BETWEEN STATE

AND MARKET

The Adoption of Renovation Passports in the Netherlands

Master thesis of E. van der Bijl
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COLOPHON

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Access to data has been according to the approved Data Management Plan (Appendix I).

Use of Artificial Intelligence (AI)
Artificial Intelligence has been used in preliminary exploration and assistance in stylistic improvements.

ABSTRACT

Despite ambitious European and national sustainability goals, the amount of energy renovations in the Netherlands stays behind. Various instruments are promoted by the EU to support energy-efficient renovation to achieve these goals, yet there is insufficient understanding of how Building Renovation Passports (BRP) can be effectively embedded within existing governance structures, policy frameworks, and market practices in order to support the adoption of these BRPs. Therefore, the main research question of this research is how policy instruments can support the adoption of renovation passports in the Netherlands. This study combines a literature review, organisational ethnography, semi-structured interviews and a focus group. The literature review analyses policy frameworks and incentive barriers for BRPs to identify gaps between theory and practice. During the interviews, the values and roles of the actors and their perceived barriers are researched and analysed. Five unresolved matters are discussed in a focus group. Triangulation is used to improve validity and credibility. Together, these qualitative methods support an abductive–deductive approach to answer the main research question. The main objective of this research is to support the adoption of renovation passports under private homeowners and to propose policy instruments needed to establish this. With the use of the Policy Compass, various options of policy instruments are explored. The recommended policy instruments for the implementation of BRPs in the Netherlands consist of four main components: an administrative consultation followed by a covenant, decentralisation of tasks to municipalities in combination with supervision of the Dutch government, experiments of the use of BRP with a financial incentive and lastly, a complete set of policy rules and general information to support the recommended policy instruments. This research is relevant for policy makers in energy renovations as well as academics in the built environment, specifically for renovations and the energy transition.

KEYWORDS – renovation passport, policy instruments, energy renovation, digitalisation

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In addition, many thanks go out to all of the people that participated in the interviews. Most of these participants had an incredibly busy schedule, and therefore I am grateful that they made time to help with my thesis – regardless whether this was in partnership with the Ministry or not. Their insights and qualitative yet fun conversations taught me so much about not only the world of policy-making, but also the rest of the construction chain and how all parties collaborate in this. As reflected in the design of the front page, there is much more below the surface than I expected. I am truly happy to have been part of this conversation.

Last but not least, a perhaps expected but huge thank you to my friends and family for being there for me the past year. For most students, the final thesis is a big highlight of their career, and naturally, so is mine. On top of that, this year has had its challenges when it comes to an overwhelming amount of responsibilities. Though at times this took a toll on me, my thesis was surprisingly one of the most positive and rewarding experiences and gave me so much energy, that I happily made my way through. Enjoy the read!

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LIST OF ABBREVIATIONS

BRP	Building Renovation Passport
DBL	Digital Building Logbook
EC	European Commission
EED	Energy Efficiency Directive
EPBD	Energy Performance Building Directive
EPC	Energy Performance Certificate
EU	European Union
KPI	Key Performance Indicator
LVG	*Landelijke Voorziening Gebouwgegevens* (National Provision Building Information)
NBRP	National Building Renovation Plan
NIP	*Nationaal Isolatieprogramma* (National Insulation Programme)
NPLW	*Nationaal Programma Lokale Warmtetransitie* (National Programme Local Heat Transition)
PAW	*Programma Aardgasvrije Wijken* (Program Natural Gas-free Districts)
RED	Renewable Energy Directive
RVO	*Rijksdienst voor Ondernemend Nederland* (Netherlands Enterprise Agency)
RWS	Renovation Wave Strategy
SFDR	Sustainable Finance Disclosure Regulation
WLC-GWP	Whole Life-Cycle Global Warming Potential
ZEB	Zero Energy Building

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CHAPTER 1

INTRODUCTION

CHAPTER 1. INTRODUCTION

1.1 Background

About two years ago, the fourth recast of the Energy Performance of Buildings Directive (EPBD IV) (European Commission, 2024) was published, representing the European Union's climate and energy policy framework for the built environment. As part of the broader European Green Deal (European Commission, 2019) and the "Fit for 55" package (European Commission, 2021), the EPBD IV aims to accelerate the decarbonisation of buildings by strengthening energy performance requirements, improving transparency, and promoting long-term renovation planning across Member States. The directive recognises that buildings play a critical role in achieving climate neutrality, given their contribution to energy consumption and emissions (Chatterjee et al., 2022). Similarly, in the Netherlands, the sustainability crisis in the housing sector has gained prominence, as residential buildings account for a significant share of energy use and emissions (Tsemekidi-Tzeiranaki et al., 2022). Despite efforts to decarbonise the housing stock, many dwellings remain energy inefficient, dependent on outdated systems, and exposure to rising energy costs (Delclós & Vidal, 2021). Energy-efficient renovations lower energy use, emissions, and rising energy costs, in line with the EPBD IV (European Commission, 2024). Renovating existing homes is a key strategy for addressing sustainability challenges, but it also addresses the housing shortages (Boelhouwer, 2020). Since new construction alone cannot meet demand quickly, upgrading the existing housing stock helps extend building lifespans, improve quality, and return underused dwellings to the market, which reduces pressure on the housing supply (Delclós & Vidal, 2021). It is mandatory to have an energy label during a transaction moment, such as a sale or rent (Rijksoverheid, 2026a), but not to reach a minimum energy performance level. In contrast to this, the corporate sector, such as offices, have the requirement to achieve energy label C (*Rijksdienst voor Ondernemend Nederland* (RVO) (Netherlands Enterprise Agency), 2026a), which gives this sector an additional incentive to initiate an energy renovation. Unfortunately, homeowners often face financial, informational, and organisational barriers to do an energy renovation (Sesana & Salvalai, 2018; Mannoni, & Löschke, 2025). High upfront costs, complex subsidy procedures, and limited knowledge create uncertainty and thereby delaying renovation decisions for private homeowners (Fawcett & Topouzi, 2019).

The slow rise of energy renovations by private homeowners led to various EU Directives that introduce recommendations for a stable environment that improves decision-making, which includes digitalisation (European Commission, 2024). Over the past decade, this process has received considerable attention, leading to various digital instruments. One of these instruments is the Building Renovation Passport (BRP), which is a "user-friendly document that outlines the long-term, step-by-step renovation roadmap for homeowners to easily plan deep renovations" (BPIE, 2016). The BRP offers a solution to improve decision-making and lower barriers for homeowners to renovate their properties.

1.2 Problem statement

The international goals set by the EU require for all Member States to incorporate a national BRP. The BRP will become an official instrument in the Netherlands on the 29th of May in 2026 (Rijksdienst voor Ondernemend Nederland, 2026c). However, research on their effective implementation in the Dutch context remains limited. Therefore, the use and the adoption of this instrument among homeowners is uncertain. First of all, renovation projects still require coordination among multiple actors and are often face various barriers, such as lack of technical support and regulatory consistency (Barbosa & Almeida, 2025). At the same time, professionals in the construction sector express concerns about the additional workload associated with data entry, the absence of harmonised data standards, and uncertainties surrounding data ownership and responsibility (Hwang et al., 2025). A further challenge lies in coordinating sustainability policies across governance levels (Hartenberger & Frics, 2017). While national governments create long-term renovation strategies, their successful

implementation depends on the feasibility in terms of capacity and institutional systems. Moreover, the current state of policy instruments, such as subsidies or fiscal incentives, provides limited guidance on how renovation passports should be integrated into renovation processes. As a result, market actors lack a clear and sustainable business model for developing and maintaining the BRP for individual homeowners (Dos Santos Gonçalves et al., 2024). These gaps illustrate the need for more coherent policy frameworks and clearer implementation strategies. Existing research largely focuses on technical aspects such as data standardisation, interoperability, and digital infrastructure (Hwang et al., 2025). Less attention has been given to how renovation passports can be integrated into governance structures and policy instruments. In particular, it remains unclear which actors benefit from renovation passports, who should take responsibility for their development and maintenance, and how value can be captured across stakeholders. As a result, there is limited understanding of how policy instruments can distribute responsibilities over actors, create incentives, and support the widespread adoption of renovation passports by private homeowners in the Netherlands.

1.3 Research questions

Distilled from the problem statement, the following main research question is to be answered:

How can national policies stimulate the adoption of renovation passports in the Netherlands?

To enable a satisfactory answer, the following sub-questions are proposed:
Q1: What is the state of the art of renovation passports in the Netherlands in relation to policies?
Q2: What are the values and roles of actors for renovation passports in the Netherlands?
Q3: What variations exist for policies to implement renovation passports?
Q4: In what way can actors be supported through policies in order to effectively adopt renovation passports in the Netherlands?

1.4 Relevance of research

Although renovation ambitions are high on a national level, many homeowners are still reluctant to take action (Mannoni, & Löschke, 2025). This has led to growing interest in finding practical solutions that can better support renovation decisions. As the BRP is still to be launched at the end of May 2026 (Rijksoverheid, 2026c), awareness and thus adoption remains slow in the Netherlands. Therefore, policy instruments should be introduced in order to stimulate the use of BRPs.

1.5 Objective of research

The main aim of this thesis is to support the adoption of renovation passports and to advise for policy instruments needed to establish this. An important aspect to determine is what exact value is created by the use of a BRP and who should take responsibilities in the implementation of the BRP in the Netherlands. By listening to perspectives from Dutch policymakers, as well as market parties, their voices can be heard and reflected into practical policy measures.

The objectives of this research are according to the research questions:
Q1: What is the state of the art of renovation passports in the Netherlands in relation to policies?
Understanding the embedding of the renovation passport in the Dutch policy context is crucial to give profound advice.

Q2: What are the values and roles of actors for renovation passports in the Netherlands?
An important aspect of a ‘useful’ instrument to eventually be adopted is to capture values. These values are identified for actors in the process of energy renovation. This theoretical framework gives a clear overview of the stakeholders, their roles and values and what is needed to adopt the BRP successfully.

Q3: What variations exist for policies to implement renovation passport?
There are various possibilities for the renovation passport to be adopted. Different options of policy instruments are researched using the interviews and Policy Compass. Exploring multiple possibilities and balancing benefits and drawbacks leads to a good foundation to make decisions.

Q4: In what way can actors be supported through policies in order to effectively adopt renovation passports in the Netherlands?
Each possible policy instrument has consequences and requirements for the involved parties. It is necessary to understand how actors can be supported to further implement the renovation passport in the Netherlands.

The targeted audience of this research consists of:

- Policymakers across various governance levels (national, regional, municipality) in the built environment, renovation and energy transition
- Academics in the built environment, specifically renovation and energy transition

Other possible audiences may be market parties in various sectors, such as the construction sector or the financial sector, as well as peer students or anyone who is interested in the subject.

1.6 Scope of research

This research focuses on the implementation of BRPs in the Netherlands, specifically examining the roles, responsibilities, and values of key stakeholders, including representatives of government bodies, market actors, and homeowners. The study is limited to governance, policy, and organisational aspects, and does not address technical system design in detail. The goal is to understand the most important values and possible roles for actors in the energy renovation process, to give advice to policymakers on how to support national adoption of the BRP by private homeowners. During the research, many problems and barriers in the general renovation process were identified. Some of these barriers are so closely linked to the implementation of BRPs, that these barriers have a high priority to be solved. However, some retrieved barriers are of such magnitude and complexity, that they will be regarded as out of scope of this policy advice. An example is the fragmentation of the construction sector.

Personal study goals are to learn more about the Building Renovation Passport, and the whole energy renovation process for private homeowners. On top of that, the internship within the Ministry of Interior and Kingdom Relations offers an excellent opportunity to learn more about policy-making and the governance structure of energy renovation. Lastly, this is the first official research carried out by the researcher, and therefore learning the entire process of doing research is a goal in itself.

1.7 Conceptual model

The research questions and the relation between concepts can be seen in the conceptual model below.

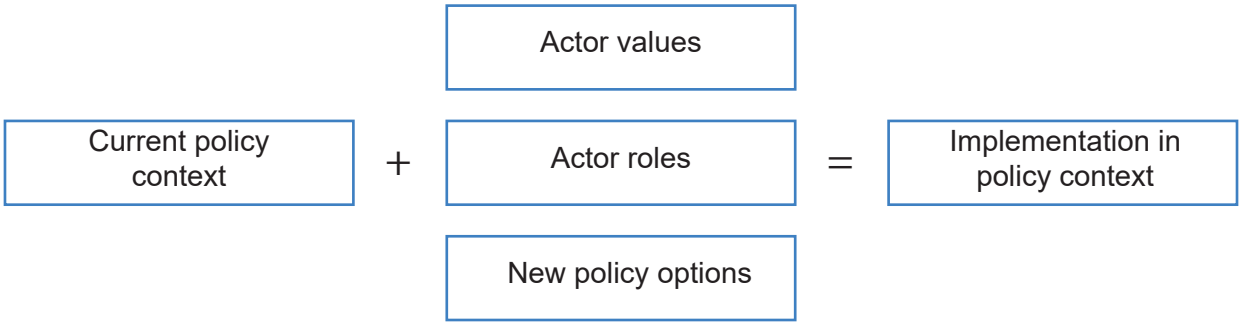

Figure 1: A conceptual model of relationships among research question concepts (own work)

CHAPTER 2

THEORETICAL FRAMEWORK

CHAPTER 2. THEORETICAL FRAMEWORK

The second chapter has three key parts. Firstly, the literature about renovation passports is read and analysed to provide an official definition of the Building Renovation Passport. Secondly, the Diffusion of Innovations Theory of Rogers (2003) is explained, which gives insight into how theoretically a new concept is introduced and adopted into society. This theory serve as a paradigm for reflecting on the stakeholders' adoption of the BEP. Lastly, the official *Beleidskompas* (Policy Compass) of the Dutch Government is explained, which is necessary to understand how a policy instrument comes to be. Further literature review can be found in Chapter 4. The structure of this chapter can be seen in Figure 2 below.

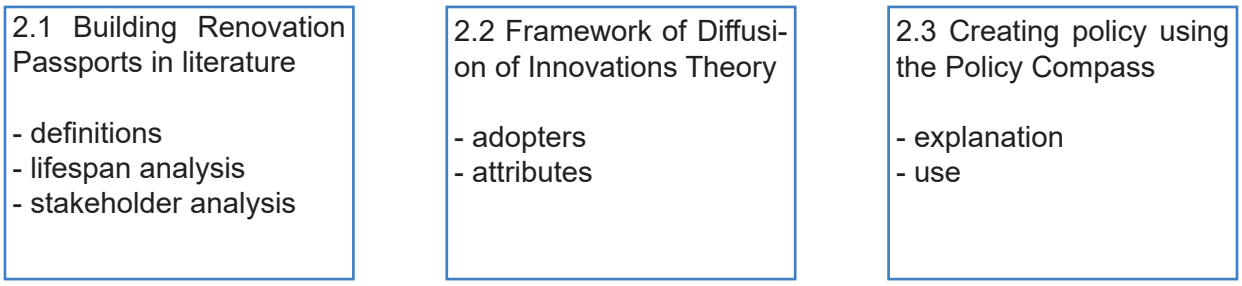

Figure 2: The structure of chapter 2 (own work)

2.1 Building Renovation Passports in literature

The first introduction of the concept of renovation passports was by Fabbri (2017), who attempts to define the BRP as a "document – in electronic or paper format – outlining a long-term (up to 15 or 20 years) step-by-step renovation roadmap for a specific building, resulting from an on-site energy audit and fulfilling specific quality criteria and indicators established in dialogue with building owners". Fabbri (2017) mentions how a BRP often does not stand alone and is frequently combined with a repository of digital environments, which altogether gather building-related information regarding energy performance (BPIE, 2016). A simple model (Figure 3) is shown below to indicate how the BRP comes to be.

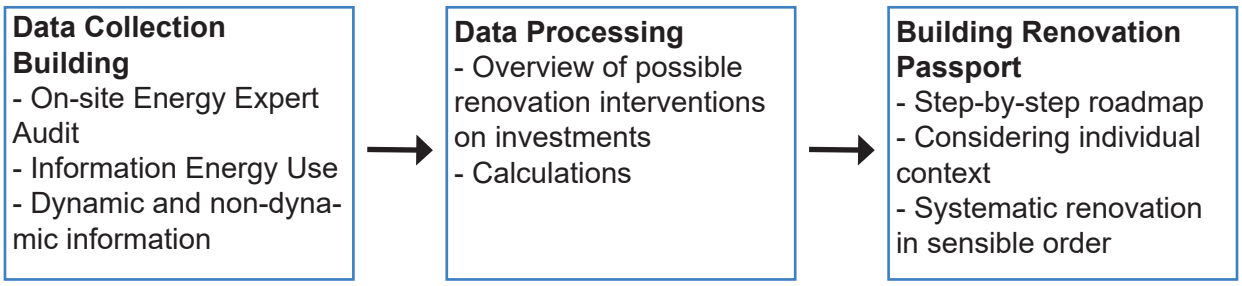

Figure 3: A simple model of the creation of the Building Renovation Passport (own work based on BPIE (2016))

The content of the BRP is the “step-by-step renovation roadmap” (Fabbri, 2017). The data collection is to be carried out usually by a certified energy expert, even though the building owner or user needs to provide certain information around energy use (BPIE, 2016). The benefits of a Digital Building Logbook (DBL) are for example that access is easily shared with public authorities, experts and craftsmen (BPIE, 2016).

According to Fabbri (2017), there are five key principles that the BRP is based on:

(i) Provide a long-term perspective to enable consistent renovation planning, achieve high energy performance, and manage renovation costs effectively.
(ii) Include short- and long-term measures clearly outlining the proper sequence of actions to avoid lock-in effects, build confidence, and encourage deep renovations.
(iii) Engage with occupants, as RPs consider occupants’ needs, preferences, and financial circumstances, aligning renovations with personal situations like family changes or financial opportunities.
(iv) Design a visually appealing and user-friendly document, offering clear guidance to ensure building owners are not discouraged by the complexities of renovations.
(v) Optimise audits by leveraging automation tools that streamline data collection, enhance error detection, and facilitate result generation.

Sesana & Salvalai (2018) add to this by describing the function of BRPs as a “user-friendly long-term roadmap that owners can use to plan deep renovations, gather all relevant building information in a single place and get an up-to-date screenshot of the building across its lifetime, with information about comfort levels and potential access to finance.” This reflects the broad scope of the BRP and how many types of information is needed to provide for accurate advice. In this research of definitions over the years (Sesana & Salvalai, 2018), results show that Germany has often led initiatives around the concept of Building (Renovation) Passports, on both the local and national level. Important keywords are “transparency, responsibility, quality assurance, consumer protection, marketing” (Sesana & Salvalai, 2018). Lastly, Barbosa & Almeida (2025) is a recent literature study about BRPs. They highlight the fact that homeowners are often discouraged from engaging in deep renovations due to the absence of clear long-term goals. The concept of the BRP is crucial in tackling this barrier, as it not only explains the benefits of energy renovation (lower electricity bills, improved comfort) but also provides a detailed, explicit format on energy performance goals and how to achieve them (Barbosa & Almeida, 2025). Barbosa & Almeida (2025) also provide a model that takes the future steps of the renovation passport into account. A simple interpretation is shown in Figure 4.

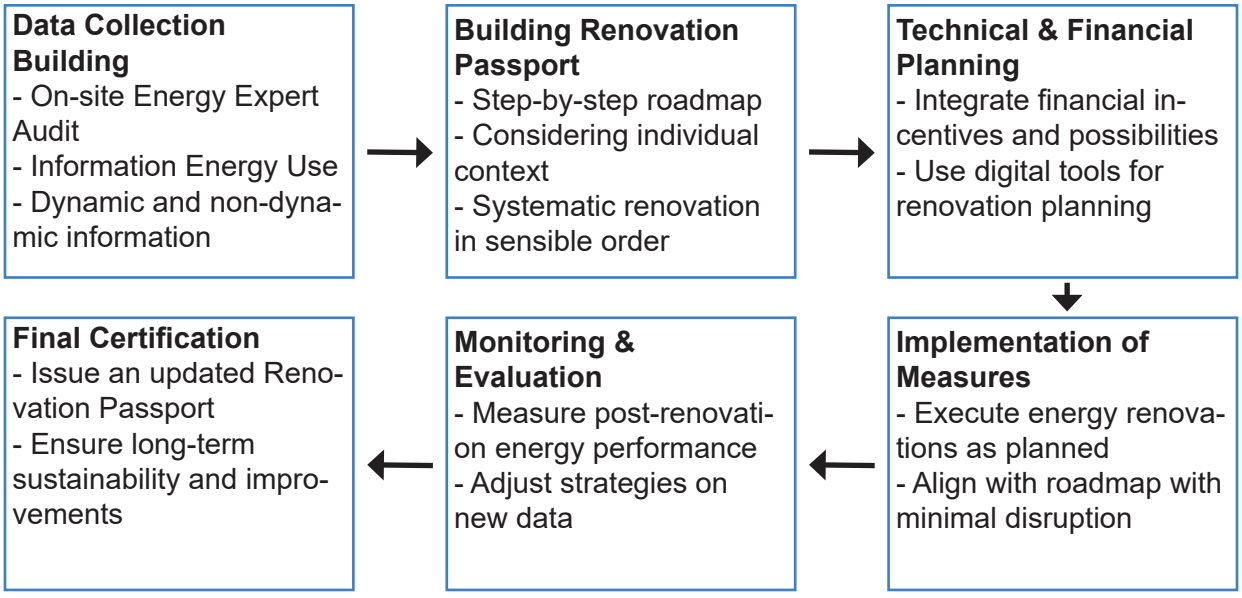

Figure 4: A simple model of the full lifespan of the Building Renovation Passport (own work based on Barbosa & Almeida (2025))

Based on this lifespan and Sequeira & Gouveia (2022) a stakeholder analysis is conducted.

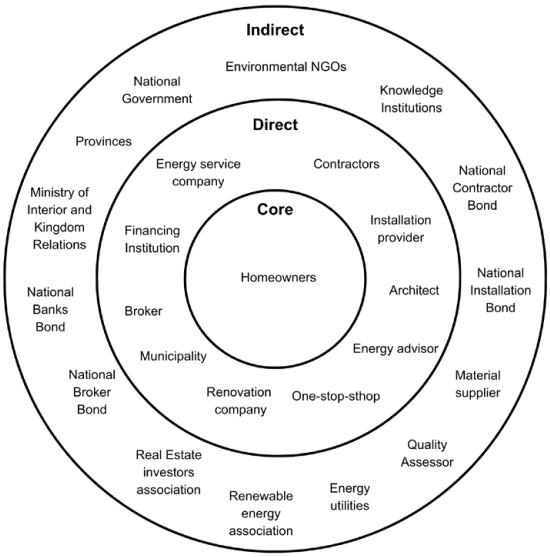

Figure 5: An overview of actors in the lifespan of a Building Renovation Passport (own work)

Combining the stakeholder analysis with the lifespan of the BRP creates a full overview of which actor is relevant in which part of the use of a BRP. There is an incredibly big structure behind the organisation and creation of a BRP, that relates to creation and calculation of the BRP. A homeowner simply sees the tip of the iceberg. The following visual has been created (Figure 6), which shows both the sketched 'customer journey' (blue line), and what happens under the surface around the BRP. This mostly consists of the complex data management (in a possible digital repository, allowing access for interested parties) and other instruments or structures needed to use the BRP.

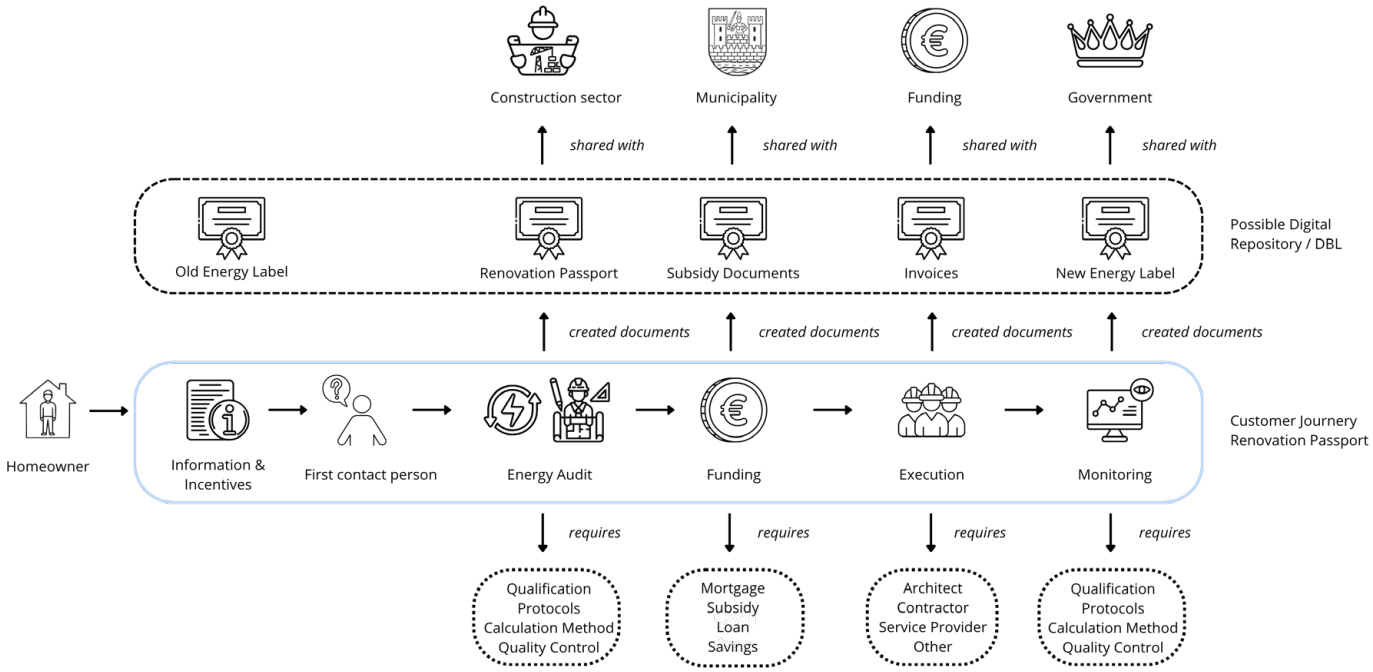

Figure 6: A visual interpretation of the customer journey and organisation of the BRP (own work)

2.2 Framework of Diffusion of Innovations Theory

In the context of this research, stakeholders or actors are the individuals and organisations that influence, implement, or are affected by renovation passport initiatives and related policies. They include public authorities such as municipalities, and private market actors such as homeowners and consultants. Stakeholders contribute by shaping policy, supplying technical expertise, providing financing, managing data, or carrying out renovation activities. Their interests, capacities, and interactions have significant influence on how effectively renovation initiatives are implemented. Understanding stakeholder behaviour is essential to ensure that BRPs are effectively adopted. Therefore, the Diffusion of Innovations theory of Rogers (2003) is used as a theoretical framework to understand the adoption process and apply it to the adoption of BRPs.

The theory distinguishes between different adopter categories based on their willingness to adopt innovations: innovators, early adopters, early majority, late majority, and laggards (Rogers, 2003). These groups differ in risk tolerance, access to resources, and social influence. Early adopters are particularly important, as they act as opinion leaders and help reduce uncertainty for later adopters. The table below (Table 1) is based on the research of Doyle et al. (2014), which created a comprehensive overview of the various adopter groups.

Adopter group	Description
Innovators	• Venturesome types who are typically well educated, more likely to take risks, enjoy being on the cutting edge, and are motivated by the idea of being a change agent (Rogers, 2003). • Play a gatekeeping role in the introduction of new ideas into a system (Rogers, 2003).
Early adopters	• Use the data provided by the innovators to make their own adoption decisions (Rogers, 2003). • Usually respected social leaders, visionaries in their field, often considered as key decision makers (Rogers, 2003).
Early majority	• Will adopt an innovation before the average individual (Rogers, 2003). • Make up about one-third of all members of a system (Rogers, 2003). • Tend to be slower with the adoption process than the early adopters (Rogers, 2003).
Late majority	• Adopt an innovation after the average member of a system (Rogers, 2003). • Approach new innovations with a high degree of scepticism and are slow in adopting the innovation (Rogers, 2003).
Laggards	• The last to adopt an innovation (Rogers, 2003).

Table 1: An overview of types of actors in innovation (Rogers, 2003)

Rogers (2003) explains how new ideas, technologies, or practices spread through a social system over time. Adoption is understood as a process rather than a single decision, consisting of five stages: knowledge, persuasion, decision, implementation, and confirmation. Actors first become aware of an innovation, then form an attitude towards it, decide whether to adopt or reject it, implement it in practice, and finally seek confirmation of their decision through experience and social feedback.

Lastly, Rogers (2003) identifies five attributes that influence adoption rates:

(i) relative advantage
(ii) compatibility with existing practices
(iii) perceived complexity
(iv) trialability
(v) observability of results

With these attributes, the proposed policy instruments for the adoption of BRPs will be tested. Altogether, this theory provides for a framework that helps understand the adoption of renovation passports by stakeholders in the Netherlands.

2.3 Creating policy using the Policy Compass

The *Beleidskompas* (Policy Compass) (Kenniscentrum voor beleid en regelgeving, 2026) is the Dutch government's central framework for developing, evaluating, and implementing public policy. It has been introduced, based on the previous "*Integraal afwegingskader voor beleid en regelgeving*" (Integrated assessment framework for policy and regulations) to improve the quality and transparency of policymaking. The Policy Compass provides a structured approach for analysing societal problems, exploring policy options, assessing impacts, and monitoring implementation.

The framework supports evidence-based policymaking by encouraging policymakers to systematically evaluate the necessity, feasibility, and effectiveness of proposed interventions before introducing new regulations or policy instruments. It also emphasises the importance of considering implementation capacity, enforcement, behavioural effects, and unintended consequences. As a result, the framework promotes an integrated and iterative policy process. During this research, the Policy Compass is used to explore various ways to implement the renovation passport into the current policy context.

CHAPTER 3

APPROACH

CHAPTER 3. APPROACH

In this chapter, the research methodology and the chosen methods are explained. The data sources and sample sizes are argued. A statement about ethical research and the data management approach is also elaborated. Lastly, a conceptual planning of the research is shown. The structure of the chapter is shown in Figure 7 below.

3.1 Methodology	3.2 Development Instruments	3.3 Ethical Considerations	3.4 Data Management Plan	3.5 Research Plan

Figure 7: The structure of chapter 3 (own work)

3.1 Methodology

Firstly, the data collection methods of the research are explained. To relate the steps and research methods to the expected output, a visualisation of the methodology is shown in Figure 8.

Figure 8: The structure of the research methods from introduction to reflection (own work)

3.1.1 Literature review
The first part of this study is a literature review to gain a deeper understanding of the latest literature and initiatives on BRPs, as well as an overview of the European and national regulations on energy renovation. Understanding the previous literature is helpful to be able to find gaps between theory and practice as well as to raise critical questions.

3.1.2 Qualitative instrument: organisational ethnography
The second part of the research is an organisational ethnography, which is interpreted as a study and experience from within the Ministry of the Interior and Kingdom Relations. Insight is gained through this research method on how policy comes to be, related to the Policy Compass. During an internship within the department of Building and Energy (SBE), insight is gained in infrastructure, systems and terminology. Throughout this internship, a logbook has been kept to record key insights and integrate this knowledge into this report. However, all information sources used in the report are either from openly published articles or specifically framed as interviews and managed accordingly.

3.1.3 Qualitative instrument: semi-structured in-depth interviews
This literature review and the observation during the organisational ethnography create the baseline for the third research method, semi-structured interviews. Critical and deepening questions are prepared to have a conversation with experts. The purpose of this research method is to verify the hypotheses by using a deductive logic of inquiry and provide for argumentation and explanation to the answers.

3.1.4 Qualitative instrument: focus groups
As a fourth research method, a focus group is used. The reason to host a focus group session is to let experts discuss unresolved matters from the interviews. These new insights will help solve remaining problems. Together with the previous research methods, a deductive approach is used so that hypotheses for the research questions can be verified or amended.

3.2 Development of research methods
The data generated from previously mentioned instruments, which are part of the empirical study, are sufficient to answer the research questions. In this chapter, the sampling methods and sizes are explained and justified. For both empirical studies, the same stakeholder analysis (found in chapter 2) is conducted to identify which experts are crucial to answering the research questions.

3.2.1 Organisational Ethnography
The first qualitative method generates no direct data. It only gives a direction on where to find required data, and helps to structure the rest of the research. The only data created are notes during meetings, which contain findings that are not directly included in this report due to intellectual property rights.

3.2.2 In-depth interviews
The interviews are held in order to discuss the implementation of renovation passports with a wide variety of stakeholders. Based on the stakeholder analysis carried out during this research, the following stakeholders are considered relevant to converse with (Table 2). However, due to time constraints, not all stakeholder groups as identified in the previous section can be fully represented in this research. The maximum number of interviews is set on 15 to maintain a realistic scope, resulting in 12 interviews carried out.

Stakeholder	For interview and why?	Sampling method
Homeowners	Yes: a representative of Vereniging Eigen Huis is chosen to understand the added value of the BRP for homeowners	Network of Ministry
Energy advisor	Yes: a representative of Groene Grachten is chosen to understand the role of and the added value of the BRP for energy coaches	Own network
Municipality	No: planned but eventually cancelled; solved by another interview but with a representative of NPLW	Network of Ministry
Contractor	Yes: a representative of Bouwend Nederland is chosen to understand the added value and role of the BRP for contractors	Network of Ministry
Installation provider	Yes: a representative of Techniek Nederland is chosen to understand the added value and role of the BRP for service providers	Network of Ministry
Architect	Yes: a representative of Zeeuwse Jongens is chosen to understand the added value and role of the BRP for architects	Online invite
Financial institute	No: planned but eventually cancelled; solved by discussing with NVM	Network of Ministry
Broker	Yes: a representative of brainbay (NVM) is chosen to understand the added value and role of the BRP for brokers and real estate agents	Network of Ministry
National Government	Yes: five representatives of the Dutch Government are selected to understand the added value and role of the BRP for the government. Both policy perspective (Ministry) and executive perspective (RVO).	Network of Ministry

Table 2: An overview of stakeholders that are interviewed including sampling method (own work)

The interviews lasted approximately one hour each. This excludes preparation and reflection. Preparation is necessary for both the interviewer and the interviewee. Therefore, the consent form as well as topics to be discussed, were provided at most a week in advance of the planned interview. Since there are four sub-questions to be answered, a variety of topics need to be considered, but every interviewee received a different set of topics to fit their expertise. Answers can be given to uncontrolled depths, which is a downside of these interviews. The interviews have been recorded and transcribed using Samsung Transcript to analyse the collected data. For the analysis of the interviews, various codes have been used. These can be seen in Appendix II. The interviews have been coded with atlas.ti software, under a protected license.

3.3.3 Focus groups

A focus group has been organised to verify the research findings through collective discussion and interaction between experts. The focus group aims to discuss unresolved issues related to the implementation of BRPs, with particular attention to the construction chain and policymakers as the primary target groups. The main benefit of focus groups lies in the interaction between participants, which stimulates discussion, comparison of experiences, and critical reflection. This collective setting can reveal shared assumptions, disagreements, and power dynamics that may not emerge in individual interviews. The focus group consists of four participants, depending on availability, who have been interviewed previously to ensure a balance between diversity of views and manageable discussion dynamics. The focus group is structured around five discussion topics, while allowing flexibility for participants to introduce additional insights. Sessions lasted approximately an hour, excluding preparation and reflection. During the previously conducted interview, a consent form was signed in which the interviewee agreed or disagreed to participate in the focus group. Therefore, there will be no separate form for this method. As each interviewee has participated in the previous focus groups, it is sufficient to give the findings one week in advance. As with the interviews, the focus group will be transcribed using Samsung Transcript, and the audio recordings will be removed.

3.3 Ethical considerations

During this research, various ethical obligations are upheld to protect the stakeholders involved in the research. Some virtues throughout this research are honesty, compassion and fairness. In cases where an ethical dilemma arises, this will be handled carefully and morally. This paragraph has been written according to Blaike & Priest (2019).

Voluntary participation

All participation by the respondents is entirely voluntary. It is at any point possible to withdraw from participation, and take back possible data that has been collected by the researcher. The transcription of the interview and main findings of the research have been sent to the participants prior to the finalisation of the report.

Informed consent

Consent forms are sent along with the outlines of research instruments according to TU Delft standards. All rights and information about consent are given in the consent forms, which discuss a few major points. All participants delivered a signed informed consent before or shortly after the interview.

Protection of privacy

The privacy of the respondents is important and therefore, all transcriptions have been completely anonymised. The interview transcriptions will be kept confidential and therefore, even less risk of breach of privacy occurs. Lastly, during the processing of results, very minimal parties are specifically named in what their expressions on the topic are. This research is on an abstract level, and therefore name-calling is unnecessary.

Independent research
Objectivity is an important aspect of this research and seriously taken into account. Assumptions and judgements of participant's opportunities, challenges and choices will not be tolerated at any point during the conduct of this research. No power abuse is to take place, neither is the abuse of trust of participants. The research is independent and therefore conflict of interest is either avoided or mentioned explicitly.

3.4 Data management plan

Even though minimal personal data is collected, there are risks regarding data storage and privacy. The collected data is to be acquired and stored professionally to mitigate these risks as much as possible. Some matters are addressed in this paragraph. The full Data Management Plan is available in Appendix I. During this research, four types of data will be stored. The first two are the audio recordings and the transcripts from the interviews as well as for the focus group. However, the audio recordings have been removed directly after completion of transcription process. Therefore, only the anonymised transcriptions have been stored. Thirdly, the signed informed consent forms are also stored in the protected environment, and lastly the thesis report. These will be stored in a project storage drive at the University of Technology Delft and is only to be accessed by the researcher and the supervisors of this research. Therefore, after the data is made anonymous to the possible extent, this collected data has restricted access. The collected data will be available to researchers of the department for a maximum of ten years, after which all data will be destroyed. This is done in order to minimise data breaches and protect participants from any harm, according to the previous paragraph about ethics. Anonymity is not fully guaranteed in both focus group and interview, as collected information has a slim chance to conclude one's identity. However, this information has very restricted access and therefore has little risk of spreading.

3.5 Research plan

For this research to be carried out in correct order and magnitude, it is helpful to have an oversight of the activities to be done and the amount of time that is estimated to be necessary. In this schedule, the planning of these activities is laid out in a conceptual visual.

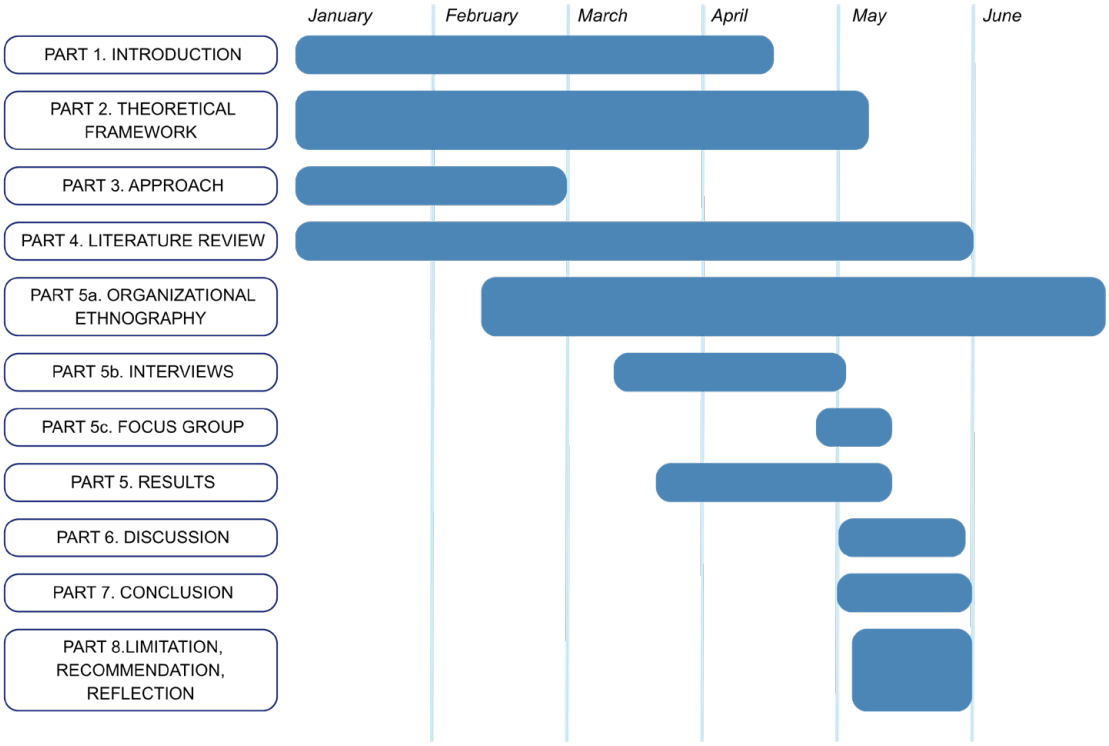

Figure 9: The planning of the research (own work)

CHAPTER 4

LITERATURE REVIEW

CHAPTER 4. LITERATURE REVIEW

The literature review starts by introducing and explaining the international policy context in which the concept of the BRP is embedded, since this is essential to understand the origin of the BRP. Next, the embedment of the BRP in the Netherlands is analysed to ensure compliance with European Union directives. Thirdly the current initiatives by government and market around renovation (passports) are highlighted, to understand the extent to which the BRP is used. Next, the lack of incentives for renovation (passports) is described in literature, as well as incentives and solutions to support renovation (passports). Lastly, the financial possibilities of funding an energy renovation are researched, as they do not exist yet for BRPs. Together, the parts finalise the literature basis for the interviews and focus group. The structure of this chapter is shown below (Figure 10).

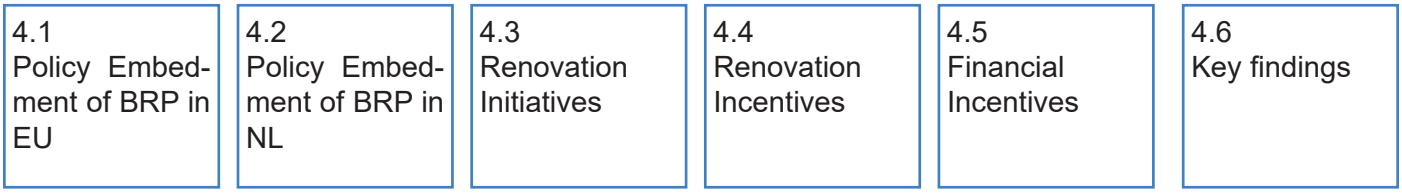

Figure 10: The structure of chapter 4 (own work)

4.1 Policy embedment of renovation passports in the European Union

4.1.1 Relevant directives and policy measures from the European Union
In general, the European Union (EU) leads internationally in climate action, beginning with the Paris Agreement (Oberthür & Dupont, 2011). The EU has developed a comprehensive policy framework to address energy efficiency, sustainability, and decarbonisation in the building sector. Along with the rest of the world, they recognise buildings as a critical leverage point for achieving climate and energy objectives (Chatterjee et al., 2022). Rather than relying on a single directive, EU action in this sector consists of a coordinated set of directives, strategies, and regulatory instruments that together shape national building policies. At the core of this framework is the Energy Performance of Buildings Directive (EPBD), which sets minimum energy performance requirements and promotes tools such as Energy Performance Certificates (EPC) and renovation planning instruments. The first EPBD version was published in 2002 (European Parliament & Council of the European Union, 2002), after which various recasts followed until the latest EPBD IV (European Commission, 2024). Complementing the EPBD is the Energy Efficiency Directive (EED), which sets overarching energy-saving targets and obligations for Member States, including measures related to public buildings and renovation rates (European Parliament & Council of the European Union, 2012).

Beyond the specific building directives, the Renewable Energy Directive (RED) (European Parliament & Council of the European Union, 2018) plays an increasingly important role in the building sector by encouraging the integration of renewable energy sources into residential buildings. The Ecodesign Directive (European Parliament & Council of the European Union, 2009) and related product regulations (country-specific) further support building sustainability by improving the energy efficiency of technical systems installed in homes. The supply chain, therefore, is also made responsible for the transition towards a more circular economy. However, these separate areas of innova-

tion did not translate directly into one coherent plan regarding renovation and digitalisation. Thus, cross-cutting initiatives such as the European Green Deal (European Commission, 2019), the Fit for 55 package (European Commission, 2021), and the Renovation Wave Strategy (RWS) (European Commission, 2020) have strengthened this coherence across the directives by explicitly linking climate ambition, social considerations, and digitalisation.

The Sustainable Finance Disclosure Regulation (SFDR) (European Parliament & Council of the European Union, 2019) is an EU regulation aimed at increasing transparency on sustainability risks and impacts in the financial sector. It requires financial market participants and advisers to disclose how environmental, social, and governance considerations are integrated into investment decisions. By standardising sustainability-related disclosures at both entity and product levels, the SFDR seeks to reduce greenwashing and enable investors to compare financial products more effectively. The regulation supports the redirection of capital toward sustainable activities and strengthens the role of sustainability data in financial decision-making across sectors, including real estate and housing. The SFDR is relevant for renovation passports as it increases demand for reliable, standardised building-level sustainability data.

It is important to note that the ambitions regarding the built environment, and specifically the EPBD IV (European Commission, 2024), cannot stand alone; renewable energy sources are crucial in enabling a net-Zero Energy Building (ZEB). On top of that, the trend of digitalisation is currently strong enough to support the digitalisation of the construction sector as well. Therefore, within this broader policy landscape, instruments such as renovation passports are emerging as integrative tools that connect multiple directives and objectives. They help translate high-level EU policy goals into actionable information at the building level, supporting Member States in aligning housing, energy, and sustainability policies more effectively. At the end of the day, the fourth revision of the EPBD is the most relevant for the implementation of renovation passports.

4.1.2 Digital embedment of renovation passport

A key feature of EPBD IV (European Commission, 2024) is its increased focus on the existing building stock, shifting attention away from isolated renovation measures toward strategic, staged renovation pathways. Member States are required to establish national building renovation plans (NBRP) that outline how the worst-performing buildings will be improved over time. These plans must address not only energy efficiency, but also affordability, social impacts, and administrative feasibility. In doing so, EPBD IV explicitly links energy policy with housing and social policy objectives. EPBD IV (European Commission, 2024) also places strong emphasis on data, transparency, and digitalisation. It promotes the use of digital tools such as EPCs, BRPs, and DBLs to support informed decision-making by homeowners, investors, and public authorities. By improving the availability and consistency of building data, the directive seeks to reduce information asymmetries that currently hinder renovation activity. Finally, the directive strengthens the role of governance and monitoring by requiring clearer targets, reporting obligations, and coordination across policy levels. While Member States retain flexibility in implementation, EPBD IV (European Commission, 2024) sets a more binding and structured framework, signalling a shift from voluntary measures toward a more integrated and policy-driven approach to improving the energy performance and sustainability of Europe’s buildings.

Some uncertainty has arisen around the relationships between the various instruments related to the Energy Performance Building Directives. For example, the Energy Performance Certificates (EPC) are certification systems that assess the energy performance of a building (Alonso et al., 2023). Most variants offer a classification system that works with points to be scored by implementing various values into the building, in order to go beyond monetary valuation methods. Next, the BRP is an instrument that provides tailored renovation pathways for a building (Alonso et al., 2023). These types of documentation can be collected in the DBL. In their research, Hwang et al. (2025) structures various different tools and means into a visual of the digital embedment of the renovation passport. An own interpretation of this figure is shown below (Figure 11), tailored to the interests of this research. It is important to understand that this is an international perspective, and has not yet been adjusted to the current Dutch digital embedment.

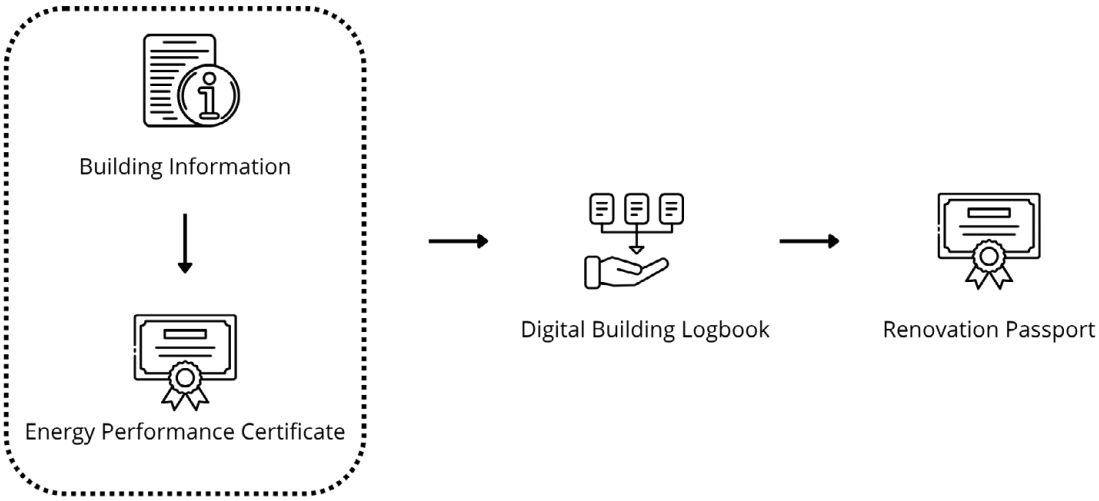

Figure 11: Own visualisation of the digital embedment of renovation passport (own work, based on Hwang et al. (2025), 2026)

For this research, the connection of the BRP with the DBL is most important in comparison to other instruments. Therefore, it is discussed briefly. In literature, the DBL has primarily emerged as a tool to fundamentally change the design and construction process in line with the EU ambitions to be net carbon neutral and improve energy savings (Alonso et al., 2023). It combines the technical perspective with a methodological and procedural perspective. The construction sector is said to be the least digitalised sector in the economy (Alonso et al., 2023), and therefore currently lacks such a tool. Through the EPBD as well as the Renovation Wave of 2020 (European Commission, 2020) the European Commission introduced the possibility of these DBLs to support the energy transition. Requirements for the Member States are to provide for constantly progressing standards for renovated buildings (Hwang et al., 2025).

Over the years, researchers have attempted to come up with a definition of the DBL. The definition that followed after the “Amended version of the proposal for the EPBD recast” (European Commission, 2023) is as follows: “a common repository for all relevant building data, including data related to energy performance such as energy performance certificates, renovation passports and smart readiness indicators, as well as on the Whole Life-Cycle Global Warming Potential (WLC-GWP) and indoor environmental quality, which facilitates informed decision making and information sharing within the construction sector, among building owners and occupants, financial institutions and public authorities”.

4.2 Policy embedment of renovation passports in the Netherlands

In line with the history of the EPBD and the resulting in energy labels and renovation passports, the embedment of these directives in the Netherlands provides for the context and base to implement the renovation passport. Understanding the Dutch regulatory context and programs for energy renovations will help position the BRP accordingly.

4.2.1 Energy label & Maatwerkadvies

In the Netherlands, the energy label of a building is calculated using a standardised assessment method based on the national implementation of the EPBD IV (Rijksoverheid, 2026a). Certified energy advisors inspect the building and collect data on characteristics such as insulation levels, glazing and ventilation. This information is entered into approved calculation software following the Dutch NTA 8800 methodology (NEN, 2026), which determines the building's energy performance and assigns an energy label ranging from A++++ to G (Milieu Centraal, 2026). The resulting label provides a simplified indication of the building's energy efficiency and is registered in EP-online, the national energy performance database managed on behalf of the Dutch government (Rijksoverheid, 2026b). In addition to the energy label, homeowners can obtain a *maatwerkadvies* (tailored renovation advice) (RVO, 2026b). This goes beyond the standard label by analysing the specific condition and use of the building and proposing concrete renovation measures, such as insulation upgrades, heat pumps, or solar panels. The advice often includes estimated costs, expected energy savings, and recommended renovation sequences. A *maatwerkadvies* is intended to support informed decision-making and help homeowners plan phased and cost-effective energy renovations. The Dutch BRP builds upon the *maatwerkadvies* (RVO, 2026c). While the energy label provides a standardised indication of a building's energy performance and the *maatwerkadvies* offers tailored renovation recommendations, the BRP aims to combine and structure this information within a long-term renovation roadmap. It is seen as a *maatwerkadvies*, where following the advice certainly leads to a cost-optimized ZEB-building in 2050. Notably, all of these instruments are for all types of buildings, However, different functions will have a different set of parameters and standards in the NTA-8800.

The digital embedment of these concepts are all in the platform EP-online. Managed on behalf of the Dutch government, it stores and verifies information related to EPCs, energy labels, and certified energy assessments for residential and non-residential buildings (Rijksoverheid, 2026b). The platform is used by certified energy advisors, municipalities, and national authorities to monitor compliance with energy performance regulations derived from the EPBD. By centralising building energy data, EP-Online supports policy implementation and long-term monitoring of sustainability targets within the Dutch built environment. In Figure 12 on the next page, it can be seen how these tools are structured, and how they relate to other digital tools in the market. It is clear that there is a significant separation between the types of EPCs and DBLs the government supports and those it does not.

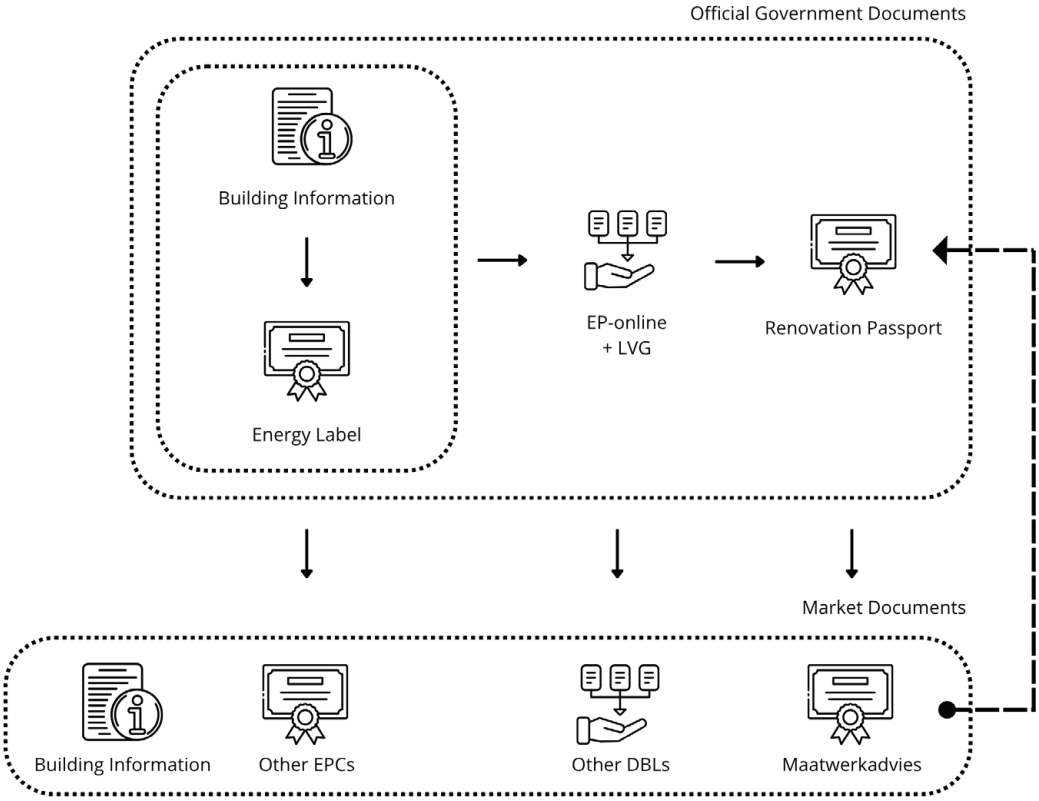

Figure 12: Own visualisation of the Dutch digital embedment of the BRP (own work, 2026)

4.2.2 National programs in relation to renovation

The Netherlands has developed several national programmes and policy instruments to support the implementation of the EPBD and broader European climate objectives related to the built environment. These programmes aim to accelerate energy renovation, reduce greenhouse gas emissions, and improve the energy performance of the existing building stock. One of the central national strategies is the *Nationaal Isolatieprogramma* (NIP) (National Insulation Programme), which focuses on improving insulation in poorly performing homes (Ministry of Interior and Kingdom Relations, 2026). The programme particularly targets vulnerable households that face high energy costs and energy poverty. Through four main tracks of subsidies and municipal support schemes, homeowners are encouraged to invest in measures such as roof, wall, and floor insulation. This contributes directly to EPBD objectives aimed at reducing energy demand and improving building performance, and targets the first steps of the BRP.

Another important framework is the *Nationale Programma Lokale Warmtetransitie* (NPLW), which supports municipalities in transitioning neighbourhoods away from natural gas to mostly heat nets (NPLW, 2026a). The previous initiative was the *Programma Aardgasvrije Wijken* (PAW), which has resulted in various pilot projects that now lead to leading examples (NPLW, 2026b). Municipalities receive funding and guidance to develop local heat transition plans, experiment with sustainable heating systems, and coordinate stakeholders involved in renovation projects. The programme reflects the Dutch emphasis on area-based and phased renovation approaches aligned with long-term decarbonisation goals. Though this programme might not be focused on building level, the last step of the BRP is to move towards renewable energy sources. Following this framework, the (Wgiw) (NPLW, 2026c) provides for the legal instruments for the municipalities to carry out these transitions. Most importantly, all Member States are currently developing the National Building Renovation Plan, the NBRP. The Dutch government has recently published the draft version (Ministry of Interior and

Kingdom Relations and Ministry of Housing and Spatial Planning, 2026), and will deliver the definitive version at the end of 2026. The NBRP outlines a detailed execution strategy to accelerate the renovation of private owner-occupied housing in line with the EPBD IV. The plan focuses on scaling insulation measures, hybrid and electric heat pumps, low-temperature heating systems, and energy-efficient ventilation through a combination of subsidies, financing instruments, and local implementation programmes. Municipalities are given a coordinating role in identifying priority neighbourhoods and supporting homeowners through energy counters and renovation guidance. The NBRP also emphasises digitalisation through the integration of energy labels, tailored renovation advice, and future renovation passports into centralised data systems. Special attention is given to vulnerable households, workforce shortages, and simplifying renovation processes. The plan promotes phased renovation pathways and stronger collaboration between governments, market parties, installers, and financial institutions to ensure long-term implementation and monitoring of renovation progress.

However, all of these programs are mostly internal to government layers. In addition to national renovation programmes, the Dutch government collaborates with market parties, knowledge institutions, and sector organisations in various research and pilot initiatives related to digitalisation and energy renovation. These collaborations often focus on the development of data interoperability, and scalable renovation approaches. One example from a university is the *Renovatieverkenner* (Renovation explorer) (University of Technology Eindhoven, 2026), which is scheduled for publication in the summer of 2026. Pilot projects such as these investigate how building data can be standardised, shared, and integrated into renovation processes and financing structures. Particular attention is given to user acceptance, governance structures, and viable business models for maintaining digital renovation tools. It is clear that various tools and instruments are currently in development, but little has been published and thus delivered any results yet.

4.3 Initiatives for renovation in the Netherlands

4.3.1 Initiatives from government layers

The Netherlands has developed a growing ecosystem of digital platforms and one-stop-shop initiatives that support homeowners in making renovation and sustainability decisions. These initiatives aim to reduce informational barriers, simplify access to subsidies and technical advice, and guide households through the increasingly complex renovation process. By centralising information and services, they support national and European ambitions related to energy efficiency and building renovation.

One of the most prominent platforms is Milieu Centraal, an independent information organisation funded by the Dutch government and managed by RVO. The platform provides practical and accessible guidance on sustainable living, energy-saving measures, insulation, heating systems, and renovation strategies. Homeowners can use online tools to estimate energy savings, compare technologies, and identify suitable renovation measures. Milieu Centraal plays an important role in translating technical and policy information into understandable advice for citizens (Milieu Centraal, n.d.,b).

Another important initiative is *Verbeter Je Huis* (Milieu Centraal, n.d.,c), a website that falls under Milieu Centraal, and that is managed by the RVO as well. The website functions as a renovation guide focused specifically on improving homes through energy-efficient measures. It provides tailored renovation advice, information on subsidies and financing opportunities, and explanations of technologies such as heat pumps and insulation systems. The platform is designed to help homeowners make informed renovation decisions and lower the threshold for sustainable investments.

The concept of the one-stop-shop named the *Energieloket* is an initiative operating at the municipal level. An example is the *Energieloket* of the Municipality of Rotterdam (Energieloket Rotterdam: Gemeente Rotterdam (n.d.). This can be seen as the prominent one-stop-shop. One-stop shops have been increasingly interesting to simplify the ‘customer journey’ for energy renovations, as one actor can coordinate the interventions with the entire construction chain (Pardalis, 2021). Dutch municipalities collaborate through a public-private construction with regional or local energy counters to provide residents with accessible and location-specific renovation support. Through *Energieloket* platforms, homeowners can receive advice on energy-saving measures, available subsidies, local policies, and certified installers. These localised platforms are particularly important because renovation policies and support mechanisms often differ between municipalities.

Current research by the Dutch government explores the overarching structure of the *Energiehuis* (Energy House) (Ministry of Housing and Spatial Planning, 2026b). It structures all of the *Energieloketten* and also refers to *Verbeter Je Huis*. However, there is already a website that encompasses all *Energieloketten*, called energieloketten.nl (Energieloketten, n.d.). This is created by the *Duurzaam Bouwloket*, which does not seem to be government related. There is no clear vision on how all of these websites currently relate to each other or how they will interact with each other in the future.

4.3.2 Initiatives from market parties

In addition to government-supported platforms and municipal energy desks such as *Energieloketten*, a wide range of market-driven initiatives has emerged in the Netherlands to support energy renovation and sustainability in the built environment. These initiatives aim to simplify renovation processes, coordinate stakeholders, and create scalable approaches for improving building performance. However, many of these initiatives primarily focus on utility buildings, large real estate portfolios, or housing corporations rather than individual homeowners. This reflects the economic and organisational realities of the Dutch renovation market, where larger building owners offer more predictable demand, greater data availability, and clearer financial returns.

One of the best-known Dutch renovation initiatives is *Winst uit je woning* (Winst uit je woning, n.d.). This platform collaborates with municipalities to organise collective purchasing campaigns for insulation, solar panels, glazing, and heating systems. By aggregating demand from homeowners within specific regions, the initiative reduces costs and lowers organisational barriers for households. Winst uit je woning acts as an intermediary between municipalities, residents, and contractors, and intends to help homeowners navigate through subsidies, contractor selection, and technical decisions. Its current success demonstrates the importance of guided renovation support and trusted intermediaries in stimulating homeowner participation. However, the company behind this has officially requested bankruptcy in November 2025 (nu.nl, 2025). Since then, there have been publications on the website, but it seems unclear whether the company still functions as before.

Another major actor is *Vereniging Eigen Huis*, the largest Dutch homeowners' association (Vereniging Eigen Huis, n.d.). *Vereniging Eigen Huis* represents homeowner interests in political discussions while also providing practical services related to renovation, sustainability, mortgages, and maintenance. The organisation offers advice on energy-saving measures, legal guidance, and collective procurement initiatives. Because homeowners often lack technical expertise and experience uncertainty regarding renovation investments, organisations such as *Vereniging Eigen Huis* play an important role in increasing trust and reducing informational asymmetry.

One last initiative to be discussed is the *Verbouwstromen* (Verbouwstromen, n.d.). This is a non-profit organisation based on a collaboration between public and private actors, officially led by the Ministry of Housing and Spatial Planning. However, this initiative does not focus on directly helping homeowners, but rather on municipalities.

4.4 Incentives for renovation (passports) in the Netherlands

When it comes to barriers and limitations of BRPs, it is important to make a distinction between challenges in general renovations, and challenges specifically for BRPs. Ideally, the renovation passports help to overcome the general renovation barriers. Naturally, the challenges of the BRP itself are the main discussion topic in the interviews that are part of the current research.

4.4.1 Motivation and incentives to renovate

Recent research by Ipsos, commissioned by *Centraal Beheer* (2026), concludes that 76% of homeowners in the Netherlands intend to invest in their home this year. About 33% wants to invest in making their house more sustainable. According to Ipsos' findings, knowledge about what to do is the most important barrier for this. On top of that, research of Univé (n.d.) carried out in 2024 showed the division in motivation on why homeowners want to make their homes more sustainable, as seen in Figure 13 below.

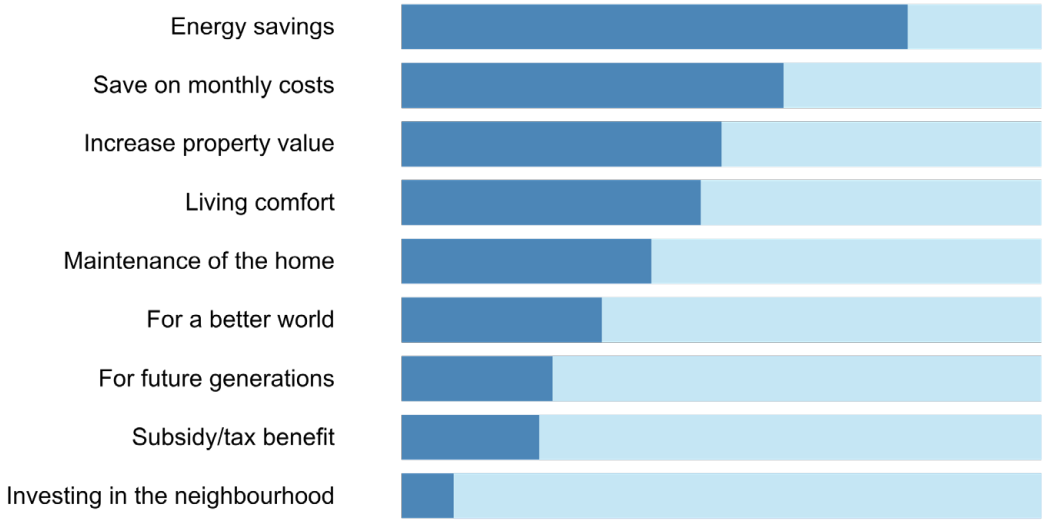

Figure 13 : A translation of visual of Univé (n.d.)

Barriers and limitations of energy renovation

In various literature, e.g. Mannoni & Löschke (2025), multiple other barriers have been found when it comes to energy renovations for homeowners:

- Lack of knowledge and awareness
- Extensive planning
- Unreliable professionals, trustworthiness
- Fear of "lock-in"
- Vulnerable/hard-to-reach groups
- Funding
- Decision-making
- Behavioural challenges (political belief)

The use of BRPs should overcome some of these barriers. For example, the extensive planning is supported by the step-by-step roadmap that the BRP provides. A huge improvement for decision-making is a benefit as well. The aspect of unreliable professionals, hard-to-reach groups and behavioural challenges are not particularly barriers that a BRP solves.

4.4.2 Motivation and incentives to use renovation passports

As the BRPs are still new, internationally as well, there are mostly barriers and limitations found (Barbosa & Almeida, 2025):

- Limited knowledge of broader impact: minimal research into broader socio-economic factors
- Automatization & scalability
- Adherence with energy renovation strategies
- Unclear why this measure specifically overcomes other initiatives' barriers
- No universal accepted standard or framework
- Substantial upfront costs and affordability, related to inclusion
- Complex information management Data collection
- Adaptability to EU context
- Lack of capacity
- Funding for all institutions & systems

Various of these barriers are currently under research or adopted by the Dutch government and its partners. For example, the BRP in the Netherlands has one design that is carried by the Dutch government (RVO, 2026c). The funding for institutions and systems can be expected to come with time, and most of the system is based on an already existing system (*maatwerkadvies*), which saves time and money. Therefore, the information management and data collection is also already established, yet this is indeed quite complex. In this research, the adherence with energy renovation strategies has already been clarified, which is also strongly linked to the adaptability to EU context. Significant barriers for which no solutions have been found, are the scalability, relation to other initiatives, affordability and lack of capacity.

4.4.3 Solutions and recommendations for renovation passports

Lowering the previously mentioned barries and occurring problems with implementation of the BRP is crucial to successfully let the BRP be used. Otherwise, this will only create more problems than it solves. Therefore, there is a list of recommendations by Barbosa & Almeida (2025) for policy makers when it comes to implementing BRPs. However, these recommendations are general and not tailored to the Dutch embedment of BRPs.

- Involve customers - participation
- Guidance and narrative
- Modular approach with mandatory and optional modules
- Coordination with other (digital) tools
- Promotion & marketing for both stakeholders and end users
- Financial tools to support
- Schooling stakeholders
- Offer software/work packages
- Establish KPIs (Key Performance Indicators)
- Proper digital embedment (central repository)

These solutions offered by Barbosa & Almeida (2025) are a step in the right direction to further support the implementation of BRPs, also in the Netherlands. Especially promotion and marketing has been lacking, as well as a thorough and meaningful software development trajectory. That would cover aspects such as the modular approach, work packages, KPI's and a proper digital embedment. There is no clear publication on the extent of which customers have been involved in the creation of the current design of the BRP. This should be further researched, as there is little literature available.

4.5 Financial incentives for renovation (passports) in the Netherlands

The Dutch government and financial sector provide several financial incentives to encourage homeowners to undertake energy-efficient renovations and support national sustainability goals. These incentives aim to reduce the high upfront investment costs that often delay renovation decisions and improve access to financing for sustainable home improvements.

4.5.1 National and local subsidies

One of the most important government incentives is the *Investeringssubsidie Duurzame Energie en Energiebesparing* (ISDE). Through this subsidy scheme, homeowners can receive financial support for insulation measures, heat pumps, solar boilers, and connection to district heating systems. The subsidy lowers investment thresholds and stimulates the adoption of low-carbon technologies. The terms and condition do change yearly, which is a confusing point. (RVO, 2026d).

In addition, municipalities may offer supplementary local subsidies or collective purchasing programmes to support energy-saving renovations. For example, in the municipality of Delft, there is a specific subsidy for insulation. Depending on amount of measures to be taken and property value, an amount can be subsidised. There are many conditions and initiative needs to be taken by the homeowner (Gemeente Delft, n.d.).

4.5.1 Loans

Another major instrument is the *Nationaal Warmtefonds* (National Heat Fund), a national financing fund that provides loans specifically for sustainable renovations. The fund offers accessible financing conditions and, in some cases, interest-free loans for lower-income households. This is particularly important because many homeowners lack sufficient savings to finance large renovation projects independently (Nationaal Warmtefonds, n.d.).

4.5.1 Mortgage options

Dutch banks also increasingly support sustainable renovation through green mortgages and additional borrowing capacity for energy-saving measures. Banks such as Rabobank offer various options in loans or mortgages to provide funding for specific energy renovations, energy advice or a new energy label. On their website, the Rabobank (n.d.) provides an overview for possible ways to finance a renovation, which partly have been mentioned previously:

- Savings
- Subsidies
- Increased mortgage
- Extra financial support based on energy label
- Increased mortgage based in property value
- Loan specific for renovations by bank
- Loan for renovations by *Warmtefonds*
- Deposit
- Personal Loan

4.6 Key findings literature review

Within the EU policy landscape, renovation passports are emerging as integrative tools that connect multiple directives and objectives. At the core of this framework is the EPBD IV. It promotes the use of digital tools such as EPCs, BRPs, and DBLs to support informed decision-making by homeowners, investors, and public authorities Complementing the EPBD is the EED, which establishes overarching energy-saving targets and obligations for Member States, including measures related to public buildings and renovation rates. The SFDR is relevant for BRPs as it increases demand for reliable, standardised building-level sustainability data.

The Dutch BRP builds upon the *maatwerkadvies*. While the energy label provides a standardised indication of a building's energy performance and the maatwerkadvies offers tailored renovation recommendations, the BRP aims to combine and structure this information within a long-term renovation roadmap. It is seen as a *maatwerkadvies*, where following the advice certainly leads to a ZEB-building in 2050. The digital embedment of these concepts is all in the platform EP-online. The platform is used by certified energy advisors, municipalities, and national authorities to monitor compliance with energy performance regulations derived from the EPBD IV.

The Dutch Government has a few programmes that the BRP relates to:

- NIP: The programme particularly targets vulnerable households that face high energy costs and energy poverty. Through four main tracks of subsidies and municipal support schemes, homeowners are encouraged to invest in measures such as insulation for roofs, walls, and floors.
- NPLW: Municipalities receive funding and guidance to develop local heat transition plans, experiment with sustainable heating systems, and coordinate stakeholders involved in reno vation projects. The programme reflects the Dutch emphasis on area-based and phased renovation approaches aligned with long-term decarbonisation goals. Though this programme might not be focused on building level, the last step of the BRP is to move towards renewable energy sources.
- NBRP: The plan focuses on scaling insulation measures, hybrid and electric heat pumps, low-temperature heating systems, and energy-efficient ventilation through a combination of subsidies, financing instruments, and local implementation programmes. Municipalities are given a coordinating role in identifying priority neighbourhoods and supporting homeowners through energy counters and renovation guidance. The NBRP also emphasises digitalisation ny integrating energy labels, tailored renovation advice, and future renovation passports into centralised data systems. Special attention is given to vulnerable households, workforce shortages, and the simplification of renovation processes. The plan promotes phased renovation pathways and stronger collaboration between governments, market parties, installers, and financial institutions to ensure long-term implementation and monitoring of renovation progress.

In addition to national renovation programmes, the Dutch government collaborates with market parties, knowledge institutions, and sector organisations in various research and pilot initiatives related to digitalisation and energy renovation. Various tools and instruments are currently in development, but little has been published and thus delivered any results yet.

The Netherlands has developed several digital platforms and one-stop-shop initiatives to support homeowners with sustainable renovation decisions. These platforms aim to reduce informational barriers, simplify access to subsidies, and guide households through complex renovation processes. Milieu Centraal provides practical advice on energy-saving measures, insulation, and sustainable living, translating technical information into accessible guidance. *Verbeter Je Huis*, managed by the RVO, offers tailored renovation advice and information on subsidies and technologies. Municipal one-stop-shops such as *Energieloket* provide localised support, helping homeowners navigate regional policies, financial incentives, and certified installers. Current research, especially in regards to the *Energiehuis*, aims to structure these different websites and initiatives.

Renovation passports aim to reduce several barriers related to energy renovation by improving planning and decision-making through structured, step-by-step renovation roadmaps. Existing systems such as the Dutch *maatwerkadvies* already provide a foundation for building data collection and information management, which supports BRP development and reduces implementation costs. Current research by the Dutch government and its partners focuses on addressing practical implementation challenges and aligning BRPs with broader EU renovation strategies. However, major barriers remain unresolved, including scalability, affordability, limited sector capacity, and the relationship between BRPs and existing initiatives. In addition, aspects such as promotion, stakeholder engagement, and software development remain underdeveloped. Literature suggests that stronger marketing, modular software design, clear KPI structures, and better digital integration could improve implementation. Furthermore, it remains unclear to what extent end users and homeowners have been involved in the current development process of the Dutch BRP.

The Dutch government and financial sector offer several incentives to stimulate energy-efficient home renovations. The ISDE subsidy supports measures such as insulation, heat pumps, and solar boilers, while municipalities may provide additional local subsidies. The *Nationaal Warmtefonds* offers accessible loans for sustainable renovations, including low-interest options for lower-income households. Dutch banks, such as Rabobank, also offer additional financing options for energy-saving home improvements.

CHAPTER 5

RESULTS

CHAPTER 5. RESULTS

In this chapter, the results of the interviews and focus groups are elaborated based on various appendices II-VII. Firstly, the values and ambitions of actors are analysed, followed by their roles and responsibilities. These form the basis of the answer to the second research question. Next, the barriers in the 'customer journey' of a homeowner are identified. Most of these barriers have a way of being resolved, but some remain unsolved. Therefore, policy instruments are analysed and judged by their suitability to solve the identified barriers. This will answer the third research question. During the focus group, these unresolved matters have been discussed once more, to come to a final set of policy recommendations. The way these policy recommendations help the actors in the energy renovation process is the answer to the fourth question. The final set of policy recommendations is explained lastly. The structure of the chapter is shown below (Figure 14).

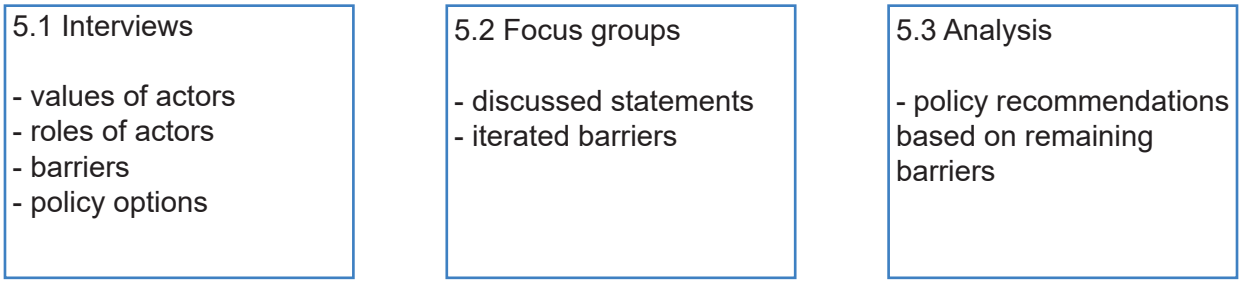

Figure 14: The structure of chapter 5 (own work)

5.1 Interviews

5.1.1 Overview of actor values

One of the sub-questions is to have an overview of all mentioned values by the stakeholders. In Appendix III, these can be seen completely as well as the ambitions mentioned by the interviewees. It is necessary to understand these values and ensure that these are embedded in future policies. Some values of a certain stakeholder may be mentioned by another interviewee than the stakeholder's representative.

Various values are mentioned by multiple stakeholders, and are therefore highlighted. Some values are related to one another, meaning that complementary values can be achieved through similar measures.

- Consistency (continuity, clarity): this is the most important value for all participants. As seen in the literature, inconsistencies between past and present policies are a major problem and negatively affect trust and simplicity.
- Privacy (cybersecurity, safety, protection): though there are a lot of ambitions regarding traceability, the privacy and safety of consumers need to be guaranteed before creating systems that provide this clarity.
- Sustainability (future-proof): sustainability may be regarded as a political subject in some cases, however, there are international and national regulations that require people to intervene.
- Simplicity (scalability, inclusivity): in line with the consistency value, almost all parties want a simplified system. There must be a simple process of energy renovations with fewer barriers than the current system.
- Traceability (insight, clarity, accessibility, data quality): though actors all come from different reasoning, traceability of information about the buildings is desired by all. Ideally, this is solved digitally, and data is easily shareable between different parties.
- Affordability (feasibility): Most importantly for the homeowners, the process of energy renovation needs to be rewarding. Upfront costs are often a problem but can be addressed with subsidies or other means.
- Autonomy (freedom of choice): both the government and homeowners believe that freedom of choice is a big value for civilians. In this case, it means that a homeowner has the freedom to select their own parties and measures to achieve their goals.
- Trust (quality of works, traceability): a big issue currently is trust by civilians in the government, but also in the quality of works by a contractor or service provider. Lack of proof and guarantees or maintenance options damages the trust.

Some values do not create a synergy, but rather clash with each other:

- Accessibility of data versus privacy: it is desirable by various government and also market parties to gain access to data of buildings. This is ideal within projects where the homeowner can give explicit consent, but there are various risks in sharing information and having a central digital environment where this data is stored.
- Flexibility versus continuity: as all parties want a consistent and continuous vision and policy, yet a lot of aspects are still uncertain. This then requires flexibility, which will lower the consistency aspect.
- Affordability versus all: all values are at the end in contrast to affordability, as embedding these values requires investment upfront. The most important party that needs affordability is the homeowner, yet there needs to be a business model in order for these values to be captured.
- Autonomy versus support: homeowners wish for autonomy and freedom of choice, but are also lacking in technical knowledge and therefore need experts for advice. More advice means more support, which might be against the autonomy.

5.1.2 Overview actor roles & responsibilities

Similar to the values and ambitions, the roles and responsibilities of the stakeholders are also discussed in the interviews. The overview can be found in Appendix IV. A distinction has been made between which roles are said by which type of stakeholder, and whether these role are in the present or in the future. Additionally, one does not exclude the other: it is quite assumable that the current roles will stay similar in the future. There may be roles or responsibilities by the stakeholders that are not mentioned in this table.

Role of government layers

The role of the various layers and organisations of the government is addressed in the most roles and responsibilities. In the bigger picture, the role is to stimulate homeowners to renovate their homes. On top of that, they ensure that the international and national goals are achieved. Through instruments such as subsidies, the market and consumers are stimulated to take action. All government layers need to capture the values of each stakeholder. Sometimes, the government is also the client. Market parties ask the government layers to jointly improve the system around renovation.

Specifying into technical responsibilities, the Ministry of Housing and Spatial Planning needs to ensure that the methodology around energy labels and BRPs is qualitatively correct. On this level, the government needs to provide basic information for the *Landelijke Voorziening Gebouwgegevens* (LVG) (Noordegraaf & Haaften, 2024). In collaboration with the RVO, they monitor the data and keep improving the systems.

Provinces are indispensable between layers of government, even though in this research they are mentioned relatively little. Their presence in discussions and policies is required to align national and local goals. Specifically, the provinces need to direct municipalities on protocols.

Municipalities play a significant role in helping people with their energy renovations. For example, in granting permits for bigger renovations as well as additional subsidies. These must align with the national subsidy structure. Lastly, the municipality is the government layer that actually reaches its citizens to achieve national goals. The municipality must have a plan to meet these goals, in conversation with local actors and homeowners.

Role of Market

Not only does the government need to improve the construction chain, but the market parties are also just as responsible for making this happen. Ideally, the market uses the LVG established by the government to create an additional digital environment for consumers (homeowners). This would lead to more affordable and scalable solutions. Market parties need to ensure they can deliver quality services and perform their roles appropriately. The primary role of market participants is to meet homeowners' demand by supplying.

Role of Homeowners (customers)

The homeowners seem to have one major role/responsibility: take action and therefore create demand. The incentives to do this can vary and are a big part of this research as well. As the government needs to help create these incentives, and the market (and government) decrease the number of barriers, the demand for energy renovations and therefore BRPs by homeowners should increase. Lastly, some homeowners are in a risk group, meaning they are included in the NIP programmes of the local municipalities. These households receive additional support; therefore, the demand passes through the municipality to the market.

5.1.3 Barriers and solutions for the implementation of the Building Renovation Passport

The results of barriers and solutions for the implementation of the BRP are structured according to the 'customer journey' sketched previously in Chapter 2. As described, there is the tip of the iceberg that is just visible for the consumers, but a huge system under the surface that is necessary to allow for the renovation passport to exist. However, there is a difference in barriers for homeowners to renovate and barriers for homeowners to use the renovation passport. As an official renovation passport does not yet exist in the Netherlands, these motivations are closely related to each other. Therefore, both are needed to understand the current and foreseeable problems in implementing the renovation passport. This difference is clearly marked in the results. Based on the barrier analysis in Appendix V, the most relevant and recurring problems related to energy renovation and renovation passports are explained below. On top of that, some of these barriers have already been resolved in the interviews or in external literature. These are mentioned in Appendix V as well as textually below.

The organisation of renovation across actors

For all energy renovations to be done, the entire structure behind th customer journey must be in place. This structure defines roles and collaboration as well as jurisdictional, financial, technical and informational aspects. One of the interviewees spoke of a 'highway' that anyone can join to get to the same destination. This highway is a metaphor for the system around energy renovation that needs to be established before mass energy renovations can occur. However, various barriers in the current structure have been identified during this research. These are described below. By addressing these problems, an improved highway can be achieved. This entire section applies to general energy renovations.

Diffuse structure of information and information overload

A shared perspective among all parties involved is the overload of information. The root of the problem lies in the diffuse, unstructured spread of contrasting information across various websites, or rather, the lack of structure. Many parties claim they know best and are the responsible party to provide information, yet the quality of the information and the help after giving this advice fall short. The concept of a one-stop-shop should solve this problem.

Unclear vision about energy label, renovation passport and other initiatives

There is a lack of a shared vision for the future of the relationship between the energy label, the renovation passport and other instruments. Especially the structure linking digital systems and collaborations in this structure is new and therefore currently under-researched. However, it is assumed that the Ministry of Interior and Kingdom Relations is currently creating this vision.

Inconsistent and unclear policies by the national government

The inconsistent policies and regulations by the Dutch government are a frequently mentioned problem, especially when it comes to subsidies. Requirements for these subsidies (in this case, ISDE) change, as do various very specific regulations, such as the '*salderingsregeling*'. This creates an unstable environment, making it too uncertain for homeowners to secure sufficient funds. This remains unresolved.

Inconsistent and unclear advice by different parties

This barrier also relates to the first one, as each party gives different advice for each homeowner. Indeed, there are overarching topics such as insulation. However, when it comes to specific advice such as the costs of a measure to be taken, there are big differences from reality. On top of that, advice changes, for example, the advice to insulate cavities in the wall. A solution might be to either significantly improve the knowledge of the energy advisors or improve the collaboration between market parties.

Lack of regulations and legal guidelines around data management
The benefits of digitalisation are not new, yet the legal guidelines and regulations regarding data protection and management stay behind in the built environment. This problem occurs not only between market parties but also between government layers, even within departments. One proposed solution is that the Dutch government should create a guideline for each target group, in which either these rules are set, or are to be implemented in one's own rulebook. Research for this is currently going on.

Interdependency between heat nets and insulation advice
This barrier is relevant across multiple topics, but there might be a wicked problem with heat nets and insulation advice. For the heat nets, there needs to be a sufficient insulation level across the designated area. In general, a renovation passport suggests that maximum insulation is needed. This, however, makes the business case of the heat net less viable for the municipality. Time-wise, it is also necessary to know whether there will be a heat net in the area for the advice of the renovation passport to be correct. This problem is to be discussed in the focus group.

Balance of focus between individual homeowners and bigger scale solutions
Multiple interviews highlight that a door-by-door approach will not be sufficient to visit all houses before 2050. However, the whole purpose of the renovation passport is to provide advice for one house specifically. This problem is to be discussed in the focus group.

Incentives for homeowners to use renovation passports
Another frequently discussed problem, also in the literature, is understanding why homeowners are not taking action in renovating their homes, even though the motivation to renovate is quite high. In this research, there is a distinction between barriers to renovating at all or using the BRP. The focus in this paragraph is on the reasons why not to use the BRP, even though the motives may seem similar to those for energy renovations.

High upfront costs
Other than current energy renovations, the upfront costs are expected to be a big barrier for homeowners to request a renovation passport. The *maatwerkadvies*, which is the base of the BRP, costs a few hundred euros, depending on the size of the building. As only having advice does not directly result in monetary benefits, there is little financial stimulus to get a BRP.

Other priorities than energy renovations
Aside from the high upfront costs, homeowners may also be hesitant in choosing to use the BRP because their priorities lie elsewhere. Since an energy renovation is more of an investment than a quick solution, homeowners delay it until the 'time is right', which rarely comes. This can, in theory, be solved by obligating the BRP, but the effectiveness is questionable.

Lack of sense of urgency
Balancing all the priorities in the short term, an energy renovation of the house is rarely at the top. For most homeowners, energy renovation is not that urgent. However, during the research, various national problems have arisen that may increase the awareness of this sense of urgency. This can, in theory, also be solved by obligating the BRP, but the effectiveness is questionable.

Refusal to pay for only advice if not binding
Based on the interviews, the number of requests for *maatwerkadviezen* is incredibly low. One of the reasons is said to be that a very small number of homeowners actually want advice on how to improve their residence. Trials by several banks have shown that requiring a *maatwerkadvies* for a loan significantly increases demand for *maatwerkadviezen*, which might be similar for BRPs.

Lack of trust in new instruments
Some participants mentioned that new instruments are slow to be adopted, which may relate to Rogers' Theory (2003). It might not be a smart move to be an early adopter. As the *maatwerkadviezen* and thus renovation passports seem to be adopted more quickly in utility, this might slowly spread to private homeowners as well. This seems to only resolve itself over time and by lowering other barriers, according to the adoption theory.

Lack of technical knowledge
This is similar to the readability of online advice, but for a *maatwerkadvies* request, the technical complexity is even higher. On the first page of the renovation passport, there are various indicators that an average homeowner does not comprehend. These indicators are required under the EPBD IV, but may reduce comprehensibility for the target group. The lack of technical knowledge among homeowners also makes them feel less in control, as they cannot verify the quality and trustworthiness of the renovation passport, as well as the execution by contractors. This remains an unresolved discussion.

Assumption technology will quickly develop
Similar to the lack of trust in new instruments, there is also the assumption that, in a relatively short time, there will be 'better' innovations to renovate the house. Whether this is true or not does not fall under the scope of this research.

Lack of a clear business model
The lack of a clear business model is eventually the problem that summarises all the barriers to incentives. There have been various attempts to create this business model, but in the past few years none have really taken off. This is explained mostly by a combination of a lack of sense of urgency, high upfront costs, and information overload.

The first place to go for homeowners to renovate
In addition to the diffuse structure of information and information overload, there are still problems for homeowners to reach the first contact person or company. This topic is one where the homeowners immediately experience problems with and focuses on the general energy renovation. Some of the barriers are the following.

Lack of inclusivity and high diversity in buildings
Most online platforms and first-contact persons are good at giving general advice, but this is insufficient for highly unique or specific situations. The renovation passport is a solution to this problem: an expert can visit the site and provide advice tailored to a specific residence.

Readability of online advice
Renovation can get detailed and technical quite rapidly. Therefore, for many people, the readability of online advice is insufficient. This often makes the effort threshold too high, resulting in no action by the homeowner. This remains an unresolved discussion.

Quality of online advice
Similar to the lack of inclusivity, the quality of advice given online is not always guaranteed. Every house has its own context, which should be considered carefully before mindlessly following online advice. Possibly, one can do negative interventions if that occurs. The renovation passport is actually a solution for this problem: an expert can visit the site and give advice tailored to a specific

residence.

Lack of actual help

The lack of help for homeowners has been brought to attention by the representative of the homeowner association. Even though there are so many first-contact people or websites to find information, it is hard to get in touch with a party that can help one take the first step in an energy renovation. Given examples were the lack of communication with the local *Energieloket* and being unable to find a suitable contractor, even though the website provides a list. The functionality of the *Energieloket* should be further researched and improved, but this is outside the scope of this research.

Collecting and sharing information

A struggle that is known among various stakeholders is the collection and sharing of information. A lot of information and data is required to create a renovation passport. This applies to the general energy renovation system.

Hesitance to share personal information

A very common barrier that not only applies to renovations but still needs to be solved is the hesitance to share personal information by customers. For energy labels, this is more secure because the audit and calculations are based solely on the building. However, with a *maatwerkadvies* or renovation passport, a user profile with more personal data is used and thus, people are hesitant to share this information. Safeguarding these values should be in accordance with the relevant protocols and sufficient to convince customers.

Various parties that have legal rights to data

In the current fragmented market system, there are some parties that may legally have ownership of data that they should not have in order to, for example, create a personal digital environment for every residence. As these parties have official contracts, there is a huge jurisdictional barrier to undo these ownerships. This remains unresolved.

Wrong information in official systems

During the creation of the LVG, it was noted that even government information can sometimes be wrong. This can be quite confusing and stressful for owners. If there is no verification of the correctness of the information, the specific advice in the renovation passport might be wrong if incorrect information is used in the calculations. The solution mentioned in one of the interviews is not to chase these mistakes, but rather to make it simple for customers to flag them.

Proof of building level information

Even when an energy advisor completes an audit, there is still a significant risk that some building-level information is incorrect or not fully proven. This may lead to lower quality advice, or bigger surprises during the execution of the prescribed interventions. The entire process of digitalisation aims to improve this, and the BRP is part of it.

Privacy risks

Related to all data management aspects, there are always risks when it comes to the privacy of the homeowner’s information. These are protected as much as possible by the government, for example, by the procedure of the DPIA (Data Protection Impact Assessment).

The calculation and methodology behind a renovation passport
The BRP to be launched in 2030 is based on the current calculation methodology used for the maatwerkadvies. However, in current practice, there are flaws and imperfections that need improvement to provide qualitative advice that is closer to the actual situation. This applies to general energy renovation, though it is specific to energy label and maatwerkadvies.

Discrepancy between calculated and actual energy use
In the current calculations of energy label, there is a discrepancy between the calculated and actual energy use. This is due to various incorrectly assumed indicators and incorrect flat-rate values. This is to be solved during the modernisation of the NTA 8800 in 2030, but may raise questions for advice before that modernisation.

Temporary definition of a Zero Energy Building
One aspect that may confuse homeowners is that the calculation method and the standards used in the renovation passport are based on temporary definitions. These standards will change once the new official definitions of ZEB have been published, which would lead to different advice. Even though the new definition will be less strict in achieving those standards, interviewees find it too confusing.

Modernisation of calculations in 2030
Various representatives mentioned how the modernisation of the energy label and *maatwerkadvies* in 2030 will significantly impact the market. There is very little knowledge or research on the exact market shock, yet expectations are that it will have a significant and chaotic effect on the housing market. This remains unresolved.

Debate on advising for building or owner
A big difference between the energy label and the maatwerkadvies is whether the advice is oriented towards the building or the homeowner. Regarding the renovation passport, this debate remains unclear. Especially when a house is sold with a renovation passport and a completely different type of homeowner moves in, that passport might lose its value. Though this need not be a problem, there is no clear vision for it yet.

Short time of design BRP
The current organisation and structure around the renovation passport were created in a very short time due to EPBD IV deadlines. Though, presumably, the important aspects and consequences of the renovation passports have been thoroughly thought through, there might be some flaws and imperfections that are yet to be repaired.

The quality of the advice
Even when the official calculation method has improved to deliver a well-calculated approach to the real situation, there are still many factors that influence the advice. The biggest barriers to be solved are listed below. This applies to general energy renovations unless specified otherwise.

Lack of educated energy advisors
Currently, there are a few hundred qualified '*maatwerkadviseurs*'. If, in a short time span, all houses were to receive a renovation passport or *maatwerkadvies*, the capacity of advisors would be far too low. Beyond that, these qualified advisors still need additional training to understand amendments to the *maatwerkadvies* and the introduction to the renovation passport.

Lack of collaboration between market parties
As it is quite possible that the entire energy renovation of a house requires multiple market parties to execute interventions, it is likely that these market parties sometimes have contradicting advice on how to carry out the works.

Difference in quality between market parties
Contradictions can arise not only among various market parties but also among different contractors. These can be technical, but may also occur in aspects such as pricing or planning. Finding the right contractor is a big barrier for homeowners. Attempts to solve this are in certification and visitation.

Interdependency in order interventions
The renovation passport describes the step-by-step process quite well, which gives a good overview of the order of interventions. However, the advice is not binding, so it is possible to perform the interventions in the wrong order, even when there is significant interdependency.

Interventions that are not feasible
Although the energy advisors and *maatwerkadviseurs* are qualified, there is still a possibility that an intervention prescribed in the renovation passport may not be feasible. This is usually only discovered during the execution by a service provider or contractor, which is undesirable and decreases the trustworthiness of the advice. This points to a lack of collaboration.

Getting funds for renovation (passport)
One aspect of the high upfront costs is indeed monetary. However, as seen in the literature review, there are quite a few options for obtaining financial support to address this problem, as it has been noted for a long time. In an attempt to identify the funding problems around the BRP, the following barriers have been identified.

Provision for access to funding
Sometimes, there are requirements to get access to funding that are hard to keep track of or hard to comply with. Usually, a homeowner will not take action unless it is clear whether funding is available. This could be carefully considered by the local authority or a one-stop shop like the *Energieloket*.

Relationship between funds and execution
During the interviews, multiple parties noted that the relationship between executives and funds is unclear or could be improved. It has been verified that it should be possible, for example, to get a different or amended mortgage when a homeowner carries out the interventions and has proof that, for example, the house went from label C to label A by these interventions.

Financial planning
The interventions proposed by the renovation passport can be quite costly, and therefore, proper financial planning is needed. Homeowners see this as a barrier, but with the renovation passport, banks might be able to jointly develop a plan with the homeowner to spread the investment over a set period, taking into account the homeowner’s personal situation.

The execution of the proposed measures
Once the detailed advice has been provided in the form of a BRP and the funds have been secured, the proposed measures need to be carried out. Even in the current energy renovation process, there are various problems. Therefore, there is no distinction between barriers for energy renovation in general and BRP specifically.

General fragmentation of the construction sector
As mentioned previously, there is little collaboration between market parties when it comes to these smaller projects. Rarely is an integrated process carried out; rather, separate interventions are used. Although chain collaboration is increasingly popular in newly built residences and other market sectors, it remains behind in private housing. This is such a big and structural problem, that this is out of scope of this research.

Contractors with different interests than homeowners
A shared problem between representatives is that, at the end of the day, the execution of the proposed intervention is crucial for a successful energy renovation. However, there is a lack of trust in contractors in whether they always strive for the best outcome for the client rather than themselves. Usually, clients are not that knowledgeable about the works, and therefore cannot verify the integrity of contractors. This problem should, in theory, be solved through the current system of certification and visitation, but it might not be strong enough.

Lack of qualitative execution
Multiple interviewees highlight how this lack of trust in contractors (or service providers) is based on negative experiences with contractors. On top of that, the consequences of the failed execution is often not immediately seen, but can take years to have an effect on the quality of the house. This is in line with the previous problem: in theory, this should be solved through the current system of certification and visitation, but might not be strong enough.

Lack of correct documentation
A general problem noticed by parties is that contractors or service providers do not correctly document their work. This would help solve previous problems as well. However, representatives do not expect these people to change their behaviour accordingly, and therefore, this remains unresolved.

Monitoring process and certification
As with the problems related to the execution of the works, the certification and monitoring of the measures to be taken are lacking. The only current monitoring aspect that is easy to analyse is the energy bill and the total energy use. These can also be seen in the design of the BRP. Once again, there is no distinction between barriers for energy renovation in general and BRP specifically.

Lack of accessible certification methods
Even though an energy audit is a great way to certify a building's energy performance, some technologies are still lacking. Especially when it comes to gap sealing, bats or tests where deconstructive research is still necessary. This makes it much more difficult to certify the energy performance, and creates a high barrier to doing so. As this is a technical problem, it is out of the scope of this research.

Lack of traceability of interventions
This topic is an ongoing problem for architects, for example. Even within a row of houses that were originally exactly the same, over time, interventions have been carried out. Usually, this is insufficiently documented. It would require too much work to identify past interventions, but audits and

proper documentation from now on should improve this.

Transaction moments

During transactions such as the purchase of a residence, there are still questions about renovation passports. In theory, if one had a renovation passport, it might not be up to date, and certain interventions may have been carried out in the meantime. There is no clear vision yet about how this would function.

Maintenance and problems

All customers need to be able to trust the quality of the services and often prefer a maintenance and guarantee structure. As the new measures and technology are quite new and evolve rapidly, as mentioned previously, the early adopters want some kind of guarantee. There are a few problems arising in this topic. This applies to general energy renovation.

Unforeseen circumstances (geopolitical, technical, bats)

Various interviewees mention risks and unforeseen circumstances during the energy renovation process. These can have a wide range of causes, such as geopolitical changes, often resulting in market fluctuations, or technical changes, such as the presence of bats in a wall. This remains an unresolved issue, but it is too structural and therefore out of scope of this research.

Lack of guarantee and maintenance options

Normally, products or services provide for comprehensive guarantees and maintenance options. However, some products in energy renovations are new and therefore lack guarantees. At the same time, the construction market is very hesitant to offer maintenance options. This remains an unresolved issue, but it is too structural and therefore out of scope of this research.

5.1.4 Overview of resolved and unresolved matters

Some of the barriers mentioned above have been solved, or are currently being researched. Resolved does not imply that the problem will vanish tomorrow; rather, it indicates the existence of potential programs or solutions that are currently enhancing the situation. Firstly, there are some matters that are either solved through another concept or trend, or are out of the scope of this research:

- Solved by BRP: diversity in buildings, debatable quality of online advice, interdependency of order of interventions
- Solved by one-stop-shop: diffuse information structure and overload, lack of 'actual' help, provisions for funding, financial planning
- Solved by the Dutch government: unclear future vision about energy label and renovation passport, regulations about data management, privacy risks, discrepancy between calculated and actual energy use, ongoing development of BRP
- Solved by process of digitalisation: proof of building level information, traceability of previous interventions
- Out of scope of the research: bat protection, quick development of technology, general fragmentation of construction sector, lack of certification methods, unforeseen circumstances
- Will solve over time: trust in new instruments, wrong information in systems

Secondly, a list of unresolved matters is made to see which problems might need additional policy measures to support the implementation of BRPs. There is a split between general energy renovation and specific to the BRP. Some of these barriers definitely require policy instruments to be solved, and others (in bold) will be discussed during the focus group.

Building Renovation Passport

- High upfront costs
- Other priorities than energy renovations
- **Lack of technical knowledge and thus the readability of advice**
- **Lack of clear business model**
- **Transaction moments**

General Energy Renovations

- **Inconsistent and unclear policies by the national government**
- **Interdependency between heat nets and insulation advice**
- **Balance of focus between individual homeowners and bigger scale solutions**
- Modernisation of energy labels in 2030
- **Lack of educated energy advisors**
- **Lack of collaboration between market parties**
- **Lack of qualitative execution**
- Lack of correct documentation
- **Lack of guarantee and maintenance options**

5.1.5 Possible policy instruments

Within the Policy Compass (*Kenniscentrum voor beleid en regelgeving*, 2026), policy interventions are elaborated on the topic of aim, benefits and drawbacks, and their consequences on the target group. Nearly 40 interventions from the Policy Compass are briefly analysed in the table in Appendix VI. There are a few possibilities for the policy instruments: not relevant, already existing, maybe relevant, relevant but not at this time, and relevant at this stage of implementation of the BRP. The suitability of policy instruments is specific to the implementation of BRP, and not about energy renovation in general. All possibly relevant instruments are explained below. Abbreviations are explained in the Appendix VI.

Already existing:

- (S-R) Conformity Assessment
- (S-R) Accreditation
- (S-R) Certification
- (S-R) Standardisation
- (S-R) Standard Regulation
- (S-R) Visitation

Maybe relevant:

- (C) General information: there is already a lot of information out there about energy renovations, but little about BRPs specifically.
- (S-R) Professional Regulation: seems heavy and political, but has significant potential.
- (F) Financial Incentive: the most important problem for BRPs is not costs or money. Takes effort still.
- (F) Subsidy: the most important problem for BRPs is not costs or money.
- (F) Voucher: the most important problem for BRPs is not costs or money.

Relevant, but not now:

- (J) Protocol: needed later in the system, but not currently for the initial implementation of the BRP.
- (S-R) Benchmarking: not in this early phase of implementation.
- (S-R) Code of conduct: but feasibility might be hard and this has a very top-down approach.
- (S-R) Obligations: could be like the energy label, but not this early in the implementation phase
- (S-I) Transitional Law: definitely needed around 2030 with the modernisation of energy label methodology.

Relevant:

- (C) Administrative consultation: can be organised between boards of various initiatives to determine the purpose of the BRP. But time-consuming.
- (J) Policy rules: are required in all cases. This will require further research as there are a lot of possibilities.
- (J) Covenant: this would work well in combination with administrative consultation
- (O) Decentralisation: municipalities might be more effective in stimulating use of BRPs.
- (O) Supervision of decentralisation: needed if decentralised
- (S-I) Experiment: sounds like a good option, but make clear what the aim and means of experiment is
- (S-I) Supervision: bare minimum role of government

5.2 Focus group

5.2.1 Results of focus groups
During the focus group, five statements based on previous findings were revisited. The discussions about the five statements were as follows.

“Having a renovation passport during the transaction moment of a residence should be obligatory in 2030.”

The first statement mostly started the discussion on what exactly the renovation passport is and what its intended purpose is or will be. The statement was quickly rejected. In the current state, obliging homeowners to have this BRP is impossible. It is too costly, and the lack of qualified energy advisors is a huge barrier. A possible solution is to use the energy label audit to create a light version of the BRP, thereby improving the automation of the process, but the balance with the EPBD directives has not been thoroughly analysed. It is related to the level of information available on the BRP, such as investment costs (which can fluctuate widely) and CO2 emissions. An interesting observation is that some of the EPBD requirements on the BRP are not user-friendly at all. Another significant consideration is that, ideally, the Building Renovation Pass (BRP) and/or energy label should be accessible prior to the transaction moment, thus preceding the current system; however, questions arise regarding who bears the associated costs and the implications if the BRP is deemed invalid owing to personal characteristics of the advice. Lastly, being required to have a BRP might lead actors to take it too literally and perceive it as the only truth, even though it is not.

“Energy renovations should focus on a bigger scale, such as a neighbourhood, rather than on singular homeowners.”

During this discussion, there was a split between homeowners and corporations. For the latter, a focus on bigger scale renovations is recommended and more than logical. However, for private homeowners, this was not the case. Even though ten houses in a row might look the same and initially might have been the same, over the years, interventions have occurred. Therefore, each house really requires a separate BRP. The participants came up with an example of “*Stroomversnelling*”, where about 14.000 euros in costs were incurred in the actual interventions, and about 80.000 euros in costs were incurred only in the engineering part. On top of that, there is a clash with the value of freedom of choice. Interestingly, there is still a major clash between this freedom of choice and the desire to let the renovation be handled.

“Subsidies should only be given to integral energy renovations, no separate steps.”

This statement was quickly rejected by the participants, as the whole point of the BRP is to have separate interventions, but one integral plan. Reasons against this statement were also that this will significantly lower homeowners’ motivation to renovate, and that the proposed roadmap in the BRP is not the only truth or golden path to becoming ZEB in 2050. However, participants agreed that subsidies should focus more on achieving the ZEB goals and have a robust selection process.

“Contractors and service providers should guarantee their products or services.”

The participants admitted how contractors and service providers seriously fall behind in guaranteeing their products and services. However, this is such a structural and behavioural problem that there seems to be no straightforward solution for making these companies improve their way of working. One of the participants came up with the idea of a ‘*waarborgfonds*’ (guarantee fund). The participant description explains how companies can join this fund, and a portion of the invoice/payment goes to it. In case there is a failure, and the company does not resolve the problem by itself, the fund can pay the damages for the customer, and another company from the fund will solve the problem. Consequently, the original company will get a negative reputation, which creates a sense of benchmarking in itself. The nature of the product or service needs to be defined quite precisely for this to work.

“Advice from a BRP should be made only after a municipality has plans for a heat net.”

This discussion was ended rather swiftly: the municipality’s plans typically remain unchanged for a long time and are not very dependable. Only when the *Omgevingsplan* (Environmental Plan) changes do the chances of a heat net becoming a reality increase slightly. On top of that, the participants were quite sceptical about the whole concept of heat nets due to unviable business cases and negative experiences.

5.2.2 Adjusted list of unresolved matters
Since most of the statements have been rejected with several arguments, some barriers can be seen as ‘solved’ or ‘discussed’. An updated version of the unresolved matters is as follows:

Building Renovation Passport
- High upfront costs
- Other priorities than energy renovations
- Discussed: Lack of technical knowledge and thus readability of advice
- Discussed: Lack of clear business model
- Solved: Transaction moments

General Energy Renovations
- Discussed: Inconsistent and unclear policies by national government
- Solved: Interdependency between heat nets and insulation advice
- Solved: Balance of focus between individual homeowners and bigger scale solutions
- Modernisation of energy labels in 2030
- Discussed: Lack of educated energy advisors
- Discussed: Lack of collaboration between market parties
- Discussed: Lack of qualitative execution
- Discussed: Lack of correct documentation
- Solved: Lack of guarantee and maintenance options

The remainder of the problems in the implementation of the BRP are either extremely customer-focused (high upfront costs, other priorities, lack of knowledge) or very specific about the quality of the advice and the advisors. The next step is to adjust the available policy instruments to address these problems in order to improve these situations.

5.3 Analysis of results in relation to policy instruments

The unresolved matters for both the BRP and the energy renovation system are linked to the most suitable policy instruments from the Policy Compass. Together, they form the basis of the final recommended set of policy instruments for implementing the renovation passport in the Netherlands. These recommended instruments and the unresolved barriers they aim to solve can be found in Appendix VII. The recommended set is explained below.

Recommended policy instruments

Administrative consultation + covenant

As seen in the results of the interviews, there are various structural barriers in the entire energy renovation process that need to be established or improved in order for the BRP to fully function. Therefore, further administrative consultation with various national bonds is required to improve the entire system. One major aspect, relevant to many more topics than just the BRP, is the need for guidelines on legal rights over data, and on how data accessibility and privacy should be incorporated into these guidelines. Many stakeholder values identified in this research are highly relevant, such as privacy, cybersecurity and protection, as well as quality and accessibility, trust, and autonomy. These guidelines are also a condition for the LVG and other data collection or monitoring goals. Next, structural collaboration between market parties needs to be improved. Further research on, for example, chain collaboration can be tailored to energy renovation as well. Together with the market, the Dutch government needs to ensure there are sufficient high-quality energy advisors. The exact way to do this would require further collaboration, but with administrative consultation, the first steps can be made. When various bonds, market parties and the government align on these matters, a covenant can be the legal instrument to carry out the promises.

The problems that are being solved:

- Various parties having legal rights to data
- Inconsistent and unclear policies by national government
- Lack of educated energy advisors
- Lack of collaboration between market parties

This policy instrument requires multiple national bonds and governments to work together. As they create national policies, their agreements affect the entire country and should therefore be extremely well argued. This consultation does not always yield the same policy outputs and is often relatively informal. General benefits include shared knowledge among a large group of stakeholders, improved relationships, and greater national support. However, it might take a long time and require a lot of effort from participants. The output chosen from this administrative consultation is a covenant, which is a legal instrument to implement the results of the consultation. It is still fairly informal, as no laws are involved, but it might be binding. The benefits are that with a covenant, all strengths among participants are supported, and integrating their opinions improves the support. They can be arranged quickly. Drawbacks are that it requires a lot of organisation and capacity, and a bond does not have to legally bind its underlying members.

Decentralisation to municipalities + supervision of decentralisation
The interview results clearly show that general online advice or incentives alone are not enough to engage homeowners or motivate them to act. Therefore, the advice is to bring the incentives to a more local level, namely the municipality. These are already in collaboration with the various *Energieloketten* and therefore have a natural role in meeting the locals halfway. On top of that, the local market parties play a big role in the availability of works, pricing and possibilities. Local subsidies and common practices can differ between regions, and therefore, the experts should really understand the local situation. Decentralisation has already occurred, for example, with targets of insulation levels across the buildings in the municipality, so the municipality has an interest in the use and rise of BRPs to further meet their own targets.

This policy instrument is plainly said to be between the national government and the municipality. However, there are over 300 municipalities in the Netherlands, each with different characteristics. This means that in the municipality of Amsterdam, for example, the trusted relationship is significantly different from that in the municipality of Blaricum. It affects the municipality's workforce, which is already under pressure. The most important argument for decentralisation is that in the current system, the municipality already carries most responsibility when it comes to achieving targets and helping locals. The Dutch government still has the duty to supervise and provide guidance.

Experiment + financial incentive
As is well known, the BRP is an entirely new instrument for homeowners. It exists in the form of a maatwerkadvies, and there are various ways to receive advice on energy renovation, but the exact functionality of a BRP remains unknown. Therefore, the suggestion is to conduct experiments at the municipal level in combination with a financial incentive. Boldly, some homeowners could receive a BRP for free, made possible by the collaboration with the municipality and local *Energieloket*. For example, the households in a risk group can get priority. This would offer a trusted face, and there would be few conditions except sharing results and the monitoring by the municipality. Additionally, the municipality might combine this plan with other important ambitions, such as the foundation problems.

The problems that are being solved:
- High upfront costs
- Other priorities than energy renovations
- Lack of technical knowledge and thus the readability of advice

In this set of policy recommendations, the appointed taskforce is the municipality in collaboration with the local *Energieloket*. Maybe not every municipality has to do the exact same experiment at the exact same time. It would be fairer, yet the geographic scope of an experiment should be as limited as possible. The experiment allows for bypassing certain laws or regulations in a relatively short time. If the experiment results in negative advice, this saves a lot of time, money and effort in opposition to implementing policy instruments nationally. A drawback is that an experiment is slightly costly (especially if the BRP is given for free), and municipalities must be willing to volunteer. In this case specifically, it also asks a lot of the capacity of energy advisors and municipal employees.

Policy rules + general information

Policy rules and general information are, in any case, crucial to support the selection of policy instruments and their execution. The most important request by the interviewees is to be consistent with policy and help get the country on the same level when it comes to the future. Consistency and a long-term vision, understandable for all citizens, are necessary to achieve the goals. One specific example where policy rules are necessary is the need for BRPs during a natural transaction moment.

The problems that are being solved:

- Transaction moments
- Inconsistent and unclear policies by the national government

The instrument of policy rules is too broad to delve into the details of which stakeholders are affected by them and what the exact benefits and drawbacks are. These policy rules are intended to support the rest of the energy renovation process and the BRP's implementation. Assuming the experimental results will lead to a long list of required policy rules. The general provision of information by the government is, in this case, specifically targeted at homeowners about the use of BRP. Currently, there is little known about the BRP on government websites and information points, which should be improved if the implementation of the BRP is to be further supported.

Improve the already existing policy instruments
Some findings of the interviews focus on the lack of qualitative energy audits and the qualitative execution of the works by contractors. In the current NTA-8800 methodology, many policy instruments already exist to ensure sufficient quality. However, if the perception is that these instruments are insufficient among interviewees, they should be improved accordingly. Assumably, some of these problems will be resolved in the modernisation in 2030. If those problems are not currently being addressed and researched, they should be.

- (S-R) Conformity Assessment
- (S-R) Accreditation
- (S-R) Certification
- (S-R) Standardization
- (S-R) Standard Regulation
- (S-R) Visitation
- (S-I) Supervision

The problems that are being solved:
- Lack of qualitative execution
- Lack of guarantee and maintenance options

Policy instruments recommended in a later stadium
This recommendation will not go into detail about the following policy instruments, but these might be relevant in a later phase of implementation of the BRP:
- (S-R) Benchmarking: might also be solved with the previous proposal of a '*waarborgsysteem*'
    - o Solves lack of qualitative execution (higher competition, reputation damage)
- (S-R) Code of conduct: can be a result of the covenant, but the feasibility when it comes to getting all contractors aligned for example can be questioned. Might also need digitalisation to be further developed.
    - o Solves lack of correct documentation (improved behaviour)
- (S-R) Obligations: could be like the energy label, but not this early in the implementation phase of the BRP. It is too underdeveloped and unknown across homeowners.
    - o Solves problem of homeowners having other priorities than energy renovations (obeying the law is usually a high priority)
- (S-I) Transitional Law: definitely needed around 2030 with the modernisation of energy label methodology.
    - o Softens the negative consequences of the modernisation of energy labels in 2030

CHAPTER 6

DISCUSSION

CHAPTER 6. DISCUSSION

The brief summary of the policy recommendation starts by recommending stronger administrative consultation among governments, sector organisations, and market parties to align responsibilities and establish shared agreements, preferably through a covenant. Decentralisation is proposed to give municipalities a larger role in implementation through local Energieloketten and tailored support for homeowners. In addition, municipal-level experiments combined with financial incentives are recommended to test BRP adoption and improve homeowner action. Finally, there is a strong plea for consistent policy rules, an improved structure of public information, and stronger quality assurance instruments, such as certification, standardisation, supervision, and accreditation, to support long-term implementation and trust. The discussion of the results are compared to the Adoption Theory Framework as explained in Chapter 2, as well as the embedding of the BRP in Chapter 4 and the theory from Chapter 2. Lastly, the interpretation of the results and the estimated impact are elaborated. The structure of this chapter is shown below in Figure 15.

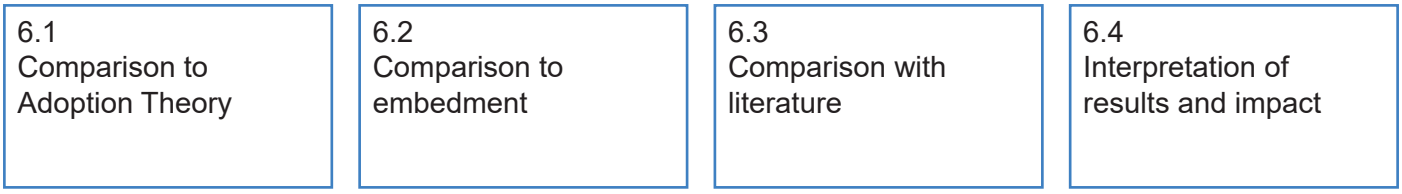

Figure 15: The structure of chapter 6 (own work)

6.1. Comparison to Adoption Theory framework

The final set of recommended policy instruments will be compared to the Adoption Theory (Rogers, 2003) to test whether the BRP as an innovative instrument will be successfully adopted. Once again, these are the five attributes that help the adoption of an innovative instrument:

(i) relative advantage
(ii) compatibility with existing practices
(iii) perceived complexity
(iv) trialability
(v) observability of results

The recommended policy instruments generally align positively with the attributes. First, they demonstrate a strong relative advantage by improving stakeholder coordination, reducing information barriers, and supporting more structured, long-term renovation planning processes. Second, the recommendations are substantially compatible with existing practices, as they build on established structures such as *Energieloketten*, municipal sustainability programmes, and current energy advisory systems. This will be further elaborated shortly. Regarding perceived complexity, challenges remain due to the technical, administrative, and digital nature of BRPS. Especially when the concept of a DBL is not yet embedded among homeowners in the Netherlands. The idea of the experiment is to create a positive attitude among testers, which will spread the word and therefore convince others to lower this perceived complexity. In the bigger picture of energy renovations, the BRP is intended to lower this barrier on its own. Additionally, decentralised support structures and improved government communication may reduce this complexity for homeowners and local actors over time. The proposed municipal experiment has a high trialability, as experimental implementation allows stakeholders to test and evaluate BRPs in controlled local settings before wider national adoption. Finally, the recommendations show relatively strong observability of results, with monitoring, visible renovation measures, and measurable energy savings.

6.2 Comparison to embedment

One of the five attributes by Rogers (2003) is compatibility with existing governance structures, policy programmes, and stakeholder roles within the Dutch renovation sector. Since information overload and a diffuse structure of information, it is only logical that the BRP should fit well into the current embedment. Rather than requiring the creation of entirely new institutional arrangements, the sketched policy recommendations primarily build upon established responsibilities and collaborative frameworks like a public-private partnership that already characterise the Dutch multi-level governance context. Municipalities, for instance, currently play a significant role in the implementation of local programmes like the NIP, neighbourhood-based energy transition programmes, and homeowner support through *Energieloketten*. Expanding their responsibilities regarding the implementation of BRPs therefore aligns quite well with their existing policy mandates and operational practices. In addition, the proposed instruments are compatible with current digital and advisory infrastructures, including energy labels, *maatwerkadvies*, EP-Online, and other building data environments. Integrating BRPs within these existing systems reduces administrative burdens and improve implementation feasibility by relying on already established data collection and information management processes. However, the interviews also admitted that this has partly been done due to the high pressure in time. Similarly, the proposed role of market actors, such as energy advisors, service providers, and contractors, remains largely consistent with their current involvement in sustainability advice, digital building information, and renovation planning. The emphasis on administrative consultation and covenant-based cooperation is also consistent with the Dutch tradition of policymaking with participation and public–private collaboration. The same structure applies to the *Energieloketten*, for example. This institutional continuity may contribute to greater stakeholder acceptance, facilitate coordination between actors, and support the gradual integration of BRPs into the existing renovation system.

6.3 Comparison with literature

The embedment of BRPs within the Dutch renovation sector strongly reflects the theoretical principles described by Fabbri (2017) and Sesana & Salvalai (2018). The BRP is primarily positioned as a long-term and user-oriented renovation roadmap that supports structured decision-making, phased renovation strategies, and improved information management throughout the lifecycle of a building. This aligns closely with the first two principles identified by Fabbri (2017), which are providing a long-term perspective and sequencing renovation measures to avoid lock-in effects and stimulate deep renovation.

The stakeholder values as found in the results further build Fabbri (2017). Homeowners particularly value accessibility, clarity, trust, affordability, and usability. These values correspond strongly with the third and fourth principles of Fabbri (2017), which emphasise the importance of stimulating homeowners and designing user-friendly renovation tools that take personal circumstances into account, as well as financial capacities and behavioural barriers. The results show that homeowners are more likely to engage with BRPs when the information is understandable, visually appealing, and connected to trusted local actors such as municipalities and *Energieloketten*. At the same time, market actors and public authorities place strong emphasis on transparency, interoperability, quality assurance, and reliable data governance. These values correspond with the fifth principle of Fabbri (2017), which focuses on optimising audits and data collection through digitalisation and automation. The broader concept of the DBL further expands this principle by enabling data sharing between actors, but the DBL is not maturely implemented in the Dutch digital systems. However, the research also demonstrates that there are still tensions surrounding data ownership, cybersecurity, privacy, and governance responsibilities, which calls for the government to intervene.

The findings additionally align with the broader interpretation of BRPs by Sesana and Salvalai (2018), who also describe BRPs as comprehensive and user-friendly repositories of building information. In the Dutch context, the current embedment of BRPs reflects this multifunctional ambition, but practical implementation remains limited due to fragmented stakeholder responsibilities, uncertain business models, and insufficient alignment between governance levels. Consequently, while the theoretical values underlying BRPs are widely supported by the respondents of this research, the broader conditions necessary for implementation remain underdeveloped.

The barriers identified in this research also show overlap with challenges discussed in existing literature on BRPs, such as Barbosa & Almeida (2025). Unresolved issues include high upfront costs, affordability, lack of capacity, insufficient incentives and thus lack of business models, and complex information management. The findings also confirm broader concerns regarding scalability, funding for institutions and systems, and the absence of universally accepted standards or frameworks. In addition, this research reinforces the importance of aligning BRPs with wider energy renovation strategies and EU policy objectives. However, this study contributes additional insights by emphasising governance-related barriers, particularly inconsistent national policies, weak collaboration between market parties, and uncertainty surrounding stakeholder responsibilities. Some of these are rather symptoms that point to root causes, such as the fragmentation of the Dutch construction sector. Furthermore, while previous studies often discuss technical digitalisation challenges, also mentioned in the introduction, this research highlights the institutional complexity of embedding BRPs into existing renovation systems.

6.4 Interpretation of results and impact

The results of this research indicate that the implementation of BPRs is not primarily constrained by technological limitations as current literature suggests, but rather by governance complexity, stakeholder coordination, and institutional embedment. The findings show that stakeholders attach strong value to transparency, trust, affordability, and long-term policy consistency. Homeowners particularly value clear guidance and practical support, while governments and market actors emphasise data reliability, interoperability, quality assurance, and accountability. These differing values reveal that successful implementation requires balancing technical digitalisation with social acceptance and institutional coordination. The results also show a slight shift in stakeholder roles. Municipalities increasingly emerge as local coordinators and facilitators. National government retains a strategic and supervisory role by providing policy consistency, funding frameworks, and regulatory guidance. Market actors, such as energy advisors and software providers, become more integrated into data management, implementation, and advisory processes. Consequently, the implementation of BRPs depends on stronger collaboration between public and private actors within existing governance structures. The proposed policy instruments reflect this institutional interpretation. Administrative consultation and covenants aim to improve coordination and clarify responsibilities, while decentralisation strengthens local implementation capacity. Experiments combined with financial incentives support homeowner engagement and reduce uncertainty surrounding adoption. In addition, consistent policy rules and improved public communication are intended to normalise BRPs within existing renovation processes and transaction moments.

This research has societal, policy, and academic impact by contributing to the broader transition toward a more sustainable and digitally supported housing sector. In society, the implementation of BRPs may improve homeowner access to understandable renovation guidance, reduce informational barriers, and support more affordable and energy-efficient housing. This can contribute to lower energy consumption, reduced emissions, and increased resilience against rising energy costs. From a policy perspective, the research highlights the importance of coordinated governance, long-term policy consistency, and clearer stakeholder responsibilities. The policy recommendations provide policymakers with practical approaches for integrating BRPs into existing renovation programmes through decentralisation, experimentation, and collaborative governance structures. Within the academic field, the research contributes by extending the discussion on DBLs and BRPs beyond technical development toward governance, stakeholder values, and widespread adoption. It strengthens understanding of how digital policy instruments can be embedded within complex multi-level governance systems and existing renovation practices.

CHAPTER 7

CONCLUSION

CHAPTER 7. CONCLUSION

Combining the literature review, results and discussion, a complete analysis of the policy implementation of BRPs is given. Firstly in this chapter, the four research questions are answered. Secondly, the conclusion of this research will be given, which answers the main research question.

7.1 Answers to research questions

Q1: What is the state of the art of renovation passports in the Netherlands in relation to policies?

The state of the art of renovation passports in the Netherlands is characterised by increasing policy attention, growing digitalisation of building information, and ongoing experimentation with implementation strategies. Renovation passports are increasingly viewed as instruments that can support long-term renovation planning, improve transparency in the housing sector, and contribute to European and national sustainability objectives. Their development is closely linked to European frameworks such as the EPBD IV, EED and RED, as well as the European Green Deal, and the Renovation Wave, which promote structured building data and phased renovation approaches to accelerate decarbonisation. Current research and pilot projects primarily focus on technical aspects such as interoperability, data structures, and digital infrastructure. Less attention has been given to governance structures, stakeholder responsibilities, and viable business models. As responsibilities are distributed across governments, municipalities, market actors, and homeowners, uncertainty remains regarding who should finance, manage, and maintain renovation passports. Combined with political instability and changing policy priorities, these uncertainties continue to slow large-scale adoption.

Currently, BRPs are embedded within the existing system of energy labels and *maatwerkadvies*. The Dutch energy label, calculated according to the NTA 8800 methodology and registered in EP-Online, provides a standardised indication of a building's energy performance. While the energy label primarily functions as a regulatory and informative instrument, BRPs aim to expand this role by transforming static energy data into a long-term renovation strategy. The relationship between BRPs and energy labels is therefore complementary. Energy labels provide the baseline information regarding current building performance, while BRPs build upon this data by proposing phased renovation pathways and tracking implemented measures over time. The *maatwerkadvies* already acts as an intermediate step, but is not officially carried by the government. BRPs aim to integrate these recommendations into a continuous and structured roadmap connected to broader building data.

Q2: What are the values and roles of actors for renovation passports in the Netherlands?

Values of actors

Across all interviewed actors, a shared set of core values emerges. The most prominent is consistency, referring to stable, clear, and continuous policy. Stakeholders view past policy inconsistency as a major barrier that undermines trust and slows adoption. Closely linked is simplicity, which highlights the need for comprehensible, accessible, and scalable renovation processes with minimal burden/costs. Another widely shared value is traceability, meaning transparent, accessible, and high-quality data about buildings and renovation steps. This is often envisioned as a digital system where information can be easily shared between actors, a DBL. Especially these values are also carried by literature, which has a big focus on digitalisation. However, this must be balanced with privacy, as stakeholders stress the importance of protecting sensitive homeowner data through strong cybersecurity and clear consent mechanisms. Sustainability is also a key value, driven by regulatory requirements and long-term environmental goals. This highlights the long-term vision of all participants. At the same time, affordability is critical, especially for homeowners, as high upfront costs can discourage the use of BRPs unless supported by subsidies or financial incentives. Autonomy reflects the desire of homeowners to maintain freedom of choice in selecting renovation measures and service providers. Finally, trust is essential, as current scepticism toward government policies and the quality of market services highlights the need for transparency, guarantees, and reliable outcomes. These mentioned values do not always align. For example, accessibility can conflict with privacy, flexibility in policy can reduce consistency, and affordability can limit the implementation of other values. Similarly, autonomy may conflict with the need for expert guidance.

Roles of actors

The government, in all its layers, plays a central and coordinating role. The primary responsibility of the national government is to stimulate energy renovations and ensure national and international climate goals are met. This is achieved through policies, subsidies, and regulatory frameworks. Different government layers have distinct roles: national authorities develop methodologies (such as energy labels) and maintain data systems, provinces align policies between national and local levels, and municipalities handle permits, local subsidies, and direct engagement with homeowners. Governments are also responsible for embedding the previous stakeholder values into policy and improving the overall renovation system.

The market sector (contractors, advisors, service providers) is responsible for delivering practical solutions. Market actors are expected to improve on government-provided systems, such as digital infrastructures, to create scalable and efficient services for homeowners. Their main role is to meet demand by providing high-quality, reliable renovation services, thereby contributing to trust and feasibility within the system. Homeowners (customers) have a more demand-driven role. Their primary responsibility is to take action and initiate renovation projects. However, their willingness to do so depends on incentives, affordability, and the reduction of barriers. Increasing these incentives is once again the role of the governments. Some homeowners, particularly vulnerable groups, receive additional support through municipal programs, which help translate policy into actual demand.

Q3: What variations exist for policies to implement renovation passports?

The policy options for the implementation of renovation passports that are provided by the Policy Compass have been researched. The following policy instruments can be relevant for the barriers that remain unsolved and therefore need additional policy instruments. For a more detailed analysis, Appendix III shows all of the considered policy instruments.

The following policy instruments can be relevant for the implementation of BRPs:

- (C) General information: there is already a lot of information out there about energy renovations, but little about BRPs specifically.
- (S-R) Professional Regulation: seems heavy and political, but has significant potential.
- (F) Financial Incentive: the most important problem for BRPs is not costs or money.
- (F) Subsidy: the most important problem for BRPs is not costs or money.
- (F) Voucher: the most important problem for BRPs is not costs or money,.

The following policy instruments are relevant for the implementation of BRPs, but not in the current phase of implementation:

- (J) Protocol: needed later in the system, but not currently for the initial implementation.
- (S-R) Benchmarking: not in this early phase of implementation.
- (S-R) Code of conduct: but feasibility might be hard and this has a very top-down approach.
- (S-R) Obligations: could be like the energy label, but not this early in the implementation phase
- (S-I) MoU: maybe interesting with other Member States but not in this phase
- (S-I) Transitional Law: definitely needed around 2030 with the modernisation of energy label methodology.

The following policy instruments are definitely relevant for the implementation of BRPs:

- (C) Administrative consultation: can be organised between boards of various initiatives to determine the purpose of the BRP. But time-consuming. Similar concept to this research.
- (J) Policy rules: is required in all cases. Will require further research as there are a lot of possibilities.
- (J) Covenant: this would work well in combination with administrative consultation
- (O) Decentralisation: municipalities might be more effective in stimulating use of BRPs.
- (O) Supervision of decentralisation: needed if decentralised
- (S-I) Experiment: sounds like a good option, but make clear what is the aim and means of experiment
- (S-I) Supervision: minimum role of government

Q4: In what way can actors be supported through policies in order to effectively adopt renovation passports in the Netherlands?

By combining the unresolved matters from interviews and focus group with the possible policy instruments, a final set of policy instruments has been created. The result of how the actors are supported and involved through this set of policy instruments is as follows.

Firstly, administrative consultation is an important mechanism for improving the implementation of the BRP. As energy renovation involves multiple governance levels and stakeholders, stronger coordination between national government, sector organisations, and market parties is required to address structural barriers. Important topics include data management guidelines, which includes privacy regulations and cybersecurity, policy consistency, collaboration within the renovation chain, and the shortage of qualified energy advisors. Administrative consultation enables knowledge sharing, alignment of stakeholder interests, and the development of broadly supported strategies. Although such processes can be time-consuming and are relatively informal, they help create national support and coordinated action. Therefore, this policy is beneficial to the entire construction sector. The research proposes a covenant as a possible outcome of these consultations to formalise agreements and support implementation.

Secondly, the interviews indicate that general national incentives and online advice are insufficient to effectively motivate homeowners to renovate and thus start using the BRP. Therefore, decentralisation is proposed as one of the main policy instruments, giving municipalities a stronger role in implementing BRPs. Municipalities already collaborate with local *Energieloketten* and are closely connected to local market conditions, subsidy structures, and renovation practices. This enables more tailored and trusted support for homeowners. Since municipalities are already responsible for achieving local sustainability targets, they also have a direct interest in promoting BRPs. However, decentralisation creates challenges due to differences in municipal capacity, local characteristics, and workforce limitations, requiring continued national supervision and guidance. Jointly with the Dutch government, the municipalities need to determine to which extent the support and guidance of the national government is needed.

Thirdly, the research proposes municipal-level experiments as a policy instrument to introduce BRPs to homeowners. Since BRPs are still relatively unknown, municipalities and local *Energieloketten* could provide selected households with free BRPs combined with financial incentives and monitoring. Priority could be given to vulnerable or high-risk households. These experiments aim to reduce upfront costs (not only monetary), improve understanding of renovation advice, and increase homeowner action through trusted local actors. Conducting these experiments at a local scale allows municipalities to test implementation strategies, adapt to regional conditions, and evaluate outcomes before national implementation. However, experiments require significant local capacity, funding, and willingness from municipalities and energy advisors to participate. Again, the Dutch government will have to provide (financial) support, guidance and supervision for these experiments.

Lastly, consistent policy rules and accessible public information are essential for the successful implementation of BRPs. Interviewees emphasised the importance of a long-term and stable national vision that provides clarity for homeowners and market parties. Policy rules can support the integration of BRPs into natural transaction moments, such as home sales or major renovations, helping to normalise their use. In addition, government communication on BRPs remains limited and should be improved through existing information platforms. There is also the need to improve existing policy instruments related to certification, standardisation, supervision, accreditation, and quality control. Improving these frameworks can support reliable execution, better documentation, and stronger guarantees for advice and renovation quality .

7.2 Conclusion

By integrating the answers of the previous research question, a coherent answer can be concluded to fully answer the main question of this research:

How can national policies stimulate the adoption of renovation passports in the Netherlands?

For each policy recommendation, the values that are most important for the actors are listed, as these are crucial to be captured in the new policy instruments to support these actors. The way and extent to which the policy instruments support the implementation of BRPs in the Netherlands is described by explaining which problems are solved and why. Next, the roles of the actors as a consequence of the new policy instruments is described. The relation with the current programs are explained as well, which is one of the five attributes by the Diffusion of Innovation Theory. This theory and its relationship with the new policy instruments is therefore further elaborated.

Administrative consultation + covenant

The first proposed policy instrument consists of an administrative consultation between national government, sector organisations, and market parties, resulting in a covenant that formalises agreements regarding the implementation of BRPs. The recommendation aims to capture values such as trust, transparency, collaboration, accessibility, data protection, and long-term policy consistency. The primary problems addressed are fragmented data ownership, inconsistent national policies, insufficient collaboration between market actors, and shortages of qualified energy advisors. Within this framework, stakeholder roles evolve rather than fundamentally change. National government shifts towards coordination, supervision, and policy alignment, while municipalities strengthen their role as local facilitators through existing structures such as *Energieloketten*. Market parties and sector organisations become more structurally involved in data management, implementation, and knowledge sharing. Homeowners remain end users, but benefit from improved guidance and clearer responsibilities among actors. The recommendation aligns with existing programmes and infrastructures, including energy labels, maatwerkadvies, municipal sustainability programmes, and digital systems such as EP-Online. Regarding Rogers' five attributes, the instrument demonstrates relative advantage through improved coordination, compatibility with existing governance structures, moderate complexity due to administrative coordination, strong trialability through phased collaboration, and observable results through clearer implementation processes and stakeholder cooperation.

Decentralisation to municipalities + supervision of decentralisation

The second recommended policy instruments focuses on decentralisation combined with national supervision to stimulate the implementation of BRPs. Within this approach, municipalities receive a stronger role in supporting homeowners through local implementation, while the national government maintains responsibility for supervision, policy consistency, and strategic guidance. The recommendation captures values such as accessibility, trust, local responsiveness, flexibility, and accountability. The primary problems addressed are the lack of incentives for homeowners and market parties, as well as the absence of clear and sustainable business models for BRPs. Stakeholder roles shift toward a more locally embedded implementation structure. Municipalities expand their role from primarily policy execution toward active facilitation and coordination through existing *Energieloketten* and local sustainability programmes. The national government keeps a supervisory and coordinating role by providing regulatory frameworks, funding structures, and national objectives. Market parties gain clearer opportunities to develop local service models connected to renovation support and digital tools. The recommendation aligns closely with existing Dutch governance structures, as municipalities already carry significant responsibility for achieving local sustainability targets and supporting energy renovations. It therefore integrates well into current programmes such as municipal energy transition plans and homeowner advisory systems. When it comes to Rogers' five attributes, decentralisation demonstrates relative advantage through tailored local support

and clearer incentives. Compatibility is high due to alignment with existing municipal responsibilities. Perceived complexity remains moderate because implementation differs across municipalities. Some municipalities might have more impact than others. Observability is also high, since local renovation outcomes and homeowner participation can become directly visible within municipalities.

Experiment + financial incentive
The third proposed policy instrument consists of conducting municipal-level experiments with BRPs combined with financial incentives for homeowners. Through collaboration between municipalities, *Energieloketten*, and local market actors, selected households could receive subsidised or free BRPs to stimulate engagement with energy renovations. This recommendation aims to capture values like accessibility, affordability, trust, usability, and inclusiveness. The primary problems addressed are high upfront renovation costs, competing household priorities, and the lack of technical knowledge needed to interpret renovation advice and make informed decisions. The policy instrument introduces a more active role for municipalities and local *Energieloketten* in guiding homeowners through the renovation process. Whereas homeowners previously relied largely on fragmented information and voluntary initiatives, they would now receive structured local support and financial encouragement. Market actors and energy advisors gain a more direct role in implementation, monitoring, and communication with residents, while the national government primarily facilitates funding frameworks and supervision. The recommendation fits well within existing municipal sustainability programmes and strategies. It also aligns with current advisory structures and financial support mechanisms already used within the Dutch renovation sector. In terms of Rogers' five attributes, the recommendation has a clear relative advantage by lowering financial and informational barriers. Compatibility is high because it builds upon existing local initiatives and subsidy systems, as mentioned previously. Perceived complexity is reduced through direct support and simplified guidance. Trialability is particularly strong, as municipalities can test approaches on a limited scale before wider and national implementation. Observability is also high, since renovation outcomes and homeowner experiences become visible within local communities and pilot projects.

Policy rules + general information
The last suggested policy instruments focuses on the establishment of consistent policy rules and the provision of organised communication methods to support the implementation of BRPs. The recommendation aims to capture values such as transparency, clarity, trust, accessibility, and long-term policy consistency. The primary problems addressed are the lack of clear national policy direction and the absence of structured integration of BRPs into natural transaction moments, such as property sales, renovations, or mortgage applications. Within this framework, the national government strengthens its role in policy coordination, communication, and regulatory guidance. Municipalities and local support structures, such as *Energieloketten*, continue their role in homeowner assistance but operate within clearer and more standardised national frameworks. Market actors, including advisors and software providers, benefit from greater certainty regarding standards, quality requirements, and implementation expectations. Homeowners once again remain end users, but receive more structured reliable information regarding the purpose and use of BRPs. The recommendation fits closely within existing programmes and infrastructures, including energy labels, maatwerkadvies, *Energieloketten*, and EP-Online. Rather than introducing entirely new structures, it strengthens and aligns current systems. Regarding Rogers' five attributes, the recommendation demonstrates relative advantage through increased policy clarity and improved implementation consistency. Compatibility is high due to alignment with existing governance structures and advisory systems. Perceived complexity should improve and be reduced, as the instruments primarily standardises current practices. Trialability is not really affected. Observability should be strong, as clearer communication and integration into transaction moments can produce visible behavioural and procedural changes within the renovation process.

CHAPTER 8

LIMITATION. RECOMMENDATION & REFLECTION

CHAPTER 8: LIMITATION AND RECOMMENDATIONS

In this chapter, the limitations of the research are explained. Mostly, the scope has a big influence on the result, as well as quick development in this research area by academics, government and market parties. Lastly, recommendations for further research is given.

8.1 Research limitations

This research has several limitations, mostly due to the scope. The scope of the study is limited by available time, resources, and access to respondents, which restricts the number of stakeholders and perspectives that can be included. Usually, initial contact with respondents went fairly smoothly, yet when it came down to planning and time management, various interviewees struggled to fully prepare for the conversation and find time to carry this out. Preferably, another focus group had taken place, but due to busy schedules this focus group had been cancelled. More perspectives could have been gained for example by the VNG or a municipality, or a bank in general, or include more homeowner perspectives. A representative from the VNG or a municipality could have given more insight in the works and roles of the local government, and provided for insight into the possibility of the proposed experiment. In addition to this, the research relies primarily on qualitative methods, meaning that findings are based on interpretations and experiences rather than statistically representative data. As mostly spokespersons of national industry associations have been interviewed, there may be various practical insights that have been left out. Some of these representatives have specified whether they spoke as an individual or for the company, which also shows that personal opinions may influence the results of this research.

The study is also conducted within a limited timeframe, while policy developments, market conditions, and technological innovations continue to evolve. As a result, some findings may become less applicable over time. As the Dutch publication of the BRP will start the 29th of May, the first actual user data will be available soon. Mentioned in the interviews, it is likely that software development and multiple versions will be needed to further perfect the functionality of the Dutch BRP. This will be further discussed in the recommendations for further research. On top of this, it is assumable that various state and market parties are continuously working on improving energy renovation with programs that are unavailable to the public.

Finally, the conclusions are significantly influenced by the selected literature, case context, and stakeholder participation available during the research period. Even though literature on BRPs is quite limited, especially within the scope of the Netherlands, there is a chance that some innovations or initiatives when it comes to renovation passports have been overlooked. This does however not discredit the research, as the generated data still supplies new and qualitative information.

8.2 Recommendations for further research

There is still much to discover when it comes to the Dutch implementation of the renovation passport. Especially since at the end of May 2026, the BRP is officially launched, some research can only be done after a significant amount of data is generated by users of the BRP. Various types of research about the use of BRPs among homeowners, and potentially through the municipal experiments, should be carried out. Even at the current phase of implementation, several topics remain insufficiently researched and require further investigation. First, there is little known about the societal impact on homeowners with the introduction of DBLs, particularly regarding behaviour, digital inclusion, trust in data systems, and unequal access between socio-economic groups. This is also related to the question whether the BRP is as user-friendly as desired, and how participation has been included in the design process. Especially with regard to the relationship of BRPs to DBLs, there is no future vision for the Dutch context.

Second, governance-related consequences require further research. It is still uncertain how precise liabilities, and data ownership should be distributed among governments, municipalities, market actors, and homeowners, which is part of the advice. These topics require further research by the government or an external party such as a knowledge institution. Third, there is limited research on the economic consequences and viability of business models surrounding BRPs and DBLs. Though these have arisen in market sector like utility and housing corporations, there still seems to be little demand for *maatwerkadviezen* and thus BRPs. Questions remain regarding scalability, maintenance costs, sustainable revenue streams, and market adoption within fragmented owner-occupied housing markets. As this research has focused on the policy aspects of implementation, there might be research necessary to focus on the business model from a different perspective. Lastly, it can be interesting to compare the Dutch BRP to those of other Member States. This would require an intensive understanding of a country's policy context as well as understanding of the requirements of BRPs by the EPBD IV.

8.3 Reflection

This thesis positions itself within the broader Dutch renovation challenge by focusing on the barriers that prevent private homeowners from carrying out energy-efficient renovations. While energy renovation is essential for achieving national and European sustainability goals, progress within the owner-occupied housing sector remains limited due to financial, informational, and organisational challenges. In contrast to housing corporations and commercial buildings, private homeowners face fewer regulatory incentives and greater decision-making uncertainty. The research therefore examines how BRPs can support homeowners through improved guidance, digitalisation, and structured renovation planning. By analysing governance structures and policy instruments, the thesis contributes to understanding how BRPs can support the Dutch energy transition and housing sustainability objectives.

The main contribution of this thesis lies in connecting the technical concept of BRPs to governance, policy implementation, and business model development within the Dutch renovation sector. While existing research primarily focuses on digitalisation, interoperability, and data structures, this thesis examines how BRPs can be effectively embedded into Dutch policy and practice. It specifically contributes by identifying unresolved implementation barriers, analysing stakeholder values and responsibilities, and evaluating policy instruments that could support adoption by homeowners. In doing so, the research broadens the academic discussion beyond technical functionality toward multi-level governance, institutional coordination, and practical implementation strategies for sustainable renovation policy in the Netherlands.

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APPENDICES

APPENDICES

Appendix 1: Data Management Plan
Appendix 2: Overview codes of interviews
Appendix 3: Table of actor values and ambitions
Appendix 4: Table of actor roles and responsibilities
Appendix 5: Table of energy renovation barriers
Appendix 6: Table of possible policy instruments
Appendix 7: Table of recommended policy instruments

APPENDIX II: OVERVIEW CODES OF INTERVIEWS

Code	Reason	Example Quote
Ambition/goals	Understanding actors' goals and ambitions	*"The purpose of the modernisation of the calculation method is to align the calculated and actual use of energy, which is not the case in the current methodology."* (translation, interview employee of RVO)
Barriers	Finding barriers in using the BRP and incentives, or other barriers	*"If you are a layman, and you cannot retrace the works of a contractor and the quality is insufficient, you might get in trouble."* (translation, interview energy coach)
Calculation Method	Understanding the calculation method of the Maatwerkadvies and thus BRP	*"We know if you reach that level, you are sure to comply to future regulations. Possibly, we will even make a lower definition of ZEB."* (translation, interview policy maker)
Collaboration	Understanding the collaboration between parties to achieve goals	*"I think you should rely on current structures and collaboration, and not make a new proces."* (translation, interview energy coach)
Design RP	Listing all comments and needs for the design of the BRP	*"I think you should research whether people actually understand this."* (translation, interview homeowner association)
Digital Structure	Understanding current and future digital infrastructure around the BRP and DBL or other initiatives	*"I am curious how the structure will be between the LVG, EP-online, the renovatieverkenner, this passport and verbeterjehuis,."* (translation, interview policy maker)
Digitalisation	Listing all comments about digitalisation in general	*"As a sector, we are investing in digitalisation, and that has a relation with exchanging information in the shape of this passport."*

		(translation, representative of contractor)
History of Energy Label/Maatwerkadvies	Understanding the history of the Energy Label and Maatwerkadvies	*"Initially, the first EPBD left a lot up to the member states, and now this is more a directive than a guideline. That makes it hard to implement, as all parties are separated."* (translation, interview policy maker)
Incentives	Listing all mentions about the incentives for homeowners, positive or negative	*"The better your energy label, the more mortgage you can get. But the worse, the higher a loan you can get specifically for renovation."* (translation, interview broker association)
Lifespan RP	Listing all mentions about the entire lifespan and purpose of the BRP	*"It is interesting what happens if a homeowner carried out some of the interventions, and then sells the house."* (translation, interview broker association)
More research	Listing all mentions about other things that need to be researched in the literature study	*"winstuitjewoning"* (translation, interview contractor)
Other initiatives	Listing all mentions of other initiatives similar to the BRP or in different market sectors	*"What we saw with verbeterjehuis as a one-stop-shop, is that the amount of companies like that stayed quite low."* (translation, interview policy maker)
Other relevant	Listing all mentions of other relevant ideas/opinions	*"There are still a lot of houses without an energy label, since they never changed ownership since then"* (translation, interview policy maker)
Possible BM	Listing all mentions of ideas around a business model about BRPs, finding gaps in the market	*"We do the entire project management, until delivery. So the energy advice is just a part of that."* (translation, interview energy coach)

Quality Assurance	Understanding the quality assurance in the current system and how this should work with the BRP	*"You don't want a certification to increase the price, but at the same time I would have wanted proof what my contractor did in my residence, though a contractor or service provider will not initiate that."* (translation, interview homeowner association)
Renovation general	Listing of all mentions of renovation in general, that are not specific to the BRP	*"If people see that the subsidy for a heat pump is 8.000 and for insulation 2.000, they will probably get the heat pump."* (translation, interview policy maker)
Roles	Roles of actors now and in the future around renovation and BRP	*"It is the small company around the corner, that only works in that area, that you will approach for an energy renovation."* (translation, interview contractor)
Solutions	Solutions for any barriers or problems in renovation and BRP	*"When a financial institution requires this for a subsidy. You saw it with a promotion of the Rabobank, the request for "maatwerkadviezen" went from some 100s to 10.000 in no time."* (translation, interview policy maker)
Values	Listing all mentioned values by parties that are desired to be embedded in their works or renovation/BRP	*"The added value for our clients is that the process is ready to go and there for possible to scale up easily."* (translation, interview service provider)

APPENDIX III: TABLE OF ACTOR VALUES AND AMBITIONS

Stakeholder	Mentioned Value	Mentioned Ambitions
National Government	• Sustainability • Future-proof • High quality of data • Accessibility of data • Trust • Privacy • Safety • Cybersecurity • Continuity • Feasibility • Affordability • Quality of works • Health • Traceability	• To have a centralised digital environment • To improve the system for energy labels • To achieve national goals • To be consistent with measures • To give homeowners something to work towards
Municipality	• Privacy • Consistency • Protection • Feasibility	• To help those who cannot afford to renovate • To follow national programs
Energy Coach	• Quality of works • Insight • Functionality • Comfort • Freedom of choice • Trust • Traceability • Affordability	• To preserve monumental elements • To respond to clients demands • To give homeowners something to work towards
Architect	• Sustainability • Affordability • Accessibility	• To respond to clients' needs • To preserve buildings • To have a balance in information level
Installation Expert	• Calmness • Simplicity • Scalability • (Data-driven) Sustainability • Cost Optimalization • Flexibility • Clarity • Freedom of choice	• To create a scalable process for energy renovations • To have a consistent policy environment to work in • To have a living digital document for each building • To provide clarity in renovation steps
Contractor	• Continuity • Lowest risks	• To work in a collaborative digital environment
Banks	• Flexibility • Affordability • Future-proof • Clarity	• Not explicitly mentioned

Homeowner	• Simplicity • Support • Autonomy • Affordability • Inclusivity • Freedom of choice • Comfort • Health • Sustainability • Future-proof • Clarity • Consistency • Flexibility	• To have a consistent policy environment to work in • To comply to regulations

APPENDIX IV: TABLE OF ACTOR ROLES AND RESPONSIBILITIES

Stakeholder	Role now	Role future
National Government	By government interviews: • to stimulate homeowners to renovate • provide for information to LVG • make a qualitative design for the renovation passport • ensure qualitative methods for calculation • gives RVO commission to carry out works • expected to do market consultations from EPBD • do research • finance what is needed • support local and regional governments in their goals and challenges By market interviews: • provide for subsidies • preserving old/monumental houses is already very sustainable • sometimes a client as well	By government interviews • protect the civilians' values • create a trustworthy data supply • monitoring of RP data • improve quality of energy label/calculation methodology • should not make BRP mandatory, will always just get the most for the least money • need to ensure loans and subsidies are consistent and reliable By market interviews: • should redesign entire system and chain to meet goals and ambitions" • LVG would be a good system, so continue creating this • policies and subsidy structure more in line between national and local structures • will probably monitor to achieve certain goals
Province	By government interviews: • to stimulate homeowners to renovate • inform • test and approve methods and protocols By market interviews: • not mentioned	By government interviews: • Not mentioned By market interviews: • should redesign entire system and chain to meet goals and ambitions
Municipality	By government interviews: • to stimulate homeowners to renovate • inform and direct to other parties • organise local plans and measures such as 'warmtenetten'	By government interviews: • do not take over renovation of individual households By market interviews: • should redesign entire system and chain to meet goals and ambitions

	• make 'warmteprogramma' in 2027 • expected to target the 'weakest' households • meet goals and ambitions by government By market interviews: • big say when it comes to permits or monumental state of a building • preserve monumental value • sometimes a client as well	• policies and subsidy structure more in line between national and local structures • target more specific groups, who need the most help
RVO	By government interviews: • to provide for qualitative data for VRO • good collaboration with VRO • commissioned by VRO to carry out works • expected to do market consultations from EPBD • do research • finance what is needed By market interviews: • not mentioned	By government interviews: • to generate and deliver energy labels and renovation passports to homeowners • should not make BRP mandatory, will always just get the most for the least money By market interviews: • not mentioned
Market general	By government interviews: • not mentioned By market interviews: • preserving old/monumental houses is already very sustainable	By government interviews: • make another layer on top of the LVG to create a digital environment for homeowners, multiple versions possible • improve maturity when it comes to data ownership • do not take over renovation of individual households By market interviews: • should redesign entire system and chain to meet goals and ambitions • create more affordable and bigger scale solutions
Energy Coach	By government interviews: • findable in CRT • needs to be qualified	By government interviews: • not mentioned By market interviews:

	• has freedom in Maatwerkadvies, but not in BRP By market interviews: • create specific building level advice on how to renovate • can do entire project management if client asks • connect client to contractor • needs to be sufficiently qualified • approached by homeowner to get works done • needs to do a lot of research to understand building • contacted to collaborate	• not mentioned
Energy Label Provider	By government interviews: • findable in CRT • needs to be qualified By market interviews: • create an energy label for building • approached by homeowner to get works done • needs to do a lot of research to understand building	By government interviews: • not mentioned By market interviews: • not mentioned
Architect	By government interviews: • findable in CRT By market interviews: • approached by homeowner to get works done • needs to do a lot of research to understand building • connects client with contractor) • can sometimes do project management but expensive • collaboration, depending on project	By government interviews: • By market interviews: • need to be able to trust the quality
Installation Expert	By government interviews: • findable in CRT • deliver the works as asked by the client	By government interviews: • not mentioned By market interviews:

	• currently without any guarantee By market interviews: • contacted to collaborate • All kinds of installations, from electrical to kitchen appliances • Mostly work directly with clients • can be hired by contractor to do works	• Some companies can develop based on the clients' needs • need to be able to trust the quality
Contractor	By government interviews: • findable in CRT • deliver the works as asked by the client • currently without any guarantee By market interviews: • contacted to collaborate • collaboration, depending on project • approached by homeowner to do some works • sometimes lets work be done by other party	By government interviews: • By market interviews: • need to be able to trust the quality • should deliver improved and consistent quality, do more than just what is asked • in theory not parties that can carry out project management
Quality Assurance	By government interviews: • by installQ, NEN, ISSO, to make protocols and guidelines • in the system, executing companies need to be qualified and are also checked by an organisation By market interviews: •	By government interviews: • By market interviews: • need to be able to trust the quality
Financial sector (banks + brokers)	By government interviews: • give advice and support in lending/receiving money to renovate • possibility to get funds in loans or subsidies By market interviews:	By government interviews: • improvement in argumentation rent price By market interviews: • need to ensure this is consistent and reliable

	• during purchase of house, necessary to have inspection and deliver documents • General role to supervise and watch trends in housing market • Have been working on energy renovations for a while • Connect clients to financial means and energy label advisors	
Vereniging Eigen Huis	By government interviews: • Not mentioned By market interviews: • inform members, deliver checklist, come up for their rights, test and advice products	By government interviews: • not mentioned By market interviews: • not sure if VEH should make digital environment
Homeowner	By government interviews: • can view and download RP/EL in MijnOverheid • households under NIP are helped by municipality • other households have their own responsibility to improve their residence By market interviews: • during purchase of house, necessary to have inspection and deliver documents • comes to architect to get works done • needs to define goals, ambitions and budget • Need to have a need/problem that needs to be solved for works to be done or business to start • goes to a contractor or so to get works done • Need to ask for MWA but barely do	By government interviews: • should be able to choose which type of digital environment is best suitable By market interviews: • not mentioned

APPENDIX V: TABLE OF ENERGY RENOVATION BARRIERS

Barrier	Theme	Carried by interview	Solution
Incorrect information in official systems	Data quality	State 1	Over time
Too easy for people to share data	Privacy	State 1. 6	Legal data guidelines by government
Homeowners do not have time	Incentive barrier	State 1	one-stop-shop
Insight is not always relevant and necessary	Level of information	State 1	No, but also not a big problem
Multiple parties rightfully own data	Data ownership	State 1, 6	Legal data guidelines by government
Insufficient regulations about data ownership	Data ownership	State 1, 6	Legal data guidelines by government
Renewing a data management system is juridically complicated	Data ownership	State 1, 13, 6	Legal data guidelines by government
No structure between information providers	System structure	State 1	Legal data guidelines by government
Hard to be inclusive for all buildings	Inclusivity	State 1	BRP is for all buildings
Traceability of building information	Data quality	State 2, 5, Market 7, 12	Digitalisation
Difference in calculated energy use versus actual energy use	Calculation	State 2, Market 4	Modernisation of energy label in 2030
Complicated transition calculation method 2030	Market disruption	State 2	Not yet
Insufficient reasoning for rent based on label	Financial structure	State 2	Out of scope
Lack of clarity by government	Regulation	State 2, 7, 8, 9, 11	Needs vision by government
Quality of energy audits	Quality	State 2	There is a certification system, can be improved
Quality of works done by market parties	Quality	State 2	Not yet
Quality of advice of energy coaches	Quality	State 2	There is a certification system, can be improved
Costs are not material but in labour	Incentive barrier	State 2	Not really a problem

Uncertain purpose of BRP	Regulation	State 3	Needs vision by government
No official ZEB definition yet	Calculation	State 3, Market 4, 11	There is one end of May, definition will only lower in 2030
Owning a BRP does not mean carrying out measures	Incentive barrier	State 3	Not really a problem
Reschooling energy coaches is delayed	Quality	State 3	Over time solves, but still a problem
Policy need to suit all buildings	Regulation	State 3, Market 4	Part of making policy, no direct problem
Actors do not always take their responsibilities	Actors	State 3	Structural thus out of scope
Low threshold to become an energy coach	Quality	State 3	Both a problem (quality) and a solution (easy to become one)
Difference in quality between market parties	Quality	State 3	Not yet
Possible difference in input and output BRP	Calculation	Market 4	Purpose of BRP is that it fits the owner, and there is no one truth
Balance between energy renovation and monumental value	Regulation	Market 4	Too specific for this research, but needs attention
Huge amount of stakeholders in projects	Actors	Market 4, 8	One-stop-shop
Balance between advising for building or owner	Incentive barrier	Market 4	BRP is for owner, but problem during transaction moment
Level of information on BRP	BRP	State 3, Market 4, 7, 11	Not yet
Order of measures in BRP	BRP	State 5	Whole point of BRP
Low urgency for homeowners	Incentive barrier	State 5	Not yet
A lot of prerequisites of getting financial means	Incentive barrier	State 5	One-stop-shop
Policy need to be neutral to technology	Regulation	State 5, Market 11	Part of making policy
Comfort might be more important than sustainability	Incentive barrier	State 5	One-stop-shop
Complicated relationship between quality of works and financial means	Financial structure	State 5	Not yet
Low amount of MWA requested	Incentive barrier	State 6, Market 12	Not yet

Short amount of time for creation BRP	Regulation	State 3, 6	Continuous development
Constant redevelopment necessary	Quality	State 6	Part of making policy
Difference in advice between market parties	Actors	Market 7	Debatable if is this a problem
Technical or juridical restrictions in renovation	Regulation	Market 7	Not yet
Changing or wrong national advices such as post-insulation	Regulation	Market 7, 11	BRP should solve this
Lack of documentation by contractors	Quality	Market 7, 11	Not yet
Contractors do not reason from a clients perspective	Quality	Market 7	Not yet
Clients do not always steer on energy label/use	Incentive barrier	Market 7	Not yet
Clients have a lot of priorities to balance	Incentive barrier	Market 7	Not yet
Sustainability is a political discussion	Incentive barrier	Market 7, 12	Solves over time when obliged by EU/national policy
Fragmentation along construction chain	Actors	Market 8	Structural so out of scope
Door-to-door approach is not fast enough	Scale	Market 8, 12	Not yet
Too many small interventions, but lack of integral plans	Quality	Market 8, 11	BRP should solve this
What people don't know, people don't trust	Incentive barrier	Market 8	one-stop-shop
Lack of technical knowledge amongst clients	Incentive barrier	Market 8	one-stop-shop
Life cycle of certain interventions end before 2050	Calculation	Market 8	BRP should solve this
Energy contracts are very individual/private	Calculation	Market 8, 12	Not yet
Contractors and service providers do not give out guarantees	Quality	Market 8, 11	Not yet
There is no MVP for energy renovation of homeowners	Actors	Market 9	Not yet
Unforeseen risks during execution of interventions	Risks	Market 9	Not yet, is this really a problem?
Geopolitical circumstances	Risks	Market 9	Structural, so out of scope of this research

Lack of insight in trends and developments	Risks	Market 9	Structural, so out of scope of this research
Lack of regulations means lack of market involvement	Continuity	Market 9	Not yet
Differences between areas and neighbourhoods	Continuity	Market 9, State 13	One-stop-shop
Bats and their impact on renovation or insulation methods	Risks	Market 9, State 13	Out of scope of this research
Some markets are not continuous all year round	Continuity	Market 9	Structural, so out of scope of this research
Capacity loss due to changing regulations	Continuity	Market 9	Structural, so out of scope of this research
Risk of entrepreneurship	Risks	Market 9	Structural, so out of scope of this research
Support for energy renovation is insufficient	Incentive barrier	Market 11	Not yet
Lack of maintenance options	Incentive barrier	Market 11	Not yet
Indicated costs can be extremely different from national advices	Incentive barrier	Market 11	Not yet
Information overload for homeowners	Level of information	Market 11	One-stop-shop
Technology develops quick, so unclear when it is the best time to step in	Incentive barrier	Market 11	Structural, so out of scope of this research
Clients do not want to pay for advices	Incentive barrier	Market 12	Not yet
Advices are often too theoretical and not practical	Level of information	Market 12	Not yet
Not every building needs to reach their highest potential, it is about average	Scale	Market 12	Not yet
Clients are hesitant to share data	Data ownership	Market 12	Legal data guidelines by government
Dependency on heat nets	Quality	Market 12	Not yet
Hard to reach the targeted households	Regulation	State 13	Legal data guidelines by government
Alignment between government layers	Actors	State 13	Part of making policy

Sharing information between government layers	Data ownership	State 13	Legal data guidelines by government
No funds to finance all plans and initiatives	Financial structure	State 13	Not yet
Lack of clarity for some specific measures	Regulation	State 13	Part of making policy

APPENDIX VI: TABLE OF POSSIBLE POLICY INSTRUMENTS

(C) Communication

(J) Jurisdictional

(S-R) Self-Regulation

(F) Financial

(O) Organisational

(S-I) Supporting Instrument

Policy Instrument:	**Description**	**Suitability**
Communication		
Administrative consultation	Board consultation takes place between the highest-ranking executives of organizations. Information is exchanged during the consultation. An attempt is made to reach a consensus and broaden support. In this way, board consultation can lead to agreements. Furthermore, it ensures transparency, trust, and good governance relations. Board consultation also prevents disagreement between boards.	**Yes**, can be organised between boards of various initiatives to determine the purpose of the BRP. But time-consuming. Similar concept to this research
Feedback	With feedback, the government can prepare people for behavioural change and ensure that they want to change their behaviour. Sometimes, feedback can be given immediately during or right after the behaviour.	Not really, the Renovation Passport already is an instrument to give feedback. Can be negative, and costly.
Environmental stimulus	Environmental stimuli are things that happen in your environment that you see, hear, smell, or feel. Environmental stimuli are also known as ‘cues’. They appeal to unconscious mental processes and trigger specific behaviour. Therefore, you can influence people's behaviour using environmental stimuli.	Not really. It is good for those who are still unaware of energy renovations in general, but not specific to BRP. Using a BRP is very conscious and precise.
General informing	With general education, you actively provide information without targeting a specific group. The goal of general education is to influence knowledge, attitudes, and/or behaviour, or to raise awareness. There is also specific education, where you do target a particular group.	**Maybe**. There is already a lot of information out there about energy renovations, but little about BRPs specifically.

Policy Instrument: Jurisdictional	Description	Suitability
Arbitration	Arbitration is a form of private adjudication in which a dispute is decided by one or more arbitrators. It is an alternative to state judicial proceedings. Arbitration is regulated by law in Book Four of the Code of Civil Procedure (Rv) (Articles 1020 et seq. Rv). This regulation contains, among other things, safeguards for the organization of an arbitration and for the challenging of an arbitral award.	Not al all
Policy Rules	Policy rules can be used to further elaborate on an existing administrative power, provided that the power in question allows the administrative body the discretion to determine how to exercise it. The statutory provision granting the power then, for example, leaves room for discretion or is formulated in a manner that allows for multiple interpretations. By drafting policy rules, the administrative body ensures systematicity and consistency in the exercise of the power.	**Yes**, this is required in all cases. Will require further research as there are a lot of possibilities.
Enforcement and sanctions	Violation of the rules can lead to sanctions, or punishment. The basis for this lies, among other things, in criminal law. In addition, there may also be administrative enforcement and sanctions. It is even possible that you are punished under both criminal and administrative law for the same offense.	Not al all
Covenant	By drafting a covenant, a problem is addressed in collaboration with other parties. The parties are treated as equals in this process. A covenant can be entered into with companies, interest groups, or other government organizations. A covenant aims to ensure that all parties are involved in the solution to the problem. This is achieved by the fact that entering into a covenant is voluntary and by holding consultations regarding the agreements contained within the covenant. The government attempts to place the initiative for solving the problem with the responsible parties.	**Yes**, this would work well in combination with administrative consultation

Protocol	A protocol regulates how to act in specific situations. Often, a protocol is an elaboration of a code of conduct. This elaboration is usually very precise and clear. As a result, a protocol is often more decisive than a code of conduct. A protocol is often aimed at policy implementers. Protocols can be used in a wide variety of situations. It is beneficial to draw up a protocol, as its use can lead to lower implementation and enforcement costs and less government regulation.	Needed later in the system, but not currently for the initial implementation of the BRP.
Right to Challenge	With a 'Right to Challenge' provision, you establish the possibility in legislation to grant an exemption or waiver from the rules. This is possible if one wishes to and is able to achieve the objective of that regulation in a manner other than prescribed. In this way, technical and innovative developments are given a chance without the rules having to be immediately adapted to them.	Not really since in the as-is situation, there are little rules or obligations anyways.
Permit	A permit is a decision that authorizes certain activities or actions that would not be permitted without it. The permit is a tool widely used to achieve public objectives and protect the public interest. By granting permits, an administrative body can therefore regulate activities or actions that are acceptable but would not be permitted without the permit. A permit system is particularly suitable when providing general standards is insufficient for carrying out activities or actions, but where admissibility must be assessed on a case-by-case basis. Conversely, a permit system should essentially only be introduced if general legislation or regulations are insufficient to achieve the policy objective.	Not at all

Policy Instrument: Self-Regulation	Description	Suitability
Benchmarking	Benchmarking involves comparing the performance of various companies or organizations. This allows them to compare themselves with one another. As a result, the quality of organizations improves.	**Yes**, but not in this early phase of implementation.
Professional regulation	Professional regulation imposes requirements on specific professions or positions. In the General Act on the Recognition of EU Professional Qualifications, a regulated profession is defined as a 'professional activity or set of professional activities for which access thereto or the exercise thereof, including the use of a professional title, is made directly or indirectly dependent by or pursuant to law on the possession of specific professional qualifications'. Professional regulation must therefore be contained in legislation or regulations.	**Maybe**, seems heavy and political, but has significant potential.
Conformity assessment	Conformity assessment and accreditation provide insight into the quality of products and services, even when this is not immediately apparent. The system of conformity assessment and accreditation helps build confidence in the quality and safety of products and services. This insight facilitates (international) trade and contributes to the proper functioning of markets.	Already exists in the system of BRP, but improvements can be made.
Accreditation	An accreditation scheme is a system used to verify whether a company's activities meet certain conditions. If it meets these requirements, the company may call itself 'accredited'. Accreditation allows a company to stand out compared to competitors.	Already exists in the system of BRP, but improvements can be made.
Code of conduct	A code of conduct is a tool for regulating behaviour in organizations or within a professional group. It is a document containing norms, values, and rules that apply to the entire organization or professional group. A code of conduct can assist in the implementation of policy. Furthermore, a code of conduct is quicker to draft than laws and regulations and helps the government establish what is	**Yes**, but feasibility might be hard and this has a very top-down approach.

	considered normal practice in the industry.	
Certification	A quality mark is a logo on a product. It is an image that provides information about the quality.	Already exists in the system of BRP, but improvements can be made.
Standardization	Standardization is the creation of standards: agreements regarding products, services, or processes. If the standardization process between the various stakeholders is guided by a national standardization body designated by the government, we call the process standardization and the result a standard. The Dutch standardization body is NEN, the Royal Netherlands Standardization Institute. It connects stakeholders and supports the process by which widely accepted agreements are recorded in a standard.	Already exists in the system of BRP, but improvements can be made.
Standard regulation	A standard regulation provides supplementary rules for specific types of agreements within a particular industry or profession. Unlike general terms and conditions, a standard regulation applies by operation of law.	Already exists in the system of BRP, but improvements can be made.
Visitation	Visitation is the assessment by experts in a specific sector of each other's working methods. In some sectors, visitation is used to safeguard the quality of work. Visitation is primarily applied in public administration, the medical sector, and higher education. During visitation, a committee of colleagues appointed for this purpose by an independent party visits other colleagues in the sector. The members of this sector committee are independent.	Already exists in the system of BRP, but improvements can be made.
Obligations	The government can impose obligations on citizens and businesses. However, a sector or professional group can also impose obligations on itself. This is referred to as ‘self-regulation’. The government can assist citizens, businesses, and civil society organizations in taking such initiatives, but can also bring parties together for this purpose. They can then take initiatives together to solve societal challenges.	Maybe like the energy label, but not this early in the implementation phase

Policy Instrument:	Description	Suitability
Financial		
Financial Incentive	With a financial incentive, you can steer the choice of a specific target group in the right direction because you change the costs and benefits of various choices. There are different types of financial incentives, such as taxes, excise duties, personal contributions, and financing levies.	**Maybe**, but the most important problem for BRPs is not costs or money. Takes effort still.
Subsidy	Subsidies are useful when the government wants to encourage specific behavior or activities. This concerns activities that would otherwise not be undertaken because the expected costs are too high. By providing a subsidy, the government can persuade citizens or businesses to carry out the activity after all.	Maybe, but the most important problem for BRPs is not costs or money. Takes effort still.
Voucher	A voucher is a subsidy in the form of a credit note for a monetary amount or a service. You receive the voucher if you meet certain conditions. A voucher is a tool to steer demand. The market is hardly disrupted by this. However, a voucher can address a lack of information for the consumer.	Maybe, but the most important problem for BRPs is not costs or money. Takes effort still.

Policy Instrument:	Description	Suitability
Organisation		
Attribution	Attribution is a form of allocation of powers whereby a power that did not previously exist is created and granted to an administrative body. In principle, any government body with regulatory powers can attribute a power to another government body.	No, too heavy for just the BRP.
Decentralisation	If tasks can be performed in an efficient and effective manner by the boards of provinces, municipalities, or water authorities, they should not be carried out by the central government. And tasks that can be performed by the boards of municipalities or water authorities should not be assigned to the boards of provinces.	**Yes**, municipalities might be more effective in stimulating use of BRPs.
Supervision of Decentralisation	With the decentralization of tasks, one might wonder how this is supervised. With	Needed if decentralised

	the Generic Supervision Revitalization Act, most specific supervision arrangements have been abolished and replaced by generic supervision. This is the starting point for new policy. This means that if supervision is required, it is carried out in a 'generic' manner by the next administrative level. For example, the province supervises the municipality, unless the province lacks sufficient knowledge regarding this subject.	
Delegation	Delegation is a form of allocation of powers whereby an existing administrative power is transferred by one administrative body (the delegator) to another administrative body (the delegatee). The delegatee subsequently exercises the power under his or her own responsibility.	No, too heavy for just the BRP.
Autonomisation	Autonomisation can take various forms. These forms are also referred to as 'institutions at a distance from the State'. A distinction can be made between autonomisation in the legal field and autonomisation in the economic/administrative field.	No, too heavy for just the BRP.
Mandate	Granting a mandate entails that an administrative body (the mandator) authorizes another party (the mandated party) to exercise a power in the name of (and under the responsibility of) the administrative body. The administrative body has acquired the power through attribution or delegation, but thereby has the task in question performed by another party. Decisions of the authorized party are considered a decision of the mandating administrative body.	No, too heavy for just the BRP.
Privatization	Privatization involves the sale of a government organization, service, or company to a private sector market party. In the case of a state participation, the shares are sold directly or traded on the stock exchange. In the event of a partial sale of shares, this does not actually constitute privatization. It remains a state participation.	No, too heavy for just the BRP.

Policy Instrument: Supporting Instrument	Description	Suitability
Experiment	An experiment or pilot can be used to test whether, how, and to what extent a specific policy intervention—for example, newly introduced legislation or regulations, or an amendment to existing regulations—contributes to solving a particular societal problem.	**Yes**, sounds like a good option, but make clear what is the aim and means of experiment
Memorandum of Understanding (MoU)	A Memorandum of Understanding (MoU) is an international written policy agreement that is not legally binding on the participants. Agreements that can be laid down in an MoU include, for example, practical working arrangements and letters of intent. An MoU is not legally binding, but merely politically and morally binding on the participants. To make it clear that this is not a treaty, treaty language, such as 'article' and 'party', should be avoided.	Maybe, interesting for Member States but not in this phase.
Nature-based Solutions (NbS)	Nature-based Solutions (NbS) are multifunctional solutions that can address diverse societal challenges simultaneously by utilizing nature, while at the same time improving nature. An example of an NbS is a green vegetated roof, which retains rainwater longer, reduces heat stress, and is beneficial for birds and insects. In this way, the risk of flooding is reduced, the living environment is improved, and biodiversity benefits from the implementation of a single green solution.	No, intention is maybe comparable but instrument is not.
Transitional Law	Transitional law regulates the relationship between the new law and the existing legal situation. Both a new law and an amendment to a law may result in a change to the existing legal situation. Therefore, when creating new policy or drafting new rules, you must consider the consequences for the existing legal situation in a timely manner (see Article 5.59 for further details). If those consequences cannot be made known to those involved in time and the entry into force cannot be postponed to allow those involved time to prepare for the new legal situation, you may take measures in the form of transitional law.	Not now but **definitely** needed around 2030 with the modernisation of energy label methodology.
Supervision	Supervision involves gathering information regarding whether an action or matter complies with the applicable requirements.	**Yes**, bare minimum

	Subsequently, the information is assessed, and intervention can be taken if necessary.

APPENDIX VII: TABLE OF RECOMMENDED POLICY INSTRUMENTS

Barrier	Policy Instruments or Solutions	Explanation
High upfront costs	Experiment + financial incentives	The high upfront costs (more than monetary) are the biggest barriers for homeowners to renovate and assumably for. With the experiment, a group will get the BRP for free, with lower efforts (only audit takes some time)
Other priorities than energy renovations	Experiment + financial incentives Possibly later obligation	The high upfront costs (more than monetary) are the biggest barriers for homeowners to renovate and assumably for. With the experiment, a group will get the BRP for free, with lower efforts (only audit takes some time)
Lack of technical knowledge and readability of advice	General Information	Though the design of the BRP might also be questioned, the only way to improve knowledge about the BRP is to provide information through various channels.
Lack of clear business model	Experiment + financial incentives Decentralisation Supervision of decentralisation Possibly later obligation	In this early stage, there is no MVP yet; by experimenting with the new BRP on local level, best practices can be found in order to find a feasible business model.
Transaction moments	Policy Rules	Some rules might be needed to find a suitable moment for the BRP to exist in the transaction process.
Inconsistent and unclear policies by national government	Policy Rules Supervision	It is the government's duty to improve their policy and create a long-term and consistent vision, now specifically for the energy label and BRP
Modernisation of energy labels in 2030	Transitional Law	It is the government's duty to improve their policy and create a long-term and consistent vision, now specifically for the energy label and BRP. The modernisation requires additional law, as it is expected to have a huge impact on the market.
Lack of educated energy advisors	Experiment + Financial incentives	

Lack of collaboration between market parties	Administrative consultation and covenant	The collaboration between different market parties of the construction sector needs to be improved. By making agreements on a national bond level, the aim is to reach all companies to improve the collaboration. Might require further digitalisation.
Lack of qualitative execution	Improved • Conformity Assessment • Accreditation • Certification • Standardization • Standard Regulation • Visitation Possibly later Benchmarking, Code of Conduct	Results show that the current methodology of certification and standardization might not be sufficient to guarantee the quality of both energy advice and execution of the works. This might need additional policy support by benchmarking or a code of conduct, which could follow the previously mentioned covenant.
Lack of correct documentation	Administrative consultation and covenant, policy rules	This problem is relevant for much more topics than just the BRP, are guidelines when it comes to having legal rights of data, and how data accessibility and privacy should be captured into these guidelines. Collaboration throughout the sector is necessary to agree on these guidelines.
Lack of guarantee and maintenance options	Improved • Conformity Assessment • Accreditation • Certification • Standardization • Standard Regulation • Visitation Possibly later Benchmarking, Code of Conduct	Results show that the current methodology of certification and standardization might not be sufficient to guarantee the quality of both energy advice and execution of the works. This might need additional policy support by benchmarking or a code of conduct, which could follow the previously mentioned covenant.