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Sustainable renovation of non-profit housing in the Netherlands: from projects to programs

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Abstract. Dutch policies to reach a CO_2 neutral housing stock in 2050 force housing associations to realise higher renovation rates at lower costs. The potential for standardisation in renovation processes of the housing stock is huge. Practice shows that an increasing number of housing associations bundle their individual maintenance and sustainable renovation projects in renovation programs for two or more years. Programs that are then implemented in strategic partnerships with maintenance contractors. This paper clarifies the rationale behind this development, sketches internal and external factors that encourage and hinder this development and presents the effects of the shift from projects to programs. The paper contributes to the scientific body of knowledge of public clients in construction collaborating with market parties. The research provides housing associations and contractors tools for the implementation of successful partnerships. The paper is based on an explorative literature review and case-studies of strategic partnerships in this field. The findings show that strategic partnering in housing renovation programs increases the renovation rates of individual housing associations. Also the tenants' satisfaction with the renovation process is high. Trust is key in the collaboration between the strategic partners. Hindering factors are the realisation of the necessary culture and organizational changes on both the supply and demand side.

1. Introduction

Since the last decades government policies are aimed to diminish the energy use of the built environment and especially the housing stock. Important relevant policy documents on an European level are the 2010 Energy Performance of Buildings Directive (1)) and the 2012 Energy Efficiency Directive (2). The adoption of the Paris Climate agreement in 2015 (3) presented a further major challenge for national policy-makers, asking for a far-reaching decrease of global greenhouse gas emission (4). In the Netherlands the Dutch Climate Agreement has set a central goal on the horizon: the decrease of greenhouse gases with 49% in the year 2030 compared to the year 1990 (5). This is an intermediate step on the way to the goals of the Paris Climate agreement in 2050. The existing housing stock is important to achieve the energy efficiency targets in the European Union (6, 7). Energy efficiency has therefore become an important topic in the Dutch non-profit rental housing sector, not only stimulated by European policies, but also by national political and regulatory pressures on the sector. Aedes, the national umbrella organisation for Dutch housing associations, aims at a CO_2 neutral social housing stock by 2050, which is in line with national and international policies (8). To reach this goal, high investments are needed. Filippidou et al. (9) present in a study the renovation rates for the non-profit housing stock of the Netherlands, based on the changes in the energy performance

of over 850,000 dwellings for the period of 2010–2014. The results show that although many energy improvements have been realized, they result in small changes of the energy efficiency of the dwellings. Deep energy renovation rates are very low.

Housing associations are aware that traditional approaches have to be changed. From the assumption that both the effectiveness as the efficiency of sustainable renovation can be improved, they bundle their maintenance and sustainable renovation projects in programs. Programs that are being implemented in strategic partnerships with contractors. As not much is known about the approaches that are chosen and the results, this paper aims to answer the following questions:

- What is the rationale behind this development?
- How are the strategic partnerships implemented?
- Which factors stimulate and hinder this development?
- What are the results and future perspectives of the shift from projects to programs?

Section 2 provides essential background information about Dutch housing associations and relevant energy and sustainability policies applicable to them. Consequently developments with respect to strategic partnering are addressed (section 3). The sections that follow present the results of the research project: the research approach (section 4). various strategic partnership models that are being used and factors that can encourage or hinder the partnerships (section 5). The paper ends with a discussion and conclusion section.

2. The sustainability challenge of Dutch housing associations

In 2021, about three hundred housing associations owned 29% of the Dutch housing stock, being approximately 2,3 Million dwellings. Dutch housing associations are semi-public organisations. They have favourable conditions for synchronizing and upscaling demand and continuity in production flows, because they own large series of relatively homogeneous properties. They generally are motivated to make considerable progress in the energy performance of their homes, but they also face considerable internal and external resistance. That is the reason why the average progress is slower than originally intended (9, 10). This suggests that the aim of a CO_2-neutral housing portfolio is difficult to attain in current circumstances.

Housing associations have been active (via covenants, programs and policies) to improve the energy performance of their stock. In 2007 and 2013 Energy Saving Covenants were concluded between the sector and the government. Housing associations agreed to be on an average B-label by 2021. This corresponds to an Energy Index of 1.4 or better. At the end of 2021 indeed the average Energy Index was 1.4 (11).

Development of affordable energy renovation concepts, and a fast renovation process are seen as essential in realizing a climate neutral built environment in 2050. Various programmes have been introduced to stimulate this. The *Energiestroom* programme (2013) wanted to stimulate the development of innovations in renovation processes, products and services, and organisations (12). Within that programme four Dutch construction consortia started to develop renovation concepts for six housing associations to upgrade the energy performance of mass-housing dating from the sixties and seventies to (nearly) zero-energy or zero-on-the-meter dwellings. Van Oorschot et al. (13) characterized these concepts as modular, platform-based retrofit concepts, that drastically improve the overall performance with respect to energy consumption and indoor climate while building aesthetics radically change. Although the various programmes have challenged the Dutch building industry and clients to innovate drastically, and the cost of net zero energy renovations of terraced housing has been reduced considerably (12), market diffusion of this kind of renovations is very low. In the national debate the very high costs for renovation are the most mentioned reason. Most housing associations prefer to spread out their limited financial resources to a greater part of their housing stock in need for energy measures. The construction industry argues that they need a much higher demand to innovate and reduce costs further. In 2020 a new innovation programme of the Dutch government was launched: the ‘Renovation Accelerator’ (14). This program aims for housing organisations to bundle their

sustainable renovation demands to upscale demand, secure production flows and lower renovation costs. It aims to stimulate inter-organisational demand for renovation, innovations by the supply-side, and subsequently lower cost per renovated dwelling. The assumption is that this approach will lead to a breakthrough to realise the ambitious energy saving goals. However practice shows that housing associations are focussed on bundling their own maintenance and renovation project in programs. Their need for inter organisational cooperation is apparently less.

3. Strategic partnering

The concept 'strategic partnerships' relating to sustainability issues was clearly defined for the first time in the 1990s as the voluntary collaboration between two or more organizations with a clear agenda of common interest, focused on achieving discrete and measurable objectives (15, 16). Nonetheless some years before, the Brundtland report already mentions the importance of strategic partnerships between governments, businesses, and societies to realize sustainable development and to protect the environment (17). In the years that followed strategic partnerships have been incorporated all over the world in many common agendas, policies and goals related to sustainability. These strategic partnerships often relate to formulating common goals, tools, methods and policies in the field of sustainability. Only in a few cases does it involve strategic cooperation in the realization of sustainable renovation projects. Although some studies do come a little closer to the central theme of this paper. For instance in the Netherlands the study of Van Zoest et al. (18) addresses the barriers that Dutch housing associations encounter in implementing new procurement strategies, touches on the theme of strategic partnerships. On a more general level Koolwijk et al. (19) explore how and why the social structures of strategic partnerships in the construction industry are shaped by actors and how these interrelate with a team's interpersonal relationships over time. In the United Kingdom Homes England started in 2018 to set up models for strategic partnerships to increase the delivery of affordable housing. Rather than applying for funding on a scheme-by-scheme basis, strategic partners enter into a multi-year grant agreement with Homes England to deliver affordable housing (20). A study by Anker Jensen et al. (21) comes the closest to the theme of this paper. Based on two case studies in the UK and Sweden they try to identify the prerequisites for establishing successful strategic partnerships in relation to renovating buildings sustainably. The most important condition is stable project partners. Partly this can be realized by legally establish collaboration with more stable project partners, but it is also in itself an important prerequisite to target together challenges related to tender, competition and an extreme focus on lowest price.
Over 15 years ago Dutch housing associations began to develop supply chain partnerships in maintenance. Dutch housing associations initiated partnership arrangements and performance-based maintenance contracts with maintenance contractors for planned preventive maintenance of especially facades and roofs and responsive maintenance of their dwellings (22). This meant that a housing association focused more on its core tasks and the traditional role and tasks of the contractors were extended. Contractors are asked to design possible sustainable renovation scenarios and play an important role in the subsequent preparation and implementation phases. Besides, contractors' involvement continues for a service period after execution of the initial maintenance work in monitoring the technical status of the contracted elements. A guaranteed contract period implies performance measurements by contractors and evaluation of these with the clients to adjust the maintenance scenarios (23). In renovation innovative procurement and tendering models focused on single renovation projects only and were not followed by other similar projects. Roders et al. argue (24) that the lack of a strategic partnering approach resulted in a lack of learning curves.

4. Methodology

On the basis of articles in professional journals, social media messages and practical knowledge of colleagues, approximately 15-20 housing associations were selected in this project that made the shift from projects to programs and work in strategic partnerships with contractors on the sustainable renovation of

their housing stock. Data about those programs was collected through desktop research from public sources. Based on this, a selection was made of seven housing associations that were further investigated through case study research. In order to obtain a broad overview of the factors related with strategic partnerships (e.g. content, practical implementation, results, incentives and barriers) the geographical work area and size of the associations were taken into account in the selection process. See Table 1.

Table 1: Main characteristics of selected housing associations and renovation programs

Housing associations				**Strategic partnerships**		
	Houses	**Staff**	**Since**	**Current**	**Partners**	**Focus on**
A	50,000	585	2013	2020-2024	12	Integrated asset management: 'stepwise' approach: CO_2 neutral by 2050
B	8,200	85	2014	2019-2022	2	Program-based renovation (NZEB, label A and B)
C	27,000	350	2020	2020-2024	4	Program-based renovation to average label A
D	27,000	350	2012	2020-2025	2	High-risk major renovation projects (label A)
E	14,500	130	2012	2016-2026	2	Sustainable shell improvement
F	12,000	120	2014	2018-2022	6	Integrated asset management: 'just in time' approach CO_2 neutral by 2050
G	26,000	250	2011	2017-2021	3	Energy projects, label B; CO_2 neutral by 2050

Semi-structured interviews were held, both with representatives of the housing associations as with one or more of their partners. Given the number of interviewees and to safeguard the internal validation of the cases two researchers were involved in each interview. The interviews took 1.5 hour and were recorded. Interviewees were asked to give feedback on the summary of the transcriptions of the interviews. During the interviews the following four main topics were addressed:

1. Objectives and organization;
2. Tendering and selection process;
3. Renovation approach and results;
4. Barriers and incentives.

5. Findings

5.1 Objectives and organisation

The experiences of housing associations with strategic partnerships vary. Some housing associations are already ten year involved and others have just made a start with it. The strategic partnerships often are structured in multi-year cooperation agreements with a limited number of contractors. The length is usually four to five years, but in some cases the partnership covers a period of ten years) and the number of partners is usually between two and four (with an outlier of twelve partners). The collaboration therefore has a strategic and sustainable character, it is about achieving long-term goals.

The general objectives of the associations to opt for to strategic partnering are broadly comparable. Generally the aim is that strategic partnering enable them to concentrate on their core tasks and that it leaves the further elaboration and implementation of sustainable maintenance and improvement assignments to their partners. The overall goal is to improve and accelerate the sustainability performance of their dwellings

and to streamline the preparation and implementation processes (e.g. smooth and continuous renovation flows with small teams). Housing associations maintain control, focus on the end result and rely on the knowledge and skills of their partners. Additional goals relate to cost savings, faster lead times, higher product performance and higher customer satisfaction and sometimes the use of innovative products. These goals are usually formulated as Key Performance Indicators (KPI's). The subjects the goals relate to are generally the same, however in practice the level of detail of the requirements varies widely.

Compared to a traditional tendering process and a traditional relation with construction contractors, strategic partnering generally does impose requirements on the internal organization and the capacities of the employees at both the demand and supply side. Some housing association have implemented substantial organizational changes and have introduced new task groups, function groups and new forms of consultation. Other associations have tried to keep the organizational consequences as limited as possible and directly involve a relatively small group of people in the strategic partnership program. They try to keep the procedures and organization surrounding the implementation as limited as possible.

Numerous adjustments have also been made on the side of contractors. They have invested in themselves and, for example, followed courses and started a joint learning process to learn the principles of lean management. The most important change however that is required, is a cultural and behavioural change. All interviewees realise that that is a matter of patience and continuing to work on it actively. Strategic partnering relies heavily on principles such as trust, openness and transparency, continuity, learning from each other and sharing and increasing knowledge. These principles cannot be introduced overnight. It is the result of a development process, a process that in practice does not always run smoothly.

5.2 Selection process of partners

In almost all cases housing associations have followed a careful selection process to find the best partners. In addition to technical knowledge and skills, they want partners that are: reliable, accessible and communicative, open to make organizational changes and willing to adapt a different way of working, daring to be vulnerable, willing to collaborate and share knowledge and willing to consult with the resident in the process. In short they must "have the same DNA" as the housing association and realise that a strategic partnering process takes time. To find such partners the selection process usually consisted of various phases, A first phase in which partners had to fill in a questionnaire, or to write a short vision paper and sometimes had to calculate a renovation plan. The partners that passed this phase were interviewed and sometimes a delegation of the housing association even visited the potential partners to get a feel of the their vision, culture and mission.

5.3 Renovation approach and results

In practice, especially compared to a traditional working process, the preparation and implementation process has much more flexibility. The idea is that collaboration and consultation is the best approach. From the start of a project, the best feasible plan within the established scenarios is chosen based on the specific knowledge and expertise of the partners. However this process does not always goes smoothly. Some housing associations point out that they have to manage this process a little more than expected. In these cases the construction companies still have to get used to their new role and they stick too much to their old contractor role.

Some housing associations have already adapted their sustainability goals. Initially the renovation programs were aimed at realising an average energy label B. In most cases this goals has been reached and the focus for the future lies now on realising a CO_2-neutral housing stock in 2050. Generally the housing associations want to continue their collaboration with their partners. Another similarity with respect to their renovation approach is that they want to realise their goal step-by-step, with a 'no regret' and 'just in time' renovation approach;

Many programs and underlying projects are still in preparation and therefore robust results of the ongoing partnerships are still missing. According to the interviewees current projects show that the benefits of strategic partnering are significant and that they are on track to achieve the KPIs. Provisional results indicate that although direct costs are more or less on the same level, major maintenance cycles can be stretched (e.g. from five to seven years) that will yield future savings, Besides that resident support and customer satisfaction appears to score high

5.4 Stimulating and inhibiting factors

A condition for success is that all partners must have the right and the same 'mindset'. The bottom line is that everyone involved should have the same attitude and way of thinking with an open mind and on the basis of equality sharing and connecting knowledge in order to achieve the same goal together. Besides that there must be broad support internally for strategic partnering. A hindering factor mentioned by several housing associations and construction companies are staff changes among the partners. Collaboration can be influenced by this. There are few people in the real estate world who really understand integrated asset and property management and who not only can tie the processes together (the maintenance types, the investments, the goals, etc.) but also could manage that in close collaboration with the strategic partners. This illustrates the fact that personal factors are essential in collaboration.

The housing associations studied have serious doubts whether strategic partnering in this form could be implemented together with other housing associations. Their general opinion is that it could have a significant and undesirable impact on their own policy and working methods. Each housing association has its own approach and its own partners and would prefer to keep it that way. It will be a great challenge to bring that together.

6. Discussion and conclusion

New Dutch policies for a CO2-neutral building stock in 2050 force for a much higher housing renovation rate at a lower cost. Recently, a significant development has started towards program-based strategic partnering between housing associations and construction partners. Housing associations believe that moving from a unique project approach to a programmatic asset management approach and strategic partnering with contractors can speed up the renovation process and will reduce the costs. Learning from previous renovations by the same teams could be very useful. Strategic partnerships could provide a good opportunity for that.

The programs and co-creation of clients and contractors are not just aimed at the execution of sustainable renovation programs, but also focussed on integrated asset and maintenance management. Maintenance and improvement programs, budgets and schedules are being interrelated and aligned. Most programs are based upon step-wise renovations, taking 'no-regret solutions' and 'just in time' strategies. The overall goal is to realise a CO_2 neutral housing stock by 2050. Obviously, organizational and cultural changes are necessary both at the demand and supply side, which takes time and effort. It is a long term process to adjust not only competences and skills but (more important) visions and attitudes. New balances and relationships arise between demand and supply side with respect to mutual relationships, tasks and responsibility perceptions, knowledge sharing, pro-activeness etc.

The findings show that strategic partnerships in housing renovation indeed results in faster lead times and consequently increases the renovation rates. In addition, the tenants' satisfaction with the renovation process is high. In most cases cost savings are limited to savings on transaction cost at the side of the housing associations.

Trust between the strategic partners is one of the key factors for a successful partnership. Important hindering factors are time to realize the necessary culture and organizational changes on both the supply and demand side.

The current strategic partnerships are firmly based on process innovations. The question is why product innovations do not or hardly get off the ground while the breeding ground seems ideal. An important reason could be that for the implementation of technological innovations the market power of the contractors, combined with the scope of the partnerships, might be too small. The maintenance suppliers should strongly work together with product suppliers. Even then it cannot be expected that complete prefabricated renovation solutions will be applied on a large scale. The greatest future benefit will probably lie in the development of innovative building component concepts and products.

It is unlikely that housing associations will collaborate on a large scale to realize the sustainability goals of the sector. This current research shows that housing associations have their own asset management and decision-making, and prefer to keep it that way. However, a joint strategic partnering approach regarding building parts and components seems to have a change of success. Inhibiting factors for strategic partnering are that it takes time to realize the necessary culture and organizational changes on both the supply and demand side. Other hindrances are the insecurity of municipal plans for energy supply and differences in internal procedures and decision-making of housing associations.

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