example, municipalities can come with checklists, template presentations and attention points for the plan's completeness. This type of help is appreciated by the board of the condominium association of the Lucellestraat (I15; I19). Moreover, when partnering up with a one-stop shop, condominium associations get assistance from them to go through this step of the customer journey. Other help can come from process guides.

Step 4: Business case, plan and requesting quotes.

From the literature review, the fourth step of the customer journey was reasonably similar to the second step as again transaction cost barriers must be overcome to come to a complete plan with a corresponding business case (section 3.6.4). From the case studies, this image is validated and shows how the transaction cost barriers can be challenging for condominium associations when the level of detail rises (section 4.4). As the plan gets more detailed, the consequences of choices become more apparent, making it more difficult. Moreover, when condominium associations do not clearly

understand their requirements from the previous steps, it can set them back when developing their plan further.

During this step, condominium associations often require professional help or guidance to complete their plans. This help can come from an architect or other consulting party that helps to draw up the plans. One-stop-shop parties help the condominium associations through the whole process and help with the barriers in this step of the customer journey.

Step 5: Voting about the execution of the renovation.

The fifth step concerns the vote and decision about the execution of the renovation. From the literature, it was clear that this step mainly consisted of collective decision-making barriers, but the plan's basis must be reasonable. Otherwise, transaction cost barriers also start playing a role again (section 3.4.5). In addition, the case studies made it clear that meeting the quorum to decide can be a real issue (G₃o). Again in this step of the customer journey, as with the third step, attention must be paid to giving a clear presentation and distributing the information. This validates the barriers found in the literature. It also shows the importance of a well-functioning condominium association where people turn up for their annual meetings and can make voting procedures eligible. Moreover, it validates figure 3.16 (Paradies et al., 2015) that members must be in the same stage of the decision-making process and the communication between members of the association to get there.

As with the second step of the customer journey, municipalities can help prepare condominium associations by providing them with tools to overcome these barriers. Moreover, it is essential to have well functioning condominium association as described earlier in this section. One-stop shops and process guides can also help with the barriers of a condominium association in the step.

Step 6: Finalising the finances and requesting quotes.

From the literature review, the barriers of this step of the journey mainly consist of understanding the possible subsidies and how to apply for them (3.6.6). This is the step in the process where that barrier must be overcome to continue. With the case studies, this barrier starts playing a role early on as has a big influence on the choices made. Part of the reason that the condominium association of the Lucellestraat is looking at WNR is to clarify the subject (I12). For Venserpolder, the subsidies might be the reason to replace their new heating system (G13). Klimaatmissie helps to understand the subsidies for the condominium associations of Reigersbos. The subsidies and requesting them must happen in every customer journey (as long they are still provided) and can make or break the financial side of the plan. It is not just a barrier that plays a role at the end of the process but throughout and must be dealt with and understood at one point.

As these subsidies and other types come from the municipality or other public parties, municipalities can look for ways to make this easy to understand and fit with condominium associations. Section 5.1 showed that condominium associations tend to fall by the wayside with national regulations.

Concluding words with comparison from chapter 4.

Table 6.1 contains a simplification of the barrier encountered during the different customer journey steps by condominium associations and whether help is required from outside the condominium association during that step. It shows a comparison between the barriers expected from literature and encountered during the case studies. The type of barriers encountered for the different steps of the journey match with each other. The differences mainly come from how intense the barrier can be experienced for condominium associations instead of just classification on paper in literature. For example, condominium associations might not understand what the renovations mean, get stuck and be unable to continue. During voting procedures, moods can run high and have extreme consequences. The barriers from the customer journey can not be seen as one problem with one question that

Table 6.1 – Comparison of barriers from literature and case studies per category (own table) TC= Transaction costs, CDM= collective decision-making, CAPFH = comprehending and applying for help.

Step of the journey	TC barriers literature	TC barriers case studies	CDM barriers literature	CDM barriers case studies	CAPFH barrier literature	CAPFH barriers case study	Outside help required
Step 1	N/A	N/A	N/A	N/A	N/A	N/A	+
Step 2	+	++	-	-	+/-	+	+/-
Step 3	+/-	+/-	+	+	+/-	-	+/-
Step 4	+	++	-	-	+/-	+	+
Step 5	+	+	+	++	+/-	-	+/-
Step 6	+/-	-	-	-	+	++	+/-

municipalities have to deal with but rather as a collection of smaller problems with questions to answer. By morphological mapping these smaller but key concerns, municipalities create an overview of the barriers that can be encountered by condominium associations and come with solutions to overcome these specific barriers. Together, all these answers to the specific barriers form the answers for guiding condominium associations through the customer journey. Municipalities will not and can not help or have the answers to all barriers and require help from market parties in this process. Table 6.2 gives an overview of the different barriers encountered in literature and with the condominium associations from the case studies. The grey boxes show in what steps the specific barriers can be expected. Municipalities could use this way of morphological mapping as a tool for the energy transition with condominium associations where their approach must answer to. Municipalities can help overcome some of the barriers that condominium associations encounter in their customer journey. However, they do and can not have an answer to all barriers. For those barriers, condominium associations should be able to refer them to a party that can help them with those barriers.

To overcome the specific barriers from table 6.2, condominium associations require help. One-stop shops parties such as WNR and Klimaatmissie can help them through the whole process. These market parties seem helpful when condominium associations need to renovate many (or all) parts of their building as they offer the complete package. This is a good option for situations such as with Reigersbos where overdue maintenance and the energy performance is lacking. The condominium association such as the Lucellestraat and in Venserpolder must consider whether this is the right option. As the condominium associations have recently replaced their heating system, this can be questioned. They should consider replacing their building elements one by one and look at their long-term maintenance plan to see what fits best. The number of condominium associations and dwellings in Venserpolder give, however, a possibility to scale up.

Table 6.2 - Matrix of barriers for the different steps of the customer journey for large condominium associations (own table) (CA; condominium association)

Type of barrier	arrier Barrier		Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Making condominium	Activating condominium associations							
	Correct MJOP							
functioning	Registered with KvK							
Junctioning	Have annual meetings							
Reason to start the journey	see decription in beginning of the section							
	Understanding sustainable measures							
	Where to find credible information							
	How to judge and filter information							
	Set up correct program of requirements							
Transaction costs barriers	Lack of knowledge about buildings							
	Setting up the business case							
	Deciding what the best options are							
	Track down the state of the building							
	Requisting permits							
	How to inform/ communicate with the CA							
	How to present and convince CA							
	Getting people on the same page							
Collective decision-making	How convince other members of CA							
barriers	Meeting the quorum							
	How to answer the questions from members							
	Understanding meaning of CA							
	Creating support for the renovation plans							
Comprehending and	Comprehending what is offered							
applying for help	Comprehending what is needed to apply							
municipalities	The application of the incentives							

6.2 Approaches of the municipalities.

This section looks at the analysed approaches of the municipalities. It compares this with the literature about public policy and energy-efficient governance to see the differences and similarities and whether the literature shows if the approach can be enhanced at some places.

Levels and scales.

The enabling frameworks of energy-efficient governance were described by (Jollands et al., 2011). They should be linked to an energy-efficient law or legislative framework, reflect on a country context, establish accountability and be sector-specific. The approach of the Dutch government and municipalities in the Netherlands follows these points. An overall legislative framework has sector-specific goals with the Dutch climate agreement (Ministerie van Economiscie Zaken en Klimaat, 2019). Moreover, this document has established that accountability for the energy transition of the built environment has fallen to the municipalities.

Moreover, Jollands et al. (2011) provided inside for how to coordinate with such approaches. The functional vertical coordination can be seen in Amsterdam, Rotterdam and Utrecht (section 5.1) and the Dutch government. The Dutch government has several (many) organisations working for them who have part of their organisation again. Other municipalities should also set up their organisation to be accountable for the built environment's energy transition and the condominium associations. What became clear from studying the municipalities' approaches is the difficulties that can arise with what is for the national government and what is for the municipalities. However, the communication between the different levels must be improved for it to work well since condominium associations are now falling by the wayside as the national regulations often overlook them.

A possible solution to this could lie with municipalities starting working together. This collaboration

helps prevent them from encountering the same problems and allows a better united front to bring forward problems to the national government. Moreover, this collaboration for municipalities concerning condominium associations can also involve provinces. Provinces are already involved in larger projects concerning the energy transition, including projects for the built environment (Interprovinciaal Overleg, 2015). Moreover, setting up projects with a province might be easier as the regulations do not cover all dwellings and condominium associations in the Netherlands. An example of this is how the financial guarantee of the province of Utrecht helps with the realisation of collective energy projects (Interprovinciaal Overleg, 2015). Collaborating with the province can be helpful for smaller municipalities that do not have the resources. This is further discussed later in this section.

The coordination and collaboration between municipalities and the national government is not the only relation between levels that could be improved. The functioning of different municipality departments could also limit its practical working, as described in section 5.5. The energy transition means a new responsibility for condominium associations and the departments of municipalities. A new way of thinking and working is required, which can become a limiting factor for the execution of the approach of a municipality if they can not make this work.

Actors and networks.

The situation with the involved actors is relatively similar with the three different municipalities. All three situations have the municipality's role as a policymaker, the information window, the condominium associations and the market parties. It can be debated what the best setup is for a municipality and an information window to assist the condominium associations. Sections 5.2 and 5.4 have shown the usefulnessof an information window to support condominium associations as condominium associations require support throughout the customer journey. To better guide the condominium associations, a file for each association they come in contact with is created by the municipality of Utrecht (E11). As described in section 6.1, however, municipalities can not help condominium associations overcome all barriers and assistance from market parties is required. Therefore, municipalities should look for ways how to further incorporate this in their approaches. For example, the municipality of Rotterdam has appointed process guides to assist condominium associations through procurement. Municipalities could also look at ways to incorporate one-stop shops in their approaches to profit from setting up these types of collaborations. However, more research must be done to see the best setup for such collaboration (e.g. public-private partnership or special purpose companies).

PAW (n.d.) provided insight on how municipalities should approach residents and their relations. As all neighbourhoods and condominium associations are different, an one fits all approach will not work. Municipalities should start with minor changes, look at what already is happening in the neighbourhood, come with a human approach to get to know each other. The information nights that the municipality of Utrecht applies (section 5.3) is an example of how this relationship can be started and built. The approach of the municipality of Amsterdam in Venserpolder could have made better use of these points. Not knowing what was already happening has put the condominium associations on their back heels and complicated the relationship.

A theme that has not been discussed extensively with the different actors concern condominium associations organising themselves to help each other out. The municipality of Amsterdam aims to set up networking events for condominium associations twice a year (Slauerhoff et al., 2021). In Rotterdam, such events are also taking place (D9). Moreover, organisations such as VvE Belang advocate condominium associations and can be helpful for them as they look at problems from their perspective. Other such networking events can be very informative for condominium associations to see how others have done things.

Problem perspectives and goal ambitions.

The goal of the energy transition for the built environment has been clear from the beginning, as in 2050, it must be energy neutral. The municipalities have translated this into their own target and intermediate targets. For these targets to be functional, they should be supported by resources and networks, have medium-term relevance, be straightforward to monitor, not overlap other targets, and be well communicated. All municipalities have set intermediate goals that are easy to understand and measure for 2030. This will be after their first transition period and be an essential milestone for how they are doing.

The translation of these goals to the execution of renovations starts with the transition vision heat of municipalities. After that, they must draw up action plans for specific neighbourhoods and areas to execute their transition vision heats (PAW, n.d.). Unfortunately, as the deadline for transition vision heat for municipalities is not here yet, not many action plans have been developed yet or come to execution.

Moreover, as Jollands et al. (2011) described, the approach and strategies should be sector-specific and reinforced through action and economic planning. This can be seen in how the municipalities write the goals and ambitions in their transition vision heat. This shows how it is linked to each other and how is reinforced.

Municipalities' problems and barriers aim to help condominium associations more or less in line with the barriers coming from literature and encountered with the case studies (table 4.1). The municipalities focus on the condominium associations not being professional clients, struggling with a lack of knowledge, and creating a supporting ground that is similar to the root of the barriers of the condominium associations

Strategies and policy instruments.

Two types of instruments have been distinguished from the literature review (Adams & Tiesdell, 2012; Van der Heijden, 2016) that could help municipalities stimulate condominium associations in their decision-making process. These are financial stimulating – and capacity building instruments.

All three municipalities use financially stimulating instruments that make it more attractive to renovate their dwelling right now. These are subsidies for becoming free of natural gas, solar panels or something similar but only meant for a short period and not the whole transition. The loan for condominium associations is a financially stimulating instrument that could stay longer as it just is there to facilitate the process. However, the demands and specifications of the loans are not always favourable enough for condominium associations (D₅).

There is a wide range of capacity-building instruments that municipalities use to better participate in market processes. For example, the information window seems to be a helpful tool to organise assistance for condominium associations. It can be a point where condominium associations come to with their problems and a helpful place to distribute information. For bigger municipalities, this is an interesting option as they are more likely to have the resources. However, smaller municipalities struggle with inadequate means for the budget and engaging residents and entrepreneurs (Dorenbos et al., 2020). Provinces can help in those situations by assisting and connecting these smaller municipalities and possibly taking on the role information window.

In addition to that, several instruments help guide teaching and assist condominium associations, such as process guide are information evenings. These capacity-building instruments are present but do not have the capacity yet to help and do not reach all condominium associations. An issue for some of these capacity-building instruments has to do with appointing the parties that execute it. For example,
the municipality of Amsterdam is planning to guide several condominium associations through their renovation process using process guides (Slauerhoff et al., 2021). Acquiring process guides must have with the consideration of procurement law or public-private partnerships. For example, the process guides that help the municipality of Rotterdam and VvE010 are acquired through procurement law (section 5.4). In this fashion, municipalities could collaborate with one-stop shops such as WNR and Klimaatmissie, as this provides an option for the whole renovation of a dwelling. Unfortunately, this also means they need to consider how to set this up while considering procurement law. Setting up a special purpose vehicle or engaging in a public-private partnership are options to do this.

Next to the policy instruments, part of the municipalities (must) approach involves engaging stakeholders in creating awareness about the energy transition. Stakeholder engagement should be an ongoing process and should aim for diversity in interests and concerns (Jollands et al., 2011). The literature review has described multiple options to organise this. PAW (n.d.) give some precise points on how to do this, with attention needing to be paid to defining a clear point of view, recognizability, showing seriousness and support and making it visible to the residents. For example, making it visible can be done through pop-up centres and web portals (Mlecnik et al., 2018). The approaches of the municipalities all show examples of using this. Webinars are being organised in all three municipalities with the message for the energy transition. The municipality of Utrecht, Stichting !Woon and VvE010 are organising information nights to give specific information to residents. Moreover, model homes as pop-up centres are used in Reigersbos to make them visible to residents. Municipalities, however, can always do more and improve as elements such as web portals can be improved, and more people can be engaged.

Responsibilities and resources.

The literature review stated that establishing accountability was one of the critical factors in an enabling network (Jollands et al., 2011). Accountability has been established for the energy transition in the Netherlands as it has become a task for municipalities. It has, however, not come with forcing legal power making this the complex problem that it is. For municipalities with fewer resources, this can become a bigger problem as it might be more difficult to facilitate and assist the condominium association in their decision-making process. Therefore, these provinces should look at setting up collaborating with other larger municipalities in the area or their province. Section 7.?? discusses this issue further.

The transition should also allow for a learning process in the approaches (Jollands et al., 2011. This is something that clearly comes back in the Dutch climate agreement and the approaches of the municipalities. The Dutch Climate agreement states that not all knowledge is available to make the energy transition, and learning and development programmes should get special attention in the approaches of the municipalities. Moreover, the municipalities have set up programs to create new knowledge done by actors such as VvE010 and the Energy Lab Zuid Oost, who can help provide this type of new information. Furthermore, all three municipalities have actors with the means to distribute this.

Chapter 7 - Discussion part II on enhancing the approach of the municipality of Amsterdam.

The last chapter reflected on chapters 4 and 5 to draw lessons for municipalities on how to enhance their approaches for the energy transition. This chapter adopts this knowledge and solely focuses on the municipality. It compares Amsterdam's municipality's approach with the barriers encountered by the condominium associations in Amsterdam. Moreover, the chapter uses the conclusions and lessons of chapter 6 to enhance the approach of the municipality of Amsterdam. It starts with describing some of the problems followed up by a SWOT-analyses. The chapter ends with some indications for how to enhance the approach. Moreover, this chapter answers SQ4 and SQ5:

Is the approach of the municipality of Amsterdam in line with the barriers encountered by the condominium associations? (SQ4)

How can the municipality of Amsterdam enhance their current policy instruments or strategy to stimulate condominium associations to renovate their dwellings for the energy transition? (SQ5)

7.1 Comparison of barriers and approaches.

To give advice, it is essential to understand the problems and mismatches with Amsterdam's municipality.

7.1.1 Problems condominium associations.

The energy transition has given an enormous task to an actor who is not equipped to fulfil it. Condominium associations encounter barriers which they can not overcome by themselves and require the help of other parties. The problem for condominium associations can be split up into different parts. Many condominium associations are struggling to function well and to keep up with regular maintenance. They are not active and do not have a long-term maintenance plan that covers everything. The condominium associations that are barely holding it together with the current situation will have a challenging time as they cannot start a customer journey for an energy-efficient renovation. This situation has been described in section 6.1.

On top of that has come the energy transition, which requires a lot of the condominium associations. It demands them to acquire a ton of extra knowledge. Condominium associations are no professional clients but are required to participate in a market where many are. These barriers come forward from the results of Chapter 4 and Chapter 5 that show the lack of understanding and judging of condominium associations. For condominium associations, many transaction costs come from their lack of knowledge about different parts. This is more extensively described in chapter 4 but include:

- How to determine the state of the building
- Different sustainable measures
- How to find, filter and judge information concerning sustainable measures
- Understanding the help being offered and how to apply for it (guidance, subsidies, etc.)

Moreover, once the board understands of condominium association understands these things, they must convince the rest of their members about their plans. This brings forward the collective decision-making barriers that condominium associations must deal with. Communicating with all the members in larger condominium associations can be challenging as they all have different motivations and opinions to consider (section 4.3 & 4.5).

The condominium associations need help in this decision-making process as they can not finish it themselves. As the municipality of Amsterdam want the associations to make the transition and are tasked with the energy transition, they should look for ways to facilitate that process and make the customer journey as easy as possible.

7.1.2 Goals and problems of the municipality.

As described multiple times in this report, the municipalities in the Netherlands have been tasked with the energy transition for the built environment as the scale of making these renovation plans work best on a district level. The municipality does not have much forcing power to force homeowners and can only stimulate and accommodate condominium associations (Nieboer & Straub, year?). When comparing the approaches of the different municipalities, it is clear that the municipality of Amsterdam is not perfect and can improve certain parts of its approach. Through the lack of communication and coordination between the municipalities and the national government, condominium associations fall by the wayside and lack the proper assistance (section 5.1). Strategies and policy instruments are being set up to help condominium associations. This is happening both on a municipal level by the municipality of Amsterdam (Slauerhoff, 2021) and with the cities of the G4 partnering up (section 5.1). The municipality of Amsterdam is aiming to set up several instruments to help condominium associations better. They aim to set up an information window in cooperation with Stichting !Woon and have process guides guide several condominium associations and learn from them (Slauerhoff, 2021). These are steps necessary to be better able to assist condominium associations.

7.1.3 Two routes as a solution for renovation.

Two routes can be distinguished for condominium associations to an (almost) energy neutral home free of natural gas. The associations can either do a big renovation and fix everything in one step or small steps. For both these cases, they can be assisted by the municipality of Amsterdam as they require independent sources to find their information make their choices. The municipality of Amsterdam can, however, not help all these condominium associations by themselves. Moreover, help from other actors is required to execute renovations. The municipality can help condominium associations with certain barriers but not all of them.



Figure 7.1 – Two routes towards an energy-neutral building that is free of natural gas (own figure)

7.2 Swot analysis on the approach of the municipality of Amsterdam.

This section consists of a SWOT analysis on Amsterdam's municipality's approach for condominium associations (table 6.1). It looks at the approach's strengths, weaknesses, opportunities, and threats and aims to define what is harmful and helpful for internal and external processes. Indications are shown whether the statements concern long-term visions (LT), medium-term tactics (MT) or short-operations (ST). These indications give structure to the timeline of the different aspects of the approach. Moreover, there are also used to give structure to the timeframe in the next section. The overview of the approaches of the municipalities from chapter 5 and how to deal with the barriers for the condominium associations are used as a basis for the SWOT analysis. The barriers from chapter 4 form the basis of where the municipalities must deal with.

IELPFUL	HARMFUL
trengths	Weaknesses
Current ambitions to set things in motion for the energy transition (LT)	- Not much forcing power (LT)
Variety of research projects which can be used to learn from (Energy Lab	- No blueprint for guiding all condominium associations towards an energy-
uid Oost with Reigersbos to the municipality with process guides) (MT +	neutral existence (MT)
Τ)	- Not reaching all condominium associations (ST)
Variety of interested actors involved and relation with Stichting !Woon	- No clear point of information distribution for condominium associations
MT + ST)	(MT + ST)
	- Currently not able to facilitate the process of condominium association and
	answer their questions (ST)
<u>Opportunities</u>	Threats
More reasons to renovate besides energy transition/ reason to convince	- Not meeting sustainability target (LT)
hem (MT)	- Not covering all condominium associations (All)
Opportunities to reach condominium associations (MT)	 Underlying issues CA's (building state, MJOP, sleeping) (LT + MT)
Guiding CA through the whole process (MT + ST)	- Not knowing what happens in neighbourhoods (with proposed plans) (ST)
Improving the city (LT)	 Loss of faith in the municipality (LT + MT)
Network with other cities (G4) (LT + MT)	- The complexity of the problem for condominium associations (All)
	ELPFUL rengths Current ambitions to set things in motion for the energy transition (LT) Variety of research projects which can be used to learn from (Energy Lab uid Oost with Reigersbos to the municipality with process guides) (MT + F) Variety of interested actors involved and relation with Stichting !Woon AT + ST) Pportunities More reasons to renovate besides energy transition/ reason to convince tem (MT) Opportunities to reach condominium associations (MT) Guiding CA through the whole process (MT + ST) Improving the city (LT) Network with other cities (G4) (LT + MT)

7.2.1 Opportunities.

Global warming and the energy transition are subjects that live in the Dutch society (section 4.1). The municipality of Amsterdam uses this to stimulate people to renovate (Slauerhoff et al., 2021). However, this does not need to be the only reason to focus on. Energy-efficient renovations help with the energy transition and increase health and living comfort, and are financially beneficial. Condominium

associations have all kinds of different people amongst them who are sensitive to different kinds of arguments. In the Lucellestraat, one of the board members is doing it from a conviction to the world while others focus on lower living costs. Section 4.1 has described this. This gives the municipality of Amsterdam multiple points to target condominium associations with and strengthens their medium-term tactics.

In addition to the variety of reasons to renovate, is also a variety of reasons how to reach them that can be successful. For example, the involvement of the municipality can boost projects such as Venserpolder and Reigersbos. Their involvement was not an undivided success for multiple reasons (chapter 4), but it remains why the projects were started. Furthermore, peer-to-peer communication works, as it was the reason for the condominium associations of the Lucellestraat to start looking at WNR. Moreover, with Reigerbos, the peer-to-peer communication and the model home helped get people behind the project.

Another opportunity lies with guiding the condominium associations for the short-term operations and the medium-term tactics. By offering guidance to condominium associations through their customer journey, the execution of renovations can be established in the short term. Moreover, this guidance can also help the tactics in the medium term as barriers and ways to overcome them can be discovered.

Moreover, the necessity to renovate buildings and dwellings for the energy transition allows for an opportunity for the municipality of Amsterdam. With over 30 development neighbourhoods in the city Gemeente Amsterdam. (n.d.-d), many areas need improvement. Renovating old buildings with overdue maintenance from these development neighbourhoods also improves the city. The street view will likely increase in the process, making the city more attractive to live in and see. This helps with creating a more liveable city of Amsterdam in the long term.

Furthermore, an opportunity lies with the networks with other actors in the process. Through the government's lack of communication and coordination, condominium associations are falling by the wayside (section 5.1). The municipality of Amsterdam is, however, just of one the Dutch municipalities that must deal with the energy transition for condominium associations and not the only one facing these issues. There are talks with the other larger municipalities to see how they are handling the energy transition for condominium associations and their problems (Section 5.1). Partnering up here seems wise as the problems condominium associations encounter in other cities are likely to be similar to the problems in Amsterdam. The same goes for the solutions to these problems. Why should every municipalities can also benefit smaller municipalities that do not have the same resources but must still deal with the same barriers. This collaboration can help with medium-term tactics when the collaboration turns out to be fruitful. Moreover, collaborations between municipalities can become a significant part of the energy transition vision for the built environment. More municipalities likely encounter certain types of problems, so overcoming them together or explaining how to overcome them is more manageable than fixing them alone.

7.2.2 Threats.

A threat that is not necessarily a threat to the approach but for the municipality is not meeting the targets for 2040 and 2050. The use of the goal for 2040 of becoming free of natural gas by 2040 can also be questioned as it can drive up the costs and not necessarily benefit dwellings' energy efficiency. Moreover, it can be questioned whether these are realistic goals to pursue. On top of that are the decision-making processes with condominiums and renovations to dwellings that take a long time to finish. This all puts pressure on the long term goals and the whole approach.

In addition to the pressure on meeting the targets, some circumstances could become a threat to the municipality of Amsterdam and their approach. All condominium associations must be covered in the

municipality's approach. Assistance must be available to all types of condominium associations as this concerns issues in the long-, medium- and short term. This includes the condominium associations that currently cannot take part in the customer journey as they are not active. The Amsterdam municipality's approach also needs to address these types of condominium associations and their issues actively. These include the overdue maintenance of some buildings, incorrect long term maintenance plans and sleeping condominium associations. Attention must be paid to the complex situations which may occur with condominium associations. Next to that are barriers and problems that may occur where the municipality of Amsterdam (or other municipalities) might not be aware of and can not respond to. Without covering all condominium associations, operations in the short term fail to address all members of an association that must participate. In the medium- and long term, this has consequences for the strategy and vision as they might not be a complete image and therefore will not be adequate to conduct governance with.

One of these issues that should be incorporated in the vision and strategy of the municipality of Amsterdam has to the with the underlying issues of some condominium associations. A significant part of the condominium associations in Amsterdam is sleeping (figure 3.7), and long term maintenance plans are often not up-to-date. They do not account for all necessary maintenance (section 4.7). These condominium associations need extra attention as it is not likely they will be able to start and finish the customer journey.

Moreover, the municipality needs to know what the situation is with the projects their starting. The execution plans that follow from the transition vision heat and describe how the transition will occur should be correct. In Venserpolder, the municipality of Amsterdam turned out to be wrong about the situation of the heating systems of the condominium associations (section 4.1 & 4.2). This, together with the other threats described earlier, can lead to a loss of faith in Amsterdam's approach, which is very undesirable as the participation of the condominium associations is needed in the energy transition.

Another threat has to do with the condominium associations and how their perception of the process and barriers. The fact that condominium associations are not professional clients and lack knowledge has become apparent in both chapter 4 and chapter 5. Moreover, members of condominium associations may lack the level of understanding required to envision what a renovation means for them, as discussed in section 4.7. Nevertheless, condominium associations must eventually understand the plans when they are presented as they decide on these issues during their meetings. During the whole transition, this challenge can occur with every condominium association.

7.2.3 Strengths.

Multiple strengths form a solid base for the approach of the municipality of Amsterdam. To start, it has an outspoken ambition and long-term vision to become free of natural gas in 2040 and energy-neutral by 2050. This ambition works as fuel for the approach as it put a precise point on the horizon that should be worked towards. This helps with setting projects in motion and to take steps in the transition process.

Another strength lies with the projects set up to learn from. In Amsterdam, many projects are started to help with the transition and learn from them. Projects such as Energy Lab Zuid Oost do projects where help with the goals of the energy transition but also help with the development of plans for the rest of the transition. An example of this is the project in Reigersbos, where the situation can be used to draw lessons from the rest of the transition. These projects help in the short term as actual renovations are being executed and in the medium term since the lessons learned can be used from strategies.

Moreover, there is a variety of actors interested and involved in the process. For example, next to the municipality of Amsterdam, condominium associations have also shown interest in renovating their

dwellings and upgrading their living quality. Next to that is Stichting !Woon, who assists and advise tenants, homeowners and condominium associations. This is not only for regular advice about their rights, but they also help with condominium associations becoming more sustainable. In addition to that are market parties interested in energy-efficient renovations and can be helpful in this process. These actors include earlier named actors such as Klimaatmissie and WNR and others executing actors. Together, this network can be a real asset to the energy transition in Amsterdam.

Another strength of the approach of the municipality of Amsterdam lies in collaboration with the interested actors. This can, however, still be improved and organised better. One of these actors that lies an opportunity with is Stichting !Woon. The opportunity exists with setting up facilities to guide the condominium associations through their decision-making process. The associations must go through a maze of barriers to finishing the customer journey. Assisting them in this process and helping in any way possible increases the chances of meeting the sustainability goals. In Amsterdam, further partnering up with Stichting !Woon seems like an astute option as they are already connected to the tenants and homeowners in the city. Their brand awareness can help with setting up the project quickly. Partnership with other actors also can help the municipality with their approach.

7.2.4 Weaknesses.

Not necessarily a weakness of the approach of the municipality of Amsterdam, but a disadvantage where must be dealt with during the transition is the absence of any real forcing power from the municipality. Condominium associations are not obligated to renovate their dwelling in an energy-efficiency manner as they are only required to maintain the state of the building (VvE Belang, n.d.). This limits the municipality's options as opposed to other situations where the municipality of Amsterdam must deal with and can use more traditional and forcing policy instruments. Therefore, the focus is on more stimulating and facilitating instruments. These instruments are described in more detail in section 3.2 and section 5.4.

As of right now, however, these facilitating instruments are not helping the condominium associations enough. The municipality of Amsterdam is currently not able to assist all condominium associations in their whole process, answer their questions and give them clarity or directions, which affects the short term operations of the approach. This is partly because no blueprint has been developed yet for a how-to guide and facilitate condominium associations' decision-making process. Moreover, there is no overview yet of all the problems that can occur with large condominium associations, so it is not possible to answer them quickly and directly. Condominium associations are renovating their building, but the decision-making process takes too long to meet the energy transition goals. For example, the decision-making process of the condominium associations of Reigersbos is already lasting for around 2 years.

What does not help with Amsterdam's municipality's approach is that there is no central point where condominium associations can turn to for questions. As a result, when condominium associations get stuck in the customer journey and have difficulties overcoming a barrier, no information window can function as a central point to distribute information and help them. This has difficulties on both short-term operations as condominium associations take longer to finish their customer journey and medium-term strategies as they are missing a function. In addition to that, is no plan or way to reach all or many condominium associations with information as in Rotterdam with VvE010 and in Utrecht with the information nights.

7.3 Recommendations for the municipality of Amsterdam.

This paragraph continues on the SWOT analysis and gives direction for the approach of the municipality of Amsterdam.

7.3.1 Facilitating all condominium associations.

The starting position of the Amsterdam municipality's approach should follow from their possibilities and resources and address the issues and barriers that play a part with condominium associations. The municipality of Amsterdam can not force condominium associations to renovate their dwelling and not lead every project themselves. It must look at different options to meet its goals and help condominium associations. As of right now, there is no blueprint of how to help all condominium associations become energy-neutral and free of natural gas. There are some subsidies, some capacity building instruments and some pilot projects to help condominium associations and to learn from them. These subsidies only help condominium associations that can take part in the customer journey of a decision-making process about an energy-efficient renovation. Active condominium associations that have their act together and are interested in sustainable renovations are the ones who can make use of the help of the municipality and who will eventually become energy-neutral. However, this will only target the innovators and early adaptors, but the approach of the municipality of Amsterdam should target all the condominium associations. For the whole built environment, all the dwellings of condominium associations must be renovated. Since the municipality of Amsterdam has the desire to accomplish this but not the forcing power to do so, its approach should aim to make this as easy as possible for the condominium associations, which can help them execute the renovations. Since it can not pay for all the renovations, the most significant focus of the municipality of Amsterdam should lie in facilitating the condominium associations in their process. The municipality of Amsterdam should look for ways to become the facilitator of the energy transition for condominium associations. Five different tasks have been drawn up to accomplish this and enhance the municipality's approach (Figure 6.2).

The rest of this paragraph describes different options for how the municipality of Amsterdam can better facilitate and assist condominium associations in the process. By doing that, more condominium associations will be stimulated to renovate their dwelling.



Figure 7.2 – Recommendation for enhancing the approach of municipality of Amsterdam (own figure)

7.3.2 Instigating.

One of Amsterdam's municipality's five tasks should consist of instigating condominium associations to start their customer journey. This can be done by raising awareness about the energy transition and engaging condominium associations in the process. When effective, this means more condominium associations are stimulated to start their customer journey.

As described in sections 3.6.1 and 4.1 during step 1 of the customer journey, condominium associations have no real barriers. However, the municipality of Amsterdam can still influence this process by making condominium associations interested in an energy-efficient renovation. The literature shows (section 3.2.7) that engaging stakeholders is an essential part of the strategy of municipalities. Moreover, the interviews and literature have shown several possibilities to do this that appear to be effective. Drawing attention to the energy transition and energy-efficient will turn into more condominium associations to renovate their dwelling.

When the municipality of Amsterdam wants to convince people of executing an energy-efficient renovation, they should not just focus on that but take on a broader scope. These energy-efficient renovations also increase health and comfort and should be living cost-neutral (with the precondition that the long term-maintenance plan is correct) find sources. This way, more reasons can convince people who might not feel much about the energy transition.

A possibility to do draw attention to the energy transition is with information nights similar to what the municipality of Utrecht is doing for the different neighbourhoods (section 5.4). By holding an information night once a year for the different neighbourhoods. During these nights, residents can be informed about the current situation of their neighbourhood and get more specific information about that. For example, information about renovating their dwelling can help them in their process towards a renovation. It is important to get to know the neighbourhood and let the plans grow. Significant changes start and happen with small steps (PAW, n.d.).

Another medium of drawing attention from people can come from pop-up centres or other physical objects. An example of this is the model home in Reigerbos, where people could stop by to see the possibilities. The model house in Reigerbos turned out to be an effective tool for the residents' awareness and in helping them imagine how their house or apartment could look. This helped the condominium associations' members see how the health and comfort of their apartments could be improved. Moreover, the Woonzijer Winkel is a consultancy centre in Rotterdam where people can get more comfortable with looking at the different options as it helps them in their search (D8).

During the literature review, peer-to-peer communication (Kwon & Mlecnik, 2020) was named as a helpful way of drawing people's attention and turning it into a reason to start the journey. During the interviews with the condominium associations, this appeared to work as well. Both with the model house where residents showed up and then told it to other residents and with the condominium association of the Lucellestraat hearing about WNR, peer-to-peer communication helped as a reason to start.

Recommendation.

By deploying some of these instruments, the municipality should raise awareness and engage condominium associations in their process to stimulate them to start their customer journey. These instruments can (and should) be deployed in the short term. With starting to give information nights aimed at specific neighbourhoods, the process can start in these neighbourhoods. Moreover, when the municipality has plans for a whole neighbourhood to become free of natural gas, model houses can help with overcoming the barrier of basic understanding and visualisation.

7.3.3. Teaching.

Chapter 4 and figure 6.1 show that not every condominium association can start their customer journey. The second task consists of creating a basic understanding of condominium associations what it means for them and requires to be a well-functioning condominium association. This task helps with creating adequate boards and healthy and active condominium associations.

Understandably, boards of condominium associations lack knowledge concerning sustainability which does not have to be a problem either. Some essential elements are, however, required for the functioning of their board and the association. This is another aspect where the municipality of Amsterdam should pay attention to when trying to facilitate condominium associations better. This should not be a problem for many well-functioning condominium associations, but learning about essential elements could be very helpful for in-active associations or people just starting in the board. The literature (section 3.1), the barriers with the condominium associations have troubles with their long term maintenance plan. This is, however, a vital element of a well-functioning condominium association and determines whether renovations can be executed. Moreover, the sense of co-responsibility for the building can be lacking, making it hard to work together in the customer journey (section 4.3). Therefore, the board of a condominium association well that include:

- Understand how the deed of division works;
- Understanding how the long term maintenance plan works;
- How to communicate with the other members and keep them up-to-date;
- Understanding what the energy transition means for the neighbourhood;
- Understanding what the basics of the energy transition mean for their dwelling;
- Where to go with questions and how to find answers.

Recommendation

As of right now, the municipality of Amsterdam is giving several courses on how condominium associations can become more sustainable (Slauerhoff et al., 2021). In addition, Stichting !Woon is also giving webinars on different topics to help condominium associations (Stichting !Woon, n.d.). These courses should continue as they help with creating an understanding of condominium associations. However, these courses do not cover the basic elements required for condominium associations to be active and well-functioning. Therefore, the municipality should start giving courses about these issues in the short term to create more adequate boards and well-functioning condominium associations that can start their customer journey.

7.3.4 Guiding and assisting.

A third task focuses on the condominium associations that are occupied with their customer journey of an energy-efficiency renovation. The municipality of Amsterdam should be there to guide and assist condominium associations when they encounter barriers in their decision-making process.

Chapter 4 has shown the numerous barriers that condominium associations can encounter in their collective decision-making process. As discussed in section 5.3, this can lead to them not being professional clients and needing assistance to overcome their barriers. Unfortunately, municipalities and the municipality of Amsterdam can not help them with all barriers such as designing the plan. However, they can help them up to a certain point or help them continue their customer journey. An important reason for condominium associations to turn to the municipalities with these barriers is the motive of Amsterdam's municipality. Municipalities provide independent and unbiased information as they have no financial motive, and it helps them achieve their goals for the energy transition. Condominium associations and municipalities support this as they both see a role in this process for municipalities.



Figure 7.3 – Concept of information window as a machine that keeps itself going (own image)

Recommendation

To assist the condominium associations in their customer journey and overcome the barriers, the municipality of Amsterdam needs to add a central point for the distribution of information. This should be a place where condominium associations can come to for their questions. A good example of this is the already existing information window in Utrecht and Rotterdam. When setting up something similar to the information windows in Rotterdam and Utrecht, it should aim to create a machine that keeps itself going and learning about new problems (figure 7.3). Next to helping condominium associations, an advantage of having a large scale information window is that they come to you with their problems so they will hear about them when new problems start occurring. This allows them to find the answers before it becomes a significant problem for all condominium associations. Besides condominium associations coming to the information window to overcome barriers, the information window itself should also be involved with research projects about condominium associations. By doing this, the information window will keep discovering new barriers and creating new information and turn into a machine that keeps itself going and assists and facilitates condominium associations. Setting up this information window or central point of information distribution helps directly in the short term as it helps condominium associations overcome barriers and finish their customer journey. Moreover, aiming for it to be a machine that keeps itself going helps in the medium term for discovering new barriers that could arise. To gather and organise these barriers, the municipality of Amsterdam could make use of the morfological tool of table 6.2 (section 6.1)

The municipality of Amsterdam is currently researching possibilities to do this with Stichting !Woon. Considering the brand awareness of Stiching !Woon in Amsterdam and their relation to tenants and homeowners, it would be a wise choice for them to function as the information window of condominium associations in Amsterdam.

7.3.5 Take away barriers.

Next to assisting condominium associations with specific barriers, they encounter during their customer journey. There are more general barriers that condominium associations must overcome to be able to execute an energy-efficiency renovation. These are general barriers that condominium associations (and also homeowners) must deal with. To further embrace the role as the facilitator of the energy transition, the municipality of Amsterdam should look for ways to help them with this. They should search for general barriers that complicate the customer journey and remove them or lower their burden. This fits with the long term vision of becoming the facilitator for the energy transition of condominium

associations. The rest of this section highlights two examples in more detail where the municipality of Amsterdam could do this with. There are, however, more examples where the municipality could look to see what is possible with problems such as asbestos removal, structural damage or suitability of placing thermal insulation.

Recommendations

A barrier that the municipality of Amsterdam could help condominium associations with has to do with the fact that for almost all renovations (besides some small renovations and exceptions) a building permit is required. In most cases, to get this building permit, it is required to do an exploratory soil investigation (Gemeente Amsterdam, n.d.-b). If this investigation comes back with a negative result and further soil investigation is required, it can cause severe delay to the project. However, when the municipality of Amsterdam wants a neighbourhood to become free of natural gas in the coming period or has appointed it as a development neighbourhood, it wants and can expect renovations to take place in that area. To make these renovations easier, the municipality of Amsterdam could take matters into its own hands and do the exploratory soil investigation themselves. The municipality would take away a barrier and make the customer journey a bit easier for the condominium associations. This adds to the story of assisting and facilitating the condominium associations and making that process as easy as possible for them.

Another barrier that condominium associations face has to do with the finances of the project. To execute big renovations, condominium associations must have a large amount of money beforehand. When the association has not saved enough money yet but wants to move up certain maintenance projects, the special revolving loan could come in helpful for condominium associations. VvEo10 is now doing this as the loan of the Warmtefonds did not fit with the condominium associations yet (D5). This stimulating financial tool does not have to cost the municipality of Amsterdam much money but assists condominium associations in the process.

7.3.6 Communication and collaboration.

The fifth task for the municipality of Amsterdam lies with further developing and intensifying the collaboration and communication with other stakeholders. This task helps with better sharing and understanding the problems that condominium associations encounter in their decision-making process.

As mentioned with assisting and guiding condominium associations, the municipality can not help to overcome all barriers that condominium associations encounter. For some barriers, the knowledge of experts is necessary. Therefore, the municipality of Amsterdam should look for ways to collaborate with market parties. Several options are available to do this. One-stop shops-parties such as Klimaatmissie and WNR can partner up with such actors to provide a full ride for condominium associations that require that. Moreover, partnering up with process guides or other consulting parties can help condominium associations with specific questions or issues with specific barriers. Further research (by the municipality of Amsterdam) is needed to see what and how to best set up such collaborations.

Chapter 5 showed that condominium associations tend to fall by the wayside as the national regulations overlook them. Therefore, the municipalities of the G4 have started working together to share their problems. This is a good start for the collaboration between municipalities, and it would be wise to intensify this collaboration to learn from each other. The energy transition is a complicated process, but not every municipality should invent the wheel by itself. This collaboration can also help in forming a front to communicate with the national government. This allows them to bring forward the issues with condominium associations on a larger platform. Moreover, the municipalities can explain what condominium associations need and how regulations should be organised not to overlook condominium associations.

This collaboration also allows the municipality of Amsterdam to take on the frontrunner role it aspires to (Gemeente Amsterdam, n.d.-c). It also takes on a frontrunner role in creating new knowledge about the energy transition and projects such as Energy Lab Zuid Oost. These projects create new knowledge that can be directly used with the projects. Moreover, the municipality of Amsterdam should aim to set up networks with other (smaller) municipalities that do not have the resources to figure out how to stimulate condominium associations by themselves.

7.4 Generalising recommendation approach municipality of Amsterdam.

This section looks at the advice given in the previous section to enhance Amsterdam's municipality's approach. Next, it looked at what could be added to the policy instruments and strategy. Finally, this section looks at how that piece of advice can help other municipalities by generalizing it.

Problems and struggles of the condominium associations.

Even though every condominium association is different, they must go through the same customer journey for their collective decision-making process, resulting in them needing to overcome the same barriers. For a large part, these barriers are not tied to the condominium association's location, but to the process they must go through and other attributes that define a condominium association. This means that the different barriers that condominium associations in Amsterdam must deal with are also encountered by other municipalities throughout the Netherlands when it concerns a similar condominium association. This means similar transaction cost -, collective decision-making-, and comprehending and applying for the help of the municipality barriers come back with the other municipalities in the Netherlands.

The starting position of an average municipality is not different from that of the municipality of Amsterdam for stimulating condominium associations. It is impossible to force condominium associations to renovate their dwelling, and municipalities can not lead every project themselves. Therefore, municipalities should focus on stimulating the condominium associations to decide on an energy-efficient renovation. To have an energy-neutral built environment, all condominium associations must renovate their dwellings, meaning that municipalities should arrange their approach that way. Municipalities should look for ways to stimulate and facilitate all condominium associations in this process. For a large part, they can follow the piece of advice for the municipality of Amsterdam. However, the resources of an average municipality are likely to be less and will not be able to use all the instruments as the municipality of Amsterdam. Therefore, municipalities must look for ways to help each other in this process. This can be done by sharing knowledge about barriers that condominium associations encounter or policy instruments for specific barriers. Moreover, smaller municipalities could partner up to facilitate condominium associations in their area. Provinces also could step in this process and take a leading role in organising these collaborations.

The basis of the advice for the municipality of Amsterdam followed from the analysis of the barriers (chapter 4) and the approach (chapter 5) on the specific context of Amsterdam. When considering following this advice, municipalities should not forget to look at the type of condominium associations in their area and whether this is comparable.

7.5 Limitations of the research.

The research has encountered some limitations that should be considered if others use results to give some options for further research.

The initial plan was to a questionnaire to the boards of many condominium associations and to do a statistical analysis of the responses. The response rate was, however, way too low to have any significant value. The low response rate was due to several factors. First, not all condominium association members are active enough to say something useful about their decision-making process for an energy-efficient renovation. Most of the time, only the board of condominium associations or a sustainability commission can say something about that process, reducing the response rate to one or two answers per association. Moreover, board members of a condominium association did not appear very appealed by answering the somewhat longer questionnaire. This is somewhat understandable as they do this next to their everyday life. This, however, changed the research method from getting the data from a questionnaire to interviews with condominium associations.

This change had some consequences for the research results as it did not concern a large pile of data from many condominium associations anymore but experiences from stakeholders close to the process. These interviews were able to give more details about specific barriers and the process of condominium associations. Unfortunately, as it only concerns a couple of interviews and not significant statistical results, it may be more difficult to generalise the results as there were only a limited amount of case studies interviews. It should, therefore, be noted that advice can still differ at regional level and national level.

Moreover, the research aimed only at a group of condominium associations, but this remains a significant part of the condominium associations. The results can vary further when attributes are defined in more detail. This can be done by considering the building year and maintenance state, more divisions in the size or ownership situation, the WOZ value or income level of residents.

Chapter 8 – Conclusion.

The energy transition has given the municipalities in the Netherlands a task for 2050 to have a built environment that is energy neutral and free of natural gas. To achieve this, many condominium associations must execute energy-efficient renovations. This research aims to help municipalities in this process by answering the following main research question (RQ):

'How can the approach of municipalities for stimulating condominium associations to renovate their dwelling for the energy transition be enhanced?'

8.1 Answer to the main research question.

The research started with looking at relevant literature to find an answer to the main research question. First, the literature review gave background to the different attributes and struggles of condominium associations. Moreover, the literature review resulted in two theoretical frameworks to study the barriers encountered by condominium associations and the approaches of municipalities for the energy transition. bbbb add figure/research variables show the research variables to study the approaches of municipalities with for the energy transition. Figure 3.19 (blz?) forms the basis for studying the customer journey barriers for condominium associations. These theoretical frameworks were used to look at the barriers encountered by condominium associations in Amsterdam and study approaches for the energy transition of the municipalities of Amsterdam, Rotterdam.

Chapter 4 gave insight into these barriers encountered by the case studies condominium associations in Amsterdam. Table 3.1 and table 3.2 (pagenog wat) show the barriers for each step of the journey. Chapter 5 compared the approaches of the municipalities and analysed them. Section 5.6 and table 5.6 give an overview of this. Chapter 6 discussed and reflected on the results of these two chapters to draw lessons from them. In Chapter 7, the results and those lessons together with the SWOT-analysis formed the basis for the recommendation to the municipality of Amsterdam. This recommendation aims to enhance the approach to stimulate condominium associations. Finally, this advice was generalized to answer the main research questions.

It is necessary to include all condominium associations in the transition to achieve an energyneutral built environment. The municipalities' approach should focus on all the different types of condominium associations that exist, from those ready to execute an energy-efficient renovation to the sleeping ones with a long-term maintenance plan of low quality. As municipalities can not force condominium associations to renovate their dwelling, municipalities should find ways to help them overcome their barriers and become their facilitator in the energy transition (figure 8.1). Five tasks can help municipalities in this process.



Figure 8.1 - Recommendation for enhancing the approach of municipalities (own figure)

Instigating (ST)

This task focuses on raising awareness and engaging condominium associations to have more condominium associations start their customer journey. Instigating instruments can be deployed in the short term with starting to give information nights aimed at specific neighbourhoods, the process can start in these neighbourhoods. Moreover, when the municipality has plans for a whole neighbourhood to become free of natural gas, model houses can help with overcoming the barrier of basic understanding and visualisation.

Teaching (ST)

This task aims to create a basic understanding with condominium associations for what it means to be an association. This should aim to cover the basic elements that boards require to function. Municipalities should start giving courses on these to help the condominium associations in the short term. As a result, there will be more adequate boards and well functioning associations.

Guiding and assisting (ST + MT)

During their collective decision-making process, condominium associations encounter barriers for which they require help. Municipalities should guide and assist them in this process and aim to create a machine that keeps itself going in this process. Setting up an information window like the municipality of Rotterdam and Utrecht is a good option to do this. The morphological tool of table 6.2 (section 6.1) can help municipalities to oversee the barriers they must help condominium associations with. By fulfilling this task, more condominium association can finish their customer journey.

Take away barriers (LT)

The energy transition has put a task with condominium associations that is not necessarily theirs, but their corporation is needed. There are general barriers that complicate the customer journey of condominium associations. To help the condominium associations meet them in the middle, municipalities can look for ways to remove barriers. Examples of this include helping with the exploratory soil investigation and the revolving loan for condominium associations.

Communication and collaboration (LT)

Not every municipality should invent the wheel for the energy transition. Instead, to help with understanding the problems and how to overcome them, they should collaborate. Municipalities should collaborate in stimulating condominium associations. This could especially be helpful for smaller municipalities with fewer resources. By partnering up with larger municipalities or the province, they have more resources to help and assist condominium associations adequately. Moreover, municipalities can look for ways to collaborate with market parties and get help from them. The next section describes this further.

Together these tasks and the main idea of facilitating the energy transition for condominium associations can help municipalities enhance their approach.

8.2 Further research possibilities.

This research has not answered all the questions for stimulating and facilitating condominium associations in the energy transition. During the research, many different topics passed by for further research. This section describes a few of them.

Stakeholder involvement

The relation of the municipality and condominium associations was central in this research which is logical as the aim of the research was to enhance the approach of municipalities in stimulating condominium associations to renovate their dwelling for the energy transition. These are, of course, not the only actors that come forward in this process. Parties such as VvE010, Sticthing !Woon, WNR and Klimaatmissie have been named frequently in this report, and more market parties could also help here. Future research could look at how these and other stakeholders could be more involved in this process and how their roles can grow. Moreover, it could look at collaborations like public-private partnerships (or other forms), how they could be used in this process, and how municipalities can procure this.

The organisation of the municipality

During the first round of interviews, some internal struggles and troubles with the communication with the national government came to light. In Amsterdam, this gives two different problems. The first one has to do with people from different departments who must start working together and figure out who is accountable for what and who is in charge. The communication between these different departments also must be improved to handle the projects better. Future research could focus on how the internal organisation can better organise this new mission thinking (B5). In addition to that problem is the struggle with transferring new knowledge from pilot projects, for instance, done by Energy Lab Zuid Oost. After such pilot projects are done, whether it was a success or not, the knowledge gained from the project should be transferred and usable for other city projects. This also goes for the problems with national regulations and the communication between municipalities and the national government about condominium associations falling by the wayside. Future research might look into how this communication and connection can be improved to transfer lessons faster to help more condominium associations.

Other forms of policy instruments

This research was focused on how municipalities could use their strategy and policy instruments to stimulate and facilitate condominium associations. For future research, looking at the nature of policy instruments and researching whether stimulating and facilitating are the only options for condominium associations for the energy transition. Right now, many policies are now generating and showcasing leadership (Van der Heijden, 2016). The focus on the next generation of policy instruments might shift to the players instead of the leaders. Moreover, for a very large part, this research assumed that municipalities do not have legal forcing power. Future research might look into changing this voluntary nature of instruments and see if it is possible to move to more mandatory instruments that can force change with condominium associations

Condominium associations

Future research could also focus on studying types of condominium associations. This research focussed on larger condominium associations where group decision-making processes started playing a role. As already described in the previous section with the liabilities, much more specification in this group can be made to ensure better assistance for a specific group. Moreover, research into smaller condominium associations is also necessary since most condominium associations are of a smaller size. The resources of these condominium associations are often less than those with bigger ones and often have less assistance from condominium associations management offices. Future research could look at the barriers of these smaller associations and how they can overcome their barriers.

Chapter 9 – Reflection.

This last chapter contains a reflection on the product, process and planning of this master thesis.

9.1 Product.

This research is a product of my thesis for the master Management in the Built Environment (MBE). MBE strives for a sustainable built environment where the wishes and demands of stakeholders are considered. MBE aims to find solutions for developing and managing buildings, portfolios, and the urban environment (Management in the Built Environment, 2021). My research focuses on the chair of Housing Quality and Process Innovation and Housing Management. The chair of Housing Quality and Process Innovation deals with process innovations that help with housing quality. Important aspects of the chair are energy efficiency, environmental impact, and the safety, health, and usability of both existing and new homes. The energy transition is an important subject in this chair (Management in the Built Environment, 2021). The Housing Management chair focuses on strategies for management and redevelopment of the housing stock to increase socioeconomic and environmental sustainability. Adaptation of housing to the new needs of housing stock largely depends on the redevelopment of the current housing stock (Management in the Built Environment, 2021).

The approach of municipalities to stimulate condominium associations for energy-efficient renovation is consistent with both chairs and the master. The research to enhance the approach fits with the chair of Housing Quality and Process Innovation. It tries to find new ways for the approach of municipalities for the energy transition of the built environment where the dwellings of condominium associations play a prominent role. The research fitted with the chair of Housing Management deals with strategies to make the existing housing stock environmentally sustainable.

At the start of the research, I had not yet a vision or idea of what the result of this research would become. This gradually grew when developing the research and meeting and talking with people from the field. It started as something that would help with the energy transition and turned from how municipalities could help homeowners with renovating into advice for municipalities to enhance their approach for stimulating condominium associations for the energy transition. As I did my internship with the municipality of Amsterdam, this became the municipality that was studied the most and for which the first piece of advice was created. In addition to that was a piece of advice for other municipalities for their approach. This view on their energy transition approaches might help them better assist condominium associations and meet their goals for the energy transition.

9.2 Process.

For me, the first start of the graduation process was a bumpy one. Before the beginning of the previous academic year, I had no clear idea of my thesis or what this year would be like, especially with COVID-19 as extra uncertainty in the process. Therefore, I was very content after the first week program in which I had found a subject, building bound financing, and a mentor with Harry van der Heijden. However, after a couple of weeks where I had made some progress in learning about building bound financing and the implementation of the process of it in the Netherlands, Kajsa Ollongren, the minister of Interior and Kingdom Relations, unfortunately, decided building bound financing was not feasible in the Netherland and Harry van der Heijden and I decided that further research into this was not desirable.

This meant the process needed to start over again, which is how I came in contact with Queena Qian and Erwin Mlecnik and how they became my mentors. Their assistance and view on things helped me through that first period to pass my P2. I am grateful for how this continued after that period and how they kept on challenging to develop, focus and strengthen my research. Moreover, my mentors provided me contacts, literature, documents and links to webinars to substantiate my research. Through Queena, I also came in contact with the municipality of Amsterdam and Else Veldman, who became my

internship mentor. This internship gave an easy way to talk to stakeholders from the field.

Doing my research and writing my thesis has taught me several things. Using literature and scientific sources can form a basis for your research that can cover the aspects needed to execute the research. It is, however, essential to connect with in-field experts that know what is happening. I realised this when meeting Walter van Steenis from WNR, went to the model building in Reigersbos to meet Bouke Staphorst and walked through Venserpolder with Baudouin Knaapen. These meetings showed me the problems and barriers I was reading and writing about meant for the members of the condominium associations.

9.3 Planning.

This whole research was the first big research that I was doing alone. Designing and executing it, is something that I had not done before and taught me a few things when considering the planning. I learned the importance of planning and keeping an eye on important dates. After my P₂, I started further developing my research method, designing my questionnaire and slowly setting up the interviews with representatives of the municipality. Since I had not set a date for P₃ and P₄ was vague in the future, I had an absence of important deadlines to work up to. This, together with working from home during COVID-19 times, got me stuck in my daily routine. This resulted in me losing track of how I should have been with the research and me cancelling the P₄ date in June. To prevent this from happening again and being hit by surprise by the deadline, I made a plan for the whole to summer in so assure being able to present when the new date of P₄ was there. This was successful as I passed P₄ and turned in my work to graduate.

References

- Adams, D., & Tiesdell, S. (2012). Shaping places: urban planning, design and development. Routledge.

- Allecijfers. (2021, 17 september). Duidelijke informatie in cijfers en grafieken (update 2021!). AlleCijfers.nl. https://allecijfers.nl/

- AMS Institute. (z.d.). Energy Lab Zuidoost. Geraadpleegd op 18 september 2021, van https:// www.ams-institute.org/urban-challenges/urban-energy/energy-lab-zuidoost/

- Baas, J. (2019, augustus). Een analyse van verschillende typen VvE's voor duurzame woningverbetering. Focusaanpak Klimaatneutraal Wonen - Gemeente Amsterdam.

- Björkqvist, O., Wene, C. (1993) 'A study of transaction costs for energy investments in the residential sector.' In Proceedings of the 1993 Summer Study. The European Council for an Energy-Efficient Economy (ECEEE), Stockholm, 1993, p. 23–30.

- Blunden, A. (2016). The Origins of Collective Decision Making. Leiden, Nederland: Brill.

- Bouwkennis. (2016, januari). VVE-MARKT IN BEELD. http://www.bouwkennis.nl/wp-content/uploads/2016/01/Factsheet-VvE-markt-in-Beeld.pdf

- Bressers, H. (2007). Contextual Interaction Theory and the issue of boundary definition: In N. Stephane, & F. Varone, Rediscovering public law and public administration in comparative policy analysis. (pp. 123-142). Lausanne: Presses Polytechniques.

- Bressers, H. (2009). From public administration to policy networks: Contextual interaction analysis. In S. Narath, & F. Varone, Rediscovering public law and public administration in comparative policy analysis (pp. 123-142). Lausanne: Presses polytechnics.

- Bressers, H. J. T. (2004). Implementing sustainable development: how to know what works, where, when and how. In W. M. Lafferty, Governance for Sustainable Development: The Challenge of Adapting Form to Function (pp. 284-318). Cheltenham: Edward Elgar Publishing.

- Bressers, H., Bressers, N., Kuks, S., & Larrue, C. (2016). The Governance Assessment Tool and Its Use. In H. Bressers, N. Bressers, & C. Larrue, Governance for Drought Resilience (pp. 45-65). Cham: Springer.

- CBS, PBL, RIVM, WUR (2020). Energielabels van woningen, 2010-2019 (indicator 0556, versie 08, 13 augustus 2020). www.clo.nl. Centraal Bureau voor de Statistiek (CBS), Den Haag; PBL Planbureau voor de Leefomgeving, Den Haag; RIVM Rijksinstituut voor Volksgezondheid en Milieu, Bilthoven; en Wageningen University and Research, Wageningen.

- CBS. (2016a). Aantallen en kenmerken van Verenigingen van Eigenaren Een verkennend onderzoek. Retrieved from https://www.cbs.nl/nl-nl/achtergrond/2016/20/aantallen-en-kenmerkenvan-verenigingen-van-eigenaren

- CBS. (2016b). Tabel - Verkennend onderzoek naar VvE's 2015. https://www.cbs.nl/nl-nl/achtergrond/2016/20/aantallen-en-kenmerken-van-verenigingen-van-eigenaren

- CBS. (2020, 10 september). WOZ-waarde gemiddeld 8,9 procent hoger. Centraal Bureau voor de Statistiek. https://www.cbs.nl/nl-nl/nieuws/2020/37/woz-waarde-gemiddeld-8-9-procent-hoger

- Centraal Bureau voor de Statistiek. (2021, 5 augustus). 8 miljoen woningen in Nederland. Geraadpleegd op 23 oktober 2021, van https://www.cbs.nl/nl-nl/nieuws/2021/31/8-miljoen-woningenin-nederland

- Cochran, C. L., & Malone, E. F. (2005). Public Policy: Perspectives And Choices (3rd ed.). Boulder, USA: Lynne Rienner Pub.

- Companen (2015). Wegnemen van belemmeringen bij het verduurzamen van VvE's: uitwerking SER-Energieakkoord. Arnhem. Retrieved from https://www.vvebelang.nl/media/VvEBelang_SER_def.pdf

- Dorenbos, R., Dural, S., & Gietema, S. (2020). Kleine gemeenten aan de slag met de energietransitie. Platform 31. https://www.platform31.nl/publicaties/kleine-gemeenten-aan-de-slag-met-de-energietransitie

- Duffhues, G. (2019). The Sustainability Challenge of Condominium Associations in the Netherlands: An Ex-Ante Policy Analysis of Building-Bound Financing. http://resolver.tudelft.nl/uuid:7b11c719-d8d5-4186-abae-af87a4c40edf

- Duurzaam 010. (2021, 10 september). Aardgasvrij. https://duurzaam010.nl/aardgasvrijewijken/

- Duurzaam Den Haag. (2019, August 30). Belangrijke stukken rondom de warmtetransitie. Retrieved from https://duurzaamdenhaag.nl/activiteiten/haagsewarmte/belangrijke-stukkenrondom-de-warmtetransitie

- Ebrahimigharehbaghi, S., Qian, Q. K., Meijer, F. M., & Visscher, H. J. (2019). Unravelling Dutch homeowners' behaviour towards energy efficiency renovations: What drives and hinders their decision-making? Energy Policy, 546–651. Retrieved from https://www.journals.elsevier.com/energy-policy

- Ebrahimigharehbaghi, S., Qian, Q. K., Meijer, F. M., & Visscher, H. J. (2020). Transaction costs as a barrier in the renovation decision-making process: A study of homeowners in the Netherlands. Energy and Buildings, 215, 109849. https://doi.org/10.1016/j.enbuild.2020.109849

- Energie in Nederland. (2020). Energieverbruik in Nederland in 2019. Energieverbruik in Nederland in 2019. https://www.energieinnederland.nl/feiten-en-cijfers/uitgebreid/2019/energieverbruik

- EPBD. (2019, May). AANBEVELING (EU) 2019/786 VAN DE COMMISSIE van 8 mei 2019 betreffende de renovatie van gebouwen (Kennisgeving geschied onder nummer C(2019) 3352). Retrieved from https://eur-lex.europa.eu/legal-content/NL/TXT/ PDF/?uri=CELEX:32019H0786&from=GA

- European Comission. (2020). COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS A Renovation Wave for Europe greening our buildings, creating jobs, improving lives. https://eur-lex.europa.eu/legal-content/EN/ TXT/?qid=1603122220757&uri=CELEX:52020DC0662

- European Commision. (2021, April 12). Energy performance of buildings directive - European Commission. Retrieved from https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en

- European Commission. (z.d.). Renovation wave - Energy European Commission. Energy -European Commission. Geraadpleegd op 20 september 2021, van https://ec.europa.eu/energy/topics/ energy-efficiency/energy-efficient-buildings/renovation-wave_en

- Fobe, E., Brands, M., & Wayenberg, E. (2014). Beleidsinstrumenten: theoretische perspectieven en keuzemodellen. Gent: Universiteit Gent: Department of Political science.

- Gemeente Amsterdam. (2018, juli). Vereniging van Eigenaren Onderzoek, Informatie en Statistiek. https://data.amsterdam.nl/publicaties/publicatie/verenigingen-van-eigenaren/dce6c12c-a6f1-4490-aa7a-00a1e273c45b/

- Gemeente Amsterdam. (2020a). Nieuw Amsterdams Klimaat - Routekaart Amsterdam Klimaatneutraal 2050. Retrieved from https://www.amsterdam.nl/bestuur-organisatie/volg-beleid/ coalitieakkoord-uitvoeringsagenda/gezonde-duurzame-stad/klimaatneutraal/#:~:text=Om%20 de%20gemiddelde%20temperatuurstijging%200p,met%20de%20uitstoot%20in%201990.

- Gemeente Amsterdam. (2020b, August). Transitie Visie Warmte Amsterdam. Retrieved from https://overmorgen.nl/wp-content/uploads/2020/09/tvw-amsterdam.pdf

- Gemeente Amsterdam. (2021a, 18 september). Buurt voor buurt aardgasvrij. Amsterdam.nl. https://www.amsterdam.nl/wonen-leefomgeving/duurzaam-amsterdam/aardgasvrij/aardgasvrije-buurten/

- Gemeente Amsterdam. (2021b, september 18). Venserpolder: opknappen en ontwikkelen. Amsterdam.nl. https://www.amsterdam.nl/projecten/venserpolder-opknappen-ontwikkelen/#h965efe87-4770-4f72-a316-1d515dbbocfi

- Gemeente Amsterdam. (2021c, september 18). Venserpolder aardgasvrij. Amsterdam.nl. https://www.amsterdam.nl/wonen-leefomgeving/duurzaam-amsterdam/aardgasvrij/aardgasvrijebuurten/venserpolder-aardgasvrij/

- Gemeente Amsterdam. (2021d, January 8). Duurzaam Amsterdam. Retrieved from https://

www.amsterdam.nl/wonen-leefomgeving/duurzaam-amsterdam

- Gemeente Amsterdam. (n.d.-a). Duurzaam wonen. Amsterdam.nl. Geraadpleegd op 18 september 2021, van https://www.amsterdam.nl/wonen-leefomgeving/duurzaam-amsterdam/wonen/

- Gemeente Amsterdam. (n.d.-b). Wanneer hoef ik geen bodemonderzoek te doen? Amsterdam.nl. Geraadpleegd op 18 september 2021, van https://www.amsterdam.nl/ veelgevraagd/?caseid=%7B41B76820-C807-4DFA-8633-97DC272CFD58%7D

- Gemeente Amsterdam. (z.d.-c). Volg het beleid: duurzaamheid. Amsterdam.nl. Geraadpleegd op 23 oktober 2021, van https://www.amsterdam.nl/bestuur-en-organisatie/volg-beleid/ duurzaamheid/

- Gemeente Amsterdam. (z.d.-d). Overzicht ontwikkelbuurten. Amsterdam.nl. Geraadpleegd op 26 oktober 2021, van https://www.amsterdam.nl/bestuur-en-organisatie/volg-beleid/coalitieakkoord-uitvoeringsagenda/fijne-buurten/ontwikkelbuurten/overzicht/

- Gemeente Rotterdam. (2020a, December). Rotterdams Duurzaamheidskompas. Retrieved from https://duurzaamoio.nl/app/uploads/2020/12/GRO-duurzaamheidskompas-okt2020-toegankelijk-spreads.pdf

- Gemeente Rotterdam. (n.d.). Energietransitie | Rotterdam.nl. Retrieved from https://www.rotterdam.nl/wonen-leven/energietransitie/

- Gemeente Utrecht. (2017). Visie op de warmtevoorziening in Utrecht Naar een klimaatneutrale stad. https://omgevingsvisie.utrecht.nl/fileadmin/uploads/documenten/zz-omgevingsvisie/ thematisch-beleid/energie/2017-07-visie-op-de-warmtevoorziening-in-utrecht.pdf

- Gemeente Utrecht. (2021a). Plan aardgasvrij verwarmen: Transitievisie Warmte | Gemeente Utrecht - Omgevingsvisie. Retrieved from https://omgevingsvisie.utrecht.nl/thematisch-beleid/energie/transitievisie-warmte/

- Gemeente Utrecht. (2021b). Duurzaam bouwen | Gemeente Utrecht. Retrieved from https:// www.utrecht.nl/wonen-en-leven/bouwen/bouwen-en-verbouwen/u-wilt-bouwen-of-verbouwen/ stap-2-uw-aanvraag-voorbereiden/duurzaam-bouwen/

- Gemeente Utrecht. (2021c). Hulp voor uw VvE | Gemeente Utrecht. Retrieved from https:// www.utrecht.nl/wonen-en-leven/wonen/uw-koopwoning/hulp-voor-uw-vve/

- Gregory, R., Failing, L., Harstone, M., Long, G., McDaniels, T., & Ohlson, D. (2012). Structured Decision Making: A Practical Guide to Environmental Management Choices (1ste ed.). Wiley-Blackwell.

- Het Parool. (2009, 28 januari). Venserpolder in criminele handen. https://www.parool.nl/ nieuws/venserpolder-in-criminele-handen~bicbci50/

- Hoppe, T. (2009). CO2 Reductie in de bestaande woningbouw- Een Beleidswetenschappelijk onderzoek naar ambitie en realisatie (Proefschrift). Enschede: Universiteit Twente/ CSTM.

- Human Interest. (2020, February 20). Do groups make better decisions than individuals? Retrieved 9 August 2021, from https://humaninterest.co.za/groups-make-better-decisionsindividuals/

- Interprovinciaal Overleg. (2015). Provincies investeren in de Energietransitie. SER. https://www.ser.nl/-/media/ser/downloads/thema/energieakkoord/regio/provincies-investeren-inenergietransitie.pdf?la=nl&hash=49F8E96FCCoFE479BB9F35C185EF934F

- Interreg 2 Seas Mers Zeeën Triple-A. (2020). Triple-A encouraging energy-efficient home renovations. Retrieved from http://www.triple-a-interreg.eu/

- Jollands, N., Pasquier, S., Heffner, G., & Saussay, A. (2011). Enabling energy efficiency through good governance. ECEEE 2011 SUMMER STUDY • Energy efficiency first : The foundation of a low-carbon society 145, 145–157. https://www.eceee.org/library/conference_proceedings/eceee_Summer_Studies/2011/1-foundations-of-future-energy-policy-cutting-the-gordian-knot/enabling-energy-efficiency-through-good-governance/

- Jouw Huis Slimmer. (z.d.). Jouw Huis Slimmer - slim met energie! Geraadpleegd op 18 september 2021, van https://jouwhuisslimmer.nl/

- Klimaatmissie Nederland. (2021, 31 augustus). Klimaatmissie Nederland | Vraag nu je gratis

klimaatplan aan! https://klimaatmissienederland.nl/

- Klimaatmissie. (2020, november). Gevelaanpak Woningen Winkelgebied Reigersbos

- Kwon, M., & Mlecnik, E. (2020). Local authority web portals for the adoption of low-carbon technologies by homeowners: Evaluation report Triple-A. Interreg.

- Meer met Minder, 2010. Kansrijke aanpakken in gebouwgebonden energiebesparing. De particuliere eigenaar. Research report Agentschap NL, Energie & Klimaat, Sittard/Utrecht, Motivaction, Meer Met Minder. http://www.bespaarlokaal.nl/userfiles/files/kansrijke_aanpakken_ compleet.pdf.

- Meer met Minder, 2010. Kansrijke aanpakken in gebouwgebonden energiebesparing. De particuliere eigenaar. Research report Agentschap NL, Energie & Klimaat, Sittard/Utrecht, Motivaction, Meer Met Minder. http://www.bespaarlokaal.nl/userfiles/files/kansrijke_aanpakken_ compleet.pdf.

- Ministerie van Algemene Zaken. (2020, 23 juli). Geld reserveren voor groot onderhoud appartementengebouw. Huis kopen | Rijksoverheid.nl. https://www.rijksoverheid.nl/onderwerpen/ huis-kopen/geld-reserveren-voor-groot-onderhoud-appartementengebouw

- Ministerie van Algemene Zaken. (2021, 18 augustus). Wat houdt een Vereniging van Eigenaars (VvE) in? Rijksoverheid.nl. https://www.rijksoverheid.nl/onderwerpen/huis-kopen/vraag-en-antwoord/wat-houdt-een-vereniging-van-eigenaars-vve-in

- Ministerie van Economische Zaken en Klimaat. (2019). Klimaatakkoord. Retrieved from https://www.rijksoverheid.nl/documenten/rapporten/2019/06/28/klimaatakkoord

- Ministerie van Economische Zaken en Klimaat. (z.d.). Rijksoverheid stimuleert energiebesparing. Duurzame energie | Rijksoverheid.nl. Geraadpleegd op 20 september 2021, van https://www.rijksoverheid.nl/onderwerpen/duurzame-energie/rijksoverheid-stimuleertenergiebesparing

- Ministerie van Economische Zaken, Landbouw en Innovatie. (2020, January 22). Wat is het Klimaatakkoord? Retrieved from https://www.rijksoverheid.nl/onderwerpen/klimaatverandering/ klimaatakkoord/wat-is-het-klimaatakkoord

- Mlecnik, E., Meijer, F., & Bracke, W. (2018, January). Strengthening local authority web portals for the adoption of low-carbon technologies by homeowners. Retrieved from http://www.triple-a-interreg.eu/project-reports

- MR 2017. (2017, December 19). Modelreglement bij splitsing in appartementsrechten 2017.

- Mundaca T, L., Mansoz, M., Neij, L., & Timilsina, G. R. (2013). Transaction costs analysis of low-carbon technologies. Climate Policy, 13(4), 490–513. https://doi.org/10.1080/14693062.2013.781452

- Nieboer, N., & Straub, A. (2018). How do customer journeys regarding energy investments look like? In Conference papers of the European Network for Housing Research (ENHR 2018): More together, more apart: Migration, densification, segregation ENHR.

- Oba. (z.d.). OBA Reigersbos. Geraadpleegd op 21 september 2021, van https://www.oba.nl/ vestigingen/oba-reigersbos.html

- Oozo. (z.d.). Woning Lucellestraat 17III Amsterdam. Oozo.nl. Geraadpleegd op 21 september 2021, van https://www.oozo.nl/woningen/amsterdam/landlust/bosleeuw/woning/634337/woning-lucellestraat-17iii-amsterdam

- Ostertag, K, (2019) and Centre International de Recherche sur l'Environnement et le Developpement (CIRED), 94 - Nogent sur Marne (France)]. Transaction costs of raising energy efficiency. Working paper. Germany: N. p., 1999. Web.

- Otten, H. (2014, 12 februari). Woonwijk Venserpolder. Andere Tijden Architectuur. https://anderetijdenarchitectuur.com/2011/09/09/venserpolder-amsterdam/

- Paradies, G., Beekman, L., Ooms, M., De Koning, N., Mulder, G., Van Baar, M., ... Van Winden, J. (2017). De Duurzame VvE

- PAW. (n.d.). Programma Aardgasvrije Wijken. Retrieved from https://aardgasvrijewijken.nl/ default.aspx

- Plettenburg, S. (2018). Local performance agreements for (social) housing policy-does it work?

Retrieved from https://repository.tudelft.nl/islandora/object/uuid%3Adf71dofe-a8e6-4d7a-a3c9-3dbe6934abof?collection=education

- Quinn, B. (2008). The psychology of group decision making in collection development. Library Collections, Acquisitions, & Technical Services, 32(1), 10–18. https://doi.org/10.1080/14649055.2008.10 766188

- Richardson, A. (2010). Using customer journey maps to improve customer experience. Harvard Business Review. http://www.iimagineservicedesign.com/wp-content/uploads/2015/07/Experience-Maps-Using-Customer-Journey-Maps-to-Improve-Customer-Experience.pdf

- Rijksdienst voor Ondernemend Nederland. (2013). Infoblad Trias Energetica en energieneutraal bouwen. https://www.rvo.nl/sites/default/files/Infoblad%20Trias%20Energetica%20 en%20energieneutraal%20bouwen-juni%202013.pdf

- Rijksdienst voor Ondernemend Nederland. (z.d.). Investeringssubsidie duurzame energie en energiebesparing (ISDE) | RVO.nl | Rijksdienst. Geraadpleegd op 18 september 2021, van https://www.rvo.nl/subsidie-en-financieringswijzer/isde

- Rijksoverheid voor Ondernemen Nederland. (2021). Energielabel woningen. https://www.rvo. nl/sites/default/files/2021/08/energielabel-voorbeeld-woningen.pdf

- Rijksoverheid Voor Ondernemend Nederland. (2019). Monitor Energiebesparing Gebouwde Omgeving. Ministerie van Binnenlandse Zaken en Koninkrijksrelaties. https://www.rvo.nl/sites/default/files/2021/01/monitor-energiebesparing-gebouwde-omgeving-2019.pdf

- Rijksoverheid. (2019). Energieverbruik door huishoudens, 1990–2018 | Compendium voor de Leefomgeving. Geraadpleegd op 23 oktober 2021, van https://www.clo.nl/indicatoren/nlo03521-energieverbruik-door-de-huishoudens

- Rijksoverheid. (z.d.). EP Online Energie Label Zoeken. https://www.ep-online.nl/. Geraadpleegd op 25 oktober 2021, van https://www.ep-online.nl/

- Rose, J., Thomsen, K. E., Domingo-Irigoyen, S., Bolliger, R., Venus, D., Konstantinou, T., Mlecnik, E., Almeida, M., Barbosa, R., Terés-Zubiaga, J., Johansson, E., Davidsson, H., Conci, M., Mora, T. D., Ferrari, S., Zagarella, F., Sanchez Ostiz, A., San Miguel-Bellod, J., Monge-Barrio, A., & Hidalgo-Betanzos, J. M. (2021). Building renovation at district level – Lessons learned from international case studies. Sustainable Cities and Society, 72, 103037. https://doi.org/10.1016/j. scs.2021.103037

- Schilder, F., & Van der Staak, M. (2020, augustus). WOONLASTENNEUTRAAL KOOPWONINGEN VERDUURZAMEN Verkenning van de effecten van beleids- en financieringsinstrumenten. Planbureau voor de Leefomgeving. https://www.pbl.nl/publicaties/ woonlastenneutraal-koopwoningen-verduurzamen

- Slauerhoff, M., Stants, K., & Rijsman, W. (2021, February). Vve's; motor in de energietransitie.

- Stangor, C. (2021). Principles of Social Psychology Charles Stangor (1st International Edition). -, -: Flat World Knowledge Inc.

- Stichting !Woon. (2019a, 28 november). Reigersbos - Amsterdam Zuidoost [ontwikkelbuurt]. !WOON. https://www.wooninfo.nl/projecten/reigersbos/

- Stichting !Woon. (2019b, november 28). Venserpolder - Amsterdam Zuidoost [ontwikkelbuurt]. !WOON. https://www.wooninfo.nl/projecten/venserpolder/

- Stroomversnelling & Platform 31. (2018). Handreiking voor begeleiding van VvE's naar nul op de meter Een omschrijving van ontwikkelde methode en bijbehorende hulpmiddelen. https:// energielinq.stroomversnelling.nl/nul-op-de-meter/20-tips-en-tools-voor-nul-op-de-meter/

TNO. (2020). Zet je VvE op Groen: Energy. https://energy.nl/zet-je-vve-op-groen/

- UNCC. (z.d.). The Paris Agreement. United Nations Climate Change. Geraadpleegd op 20 september 2021, van https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement

- United Nations. (2015). PARIS AGREEMENT. https://unfccc.int/sites/default/files/english_paris_agreement.pdf

- Van der Heijden, J. (2016). The new governance for low-carbon buildings: mapping, exploring,

interrogating. Building Research & Information, 44(5-6), 575-584. https://doi.org/10.1080/09613218.2 016.1159394

- van Proosdij, F. (2020, March). De transitievisie warmte: Gemeente Rotterdam. Retrieved from https://www.appm.nl/bericht/de-transitievisie-warmte-gemeente-rotterdam#:%7E:text=De%20 Gemeente%20Rotterdam%20werkt%20aan,in%20de%20stad%20verkenningen%20uitgevoerd.

- Verbond van verzekeraas. (2021). Herbouwwaardemeter Woningen 2021. verzekeraars.nl. https://www.verzekeraars.nl/media/8155/herbouwwaarde-woningen-2021def.pdf

- VvE Belang. (n.d.). Vereniging van eigenaren VvE | VvE Belang. Retrieved from https://www.vvebelang.nl/vve-informatie/over-vves/

- VvE010. (z.d.). VvE010 helpt je verder. VVE-010. Geraadpleegd op 18 september 2021, van https://www.vve010.nl/

- Warmtefonds. (n.d.). Het Nationaal Warmtefonds. Energiebespaarlening. Geraadpleegd op 18 september 2021, van https://www.energiebespaarlening.nl/

- WNR. (2021, 10 juni). WoonlastenNeutraal Renoveren. WNR. https://wnr.nu/

- Woonwijzerwinkel. (n.d.). WoonWijzerWinkel, de grootste duurzaamheidswinkel van

Nederland. Geraadpleegd op 18 september 2021, van https://www.woonwijzerwinkel.nl/

Appendix

Appendix I

This sections contains an overview of the different policy documents that were studied for this approach.

Dutch Government:

- Dutch Climate Agreement

Ministerie van Economische Zaken en Klimaat. (2019). Klimaatakkoord. Retrieved from https://www.rijksoverheid.nl/documenten/rapporten/2019/06/28/klimaatakkoord

Municipality of Amsterdam:

- Routekaart Amsterdam

(Gemeente Amsterdam. (2020a). Nieuw Amsterdams Klimaat - Routekaart Amsterdam Klimaatneutraal 2050. Retrieved from https://www.amsterdam.nl/bestuur-organisatie/volg-beleid/ coalitieakkoord-uitvoeringsagenda/gezonde-duurzame-stad/klimaatneutraal/#:~:text=Om%20 de%20gemiddelde%20temperatuurstijging%200p,met%20de%20uitstoot%20in%201990.) Transitivies warmte Amsterdam

(Gemeente Amsterdam. (2020b, August). Transitie Visie Warmte Amsterdam. Retrieved from https:// overmorgen.nl/wp-content/uploads/2020/09/tvw-amsterdam.pdf)

Municipality of Rotterdam

- Duurzaamheidskompas

Gemeente Rotterdam. (2020a, December). Rotterdams Duurzaamheidskompas. Retrieved from https://duurzaamo10.nl/app/uploads/2020/12/GRO-duurzaamheidskompas-okt2020-toegankelijk-spreads.pdf

Municipality of Utrecht

Visie warmtevoorziening Utrecht

(Gemeente Utrecht. (2017). Visie op de warmtevoorziening in Utrecht Naar een klimaatneutrale stad. https://omgevingsvisie.utrecht.nl/fileadmin/uploads/documenten/zz-omgevingsvisie/thematisch-beleid/energie/2017-07-visie-op-de-warmtevoorziening-in-utrecht.pdf)

- Transitievisie Warmte Utrecht

Gemeente Utrecht. (2021a). Plan aardgasvrij verwarmen: Transitievisie Warmte | Gemeente Utrecht - Omgevingsvisie. Retrieved from https://omgevingsvisie.utrecht.nl/thematisch-beleid/energie/ transitievisie-warmte/

Appendix II – Questionnaire for the board of condominium associations.

You are being invited to participate in a research study titled 'Stimulating condominium associations to renovate their dwelling for the energy transition. This study is being done by Stijn Olthof from the TU Delft.

The purpose of this research study is to see if the municipality's approach is in line with the barriers that condominium associations encounter in their decision-making process for a sustainable renovation of their dwelling. This is done by creating an overview of what the municipality is already doing and comparing this with the barriers encountered by associations. The research focuses on the decision-making process of a condominium association from the moment they first show interest in a sustainable renovation to the moment they have decided on someone to execute the renovation. This questionnaire generates the data that helps map these barriers and will take approximately 5 – 10 minutes to complete.

Your participation in this study is entirely voluntary, and you can withdraw at any time. You are free to omit any questions.

I believe there are no know risks associated with this research study; however, as with any online related activity, the risk of a breach is always possible. To the best of my ability, your answers in this study will remain confidential. We will minimize any risks by only storing the data on a local computer. The answers will be anonymised by only taking the type of condominium associations and the area of the building into consideration.

By filling out the questionnaire, you agree that the data can be used for research purposes.

For any questions, please feel free to email me at stijnolthof@kpnmail.nl .

The first part questionnaire consists of some general questions concerning the renovation and the condominium associations. The second parts focus on the different steps from the first interest to the last decision to renovate.

Kruis aan wat van toepassing is

- 1. How many members are there in your condominium associations?
 - a. 1-8 members
 - b. 9-50 members
 - c. 50+ members
 - d. Other, namely...
- 2. In which area of Amsterdam do you live?
 - a. Amsterdam Zuid Oost Reigersbos
 - b. Amsterdam Zuid Oost Venserpolder
 - c. Wnr place
 - d. Name different possibilities
 - e. Other, namely...
- 3. Where are you in the decision-making process?
 - a. Orientating
 - b. Expanding into research into different possibilities
 - c. Vote concerning feasibility study
 - d. Requesting quotes and setting up business case
 - e. Vote concerning the execution of measures
 - f. In the building process
 - g. Renovation is finished
- 4. What type of sustainable measures were part of the renovation? (more answers possible)
 - a. New frame and windows
 - b. Highly isolated walls
 - c. New façade
 - d. New heating system free of natural gas
 - e. New ventilation system
 - f. Solar panels
 - g. Other, namely ...
- 5. Did your condominium association receive help from outside of the condominium associations during the process?

(more answers possible)

- a. Yes, with finding the right information.
- b. Yes, by advice on the decision-making process.
- c. Yes, by advice about the renovation process.
- d. Yes, by advice how to communicate with other members of the condominium associations.
- e. Yes, by receiving information concerning the different possible measures.
- f. Yes, by help with determining the state of the building.
- g. Yes, by advice about the possibilities of subsidies and financial support.
- h. Yes, by other, namely...
- i. No, the board and the management did it by themselves.

6. How would you rate your interest in sustainability and the energy transition?

- a. Very interested
- b. Interested
- c. Neutral
- d. Not interested
- e. Not interested at all

7. How would you rate your knowledge about sustainable measures and possibilities for energy-efficient renovation measures?

- a. Very high
- b. High
- c. Neutral
- d. Low
- e. Very low
- 8. How often does your condominium association have general meetings?

9. What is your role in your condominium association?

- a. I am part of the management of the condominium association.
- b. I am very active member who attends all meetings and is up to date with what is happening.
- c. I am active member that regularly shows up at meetings and knows the important things that are happening.
- d. I am not active member and only show up at the most important meetings.
- e. I am not an active member at all and never go to meetings.
- f. Other, namely ...

The second part of the questionnaire

The second part of the questionnaire focuses more on the specific step from the decision-making process which is called the customer journey. Paradies et al. (2017) already analysed the customer journey of an energy-efficient renovation process of a condominium association (figure 6). They defined six steps in this journey which happen in every customer journey but not necessarily in that exact order. The different steps of the journey are shortly explained before the questions concerning that specific step of the journey.

Step 1

e.

There must be a reason for the journey to start which can vary from a big maintenance moment, to an external party offering their services or a member of the association who comes with the idea.

- 10. What was the reason your condominium association got interest in energy-efficient renovation?
 - a. I was interested and brought it up during a meeting
 - b. Someone from my condominium association heard it from a friend and brought it up at a meeting.

c. Someone from my condominium association saw a neighbouring condominium association make an energy-efficient renovation and brought it up at a meeting.

- d. A local initiative approached our condominium association, namely...
 - The board of the condominium association brought it up during the association meeting
- f. the management of the condominium association brought it up during the association meeting
- g. other namely...
- 11. What was the reason the decision-making process was started? (more answer possible)

- a. Willingness from the association to be sustainable
- b. Necessary maintenance (MJOP)
- c. For better health and comfort
- d. For financial reasons
- e. Other, namely
- 12. What was your reason to engage in a decision-making process for an energy efficient renovation?
 - a. I brought it and was very interested.
 - b. Someone else from my condominium associations brought it up during a meeting and I became interested.

c. Someone else from my condominium associations brought it up during a meeting and I did not care but went to the meetings and voted when required.

d. Someone else from my condominium associations brought it up during a meeting and could not care less and did not vote when required.

e. Other, namely ...

Step 2: Orientating

The second step is orientating where one of the members researches the different possibilities available for the renovation. 13. What barriers did your condominium association encounter during orientating about different energy efficient measures? (more answers possible)

- a. Not enough up-to-date knowledge about the measures
- b. Not sure where to find information about the measures.
- c. Not enough financial resources available from the condominium association
- d. No clear communication within the condominium association
- e. Not enough involvement the other members of the CA
- f. No one to lead the process (voortouw nemen)
- g. Difficulties with finding out the maintenance state of the building.
- h. Not enough knowledge to set up a business case.
- i. Difficulties with comprehending what the municipality is offering.
- j. Difficulties with applying for help of the municipality.
- k. Fear for the actual renovation process.
- l. Other, namely...

14. Were those barriers overcome?

- a. No, the process was stopped at this step of the journey. (Please go to question 36 and explain why)
- b. No, we are still in the process.
- c. Yes, with the knowledge of the board and the management.
- d. Yes, with help from the municipality.
- e. Yes, with help from a third party, namely ...
- f. Other, namely...
- 15. Did your condominium association receive help from the municipality in this part of the journey?
 - a. No, we did not receive help in this part of the journey.
 - b. No, not that I am aware of.
 - c. Yes, by advice about the process.
 - d. Yes, by advice about communication with other condominium association members.
 - e. Yes, by receiving information concerning the different possible measures.
 - f. Yes, by help with determining the state of the building.
 - g. Yes, by advice about the possibilities of subsidies and financial support.
 - h. Other, namely ...
- 16. Did you want help for your condominium association in this part of the journey?
 - a. No
 - b. Yes, by advice about the process.
 - c. Yes, by advice about communication with other condominium association members.
 - d. Yes, by receiving information concerning the different possible measures.
 - e. Yes, by help with determining the state of the building.
 - f. Yes, by advice about the possibilities of subsidies and financial support.
 - g. Other, namely ...

Step 3: Expanding into possibilities

The third step consists of further developing the possibilities and deciding which are achievable and to focus on.

17. What barriers did your condominium association encounter during this step of the process? (more answers possible)

- a. Not enough up-to-date knowledge about the measures
- b. Not sure where to find information about the measures
- c. Not enough financial resources available from the condominium association
- d. No clear communication within the condominium association
- e. Not enough involvement the other members of the CA
- f. No one to lead the process (voortouw nemen)
- g. Difficulties with finding out the maintenance state of the building
- h. Not enough knowledge to set up a business case
- i. Difficulties with comprehending what the municipality is offering
- j. Difficulties with applying for help of the municipality
- k. Fear for the actual renovation process
- l. Other, namely...
- 18. Were those barriers overcome?
 - a. No, the process was stopped. (Please go to question 36 and explain why)
 - b. No, we are still in the process and in this phase.
 - c. Yes, with the knowledge of the board and the management.
 - d. Yes, with help from the municipality.
 - e. Yes, with help from a third party, namely ...
 - f. Other, namely...
- 19. Did your condominium association receive help from the municipality in this part of the journey?
 - a. No, we did not receive help in this part of the journey
 - b. No, not that I am aware of.
 - c. Yes, by advice about the process
 - d. Yes, by advice about communication with other condominium association members
 - e. Yes, by receiving information concerning the different possible measures
 - f. Yes, by help with determining the state of the building
 - g. Yes, by advice about the possibilities of subsidies and financial support
 - h. Other, namely ...
- 20. Did you want help for your condominium association in this part of the journey?
 - a. No
 - b. Yes, by advice about the process,
 - c. Yes, by advice about communication with other condominium association members
 - d. Yes, by receiving information concerning the different possible measures
 - e. Yes, by help with determining the state of the building
 - f. Yes, by advice about the possibilities of subsidies and financial support
 - g. Other, namely ...

Step 4: Vote concerning feasibility study

The fourth step consists of voting about the feasibility study. After the feasibility study, there is a go – or no-go moment since there is a possibility the renovation plan does not acquire the votes.

21. What barriers did your condominium association encounter during this step of the process? (more answers possible)

- a. Not enough up-to-date knowledge about the measures
- b. Not sure where to find information about the measures
- c. Not enough financial resources available from the condominium association
- d. No clear communication within the condominium association
- e. Not enough involvement the other members of the CA
- f. No one to lead the process (voortouw nemen)
- g. Not enough knowledge to set up a business case
- h. Difficulties with getting everyone from the associations on the same page
- i. Difficulties with comprehending what the municipality is offering
- j. Difficulties with applying for help of the municipality

- k. Not enough members showed up for the voting procedure
- 1. Not all members were informed enough to decide
- m. Other, namely...
- 22. Were those barriers overcome?
 - a. No, the process was stopped. (Please go to question 36 and explain why)
 - b. No, we are still in the process and in this phase.
 - c. Yes, with the knowledge of the board and the management.
 - d. Yes, with help from the municipality.
 - e. Yes, with help from a third party, namely ...
 - f. Other, namely...
- 23. Did your condominium association receive help from the municipality in this part of the journey?
 - a. No, we did not receive help in this part of the journey
 - b. No, not that I am aware of.
 - c. Yes, by advice about the process
 - d. Yes, by advice about communication with other condominium association members
 - e. Yes, by advice how to inform other members of the condominium association
 - f. Yes, by receiving information concerning the different possible measures
 - g. Yes, by advice about the possibilities of subsidies and financial support
 - h. Other, namely ...
- 24. Did you want help for your condominium association in this part of the journey?
 - a. No
 - b. Yes, by advice about the process,
 - c. Yes, by advice about communication with other condominium association members
 - d. Yes, by advice how to inform other members of the condominium association
 - e. Yes, by receiving information concerning the different possible measures
 - f. Yes, by advice about the possibilities of subsidies and financial support
 - g. Other, namely ...

Step 5: Developing business case and requesting quotes

The next step of the journey consists of requesting offers and setting up a business case (5). When the board of the condominium association sees this as an appealing plan, it can be put to vote during a members meeting.

25. What barriers did your condominium association encounter during this step of the process? (more answers possible)

- a. Not enough up-to-date knowledge about the measures
- b. Not sure where to find information about the measures
- c. Not enough financial resources available from the condominium association
- d. No clear communication within the condominium association
- e. Not enough involvement the other members of the CA
- f. No one to lead the process (voortouw nemen)
- g. Not enough knowledge to set up a business case
- h. Not enough knowledge on how to request quotes
- i. Difficulties with comprehending what the municipality is offering
- j. Difficulties with applying for help of the municipality
- k. Fear for the actual renovation process
- l. Other, namely...

26. Were those barriers overcome?

- a. No, the process was stopped. (Please go to question 36 and explain why)
- b. No, we are still in the process and in this phase.
- c. Yes, with the knowledge of the board and the management.
- d. Yes, with help from the municipality.
- e. Yes, with help from a third party, namely ...
- f. Other, namely...

27. Did your condominium association receive help in this part of the journey?

- a. No, we did not receive help in this part of the journey
- b. No, not that I am aware of.

- c. Yes, by advice about the process
- d. Yes, by advice about communication with other condominium association members
- e. Yes, by receiving information concerning the different possible measures
- f. Yes, by help with determining the state of the building
- g. Yes, by advice about the possibilities of subsidies and financial support
- h. Other, namely ...

No

- 28. Did you want help for your condominium association in this part of the journey?
 - a.
 - b. Yes, by advice about the process,
 - c. Yes, by advice about communication with other condominium association members
 - d. Yes, by receiving information concerning the different possible measures
 - e. Yes, by help with determining the state of the building
 - f. Yes, by advice about the possibilities of subsidies and financial support
 - g. Other, namely ...

Step 6: Vote concerning execution

This is the sixth step in the process and here is decided if the renovation does take place (6). This only happens when the minimum number of votes is met. For each step of the journey, different barriers can be encountered

- 29. What barriers did you encounter during this step of the process? (more answers possible)
 - a. Not enough up-to-date knowledge about the measures
 - b. Not enough financial resources available from the condominium association
 - c. No clear communication within the condominium association
 - d. Not enough involvement the other members of the CA
 - e. No one to lead the process (voortouw nemen)
 - f. Not enough knowledge to set up a business case
 - g. Difficulties with getting everyone from the associations on the same page
 - h. Difficulties with comprehending what the municipality is offering
 - i. Difficulties with applying for help of the municipality
 - j. Not enough members showed up for the vote
 - k. Not all members were informed enough to decide
 - l. Other, namely...
- 30. Were those barriers overcome?
 - a. No, the process was stopped. (Please go to question 36 and explain why)
 - b. No, we are still in the process and in this phase.
 - c. Yes, with the knowledge of the board and the management.
 - d. Yes, with help from the municipality.
 - e. Yes, with help from a third party, namely ...
 - f. Other, namely...
- 31. Did your condominium association receive in this part of the journey?
 - a. No, we did not receive help in this part of the journey
 - b. No, not that I am aware of.
 - c. Yes, by advice about the process
 - d. Yes, by advice about communication with other condominium association members
 - e. Yes, by advice how to inform other members of the condominium association
 - f. Yes, by advice about the possibilities of subsidies and financial support
 - g. Other, namely ...
- 32. Did you want help for your condominium association in this part of the journey?
 - a. No
 - b. Yes, by advice about the process,
 - c. Yes, by advice about communication with other condominium association members
 - d. Yes, by advice how to inform other members of the condominium association
 - e. Yes, by advice about the possibilities of subsidies and financial support
 - f. Other, namely ...
Final general questions

The final part of this questionnaire consists of some closing general questions

33. Would you recommend a sustainable renovation to others (only answer if the renovation is finished and explain why yes or no)

- a. Yes, because ...
 - b. No, no because ...
- 34. What were your biggest concerns when starting the decision-making process?
 - a. The state of the building
 - b. Getting the finances right and making it profitable
 - c. Understanding what would be happening to my house
 - d. The process with the rest of the members of the condominium association
 - e. What would be happening after the decision-making process was finished during the actual renovation.
 - f. Other, namely ...
- 35. What was the hardest step in the decision-making process?
 - a. Understanding the possible help the municipalities offers.
 - b. Applying for help of the municipality.
 - c. Finding the right information about the different energy efficient measures and understanding it.
 - d. Finding the right information for setting up the business case and understanding it.
 - e. The group decision-making process of the condominium association.
 - f. Other, namely....
- 36. Why was the decision-making process stopped? (only answer if applicable) The decision-making process was stopped because....

Appendix III – Interview quotes

Appendix III.1 - Quotes interview with Project Leader condominium associations Amsterdam.

A1: Exactly, but these are the plans, because we are discussing with the G4 (Amsterdam, Rotterdam, The Hague, Utrecht) as they see the same problem with BZK and RVO and that we need to look at what can fix on a national level and what municipalities should do.

A2: Because we started working together with the G4 for the first time. That was not something from before. That has of course to do with that the actors from the G4 know each other. I am in Amsterdam now but I know the situation well in Rotterdam. It is not like someone has left, the same people are still occupied with the task. They are in the other cities as well and see the problems there.

A3: I am in talks with Rotterdam to see if there are similar lessons we have learned and that we can place in a program. A national program, VvEo31, is still early and a challenge but we are trying to see if we can use the lessons from the G4. I think around 40% to 60% of the condominium associations is located in the G4 and the areas around it. We want to use that to help the G20 municipalities who also have a lot of condominium associations on their way so that they do not need to go through the same development as we did. So they can make use of our process.

A4: Research showed that condominium associations need independent information as they could not find that.

a5: And you have a party that can guide on a decision-making process, on that process I was talking about and then also on the content. Then you can cover some distance. This is not logical as you understand that condominium associations are no professional clients.

A6: So you consider the heat loss and the energy usage of the building and translate that to the housekeeping book of the condominium association. What is in the long term maintenance plan? Are they saving for big maintenance? You look at those things and how to translate it to becoming free of natural gas and when to make the transition.

A7: That there is the question of what you put out, how to combine it and how to judge quotes you get in return. Some guidance will come for that process.

A8: We are now starting with offering guidance to condominium associations but with a large sum of money. We hope that we can create a product in this way that condominium associations can use to make a decision. That they pay for it because it saves them money and advice is not free. So that is already difficult in the decision-making process. When we are scaling up, we want to train more process guides that can be paid by condominium associations.

Appendix III.2 – Quotes from an interview with employee innovation department in Amsterdam.

B1: That means we also look at Reigersbos and the experiment of Klimaatmissie so to say. What is happening there? How are things done? How do we approach residents? How is the residents' participation in the area, where you are focussing on? Also with what are the best technical solutions? What blueprints can we develop? And so on, and so on. What other options are there?

B2: I notice that the departments do not communicate that well with each other internally making it also more complex externally. After last year, I got involved with large-scale renovation projects to develop some kind of code for developing and scaling projects such as Reigersbos and South-East which can be used in other neighbourhoods.

B3: There are some challenges and one of them is accountability, vertically so to say to your program or director. What you see is that people should start communicating on a managing board level. The managing boards of housing, space and sustainability to which natural gas belongs, and maybe innovation, need to start talking with each other. What you see is that different dossiers come back because people barely talk with each other. People talks with each other but it is not a shared responsibility for the task. On the one hand, the communication is there and the teams talk with each other but there is still accountability. To whom should you report and be accountable? What are the goals? Are they the same? What should come together in these projects? That is not happening right now.

B4: Renovation goes deeper. There is a domain transcending problem. So you have the goal to become free of natural gas but many departments have something to do with that.

B5: To redevelop yourself to accomplish that mission. That mission thinking and thinking from a larger assignment is what must happen. It does not matter how it starts or with a bigger role for the government but we should start focussing on the goals of getting a climate-neutral city by 2050.

B6: When something is really active and does the work with a lot of passion like Richard then you come against some internal barriers because it is just very difficult to move on which can result in the motivation dropping with other employees. This is what we see with different innovation projects. At the municipality, we see if we want to organise something, we should do it differently. More from a multidisciplinary team and thinking from the problem as opposed to thinking from the organisation. Those are the barriers we come across and which are not new.

Appendix III.3 – Quotes from interview with Project leader climate and innovation in Rotterdam.

C1: And it is even the opposite with things coming from the national government as they do consider condominium associations less. It is getting better as there is a loan no wand sometimes a subsidy but what they really need is support for which money flows are required.

C2: Well with these money flows. I have been there before as I once worked in Rotterdam before with the GGD but also about sustainability and healthy building. Then, Leefbaar Rotterdam came to power and the environmental department was completely destroyed. A couple of obligated departments were sent to the regional environmental service. I was still out of range because I was at the GGD but after a short time, there were no new assignments to work on.

C3: But when you look at the housing of your people, many people in Rotterdam is more vulnerable due to overdue maintenance. This is part of the situation. There are also a lot of poor people that we do not know about who must have somewhere to live.

C4: That (=VvE010) was once founded with social housing corporations. In comparison with other cities, the social housing corporations did a lot of with founding condominium associations where they sold a part of their dwellings which created speckled property. Therefore, it was logical to start this

together but a large part of the work was activating condominium associations.

C5: We also get a lot of hassle from it. When we want to give a subsidy from tasks from the municipality to VvE010, then there are those rules of state aid and all that sort of thing. This loses us a lot of time. If you want to send it directly, the question remains if you must put it aside.

C6: There are not many companies that do that work at all. With all the construction and installation work, and the ones who are good with new and high-quality techniques, there is a shortage of manpower. So it is very difficult for condominium associations to find one, especially as they need more time to decide and must ask for many quotes as many companies leave them behind.

C7: We must offer them help and knowledge as they need that for the next time. So that next time they must fix something, they can do it by themselves.

C8: Condominium associations must be comfortable with the role as a client which comes with the necessary required knowledge, motive and financial possibilities.

C9: How can we make it more fun because it is not easy. They are dragons of things that they must push through the meetings. But how you do get the atmosphere more cheerful and become more modern. We should focus on that. They will remain associations that require structural energy. I am more of the condominium association science and try to see how it can become more fun for people to be on the board. Before understanding it well, four years have past and then it is only really starting.

C10: Every time something is organised or set up, it is without condominium associations in mind.

C11: These (instruments) are always aimed at the short term as the subsidies are usually only available for a year and then something new is made up. But when you look through it, it is usually the single homeowners who profit and when condominium associations start to get interested, it is usually too late.

C12: But getting together we a condominium association and getting clear how to request a quote to different market parties. How to judge these offers. What is needed right now? What is needed later? You can earn more on that than with a subsidy. You do not always have to give them money.

C13: I think that at this moment Rotterdam is number one with what they are doing for condominium associations, being there and visible, developing programs. But also in Rotterdam, there is room to do ten times the things that are happening right now.

C14: And Rotterdam is a systematic step further as a procurement process has started for process guides to start in September in the municipality. A VvE010 or guide or coordinator helps them. We are now searching for external advisors who can help these condominium associations.

C15: Moreover, we are setting up a fund for more irregular advice. If people (condominium associations) must undergo a divergent process, or only have questions about specifics part, or just judicial advice, or how to renovate with their dwelling being a monument and dealing with Welstand, they can go there.

C16: I think that municipalities should do more for tenants and shared owners, everything that concerns living for the living space or outdoor space. The focus should be more on the group process and setting things up on a neighbourhood level as opposed to the individual. More long term thinking than short-term thinking. All these short term actions miss setting up networks between the associations.

C17: For myself, I like quality and combining things as we are doing with the insulation regulation

which is mostly focused on biobased materials. I am designing this regulation so you will not get the subsidy if you use dirty materials. Are your materials safe and healthy? This way you fix things for 30/40 years and there are no loose ends which is also the job of the municipality.

C18: Yes and this is actually the goal of condominium associations. To improve or at least maintain itself but also to improve. It can also go about other things (than sustainability) such as living space, value development, a cool temperature in the summer, high accessibility and safety.

C19: Back then it was still a bit early for everyone to do what I was planning but the desire to talk about experiences with each other was there. And if a municipality with a small budget wants to join, they can take part and learn. It is really informal and aimed to help each other.

Appendix III.4 – Quotes from interview with the Director of VvE010.

D1: In 2016, the municipality (of Rotterdam), not the social housing corporation, asked us to also become an information window for the sustainability of condominium associations. Not just for the south of the city but the whole city. So since then, we are doing that as well. It is kind of a mirroring approach as in the South we are searching for smaller not functioning condominium associations but since then we are also looking for bigger well-functioning condominium associations to help them with the next step.

D2: That takes some thinking. How do you communicate? How do you ensure your findability? That is important for us and we are assisted in this by an IT company. And I have to say that I am not dissatisfied with how things are going as we getting a lot of views. 30.000 unique vies yearly, also thanks to our information meeting. That is the moment to start a client relationship and to convince someone to sign up for our monthly newsletter. As of right now, we have a subscriber file of 1800 people. So we are slowly but steadily growing and establishing our position for that focus group.

D3: I notice that in Rotterdam many residents are very critical of the municipality. Because we are not the actual municipality, people complain to us about a lot of things that are wrong with the municipality. But we can not and do not have to fix that while when they are with a municipal official, they will give them a very hard time. On the other hand, we are free to help them and get straight to the point. This is also helpful for the municipality as we are helping to meet their goals for the energy transition.

D4: It is kind of in collaboration with the municipality (doing research). Because that is useful to do and with idea from we are doing this but we also have to try some things. So in our year plan, we have several pilots where do research and some are with the resources of the municipality.

D5: The combination is of course what works best. What a nice instrument is and that absolutely helps when you are talking with condominium associations, is the loan for condominium associations. That loan has a long duration and low interest so it is very useful for big investments from which you can pick the cherries right away while paying them back over the next 20 years. As of right now, the national regulations are not attractive enough and not fitting with the demands of condominium associations as they often want to combine things. Not only fixing the problem of insulation but also doing their balconies. Rotterdam is fixing that with its own loan which covers about five million. But with all respect, that money is gone with a few big condominium associations.

D6: We get a subsidy for our information window function. But we also have some freedom in that. Because we get a subsidy, we also have to give some presentations, organise annual meetings, give classes and that kind of stuff. That is okay as it fits with our annual internal goals. This is where we get our resources from and that contact is going okay but we like to go to a more periodic system of financing.

D7: We are working together with the municipality of Rotterdam. First, there was a European budget but now is from the municipality. From that budget, you must work with procurement rules. Parties are selected from a procurement procedure and later they are matched to a condominium association by the organisation (VvE010). You have to see as the municipality and the government are investing in guiding condominium associations and VvE010 is the information window, does communication, kind of account management.

D8: We also have the Woonwijzer Winkel. They can advise on the choice of material, design insulation material and so on. It is a real place/store where people can go if they do not know what to do but are willing to a more comfortable and energy-efficient house. Then the search trip starts for the different scenario's and what they cost and translated into living costs. It is a quest for which a condominium association has to take different steps.

D9: Now, there is a VVE network in Rotterdam. So there are active owners of owners associations and who meet each other. With a lot of support from us, they will share knowledge and help each other if things go wrong.

Appendix III.5 – Quotes from the interview with project leader condominium associations approach and energy in Utrecht.

E1: When something is regulated on a national level, it does not need to be regulated extra on a local level is the view municipality of Utrecht. The national regulations are being used.

E2: When something is not regulated on a national level, municipalities must organise or regulate something on a local level.

E3: This year we start talks with the four biggest cities so with Amsterdam, Rotterdam and The Hague to see how can we organise ourselves to have a good approach for the smaller condominium associations.

E4: I am approachable to all people in Utrecht who are part of condominium associations and I am just helping them. To start, it does not matter what type of questions they have. It is not only focused on energy-related issues but also on people who just have a question about condominium associations. This way, we want to ensure the accessibility and the approachability to answer to people. But also help people who want to become more sustainable and how questions for how to do this.

E5: The construction market is overstrung. You get idiotic prices or you do not even get an offer at all. I feel like condominium associations are encountering this and that this is the reason they can not realise the renovation.

E6: There are always people who are leading the way and who knows everything. But gross of the people do not know anything about it at all. You must ensure that these people are also convinced and taken along in the process. We try to help condominium associations with this. How do you do this? We try to combine maintenance and sustainability.

E7: The municipality of Utrecht highly values feasibility and affordability for all people (in their approach). This also goes for the people with a smaller wallet.

E8: When such a piece of energy advice arrives with condominium associations, people still need to request quotes. But what is in it (the advice)? You can isolate the floor, the roof and add new window

frames. And then what? That only starts for the condominium associations (the process of figuring things out)

E9: Question: the problems you encounter with larger condominium associations who want to become more sustainable, are those more related to creating a supporting ground of knowledge questions? Answer: I think, both. As you said in the beginning, the situation with condominium associations is very complex.

E10: What is going on in a specific condominium association and how do we connect to that. That is one of the most important means to create a supporting ground.

E11: We start with an intake meeting where we send the associations a form where they need to answer questions like; How big is your condominium associations? To save more for renovations? How are decisions made? What are the sustainability plans? Is a long term maintenance plan present? Do you save for maintenance? The basic issues you want to know before talking with each other. Then a conversation follows with the condominium associations where the condominium associations are discussed, their problems, issues and ways how to improve them.

E12: And then I inventorize. Together (the municipality of Utrecht and condominium association), we start looking at what would be a good next step for the condominium associations. What happens often is that energy advice needs to be made.

E13: The next step, after the report and energy advice is delivered, comes with the condominium associations getting to business. Also in the report, options for subsidies are given and how to get them are given. We assume that the advising party has an interest in the advice turning into a renovation and therefore assume that they want to stay in contact with the condominium association.

E14: We advise the condominium association with the idea that the market is mature and that with a good report condominium associations know how to take the next steps. However, we always tell the condominium associations, if you have any questions, you can always come later for help.

E15: So if you look at our agenda, for instance, you can see that there is a webinar for the South-West on the 21st of April. All people or that area are invited to join also people who live in apartments. It starts with a general meeting where we tell something about the transition vision heat. What the municipality is doing. The transition vision heat is coming and what does this mean for you and your neighbourhood. People have a lot of questions about these things. After that half-hour, we split up into three groups, one for companies and social real estate, one for private owners, homeowners and tenants and one for condominium associations. Then you have the general part and the more specific part where we address what (can) happen for condominium associations on the neighbourhood level and how they can react to that.

E16: We are not sure about that (continuing the information nights next year) but in principle, I expect we do. It depends on how many people join every year. But also because the vision for the energy transition will be there so then we have to tell a different story. And every year we want to reach as many people as possible. This approach is aimed to reach as many people as possible so also condominium associations that are not registered to the KvK.

Appendix III.6 – Quotes from interview with program officer for development districts and natural gas free from Stitching!Woon.

G1: Just before the summer start, I sent out another questionnaire and it was as well responded to as your questionnaire (= almost no response)

G2: So I got a lot from the corporation and the oldest central heating boiler in Venserpolder is from 2017. That is on two blocks and other blocks they were replaced in 2019, 2020 or 2021.

G₃: The situation differs for each condominium association. All condominium associations knew that they must do something with their facade but with some, it is worse than others. Some facades are not waterproof and it leaks their often. But some apartments are waterproof.

G4: Reigersbos is part of a development neighbourhood which are areas where extra investments are needed. Reigersbos is one of the important shopping areas in Gaasperdam. The plan was to add housing and to lower the Reigerbos Dreef. When proposing this plan, you should also address the area around it. The residents from the neighbourhood and the condominium associations were struggling to replace their facades. The municipality saw this as a nice combination to turn into a project.

G5: Since it was not only part of a development neighbourhood but also part of one of the neighbourhoods that would become free of natural gas, other projects in that area were put on hold to see the outcome of this transition process would be. This project would become an important indicator for what should become the new heat source in Reigersbos.

G6: Technically the municipality of Amsterdam was never the client but it chose Venserpolder as a development neighbourhood and one of the starting neighbourhoods to become free of natural gas. This is the reason they started an investigation with all the parties that own something on the ground or below it. Parties such Liander, Vattenfall, Waternet and so an.

G7: Venserpolder is a neighbourhood that consists of 16/17 condominium associations and some tenant blocks that all have a different state of maintenance. Moreover, some have collective ventilation, some have individual ventilation but all have individual heating boilers.

G8: Apart from the owners who live there are the social housing corporations. They own around 50% in every building in the area. In some a bit more and some a bit less.

G9: During one of the annual meetings of the condominium associations (in Reigersbos), Klimaatmissie was put forward by the municipality with the message of; these people have a plan for you dwellings for how to renovate it. That is 1,5/2 years ago.

Gio: Also because there was no financial investment required from the condominium associations by Klimaatmisse, they went along with it as they were interested to see what would come from it and it did not cost them anything. And they could get something nice in return.

G11: (Klimaatmissie) came with different scenarios which that had from an earlier project and gave these as options to the condominium associations. They give an estimation on the long term maintenance plans and the savings of what the cost structure would look like.

G12: The most important cause (from the process is on hold now), which is of course way easier to name afterwards. Afterwards, it is always easier to pinpoint these things but, technically, it comes down to the program of requirements and the commissioning. It was not defined clearly enough what the residents had to say and wanted.

G13: But in 15 years the subsidies will be gone, that is true. So from an economic point of view, you would

say; if you want to you city heating (= Stadswarmte), you should go for it now as right now it is possible to stack subsidies.

G14: I think there was a misconception with the municipality as they were only using condominium associations with block heating but with Venserpolder there is no block heating. They all have individual heating systems and there is no shared infrastructure for heat distribution. This means that connecting to the heating grid is much more complex as every apartment much be connected separately. From the meeting with individual residents, it became known that the situation was way more complex than first conceived. Moreover, it turned out that all the individual heating systems were recently replaced with the oldest dating back to 2017.

G15: This means that if you switch to Stadswarmte now, you make a firm disinvestment. When looking more closely and at the facts, it is not that bad as there are subsidies to compensate. But it does not take away that there was a renovation last year and this may be one again. That is not a popular decision.

G16: I made a walk last week through Venserpolder and then you still see a lot of first-generation double glass with double slide space so to say. But this is never the same quality double glass as we have now and that means that becoming free of natural gas is competition with a renovation.

G17: You can not give those kinds of directions. I think you should really get to work. What do the long term maintenance plans look like? What must happen in the long term? Can we move things forward or push them back? What does it mean in terms of saving money? Which heating solution is the most logical?

G18: When I see the message of the different boards of the associations in Venserpolder, you see a clear image of let us first fix our long term maintenance plan so that we can make the transition in 15 years. That means we must start saving and make a plan for maintenance and renovation so that we are prepared.

G19: For a large part, it concern price buyers who have bought the apartment because they could afford it and it was cheap. They do not have a real connection with the rest of the building and do not have a sense of co-responsibility of the building. They focus on their own apartment and if that is okay.

G20: The model home was realised and it was asked to sign the intention agreement so that it was clear how many condominium associations would join at least and whether it was useful to further develop the plan because that costs money. So it was clear how many people joined.

G21: That is also the pitfall. As they are not the client which makes the working structure very unclear. Klimaatmissie is occupied with a model for the neighbourhood. The municipality of Amsterdam also has a role and looks at what is happening. And we as Stichting !Woon in the name of the residents have a role and mostly focus on what is to gain for the residents. The municipality mostly looks at subsidies, technical reasons and financing reasons.

G22: This is exactly why the process is so difficult to follow with everyone's role in it. Slowly the condominium associations are starting to see this for themselves and saying they want and must take on the client role themselves. This is also a difficult task because they are with 10 condominium associations that must figure out how to work together.

G23: about the struggles of what is nice to have for a renovation

That golden package is of course a package, but the question is whether you actually want the entire package. Yes, because uh. Umm no. You've seen that facade that separates you. I know you have a

problem with your gallery on the second floor. Yes, so they are also VVE's who say yes. But if I look at the subsidy conditions, then it is not necessary at all to go to a value of 6 or even everything to get that subsidy. Then 4 is actually enough. And what does such a facade of 4 looks like and if I take a facade of 4 I can also go all-electric? And if I don't have that problem on that mezzanine. That saves me a lot of money. Yes. So in that sense too. Is there reasoning behind it and some people say yes, wait a minute. But if I go to an all-electric system then I get low-temperature heating. That means I won't have to open my window to sleep in the winter. Because then my habitation cools down too much? But can I not compartmentalize my home, so that I insulate the living room, erm, high-quality, heat it at a low temperature and insulate my bedrooms low-quality and possibly with an infrared panel. A little extra heat when it gets really cold. So yes. Uhm, the packages as developed and named by Klimaatmissie. Yes, the residents will now also ask about this, is that very smart? Because if she only has to go to sleep at a room temperature of 20 degrees or nineteen degrees. So go home. Now it is not pleasant, but it is also not good for your resistance. And yes. So health aspects can even be attached to it. Yes, uh. So if if you're sitting in 19 degrees all night and you're sitting in an office at 21 degrees and you come back home and it's at 19 degrees. Yup, you don't come into contact with that uh, with that temperature change any more. Yes. Yes, and someone who works in his bedroom so to speak and has a 3-room house has a bedroom or works in the small bedrooms and an office and a large bedroom. Dei has a completely different need here because he needs 21 degrees in the office to be able to work comfortably. So in heating with a high temperature, you have no problems with that, because then you just open the tap. But with the lowtemperature heating, these are things that you have to take into account.

G24: Actually, here the biggest barrier is that not enough research was done into the wishes and demands of the members of the condominium associations.

Residents were not involved enough in that process (the process of orientating and researching different possibilities) as that never really got off the ground. For me, that should be the start of the process.

G25: The core group, that often comes together in the model home, realises that now because they notice it is pretty hot there. They start to realise if we built a dwelling like this, it means that we move to find something when the temperature rises. We must do something with or lifestyle of something else.

G26: For your image, during my holiday, they (= boards of the condominium associations or representatives of them) came together in the model house on a regulatory base to meet and discuss with each other.

They are starting to organise which is good to see and, hopefully, means a good start.

G27: But the programme of requirements is what the residents struggle with. But that also became clear during the meeting in the holidays that they change small things in the program of requirements to see how it can be smarter, cheaper and faster.

G28: Klimaatmissie has opted for a heat pump with a very small amount of cooling. air-water heat pump monobloc. uh. With a degree or 4 cooling in the summer. Do you now see residents who say yes, but if I can cool with an air conditioner, I can also heat with the air conditioner? And isn't an air conditioner a better thing for me? Uh, if I have to lower the temperature, then this. This heat pump with monoblock with this air-water heat pump. Because when I have to cool down in the summer, I have all the sun on my roof. So I just have all the electricity directly on the roof. It doesn't cost me anything extra. And in the winter, yes, then I may have to buy some extra energy. But then I am comfortable in all seasons. Yes. So you can see that at once and that is why it is very important to take residents very clearly through the seasons. In the Eisen program, however, the residents will be able to set a good example for a good performance, so that you don't say anything new now. But six months of experience with the model home at once concludes opportunism. We actually wish this wouldn't. After the Climate Committee has in the meantime prepared agreements with the organization that will lend the money to give the

subsidy, it has prepared agreements. And so on and so on. So do you have the chance that they will have to go back to those same authorities later, we say? The residents don't want anyone else, do they?

G29: From every condominium association, I think one person is at least part of the core group that further develops the plans. But they remain residents so you can see them as frogs in a wheelbarrow that you have a push in the right direction. That requires some management skills.

G₃o: You notice in both with Reigersbos and Venserpolder that meeting the quorum during the meetings is almost everywhere a tough battle. During some meetings, people must be called to be able to make an eligible decision. That is the standard.

G₃₁: When you have one condominium association with 1000 apartments and 500 individual owners and one major owner, it is really difficult to have a decent meeting.

G32: Until the moment of the model house, many residents could not create an image for themselves of what the renovation would mean. These residents can not read from a technical drawing. You (= Stijn) have followed education for this so I can assume you can read from a map and be able to visualise it. The same goes for me (= Baudouin). But these residents are not capable to read these drawings. They see the image but it means nothing to them. That only happens when they step into the model home and see something that looks fresh, clean and comfortable.

Appendix III.7 – Quotes from interview with Spatial and strategic advisor from Klimaatmissie.

H1: But in the base, it concerns the question the condominium associations came to the municipality with. They required new facades but the question and answers were not matching with the initial questions. I looked at that earlier but could not afford it.

H2: They could not afford that, so we said if you want a different answer, you must also ask a different question.

H₃: In the first project, there was only one scenario which was the golden scenario. The municipality of Amsterdam wanted to see multiple scenarios with the golden scenario at the end of the spectrum.

H4: We look at the total cost of living. If you fix the facades, that will cost a lot of money and not bring you that much. But if you add other costs, you can start generating money. Especially when you anticipate things in the future future or the near future.

H₅: You see that people can understand that. That is also the reason that eventually most people chose long term certainty which is the reason my people signed the intention agreement.

H6: And then there are two or three different types of people who find that difficult (to get on board with the renovation). The first type is the investor who is in it for the quick win and wants to invest as little as possible as housing prices or going up anyway. The second one says; I am only still living here for 5 more years so why should (invest in something that takes 30 years to earn back). That does not work and that person is worried about getting their money's worth. The third type could not save up money with the current situation so they just can not afford it.

H7: With the other project the residents themselves needed to pay for the preliminary stage of the process which makes it more difficult. After the start, the residents needed to invest right away which led

to an increase in the service costs. This time it was tried to prevent that and to present the condominium associations a plan before committing. That seemed like a smoothening of the process.

H8: What was clear anyway, is that they needed to do it for themselves and go after it by themselves. They could not hide behind the advice of others or be taken by the hand through the process.

H9: This also means you see less commitment with the other condominium associations (the ones in Reigersbos) as they are not paying. They are not that committed and are not putting there should under it to push through. I also noticed this in my own practice where I worked as an architect. When people ask you to make a plan and draw something, nothing happens. When you draw something and immediately send an invoice with it, they start to think; I paid for this, let us get in on.

H10: Subsidies are only paid at the end of the process as a sort of reward to pull them over the line. But at that moment, you must already have invested yourself and you just make it. While the biggest problem is, I (interviewee) believe, starting the process and the beginning. So the subsidies are of best use at the start of the process to get an offer and a plan that is trustworthy and can be paid for.

H11: The result is that the subsidies help the people who already can pay for it. For those people, it becomes easier. The subsidies make it more attractive for the people who were planning on renovating anyway.

H12: Almost nowhere that was correct (the long term maintenance plans). Legally condominium associations are required to do so and to be healthy otherwise a real estate agent can not sell the apartment. They must be registered to the KvK, have a bank account with some money on it, come together at least once a year and save some money. But if you think about two questions arise. If you save 1,5% each year and you need fifty years to complete the cycle. Does it work then? If so, then everything is okay. But the legal obligation only requires 10 years for the long term maintenance plan.

H13: That is quite a long time (10 years). But what if your maintenance cycle takes over 20 years and leaves certain building elements out. Are you saving enough money then? This is not to blame condominium associations but happens to everyone.

Appendix III.8 – Quotes from an interview with a board member of the condominium association of the Lucellestraat.

I1: From the condominium associations, there is an interest in becoming more sustainable. Multiple members have shown interest in sustainable renovations.

I2: In general, it is a hot topic. The interest in becoming more green is there anyway. Multiple times people have come and said, can we have solar panels on the roof of something.

I3: There is also interest from the social housing corporation, Stadgenoot, which have many dwellings in the building.

I4: The municipality has been lightly pushing Stadswarmte as a solution to become free of natural gas. I believe that is their plan for their whole neighbourhoods and all condominium associations in the area as a big joint project.

I5: 'What is the best way to start becoming more sustainable? Should we start with adding extra isolation?

'If we renovate the façade now, does that mean we can not paint the staircase? Or is that budgeted separately? What must happen in the building and how important is it and right now? When have we earned our money back? Are we earning our money back?

I6: I can think logically but I do not have any knowledge about buildings.

I7: But the information distribution? There are so many questions and all goes so slow. So when the information arrives, you have forgotten half your questions. There is also some resistance from the members since it is quite an investment while Stadverwarming is not yet a sustainable heat source. You read that it will become more in the future but not at this moment. So there are questions about that. But also about the monopoly position with other suppliers.

I8: Because how do you do that? Should there be a connection for all the different apartments? How do divide the electricity? How is this done and how much for who? If you generated electricity can you give that back to the grid and does that stay like this?

I9: You talk to people. I already know quite some people who have solar panels on their roofs but they have their own homes. So it is not that simple. You read some things, you watch an episode of 'Zondag met Lubach' about sustainability and energy. You read from different sources and google about sustainability and you find all kinds of things. But what is true and what to do with it?

Ito: there are so many options and opinions. When you discuss the birthday of your uncle, everyone has a different opinion about what you should do and what is best. Everyone read and heard something, somewhere. But in the end, there are no experts and how do you filter that and how do you apply it to your specific situation?

In: It brings a lot of questions. And in the end, you can not see the threes through the forest anymore. Then we decided to talk to a neighbouring condominium association where we knew someone on the board. She told us about WNR and that we should look into it.

I12: We talked to WNR and then we thought; what you are offering is so much more than the municipality or Stadswarmte. That raises so many questions. The municipality offers all types of help and subsidies which is nice but I rather work with people who have a clear story. WNR can fix it all.

I13: But from mostly the doubt of people, we started looking at alternatives and came across WNR. They offer the whole package with research, fixing everything and even applying for subsidies.

I.14: I think so. We got a tip from someone and before that, we were of course busy. But where do you start? With Stadswarmte, there was much doubt about what we were going to do. And then came this party (WNR) and came across as very trustworthy. I think they fill a gap in the market that is really necessary.

I15: But I would definitely talk to the municipality if it is something like the judicial window of the sustainablity window. But that you can go there and say; this is our condominium association and it looks like this. What can we do best? Should we add insulation first? This is WNR, would you recommend them. I expect to see specialists who can give information about the total package.

Ii6: And there are some people with clear questions that are interested. Some people you never see. You always have to deal with all different types of people. You have people who think about the investment and earning that back. But this is also about saving the plant but also about if your house becomes more valuable. If it is easy to sell and whether you make money with it. Those are all different motivations

and you have to get those people on one line.

I17: But now you have to think of these yourself and make them. The municipality could help with that in providing materials for clear figures and graphs and that sort of thing. That could help a lot. Even if it is just once every time with an email to the residents about the state of affairs; we are working on this and we can send it as a preparation for the meetings.

It8: Another obstacle has to do with my ability to present. I am afraid of presenting so when I am in front of a group, it becomes even more difficult. I am a young woman so I do not have any natural prevalence as opposed to someone who works in the construction business or who has been doing the job for a longer time. I see that as an obstacle. How do you convince these people? This is always difficult every way you go because it is a lot of money where owners usually do not have a good view on. How much money do we have as a condominium association? What are the consequences

has the decision? Everyone has access to the documents but no one looks at them. I19: Now you have to think of these things yourself. If the municipality has good materials about that

I19: Now you have to think of these things yourself. If the municipality has good materials about that with clear figures, graphs and numbers that would help a lot which you can use to show your own plans. That would definitely help a lot.

I20: They are affordable. You know for sure they are not out there to take your money. They look very suited to distribute information.

I21: Taco is already on the board for some years. Noël and I only joined last year. We are living next to each other and have a really good connection. Moreover, we are both interested in plants, green thinking and sustainability and figure why not join the board to help with these things. Even more, because the information provided is so bad.

I22: Noel and I, both started last year and we live next to each other. We removed the barriers between our two balconies and have a lot of contacts, are both interested in plans and sustainability. So the interest was there and since there were board members necessary, I volunteered and then Noel also joined.

I23: The biggest barrier might be convincing Stadsgenoot or choosing WNR because they have already invested a lot of time in this process (of Stadswarmte). That also comes from a bit of push and pull of the municipality and our enthusiasm about the new plan. That is difficult for them and easier if all 5 blocks do the same. That could be difficult.

I24: Everything about the heat grids goes through Stadgenoot. WNR has gotten approval to execute research. With technical things such as requesting quotes for painting works, there are people at VvE Amsterdam who help in that process and also Stadgenoot helps with this.

I25: It is okay as we have a reasonable turn up during meetings.

I26: It is a big barrier you must overcome. What type of barriers are there? How big is the chance of getting it? How does it work precisely? Who should apply for it? It is a complex story.