Building-Bound Financing for Owner Occupiers within Condominium Associations in the Netherlands

An ex-ante policy analysis

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The Dutch government has set the goal for the Dutch housing stock to be independent of gas by 2050. The funding for the needed energy efficiency retrofits is a bottleneck in the process. Owner occupiers within condominium associations come across many barriers in the application process for funding. One of which is the lack of a well suited funding mechanism. If implemented right, building-bound financing can be the solution to the funding problems. Seeing as it is a non-existing type of funding. The following research question was used: *What is needed for building-bound financing to be an operable funding for owner occupiers in Dutch condominium associations to support energy performance retrofits?* With use of the Governance Assessment Tool and a stakeholder analysis, the current situation of condominium associations with respect to sustainability policy and funding are analysed. From there backcasting is used to depict what changes are needed for successful implementation of building-bound financing for owner occupiers in condominiums. A institutional structure along with a list of coordination problems is provided, to depict what is has to be arranged for building-bound financing. It was found that the problem entails more than a new funding mechanisms is able to solve. Furthermore, it was found that an opt-out option for funding is also an option for the problem. Further research is needed into the operation of the structure and the societal support for it.

Keywords: Housing, Sustainability, Condominium Associations, Building-Bound Financing, Exploratory

1. INTRODUCTION

With the adoption of the Kyoto protocol the first step to slow down global warming was taken (UNFCCC, 1998). The little impact of the protocol resulted in the origin of the Paris agreement, wherein drastic cuts in fossil fuel use are prompted (UNFCCC, 2016). In the Netherlands, the large majority of the approximately 7 million dwellings is making use of natural gas (Sociaal-Economische Raad, 2018b, p. 30). By 2050 the use of natural gas has to be reduced to nearly zero (Ministerie van Economische Zaken, 2016). The Dutch housing stock is in need of an increased performance to be able to eliminate natural gas. However, the majority of households is not affluent enough to invest in the modifications needed for increased performance (Prins & De Boeck, 2018). Funding is required to reach the 2050 goal within the Dutch housing stock.

One seventh of the Dutch housing stock consists of condominiums: buildings with multiple dwellings owners and a joint responsibility for the shell and common areas (CBS, 2016). The owners are by law member of a condominium association (CA) (art. 125 sec. 2 BW Boek 5), which has an annually meeting for decision making with respect to the common areas. The joint responsibility affects the process to increase the performance of the building (Van der Waals, 2015). Moreover, funding is often the bottleneck in that process (Boendermaker et al., 2018; Paradies et al., 2017; Van der Waals, 2015). Although there are existing funding tools to fund energy efficiency retrofits (ACE Retroffiting, 2018), these are not intended for or used by condominium associations (Van der Waals, 2015). There are several types of barriers at the basis of the few energy efficiency retrofits of condominiums

(Buessler, Badariotti, & Weber, 2017; D'Oca et al., 2018):

- Economic-financial barriers
- Social-behavioural barriers
- Organizational barriers

The availability of resources, the multiplicity of owner types and expected time of residents are commonly mentioned barriers connected to the abovementioned types of barriers.

Building-bound financing is proposed by the Dutch government as a new funding tool (Sociaal-Economische Raad, 2018a). The mechanism of building-bound financing (BBF) is different to existing funding (e.g. loans, mortgages). Where the contractual arrangements are normally tied to a the owner-occupier or legal person, BBF is linked to (a part of) the building. When the building is sold, the instalments of the residual debt are transferred to the new occupant (Energiesprong, 2015; Stroomversnelling, 2018). Building-bound financing has not been implemented in the Netherlands and is intended for singular dwellings. However, it may be a solution for the existing funding problematic of condominium associations. Seeing as existing funding is lacking and it is able to surpass the time of residence of owner occupiers.

Little scientific literature was found on energy efficiency retrofits of condominium associations in the Netherlands as well as building-bound financing. Therefore there is a scientific and societal need to explore how building-bound financing can be implemented to fund owner occupiers within condominiums and what boundary conditions need to be in place.

What is needed for building-bound financing to be an operable funding for owner occupiers in Dutch condominium associations to support energy performance retrofits?

Section 2 will elaborate on the methodology used in this research, which is a combination of backcasting analysis with the Governance Assessment Tool. Subsequently, the research design is explicated in section 3. In section 4 the results of the backcasting analysis will be provided, along with a policy implication on to depict the changes needed for building-bound financing to be an operable funding mechanisms for energy efficiency retrofit of condominium associations. A discussion on the results in section 5 is followed by a conclusion and recommendations are provided in section 6.

2. THEORETICAL FRAMEWORK

Backcasting is used to depict the roadmap towards the use of building-bound financing by the owner occupiers in condominiums. Vergragt and Quist (2011) have used the definition "generating a desirable future, and then looking backwards from that future to the present in order to strategize and to plan how it could be achieved" (p. 747). By knowing the desired future and the current starting point, it is possible to trace back what steps need to be taken to arrive at the desired future. It further stipulates the challenges that need to be overcome at each step to reach the goal (Figure 1).

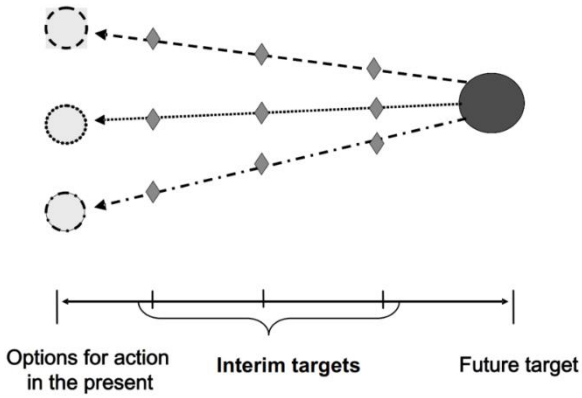

Figure 1 - Backcasting (Kosow & Gaßner, 2008, p. 82)

In essence, backcasting is a reflexive and iterative methodology, the outcome will not act as the singular path (Vergragt & Quist, 2011). It can be used to learn about barriers and incentives, the change agents and how to make a future vision more

attractive and resilient. Furthermore, it allows for involved stakeholders to get a better understanding about the gains and possible side effects of a future vision (Quist, 2013).

The methodological framework for backcasting is comprised of five steps (Figure 2). Although the stepwise approach implies a linear process, in execution it is an iterative process (Quist, 2013). Moreover, the process is multi-/transdisciplinary, so the varying perspectives from multiple stakeholders are involved. To be able to systematically gather the information needed for step 1 and 2, the Governance Assessment Tool (Bressers, Bressers, Kuks, & Larrue, 2016) and stakeholder analysis are used. The Governance Assessment Tool is used to systematically describe what the five dimensions of governance contain within the given context (Bressers et al., 2016):

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

A set of questions are developed to guide analysis of policy and other archival documents and can be used as input for the conduct and analysis of qualitative interviews (Appendix A). With the GAT, it is possible to research whether a governance context is restrictive or supportive when implementing policies or projects. The quality of the governance regime is assessed at the hand of four quality criteria (Bressers et al., 2016, p. 56):

- Extent: are all elements in the five dimensions that are relevant for the sector or project that is focused on taken into account?
- Coherence: are the elements in the dimensions of governance reinforcing rather than contradicting each other?
- Flexibility: are multiple roads to the goals, depending on opportunities and threats as they arise, permitted and supported?
- Intensity: how strongly do the elements in the dimensions of governance urge changes in the status quo or in current developments?

Step 1: Strategic problem orientation
Setting demands and basic assumptions
System and regime analysis
Stakeholder analysis
Problem and trend analysis
Socio-technical mapping
Step 2: Generating future visions
Idea articulation and elaboration
Generation of multiple perspectives
Creative techniques
Step 3: Backcasting analysis
WHAT-WHO-HOW analysis: technological, cultural-behavioral, organizational, and structural-institutional changes
Stakeholder identification: required stakeholders and actions
Drivers and barriers analysis
Step 4: Elaboration and define follow-up agenda
Scenario elaboration (turning vision into quantified scenario)
Scenario sustainability analysis
Generation of follow-agenda
Transition pathway
Step 5: Embed results and stimulate follow-up
Dissemination of results and policy recommendations
Generation of follow-up proposals
Stakeholder meetings

Figure 2 - Five steps of backcasting (Quist, 2013, p. 768)

Subsequently the backcasting analysis is done. It will depict what has to change with respect to the present situation, to be able to reach the desired future. After the required changes are depicted, policy implication can be provided to stakeholders and follow-up proposals can be delineated.

3. RESEARCH DESIGN AND METHODOLOGY

Seeing the lack of academic background connected to the research problem, an exploratory research design is executed. Exploratory research "tends to tackle new problems on which little or no previous research has been done" (Brown, 2006, as cited in Dudovskiy, n.d.). Exploratory research is meant to explore the research question, and does not necessarily converge into a final and conclusive solution. Implied in exploratory research is the

willingness of the researcher to change direction, as a consequence of new data and new insights (Saunders, Lewis & Thornhill, 2012, cited in Dudovskiy, n.d.).

DATA GATHERING

Data gathering is done at the hand of desk research and semi-structured interviews. With desk research relevant secondary data is sought, analysed and evaluated. To come across state-of-art data, not only academic literature is used as a source. Especially given the small amount of relevant academic literature, a deviation to other sources is required. During the timespan of the research the Dutch government, its affiliated bodies and independent research institutes have released a number of new (policy) documents. These have been incorporated in the research, according to the exploratory nature of the research.

Semi-structured interviews (SSI) are used to gather information from the field. Adams (2015, p. 493) mentions that while talking with one respondent at a time, the SSI employs a blend of closed- and open-ended questions, accompanied by follow-up why or how questions. Through this more open dialogue, totally unforeseen issues may arise. Two underlying principles should be taken into account in a SSI (Zorn, 2008):

1. Strive to avoid leading the interview or imposing meanings
2. Strive to create relaxed, comfortable conversation

For these interviews, a number of experts on the various types of stakeholders are queried. These experts are able to give insights in the evaluative criteria of the stakeholder groups in the decision making process of building-bound financing. A group of professionals from different fields will need to be interviewed for a broad informational input. To consolidate the findings, the job affiliation of the professionals will also vary. Academic, umbrella organizational and practice oriented professionals will form a sound mix for informational input in the backcasting process. The field of work of these professionals are all in line with or affiliated with the projected research topic.

DATA ANALYSIS

The interviews are analysed according to iterative analysis, a type of qualitative data analysis closely related to grounded theory (Tracy, 2013). The difference lies in the way the research is approached. Grounded theory originates from data, where iterative analysis alternates between new (qualitative) data and existing models, explanations and theories (Tracy, 2013, p. 184). With use of codes, the interviews are analysed systematically. Tracy (2013) defines codes as “words or short phrases that capture a summative, salient, essence-capturing, and/or evocative attribute for […] language-based or visual data” (p. 189). Iterative data analysis has multiple coding levels. The first-level codes are descriptive of nature, where striking notions are observed and labelled. The first-level codes are derived from the findings in the introduction (section 1). From there the second-level codes are incorporated, these codes are more clearly focussed on overarching themes by being based on the initial literature review (section 1.4.) and step 3 of the backcasting process (section 2.4.3.), which have provided a few overarching themes derived from the barriers, changes and drivers:

- Organizational
- Structural-institutional
- Cultural-behavioural

Tracy (2013, p. 194) mentions that these codes can be denoted as the analytic and interpretive codes. Meanwhile the researcher is able to begin with identifying patterns or groupings of codes within the data, a process called axial coding (Tracy, 2013, p. 195). By doing so, the fractured information is reassembled. In line with the iterative nature, while

analysing the codes can be split, put together and new codes can be appointed (Tubbing, 2019). Lastly the findings need to be synthesized into meaningful finding for the research.

The interviews have been analysed as described above with use of atlas.ti, a software package that is made to execute the analysis explained above. With use of this qualitative data analysis software the interviews can be systematically dissected into scientifically useful parts (Atlas.ti, n.d.). Atlas.ti is an user-friendly, widely used qualitative data-analysis tool (Tubbing, 2019). Furthermore, the aggregated quotations in Atlas.ti have been manually analysed in a later stage, to depict correspondence to the governance dimensions (levels and scales; actors and networks; problem perspectives and goal ambitions; strategies and instruments; responsibilities and resources) and quality criteria (extent, coherence, flexibility, intensity). The Governance Assessment Tool (Bressers et al., 2016) was later on embedded in the research, and was therefore not initially incorporated in the interview analysis. Moreover, the interviews were meant to get insights from the stakeholders perspectives, not the governance context in total. Albeit the stakeholders perspectives are nested into the governance context, which resulted in the posterior manual analysis with use of the Governance Assessment Tool.

4. RESULTS

In this section the results of the research are demonstrated. First the governance regime surrounding energy efficiency policies for condominiums is assessed. To depict the governance structure wherein building-bound financing is implemented. Subsequently the coordination problems within condominium associations are depicted, to display the difficulties condominium associations currently have with the application for existing funding mechanisms. Lastly backcasting is used to delineate the steps needed for successful implementation of building-bound financing for owner occupiers in condominium associations.

ENERGY EFFICIENCY GOVERNANCE OF CONDOMINIUMS

Dutch governmental policy to amplify the amount of energy performance retrofits of condominiums is limited. There is a need of improvement, to be able to reach the 2050 goal of 95% CO_2 reduction in the Dutch housing stock (Table 1). Due to the existing governance structure along with the ongoing privatisation, the Netherlands is experienced in multi-level governance and (private party) stakeholder inclusion. However, due to an underrepresentation of the problem owners (CAs) in the policy goals of the National government, condominium specific policy is missing.

Table 1 - Governance assessment of policy to amplify the amount energy efficiency retrofits of condominiums[1]

	Qualitiy of the governance regime			
Governance dimension	Extent	Coherence	Flexibility	Intesity
Levels and scales	+	0	+	0
Problem perspectives and goal ambitions	0	0	+	-
Strategies and instruments	0	0	+	0
Actors and networks	+	0	0	+
Responsibilities and resources	-	0	+	0

According to the IBP, the Dutch government is willing to improve collaboration between levels. Furthermore, the way the Dutch government is built up they are capable to switch between layers. The pilots executed on a local level could therefore be deployed on a national level, if proven successful. Not only the pilots initiated by national government

[1] + = good quality, 0 = intermediate quality, - = poor quality

can be scaled up, also the bottom up pilots have the possibility to do so. Capacity problems of municipalities can be a bottleneck for upscaling, which is the root of regional partnerships. Moreover, the political context can be a threat for execution of national policy on a local level and should therefore be monitored. Certainly seen the lack of trust that is experienced between the various tiers of government. Contrarily, there is willingness to cooperate in making the housing stock energy efficient, so there is a joint agenda and purpose to build upon.

The understanding of the condominium specific problems has to be incorporated into the goal ambitions of national policy. Furthermore, the lack of clarity from the governmental side makes condominium associations hesitant, the lack of a clear role division is in the way of action by the condominium associations. The responsibilities between the govermental tiers are in need of better allocation.

Many strategies and instruments are generic, they are not specifically meant to incentivise condominium associations. The Climate Agreement has just two sections specifically meant for CAs, both policy measures are energy performance retrofit funding mechanisms. However, both are expected to be promising funding mechanisms, the duration of the NEF has been extended to 30 years and the Heat fund is specifically meant for the less affluent people. On the contrary, the condominiums with less than 10 apartment rights are not able to make use of them. Aside from national policy, on a local level municipalities are experimenting with the physical improvement of the housing stock and information clustering (ACE Retrofitting[2]). They try to fill in the gap with respect to the need for better, objective informational sources. Information on energy performance retrofits and the processes surrounding it is shattered, and not to be trusted fully. Therewithal, smoothening decision-making of condominium associations is not incorporated in the strategy of the national government, although D66 has tried to put it on the political agenda. If a municipality would become able to impose an obligation onto a condominium association to perform energy performance retrofits, decision-making within condominium associations would become less of an issue.

Lastly, the resources are not sufficient to stimulate a full-blown transition within the condominium housing stock. However, funds like the NEF have not been exhausted yet. If those funds do get exhausted, it is expected that the financial institutions will supplement them. Certainly seen the willingness of BNG to be an investor of the NEF, while not being an investor now. The Dutch government is limited in this respect, they are legally restricted to influence the market. Allocation of too much monetary resources will constitute to state aid, which is monitored by the European Commission.

BARRIERS AND DRIVERS OF CONDOMINIUM ASSOCIATIONS FOR SUSTAINABLE DEVELOPMENT

The four internal stakeholders [3] formed the perspectives from where the barriers and drivers were looked into. However, not only the internal barriers and drivers were found, the government and commercial property managers affect the condominium associations. Prior research (see Buessler et al., 2017) was found which had looked into the CAs and owner occupiers with respect to sustainability measures, but a research from a broader perspective was missing.

[2] European Interreg program

[3] 1) condominium associations, 2) Owner occupiers, 3) Housing associations, 4) Commercial landlords

In the Netherlands only 4 per cent of the condominiums has undergone an energy performance retrofit. The barriers and drivers that were uncovered during the interviews are clustered in APPENDIX B. Decision-making forms a major barrier, but that barrier is fed by the different background and interests of the three types of owners within condominium associations. Each has a different goal they are trying to reach with their property. The focus of owner occupiers is on personal comfort, housing associations have a commercial and a social view and commercial landlords are profit oriented. Furthermore, the government is little concerned with CAs and the service of commercial property managers is limited financially.

These barriers and drivers have to be taken into account when implementing new policy that is meant to stimulate condominium associations to perform energy performance retrofits. Although the lack of financial resources is part of the problem, Table 3 shows the financial side is not the only cause of the little involvement of condominium associations with energy performance improvements of their condominium.

FUNDING PROBLEMS OF CONDOMINIUM ASSOCIATIONS

The application for funding is gravely hampered by the decision-making within condominium associations. Applying for funding is not in the mindset of CAs. Furthermore, the characteristics of the three types of owners do not correspond well with each other and the condominium associations regulations do not incorporate these differences well. Due to the different perspectives the owners bring into the decision-making process, the process itself becomes lengthy and often decisions about funding are postponed or counteracted. Furthermore, external stakeholders are not stimulating the condominium associations to apply for loans. All the influential characteristics have been summarized in APPENDIX C.

In the decision-making process, a major barrier is the ability of housing association and commercial landlords to obtain loans on favourable terms via their own channels. The owner occupiers are not able to join in those loans and have to arrange the investment differently. In case of a mixed condominium these funding schemes raise more difficulties. If the owner occupiers are willing to apply for a loan via the condominium association, the housing association will often not join in the loan. But due to the joint and several liability, the housing association would still be responsible for payment of the loan. Seeing as their funding via the sectoral banks is cheap, they are not eager to be held accountable for the extra costs the loan for the CA brings along. Even more so, due to the close monitoring of the Aw/WSW, which limits the financial capabilities of housing associations. The possibility to opt-out is not regulated, which frustrates funding application for the condominium associations of mixed condominiums. However, also for condominium associations fully consisting of owner occupiers the application for funding is not business as usual. For instance, the NEF is barely used by CAs in general, although the preconditions are advantageous. Part of that problem lies with the average size of non-mixed condominiums, which is 5 dwellings per condominium. The NEF demands a minimum of 10 dwellings per condominium. Most dwellings in those non-mixed condominiums are owned by owner occupiers, but they are not able to apply for NEF funding. So, among other factors, mixed condominium associations are hampered by the owner type difference and non-mixed condominium associations are hampered due to their size.

The risk averse behaviour of financial institutions is a bottle neck for the less affluent owner occupiers. Seeing as the interest rates go up, when the risk is

high. Which is seen as socially unfair, seeing as the people with the lowest disposable income will cumulatively amount for the highest costs that way. Thereby less affluent owner occupiers will not be tempted to take out a loan, due to the high costs.

BUILDING-BOUND FINANCING FOR OWNER OCCUPIERS IN CONDOMINIUMS

For successful implementation of building-bound financing, there are some key elements that have to be taken into account. These elements will be described here, along with the possible pitfalls. Furthermore, an elaboration is given on how the proposed funding scheme is able to balance out the factors that have been marked as part of the problem in the prior parts of this study.

INSTITUTIONAL STRUCTURE OF BUILDING-BOUND FINANCING

Figure 3 depicts the possible institutional structure in which building-bound financing could be implemented. The ability of a municipality that provides funding is fused with the providence of information on the type of improvements needed on a building level, due to the objective character of municipalities. This combination results in a single access point for information and funding, that is perceived as reliable. Besides, the funding and energy performance savings can be better aligned to each other. Seeing as there is less information lost compared to a situation where different institutions are responsible for information and funding. Furthermore, the neighbourhood focussed approach can be incorporated into the information provided to the condominiums, therefore there is clarity in what the government is expecting of the condominium associations.

To ensure efficiency, it is of importance to have a joint database to provide information from. With a joint database, a capacity problem for the municipalities is diverted in a way similar to the regional partnerships. The same goes for the funding part of the service. To ensure a contribution of financial institutions, a large-scale solution can be provided. Moreover, the lack of a structural national solution is why some municipalities have started to act on their own already.

A joint trust fund can be used as a collective means to provide the upfront payment from. To also divert a capacity problem at the funding side of the solution, a guarantee fund is advised. Seeing as most municipalities do not have the monetary capacity as well as organizational capacity to handle guarantees for building-bound financing. The guarantee fund is responsible for the assessment of the guarantee needed for the proposed energy performance retrofit, which is a similar assessment the WSW does for investments of housing associations (section 5.2.3.). The guarantee fund is the stakeholder that will provide a go or a no-go for funding within this structure. If the guarantee fund does not approve on the energy performance retrofit funding, the retrofit plan has to be revised or the condominium association has to improve its overall performance. If the guarantee fund approves of the energy performance retrofit, the trust fund transfers the money directly to the construction company responsible for the retrofit.

The moment the payment is approved on, the owner occupiers are in debt. There repayment runs through the municipality via a tax. It is advised to design a new tax for building-bound financing, as betterment levy and property tax are not meant for the repayment of a voluntary debt. One of the key features the tax must contain, is its transferability to new owners in case of a change of owners. The new owners should not be able to reject the residual debt. To create transparency, a notarial deed registered in public registers is able to ensure the residual debt is known at the moment of transfer. Transferability is a key feature of building-bound financing, therefore it has to be arranged.

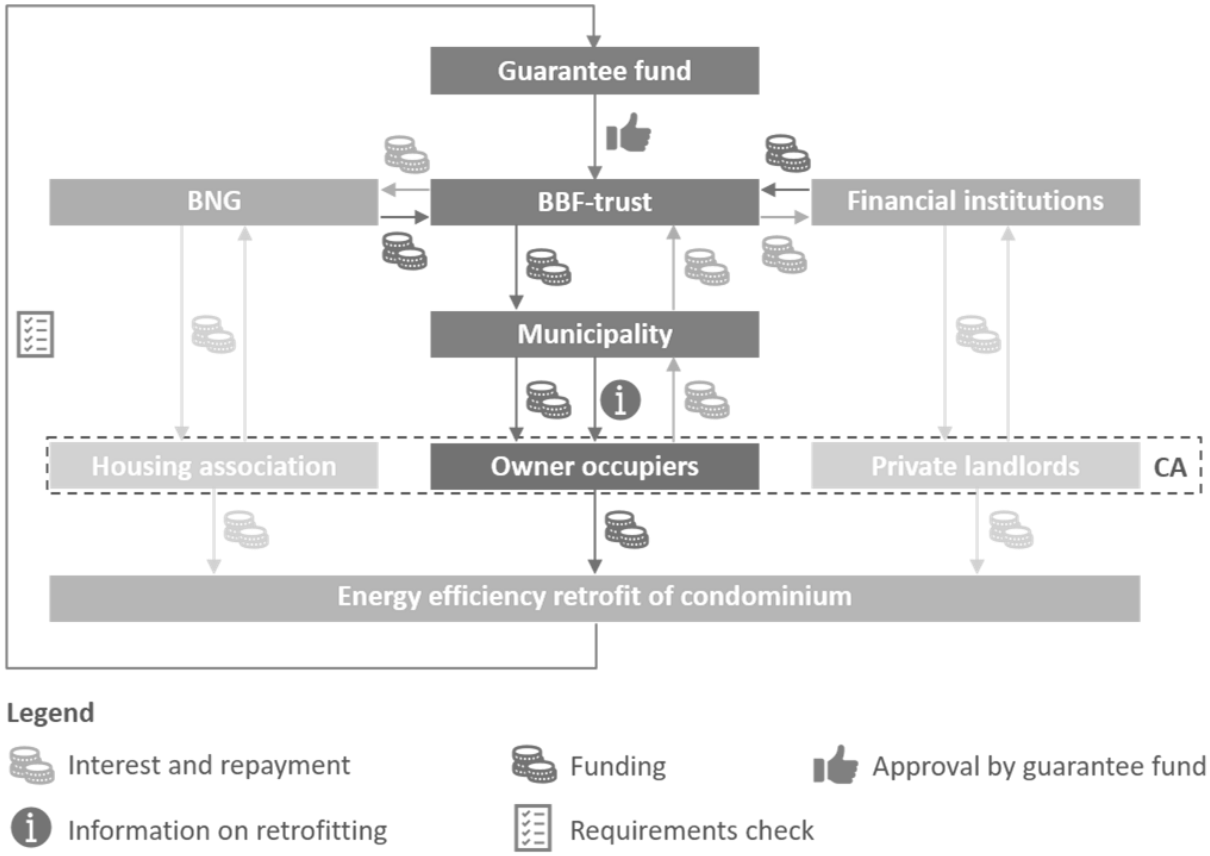

Figure 3 – Institutional structure Building-bound financing flow proposal

The government is able to provide a fair distribution of social costs by becoming the intermediary in building-bound financing. The risks for the funding parties are covered and therefore the less affluent people (who are typically the high-risk party) can have the same preconditions as affluent people. Therefore, social fairness is secured.

A benefit owner occupiers of in condominiums have is the ability to jointly apply for building-bound financing, therefore process costs of the assessment can be cut due to a singular application. If the owner occupiers applied for loans via separate channels, the full case is assessed by different financial institutions. Which accounts for higher process costs, due to cumulatively longer assessment duration.

As mentioned in chapter 4 the governance structure in the Netherlands has the flexibility to incorporate new stakeholders in the mix. Therefore, it is not expected that the incorporation of the guarantee fund and the trust fund will amount to problems. However, the national government has to approve of the institutional setting that is proposed, new rules and regulation are needed for its incorporation into Dutch society. Which may be counteracted within the political arena on a national level, which can be a major barrier.

PRECONDITIONS FOR BUILDING-BOUND FINANCING

For building-bound financing to be worthwhile, it has to fulfil a number of preconditions. These preconditions are meant to ensure building-bound financing is used as the preferred funding mechanism:

- Cost-neutrality - Savings and repayment have to be balanced. A rise in monthly costs is a scarecrow for the owner occupiers.
- Long duration - Following the expectancy of the extended payback time of the NEF, the funding is expected to get more applications with a duration of 30 years.

- Low interest rate - The lower the interest rate, the more attractive a loan becomes. Less affluent people are then also able to apply for a loan.
- Levelled interest rate - To create a social balance, the interest rate needs to be the same for every user. Normally the rate is based on the level of risk, however that will encourage social disbalance as the people who are least capable will turn up paying the most.
- Transferable - It is the basic principle of building-bound financing, it is of key importance that it is regulated. Without transferability, the essence of BBF is lost.

CONDITIONS FOR CONDOMINIUM ASSOCIATIONS

In line with the ongoing decentralisation of government, the municipal government is the befitting governmental tier to take full responsibility in the execution. The neighbourhood focussed approach can be used as the common thread in the making the housing stock sustainable, as it is meant to do. Inspired by the obligated connection to natural gas in from the 1960ies up until 2018, an obligation to disconnect can create a major change. Certainly seen the lack of action due to incentivisation policy that has already been put into force. This obligation may prove to be useful.

Accordingly, the multi-year maintenance plan of condominium associations may be a means to incorporate sustainability into the nature of condominium associations. Sustainability is legally denoted as being a part of maintenance, but in execution it is barely included. By permanent inclusion of sustainability measures into the multi-year maintenance plan, the condominium associations have to keep track of the performance of the building and its singular units. A legal obligation to do so may speed up the process. Therewith commercial property managers will be forced to incorporate sustainability as a part of their service.

The absenteeism at annual meetings of condominium associations is one of the core problems in decision-making. Which is enlarged by the qualified weighted majority needed for big decisions, as taken up in the regulation of condominium associations. The attendance has to drastically improve, and a moderation of decision-making of condominium associations is in order. However, to amend the condominium association regulations, an even stricter threshold of votes is often required. So, the change of the regulations has to be done differently. An enforcement disconnection from the natural gas-grid according to the neighbourhood focussed approach will force condominium associations to make decisions, therefore it could help to improve attendance rates.

5. DISCUSSION

This has provided an ex-ante policy analysis of building-bound financing with respect to condominium associations. The exploratory nature of the research does not provide for an immediately implementable solution, as more thorough research is needed to achieve a fully operable system with support from society. The research was meant to create a basis to build on.

Seeing as the subject is topical, a scientific body of knowledge on sustainability within condominium associations is lacking. However, it does add to the scientific body of knowledge with respect to sustainability in housing, a lot is written on this subject and this thesis provides insights in a part that has not been touched upon before. This thesis contains information on the barriers and drivers found at condominium associations with respect to sustainability, which has not been described in prior research. However, the context was needed to depict the topics that are in need of further research. The thesis has uncovered many caveats that are in need of a second opinion. Furthermore, this thesis has clustered scattered non-scientific information

surrounding condominium associations, thereby adding data to the scientific body of knowledge. Successors are able to derive the context from this thesis, which leaves time for more thorough research on the specifics of the caveats found.

Besides, incorporating the Governance Assessment Tool into backcasting is a novelty. The Governance Assessment Tool is useful to depict the current situations, from where the backcasting analysis can be done. The Governance Assessment Tool creates an understanding of what is present and what is missing, thereby the results provide an useful context to depict the end goal from. Moreover, through the Governance Assessment Tool (Bressers et al., 2016) the needed features to reach the goal, which are already in place, are known. It is advised to use this combination for research into regimes that are in need of change.

From a societal point of view, this study provides some clear coordination problems, that are in need of betterment to create the optimal solution to reach the 2050 goal set by the national government. The road towards a housing stock that does not use natural gas, is a multisided one. There are different types of owners, which are all affected in some way. Furthermore, a solution on a bigger scale is proposed, by which the costs for the affected can be lessened. It is also a wake-up call to the national government. There policy on improvement of the condominiums is close to non-existing, the Dutch government is neglecting a significant part of Dutch society.

6. CONCLUSION AND RECOMMENDATIONS

Building-bound financing could be a solution to the funding problematic of condominium association. By incorporating the municipality, a guarantee fund and a trust fund, the structure provides favourable conditions towards the owner occupiers as well as the financial institutions. The preconditions for building-bound financing as denoted in this research have to be met for it to become viable.

Furthermore it is emphasized that the problem is not only found in the funding mechanism, the internal characteristics of condominium associations play part in the problem. This study contains a number of changes needed with respect to condominium associations for building-bound financing to be used by the owner occupiers living in the condominiums.

Moreover the study came across a less time consuming solution for the funding problems: An opt-out option for existing funding mechanisms or loans. This option gives freedom to stakeholders that is not willing to partake in a loan, there resources are found elsewhere.

Future research should focus on the viability of this building-bound financing structure. The funding mechanism should be designed to its full extent. Incorporating features like the guarantee fund, trust fund and a new type of tax. Moreover, broad support from owner occupiers, municipal governments and financial institutions is needed. A big scale research is needed to depict whether the stakeholders will support the proposed solution. Lastly it is advised to research the opt-out option, as it might prove to be a more agile solution.

The seven people that were interviewed for this thesis might give a one-sided view, it is possible that other experts or the members of condominium associations have an opposite perception of the matter. However, although the background of each individual interviewee was different, their insights in the matter did align with one another. Moreover, most of the interviewees were operational on a more abstract or overarching level within their field of work. Meaning their perspective is based on a broad experience in that specific field, certainly seen that it is based on decades of work in those fields. Furthermore, this research is a starting point for a research on a bigger scale. Little was known,

therefore it was more relevant to get a broad and overarching view than being occupied with boosting the number of interviewees.

Moreover, an exploratory research provides for flexibility, which is useful for a subject wherein constant change is expected. However, the ever-changing context can entail that the research itself changes over time and it can become less relevant. For instance, if the enthusiasm of policy makers for building-bound financing keeps on declining, building-bound financing is not a relevant funding mechanism anymore. On the other hand, it is useful to know that enthusiasm is declining. It provides information on the willingness of policy makers, which can be research further.

BIBLIOGRAPHY

ACE Retroffiting. (2018). *Financial Solutions for Condominium Retrofitting*. Maastricht.

Adams, W. C. (2015). Conducting Semi-Structured Interviews. *Handbook of Practical Program Evaluation: Fourth Edition*, (August 2015), 492–505. https://doi.org/10.1002/9781119171386.ch19

Atlas.ti. (n.d.). What is ATLAS.ti. Retrieved June 19, 2019, from https://atlasti.com/product/what-is-atlas-ti/

Boendermaker, C., Elderhorst, F., Hagoort, D., Huizinga, F., Pie, R., & Röell, S. (2018). *Naar duurzame appartementen: Financieringsoplossing voor de verduurzaming van VvE-Complexen*. Amsterdam.

Bressers, H., Bressers, N., Kuks, S., & Larrue, C. (2016). The Governance Assessment Tool and Its Use. In *Governance For Drought Resilience: Land and Water Drought Management in Europe* (pp. 45–64). Springer International Publishing. https://doi.org/10.1007/978-3-319-29671-5

Buessler, S., Badariotti, D., & Weber, C. (2017). Evaluating the complex governance arrangements surrounding energy retrofitting programs: The case of collective ownership buildings in France. *Energy Research and Social Science*, *32*(August 2016), 131–148. https://doi.org/10.1016/j.erss.2017.05.007

BW Boek 5. (2018, September 19). Burgerlijk Wetboek Boek 5 - BWBR0005288. Retrieved from https://wetten.overheid.nl/BWBR0005288/2018-09-19#Boek5_Titeldeel9

CBS. (2016). *Aantallen en kenmerken van Vereniging van Eigenaren: Een verkennend onderzoek*. Den Haag.

D'Oca, S., Ferrante, A., Ferrer, C., Pernetti, R., op 't Veld, P., Sebastian, R., … Gralka, A. (2018). Technical, Financial, and Social Barriers and Challenges in Deep Building Renovation: Integration of Lessons Learned from the H2020 Cluster Projects. *Buildings*, *8*(12), 174. https://doi.org/10.3390/buildings8120174

Dudovskiy, J. (n.d.). Exploratory Research. Retrieved March 12, 2019, from http://research-methodology.net/research-methodology/research-design/exploratory-research/#_ftn1

Energiesprong. (2015). *Ontwikkelingen in Gebouwgebonden Financiering van Nul op de Meter voor Koopwoningen*.

Kosow, H., & Gaßner, R. (2008). *Methods of Future and Scenario Analysis - Overview, assessment, and selection criteria*. Bonn. https://doi.org/ISBN 978-3-88985-375-2

Ministerie van Economische Zaken. (2016). *Energieagenda - naar een CO2-arme energievoorziening*. https://doi.org/97015

Paradies, G., Beekman, L., Ooms, M., De Koning, N., Mulder, G., Van Baar, M., … Van Winden, J. (2017). *De Duurzame VvE*.

Prins, C., & De Boeck, G. (2018, July). Nederlandse huishoudens hebben weinig vrij spaargeld. *Rabobank*.

Quist, J. (2013). Backcasting and Scenarios for Sustainable Technology Development. In *Handbook of Sustainable Engineering* (pp. 749–771). Dordrecht: Springer Science. https://doi.org/10.1007/978-1-4020-8939-8

Sociaal-Economische Raad. (2018a). *Dit is een achtergrondnotitie ten behoeve van de sectortafel Gebouwde omgeving: Wijkgerichte aanpak*.

Sociaal-Economische Raad. (2018b). *Voorstel voor hoofdlijnen voor het Klimaatakkoord*. Den Haag.

Stroomversnelling. (2018). *Objectgebonden financiering*.

Tracy, S. (2013). *Qualitative Research Methods: Collecting Evidence, Crafting Analysis, Communicating Impact*. Wiley-Blackwell.

Tubbing, L. (2019). Hoe interviews te coderen. Retrieved July 3, 2019, from https://deafstudeerconsultant.nl/hoe-interviews-te-coderen/

UNFCCC. Decision 1/CP.1, adoption of the Kyoto Protocol. UN Doc FCCC/CP/1997/7 (1998).

UNFCCC. Decision 1/CP.21, adoption of the Paris Agreement. UN Doc. FCCC/CP/2015/10/Add.1. (2016).

Van der Waals, T. (2015). *Wegnemen van belemmeringen bij het verduurzamen van VvE's: uitwerking SER-Energieakkoord*. Arnhem.

Vergragt, P. J., & Quist, J. (2011). Backcasting for sustainability: Introduction to the special issue. *Technological Forecasting and Social Change*, *78*(5), 747–755. https://doi.org/10.1016/j.techfore.2011.03.010

Zorn, T. (2008). *Designing and Conducting Semi-Structured Interviews for Research*. Waikato.

APPENDIX A. GOVERNANCE ASSESSMENT TOOL MATRIX

Table 2 - Governance Assessment Tool matrix (Bressers et al., 2016, p. 57)

Governance dimension	Qualitiy of the governance regime			
	Extent	Coherence	Flexibility	Intensity
Levels and scales	How many levels are involved and dealing with an issue? Are there any important gaps or missing levels?	Do these levels work together and do they trust each other between levels? To what degree is the mutual dependence among levels recognised?	Is it possible to move up and down levels (upscaling and downscaling) given the issue at stake?	Is there a strong impact from a certain level towards behavioural change or management reform?
Actors and networks	Are alle relevant stakeholders involved? Are there any stakeholders not involved or even excluded?	What is the strength of interactions between stakeholders? In what ways are these interactions in stable structures? Do the stakeholders have experience in working together? Do they trust and respect each other?	Is it possible that new actors are included or even that the lead shifts from one actor to another when there are pragmatic reasons for this? Do the actors share in 'social capital' allowing them to support each othe's tasks?	Is there a strong pressure from an actor or actor coalition towards behavioural change or management reform?
Problem perspectives and goal ambitions	To what extent are the various problem perspectives taken into account?	To what extent do the various perspectives and goals support each other, or are they in competition or conflict?	Are there opportunities to reassess goals? Can multiple goals be optimized in package deals?	How different are the goal ambitions from the status quo or business as usual?
Strategies and instruments	What types of instruments are included in the policy strategy? Are there any excluded types? Are monitoring and enforcement instruments included?	To what extent is the incentive system based on synergy? Are tradeoffs in cost benefits and distributional effects considered? Are there any overlaps or conflicts of incentives created by the included policy instruments?	Are there opportunities to combine or make use of different types of instruments? Is there a choice?	What is the implied behavioural deviation from current practice and how strongly do the instruments require and enforce this?
Responsibilities and resources	Are all responsibilities clearly assigned and facilitated with resources?	To what extent do the assigned responsibilities create competence struggles or cooperation within or across institutions? Are they legitimate by the main stakeholders?	To what extent is it possible to pool the assigned responsibilities and resources as long as accountability and transparency are not compromised?	Is the amount of allocated resources sufficient to implement the measures needed for the intended change?

APPENDIX B. BARRIERS AND DRIVERS FOR ENERGY PERFORMANCE IMPROVEMENTS OF CONDOMINIUM ASSOCIATIONS IN THE NETHERLANDS

Table 3 - Barriers and drivers for energy performance improvements of condominium associations in the Netherlands

Barriers and drivers regarding energy performance improvement	
Barriers	
Outdated rules and regulations	Mindset
▪ internal as well as governmental	▪ not willing to contribute financially ▪ commercial view vs individual comfort
Communication	Decision-making
▪ costs ▪ information ▪ examples	▪ voting requirements ▪ absenteeism ▪ litigation procedure
Government	Commercial property managers
▪ lack of monitoring ▪ incentive for bulk consumption	▪ hiring tariffs ▪ sustainability left out of agreements
Owner occupiers	Housing association
▪ sense of urgency ▪ lack of knowledge ▪ information overload ▪ definition of comfort ▪ distrust in commercial parties ▪ short time of residence	▪ priority on fully owned property ▪ tenant approval ▪ expected sale of property ▪ reserved attitude
Commercial landlord	
▪ great variety of commercial owners ▪ aim for profit ▪ tenant approval ▪ wait and see attitude	
Drivers	
Mindset	Communication
▪ more sustainable over time	▪ storytelling
Institutional	Housing associations
▪ governmental incentivisation ▪ neighbourhood oriented approach ▪ jurisprudence	▪ energy covenant ▪ Housing law amendment ▪ driving force (due to legal obligations) ▪ ransomed maintenance

APPENDIX C. CONDOMINIUM ASSOCIATION CHARACTERISTICS INFLUENCING FUNDING APPLICATION IN THE NETHERLANDS

Table 4 - Condominium association characteristics influencing funding application in the Netherlands

Influential factors and characteristics	
Internal factors	
Institutional	Mindset
▪ joint and several liability ▪ qualified weighted majority ▪ absenteeism ▪ litigation procedure ▪ funding systematics differ	▪ loan is inappropriate ▪ time perspective of owner types ▪ commercial view vs individual comfort
Owner occupiers	Housing association
▪ interest rates ▪ absence of long-term view ▪ short time of residence ▪ transfer of personal loan not possible ▪ transfer of CA loan via notarial deed	▪ funding via own channels ▪ advantageous conditions ▪ cannot fund owner occupiers
Commercial landlord	
▪ great variety of commercial owners ▪ funding mechanisms differ within this stakeholder group	
External factors	
Financial institutions	NEF
▪ counterparty risk ▪ lack of collateral ▪ standardisation ▪ operating costs ▪ habituation ▪ focus on commercial real estate ▪ underestimation of market size	▪ size of condominiums (>10) ▪ application requirements
	Commercial property managers
	▪ low budget agreements