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Sustainable Retrofit of Dutch Social Housing: The Role and Future of Multi-Year Programs and Strategic Partnerships †

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Abstract: Dutch housing associations, being semi-public construction clients, have been assigned an important role in helping to realize the national goal of a CO_2-neutral housing stock by 2050. To achieve this goal, a growing number of housing associations have added sustainable retrofit projects into multi-year programs. Those programs are being implemented by entering into strategic partnerships with retrofit contractors. The aim of this paper is to explore the rationale behind this asset and property management approach, the process, and the organizational conditions and consequences for the partners involved. To do so, a cumulative case study for research, including seven cases, was conducted. The findings show that the rationale is primarily about improving and accelerating the retrofit process by using the knowledge, competencies, and resources of the supply-side partners as effectively and efficiently as possible. This novel approach increases the retrofit rates and tenant satisfaction with the process. Trust is key in the collaboration between housing associations and contractors. For this, partner selection is an intensive and careful process. The factor hindering the upscaling of the approach is the cultural and organizational changes needed on both the demand and supply side.

Keywords: CO_2-neutral housing; multi-year programs; retrofit; social housing; strategic partnering; tenant satisfaction

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1. Introduction

Debates between countries on addressing climate change have led to various agreements. The Kyoto Protocol of 1989 and the Paris Agreement of 2015 are considered significant milestones [1,2]. The latter posed major challenge for national policy-makers, asking for a far-reaching decrease in global greenhouse gas emissions. Following the Paris Agreement, numerous countries have enhanced their climate policies and commitments. Despite all efforts, in 2022, experts argued that the agreements and policy actions are not enough to prevent global warming and its possible devastating consequences [3]. The revised Energy Efficiency Directive 2023/1791 significantly raised the EU's energy efficiency ambitions and emphasized deeper energy savings, particularly in buildings under construction or renovation [4] The EU has introduced its specific new objective to achieve a highly energy-efficient and decarbonized building stock in the revised Energy Performance of Buildings Directive (EPBD) 2024/1275 [5,6].

Within this international framework, the Dutch government and civil society organizations suggested replacing the 2013 Energy Agreement for Sustainable Growth on energy

conservation, sustainable energy, and climate measures [7]. In 2019, the Climate Agreement became the successor to the Energy Agreement. The main goal of this is to achieve a CO_2-neutral housing stock by 2050. In 2022, the Dutch government presented the National Housing and Building Agenda. This agenda consisted of six related programs including the Sustainable Built Environment Program. The goal remained to drastically reduce CO_2 emissions and gas consumption. The new ambition was to achieve and surpass a CO_2 reduction of at least 55% by 2030 [8,9]. To reduce gas consumption, local authorities should have formulated a heating transition vision indicating which districts would be made gas-free before 2030. Although almost all local authorities had completed their visions by early 2022, it has proven difficult to heat a large number of homes with other energy sources [10].

Housing associations, as semi-public construction clients, are expected to play an important role in reaching the European and Dutch sustainability targets, not only as pacesetters to get the energy transition on track, but also to create a flywheel effect for other real-estate owners. It is further expected that housing associations can realize these goals through the industrialization of the retrofit activities at significantly lower costs [8,11]. However, Wade and Visscher [12] also pinpoint that there is a need to critically evaluate the potential of new technologies, such as off-site modular construction, for delivering a mass retrofit.

Dutch housing associations own a little less than 29% of the Dutch housing stock. Almost three-quarters of these 2.4 million social dwellings were built before 1990 and, thus, are at least thirty years or older [13]. Retrofitting and refurbishing the stock is a key challenge for housing associations. Moreover, considerable parts of the social housing stock consist of a large series of relatively homogeneous dwellings, and, in principle, favorable conditions exist for programmatic and multi-project approaches, as well as cross-project learning. Dutch tenants have a decisive voice in the decision process of energy retrofit projects. The Dutch Civil Code requires at least 70% of tenants to agree on the project. Besides that, retrofit activities must not lead to an insurmountable increase in housing costs, including rent and energy costs.

In 2013, as part of the Dutch Energy Agreement, the government, tenants, and landlords signed a covenant for rental housing. The umbrella organization for housing associations, Aedes, expressed the ambition to achieve an average energy certificate of B by 2021 (or an Energy Index of 1.4 or lower) [14]. Although housing associations started to invest substantially more in energy-saving measures, the 2016 National Energy Outlook found that the intended covenant target would not be achieved [15]. Subsequently, a mandatory measure was issued for housing associations. As a reaction, Aedes introduced the Housing Agenda 2017–2021 which stated that every housing association should have a plan by the end of 2018 to achieve a CO_2-neutral housing stock by 2050. The 2019 Climate Agreement refined sustainability ambitions and set new goals for insulation and energy transition. Aedes responded to this with their Roadmap CO_2-neutral 2050, in which they offered housing associations support to plan and execute their tasks [16]. Since 2017, the housing associations have stepped up their game and, by the end of 2021, reached an average Energy Index of nearly 1.4. By then, nearly 81% of social rental homes had a high-efficiency boiler and about 16% were equipped with solar panels. Between 2020 and 2022, the insulation values of roofs, facades, floors, and windows in the sector improved by between 9% and 13% [17].

Despite these significant efforts and successes achieved by housing associations, both the retrofitting pace and depth fell short of expectations. In the last decade, the government introduced various policy programs to stimulate breakthroughs in the retrofit pace and depth, programs that aimed at making homes more sustainable on a large scale, with

innovative approaches and solutions at significantly lower costs—seemingly sensible approaches in theory, but apparently difficult to realize in practice [18,19].

Sustainable renovation in the social rented sector, particularly the inter-organizational relationships between professional public clients, is often underexplored. Moreover, the focus of most research on building renovation concerns deep renovation [20]. Housing renovations in the Netherlands are increasingly being carried out in a step-by-step manner. In Sweden, this approach is referred to as a partial over-time renovation strategy [21].

Looking ahead to 2050, all housing associations have the same target: to realize a CO_2-neutral housing stock. The approach to achieving this goal varies for each housing association. This paper discusses housing associations forming long-term partnerships with retrofit contractors to change their traditional methods. They firmly believe that, by following this route, the effectiveness and efficiency of retrofit projects can be improved. This paper aims to explore the rationale, process, organizational conditions, and consequences of this new asset and property management approach for partner organizations.

Section 2 explores developments regarding program-based approaches, program management, and strategic partnering. Section 3 covers the case study methodology and selection process. Next, Section 4 presents the findings. The article ends with the discussion and conclusions in Sections 5 and 6.

2. Multi-Year Programs and Strategic Partnering

In practice, the terms multi-year programs, program-based approaches, and program management are frequently distinguished from one another to denote various developments. In terms of content, however, the concepts are connected and closely related. Public–private partnerships aim to achieve specific goals. This may lead to economies of scale, but also has an impact on the management set-up and style and internal organization of all partners. Strategic partnering is employed for various types of cooperation: among national governments, within nations, and between governmental organizations, construction companies, and producers and consumers. These strategic partnerships generally have the same backgrounds and ratios. International or national public–private partnerships are primarily focused on achieving and implementing shared goals and agendas. By the end of the 1980s, the Brundtland report already mentioned the importance of strategic partnerships between governments and societal partners to realize sustainable goals [22]. Since then, strategic partnerships have been implemented globally in various common agendas, policies, and objectives concerning sustainability [23]. The reasons for the strategic partnering between companies or between companies and customers are generally related to achieving shared goals in the areas of market position and knowledge development. Partnering up in strategic alliances can positively affect the operational security and continuity of the partners and can even influence their entrance to other market segments [24]. Merging preparation and productivity processes can reduce costs during production and implementation [25]. Partners can access each other's knowledge and skills, positively enhancing their knowledge position [26], advantages that can give a boost to more efficient and efficient business operations.

The choice to join activities of different partners in a multi-year strategic partnership is usually based on their program and project management. In the construction industry, this typically originates from the clients' asset and portfolio management strategies. Program management involves coordinating and managing a set of related projects to achieve benefits that cannot be realized when these projects are managed separately. Typically program management is employed by businesses to manage multiple projects. Aligning and coordinating related projects yield benefits similar to those mentioned relating to strategic partnerships: consistency in quality and production, stable workforce supply,

cross-project learning, improved knowledge management, and cost reductions [27,28]. On a more overarching level, the concept is also related to policy programming. To realize the goal of a CO_2-neutral housing stock in the Netherlands in 2030, a broad government-led coalition of market parties, interest groups, and NGOs launched programmatic approaches to accelerate the sustainability of the built environment [7,8].

International examples of strategic partnerships in the sustainable retrofitting of social housing are rare. In certain European countries, such as in Scandinavia and the United Kingdom, partnerships were established to enhance the delivery of affordable newly built housing [29]. Denmark has developed innovative public procurement schemes to support building retrofit projects for existing housing. An important condition for the success of these schemes is the involvement of competent and reliable project partners [30,31].

Since the early 2000s, Dutch housing associations have established partnerships with contractors. These partnerships initially focused on planned building envelope maintenance. Now, housing associations partner for new construction, renovation, and property maintenance [19]. These strategic partnerships have been encouraged by umbrella and sector organizations of housing associations and contractors. In 2014, a foundation was created to facilitate knowledge sharing between housing associations, contractors, and suppliers, through publications, education, training, and specific tools [32]. The most important drivers for encouraging cooperation were and are, both then and now, the potential for (transaction) costs and time reductions, the guaranteed availability of sufficient and qualified labor, improved end results, and higher tenant satisfaction. In practice, these advantages have indeed been realized [32–35].

3. Methods

An exploratory case study methodology was employed, incorporating document analysis and semi-structured interviews. A multiple case study is a qualitative research methodology that provides detailed, contextual insights into the topic. The case selection consisted of three phases. The initial step involved selecting all possible interesting cases through purposive sampling based on public sources. The second phase involved selecting cases where housing associations and contractors had framework agreements for program-based approaches. As a result, in November 2020, a preliminary selection of twenty housing associations was made. Data on these housing associations was gathered through desktop research from public sources, as well as the practical knowledge of the authors and input from closely involved experts and colleagues. In the third phase, cases were selected that already implemented the partnerships to determine if there are lessons to be learned. Additionally, representativeness criteria were considered during this phase: Are the cases adequately distributed with respect to region and size? Seven housing associations were then selected. They expressed their willingness to join the research project, involve one or more contractors, and be interviewed (see Table 1). The chosen housing associations, despite considering their size and geographical location, do not fully represent the sector. Four out of the seven housing associations are primarily located in the southern region of the country. Additionally, these seven housing associations tend to be relatively large in size.

In 2021, semi-structured interviews were held to gather additional data about the experiences with partnerships. In each instance, representatives of the housing association and one or more of their contractors were interviewed. In total, seven housing associations and nine contractors were interviewed. The questions were organized according to a predefined thematic framework, covering topics such as initiative and goals, selection of the partners, organizational consequences, involvement of tenants, retrofit approach, and initial results. To ensure the internal validation of the cases, two researchers were

involved in each interview. The interviews were conducted online. On average, each interview lasted approximately one and a half hours and was audio-recorded. A verbatim transcript of each interview was subsequently sent back to the respective interviewees for verification and approval. The findings of the interviews, complemented by the results of desk research involving policy documents from the housing associations, served as the basis for case-specific reports. These reports were, likewise, shared with the interviewees for reviews, comments, and possible amendments. In a summary, the insights, experiences, and learning lessons of all partnerships were listed. The housing associations and their partners could take note of each other's results and experiences. The final results were presented in an online meeting with all interviewees to discuss experiences with program-based retrofitting partnerships. The meeting's insights and conclusions were incorporated in the final research report.

Table 1. Main characteristics of selected housing associations and energy retrofit programs.

	Dwellings	Staff	Current Program	Contractors	Focus
1	8200	85	2019–2022	2	NZEB, Energy labels A,B
2	12,000	120	2018–2022	6	Stepwise, CO_2-neutral 2050
3	14,500	130	2016–2026	2	Building shell
4	26,000	250	2017–2021	3	Energy label B
5	27,000	350	2020–2024	4	Energy label A
6	27,000	350	2020–2025	2	Energy label A
7	50,000	585	2020–2024	12	Stepwise, CO_2-neutral 2050

Table 1 illustrates that the selected housing associations generally establish partnerships with two or more contractors, formalized through framework agreements with a duration of four to five years. In practice, a separate project agreement is concluded for each retrofit project, which frequently includes design responsibilities for the contractor, typically in the form of design-and-build contracts.

4. Results

The research demonstrates that program-based strategic partnerships can be structured in various ways. This section examines several key elements: the initiative and goals (Section 4.1), the selection of retrofit partners (Section 4.2), the characteristics of retrofit partners (Section 4.3), organizational consequences (Section 4.4), tenant involvement (Section 4.5), and the sustainable retrofit approach along with initial outcomes (Section 4.6).

4.1. Initiative and Goals

With respect to the initiative, nuanced differences between the cases can be observed. In certain instances, individuals within the operational management of the housing association initiated the partnerships. In other cases, the strategic policy decision was made at the higher management level. In all cases, however, the initiative was broadly supported within the organization and embedded within the portfolio policy and asset management frameworks of the housing association. According to the interviewees, such a combination of individual leadership, supported by both management and the board of the housing association, is essential for the development of this new approach. It is also considered a pivotal condition for ensuring the success of the development and for enabling it to permeate all levels of the organization.

The immediate reasons for all of the housing associations studied to opt for programmatic partnerships can be encapsulated in a quote from one of the interviewees, who

summarized the main objectives as follows: "Streamlining and accelerating the energy retrofitting process, resulting in the realization of a higher sustainable quality and comfort levels at lower housing costs (rent plus energy costs)".

The housing associations formulated their objectives as Key Performance Indicators (KPI's). In general, the housing associations did not anticipate a construction cost reduction per dwelling. Only two of them established explicit targets for reducing investment costs. Conversely, transaction costs were expected to decline due to the multi-year approach, resulting from the reduced tendering expense costs and cross-project learning. Additionally, most housing associations anticipated lower personnel costs as responsibilities would be transferred to the retrofit partners. Two associations explicitly aimed for a reduction in the Total Cost of Ownership (TCO). The others did not formulate explicit operational cost reduction targets. They nevertheless expected that future maintenance cycles would be extended, thereby resulting in reduced operating costs.

Product innovations were generally articulated as a target in broad terms. Some housing associations operationalized this ambition through the development of an 'innovation calendar' or by specifying a minimum number of product or material improvements and innovations. The overarching objective of all programs was to enhance the energy efficiency of the dwellings, thereby improving the energy certification ratings. In several cases, additional requirements were set concerning the minimum insulation values of specific building elements. Furthermore, all housing associations aimed to strengthen tenant support and satisfaction. This was to be achieved by involving tenants at an early stage of the retrofit process and providing tailor-made services, such as offering choices regarding color schemes and the scheduling of retrofit activities.

4.2. Selection of Retrofit Partners

The interviewees from the housing associations expressed dissatisfaction with the traditional methods of working, tendering, and collaborating with selected contractors. As a result, they opted for a new, intensive, and carefully structured partner selection process, which was developed in a series of detailed steps. In addition to technical expertise and skills, retrofit partners were sought who demonstrated reliability, accessibility, and strong communicative abilities, and who were open to organizational changes and adopting new ways of working. Moreover, partners were expected to show the courage to be transparent and vulnerable, a willingness to collaborate and share knowledge, and a commitment to engaging with tenants throughout the process. These 'softer' selection criteria often carried as much weight as 'hard' criteria, such as prices for standard services. In short, the selected partners were expected to "share the same mind-set" as the housing association. As one executive from a housing association phrased it, "We looked for partners who had to have the same DNA as us. They had to be reliable and accessible and they had to be able to interact and communicate with the residents".

The selection process typically consisted of several phases. In the initial phase, interested retrofit contractors were required to complete a questionnaire or submit a brief vision statement. In some cases, they were also asked to develop and calculate a retrofit plan. During the second phase, pre-selected contractors were invited to deliver a substantive presentation outlining their proposed approach. In a few instances, housing association staff visited potential partners to observe their internal operations and gain a better understanding of their vision, organizational culture, and mission.

Following the selection process, the housing association entered into framework agreements with the chosen contractors.

4.3. Characteristics of Retrofit Partners

In the partnerships examined, a limited number of main contractors were responsible for delivering the sustainable retrofit projects. In two cases, the selected contractors also assumed responsibility for planned maintenance, responsive maintenance, and void property maintenance. Notably, two of the contractors established partnerships with more than one of the housing associations included as cases in this research project. Additionally, all main contractors involved in this study were participating in other partnerships with housing associations not included in this research.

The selected contractors are relatively large firms with a long established history. Many began as one-person or small family-owned painting or carpentry businesses and have since expanded into larger companies, often operating across multiple regions of the country. Some have even developed international operations and are listed on the stock exchange. To illustrate, of the fifteen companies most involved in sustainable retrofit projects, five were founded before 1900 and eight were established in the first half of the last century. The remaining three were founded in the early 1970s. Two of the companies employ approximately around 150 people, while nine contractors have between 200 and 450 employees. The other two contractors employ several thousand staff members.

The larger companies typically operate through independently managed regional branches or subsidiaries, which enter into partnerships with housing associations. In several cases, smaller individual companies have formed new partnerships under a separate name, collaborating with housing associations under this newly established identity.

4.4. Organizational Consequences for Housing Associations and Contractors

Compared to traditional tendering procedures and conventional relationships with retrofit contractors, strategic partnering introduces new demands on the internal organization and the capacities of employees on both the demand and supply side. Not only have the competencies and skill requirements changed, but the mutual division of roles, tasks, and responsibilities has also been redefined. This has frequently posed a long-term challenge, requiring sustained active effort.

Differences were observed among the housing associations in how they adapted their organizational structures. Most housing associations had, in advance, carefully considered the organizational implications of adopting this new approach—both in terms of the required competencies and the distribution of tasks and responsibilities. According to the interviewees, various housing associations implemented substantial organizational changes to facilitate the new strategy, while others sought to minimize its organizational impact by involving a relatively small group of employees in the strategic partnership program. In these latter cases, organizational adjustments were primarily implemented on a work-based, pragmatic basis.

In all cases, new forms of consultation were introduced for the preparation and execution of energy retrofit and maintenance projects, both at the strategic level (through a 'steering group') and at the operational level (through a 'project team' or 'project group'). Additionally, various supporting adjustments were made, such as changes in asset management processes, the prioritization of housing complexes, data management practices, budgeting procedures, and the coordination of maintenance operations and rental services.

Interviewees from contractors indicated that numerous adjustments in working processes and knowledge development were also made on their side. For many, this process began with staff participating in training courses and joint learning programs focused on the principles of lean management. However, in light of the overarching objective to establish a new organizational culture and behavioral 'mindset and work approach', more substantial internal changes were required. Some contractors needed to acquire the ability

to design and calculate phased scenarios aligned with the sustainability objectives for 2050. New teams were assembled, emphasizing collaborative attitudes, and, in several cases, contractors appointed tenant liaison officers to intensify and strengthen their engagement with tenants.

Retrofit projects were carried out successively over a number of years by integrated design and implementation teams. Throughout the retrofit process, close collaboration with the housing associations was established through inter-organizational project teams. Interviewees from both the housing associations and the contractors emphasized that new gained knowledge and process innovations emerging from the projects were directly applied in subsequent initiatives, fostering a continuous 'learning by doing' approach.

Strategic partnering is fundamentally grounded in principles such as trust, openness, transparency, continuity, mutual learning, and the sharing and advancement of knowledge. These principles cannot, and indeed have not, been established overnight. Rather, they are the outcome on an ongoing development process, which, in practice, does not always proceed smoothly. As one interviewee observed, "For this type of collaboration, the organizations of all partners need cultural and behavioral changes. That is also a matter of patience and continuing to work actively on it". Another noted that "We have become much more aware of each other's interests and how they can be dealt with. Not an easy process, but essential to make the partnership successful".

The findings of this research indicate that current strategic partnerships are firmly rooted in process and organizational innovations. However, the individual behavioral attitudes of those involved—including trust, openness, transparency, and a willingness to share and learn—are equally decisive in determining the success of these partnerships. Such behavioral changes cannot be rapidly implemented; they represent the outcome of a continuous, and, at times, challenging, process of adjustment and development. As one interviewee emphasized, "For this type of collaboration, the organizations of all partners need cultural and behavioral changes. That is also a matter of patience and continuing to work actively on it". Another noted that "We have become much more aware of each other's interests and how they can be dealt with. Not an easy process, but essential to make the partnership successful".

In every case examined, all interviewees stressed that, despite the progress made and the results achieved, it remains crucial that we actively maintain and nurture the relationship. Sustained effort is considered essential for preserving trust, alignment, and shared commitment within the partnerships.

4.5. Tenant Involvement

Although the contractors gradually assumed greater responsibilities for tenant communication before and during the renovation process, the case studies demonstrate that housing associations continued to play a central role in engaging tenants and facilitating their involvement in retrofit plans. In the initial stages of most partnerships, housing associations remained responsible for obtaining formal tenant approval for the proposed retrofit plans. However, as the partnerships matured, the scope of responsibilities for retrofit contractors expanded. They gradually became responsible for tenant communication throughout the entire renovation process, while housing associations typically remained in the lead in the preparatory phase.

Over time, retrofit contractors developed various tools for improving tenant engagement, such as personalized interactive resident apps and digital resident platforms. Through these digital tools, residents and their families could access detailed information about the retrofit plan and scheduled retrofit activities, book appointments, review housing costs calculations, and ask questions. Additionally, as noted earlier, contractors appointed

dedicated tenant liaison officers to provide personal support throughout the retrofit and upon its completion. According to both housing associations and contractors, these personalized, proactive communication strategies significantly enhanced the preparation and implementation phases of the retrofit process. They enabled project teams to gain a thorough understanding of tenants' circumstances and preferences, ensuring that individual needs could be addressed seamlessly throughout the process.

4.6. Retrofit Approach and Initial Results

Compared to traditional working methods, the preparation and implementation processes under the new strategic partnering arrangements provided housing associations with considerably greater flexibility. From the outset of each project, the most appropriate and feasible retrofit scenario was selected, based on the established sustainability objectives and other relevant requirements. However, this process did not always proceed smoothly. In several cases, retrofit partners initially struggled to adapt to their new roles and responsibilities, often reverting to more conventional practices and failing to fully embrace their expected proactive and initiating role.

At the outset, most retrofit programs were aimed at achieving an average energy label B. In the majority of the cases, this objective was successfully met, after which focus shifted toward the longer-term ambition of realizing a CO_2-neutral housing stock by 2050. The housing associations adopted a step-by-step approach to achieving energy-saving targets. Furthermore, it became evident that most of the participating housing associations aimed to continue their partnerships with the same contractors in subsequent retrofit programs.

At the time of data collection, most programs and their underlying projects were still ongoing, which meant that conclusive results regarding the long-term outcomes of these partnerships were not yet available. Nevertheless, according to the interviewees, the current projects clearly demonstrate that the benefits of strategic partnering are both substantial and promising and well-aligned toward achieving the established Key Performance Indicators (KPIs). The findings strongly indicate that, within a relatively short period, a considerable number of homes have been made significantly more sustainable, improving both energy efficiency and residential comfort. For illustrative purposes: two housing associations succeeded in upgrading the sustainable quality of almost a third of their total stock to energy label A or B as a result of the multi-year program. In one case, an average energy cost reduction of 30% to 40% was realized following the retrofit. Although only a few housing associations formally defined KPIs related to cost reductions, several reported clear indications of a significant decrease in construction costs, ranging from 10% to 15% up to 25% relative to initial cost estimates. Similar patterns were observed in operating costs, as the deferral of cyclical maintenance activities led to rapid savings between 15% and 20%. Moreover, the transaction costs for housing associations have been substantially reduced, primarily due to the decreased need for personnel during project preparation and implementation. Furthermore, positive assessments have been achieved in resident support, rising to more than ninety percent of the projects. Additionally, tenants' satisfaction with the retrofit process and its outcomes was high, with an average rating of eight out of ten.

Several less tangible, but equally important results were reported. Interviewees noted that the predictability, transparency, and overall reliability of the retrofit processes had significantly improved. Furthermore, the mutual communication between housing associations and contractors has been optimized, leading to a stronger alignment of interests and increased mutual understanding.

The retrofit contractors also reported benefits from their participation in strategic partnerships. The partnerships contributed to a greater continuity in their business operations,

enhanced the quality and productivity of their services, secured a more stable supply of workforce, and facilitated improved knowledge management within their organizations.

5. Discussion

Dutch housing associations are making significant progress in improving the energy-efficiency of their housing stock in order to meet the national objective of achieving a CO_2-neutral housing stock in 2050 [7–9]. Given the specific characteristics of their housing portfolios and tenant populations, as well as their housing and strategic management objectives, organizational structures, and asset and property management practices, each housing association is following its own strategy towards 2050. These strategies are driven by the ambition to ensure that their retrofitted housing stock remains both profitable for the associations and affordable for their tenants. To mitigate the risks of disinvestment, most housing associations have adopted step-by-step retrofit strategies. While this approach may yield relatively lesser energy savings at the level of individual projects in the short term, it enables the realization of energy savings on a far larger scale over time.

A notable recent development is the growing shift among housing associations toward program-based multi-year strategic partnerships with retrofit partners. The primary rationale behind this approach is to accelerate the retrofitting process by leveraging the partners' expertise, competencies, and capacities as effectively and efficiently as possible. Both housing associations and construction partners share long-term objectives and corresponding responsibilities. Within these strategic partnerships, the predictability and continuity of the process is increased. For all partners involved, certainty is established about investments, budgets, production volumes, required capacity, and project schedules. Housing associations anticipated that this collaborative approach would expedite and streamline retrofit and maintenance processes, while reducing the costs. The findings of this study confirm that lead times have indeed decreased compared to the traditional project-by-project tendering model. Typically, a step-by-step retrofit approach is applied, wherein building envelopes are first insulated, followed by upgrades to the building at a later stage. Current retrofit approaches primarily rely on products, materials, and techniques that have already demonstrated their effectiveness in practice. It remains challenging to get large-scale product innovations off the ground, likely due to the limited market power of the retrofit partners in combination with the relatively modest scale of individual partnerships. As such, it cannot be expected that integral prefabricated renovation solutions will be applied on a large scale by these partnerships in the near future. Nonetheless, the case studies indicate that product innovations are receiving increasing attention within the partnerships.

The research findings correspond closely with the program management theories previously mentioned in Section 2. Coordinating and managing a series of comparable projects within programmatic strategic partnerships generates advantages that are difficult to achieve when projects are managed on an individual scale. These benefits are predominantly reflected in improved quality and production levels, enhanced process stability and operational continuity, more effective knowledge management, and reductions in both transactional and operational costs [27,28]. The results of this study are consistent with findings from other Dutch research projects in this domain [30–35]. Notably, the international scientific literature has thus far paid limited attention to the possible benefits for the end-users of programmatic approaches. Within the Dutch social rented housing sector, tenants play a pivotal role in the decision-making process concerning retrofit projects, as approval from a classified majority of tenants is required to proceed with retrofit plans. The existing literature emphasizes the importance of the systematic involvement of tenants in each phase of the retrofit process in order to facilitate effective project implementation [36–38].

This study demonstrates that the manner in which tenant involvement is organized tends to vary across projects, reflecting the differences in project scope and partnership organization. A wide range of methods is possible, assigning various roles and responsibilities to both housing associations and their retrofit partners. Overall, the comprehensive tenant engagement procedures and strategies taken by housing associations—and increasingly by their construction partners—have been met with high levels of tenants satisfaction.. These outcomes again correspond with the findings of other Dutch research projects in this field [30–35].

Engaging in programmatic strategic partnerships imposes new demands on the organizational structures, strategic planning, and programming of both housing associations and retrofit partners. Realizing and maintaining these organizational and cultural requires the time, effort, and commitment of all partners involved. Importantly, this transformation process typically starts prior to the formal establishment of agreements and persists throughout the duration of the partnership. Strategic partnering is a long-term, iterative process, which is perhaps best characterized by the motto 'learning by doing'. Inevitably, this has implications for the selection method and criteria of retrofit contractors. In contrast to conventional procurement procedures, alternative strategies are adopted, strategies in which 'hard' selection criteria, such as technical expertise, experience, and cost levels, are balanced with 'soft' criteria, including reliability, organizational flexibility, communicative competence, willingness to share knowledge, and compatibility in terms of business culture.

The establishment of strategic partnerships has fundamentally changed the balances and relationships between housing associations and retrofit contractors. These changes extend beyond the practical organization of the collaboration to encompass a reconfiguration of task division, responsibilities, knowledge-sharing mechanisms, and pro-activeness. In order to effectively prepare and implement energy retrofit and maintenance projects, new forms of consultation have been developed at both the strategic and operational levels.

Additionally, housing associations have implemented a range of supporting organizational adjustments, including modifications in asset and property management, the prioritization of housing complexes, data management practices, budgeting procedures, coordination of maintenance processes, and internal coordination procedures. The traditional roles and responsibilities of the partners are evolving. Housing associations increasingly focus on their core tasks, while placing trust in the specialist knowledge and competencies of market partners, with an emphasis on the end results rather than process control. Consequently, demands on the knowledge and skill levels of staff members and planning and programming systems are being redefined.

Comparable empirical evidence on the international level remains limited. A possible parallel may be drawn with a study examining programmatic approaches in Dutch infrastructure policies. The study suggests that the benefits of program-based strategic management strongly depend on the way in which program management is structured throughout its life-cycle—from initiation to completion [39]. Crucial for success is a program and project organization that governs key program components, including aspects such as collaboration cultural, organizational awareness and commitment, procedural transparency, progress monitoring, and outcome evaluation. A dedicated program management team, that prioritizes what needs to be coordinated on the program level and what can be done at the project level, is pivotal. A clear definition of the roles and responsibilities of team members is essential, ensuring operational reliability and alignment. Furthermore, the establishment of learning structures is crucial to fostering an integrated working approach, promoting knowledge sharing, and commitment to program objectives across all organizational levels. These insights closely correspond with the organizational demands faced by housing organizations in their partnerships with retrofit contractors,

offering them valuable points of reference to the ongoing refinement of their program management framework.

6. Conclusions

The overarching national objective in the Netherlands is to achieve a CO_2-neutral housing stock by the year 2050. In view of the size and characteristics of their housing portfolio, Dutch housing associations have been assigned a pivotal role in contributing to this target. To realize this ambition, an increasing number of housing associations are consolidating retrofit projects into multi-year programs and establishing strategic partnerships with retrofit contractors. The underlying rationale for this shift centers on enhancing the effectiveness and accelerating the pace of the retrofit process by optimally leveraging the expertise, competencies, and operational resources of supply-side partners. The outcomes of this study indicate that these partnerships are yielding positive results. Notably, project lead times have been reduced, and tenant satisfaction regarding both the retrofit process and its outcomes is high. The adoption of this new programmatic partnership approach has resulted in smoother, continuous flows of maintenance and retrofit activities, coordinated by compact, close-knit partner teams. This development has reshaped the dynamics between the partners, leading to a redefinition of roles, responsibilities, knowledge exchange practices, and proactive engagements. While housing associations retain overall control of the process and maintain a clear focus on outcomes, they increasingly rely on the expertise, capacities, and competencies of their partners.

Within these strategic partnerships, the interrelation and alignment of maintenance and retrofit programs, financial frameworks, and planning processes have become more structured and coherent. A shared mindset and a collective commitment to achieving the same long-term sustainability objectives are considered essential conditions for success. Mutual trust between the strategic partners is one of the most decisive factors contributing to successful partnerships. Conversely, one of the principal barriers to success remains the time required to realize the necessary culture and organizational transformations on both the demand and supply side. To overcome this barrier requires patience and ongoing active engagement from all stakeholders involved within the partnerships.

The findings of this study are considered to be robust, based on empirical data gathered from seven case studies, and comprehensive documentation and interviews with key stakeholders, including both housing association and retrofit contractors. The processes and outcomes of programmatic approaches and strategic partnerships can reasonably be generalized to other housing associations that have implemented multi-year programs and established similar long-term strategic partnerships. A recognized limitation of this research, however, lies in the cross-sectional nature of the data collection, which captured a single moment within the multi-year partnerships.

This research adopts a practical, applied approach, centered explicitly on the Dutch situation and on a specific topic: the organization, content, and outcomes of the strategic partnerships between housing associations and retrofit contractors for the preparation and implementation of retrofit and maintenance programs. In doing so, it provides Dutch housing associations and their retrofit partners with a wide range of insights, operational tools, and lessons learned for the development of successful partnerships. It is worth noting that, due to the exemption of Dutch housing associations from EU public tendering regulations, they can more easily engage in long-term strategic partnerships with private contractors. Nevertheless, the lessons derived from this research could also be valuable for social housing providers in other countries facing similar large-scale retrofit challenges and dependent on effective market collaboration to meet their sustainable objectives. Moreover,

the findings could be useful for tailoring government policies to the operational realities and practical needs of housing associations and their retrofit partners.

In addition, this study contributes to the growing body of academic knowledge concerning public–private inter-organizational collaboration and strategic partnering. It advances the understanding of the aims, structures, outcomes, and benefits of working in collaborative multi-year programs and the specific role of the end-users in such processes. Future research is recommended to further explore the organization and effectiveness of program-based approaches and strategic partnering, particularly with respect to their potential to reduce operational and construction costs. A longitudinal research design would be valuable in capturing the dynamics of these partnerships over time

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