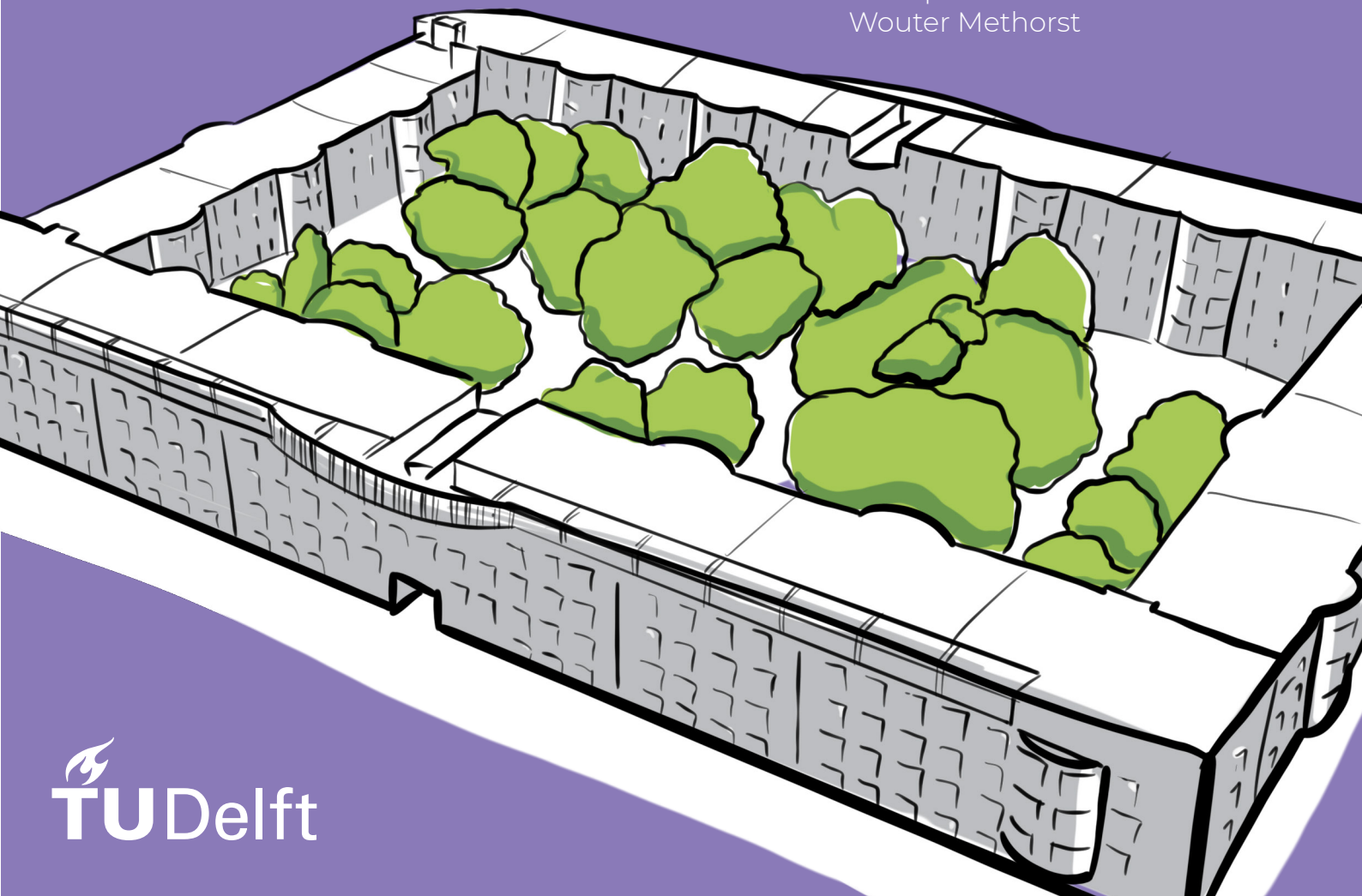# Engaging residents in sustainable renovation by simplifying complexity.

Graduation thesis by Marilou van der Vlugt

Company AMS Institute

Team MSc Gijs van Leeuwen
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Wouter Methorst

TUDelft

TUDelft

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Definitions & Abbreviations

LIFE
This is the project name of the consortium. It stands for: Local Inclusive Future Energy.

MJOP
(Meerjarenonderhoudsplan) Long-term maintenance plan. This plan describes the long-term maintenance of a VvE property.

Residents
Individuals living in an apartment building within the researched context. This building is likely overseen by a VvE.

(Sustainable) renovation
(Sustainable) renovation involves enhancing the construction of an existing building. The goal is to increase energy efficiency, usually done by improving insulation or integrating green energy sources.

SES
(Socioeconomic status) is the economic and sociological status of a person's work experience and of an individual's or family's economic access to resources and social position in relation to others.

VvE
(Vereniging van Eigenaren) Association of Owners. A homeowners' association is a legal entity that is conventionally established by homeowners. The function of the VvE is to look over communal interests, such as management and maintenance

Acknowledgement

Although the graduation journey is a solo one, the help along the way has been of vital importance.

I want to thank my supervisory team for their unwavering support throughout the entire process, especially in the moments when their faith had been so much bigger than my own. Your individual expertise has guided me through the complexity of this puzzle.

Stella Boess, thank you for all your guiding words. Never too guiding so that I would overstep my own path but always guiding enough to find my own path back.

Gijs van Leeuwen, thank you for the trust that you put in my approaches and your open-mindedness for the diversity of ideas that I have launched during our meetings.

Wouter Methorst, thank you for your valuable experience and time.

Also, I like to thank the **LIFE consortium** for allowing me to have a look in their way of working and being patient with me while explaining many interesting and unfamiliar mechanisms and structures to me.

No design research can be complete without its context, including mine. I like to especially thank the **VvE board members** who took their time to support me during the research endeavours within their premises. Knowing full well how big the load already in on them, their time has been very valuable to me. They have been a crucial link in connecting to the residents within the building.

And of course, I also like to thank **all residents** that took their time for me. Their honest and direct opinions have helped me a lot in finding my way. Especially in a context where participation is found to be troublesome, being given their time is even more rewarding.

Also, I want to thank the **volunteers of the Bonte Kraai** for introducing me into their community. Having talked with the volunteers in the Energie Hub showed me that everyone can participate in the energy transition, as long as you work together.

Having volunteered alongside the **Energy coaches of !WOON**, I have met many passionate residents who put their free time in volunteering for the cause of the energy transition. Their motivation also inspired me to put in my skills for residents for whom those skills are not natural. The work that they are doing is proving to be vital in the race for an inclusive energy transition.

This thesis left me inspired to pick up my own piece of the puzzle and continue working towards a brighter future for all.

Abstract

The energy transition holds significant importance across various sectors of our lives, and the housing sector is no exception. While constructing CO2-efficient buildings can substantially reduce emissions, the renovation of older structures is equally important. Renovation plans for the latter are predominantly focussed in increasing the thermal quality of the building and integrating green energy sources. Besides this climate goal, this challenge is also pushed by a social goal. Renovation is in some cases also vital to address the increasing number of households living in energy poverty. Households within this category have both high energy bills which is likely caused by the poor insulation and in addition to this, receive a generally low income.

Participation and engagement within this process is recognized as an important factor for successfully navigating the renovation journey. However, this is not alway an easy task since VvE boards are already carrying the heavy load of the practical renovation tasks. My research looked in the context for the barriers that hold participation back and for potential drivers that proved to be efficient in this context to stimulate participation. The six themes found are: position, trust in officials, knowledge, social cohesion, practical factors and personal factors. These themes overlap and influence each other.

Therefore, to explore and evaluate possible solutions to address the problem definition, I used the method Research through Design to observe how a design is responded to in the context. The five directions that I explored were around a vision building workshop, public discussion starters, serious gaming and interactive and visual knowledge tools.

The project concludes with an embodied design solution that addresses the problem using an interactive and visually engaging approach. The design aims to reduce barriers related to the four of the six themes found: position, knowledge, social cohesion and practical factors. Ultimately, to enable residents to engage and interact with the available information to let them experience the influence they can have in shaping the sustainable renovation process of their own homes.

Table of contents

Introduction

The energy transition holds significant importance across various sectors of our lives, and the housing sector is no exception. While constructing CO_2-efficient buildings can substantially reduce emissions, the renovation of older structures is equally important. Renovation plans for the latter are predominantly focussed in increasing the thermal quality of the building and integrating green energy sources. Besides this climate goal, this challenge is also pushed by a social goal. Renovation is in some cases also vital to address the increasing number of households living in energy poverty. Households within this category have both high energy bills which is likely caused by the poor insulation and in addition to this, receive a generally low income.

In the context of an Association of Owners (VvE), it is legally mandated that a convincing majority supports the proposed construction. Reaching consensus poses a challenge in buildings with diverse residents having varying needs, financial capacities, and priorities. Participation and engagement within this process is therefore recognized as a crucial factor for successfully navigating the renovation journey. The responsibility for guiding these challenging processes typically falls upon the VvE boards overseeing the property. However, this is not alway an easy task since VvE boards are already carrying the heavy load of the legal renovation tasks.

While technical solutions may offer answers, they must be accepted by the residents that will be influenced by these changes. The selected context features a neighbourhood in which specific challenges and possibilities can be found.

1.
Project foundation

In this chapter, I will give an overview of the project about which parties did have an influence in this graduation project. I will also explain more about the motivations behind starting this project. These motivations are both climate- and social related. Furthermore, I will give a compact overview of the problem brief and methodology used.

1.1 Climate goals

The biggest underlying goal for this graduation project can be found within the energy transition's goal to stop climate change. The energy transition objective is to move away from unsustainable fossil fuels and moving towards clean, renewable energy sources such as solar and wind power. To achieve this transition, various agreements have been made at different levels. The most important being:

· The European Union is committed to **the Paris Agreement**, aiming to become carbon neutral by 2050 (UNclimatechange, 2015).

• **In the Netherlands**, there is a goal to reduce CO2 emissions by 50% by 2030. (Ministerie van Economische Zaken en Klimaat, 2018)

• **The City of Amsterdam** has set a target to become natural gas-free by the year 2030.

To reach these climate goals, all polluting sectors must put in all the effort to cut emissions. The **public housing sector contributes to roughly 9%** of all household emissions in the Netherlands according to Klimaat Centraal, 2023 (see figure 1).

A part of the household emissions can be decreased by behaviour changes like decreasing shower time and turning off the heating. The latter cannot always be done. At least, not in a healthy and comfortable way. Most energy goes to heating during the winter. With poorly insulated housing, a lot of energy will be lost and therefore, this causes unnecessary emissions. Those emissions can be decreased by improving the thermal quality of housing so that less heat is able to keep the house at the desired temperature.

Sustainable renovations can also be deployed as a part of the solution to become fossil fuel free by implementing green energy. Due to rapid technological improvements, private household solar panels are becoming increasingly accessible and efficient. This extra green energy can cut back on the need for grey electricity from the net.
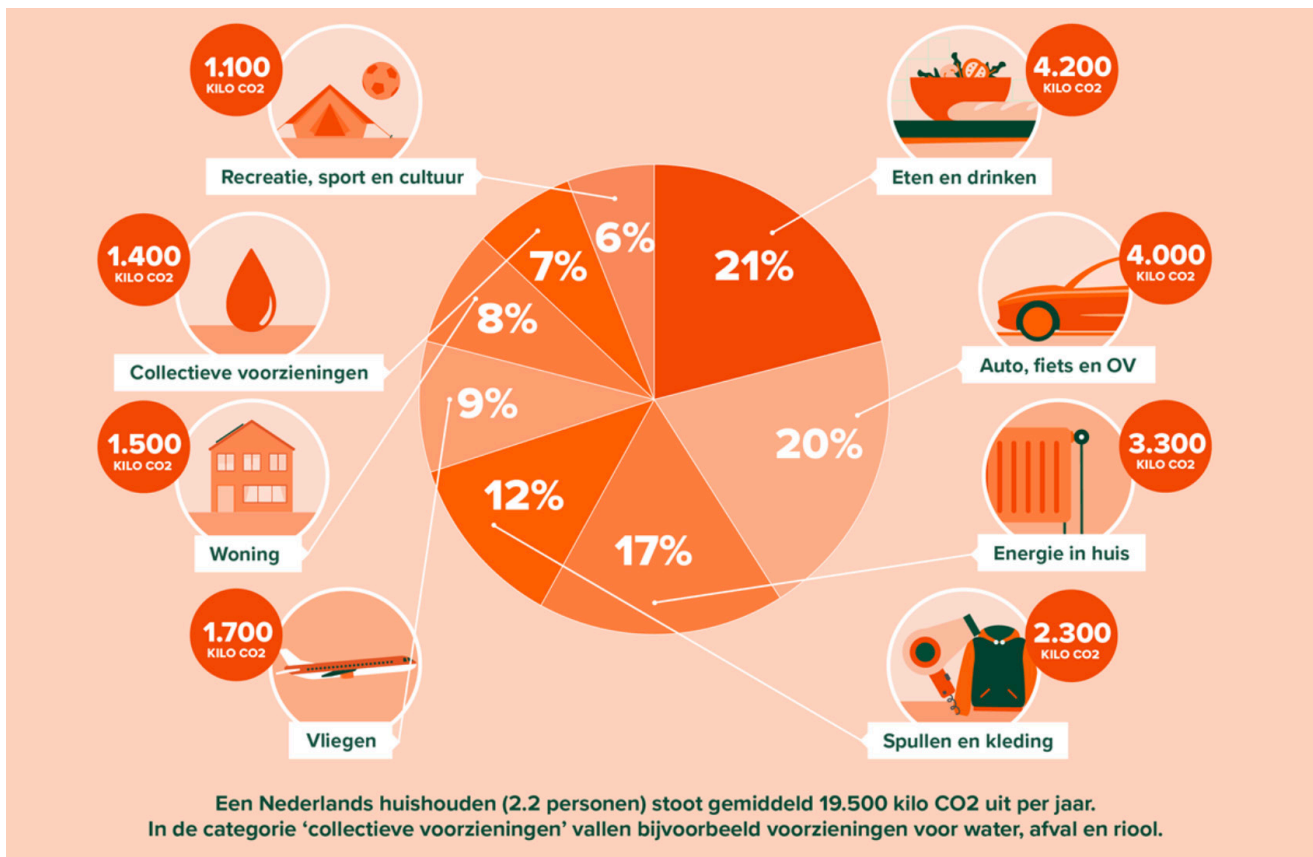

Figure 1: A diagram displaying the percentage of CO2 pollution per sector (Klimaat Centraal, 2023).

1.2 Social goal

But climate goals aren't the only important goals to consider within the energy transition. Social goals are very important to take into account to ensure a transition where everyone's values are taken into account.

In 2022, a significant 14% of households living in Amsterdam South East fell under the classification of energy poverty, according to data from Energiearmoede in Amsterdam (2021) (see figure 2).

Energy poverty, as defined by the Rijksoverheid, is characterised by households with low incomes together with high energy bills or living in homes with (very) poor energy quality as seen in figure 3.
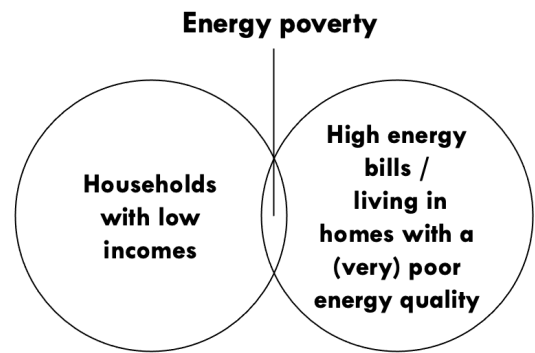

Figure 3: Visualisation of factors involved in energy poverty according to the definition given by the Rijksoverheid.

This highlights the need to target interventions and support mechanisms to address these situations. This can be done by increasing the feasibility of sustainable renovation, especially for the target group of residents living with energy poverty.

It is important to prevent social inequality as a by-product of an unfair energy transition.

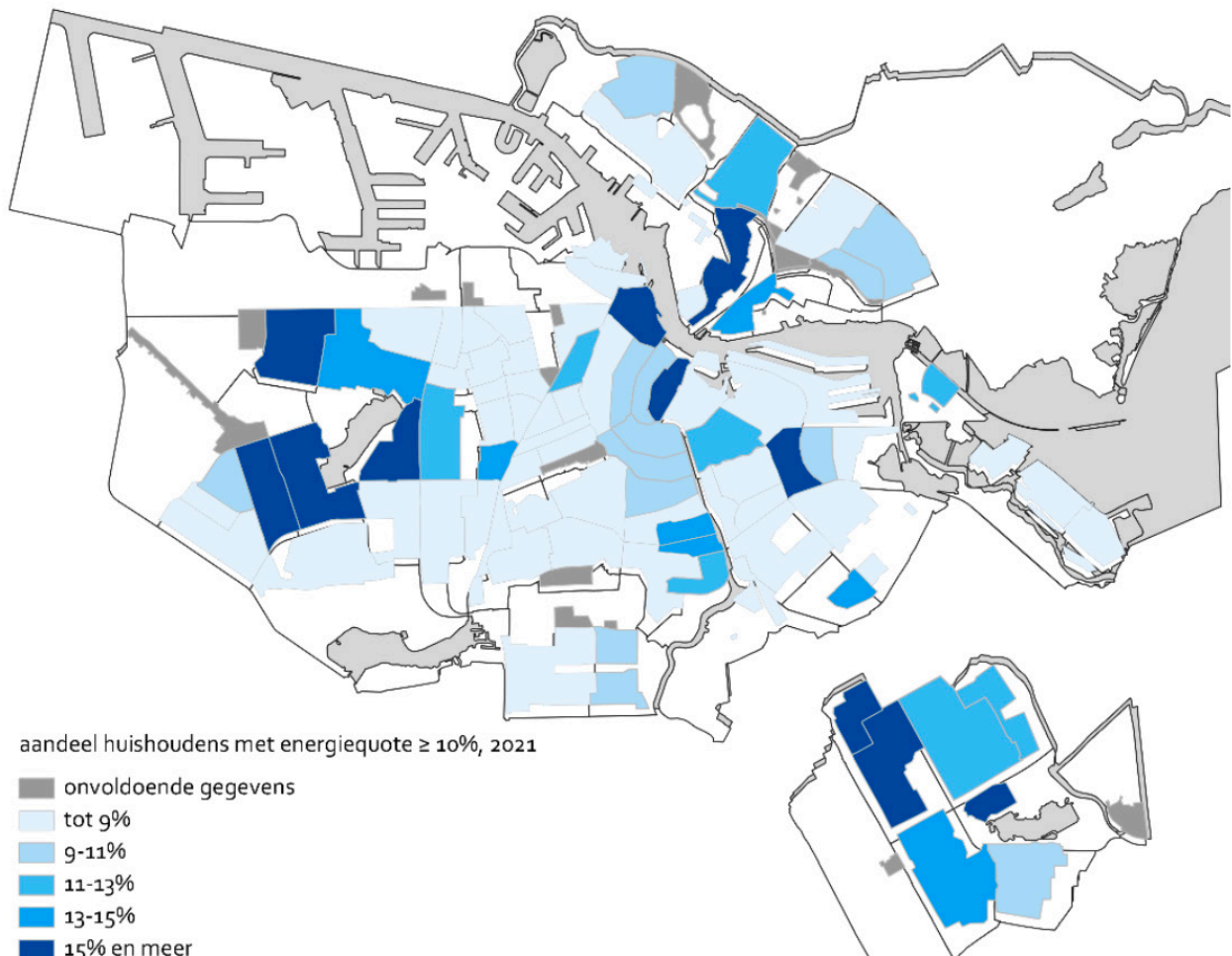

aandeel huishoudens met energiequote ≥ 10%, 2021

- onvoldoende gegevens
- tot 9%
- 9-11%
- 11-13%
- 13-15%
- 15% en meer

Figure 2: Percentages of households in energy poverty per neighbourhood in Amsterdam (Energiear-moede in Amsterdam (2021).

1.3 VvE context

These two goals can both be implemented into VvE's, where residents often have low incomes or live in old buildings that are not properly maintained or insulated, resulting in high energy bills and a lot of unnecessary emissions.

The organisational structure of VvE's are inflexible and therefore stall development. In particular, when residents have diverse needs and statuses, which makes the process of reaching consensus harder.

A sustainable renovation plan does not have the standard solution for all apartments. Especially when the options contain personal differences and financial consequences. It is important that everyone who will be affected by decisions is aware of the options and is able to voice their preferences.

Currently, to stimulate the development of sustainable renovation in VvE's, municipalities offer subsidies to make the renovation options financially more appealing and achievable for residents. Knowledge about sustainable renovation is also provided in the shape of workshops, seminars and service points. These touchpoints can provide in-depth knowledge on specific questions and are therefore mostly used by VvE boards or other engaged individuals.

This leads to the topic of participation within the VvE. What form of participation should be asked from different residents groups?

1.4 LIFE Consortium

This graduation research has been initiated by the LIFE consortium. LIFE stands for Local Inclusive Future Energy (see figure 4). LIFE aims to create a technical solution for the two goals mentioned above. But in doing so, encounter new challenges in the context of the VvE's.

Local electricity network

A solution for this problem is to construct a shared local electricity network with local producers and local consumers. Producers are parties who are able to provide electricity to the network like the Johan Cruijff ArenA at moments where they have a power surplus from their solar panels. This power surplus can be traded to local consumers for an agreed price. This has as a benefit that electricity companies can't influence this price.

Social inclusion

Currently, there already is a lot of competition between electricity providers. This is because the market is very big, everyone uses energy and the revenue is very high. Since there is no quality difference between energy providers, the price is the differentiation factor.
Since electricity is increasingly perceived as a basic right, it is important to emphasise the shared benefit for all stakeholders in a future local electricity network. This to prevent commercial companies from taking the newly created benefits for themselves.

Activate participation

The active participation of residents is crucial for the LIFE project. One of the current challenges is the fact that residents are often reluctant to engage in discussions about energy due to perceiving it as an unfamiliar complex and technical subject. It is important to involve residents in these discussions to eventually be able to reach consensus for all parties. But before these discussions are possible, it is necessarily to stimulate residents to create a basic technical understanding on the topic.

The reason why it is important to attend those discussions as a resident is because the implementation of potential steps in the energy transition will affect all residents living in these buildings. This is the case during the construction period, the livability of the apartment after but potentially also in behaviour change during day to day energy behaviour such as planning your laundry dependent on the current energy prices. By involving as many people as possible in the discussions, it ensures that everyone's concerns are taken into account, preventing the oversight of less-represented groups.

Figure 4: Logo LIFE

1.5 Project stakeholders

To first shine light in the various perceptions on this project. During the research, I've needed to find my own focusses within the focusses of the companies that I'd report to.

In this project, the end users are the residents living in the Venserpolder, and in the perception of my research, they occupy the "front end" of the context. Conversely, the stakeholder groups positioned at the "back end" have progressively less access to the group represented by the end users. This group only has indirect access to the end users through tools like policies or platforms. As is shown in figure 5, the end users were reached through the VvE boards.

Short explanation of the focus of the stakeholders as I interpreted:

TUDelft: Academical grading of the quality of the student.

AMS institute: Student research quality in the energy transition in Amsterdam

LIFE consortium: collaboration focused on designing a socially inclusive solution for net congestion

Energie lab Zuid-Oost: Stimulating the energy transition in Amsterdam South-East

CoForce: Supporting residents participation in the energy transition in AMsterdam South-East

VvE board: Being helped with the renovation process

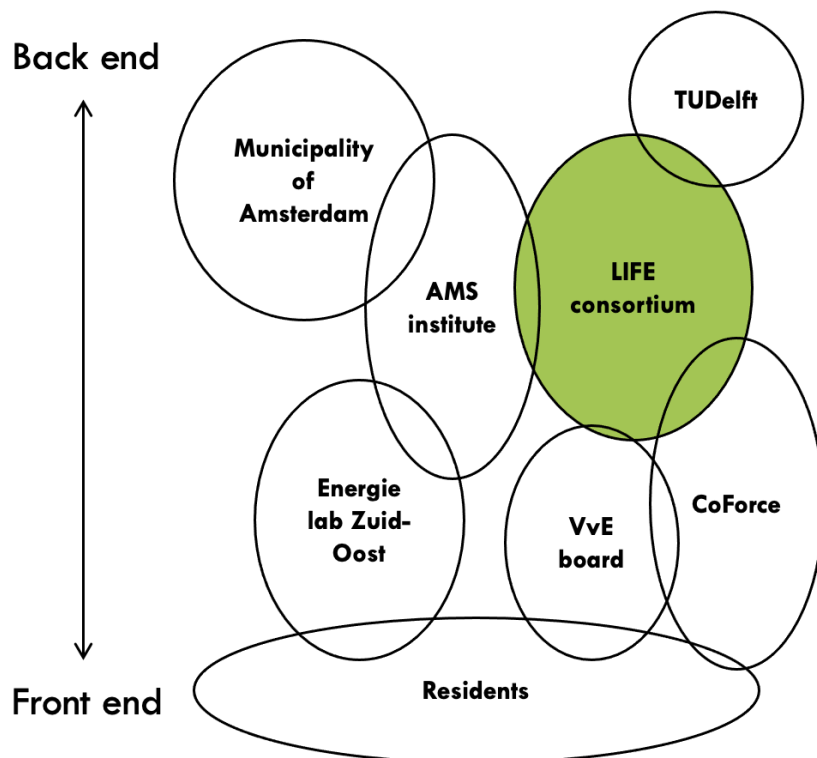**Residents:** Being helped with their own objectives

Figure 5: Visual overview of the project stakeholders with a connection to my graduation thesis

1.6 Problem brief

The problem definition

The main problem for my project is the fact that it is hard for a VvE to go through the sustainable renovation process due to the many difficulties a VvE is faced with. A cause for these difficulties is the lack of resident participation within the renovation process. The original problem brief can be seen in appendix 1.

The scope

It was necessary to define a narrow scope so that the solution is more likely to fit this specific context. This is because the context of all VvE communities can vary and the effectiveness of the project is dependent on the learning and exposure of people in the context to the research activities.

The scope of the project lies with VvE's located in the Venserpolder who can be defined as having a speckled property. In the topic of sustainable renovation, the project focuses on the role of the residents. This means that little attention has been given to the role of the housing corporation, other official parties within the VvE or the role that other non-profit organisations fulfil in the sustainable renovation process.

The solution space

To let residents join the conversation, they first need to know what they can talk about. The renovation process is an abstract story, taking place in a far away future. This causes conversations to wander around without having clear what the effects can be. By visualising the consequences and letting residents themselves influence the possible future, they will feel more empowered to join the conversation.

How can residents experience influence in the decision-making process of a VvE?

Research questions

1. What is the perception of the role of residents within home renovation?
2. What are barriers for general participation?
3. What are drivers for general participation?
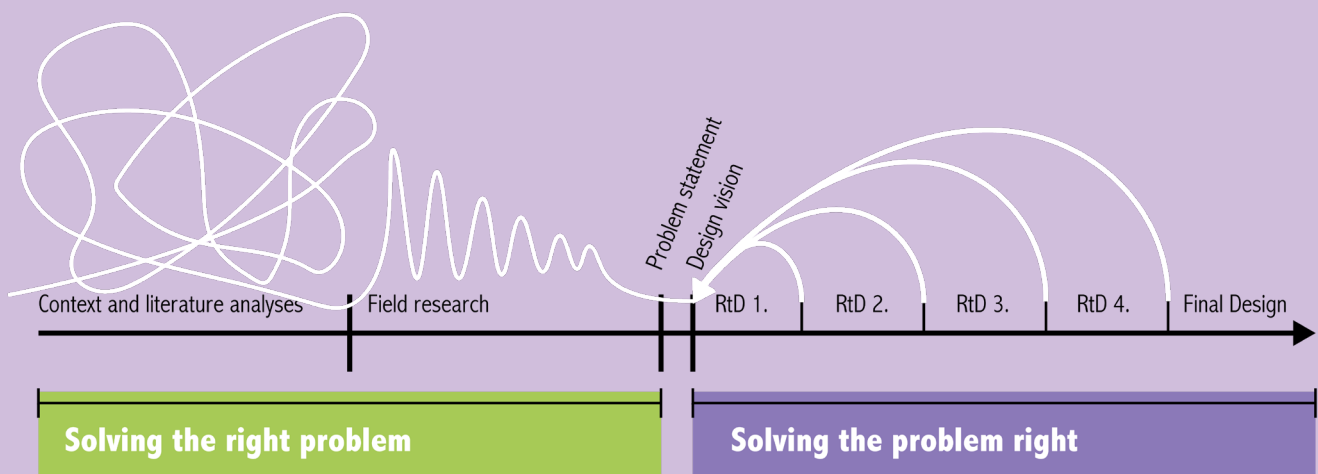
1.7 Project methods

This research can be split into two phases:
- **The problem finding phase** (Solving the right problem)
- **and the solution finding phase** (solving the problem right).

The first part consisted of an extensive **literature review** where I looked up the fundamentals of the field and explored scope. This was followed up by a field research which gave me insights about how the literature findings were reflected in my selected contexts. The methods used could be categorised as **ethnographic research** and **action research** More about these methods can be read in chapter 4.1.

The second part was dominated by a **Research through Design** approach. The method is based on the principle of making a design, putting it in the context and observing the response and learning from this. This method allows for new insights and it creates the opportunity to go after a newly found direction

Moreover, this research methodology has another benefit. By using a prototype design, users can already experience some part of the intended value. This could be knowledge, an experience or a reflection on something of importance within the context. More about these methods can be read in chapter 6.1.

Context and literature analyses | Field research | Problem statement | Design vision | RtD 1. | RtD 2. | RtD 3. | RtD 4. | Final Design

Solving the right problem

Solving the problem right

2.
Design

In this chapter, I will showcase the design which will be the conclusion of my graduation thesis. The design will be integrated in the current VvE renovation practices that I will also visualise in this chapter.

2.1 Design "The buttons of a sustainable renovation"

The design can best be described as a tool to facilitate discussions about a (sustainable) renovation at an apartment complex. The tool will lead residents though three steps. Each step will let residents reflect on what they think is important and will visualise how these can take shape in a renovation plan.

This must enable residents to have a carefully considered opinion about what they think about the renovation plan.

The steps

1. Expressing your priorities
2. Exploring the options
3. Making it work

How it address the problem

A couple of elements can be mentioned when describing the working principles on which this design is based. These principles are:

· Use **visualisations instead of text** (where possible)
· Use **interactive elements** to engage with the information.
· Providing **information in small bits**
· Focus on how it will connect to their day-to-day lives
· Create and visualise a **conversation flow**
· But, let users **free to explore** the information themselves

2.2 Journey

In figure 5, you can see a rough overview of the complete renovation journey from start to finish. Detailed steps regarding role division within the process will be explained in more detail in chapter 3.2 VvE in renovation. In this subchapter, I will explain a bit when, where and how the design can be integrated in the current journey.

Integration

The design is made in a way that allows it to be easily integrated in the current journey. There are multiple phases during the renovation that the design can be used to help reach the goals during that phase.

All use cases along the renovation journey are independent from each other, meaning that the design can only be deployed during one of the use cases and will still give value. Using the design throughout all these phases will however create a smooth transition from phase to phase for the residents and due to the learning curve of residents, the ease of use for the residents will increase after each interaction residents have.

2 Different use cases

First of all, the design can be used for two slightly different purposes, both having slightly different use cases.

The first use case is in a guided context, being:
· during the information meeting,
· the focus group meetings
· or the voting meeting.
In figure 5, you can see these being indicated with purple lines. During these moments, the experts on the topic of the renovation are present to answer questions or explain details. These experts can be architects from the feasibility research, engineers from the construction company or well informed VvE board members.
Figure 6 visualises a more detailed part of the journey around the information meeting and where the design will be integrated. The difference in use of the design during the information meeting, focus group meeting or voting meeting is the focus. In the beginning of the journey, the focus will lay on finding the priorities of the users and exploring the renovation options with rough numbers. Later in the process, the priorities will be mostly known and now, there is a bigger focus on the fine details and exact costs of the renovation options. This information will be provided in watch step by updating the cards according to the latest findings of the in-depth research.

The second use case is in an unguided context. This use case is located:
· in the public space of the complex.
It takes place around the date of the information meeting. In figure 5, you can see this use being indicated with a pink line. Placing the design, and therefore the information about the renovation, in the public space will allow residents to engage with the design without needing to go over the threshold of attending one of the official contact moments. The self-explanatory information on the design will enable users to engage with the information presented through the design at their own pace.
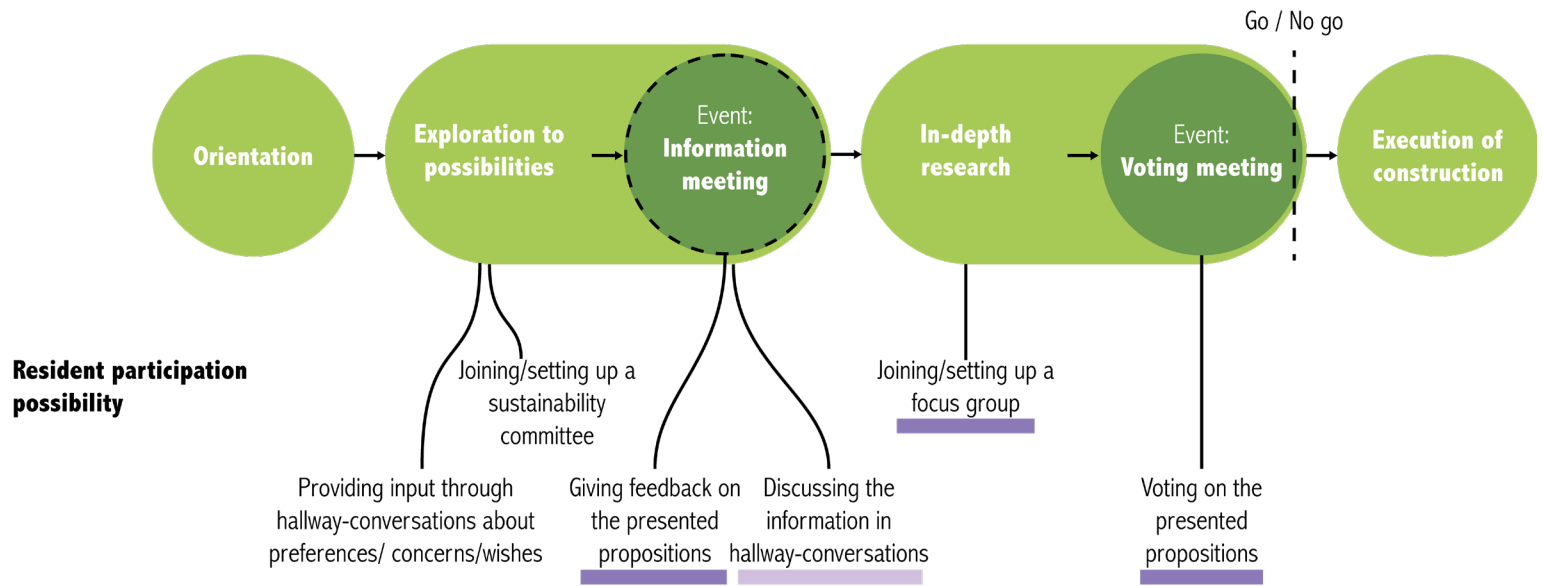
Figure 5: a rough overview of the journey from start to finish of a renovation process
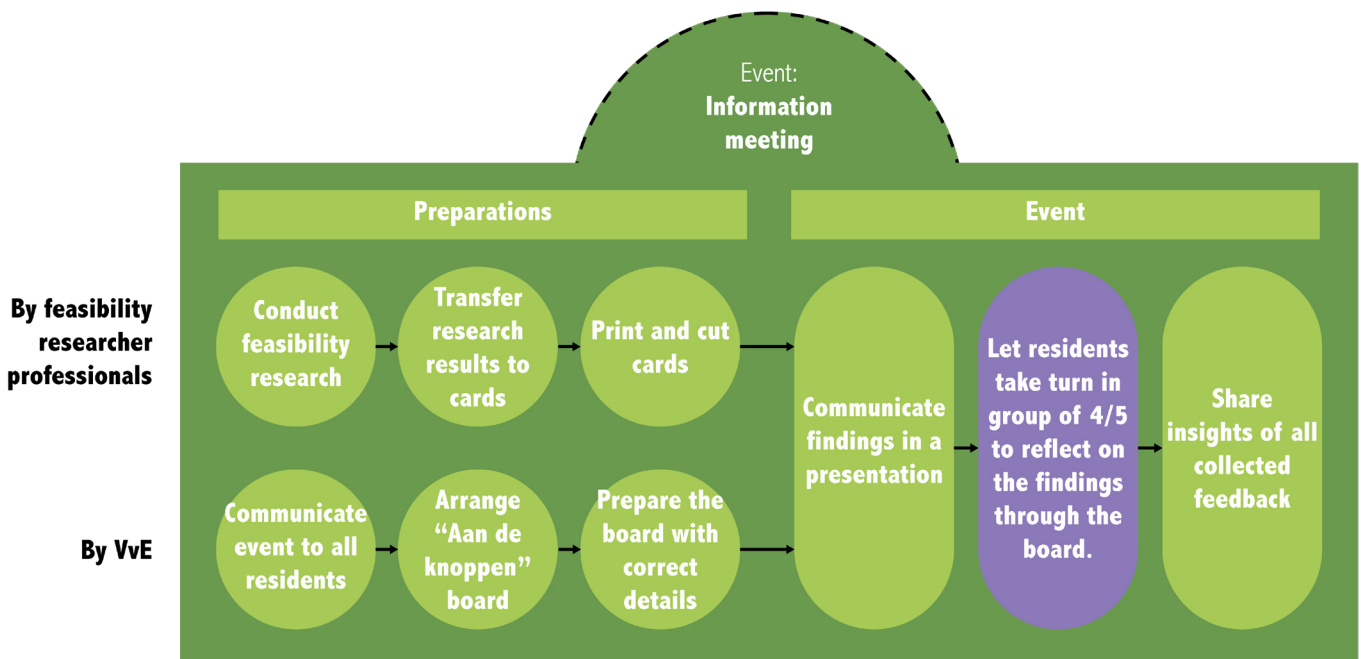

Figure 6: Zoomed in on the information meeting

2.3 Story board overview

To give a quick visual overview of the design, I made this figure below that shows the discussion-flow through the design.

Step 1: Expressing your priorities
Residents are given the opportunity to talk about their living experience in the apartment, to air out complaints about neighbours, old frustrations or any other thoughts on their minds. Then, they need to think about what they find the most important in a renovation process and come to a consensus on this. This must prompt residents to leave behind their problem-oriented mindset and shift to a solution oriented mindset in step 2.

Step 2: Exploring the options
This step starts by linking the colours of the prioritised problems of step 2 with the renovation options cards from step 2. The cards provide an complete overview
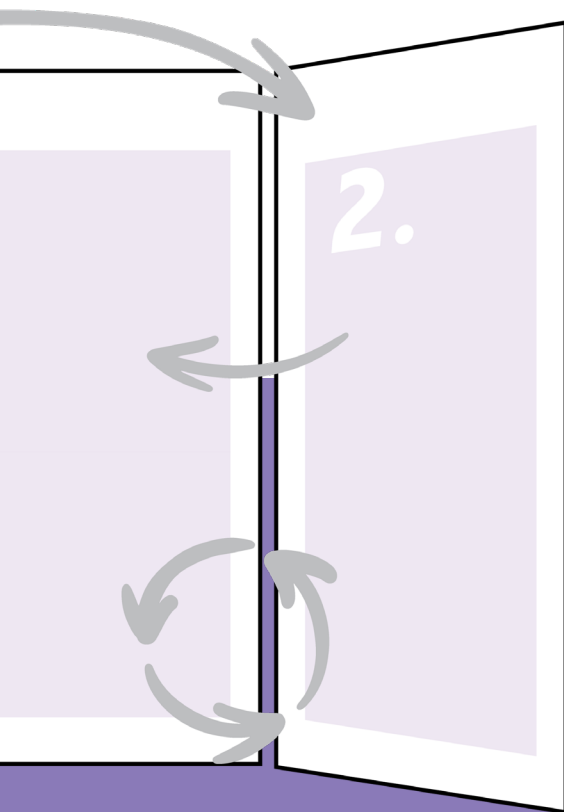
1. **Expressing your priorities**

1.

3a.

b.
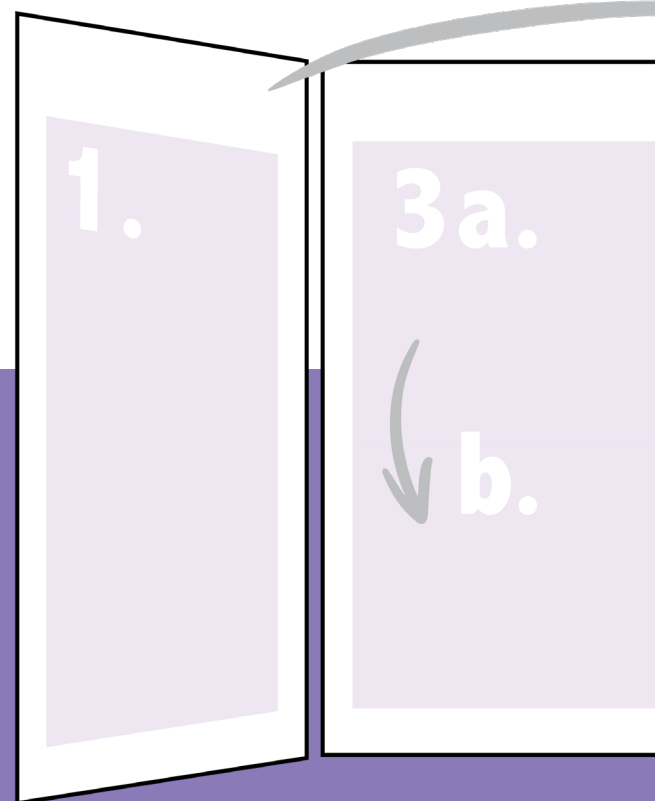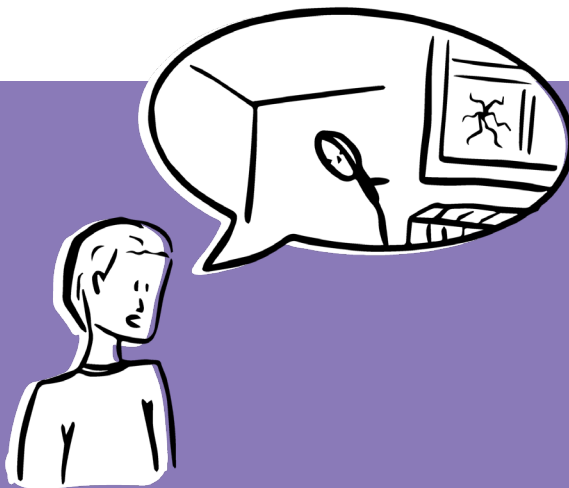
3. **Making i**

of all renovation options that can be considered within their renovation. Cards picked can be taken to step 3a.

Step 3: making it work

When a selection of options has been made in step 2, it is time to evaluate those. On each card are the individual consequences of this measure visualised. In step 3b, the financial puzzle begins. By collecting the resources written on the selected cards and placing them next to the cards, it becomes clear whether all costs can be covered. If this is not the case, an iteration needs to be done and maybe, other cards need to be selected from step 2. This cycle will continue until the residents are all satisfied with their renovation plan.
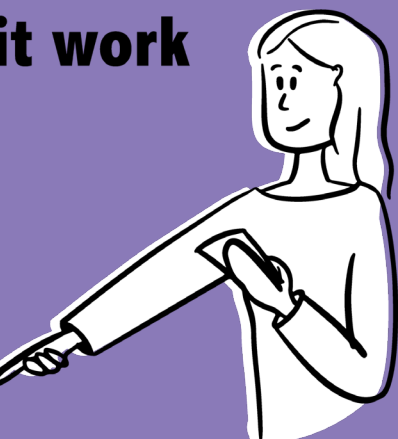
On the coming pages, a more elaborate overview is given for each of the steps.

2. Exploring the options

1. Expressing your priorities

Start the conversation easy by asking residents to talk about their current living experience and let them reflect on what they find most important to improve in a renovation.

Goals:

- Create an **easy start** of the discussion
- Let residents be heard
- Force residents to make **concessions** on what they consider important.
- Let residents see **how many wishes** they have.
- Inspire residents to shift **away from a problem-focussed mindset** to a solution-focussed one.

Activities

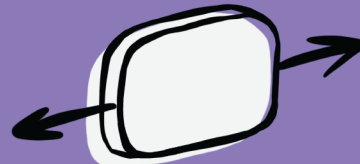Overview of problems mentioned by residents

Discuss

Reach consensus

Move sliders

Remember colours for step 2

Preperations

- **Collect information** on what residents find important to renovate in the process.
- **Prepare findings** on the sliders

1. De volgende problemen kunnen worden aangepakt in een verduurzaming.

Welke zijn voor jouw het belangrijkst?

The following problems can be addressed in sustainability.

Which ones are most important to you?

!

Kou in de winter
Cold in winter

Heet in de zomer
Hot in summer

Tocht
Draft

Vocht / schimmel
Moist / mold

Kapotte gevel
Broken facade

Groene energie
Green energy

Iets anders?
Something else?
. . .

De knop
The

Gevel
Facade

Dak
Roof

Vloer
Floor

Wat betekent
A What does that mean

De isolatie / Energi
Insulation / Energy lab

E   D   C

0   10   20
+
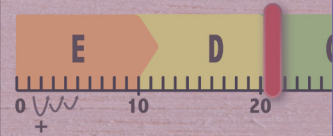
De energie re
Energy bill

Elektriciteit
Electricity

Warm water
Hot water
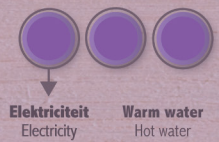
2. Exploring the options

Residents are shown a complete overview of all the decisions than can be considered in their renovation. They can make a selection based on their priorities from step 1.

Goals:

- Give residents a **comprehensive overview** of all choices that are there.
- **Connect their priorities** with the renovation options
- Focus the discussion on **one choice at the time** and let them reflect on each choice individually.

Kosten
Costs **14**

Trippel glas & nieuwe kozijnen
Tripple glass & new frames

ZEP 1/7   VHF 1/2
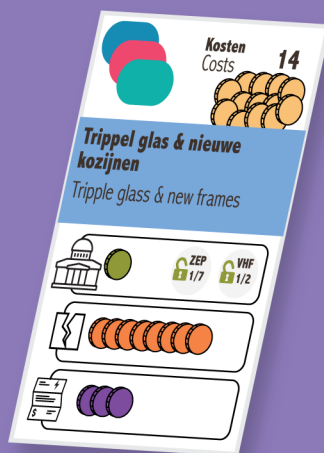
What are the costs?

What is the measure about?

How can it be financed?

Activities

Find matching cards with colours

Pick based on priorities

Hang choices on the board at 3a.
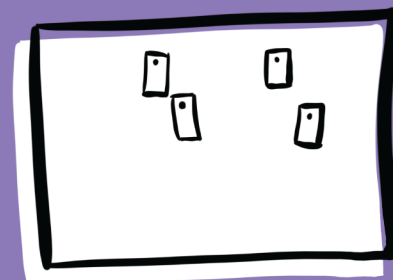
Preperations

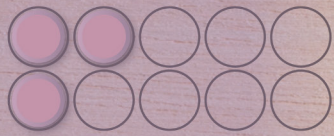- **Feasibility research outcomes** must be included on the cards

rzaming
tion

Ramen Windows

Ventilatie Ventilation
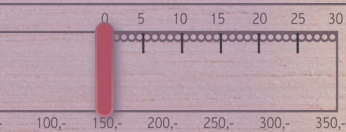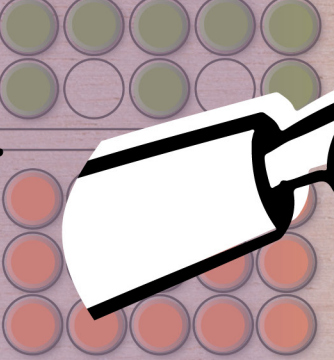
Groene energie Green energy

we dat betalen?
ing to pay that?

SVVE 🔒 2/2 **VHF** 🔒 7/7**ZEP**

0 5 10 15 20 25 30

100,- 150,- 200,- 250,- 300,- 350,-

---

2. **Welke renovatie opties kiest u?**
Which renovation options do you choose?

Gevel Facade

Repareren? Repare?

Kosten / Costs 3
Gevel repareren
Repare facade

Isoleren? Insulate?

Kosten / Costs 4
Gevel isoleren (Rc=4)
Insulate facade (Rc=4)

Kosten / Costs 9
Gevel isoleren (Rc=5)
Insulate facade (Rc=5)

Ramen Windows

Nieuwe ramen? Nieuwe kozijnen?
New windows? New frames?

Kosten / Costs 7
HR++ glas & oude kozijnen (sparen voor nieuwe)
HR++ glass & old frames (saving for new)

Kosten / Costs 14
Trippel glas & nieuwe kozijnen
Tripple glass & new frames

Kosten / Costs 15
Beter trippel glas & nieuwe kozijnen
Tripple glass & new frames

Ventilatierooster? Ventilation grilles

Kosten / Costs 5
Ventilatieroosters
Ventilation grilles

Dak Roof

Isoleren? Insulate?

Kosten / Costs 3
Dak isoleren (Rc=3.5)
Roof insulation (Rc=3.5)

Kosten / Costs 5
Dak isoleren (Rc=6.5)
Roof insulation (Rc=6.5)

Ventilatie Ventilation

Actieve CO2 ventilatie? Active CO2 ventilation?

Kosten / Costs 3
CO2 gestuurde ventilatie
CO2 controlled ventilation

Vloer Floor

Isoleren? Insulate?

Kosten / Costs 2
Kelder isoleren
Basement insulation

Groene energie Green energy

Zonnepanelen? Groen dak?
Solar panels? Green roof?

Kosten / Costs 2
Zonnepanelen
Solar panels

Kosten / Costs 4
Zonnepanelen + groen dak
Solar panels + green roof

3a. Making it work

Hang all the cards selected in step 2 on the corresponding field. This will give residents the possibility to create their own renovation plan

Goals:

- Let residents experience how it feels to be in charge of the decisions.

Activities

Build a plan
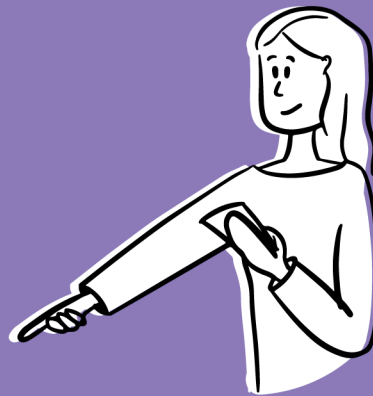
Reflect on priorities from step 1

Reach consensus

Preperations

Non needed

De knoppen van een verduurzaming
The buttons of a sustainable renovation

Gevel
Facade

Ramen
Windows

Dak
Roof

Ventilatie
Ventilation

Vloer
Floor

Groene energie
Green energy

A Wat betekent dat voor…?
What does that mean for…?

B Hoe gaan we dat betalen?
How are we going to pay that?

De isolatie / Energie Label
Insulation / Energy label

E D C B A

0 10 20 30 40 50
+

VvE spaarpot
VvE savings

Subsidie
Subsidies

SVVE   2/2 VHF   7/7 ZEP

Onderhoud besparen
Savings on maintenance

De energie rekening 35%
Energy bill

Verwarming
Heating

100%

0%

Elektriciteit
Electricity

Warm water
Hot water

Service kosten
Service costs

0 5 10 15 20 25 30

0,- 50,- 100,- 150,- 200,- 250,- 300,- 350,-
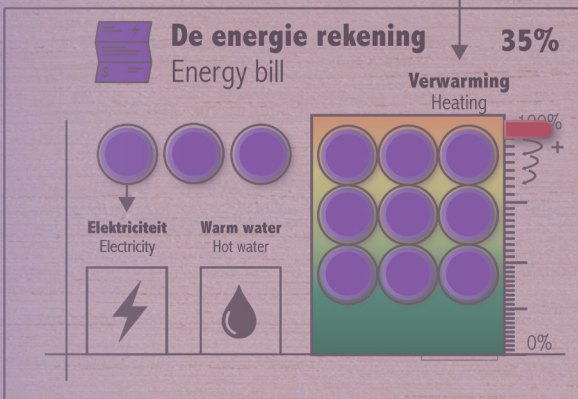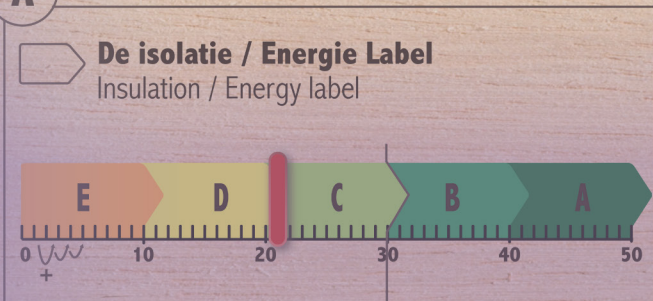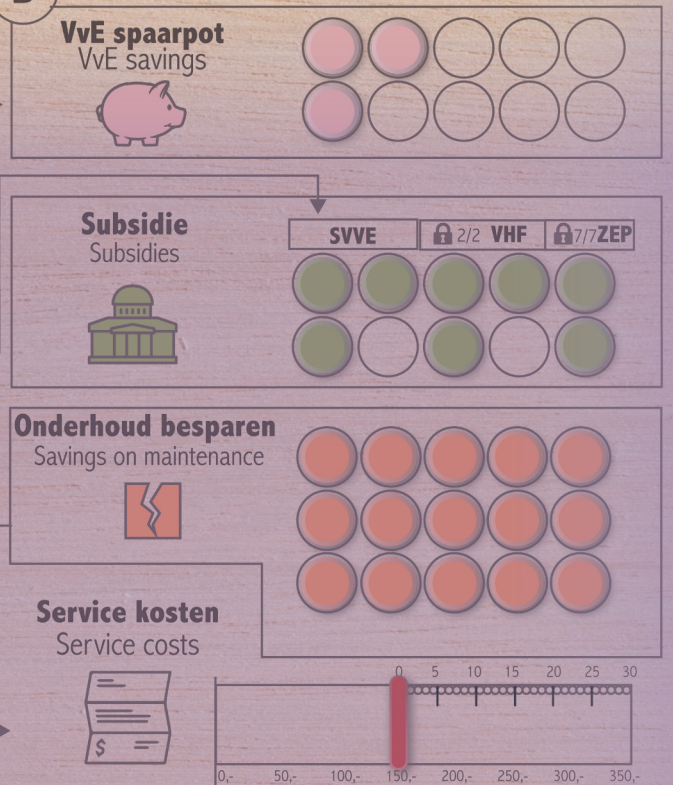
3b. Making it work

Now, the consequences of the plan must be evaluated to see how to finance it. The costs of all renovation options together must be covered by the resources that can be provided. Some subsidies can only be used when a combination of renovation measures have been selected.

Goals:

- Illustrate to residents where the **financing** of a renovation could come from
- Let residents **build confidence** with the order of magnitude of the financing options compared to the renovations options.
- Let residents **reflect on their previous decisions**, now knowing what the costs will be
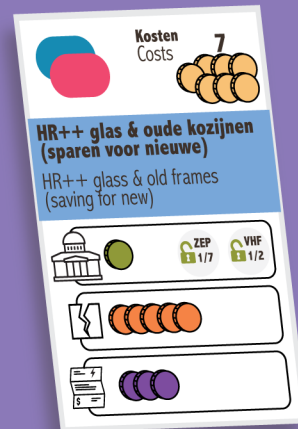
Activities

Count how much the plan will cost

Conclude if there is enough or whether the plan needs to be re-evaluated
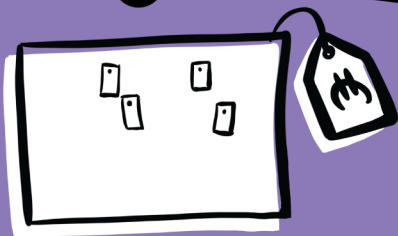
Count how much resources the plan will yield

Preperations

Prepare how much **financial resources** are available.

Iterate

Likely, not all renovation measures can be directly covered by the resources. Residents could go back to step 1, 2 and 3 to figure out combinations of renovation measures that fit their priorities and can be financed

Goals:

- Let residents **experience the search** for a realistic renovation plan.
- Let residents **reflect** on their priorities.
- Create **understanding of what is realistic**.

De volgende problemen kunnen worden aangepakt in een verduurzaming.

1. Welke zijn voor jou het belangrijkst?

The following problems can be addressed in sustainability.

Which ones are most important to you?

Kou in de winter / Cold in winter

Heet in de zomer / Hot in summer

Tocht / Draft

Vocht / schimmel / Moist / mold

Kapotte gevel / Broken facade

Groene energie / Green energy

Iets anders? / Something else?

De knoppen van ee

The buttons of a sus

Gevel / Facade

Dak / Roof

Vloer / Floor

Wat betekent dat voor...?

What does that mean for...?

A

De isolatie / Energie Label
Insulation / Energy label

De energie rekening / Energy bill 35%

Verwarming / Heating

Elektriciteit / Electricity

Warm water / Hot water
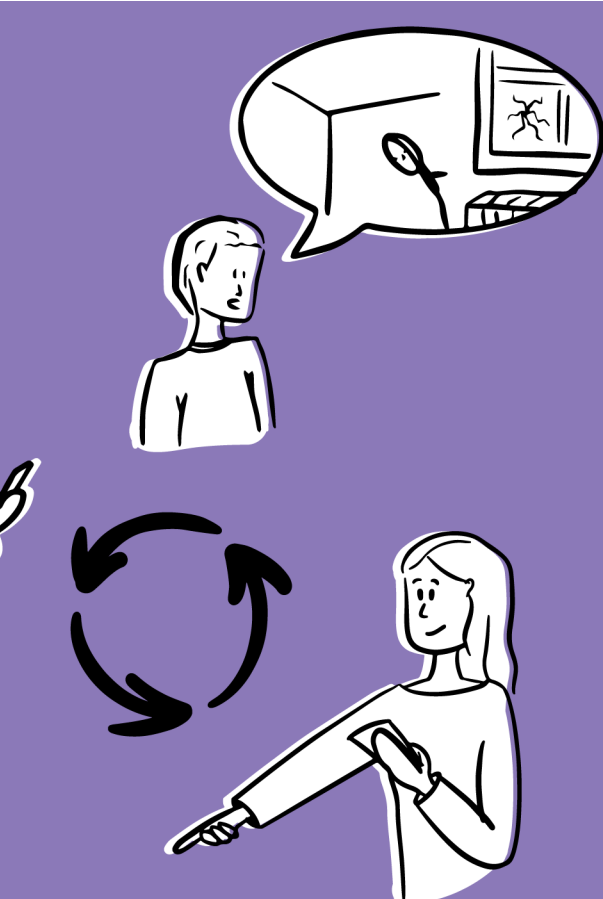
After use

After residents are done, they should

- **Feel engaged** in the renovation process and feel **capable to join coming discussions**.
- Have a better feeling what the **realistic boundaries** of a renovation are.
- Have a better understand of the **consequences** of a renovation.

2.4 Technical feasibility

The design's strength lies in the technical feasibility of the information that is provided through it.

The financial mechanisms of a renovation are complex and many factors need to be considered when calculating these details. Within this design, choices needed to be made which mechanisms were the most important to include and which ones had to be regarded as out-of-scope.

I tried to visualise the selected mechanisms as accurately as possible and will in this paragraph explain on which knowledge they are built.

Feasibility research calculations

Renovation measures get calculated considering a variety of financial consequences. These calculations result in an overview of what the financial consequences will be for the average individual household on a monthly basis. The financial consequences can only be redeemed at the households through the monthly service costs. Financial benefits for the households will be the lower energy costs and interest deduction. The latter is considered out of scope in this graduation. So, in a favourable renovation proposition, the bills will go down more than the service costs go up. This is not always the case because increase in comfort or aesthetic of the building will not result in financial gain like insulation does.

Financial resources

The financial resources considering in a renovation are:

VvE savings
This is the most straightforward resource. The current amount of saving done by the VvE that is chosen to be put in this renovation needs to be defined. The VvE board members will have full view on this.

Subsidies
An important factor in current day (sustainable) renovation calculations is the availability of subsidies. Subsidies are provided by the municipality and come in a variety of shapes and sizes and can vary a lot in their set of criteria to be met. Especially, additional subsidies provided to the district of Amsterdam South East, among other districts, can be significant. In figure 7, you can see an example of how substantial the subsidies can be.

SCEN 1	**SCEN 2**	**SCEN 3**	**SCEN 4**
globale raming 3.300.000	globale raming 3.800.000	globale raming 6.300.000	globale raming 9.500.000
42% subsidie 1.400.000	40% subsidie 1.500.000	32% subsidie 2.000.000	32% subsidie 3.000.000
investering 1.900.000	investering 2.300.000	investering 4.300.000	investering 6.500.000
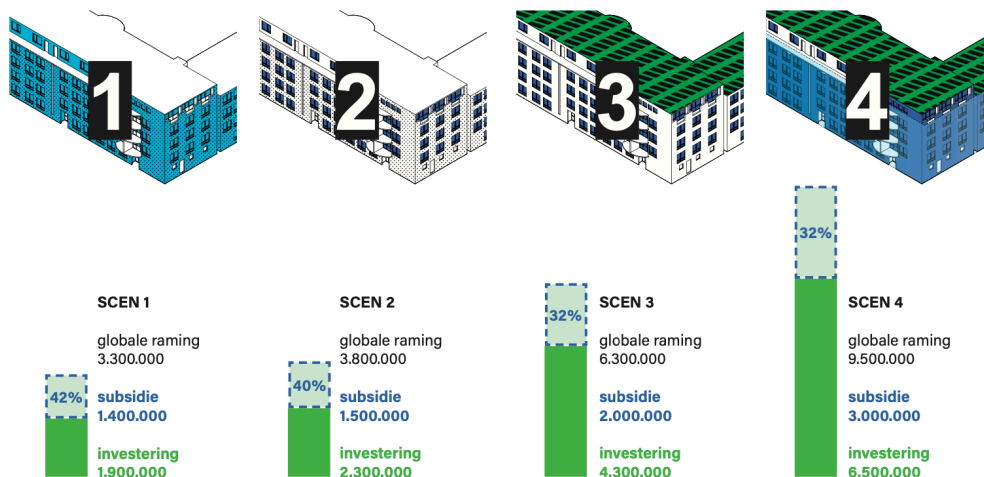
Figure 7: Example of subsidy size.

Saving on maintenance

Some parts of a building will sooner or later need to be replaced. A VvE needs to save for this in order to finance this. This maintenance will usually be covered within the MJOP (Long-term maintenance plan) and therefore be accounted for in the service costs. However, when maintenance is pushed forwards for more than 30 years, the MJOP will not need to cover this (see figure 8 for an example). This results in VvE's heading for deferred maintenance. Some renovation measures will cover this future maintenance. This makes it unnecessary to save up for future maintenance. By calculating these expenses, fictional money can be delegated to renovation measures. This can be a big amount in the final sum of resources within older apartment complexes.
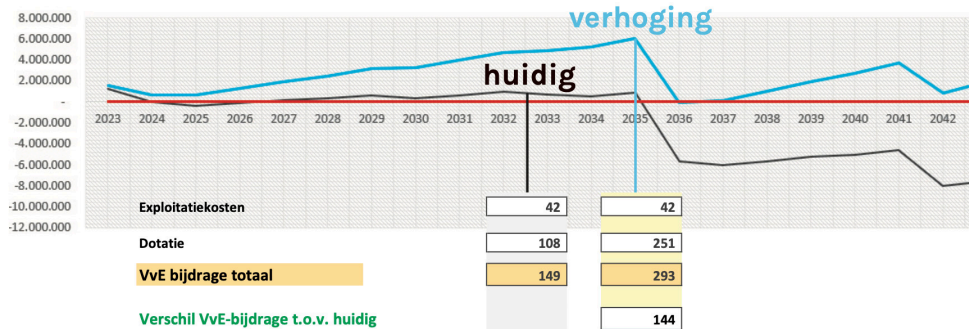
Figure 8: Example of maintenance increase

Saving on the energy bill

The main objective of many sustainable renovations is decreasing the CO_2 consumption of a building. This is achieved by increasing the thermal qualities of the construction and/or adding green energy sources, for example solar panels.

These both have the positive effects that the energy bill of individual households will go down (see figure 9 for an example). The general energy usage within a building can be read from the metres within the building. Using this data, an estimation of average use per household is made. The accuracy of these averages can be questioned since they are not displaying the difference in winter and summer consumption, residents per household and energy contract. Despite the inaccuracy, these average are necessary to estimate the savings that can be done on the energy bill going to heating when insulation gets improved or the bill going to
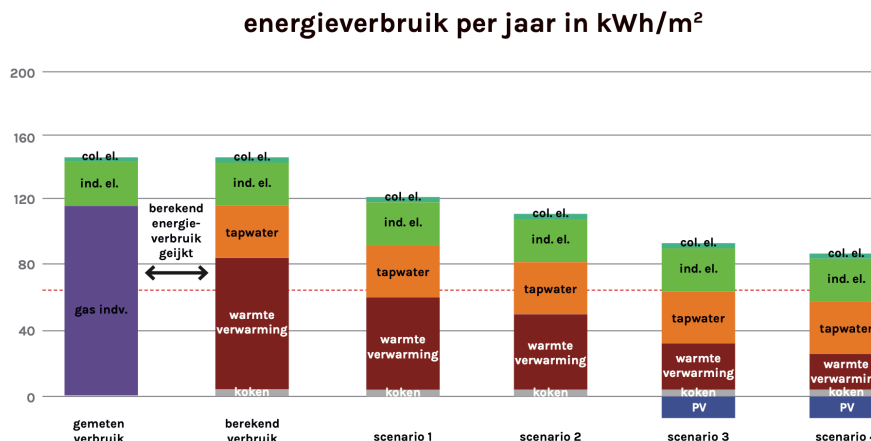
Figure 9: Example of energy saving.

Interest deduction

When having a big loan on your name, deduction on interest rates can be significant for individual households. Due to the complexity and variety in individual cases, I did not consider this financial aspect in my design.

Service costs - Loan

Saving on maintenance and saving on the energy bill and interest deduction is all fictional money. This means that real money needs to fill that place to pay for the renovation bills. VvE's do this through taking a loan, usually at the Nationaal Warmtefonds due to the favourable conditions. The loan is charged to the residents through an increase on monthly service costs (see figure 10). Options like duration of payment can also influence the final calculations but are not considered within this Design.

	verduurzamingsscenarios			
	DMJOP	kozijnen	+ dak en PV	ZEP
1 **Verschil VvE-bijdrage t.o.v. huidig**	150	100	114	125
2 Opbrengst zonnepanelen (uitgegaan van salderen voor 0,30 ct,/kWh)	0	0	-27	-27
3 Tabel renteaftrek (1e maand) obv belastingschijven	-9	-12	-28	-44
4 Energiebesparing +/-	-31	-40	-52	-61
	=	=	=	=
Totaal verschil t.o.v. huidige woonlasten	109	48	6	-7

Figure 10: Example calculation including service costs.

Kosten
Costs
14

Trippel glas & nieuwe kozijnen
Tripple glass & new frames

ZEP 1/7   VHF 1/2

De knoppen van een ver...
The buttons of a sustainable

Gevel Facade

Dak Roof

Vloer Floor

windows

Ventilatie Ventilation

Groene energie Green energy

2. **Welk...** Which

Gevel Facade

Repareren? Repare?

Kosten Costs 3
Gevel repareren Repare facade

Isoleren? Insulate?

Kosten Costs 4
Gevel isoleren (Rc=4) Insulate facade (Rc=4)

Kosten Costs 9
Gevel isoleren (Rc=5) Insulate facade (Rc=5)

Dak Roof

Isoleren? Insulate?

Kosten Costs 3
Dak isoleren (Rc=3.5) Roof insulation (Rc=3.5)

Kosten Costs 5
Dak isoleren (Rc=6.5) Roof insulation (Rc=6.5)

Isoleren? Insulate?
Vloer Floor

Kosten Costs 2
Kelder isoleren Basement insulation

Wat betekent dat voor...?
What does that mean for...?

A

De isolatie / Energie Label
Insulation / Energy label

E   D   C   B   A

0   10   20   30   40   50

De energie rekening   35%
Energy bill
Verwarming Heating
100%

Elektriciteit Electricity   **Warm water** Hot water

0%
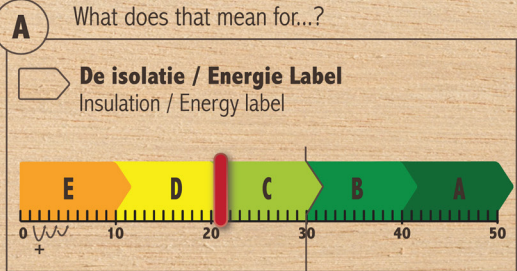
Hoe gaan we dat betalen?
How are we going to pay that?

B

VvE spaarpot
VvE savings

Subsidie Subsidies

SVVE   2/2 VHF   7/7 ZEP

Onderhoud besparen
Savings on maintenance

Service kosten
Service costs

0   5   10   15   20   25   30

0,-   50,-   100,-   150,-   200,-   250,-   300,-   350,-
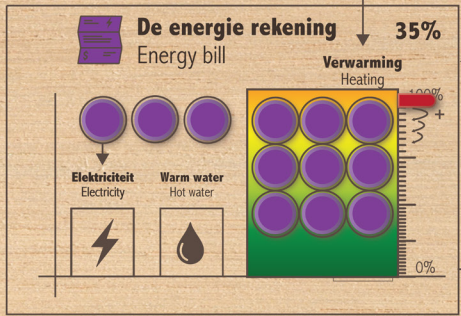
Stakeholder providing the board

When arguing the feasibility of the design, also a look needs to be takes to the stakeholder which is able to provide the design to the VvE's. Due to the importance of an socially inclusive approach, it needs to be public accessibility. Luckily, in the area of the energy transition, there are multiple NGOs present within the context of Amsterdam South East. In figure 11, you can see a visualisation of some stakeholders present in this context. Criteria a stakeholder needs to meet regarding having a physical touchpoint in the neighbourhood to make it possible for VvE's to stop by. Other stakeholders, missing from this visual could potentially also be considered but researching those has fallen out of the scope of this graduation thesis.

Figure 11: Overview of stakeholders in Amsterdam South East connected to the energy transition.

3.
Literature research

I will talk about three themes in my research:
- About the VvE
- VvE in Renovation
- Resident participation

The focus will be on the role of resident participation in the renovation process and the perception towards this as seen from the residents' side.

3.1 About the VvE

To design for VvE's during their renovation process, it is important to roughly understand their role and rules, which will be discussed in the following sections. Also, I will talk about the current participation within a VvE.

Role of the VvE

A VvE, or Vereniging van Eigenaren (Association of Owners), is an official entity responsible for overseeing and maintaining a defined set of properties. These properties typically share the maintenance of staircases, facades or roofs. VvE's can be small, overseeing managing just one or two properties, or large, overseeing hundreds of apartments. To cover the expenses a "VvE has on maintenance and other requirements, all owners are charged with a monthly contribution through the service costs.

The VvE board roughly represents their members, usually property owners and possibly (social) housing corporation representatives when they have a big share. VvE board members serve as volunteers, being paid a maximum of 190 per month for their services to the VvE.

Rules of the VvE

The legal rights within a VvE are defined in the Splitsings-akte, which is established when the VvE is created. This often happened many years ago in the case of old buildings. This document outlines crucial aspects like roof ownership, the distribution of service costs, and the required majority for legally binding decisions. Anyone who owns a property within the VvE's jurisdiction automatically becomes a member. This includes various types of property owners such as homeowners, social housing corporations, or landlords, with shares determined by the Splitsings-akte. To make decisions which deviate from the set maintenance plans, the VvE board must gain the votes of a specified number of VvE members to ensure the legality of a decision.

There are a couple of official obligations a VvE has. In the Netherlands, it's mandatory for all VvE's to register at the KvK (Chamber of Commerce). They also have to meet certain requirements, such as having a long-term maintenance plan (MJOP) and organising meetings with all members to discuss important matters. These measures help to ensure proper management and accountability in Dutch property ownership.
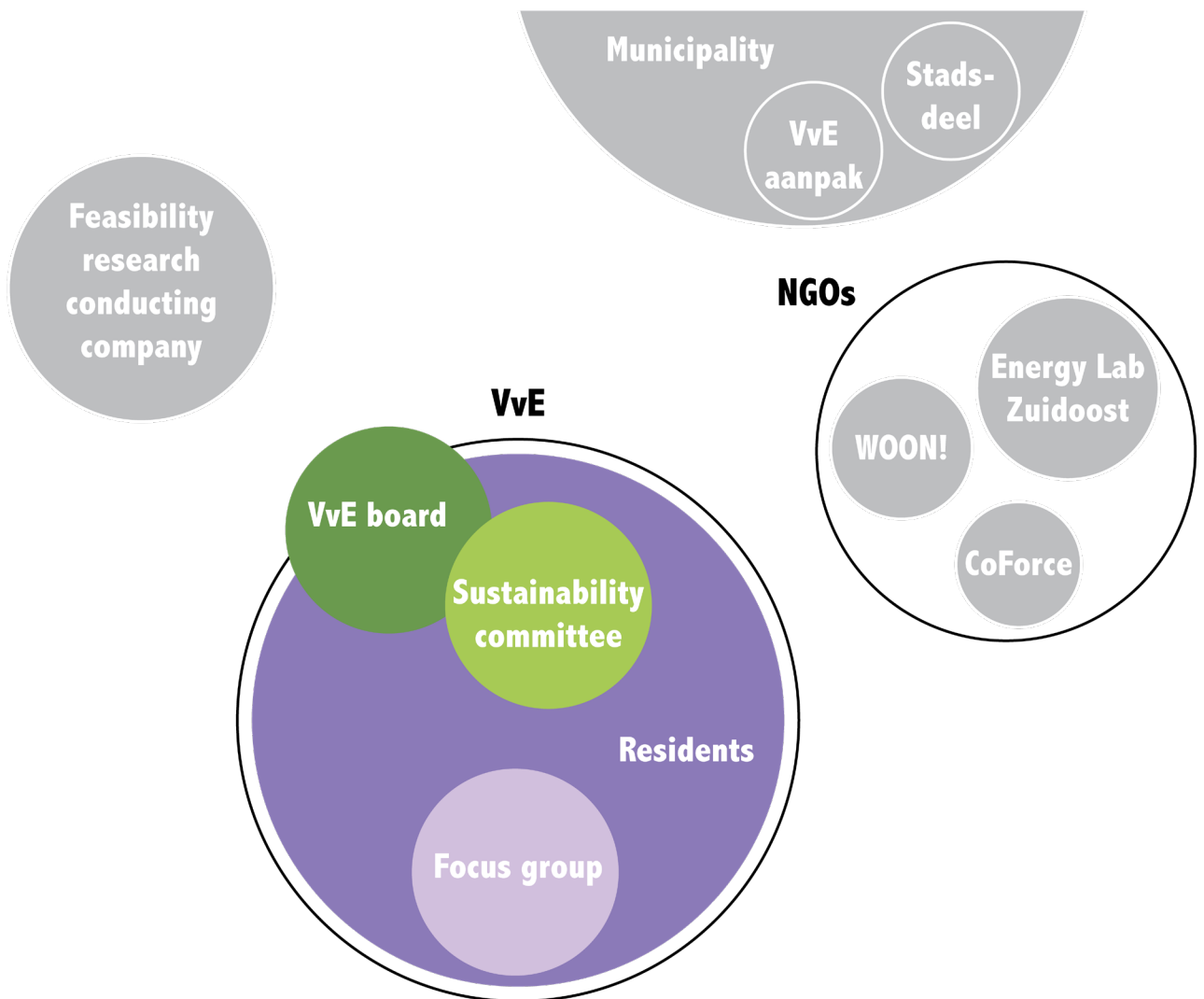
Participation in VvE's

Within daily VvE practices, participation is possible in different ways. In the following list, different types of participation are mentioned, starting with high intensity- towards low intensity participation:
Joining the VvE board (organisational participation)
Joining committees or other connected groups (organisational participation)
Attending the yearly meeting (this is a requirement to host for a VvE
Staying up to date through any communication channels used like a newsletter or a whatsapp group.
The bigger the VvE, the more need there is for participation at the top of the participation ladder of Arnstein (1969) (see figure 12).
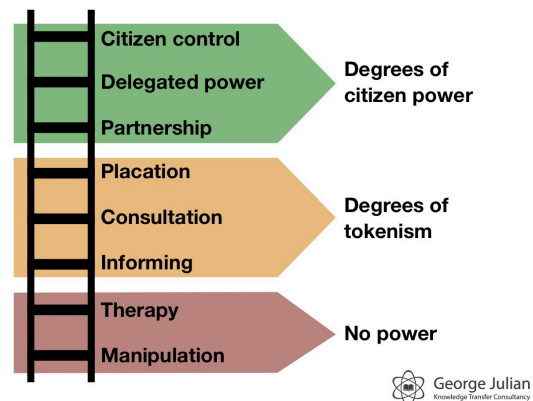
Figure 12: Arnstein (1969) ladder of citizen participation).

Indifferent boards have proven to be a challenge for participation as found in the research conducted by Wegnemen van belemmeringen bij het verduurzamen van VvE's: uitwerking SER- Energieakkoord (2015). The small financial compensation that is rewarded to board members can

3.2 VvE in renovation

In this chapter, I will talk about VvEs (Vereniging van Eigenaren) in the context of renovation. Renovation is a multifaceted process with numerous steps and considerations. I will provide an overview of the typical phases involved in renovation, highlighting the key actors who have a role throughout the process and I will discuss the role of resident participation.

The renovation

The measures and steps taken in a sustainable renovation will vary per apartment and house. This depends on many factors including the current state of the building, the financial resources available and the wishes of the residents. Therefore, there is no one-size-fits all plan for a sustainable renovation but it must be done iteratively and collaboratively.

Generally speaking, a sustainable renovation will consider the state of following elements according to the information on the website Duurzaam Zuidplas (2023).
1. Insulation
2. Ventilation
3. Sustainable energy production
4. Sustainable heating and cooling resources
And in addition, phasing out natural gas can be considered at any time.
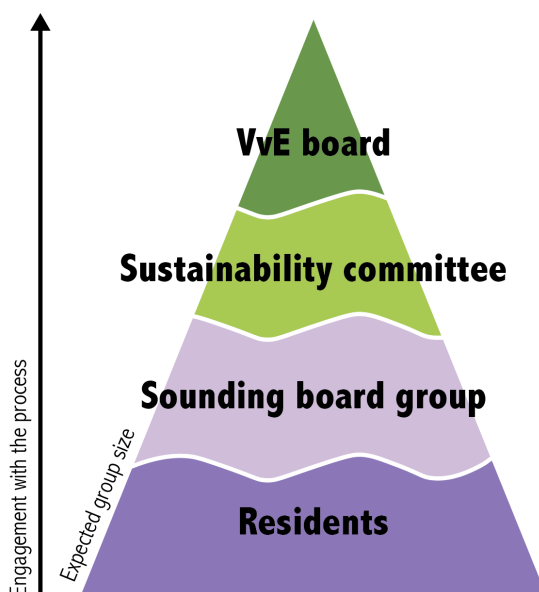
Roles within a sustainable renovation

Starting a sustainable renovation process includes a new set of tasks and roles for the VvE board and its members. When starting a sustainable renovation process, VvE boards can choose to form a **sustainability committee** to divide the task load of a renovation process. Tasks for this group are focussed on researching the content of a renovation. Individuals with expertise in finance, technology, legal matters, or municipal knowledge are needed to formulate a renovation proposal.
On top of that , a **sound board group** of residents can be formed as representatives for the whole VvE complex to evaluate the support for specific propositions. This group can act like a connection to the wider VvE community to collect concerns and opinions throughout the days and communicate that back on the sound board discussion meetings.

Next to that, this committee has a side role to bring the topic alive among all residents. Research conducted in the Venserpolder to the energy transition found that:
"Mouth-to-mouth advertisement is likely the best way to reach residents."
Resident quote from research De sociale energietransitie in ZuidOost (2022). (Translated from Dutch)

While all participation levels described in Arnstein's ladder (1969) can potentially occur within a VvE, an increase in engagement becomes clear when transitioning from the "Degrees of tokenism" to the "Degrees of citizen power." This increase in engagement can also be found when getting higher in the VvE structure. To sustain this arrangement, it is probable that a smaller group of VvE board members will be responsible for overseeing a larger group of residents. (See figure 13) The openness to enter higher levels of engagement within the VvE structure ensures that all levels of Arnstein's ladder (1969) can be accessible in all layers.

Figure 13: Engagement within a VvE.

The renovation journey

There are many sources online which describe the journey towards a sustainable renovation in a VvE building. However, due to the different status quo of each VvE, all journeys will likely look slightly differently.

Analysing the different journeys, a rough outline can be sketched with the mandatory points. In figure 14, you can see a journey, based on the information from the campaign box composed by VvE Belang (2022) with a specific focus on the interaction between the VvE board and residents.

There are two big touchpoints between the stakeholders: the Information meeting and the voting. In between these two touchpoints, the VvE board, possibly being supported by the sustainability committee and a sound board group can have contact whenever they deemed it necessary in the detailing phase.
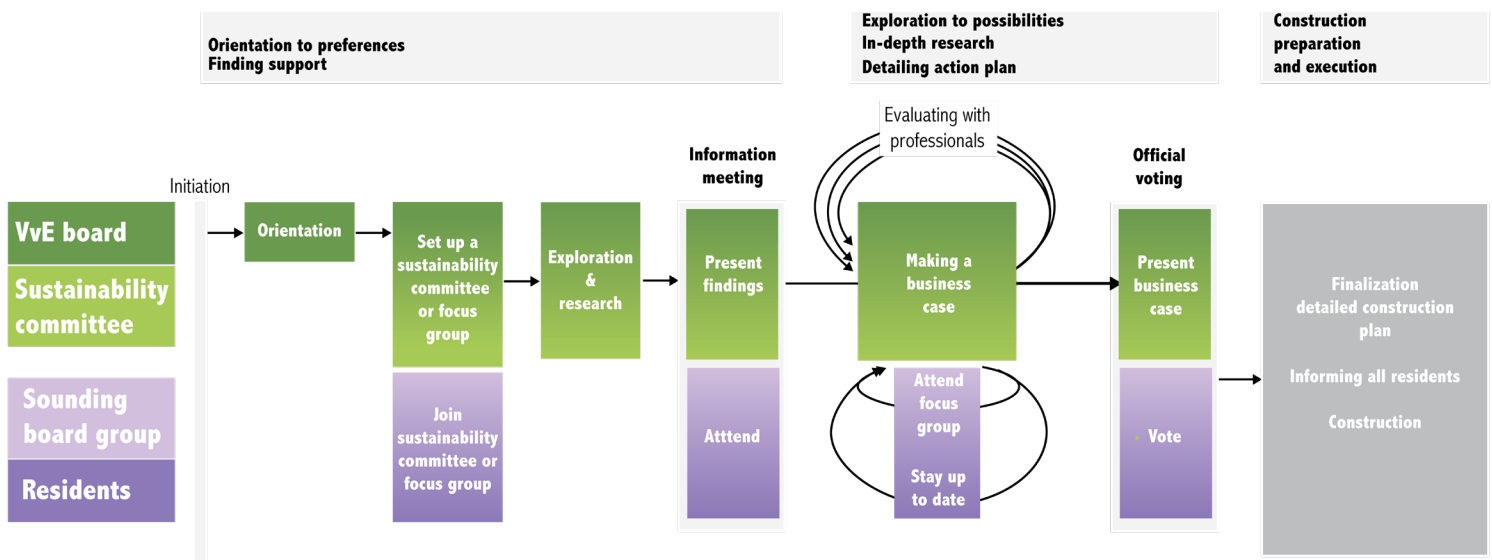
Figure 14: Own visual overview of a standardised renovation process based on the information from the campaign box composed by VvE Belang (2022).

(Official) Need for resident participation

Participation is needed at different levels. Due to the big amounts of organisational work, a lot of work needs to be done to compose the business case for the building. Without residents participating in this process, the process won't be able to move forwards. This process will move more slowly, If it is only carried by the VvE board members, especially because they are only compensated for their work financially with a small allowance. .

Furthermore, participation in the shape of a voting is required . This right is in most cases reserved for apartment owners within the VvE complex, as written in the "Splitsings-akte". This excludes the tenant from voting. There have been experimental case studies where the voting rights have been divided among apartment owners and tenants alike. Resulting in an increased involvement and the feeling of responsibility with the apartment building according to a study conducted by Evaluatie SEV-programma Bewoners en invloed (2012).

Officially, social housing tenants have the voting right to vote with their housing corporation as stated in the law "Wet op het overleg huurders verhuurders". This ensures social housing tenants to have a voice in the matter. However, this right is not mentioned in the renovation journey provided by VvE Belang (2022). It is stated now, that this voting step is only required when a final renovation proposition is formulated for the apartment owners. This limits the freedom to give input to only voting before or against it.
"When they inform us, this is done at the latest possible, so that we really have no choice but to accept it" - Resident quote found in a research conducted by Houben (2022) (Translated from Dutch).

The importance of participation throughout the decision making process is to build acceptance among residents and to find the option where values of all residents are taken into account as well as possible. Especially in buildings with tenants who are excluded from the right to vote, it is important to collect their input before the final voting according to Wegnemen van belemmeringen bij het verduurzamen van VvE's: uitwerking SER-Energieakkoord (2015).

3.3 Resident participation

There are many elements influencing resident participation. This paragraph aims to sketch an overview of the factors with influence, positive and negative, mentioned in literature. This literature looks at forms of participation within the energy transition as a whole. Not only in participation within the renovation process.

Time investment

A practical factor that is mentioned often when discussing resident participation is the time that residents need to invest in participation. A research by the TNO found that 68% of their participants would like to give input through an (online) questionnaire or focus group but only 33% would like to take an active role in the discussions. In the Venserpolder, a research into the perception of natural-gas free living found that 77% of the residents don't want to take an active role but would like to be kept up to date.

Influence

How much influence a resident has in a decision or how much influence the resident perceives could also influence the likelihood of participation.
Gemeente Amsterdam (2021) conducted a survey to investigate the opinion towards natural-gas free living. Homeowners and tenants were separately asked for their opinion. To the question whether they wanted to choose themselves from different providers, in other words whether they wanted influence, 46% of homeowners very much agreed with this. Also, 37% of tenants very much agreed with this.

It is found in a research conducted in Rotterdam by Bouchtoubi (2018) and in Smitsveen by Houben (2022), that residents mentioned that they only were involved after the majority of decisions had already been finalised. In both cases it is mentioned that residents would have wanted more influence on these decisions than only accepting or rejecting the propositions being made, which has been the case.

Motivation to participate

Motivation is an important factor in how much someone participates in processes or decisions. When people feel that their values might be overlooked by the decision-makers, it creates an urge to voice those values themselves. A research conducted by TNO (2022) found that 25% totally disagrees with the statement that the government considers their values when making policy-decision. And that 33% would actively like to discuss policy-making.

Knowledge accessibility

The content of the topics within the energy transition can become very technical and complex. Discussions in the energy transition are often about big numbers and complex systems. Also the systems that are being discussed, mainly the energy grid and the heat network are not very familiar for everyone. A resident probably knows that they exist but not how they exactly work. Also, due to the invisibility of electricity or heat, discussion is often verbally focussed.

For low literate individuals, or residents who have difficulties with the Dutch and/or English language, this lack of visuals can be an even bigger obstacle. ⅓ of the residents of the Venserpolder is defined as low-literate Gemeente Amsterdam (2021). Residents can feel overwhelmed by the information about the energy transition and find it difficult to get to grips with the complex, often technical language. A key figure from the neighbourhood mentioned that "It is already difficult for me, let alone for someone who is really illiterate." Quote is translated from Dutch and retrieved from research conducted by Dogan, B. (2022).

Communication

To make participation to everyone accessible, it is important to have communication channels that are accessible for everyone. Digital means that replace physical means have the danger of ruling out groups unintentionally.

Organisational culture / familiarity

How and where participation opportunities are organised might also influence the participation. It is a psychological principle that people feel comfortable in situations- or people which they are familiar with. In the case of the energy transition, the field is found to be dominated by white, middle aged educated people Odekerken (2021). People which do not fit in this ethnography will find it harder to find familiarity in habits and culture.
As a result, the (discussion) culture will influence the involvement of residents, Odekerken (2021). A resident mentioned the following about the Groene Hub (neighbourhood initiative focussing on the energy transition):
"We had quite a few people there who were really like, "Yes, but you're only for those people on the other side of the tracks." - Quote from "De sociale energietransitie in ZuidOost (2022), (Translated from Dutch).

Trust towards officials

If residents have had prior experiences with a subject, they are likely to associate those experiences with the previous ones when the same topic is brought up. In the case of the energy transition, residents often associate volunteers, looking to inform residents with energy suppliers who go door-to-door to sell energy contracts. Since these salesmen are viewed as untrustworthy and having a double agenda , the volunteers are also viewed as this. This effect is found in a study conducted in Smitsveen Houben (2022).

Financial limitations

Participation can also be limited by the financial ability to invest in plans or solutions, especially due to high investment costs. It is difficult to ask this type of investment from households living in (energy) poverty. This is still the case when the financial benefits are higher over the long term or in specific periods like winter.

Top down approach

Participation can be harmed through a top-down organisational approach. This is the case when residents or officials higher up in the organisational structure are inflexible with shaping participation to the needs and values of residents at the bottom of the organisational structure. The research conducted by Odekerken (2021) states that "..little attention is paid to the intermediate step of creating support. This step is (often) skipped and the focus is on achieving the goals.

Social Economic Status

The combination of many of these found factors can be seen back in connection of SES and participation. SES is composed of many different factors within the social, economic, and work status of an individual. Those factors could have consequences on the accessibility of participation. The combination of multiple consequences is what makes a distinctive theme. In literature, there is a connection found between a SES and participation within the energy transition.

For example:

"Among residents with a low socioeconomic status, the topic of energy transition plays a very small role. This is due to various reasons such as 'not having the time and money to delve into it.'

"The energy transition is a very new topic for many residents; for example, they do not know what green energy is."

"Especially residents with a low socioeconomic status do not have the space, time, and resources to delve into the energy transition."

Quotes from interviews from the research by Odekerken (2021) (translated from Dutch).

3.4 Best practices in resident participation

I have highlighted four projects, conducted by different institutions in the field of social design and architecture . All projects centre around the theme of participation. I reviewed their approaches to their challenge and identified elements which I considered to have benefitted their success. I was most interested in how they engaged the widely varied target group and on the participants' experience.

"Aardgasvrije wijken" - Zeewaardig (2022)

Goal:

The goal of this project was to prepare participants for the transition away from household gas to full electric.

Insights from this project are:

- Make it visual: This informative artwork is a interesting conversation starter for any bypassers .

- Connect to day-to-day life: A stove is a familiar object which will be a notable change after the transition.

- Information in small bits: Information is an important part of the intervention but keep it short and directly relevant.

Image from Zeewaardig (2022)

"Bakfietsrally" - Energie in Smitsveen

Goal

Bring the topic alive in the neighbourhood through a non-invasive information campaign. This, to go away from the stigma of energy-company when passing by the doors.

Insights from this project are:

- **Answer their questions:** By providing information about a topic, residents get more confidence in a topic.

- **Personal contact:** By talking to residents face to face, it is easier to trust the information provided.

- **Attract with music and food:** By wrapping the information in a casual atmosphere, residents feel more invited to pass by.

Image from Smitsveen

"Ruimte voor de stad" - Maquettelier

Goal

The municipality of Den Haag aimed to involve residents in the design of the public space in their neighbourhood. They were asked where they would place playgrounds, Agriculture, highrise buildings and schools, among other things.

Insights

- **Show input visually**: This creative way to collect input makes it easy to see what others have voted for.

- **Interactive and simple:** The physical action is easy and accessible for everyone. The colours create a fun looking result.

Image from Maquettelier

"Koningsvrouwen van Landlust" - Eigen Haard (2011)

Goal

A social housing corporation wanted to create a totally new building layout which would be best fitting with the preferences of the current residents. They let kids design their new homes and let them present it to their parents.

Insights

- **Bring the topic alive in a fun way:** Through fun activities for kids at schools, parents were also involved in the discussion.

- **Creative participation**: Letting kids craft a model and present it can give valuable insights of their values and preferences.

Image from Eigen haard (2011)

3.5 Literature research conclusion

Conclusion literature

Literature research was used to analyse how a VvE and a renovation process will generally be formed. Findings on this part can be reviewed in chapter X. Reviewing residents participation in the broadness of the energy transition, I have found many factors of influence:
· Time investment
· Influence
· Motivation to participate
· Knowledge accessibility
· Communication
· Organisational culture / familiarity

Conclusion best practices

When clustering all of the findings together, I was able to find three themes. All projects contain at least two of the themes.

Theme 1. Visual, fun, interactive
In the projects, objects were used to visualise what the actual topic was. The visual form made it easy to deliver feedback on and to see what other participants gave as input. Bright colours have been used to capture attention to what the makers found important to highlight, making it look visually attractive or fun.

Theme 2. Informative
Some type of information was passed to the participants about the topic. The density and medium varied across all projects. For example, through text, through talking or through visualisations.

Theme 3. Connect to the familiar
The projects tried to capture the attention and engage participants through familiarity. Objects or area visuals were used which were familiar to the participants in their day-to-day life. This could stimulate the participants' interest to see what it was about.

4.
Field
research

In this chapter, I will explain all of the work I have conducted within my field research. The method I have used can be described as ethnographic research or action research. WIthin the context, I entered in different parts of the context and got to speak with residents with different connections to the VvE.

4.1 Set up

The field research has been set up to answer the three research questions as posed at the beginning.

Research questions

- *What is the perception of the role of residents within home renovation?*
- *What are barriers for general participation?*
- *What are drivers for general participation?*

Research method

To conduct my field research, I switched between the methods of ethnographic research and action research. The ethnographic research I did consisted of making observations and interviewing residents in the context. Action research took place when I took an active role in the context. The residents then perceived me as having a different role then being a researcher. During this action research. I formed a part of the context that I was observing.
Activities & participants

My field research consists of data collected during four types of activities. During these activities, different groups of people have been present.

An overview of this:

Sustainability info evenings - 2 visit
- VvE's within Venserpolder (N=4)
- Residents
- Architects from Synopel (N=2)

Community centre - 3 visits
- Volunteers from "Buurthuis de Bonte Kraai" (N=8)

Energy Coach appointments - 5 visits
- Residents from Amsterdam South East (N=5)

Professional Interviews - 2 visits
- Architects from Synopel (N=2)
- Strategic consultancy Komovo (N=1)

A visual overview of the locations connected with the interviewees is shown in appendix 2.

4.2 Research findings

In this paragraph, you can read about all the activities I attended for my research. Per activity, I give a brief description of the activity, I state the goal for this activity and finally I give a summary of the most important findings for this goal. The detailed notes will be added in the appendix. Specifically, these activities have been conducted to explore the following research question:

What is the perception on the role of residents in sustainable apartment renovations, according to residents living in social housing, residents who own their apartment or by the VvE board?

Sustainability info evenings

Activity description

During my research phase, I had the luck of being invited to two VvE meetings where the results of the "Haalbaarheidsonderzoek" of the Architect studio Synopel were presented. One meeting had been organised by a VvE overseeing 200 apartments owned by private owners, landlords and 45% by a housing corporation. The other VvE oversaw 44 apartments, either privately owned or by a small real estate agent. I was there in the role of research student and was asked by Synopel to help to take notes during the discussion-round.

Goal for these activities

My goal during my visits was to see how Synopel would present their research to the residents and how this information would land with the residents. I wanted to see what concerns would be expressed/ what priorities residents would express when discussing the options. I was also curious whether residents could imagine and consider all the consequences of the choices.
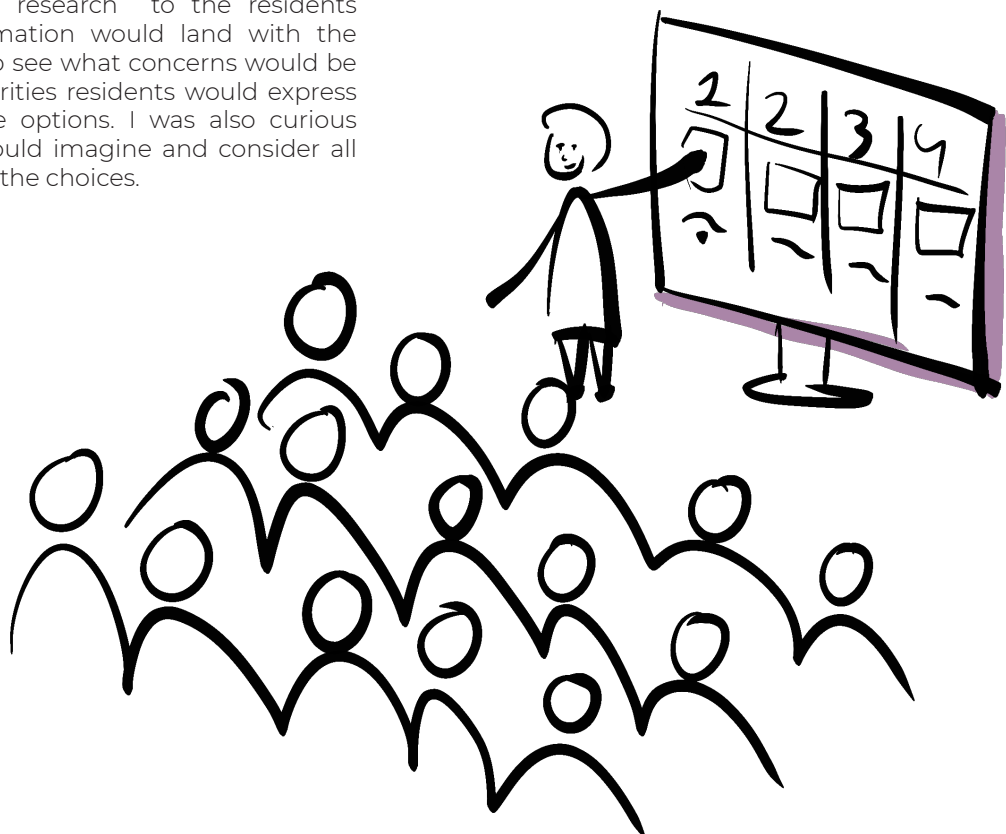
Findings

The findings of the two info evenings have been split up in two different sections. This, because the big differences in context resulted in findings that were only applicable for similar contexts. An important difference was the presence of social housing tenants. A rough overview of all findings can be reviewed in appendix 3.

Block with 200 apartments

In general, many residents were **positive towards the sustainable renovation options.** All five residents in my discussion group, home owners and social housing tenants alike, were positive towards a renovation.

When discussing the options, residents are **fixated on the energy saving impact** it will have. The rise of the service costs get briefly mentioned but the other consequences like the construction nuisance or the change in window frame aren't mentioned

> Me: "What do we think of the renovation options?" resident: "It will save a lot of energy right?" Me: "Yes, that is what was presented" resident: "Then, I think we should do it"

The claim that **social housing tenants won't be charged** with the renovation costs has to be repeated multiple times by different individuals.
Likely, because it felt too good to be true in the heads of the social housing tenants. Also, the statement was only briefly mentioned in the presentation. Something that might not feel right for such an important statement.

Putting time in trying **to reach all residents through personal contact** and promotional material likely resulted in a high attendance at the info evening.
One of the board members passed by everyone's apartment to invite them to the info evening, a video was made with details of the info evening, flyers were put up in all 20 corridors and even a website was launched (see figure 15) with contact details of the board and space to upload any updates.
It is important to provide an **opportunity for the residents to express their complaints** about their current apartments. After that, it is important to give them the feeling **that these complaints have been heard** and will be considered in further discussions. During the info evening, Synopel scheduled time to let residents talk to each other about what complaints they had about the building and their apartments.

Block with 44 apartments

Not all residents experience the same benefits as others due to **value differences.** This brought up some conversations between the residents.
A resident mentioned that he won't be able to experience the energy savings as calculated since he was consuming very little.
The 6 residents sharing the bottom apartments lose a very high amount of heat through the floor compared to the middle apartments.
When mentioning that the windows should officially only be replaced in 30 years, an older resident responded that she didn't feel obligated to already worry about that: "I won't see the end of that". Someone else mentioned that the apartments would immediately rise in value.

Throughout the evening, the same question about the new service costs was repeatedly asked. Residents had the **tendency to assume** what it would be instead of asking it.
An older resident: "The 300 euro would be distributed over the year right?", another resident: "No, that will come on top of the current service costs every month"

Due to the continuation of **individual renovation plans**, it looked like there was little faith in the success of the newly presented renovation plan.
Board members continue to plan renovations for individual households despite this not being necessary anymore when the complete renovation plans will start.

Board saw **language difference** as a barrier but didn't know how to approach this
The presentations and posters were Dutch but the board mentioned that not everyone from the apartment was able to speak Dutch. When being asked what might be a possible way to also involve them, there were no concrete ideas.

Figure 15: Screenshot of the website

Community centre

Activity description

As a research student, I was referred to the "Buurthuis De Bonte Kraai" to help the residents from the neighbourhood with my knowledge within the Energy Transition. I visited the community centre 3 times and was able to do 5 in depth interviews with volunteers and talk to some other visitors. None of the conversations have been recorded since the reaction on this was that the interviewees didn't feel comfortable with that.

Goal for these activities

I want to explore the elements that are positively affecting the activity and cohesion within a community centre like "Buurthuis de Bonte Kraai". I want to look for inspiration on how this community has been built and what elements keep it together.

Findings

A strong driver to contribute to the community is when **effort is rewarded** by a positive response from the community.

For example, a 21 year old volunteer put effort in broadening the assortment of free giveaway items like menstruation pads. She is motivated by seeing that many visitors are helped by it and are grateful for it.

Photo: banner outside of "Buurthuis De Bonte Kraai" (Personal photo)

When such a contribution has been made, other members of the community are **proud of the community member** who made that contribution. Volunteers speak proudly about contributions being made by other volunteers.

Every week, some main organisers come together to talk about all the developments. All contributions are praised.

By having a wide scope of activities within the community, volunteers were able to **find the activities which fit them the best**.

A lady likes to update the website now and then, someone who is very aware of his energy usage helps in the transition hub to answer the questions of visitors.

Photos: examples of activities provided by the "Buurthuis De Bonte Kraai"

The community members are proud of their **community centre** itself. It also plays an important role in making all the activities possible and it creates a place where people come together and are then also informed about new activities within the centre.

The community centre itself has been colourfully decorated and it has been kept clean and tidy.

Due to the busy activity schedule, there are often visitors walking in and out, chatting with acquaintances or reading the newspaper.
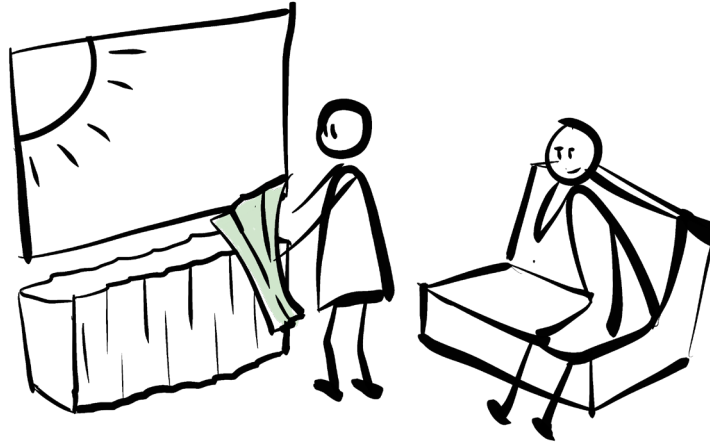
A **visual identity** helps to link new initiatives to the community and it can be used to refer to the whole community.

Volunteers are proud when saying the community name and the logo is used at multiple places around the centre and online.

Photo: Media communicatie from "Buurthuis De Bonte Kraai" displaying their logo.

Energy-coach

Activity description

As part of my research, I became an Energy Coach in Amsterdam South East. My function as energy coach was to help residents with the question of how they could save energy by giving them tips (close the shower when washing your hair) and free tools (radiator foil). I was able to visit 5 households within Amsterdam South East. Of the households, 4 were renting with a social housing corporation and 1 with a landlord.

Goal for the activity

What I wanted to discover as Energy Coach was how residents look at their responsibility over their apartment. So, how much effort a resident would be willing to invest in order to improve the quality of their apartment. Also, I wanted to ask what their opinion on Green Energy was.

Findings

Residents feel a very **low responsibility** over their apartment.
Reasons that were mentioned were that they weren't planning on living there for very long. One interviewee mentioned not liking the people in the neighbourhood and therefore wanted to move.

Residents felt **unable to influence decisions** made by their housing corporation or landlords.
Residents would not bother to initiate renovation themselves because they didn't feel this effort would be taken into account by the renting party (housing corporation or landlord). This feeling has been strengthened by the notion of past experience that requested maintenance has been ignored or only partly improved by housing corporations and landlords: "The housing corporation will do what they want anyways, even if I won't agree".

Green Energy like solar panels are perceived as **unattainably expensive and too technological to understand**. The perception of residents on solar panels has been similar in every conversation. "They are very expensive" "not for me" "they are way too technical", "I don't know anything about that" or "I wouldn't even know where to start".

When residents are interested in green energy, a shared option among all neighbours of the apartment quickly gets dismissed due to the **negative perception of codependency**.
Some residents did get curious when explaining the costs it could potentially save. However, the conversation is then always stranded with their question of: "Can I do that by myself?" when the answer was that it was possible but it would be more difficult, the motivation seemed to fade away. Reasons for this being that their neighbours would never want to contribute to the idea or it was mentioned that the neighbour always left his trash bag outside his door.

4.3 Barriers and drivers

In this part of the analyses, I categorised the different barriers and drivers that I encountered in the context into six factors. This helps to answer the questions earlier stated:
Which barriers do residents experience that could hinder them from participating?
What drivers do residents have that might be strengthened to stimulate participation?

Position

The official position of being a homeowner or a renter, has a significant role in the **influence** and the **responsibility** over the apartment a resident is experiencing. Apartment renters have in general a low feeling of responsibility over their apartment and are therefore unmotivated to put effort in improving the livability of it: "It's Rochdale's apartment, it's their responsibility". For homeowners, it is occurring that they expect the VvE to be responsible for changing their broken light bulbs as part of the building's maintenance because: "..why else am I paying 165,- per month?". In an environment where people had a big influence, like in the community centre, when something they wanted to do could indeed be done, it gave them more motivation to keep contributing.
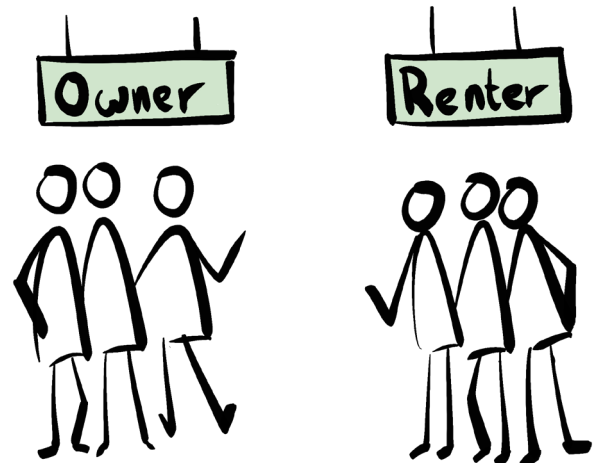
Trust in officials

Trust is a very important factor within all the contexts that I visited. There are different categories of trust that I encountered. The trust that individuals feel towards other individuals and the trust that individuals feel towards organisations. And next to that, there is also a distinct difference in the trust in someone's **honesty**, so if someone is telling the truth and the trust in someone's **authority**, so if someone is authorised or to make certain claims. Residents' lack of trust can come from suspicious propositions like: "We would get a free set of pans when taking their deal, that turns on a red light". Furthermore, it is very important with what authority someone is speaking whether residents will trust the claims. This effect was very strong when the architect presenting their research made claims about financial benefits on behalf of the housing corporation. The statement that social housing tenants couldn't be charged with the costs of a sustainable renovation process had to be repeated multiple times by different people. Also, a low trust grows with homeowners who don't know where their monthly contribution goes. "I don't mind paying extra for a renovation but I want to know where the monthly 165,- in service costs go to, the staircases aren't even cleaned properly"

Knowledge

Knowledge differences also play a factor for individuals in their ability to participate. This knowledge is both on the technical and the cultural side.

Looking at the technical side, residents often assume that the topics around sustainable energy are too technical for them to understand. This, already before ever asking or reading anything about it. They have little trust in themselves that they would be able to find out if, for example, solar panels could be interesting for them.

"I sometimes see apartments with solar panels but that is so technical, I'm not knowledgeable about that". The lack of the right vocabulary also makes it difficult to understand the

Missing the right vocabulary also causes difficulties when seeing the info presentation of Synopel. Probably causing many people to drop out of the topic. Also, when comparing different renovation options, it is challenging to weigh the future benefits when they are unclear and depend on many different factors like.

Then, the dominant **cultural knowledge** influences how accessible the activities are. Especially in general meetings, the bureaucratic style of the meetings, very familiar to the average office employee, could discourage residents who aren't used to this type of communication from actively participating and hamper effective communication.

Social cohesion

Fostering **trust** and a **shared commitment** among residents is crucial for a successful renovation process. It is important for residents to trust one another and believe that they are all dedicated to achieving a common goal. Additionally, having a willingness and a sense of responsibility towards their neighbours contributes to an enjoyable living environment. However, these positive aspects can be overshadowed by negative associations that neighbours develop towards each other, often arising from nuisances such as leaving garbage bags outside of doors. These negative perceptions can hinder cooperation and undermine the sense of community within the community. Encouraging social interactions among neighbours can stimulate providing help to neighbours or information sharing on the developments within the apartment complex. Currently, residents seem reluctant to help or engage with their neighbours. Consequently, there is a lack of a collective identity and a limited sense of belonging within the apartment block.
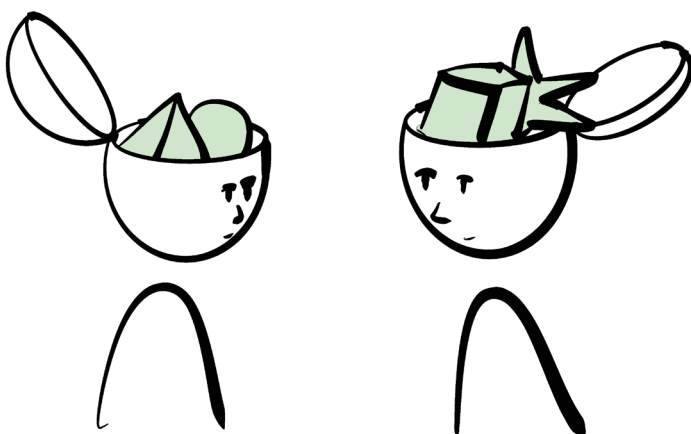
Practical factors

The time on which activities are scheduled also play a big role in who is able to join these activities. The current VvE activities predominantly consist of the official VvE meetings which mostly take place in the evening. This is due to the 9 till 5 working hours of most residents. However, for some people, these moments will always be difficult due to other activities like night shifts, very morning shifts the next morning or when single parents have to take care of the kids. Altering the moment of a VvE meeting or offering an alternative will give more people the opportunity to join. Furthermore, a general busy day schedule with for example a taxing job could leave residents too tired to join a serious evening activity at all. Another specifically difficult factor that plays a role is the fluency in the dominantly used language at VvE meetings. This is often Dutch and sometimes English as a second language. Other dominantly spoken languages in the neighbourhood are Turkish and Arab. I experienced that a lack in language fluency could result in the difficulty to understand Dutch texts. Research on the population of the Amsterdam south east found that in 2021, 32% of all residents are low literate. This is in comparison to the national average of 12%. VvE meetings where residents are expected to have read and understood propositions or agenda's will not be attempted by possibly the 33% of residents with low literacy.
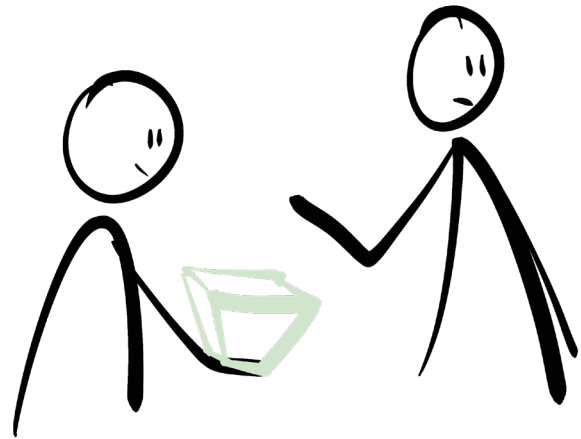
Personal factors

There are also multiple personal factors influencing a residents motivation to participate in VvE activities. The interest a resident has for the discussed topics might cause residents to look into it or not. In general, topics like maintenance, financial consequences or nuisances aren't perceived as very interesting by many residents. Also, when doing something where you are not good at something you don't understand, like discussing complicated maintenance expenses, can be frustrating and confusing. Also, personal motivation could form an obstacle or driver for residents. In the case that a resident has little personal motivation or a low stake in a decision, for example when someone plans to move out shortly, the motivation to put time and effort in something is lower. Also, when a resident is seeing that their contribution is valued and of use, this creates motivation for future participation.

4.4 Field research conclusion

Conclusion

I will now assess whether the field research was able to effectively address the research questions. These findings have been found through ethnographic action research, enabling me to be part of the context that I was analysing.

Through conducting interviews and observations in a diverse set of contexts and interviewees, I was able to formulate insights. A snapshot from the analyses can be found in appendix 4. The barriers and drivers found in the context can be clustered within these six factors. **The six factors that were found are:**
- **Position**
- **Trust in officials**
- **Knowledge**
- **Social cohesion**
- **Practical factors**
- **Personal factors**

These factors can take shape as barriers or drivers dependent on the specific context. To make these findings more concrete and eary to transfer, I design a cardset based on these. The complete cardset can be viewed in appendix 5. Due to the time, no further attention has been placed on evaluating the usability of the cards.

A notable insight was that there are big differences in perceptions among the broad resident group. With a particular difference between apartment owners and tenants. This difference was found with the residents themselves but also when looking at the official regulations and the professional opinions surrounding it. There are many different perceptions present on participation for tenants.

Discussion

My research has been able to provide answers to the research questions. However, the found answers are a partial view of everything that is playing within the area. Despite this partial view, I will assume these findings to be representable enough to continue my project with. In this project, I've had conversations with between 20 and 30 residents, varying from very short to very long. The insights have always been based on data coming from multiple sources, making the insights valuable enough to continue with.

The conducted research has been unique in its variety in ways to take a look at different parts of the society. The set up of this research made it possible for me to do research on the barriers blocking resident participation while simultaneously, I could explore the drivers from the neighbourhood.

The method of ethnographic action research is very sensitive to biases. A reason for this lies in the interpretation of what has been said. Especially since it has not been possible to record conversations with residents, a lot has been immediately written down as an interpretation of what has been said. Due to the researcher bias, it is possible that I have been extra sensitive to find things that confirm what has already been found in literature. Also, when doing research at only a few selected locations, this will give a partial picture of the whole neighbourhood. The selection of the locations has been heavily influenced by the possibilities at hand, which made it difficult to ensure a representative spread among the whole community.

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Reflection

In this chapter, I will reflect on some of the decisions I have made throughout the process and the influence those have had on the process and the results.

The outcomes of the research were likely significantly impacted by the choices made when selecting the research contexts. These choices were made based on the likelihood that I would meet residents groups who have been highlighted to experience the most barriers in participation. However, these decisions also came together by the emergence of opportunities that I could make use of, which I was not always in the position to do so.

Reflecting on the research methodology of ethnographic research and action research, I see these as having been very effective. Connecting to a "buurthuis" as a volunteer instead of a researcher, I believe, has helped a lot to be perceived as a trustworthy individual. Having had conversations, I believe that this perception is very important since official institutions are often mistrusted due to negative experiences in the past, for example energy corporation salesmen trying to push poor energy contracts to residents.

As an energy coach, I went through a training that in itself gave me knowledge and confidence in the topic of the energy transition and home insulation. This proved to be important to gain the trustworthiness of some interviewees I talked with later in the process. By being able to speak with the agency of an energy coach, I experienced residents being more willing to talk to me and ask me questions they need an answer for.

A downside to this method is that a bias that could come from the relationship coach - client instead of researcher - interviewee. During the energy coach training, it has been mentioned that clients sometimes (unconsciously) attempt to impress the energy coach by responding to questions based on the ideal behaviour they believe an energy coach would appreciate. When noticing this, I tried to verify these claims by asking follow up questions to the topic.

Attending VvE info evenings have also been very valuable to attend. Since I had also never attended one before, I could reflect on my own feelings and ask myself the question: "what would I have done/thought if I would have lived here?".

5.
Summary & design vision

In this transitional chapter, I will summarise the key findings from both the literature review and field research and briefly explain them. This is the foundation on which my design vision has been built. The design vision will be used in the next steps of this thesis.

5.1 Research summary

There are many social, technical and practical factors that can influence resident participation within the renovation process. Through literature research, an analysis of best practices in the context and my personal field research, I could define and describe many of them. In my attempt to classify all factors, I found that many are interconnected and will influence others in complex ways. Moreover, seemingly unrelated contextual factors could also have a significant effect which shows that all contexts are unique and could be influenced differently by similar factors.

Literature research

Literature research was used to analyse how a VvE and a renovation process will generally be formed. Findings on this part can be reviewed in chapter 3. Reviewing residents participation in the broadness of the energy transition, I have found many factors of influence:
· Time investment
· Influence
· Motivation to participate
· Knowledge accessibility
· Communication
· Organisational culture / familiarity
· Trust towards officials
· Financial limitations
· Top down approach
· Social Economic Status
A clearer description of all factors can also be found in chapter 3.

Best practices

Many interesting projects have already been launched in the past in the topic of resident participation within the energy transition. These are specifically valuable since the context factors are clearer for each project. Three lessons I found are:
· Make it **visual, fun, social or interactive**
· Provide **information in small bits**, as answer to questions and through personal contact
· Connect to what is relevant to the **day-to-day life**

Field research

Sensitised by these findings, I conducted my own research across various contexts and compiled a list of factors that I observed to be the most influential. These six factors found are:
Position
· When residents perceive a lack or influence, this can be demotivated to get involved later on.
Trust in officials
· For residents to listen, they need to trust your honesty and your authority to make the claims.
Knowledge
· To join the conversation, it is important to have knowledge of know-how in the (technical) topic of renovation and to be familiar and comfortable in the cultural habits of a VvE.
Social cohesion
· A community with a strong social cohesion will more easily do something for another without (directly) benefiting from it themselves.
Practical factors
· The selected time, location or medium for sharing information might make it difficult or less accessible for some residents to participate.
Personal factors
· Intrinsic motivation or interest in a topic are influenced by someone's situation or personal preferences. These can both be barriers or drivers to participate in the renovation process.

5.2 Problem statement

In my problem statement, I will explain which part of this bigger problem I went in depth with during the coming part of my research. There are many factors causing low participation among residents within a VvE. The factors vary in how well they can be addressed by single interventions. For example, the legal rights within a VvE could cause difficulties. Within the capabilities of this research, no impact can be made on this.

An influential barrier for residents for participation in the renovation process was that they didn't feel their efforts would have any influence on the outcome of the process. For example, because they had less legal rights than neighbours due to their housing status. Or because they felt unskilled in the topic and therefore delegated the tasks to people whom they believed knew more about them. This led to the problem of residents not experiencing the influence that they could have on the process.

5.3 Design vision

I formulated this design vision based on my prior research. Within this vision, I've outlined a design goal, specified the kind of interactions aimed for, and used an analogy to provide a visual notion. This design vision is used as a roadmap, guiding the research to ensure that the final concept is in line with the findings throughout the research.

Design goal

> **66** **How can residents _experience influence_ in the sustainable renovation process of a VvE?** **99**

Design requirements & nice to haves

To guide my design process, I formulated a couple of requirements with which I can measure the successfulness of the design. All of these must be met to be a successful design. Separate from this, I also formulated a list of design wishes. These are formulated in a way that shows the preferred direction the outcome should be but not all need to be maximally met to still be a successful design.

Requirements
· Accesaility through non digital media

Nice to haves
· Low language proficiency necessarily
· Low organisation effort of the board needed

Interaction qualities

Simple

Engaging

Social
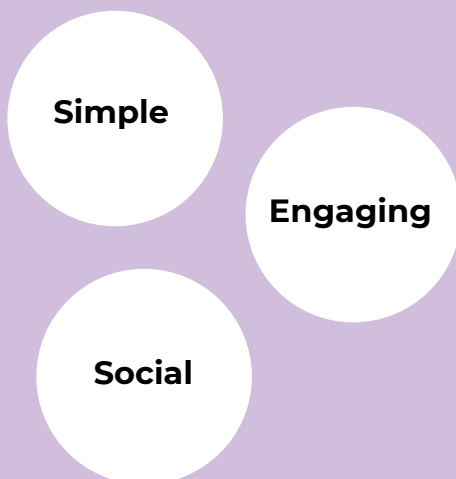
6.
Research through Design

In this chapter, I will present the five directions that I explored within this phase. Each direction will be accompanied with a small part of literature or field research. Then, I will briefly explain the prototype I designed to explore this direction and the findings that came out of this.

6.1 About the method

The method of research through design is based on the principle of making a design, putting it in the context and seeing what the context does with it so that you can learn from this. This could allow for new insights besides the insights from natural recurring situations. Also, by designing the design in a way that gives something back to the context, think about knowledge or reflection, it can directly provide value to the context.

Over-researched area

The area of the Venserpolder has been the focus of many researchers before due to a relatively high poverty and crime rates. The result of this being that some residents have formed a dislike for the typical question-asking researchers according to research conducted by Malssen (2023). A reason for this is for example that researchers might make promises of positive project outcomes that are never seen again. This might lead residents to view researchers' promises with scepticism and be less open to dedicate their time to answering questions when they can't see the value from the outcomes.

Wide exploration

Another reason for using this method is that it allows for a wide exploration within the design vision. The complexity of the dynamics within the context make it difficult to estimate how a design will fit. To find this out, the only way is to try this out.

Set up

I went 5 times through my Research through Design cycle. The steps I went through for each turn are the following:

Choose direction based on findings

Iterating

Designing

Analyzing

Making

Testing
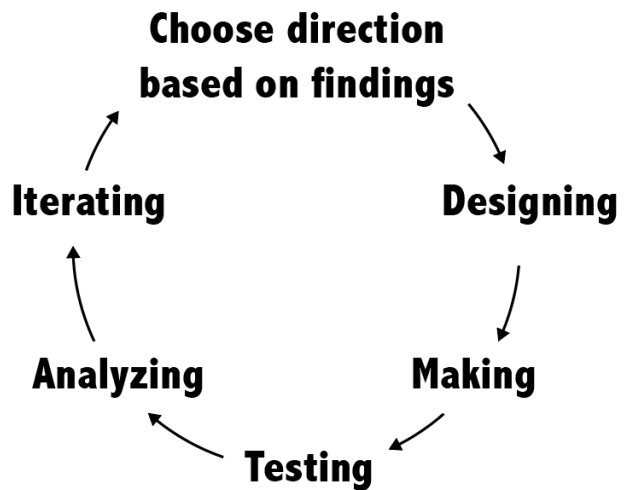
Own figure:

Explored directions

I was able to explore five directions during the Research through Design phase.

1. Vision building workshop

2. Discussion-starter board

3. Serious Games

4. Simplification with visuals

5. Simplification with interactions

Comparison tool

To easily compare each direction, I formulated a tool composed out of a select set of criteria. With this tool, I will judge how each direction scores on the criteria. The criteria are briefly explained in the next paragraph.

Barriers and drivers

These are the six themes found in the research to barriers and drivers. The 5 directions explored are aimed at fulfilling the design vision by either removing a barrier of strengthening a driver within the 6 themes. Multiple themes can be addressed within one direction. The themes being:

☐ Position
☐ Trust in officials
☐ Knowledge
☐ Social cohesion
☐ Practical factors
☐ Personal factors

Intended user group

Within the chosen direction, a diverse range of users remains relevant, each direction can address a specific user group in particular.

Dominant language proficiency needed

In this context, the dominant language is usually Dutch or Englisch. Needing a low dominant language proficiency, the design will be including residents who are troubled by a language barrier. On the scale, left is the lowest needed dominant language proficiency necessity and right the highest.

Required effort

Similarly, the required effort of the VvE board or supporting committee members or neighbours is preferred to be low accoring in the field research. This level is estimated based on how much time and effort a VvE board has to put into the usage of the design. On the scale, left is the lowest effort required and right the highest.
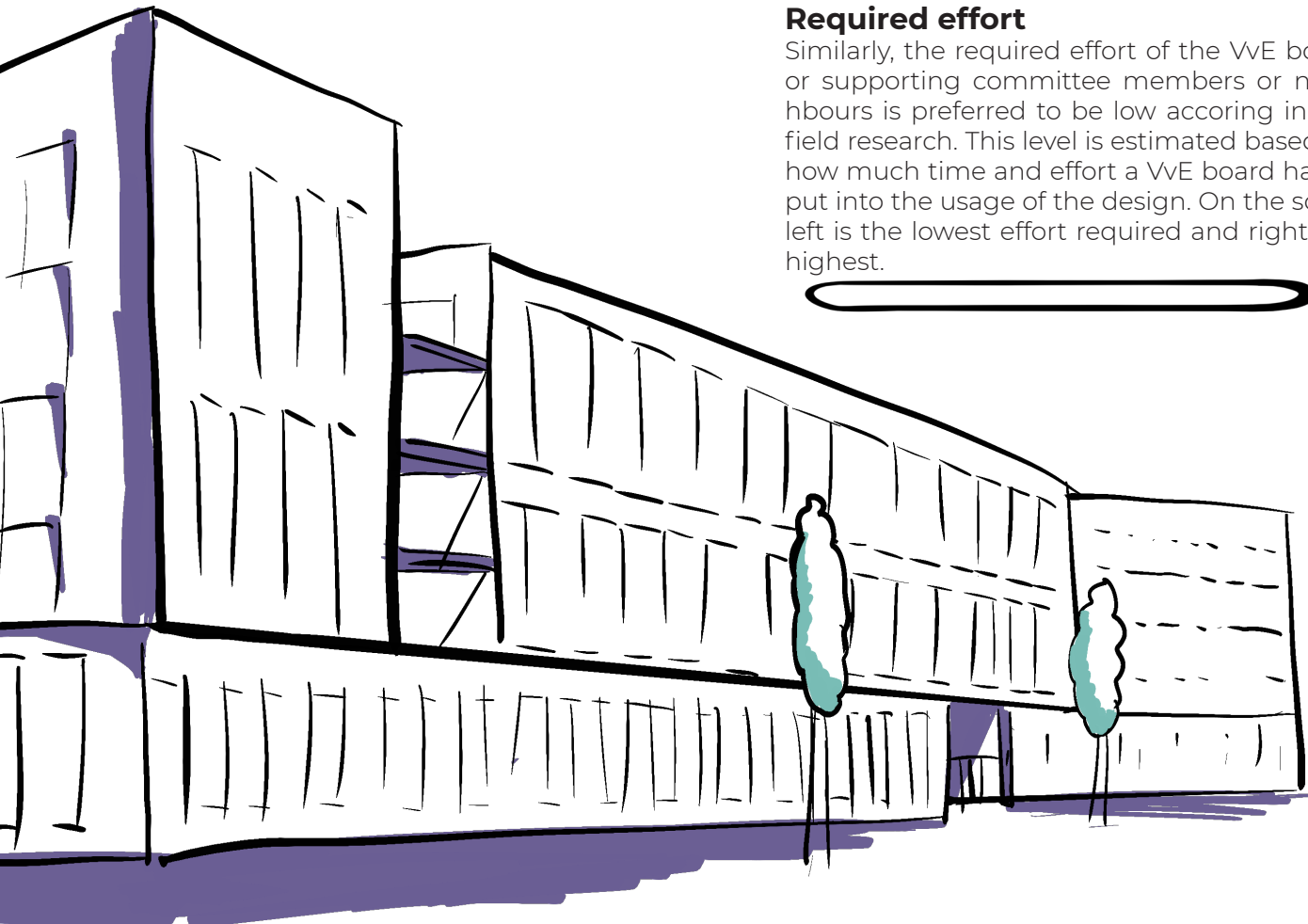
Direction 1: Vision building workshop

About

Identifying with a social group can contribute to feeling a strong social cohesion between group members. In this first direction, I wanted to explore if this feeling can be stimulated through a workshop where residents were asked to **reflect on their own values** to eventually bring everyone's values together. With these values, a visual representation of the most important collaboratively picked values were created in the form of a logo for the building. When this logo will then be designed and used, residents can **recognise the values they collaboratively picked** and identify with these values.

Tool

Barriers and drivers
☐ **Position**
   Giving everyone the chance to have influence
☐ **Trust in officials**
☐ **Knowledge**
☐ **Social cohesion**
   Sharing personal stories and stimulating collaborate decision making
☐ **Practical factors**
☐ **Personal factors**
   Residents uninterested in technical topics might participate for personal fun

Intended user group
The intended user group for this prototype are residents who are uninterested in technical topics but who are motivated to attend social events in the neighbourhood.

Dominant language proficiency needed
The session aims at visualising the discussions but the process still predominantly relies on verbal speech. This makes a basic proficiency in a shared language needed.

Required effort from the board
Organising these sessions will require preparation, execution and processing the results. A big effort is needed, in the case the board will take up this task themselves. Due to the low technical knowledge needed, different individuals would possibly take over this task.

Theory

About social cohesion
A description of the term social cohesion is given by Manca (2014) as the extent of connectedness and solidarity among groups in society. Manca (2014) also talks about social cohesion consisting out of two main dimensions being (1) the sense of belonging of a community and (2) the relationships among members within the community itself. In figure 16 can be seen that Identification is one of 9 found factors related to social cohesion.
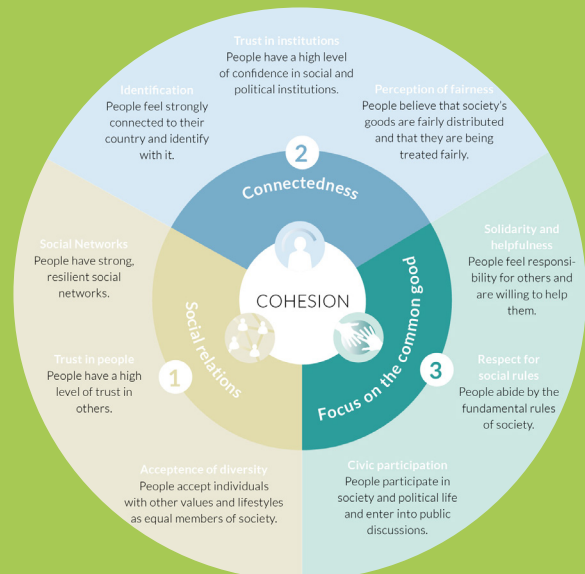

Figure 16: Infographic: Areas and dimensions of social cohesion Bertelsmann Stiftung (2018).

Then, how stimulating social cohesion will lead to an increase in the engagement in the sustainable renovation process? Bertelsmann Stiftung (2018) finds that stimulating social cohesion will result in a higher willingness to contribute to the community regardless of personal ambitions. This will stimulate residents who see a strong need for the renovation for others even if for themselves, the benefits will only be limited and insufficient to put their effort into it.

The prototype set up

Communication to participants
· Message in WhatsApp group (45 members)
· Poster in elevators/ bulletin board

Participants
· 3 (including myself as participant)

Materials
· Booklet (see photos)
· Worksheets
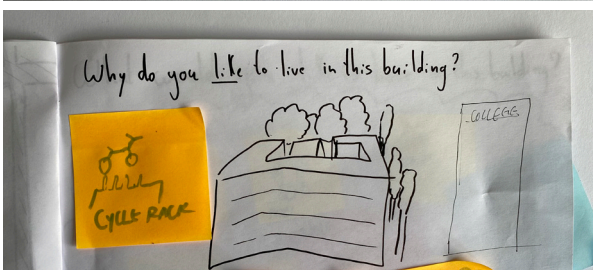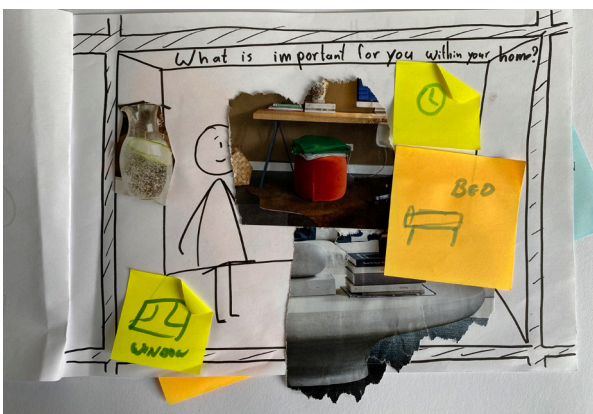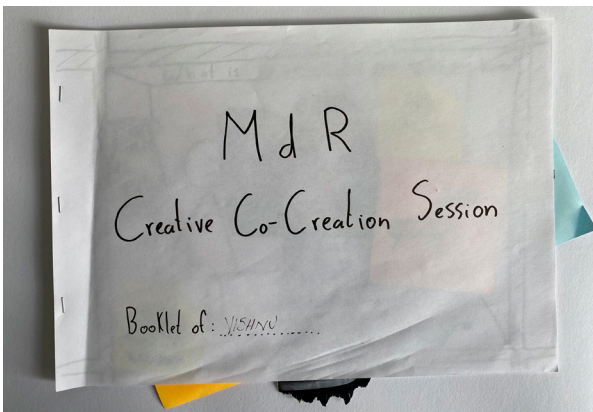· Inspirational materials on "Values"
· Post-its
· Snacks and drinks

Location
· Inside of one of the studio

Duration
· 2 hours

Photos of booklet after workshop

Insights

Positive
· The activity allowed neighbours to share a fun experience.
· An environment was created to share personal stories with the group which helped to get to know each other and learn a bit about how they lived and what they valued in their homes.
· By picking values and reflecting on those, similarities and differences could quickly be found and reflected upon.

Negative
· Due to the relative abstract discussions in the workshop, the link between the tangible world was not very strong.
· The form of participation that was being asked is very indirect on actual decisions in a sustainable renovation process
· The activities in the session relied on the affination the participants had with creativity and visualisation exercises. This made it less accessible for participants having less affinity with this.

Conclusion
The activity served as a successful social event for neighbours to meet and connect. Through the process of reflecting on personal values and bringing those collaboratively together, valuable discussions about the building's future vision were facilitated. The workshop's content sometimes felt disconnected from the practical world. The form of participation was somewhat indirect in influencing real decisions in the context of sustainable renovation. As a result, residents may continue to feel unheard and may not experience influence on the decision-making process, potentially feeling not taken seriously.
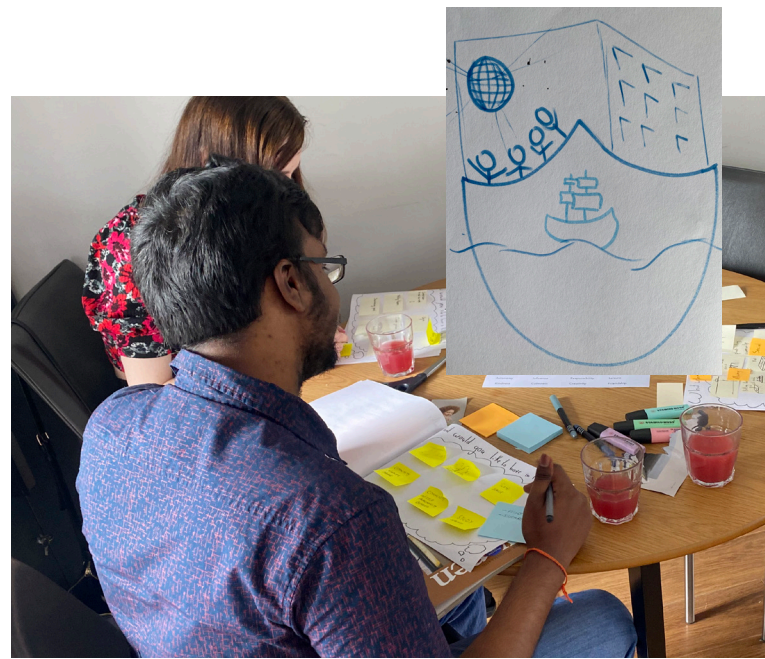
Direction 2: Discussion-starter board

About

When residents will not come to the discussion, I tried to bring the discussion to the residents. The content of the discussion was focussed on **reflecting on what future the residents saw** in the building and **how they saw themselves contributing** to this future. This discussion was visualised in the poster in three phases. The first phase being the now, where residents had to reflect on what they wanted to keep and what they wanted to change. The secondly discussed phase was the future where residents had to reflect on how a future might look like. Thirdly, they were asked to envision how they could contribute to the transition towards the created future.

Tool

Barriers and drivers
☐ **Position**
    Giving everyone the chance to have influence
☐ **Trust in officials**
☐ **Knowledge**
☐ **Social cohesion**
    Seeing other neighbours get involved can stimulate participation
☐ **Practical factors**
    Location in the common space creates low threshold to participation
☐ **Personal factors**

Intended user group
This prototype is able to reach all residents who are difficult to contact by the VvE due to for example communication barriers.

Dominant language proficiency needed
Visuals are used in the prototype but design is primarily vocally focussed. Still making language proficiency important but not on a technical level

Required effort from the board
The prototype requires someone to lead the discussion about the information. This requires a board member for example to be present. No preparations are needed.

Theory

Outdoor engagement - Venserpolder
I looked at other initiatives taking place in the public space in similar contexts. An example of this is the HoodLab or the group Duurzaam Venserpolder. Both activities focus on starting a discussion with as many residents as possible and asking input in a simple and direct way.

HoodLab
These activities were part of the 5 week lasting co-creation process in 2018. Residents were asked about their ideas and wishes which were communicated through to the sub-projects in urban planning in the neighbourhood.

Photos from www.hoodlab.nl

Stichting placemakers
In this project, the creative bureau Placemakers went into the neighbourhood to collect opinions about the public space around metro station Strandvliet. They designed a mobile research station to guide the conversation and collect feedback in a visual way.

Photo from www.placemakers.nl

The prototype set up

Location
· Test 1:Building with big international student residents
· Test 2: Building with mixed culture and occupation residents

Participants
· Test 1: 7 participants. Student with mixed cultural backgrounds
· Test 2: 5 participants. Residents with mixed age and cultural background

Materials
· Posters
· Question wheel
· Snacks

Duration
· 2 hours

Own photos: set up test 1

Insights

Positive
· Many residents that passed by were interested in the prototype and accepted the invitation to participate. This low threshold to engage could give many residents a voice.
· The reflection on the Now, the Future and the Transition subsequently let residents connect current day problems with future possibilities and be triggered by coming into action.
· Seeing the contribution of other residents motivates residents to participate.

Negative
· Due to the very quick pass of the reflection, the input of residents were often not very actionable and mostly consisted of an improvement of the services that were already there like: cleaner hallways or cheaper laundry service. How to achieve this did not inspire residents to continue thinking about it.
· The presence of a conversation leader and the connection to the residents is very important for the effectiveness of the prototype. The second test was conducted in a building where I was not living myself which resulted in less positive responses from bypassers.

Conclusion
Asking for a low form of participation works quite successfully through this prototype. Residents are quickly interested in answering a couple of questions. Especially when they see other residents engaged. However, in such a short timespan, transcending the obvious ideas is difficult. Leading to low actionable and vague ideas.

Own photos: set up test 2
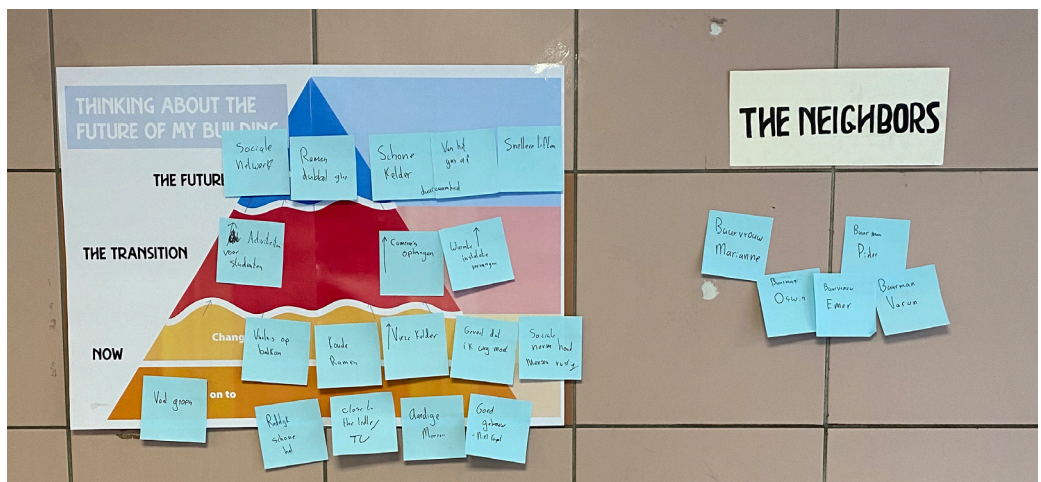
Direction 3: Serious gaming

About

This direction goes into resident involvement in a specific subject within a VvE: **the sustainable renovation process**. Residents are asked for direct input, in contrast to the previous two directions where they were asked about their perceptions of the building's future in all aspects.

But to involve residents in the decision making process of this, some knowledge and understanding are necessarily about the process and the possibilities. In the context, this information is presented through a lengthy powerpoint slideshow which has been found difficult to follow.

Therefore, I explored the **possibilities of gamifying important pieces of knowledge** to provide residents with a basic understanding of the renovation process. The **interactive and explorative** nature of gamification has to prevent the content to be boring or complex.

Tool

Barriers and drivers
☐ **Position**
   Giving everyone the chance to have influence
☐ **Trust in officials**
☐ **Knowledge**
   Providing insights in the renovation process
☐ **Social cohesion**
   Facilitating a casual space to make contact with neighbours
☐ **Practical factors**
☐ **Personal factors**
   Providing a different type of motivation to attend a gathering then the general VvE meetings

Intended user group
Residents who have the bias towards the renovation process that is too boring or difficult for them and therefore not relevant for them.
"I am not a technical person, my husband arranges those thing" - Lady at the Venserpolder

Dominant language proficiency needed
To understand the game mechanisms and rule set, language proficiency is necessarily. This can be replaced partly by well designed visual cues but I have not been able to come to this level.

Required effort from the board
The organisation and facilitation of the event will cost time and effort

Theory

Gamification principles

Gamification is a wide concept. Sailer, M. Ulrich Hense, J. Mayr, S. K., Mandl, H. (2017) explain it as:

"The central idea is to take the 'building blocks' of games, and to implement these in real-world situations, often with the goal of motivating specific behaviours within the gamified situation."

Also, Codempire (2022) describes some instruments which are often used for gamification

- **Levelling:** Providing material fitting to different levels of skill
- **Reward system:** Providing positive rewards for the intended outcome
- **Storyline:** Providing a narrative that makes the game progress more intuitive
- **Teamwork:** Requiring teamwork to achieve individual successes
- **Risk:** Create consequences for unintended outcomes
- **Challenges:** Providing a task-oriented approach to stimulate engagement
- **Interactive elements:** Providing new stimuli throughout the process to increase engagement
- **Leaderboard:** Providing an overview of opponents to compare with

Gamification instruments

The Newtonian Shift

EnecoGroep
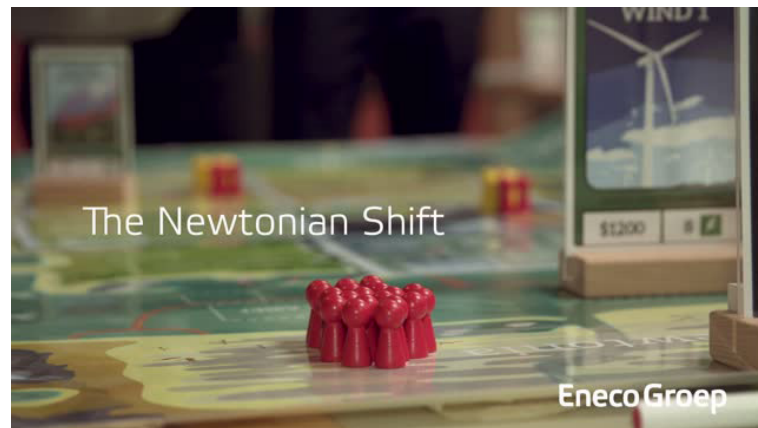
"The Newtonian Shift" (Eneco, 2023)

There are many examples of gamification in the energy transition but I picked this one due to the accurate translation from the practical world into the game structures. This serious game has four objectives: to show which parties play a role, how the energy transition is shaped, how to start strategic alliances and how to plan and invest for the future.

Photos from "The Newtonian Shift" (Eneco, 2023)

The prototype set up

Location
- University

Participants
- 4 test with a groups of 3/4 students, having mixed cultural backgrounds

Materials
- 4 Game board prototype (see photos)

Duration
- 1,5 hours per test
- 4 tests

Photos: Collection of all serious game designs.

Insights

Positive
·   The game world enabled participants to disconnect from day-to-day complaints and limitation
·   During the game, participants can form social bond through experiencing a fun activity
·   The steps of a renovation process are experienced in a simple way.

Negative
·   Little usable knowledge in context
·   Concerns about the impact it has on renovation process vs the effort and time that is asked from participants

Conclusion
The game method could capture certain knowledge about the renovation process. However, there was a correlation between the complexity of the game and the close it stayed with reality. The rules quickly became complex when the dynamics between the factors of the renovation process were described. This complexity made the game less fun, playable and valuable to the players since less knowledge was clearly translatable to the context. The game did engaging and stimulated social bonding.

The prototypes went from complex to simple and back again. This to find the right balance between the level of complexity and the level of abstraction. When abstracting too much of the information about the renovation process, it would lose "knowledge" as a one of the goals. A motivator for residents to engage with the renovation process is It is important for residents to see the value of the activity that has been done, otherwise it is hard to make them see the long term relevance.

Brown colour represents wood-look
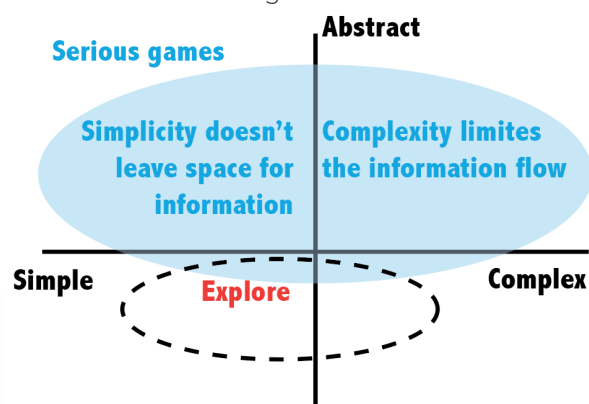
Direction 4: Simplifying with visuals

About

This prototype takes form as an informative poster, visualising all the most important variables within a sustainable renovation process. The energy costs, service costs and insulation quality are visualised. The poster contains small bits of information about the thermal quality of the building which creates the start for the discussion with residents. Residents are given a number of purple icons to express their priorities with. They can be stuck on any of the six grey renovation area's of the poster.

Tool

Barriers and drivers
☐ **Position**
Giving everyone the chance to have influence
☐ **Trust in officials**
☐ **Knowledge**
Providing insights in the renovation process
☐ **Social cohesion**
Seeing other neighbours get involved
☐ **Practical factors**
Location in the common space creates low threshold to participation
☐ **Personal factors**

Intended user group
This design addresses residents who would have difficulties with understanding information about the renovation and are predominantly interested in the most important consequences.

Dominant language proficiency needed
Information exchange is the most important feature of the prototype. This information is predominantly conveyed through visuals

Required effort from the board
Assistance is required to engage residents with the prototype and to explain and answer questions. Preparations are needed to translate the information to the prototype.

Survey

Among VvE residents
By making the prototype more concrete and less complex, I needed to specify what information is the most important for residents. I did this through conducting a survey which was distributed through the whatsapp group (55 members) and through email reaching 180 of the 200 residents. From the open question in the beginning, I found many residents wanting to know the time planning, what will happen and when will that happen. In a later, closed question, I found that the opinions vary when asking what they considered most important in a choice. Factors named were: Influence on insulation, Influence on service cost, influence on energy bill,

Energy bill (24%)
Time frame of constructions (12%)
Contribution from subsidies (12%)
Service costs (24%)
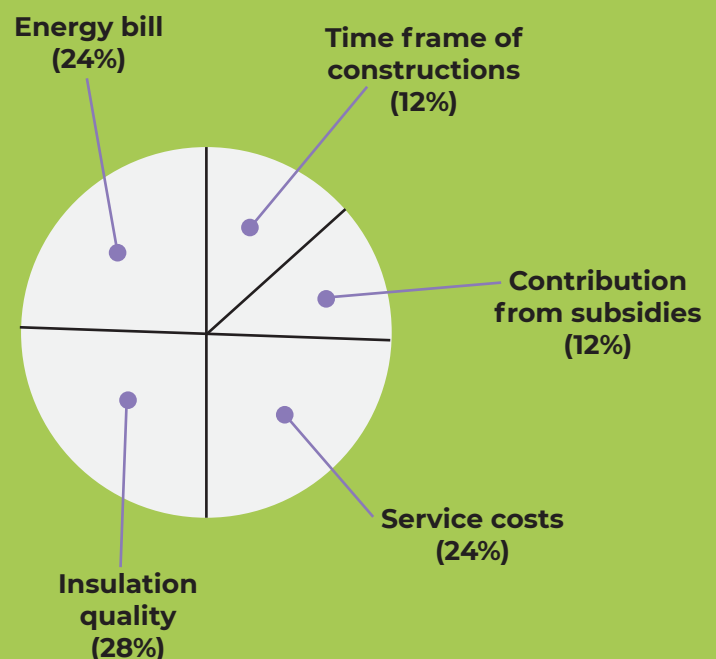**Insulation quality (28%)**

Figure 17: Answers from 25 residents on the questions "Which factor do you consider most important in making a choice?"

The prototype set up

Location
· Venserpolder
·

Participants
· 5 residents
·

Materials
· Poster prototype (see figure 18)
· Icons with tape
·

Duration
· 2 hours

Figure 18: Prototype design containing detailed information about the insulation quality of the building.

Insights

Positive
· Detailed and relevant information is provided to the participants
· The visual style is engaging and makes the information easier to take in
· The discussion flow is well guided by the use of the visualisations.
· New questions pop up by seeing the information presented

Negative
· Conversations are best one-on-one which makes it time intensive to reach many residents
· The simplifications made in the translation to visuals can oversimplify the problem, preventing thorough reflection.
· This prototype only addressed the current building state and preferences for a renovation but didn't go into the possibilities and consequences of these renovations

Conclusion
The visual approach worked well to engage residents in the information and to guide the discussion. The emergence of new questions shows that residents are curious to go deeper into the topic.
However, the next steps of going into the renovation options are missing from this prototype. This could be a good next step in the flow of the discussion.
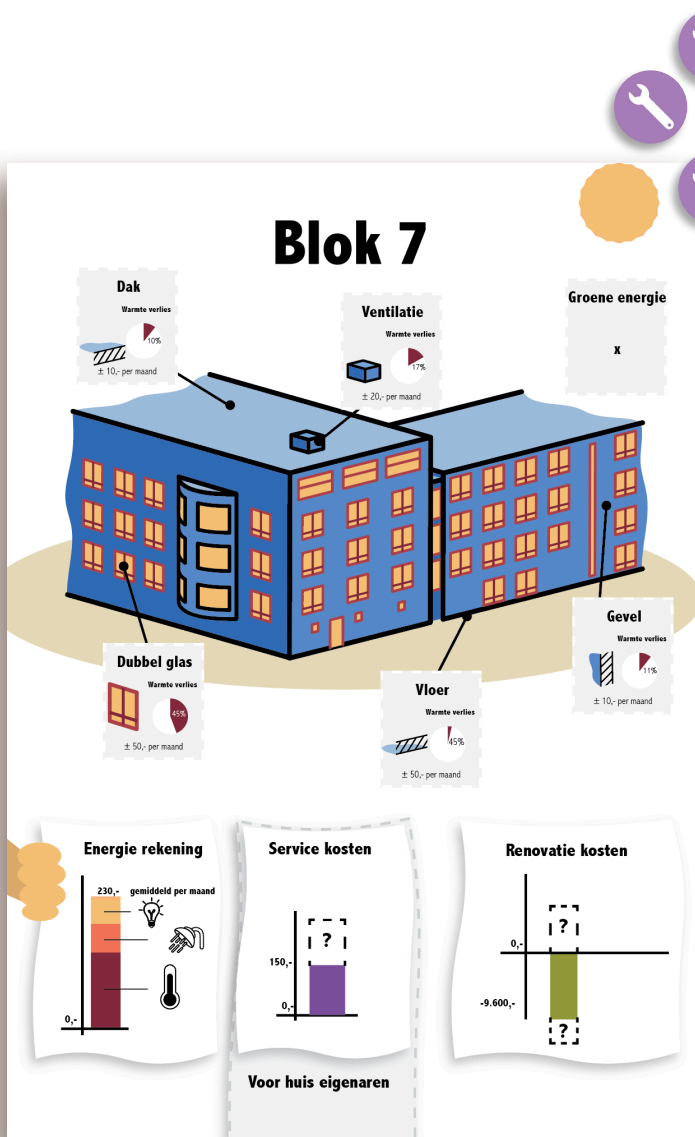
Own photo: Prototype test in the neighbourhood

Direction 5: Simplifying with interaction

About

This prototype builds further on the knowledge focus from direction 4 but adds an interactive dimension. More interactive elements are created to facilitate the discussion about the renovation options. Cards are designed which contain new information about the details of specific renovation options. Coins are added to represent the financial resources available.

Tool

Barriers and drivers
☐ **Position**
  Giving everyone the chance to have influence
☐ **Trust in officials**
☐ **Knowledge**
  Providing insights in the renovation process
☐ **Social cohesion**
  Seeing other neighbours get involved
☐ **Practical factors**
  Location in the common space creates low threshold to participation
☐ **Personal factors**

Intended user group
This design addresses residents who would have difficulties with understanding information about the renovation and are predominantly interested in the most important consequences.

Dominant language proficiency needed
Information exchange is the most important feature of the prototype. This information is predominantly conveyed through visuals

Required effort from the board
Assistance is required to engage residents with the prototype and to explain and answer questions. Preparations are needed to translate the information to the prototype.

Theory

This design focussed on increasing the gamification elements of interaction. This means, increasing the exchanges of information between the user and prototype. By interacting with the design, the user must first gain information from the design and respond by giving information back. By going back and forth in this process, a user can build their knowledge in small steps.
Elements which can stimulate the interactivity of the prototype can be found when evaluating direction 3 and 4. These are:

Direct cause and effect

Visual

Playful

Intuitive

Visual connections

Simplified

Guiding narrative

Short connections

The prototype set up

Location
· TUDelft

Participants
· First test: group of 3 students
· second test: individual student

Materials
· Prototype
· Coins
· Written info cards

Duration
· 1 h

Insights

Positive
· Participants are engaged in the decision making process of the renovation and iteratively explore the financial options.
· Participants gain confidence in making claims due to the learning curve.
· Participants like to move the slides, cards and coins
· Phases on the board enable reflection on individual decisions
· Discussion is easy to follow possible due to physical representations of decisions
· Consensus-making is forced (only for group)

Negative
· Upon first view, the information on the board looks complex
· Doubt or variation isn't facilitated on the board. Only one outcome can be presented
· When one or two participants take the lead, the others are in danger of being left out of the process (only for group)
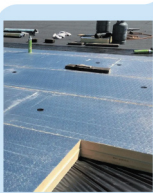
Conclusion
Engagement in the renovation process is stimulated through the interactive and visual prototype design. Because the knowledge in the cards are accurate estimations of the actual decisions, participants see the direct value of participating. The number of participants and the behaviour of participants can influence the interactions and thought processes of individual participants a lot. Participants who value to involve the silent participants can stimulate equal involvement.
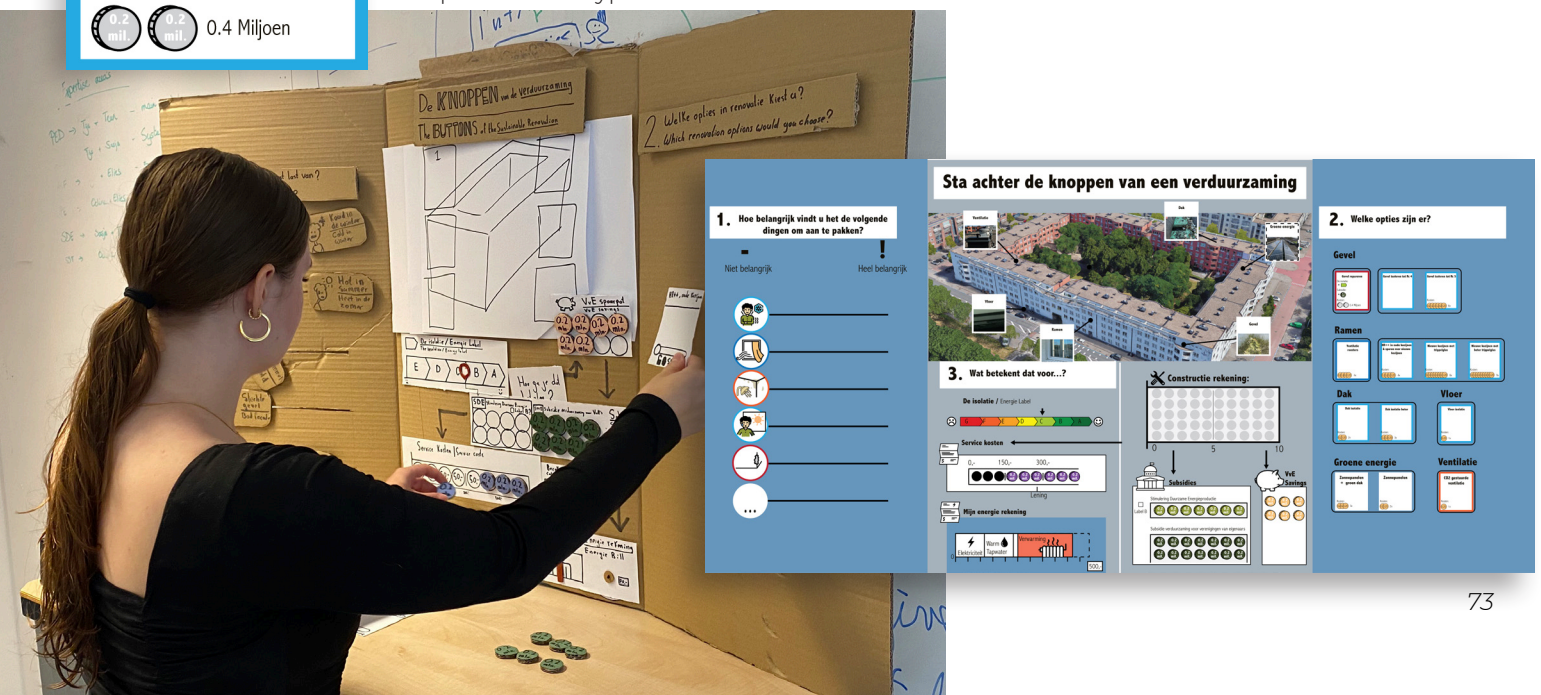
Own photo: Prototype test

7.
Evaluation

In this chapter, I will evaluate the design in different ways. Firstly, to evaluate whether the design is providing construction-technical and financial accurate information to the users. This has been done in an evaluation session with the architect company Synopel. Also, the design has been evaluated by placing it in the context and observing how the residents of an apartment block being in the process of renovating are interacting with it.

7.1 With architects

The method of research through design is the principle of making a design, putting it in the context and seeing what the context does with it so that you can learn from this. This could allow for new insights besides the insights from natural recurring situations. Also, by designing the design in a way that gives something back to the context, think about knowledge or reflection, it can directly provide value to the context.

Feasibility

I was concerned whether the simplifications hadn't led to any false information. This would be very harmful since it could raise false hopes among residents. I asked this for the following points:

Question 1: "Can all measures indeed be picked separately?"
· Answer: In most cases this is possible but not all.
· Redesign recommendations: Exceptions which construction-technical can not be separated must be highlighted.

Question 2: "Are the financial costs of measures accurate?"
· Answer: Since these numbers are your own estimations, they aren't accurate. Also, the simplification does miss some important financial consequences. Also, the different financial situation of apartment owners, private tenants and social tenants is missing.
· Redesign recommendations: Exact measure costs are not important, they can be simplified to equal units. This way, comparison between the measures is still possible.

Question 3: "Can the subsidy based on Energy label be calculated by mixing individual measures?"
· Answer: This is not possible since the energy label is per household and not collective. This calculation needs to be done by a separate corporation. However, usually, the energy label will be achieved when one or maybe two of the biggest objectives are renovated
· Redesign recommendations: The subsidy possibility must be seen separately from the energy label but it must be connected to a combination or 1 or 2 renovation options.

Question 4: "Can the energy saving costs be accurately calculated for individual measures?"
· Answer: Taking the average use, the energy use reduction can accurately be calculated. Especially when the energy bill is separated like here in electricity, hot water and heating. How much money that will save is also dependent on what the electricity and gas prices will do.
· Redesign recommendations: Mentioning why the exact price will vary over the coming years could give clarity. Or the board should only give the effect on the insulation quality of the building.

Usability

"How well would you see this product help in the context?"
Synopel mentioned the prototype being a good tool during the last part of their normal feasibility research presentation. It could be used to quickly see what residents prefer and show this in a final closing word.

7.1 With residents

The prototype set up

Location
· Community centre in the neighbourhood
·

Participants
· Small groups of 3 or 4 residents
· Residents who'd like to know more about the decisions
·

Material:
· Design with attributes
· Coffee, tea, sweets
·

Duration:
· 2 sessions, taking 45 min each

Participant recrutement

Since a lack of participation has been the problem, I had to put extra effort to recruit participants. I hung up posters in all corridors where residents could pull off a time slot and communicated the event through multiple digital platforms.

Conclusion

The game method could capture certain knowledge about the renovation process.

However, there was a correlation between the complexity of the game and the close it stayed with reality. The rules quickly became complex when the dynamics between the factors of the renovation process were described. This complexity made the game less fun, playable and valuable to the players since less knowledge was clearly translatable to the context. The game did engaging and stimulated social bonding.

The prototypes went from complex to simple and back again. This to find the right balance between the level of complexity and the level of abstraction. When abstracting too much of the information about the renovation process, it would lose "knowledge" as a one of the goals. A motivator for residents to engage with the renovation process is It is important for residents to see the value of the activity that has been done, otherwise it is hard to make them see the long term relevance.

Own photo: Participant recrutement poster

Insights

I evaluated whether the design realises the desired outcome as stated in the design goal.

How can residents experience influence in the sustainable renovation process of a VvE?

In order to evaluate this, I looked for indirect indications in participants' actions that might imply this. My assumption has been that acquiring insight into the mechanisms and rules of a renovation process is crucial for experiencing influence. Also, I reviewed if the interaction qualities: Simple, Engaging & Social could be observed. Finally, I briefly evaluated the usability of the prototype since this might have influenced how well the prototype could achieve the design goal.

Interaction qualities

Simple
This was the most difficult interaction quality to integrate due to the nature of the prototype. When looking at the interactions separately, I could observe participants to quickly and easily move objects like coins and cards from one place to the other, suggesting simplicity.

Engaging
Before the physical interactions start, participants seem engaged by the visual style of the prototype. Every single participant, also the volunteers from the event location have difficulties taking their eyes off of the design. The interactions and small surprising functionalities of the design grab the attention from the participants.

Social
During the process, the participants are actively in discussion with each other, explaining things to each other and asking questions.

Impact on Resident confidence and understanding

Participants would ask questions about the details of the renovation options like: "can the loan be paid in one go", "how long until the loan is paid"
Misconceptions are brought up:
"The power of the solar panels won't go to our houses right?"
At the end of the evaluation, participants understood the visualised mechanisms of the renovation process:
"I am not a technical person, but I really understand now"
And participants were convinced by the possibility or impossibility by options they had in their head about the renovation process:
"Now I see that it's really necessary to renovate"
"So you really need to increase the service costs then"
Redesign recommendations:
Improve visual layout of information.

Impact on experienced influence

Whether the participants experienced influence was difficult to tell. When being asked, residents answered that they understood now better what options they had but weren't so sure that the VvE would listen to them. "I don't trust the VvE, they keep increasing the service costs without and changes"
Redesign recommendations:
Add functionality that can capture the preferences of participants

Autonomous usability

Due to the importance of the visual information layout, some parts of the design needed to be explained a bit before participants could understand it. After the explanation, participants mentioned understanding the prototype and showed this understanding by asking follow up questions or interacting with the prototype as intended. Also, you could see a learning curve, also without further explanation. After this additional support, the mechanisms were usable as intended by the participants.
Redesign recommendations:
Clearer explanations on the prototype and cards will improve the autonomous usability.

8.
Conclusion

In this final chapter, you can read the overall conclusion, discussion, future research recommendations and reflection. These will cover the whole graduation thesis.

8.1 Conclusion

During the past graduation thesis, I have conducted research on the topic of resident participation within the renovation process within the context of a VvE. I explored various directions and used different methods to come to my findings.

The literature study was conducted to create an understanding of the current knowledge in the field and to explore where the possibilities lay. The field research has been conducted by using an ethnographic and action research approach. The insights were used to investigate how the literature findings were reflected in the selected context. To continue collecting insights within the design-phase, I used a Research through Design approach which allowed me to experiment with designs while maintaining the flexibility to use new insights to explore new directions.

As a final result, I developed one direction into an embodied and functional prototype design. This design has the main functionality to make the content of a renovation process visual and interactive. Through this design, residents must be able to experience the decision-making process. This prototype design was evaluated with professionals from the field and with users.

To develop this concept further, next steps go into refining the assumptions and simplifications that had to be made to achieve the current usability and interaction qualities. Also, more evaluations with different user groups need to be conducted to evaluate the usability across the wide variety of individuals that are present in the context

8.2 Discussion

In the course of this research, it is important to highlight the limitations and biases that come with the chosen method. This chapter delves into various aspects where subjectivity and bias may have influenced the research process and findings.

Biases

One of the primary sources of bias in ethnographic research is personal bias. Every individual perceives and interprets the world through the lens of their values, experiences, and knowledge. In this study, my personal values for a sustainable future may have influenced my preference for "green" choices and potentially led to judgments about individuals who did not share this value.

As a researcher, I brought pre-existing knowledge gained from relevant literature into the research process. This researcher bias might have made me more attentive to specific factors within the context, potentially impacting my data collection and analysis.
Also, I actively tried to minimise the possibility that residents associated me with a researcher. This led to me minimising my note taking during conversations, discussing topics beyond the research focus, and actively engaging in other roles, such as providing advice and knowledge on subjects of interest to the interviewees. These strategies resulted in a lot of noise in the data, being relatively irrelevant in answering my research question.

The research was conducted in a context relatively unfamiliar to me, introducing the possibility of cultural bias. Growing up in a small, affluent village and later studying in an environment dominated by white, young, highly educated individuals created a contrast with the diverse socio-economic backgrounds of the context community. This disparity in background could have influenced my understanding and interpretation of the community dynamics.

Engaging in action research and assuming roles such as an energy coach, offering support at information meetings, and volunteering at the community centre introduced role-induced bias. The expectations and perceptions that community members had of my roles could have influenced their responses to my questions and actions.

Chance and Coincidence
Ethnographic research is inherently influenced by the serendipity of interactions within the research environment. The presence of certain individuals and the opportunities for discussions were largely influenced by chance and coincidence. These unpredictable occurrences may have impacted the data collected and the overall research outcomes.

Scope

The research scope, defined as explorative, had its own limitations. The breadth of the study meant that it was challenging to delve deeply into specific elements of the topic. Consequently, certain nuances and intricate details may not have been explored in as much depth as desired.

Predefined interests

Finally, the research was initiated by the LIFE consortium, highlighting specific themes and priorities. For instance, the emphasis on resident participation in the future plans of the consortium contributed to shaping some perspectives. This influence may have affected the interpretation of findings.

In conclusion, while ethnographic research provides valuable insights into complex social contexts, it is essential to recognize and address the limitations and biases inherent in the methodology. Understanding these limitations enables a more nuanced interpretation of the research findings and supports a transparent discussion of the research's validity and applicability.

8.3 Areas of future research

As mentioned in the conclusion, there are steps to make in the technical accuracy of the information presented on the board and the cards.

Generalizability

Furthermore, I designed the board for a specific use case. To make the board generally usable for all renovation propositions, a look needs to be taken to the universally usability of this.

Technical feasibility

Like mentioned in chapter 2.4 technical feasibility, some topics were left out of scope. It is necessary for the accuracy of the design to include these within iterations of the design.

Form

Different forms instead of a physical form could be researched to make it better equipped to different user groups or other criteria. Other forms could possibly support the physical shape. For example, paper hand-outs could be made to let the information be taken with the residents after the interaction with the board. Of course a digital version could be considered to make the information quicker to update and spread.

8.2 Reflection

They say that you learn the most during your struggles. Therefore, I believe I have gathered enough learnings to write up a individually standing graduation thesis. Since I learned that writing is not my best strength, nor my passion, I will not.

Reflecting over the whole process, no one can deny that my development and outcome lies exactly in the line of expectations defined in the project brief. Also, despite a delay of 1,5 months due to personal circumstances as well as project-related delay, the agenda had also been stuck with relatively closely.

Approach, methods, and process

My experience during the process has been different due to the constant insecurities I was troubled with due to the complex dynamics and excessive number of opportunities within the context. A situation where the Dutch phrase "Door de bomen het bos niet meer zien", an accurate image forms.

My struggles came from on the one hand, my excitement to go after each possibility and on the other hand, the challenge to keep an overview of all the insights gathered along this way. Due to the time intensity, I experienced from regaining the overview, I regard the time lost in this search as unnecessarily and could have been better put in deepening the learnings along the process.

Reflecting on the method of Research through Design. I found that this method clashed with my personal preference to deliver finished results. Especially in a context where I felt that my own knowledge and position had yet to be proved. In this learning I found the saying "you are only as good as your last performance" to be the blocking mindset.
How to overcome this for me personally is to build it up in steps. First present it to close friends, then to further friends, and finally to strangers.

Personal development

This type of external confirmation has also shown itself in my nature to delay difficult decisions for as long as possible. This behaviour likely originates from my nature to overthink, second guess everything and on top of that, aim for the perfect decision. Due to these characteristics, I could find room to explore without getting stuck in unmade decisions.

Working in the context felt difficult due to the big amount of individual work combined with the big number of different stakeholders prioritising different aspects in my research. By asking time from the VvE board and residents, also knowing that the lack of time is a big struggle within the context, I felt obligated to deliver this value back. This likely fuelled my aim for finished and working prototypes. All communication between project team members or other stakeholders would take time and due to this reason, I struggled with how to make this a routine. Especially since I never experienced being stuck at any moment of time. On the contrary, I always had more directions than I could go in. This notion likely made my work come across as very all over the place and missing a red line. How to go about this differently is not something I already know but I will be more cautious.

Learning goals

My first learning goal has played a big role throughout my whole graduation. Maintaining my DfI approach has been the struggle due to the detail of interaction and intention it has in combination with the large context. This resulted in these fine details to be overshadowed in some of the research steps that I took. However, during the later stages of the process, when making more refined prototypes, this DfI perspective could be well expressed. Secondly, my visualisations skills have had the opportunity to improve in terms of information hierarchy but also around graphic skills. Thirdly, skills learned through the RtD methodology were improved. Read my reflection on approach, method, and progress. Finally, despite having used some facilitation methods in small brainstorms, I have to say that I did not see this goal as fulfilled. It would have been very valuable for me as well as for the process to have included a bigger creative session. Either with residents or with experts like the energy coaches in the field. Unfortunately, due to a lack of time and an overload of ideas, I found no space for this in my past process.

The inclusive energy transition

I would like to finalise my reflection by addressing my growth of interest in the topic around an inclusive energy transition. Researching the breadth of the topic, taking social and technological factors into account, I got even more excited to delve into this topic and see how design can help build an inclusive and green future.
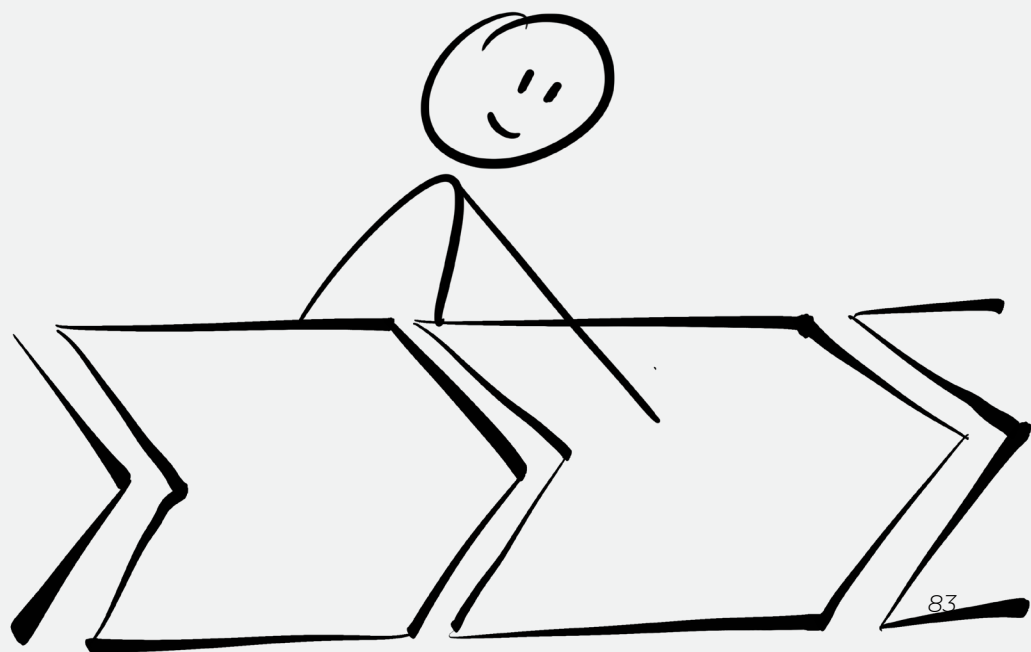
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IDE Master Graduation
Project team, Procedural checks and personal Project brief

This document contains the agreements made between student and supervisory team about the student's IDE Master Graduation Project. This document can also include the involvement of an external organisation, however, it does not cover any legal employment relationship that the student and the client (might) agree upon. Next to that, this document facilitates the required procedural checks. In this document:

- The student defines the team, what he/she is going to do/deliver and how that will come about.
- SSC E&SA (Shared Service Center, Education & Student Affairs) reports on the student's registration and study progress.
- IDE's Board of Examiners confirms if the student is allowed to start the Graduation Project.

① USE ADOBE ACROBAT READER TO OPEN, EDIT AND SAVE THIS DOCUMENT
Download again and reopen in case you tried other software, such as Preview (Mac) or a webbrowser.

STUDENT DATA & MASTER PROGRAMME
Save this form according the format "IDE Master Graduation Project Brief_familyname_firstname_studentnumber_dd-mm-yyyy".
Complete all blue parts of the form and include the approved Project Brief in your Graduation Report as Appendix 1 ! ①

family name _____

initials _____ given name _____

student number

street & no.

zipcode & city

country

phone

email

Your master programme (only select the options that apply to you):

IDE master(s): ◯ IPD   ◯ Dfl   ◯ SPD

2ⁿᵈ non-IDE master: _____

individual programme: _____ - _____ - _____ (give date of approval)

honours programme: (_____)

specialisation / annotation: (_____)

(_____)

(_____)

SUPERVISORY TEAM **
Fill in the required data for the supervisory team members. Please check the instructions on the right !

** chair _____ dept. / section: _____

** mentor _____ dept. / section: _____

2ⁿᵈ mentor _____

organisation: _____

city: _____ country: _____

comments
(optional)

① Chair should request the IDE Board of Examiners for approval of a non-IDE mentor, including a motivation letter and c.v..

① Second mentor only applies in case the assignment is hosted by an external organisation.

① Ensure a heterogeneous team. In case you wish to include two team members from the same section, please explain why.

Procedural Checks - IDE Master Graduation

TUDelft

—

APPROVAL PROJECT BRIEF
To be filled in by the chair of the supervisory team.

chair _____ date _____ - _____ - _____ signature _____

CHECK STUDY PROGRESS
To be filled in by the SSC E&SA (Shared Service Center, Education & Student Affairs), after approval of the project brief by the Chair.
The study progress will be checked for a 2nd time just before the green light meeting.

Master electives no. of EC accumulated in total: _____ EC

Of which, taking the conditional requirements
into account, can be part of the exam programme _____ EC

List of electives obtained before the third
semester without approval of the BoE

YES   all 1st year master courses passed

NO   missing 1st year master courses are:

name _____ date _____ - _____ - _____ signature _____

FORMAL APPROVAL GRADUATION PROJECT
To be filled in by the Board of Examiners of IDE TU Delft. Please check the supervisory team and study the parts of the brief marked **.
Next, please assess, (dis)approve and sign this Project Brief, by using the criteria below.

- Does the project fit within the (MSc)-programme of the student (taking into account, if described, the activities done next to the obligatory MSc specific courses)?
- Is the level of the project challenging enough for a MSc IDE graduating student?
- Is the project expected to be doable within 100 working days/20 weeks ?
- Does the composition of the supervisory team comply with the regulations and fit the assignment ?

Content: APPROVED   NOT APPROVED

Procedure: APPROVED   NOT APPROVED

comments

name _____ date _____ - _____ - _____ signature _____

IDE TU Delft - E&SA Department /// Graduation project brief & study overview /// 2018-01 v30   Page 2 of 7

Initials & Name _____ Student number _____

Title of Project _____

Personal Project Brief - IDE Master Graduation

_____ project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple.
Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date   _____ - _____ - _____   _____ - _____ - _____   end date

space available for images / figures on next page

Initials & Name _____   Student number _____

Title of Project _____

introduction (continued): space for images

image / figure 1: _____

image / figure 2: _____

Initials & Name _____   Student number _____

Title of Project _____

Personal Project Brief - IDE Master Graduation

PROBLEM DEFINITION **
Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

ASSIGNMENT **
State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

Initials & Name _____   Student number _____

Title of Project _____

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date _____ - _____   _____ - _____ end date

Initials & Name _____ Student number _____

Title of Project _____
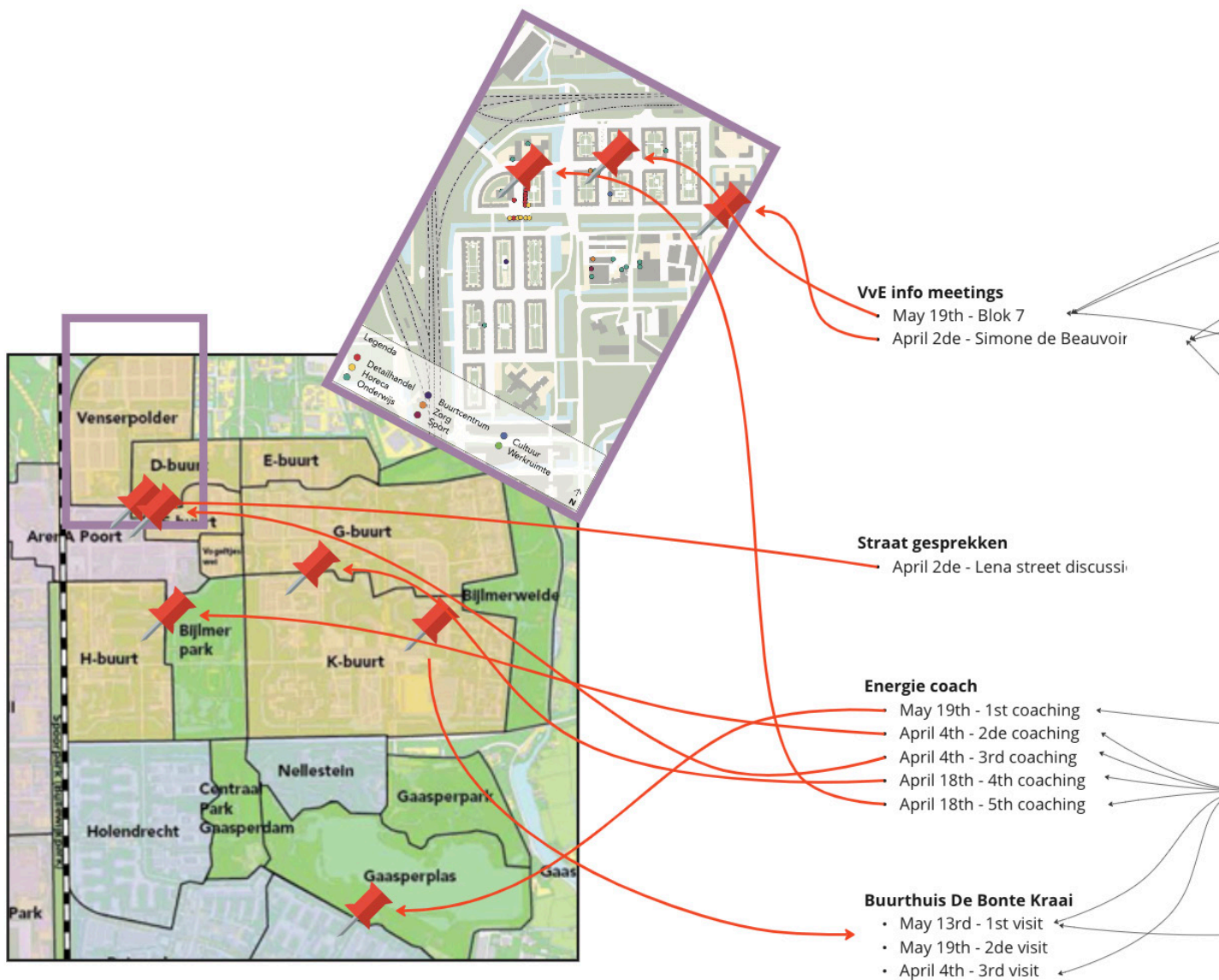
Personal Project Brief - IDE Master Graduation

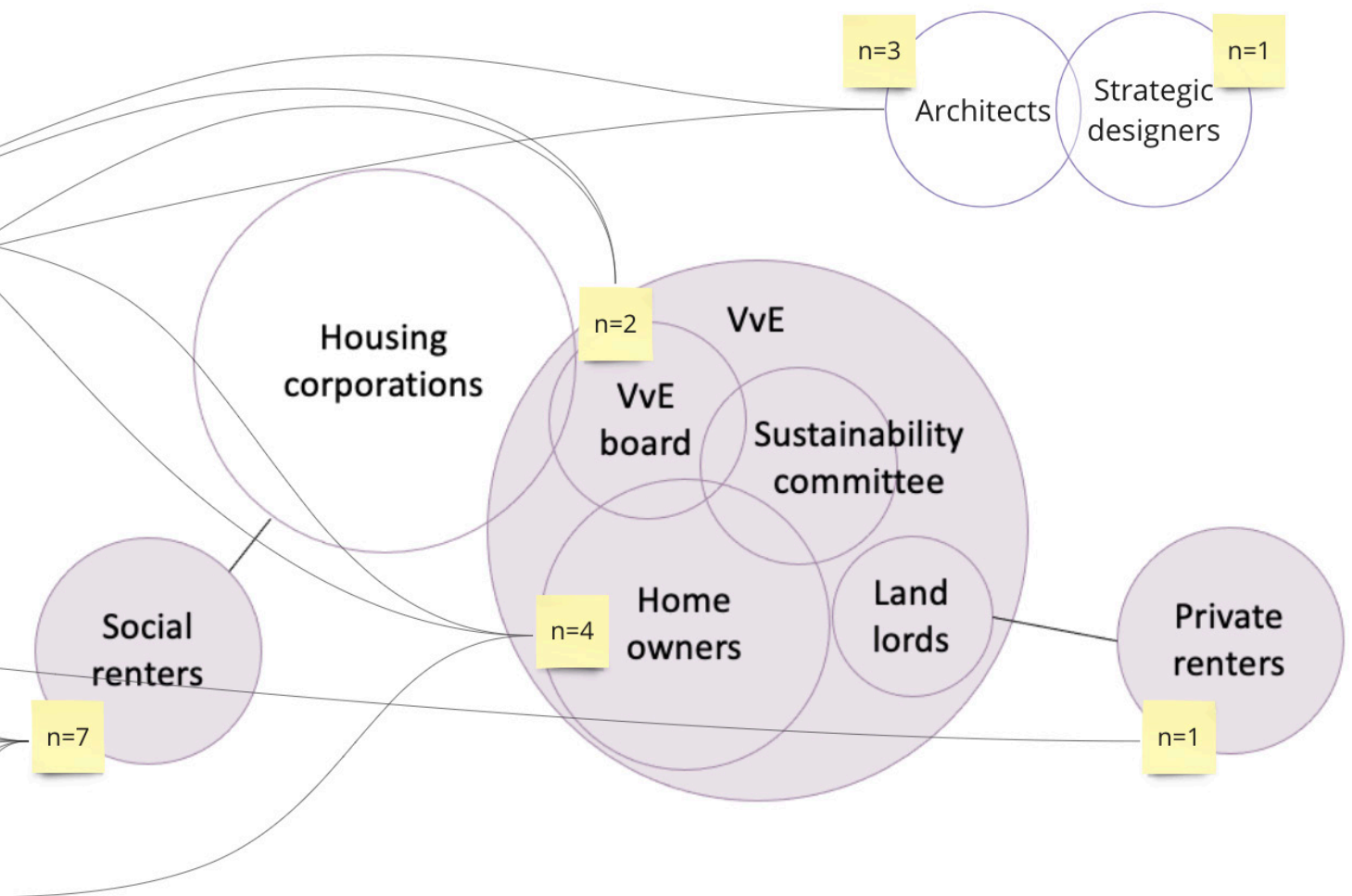## MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.

Initials & Name _____   Student number _____

Title of Project _____

Appendix 2: Research context

VvE info meetings
- May 19th - Blok 7
- April 2de - Simone de Beauvoir

Straat gesprekken
- April 2de - Lena street discussi

Energie coach
- May 19th - 1st coaching
- April 4th - 2de coaching
- April 4th - 3rd coaching
- April 18th - 4th coaching
- April 18th - 5th coaching

Buurthuis De Bonte Kraai
- May 13rd - 1st visit
- May 19th - 2de visit
- April 4th - 3rd visit

Appendix 3: Rough notes on sustainability info evenings

Goal for these activities:

To learn how information is provided, how it resonated with the residents.

VvE infoavond - speckled property

An info evening has been organised by Wim en Jeroen to share the results of the "haalbaarheidsonderzoek" conducted by the architects of Synopel; an architect company located in Rotterdam specialised in VvE renovation.

I have been invited by Wouter who had contacts with !WOON who has also been present

An intense invitation campaign of the info evening had been recommended by the architects of Synopel. Corine had recommended the board of the VvE to pass by all the 200 apartments and against expectations, Jeroen, the proclaimed "social side" of the board indeed followed this advice and passed by all apartments. Other ways to communicate the event were through posters, hung up in all 20 corridors of the apartment and a movieclip, shared on the newly activated website.

This active champaining has probably resulted in the high attendance of around 75 residents (plus partners) to the info evening. of which around 80% homeowners and 20% renters.

After a short introduction of Wim en Jeroen, the architects of Synopel presented their findings on the state of the building, 4 renovation options calculated.

My personal opinion about the presentation was that it was already in some parts difficult to follow by me. Especially the 4 options calculated consequences and benefits.

After the presentation, I talked to one of the residents about the presentation. She had concerns that it might have been too difficult and abstract for a part of the residents

The presentation took from 19:30 until 21:45 which might have been too long for some since quite a few people left right after. Personally, I also felt a bit tired with the topic.

The meeting was closed with a discussion of the results in small groups of residents. 3 questions had to be discussed:

Why do you like living here? What complaints do you have about your apartment? What sustainable renovations would you like to see in the building?

Corine beforehands asked me to note down on post-its what has been discussed in the group I sat down with. This had been a smart move since no one made an attempt to join me in note taking, even when I couldn't keep up with the reemarkt.

During the presentation, it was mentioned that the costs won't be charged by the social housing renters by the architects company. This was repeated at the end by someone from the residents while mentioning that he didn't think that everyone had really understood it.

Key insights

Financial benefits are predominantly taken into account when making a renovation decision

Residents are very talkative when complaining

Letting a resident talk to a VvE board member creates a sense of understandance at the resident side.

Residents can be positive towards a sustainable decision without knowing what the decision will exactly contain

Important claims, like costs need to be made or verified by trusted individuals, otherwise, people won't take it as believable.

VvE info evening - without large apartment owners

I got invited to this session by a local activist who had ties with the LIFE project. After having asked so, it was no problem for me to join.

The board has been inviting their residents to the sustainability evening by hanging posters in the entrance hall of the two buildings. Around 21 owners showed up.

The building consists of 44 apartments of which are either owned by the residents or a landlord.

The presentation had the same set-up as the presentation of the "haalbaarheidsonderzoek" conducted for block 7.

After the presentation, multiple questions were posed by the residents.

One person noted to be skeptical about

the energy saving costs since his energy bill has been higher than the savings would be estimated on (which would be impossible). The response was that the individuals with currently the highest energy bill, will save the most. Also it was mentioned that the 6 residents on the ground floor are the only ones who are influenced by the badly insulated floor of the block.

Someone else stated that she didn't feel responsible for the state of the building. The frames only had to be replaced within 30 years, "dat zal onze tijd wel duren".

Multiple times had to be repeated that the service costs would go to 300,- euro per month (so not per year) on top of the current service costs.

After the presentation, small groups had to discuss the questions:

Why do you like living here? What complaints do you have about your apartment? What sustainable renovations would you like to see in the building?

One resident was complaining a lot about the window frames and that something was broken that had to be fixed but that the VvE didn't do anything. The woman sitting next to her was part of the VvE board and explained to the woman that the VvE board couldn't let all window frames be individually replaced. This was eventually somewhat accepted by the woman.

Residents were not a lot complaining about their building

Key insights

when residents don't understand the full financial overview, they will fill in the blanc spots with their own assumptions of what might be logical

To verify whether something is indeed correct, after someone else has asked something, only then other residents start to ask questions.
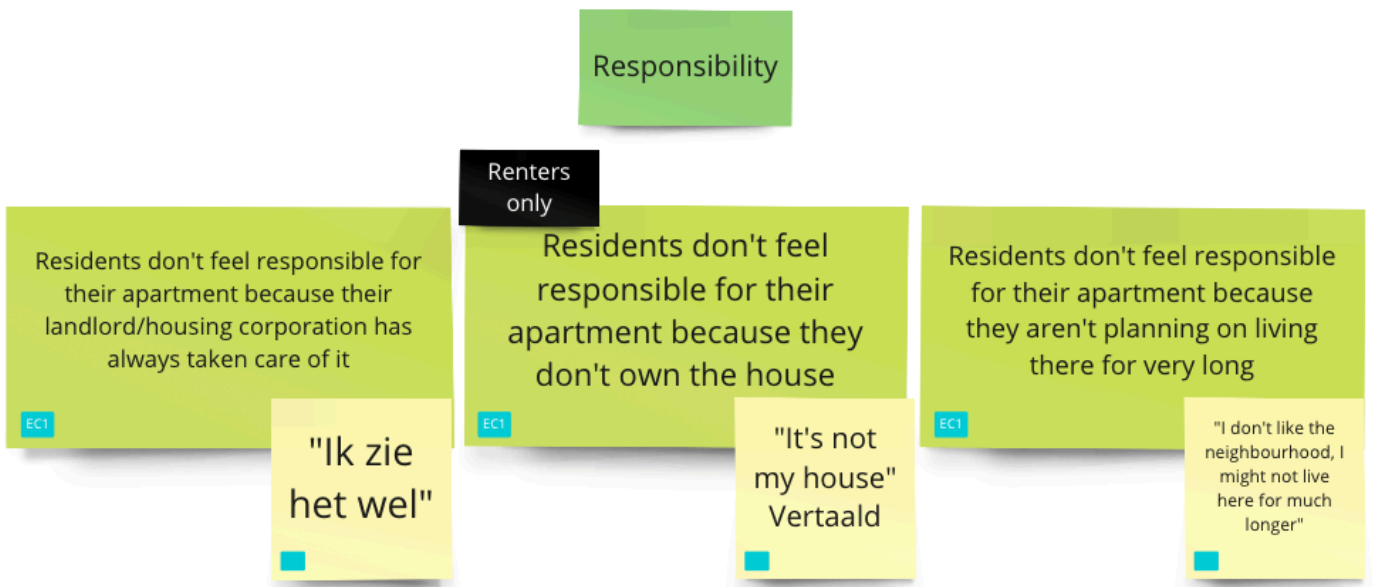
Residents might see it as a lot of trouble which might not outweigh someone's personal benefits.

Residents can get tempted when hearing "after 30 years", to pass it to the next generation.

Getting the rejection on the request explained by a VvE board member could lead to a better acceptance of the resident.

Appendix 4: Insight clusters

Posit

Responsibility

Renters only

Residents don't feel responsible for their apartment because their landlord/housing corporation has always taken care of it

EC1

"Ik zie het wel"

Residents don't feel responsible for their apartment because they don't own the house

EC1

"It's not my house" Vertaald

Residents don't feel responsible for their apartment because they aren't planning on living there for very long

EC1

"I don't like the neighbourhood, I might not live here for much longer"

ion

Differentiation between
owners / renters
-> field research
indicated little

Influence

**Renters
only**

Residents are feeling
unheard by the
housing corporation

EC3 Field research

The constructor
mentioned that
my sink had to be
replaced but that
never happened"

Residents don't feel like
their opinion will have an
influence on the process

Field research Literature: Participation di...

"In the end, they
will do what they
want anyway"
Vertaald

Residents feel left out or
discriminated because
they don't get actively
approached

Literature: Participation di...

Because of bad
experience in the
past with lack of
response on
requests or
complaints

Trust
offici

Honesty

Intenti

Residents are suspicious weather they are told the whole truth

Field research

"if you want to bribe us with a free pan, then there lights up a red light"

Residents don't trust that housing corporations will make decisions in the resident's best interests

Field research   Literature: Belemmering

Regarding housing corporation "everything is only about money they wouldn't care what it does regarding living comfort" Vertaald

e

Lite

Lite

t in
als

ons

Capacity

Residents mistrust professionals due to the preconception that they will benefit from this is some way

Literature: Belemmeringen..

Residents don't have trust in the VvE board to reach the necessary support

Literature: Venserpolder

"Onhaalbaar voor de buurt/geen vertrouwen in goede samenwerking + te weinig actieve leden" - Venerpolder enquete

Partly due to the profit oriented nergy sector which passed by houses often

erature: Soest

erature: Belemmeringen..

Partly due to the over-researching

Literature: Belemmeringen..

Technical

Residents have the prejudges that the technical content won't be understandable for them

Residents have difficulties understand the content due to a lack of basic technical knowledge / vocabluary

Residents have difficu comparing options d the vage or uncerta future benefits

Field research

"I wouldn't know where to start"

Scenario: Resident was unaware of that the effect of an vaporiser was a damp room

...ledge

Cultural

...ulties
...ue to
...ain

Residents have difficulties to follow the content due to low (Dutch/English) language skills

Literature: Belemmeringen...

Residents have difficulties to participate in the bureaucratic style (lengthy, static, organised) of a ALV meeting

Observation: many residents left after the first half of the info evening at blok 7

Combi barrier:
Residents feel encumbered (bezwaard) to speek up and are therefor
unable to contribute

Social cohesian

Trust in neighbours

Kan je op de buren vertrouwen?

Solidarity

Iets over hebben voor de ander

Residents have low trust that other residents will commit to a common goal

Literature: Venserpolder q...
Field research | Literature: Venserpolder

Resident have low willingness and sense of responsibility to help others

Field research | Literature: Venserpolder

Residents have negative associations with neighbours due to nuisance (overlast) in the past

"I have very annoying neighbours, they keep leaving their trash in the hallway"

Togetherness

Hoe erg heerst het gevoel van wij, blok 7

There is no strong active network within the apartment block

Residents aren't open towards forming new connections with neighbours

There is little sense of being part of a bigger collective within the apartment block

EC2

"I have no need to be in contact with other neighbours" Vertaald

Residents feel excluded due to different ethnic background then dominant one

Literature: Belemmeringen..

Residents feel unrepresented by the organisation due to lack of similar ethnic background

Literature: Belemmeringen..

Practical

Residents are unable to be present on the necessary times to participate

Literature: Belemmeringen...

Residents have limited time available to spend on participating in the process

Residents are unable to leave the house due to physical or psychological limitations

"I don't walk very well so I only go out to do groceries"

Residents are unable to follow the content due to low (Dutch/English) language skills

Field research   Literature: Belemmeringen...

If it is late, they have kids who need to be cared for. or early to bed due to early work shifts the next day

Residents have more urgent matters in their head like financial or emotional states

Personal

Residents don't have motivation to participate because they find it dull or boring
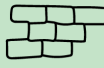
Residents are indifferent towards future plans of the apartment because of short stay

Field research Literature: Belemmeringen..

Residents aren't motivated to improve their homes becuase they aren't happy or proud of it

BH3

Appendix 5: Research finding card deck

Invloed

Zien dat je iets kan bereiken met jouw bijdrage zorgt voor motivatie.

"Dat heb ik even goed geregeld, he?"

Reflectie vraag: *Hoe kun je iemand meer invloed geven?*

Invloed

Het gevoel hebben dat er niet naar je geluisterd wordt kan machteloos voelen. Dat je geen invloed kan uitoefenen op de situatie zorgt voor weinig motivatie om het toch te proberen.

"Uiteindelijk doen ze toch wel wat ze zelf willen, wat ik er ook van vind"

Reflectie vraag: *Hoe kun je ervoor zorgen dat iedereen zich gehoord voelt?*

Verantwoordelijkheid

Verantwoordelijkheid krijgen zorgt voor motivatie om het goed te willen doen.

"Wij zijn degene die de boel hier draaiende houden"

Reflectie vraag: *Zou je de verantwoordelijk meer kunnen verdelen?*

Verantwoordelijkheid

Iemand die geen verantwoordelijkheidsgevoel ervaart over iets zal ook niet snel moeite in datgeen willen stoppen.

"Het is Rochdale's appartement, het is hun verantwoordelijkheid"

Reflectie vraag: *Wat voor verantwoordelijk-heden zijn er binnen het gebouw?*

Technische kennis

Nieuwsgierigheid is een goede driver om iets nieuws te willen leren.

"Dus jij hebt zonnepanelen, zou dat hier ook kunnen?"

Reflectie vraag: *Hoe prikkel je iemands nieuwsgierigheid?*

Culturele gewoontes

Je voelt je sneller op je gemak bij iemand die dezelfde culturele gewoontes heeft als jij.

"Zo zijn we hier allemaal!"

Reflectie vraag: *Reflecteert het bestuur de (etnische) diversiteit van de bewoners?*

Vertrouwen in de buren

Een vertrouwensrelatie kan worden opgebouwd door positieve ervaringen met elkaar mee te maken.

"Ik vertrouw hem wel want ik ken hem"

Reflectie vraag: *Hoe goed vertrouw jij je buren? En zij jou?*

Transparantie

Weten waar een keuze vandaan komt zorgt ervoor dat de keuze makkelijker geaccepteerd wordt.

"Waarom betaal ik service kosten? Ik zie er niks van terug"

Reflectie vraag: *Hoe kan je meer laten zien wat er achter de schermen gebeurt?*

Wantrouwen naar profesionals

Organisaties kunnen argwaan wekken doordat iemand hiermee negative ervaringen in het verleden heeft meegemaakt.

"Energie bedrijven willen alleen maar geld van me."

Reflectie vraag: *Hoe kun je het oude wantrouwen wegnemen?*

Autoriteit

Barière kaartje

Om iemand te kunnen vertrouwen is het belangrijk om te geloven dat die persoon zijn of haar woorden ook kan waarmaken.

"Kan hij dat wel nakomen?"

Reflectie vraag: *Hoe kun je valse beloftes voorkomen?*

Technische kennis

Achtergrond
Barière kaartje

Onbekende technische onderwerpen kunnen snel worden gezien als als eng en buiten bereik.

"Zonnepanelen? Dat snap ik niet. Ik zou niet weten waar ik moest beginnen."

Reflectie vraag: *Hoe geef je mensen de handvatten mee te praten?*

Solidariteit

Verbondenheid
Inspiratie kaartje

Je kan makkelijker iets over hebben voor een ander als de ander dat ook heeft voor jou.

"De buurman heeft mijn plantjes water in de vakantie"

Reflectie vraag: *Waar zou jij de hulp van een buur bij kunnen gebruiken?*

Saamhorigheid

Verbondenheid
Inspiratie kaartje

Ervaren dat je bij een groep hoort zorgt dat je meer over hebt voor deze groep.

"Samen uit, samen thuis"

Reflectie vraag: *Hoe kan je iemand meer invloed geven?*

Tijd gebrek

Praktisch
Barière kaartje

Vanwege de hoge druk die het basislevensonderhoud al geeft, blijft er weinig tijd over voor andere zaken.

"Ik ben al druk zat."

Reflectie vraag: *Hoe houd je mensen op de hoogte zonder (veel) tijd te vragen?*

Agenda verschillen

Praktisch
Barière kaartje

Bewoners hebben verschillende dagplanningen vanwege beroep of levensfase. Hierdoor kan het lastig zijn een moment te kiezen wat voor alle bewoners uitkomt.

"In de avonden moet ik altijd bij de kinderen blijven."

Reflectie vraag: *Welke bewoners komen nog niet? Zou dat liggen aan de meeting tijd?*

Buren irritatie

Verbondenheid
Barière kaartje

Bij het delen van gemeenschappelijke ruimtes kunnen irritaties ontstaan vanwege onbegrip voor verschillende normen en waarden die anderen hanteren.

"Hij zit vaak tot diep in de nacht tv te kijken, daar heb ik last van"

Reflectie vraag: *Hoe zou je het gesprek beginnen met een irritante buur?*

Abstract denken

Achtergrond
Barière kaartje

Vaak gaan discussies over vele mogelijke gevolgen in een verre toekomst. Dat vraagt best wat van iemands abstract denken wat voor niet iedereen even goed te volgen is.

"Maar kan ik dan nog wel ... zoals nu?"

Reflectie vraag: *Hoe kan je abstracte onderwerpen ondersteunen met praktische voorbeelden?*

Taal barière

Achtergrond
Barière kaartje

Het onvolledig beheersen van de dominante taal kan een groot obstakel zijn voor participatie. Hierdoor kan het zelfvertrouwen en het gevoel van erbij horen beschadigd raken.

"Ik kan niet alles volgen."

Reflectie vraag: *Hoe geef je mensen de handvatten mee te praten?*

Risico-avers

Elke verandering brengt gevolgen met zich mee. Hoe onduidelijker de gevolgen zijn, des te groter het risico kan voelen.

"Van mij hoeft het allemaal niet zo nodig."

Reflectie vraag: *Waar zijn mensen bang voor dat mis kan gaan? Is dat realistisch?*

Korte woontijd

Lange termijn voordelen zullen weinig meewegen voor mensen die op korte termijn willen verhuizen.

"Het zal mijn tijd wel duren."

Reflectie vraag: *Welke korte-termijn voordelen zullen iedereen meemaken?*

Ongeinteresseerd

Uiteindelijk speelt persoonlijke interesse een grote rol wie geïnteresseerd blijft. Wie echt niks met het onderwerp heeft, zal het moeten hebben van een enthousiaste omgeving.

"Het is gewoon niet echt mijn ding."

Reflectie vraag: *Hoe kan je bewoners interesseren in een (ander) deel van het proces?*

De kaartset

Participatie binnen de VvE

Inspiratie om barière te doorbreken

"Dat hebbeb we even goed geregeld, he?"

20 kaarten met barieres en inspiratie, ontworpen om creatieve oplossingen te vinden voor de complexe situatie binnen een VvE