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coping with general investment behaviours**

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DOI

[10.1108/IJBPA-01-2017-0005](https://doi.org/10.1108/IJBPA-01-2017-0005)

Publication date

2017

Document Version

Accepted author manuscript

Published in

International Journal of Building Pathology and Adaptation

Citation (APA)

Nieboer, N. (2017). Improving energy performance of Dutch homes: coping with general investment behaviours. *International Journal of Building Pathology and Adaptation*, 35(5), 488-500.
<https://doi.org/10.1108/IJBPA-01-2017-0005>

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Improving energy performance of Dutch homes: coping with general investment behaviours

Abstract

Purpose – Recent findings from a monitor containing around 1.5 million homes in the Dutch non-profit rental sector show that the improvement of the energy performance of the respective homes is mostly carried out in small steps: single measures per dwelling dominate and deep energy renovations are rare. From the way in which housing providers conceive and implement their portfolio and asset management strategies, the paper seeks explanations for the dominance of the small interventions and investigates the argument for a more concentrated allocation of budget resources.

Design/methodology – 12 housing providers with different energy investment policies were selected and interviewed.

Findings – Results show that energy investments, as most other investments, must fit in regular investment schemes and have to follow general decision criteria such as the lifespan of the respective building element and the market position of the respective dwelling. As these schemes are limited in budget and time, the room for a more concentrated allocation of budget resources is small.

Research limitations/implications – The number of organisations interviewed is obviously not statistically representative, but gives a good indication of the investment planning practice in the Dutch non-profit housing sector.

Originality/value – Much has been written about the (slow) progress of the energy performance in the housing sector, but not about the more structural organisational forces behind this progress.

Keywords

portfolio management, asset management, non-profit, housing, energy performance, the Netherlands

1. Introduction

This paper investigates to which extent the number of energy measures per dwelling of Dutch housing associations can be explained from their general portfolio and asset management strategies. In this section we first go into the data that shows the number of energy measures per dwelling. Then we deal with several angles to explain this situation, justifying the angle that has been chosen for this article.

1.1 Background

Since the implementation of the Energy Performance of Buildings Directive (EPBD), energy efficiency is a matter of great concern in the Dutch non-profit rental housing sector. This shift was not only stimulated by European policy, but also by national political pressures on the sector to show a higher degree of social performance. In 2008 *Aedes*, the national umbrella organisation for housing associations (which almost exclusively own the non-profit housing stock in the country), the Ministry responsible for housing and *Woonbond*, the national tenants' union, signed a covenant in which, among others, a 20% reduction on the total gas consumption in the non-profit housing sector over the years 2008-2018 was agreed.

In 2012 the 2008 covenant was repealed. The covenant that came in place (and that is still in force) is stricter and makes use of the Energy Index (*Energie-Index*), a unit that denotes the energy performance of a building according to the official Dutch calculation method, which had been developed as part of the implementation of the EPBD. The value of this unit approximately ranges between 0 and 4, in which 0 is energy neutral and 4 is extremely energy inefficient. The 2012 covenant states that in 2020 the average Energy Index of all homes of the Dutch housing associations should be 1.25, which is within the bands of energy performance rate B. In the Netherlands categories ranging from A++ (very high energy performance) to G (very low energy performance) are used. Rate B can thus be seen as a relatively high standard.

In the 2008 covenant it was also agreed that Aedes would develop a database to annually observe the improvement of the energy performance of the Dutch non-profit rental housing stock. This monitor is called SHAERE (*Sociale Huursector Audit en Evaluatie van Resultaten Energiebesparing* – in English: Social Rented Sector Audit and Evaluation of Energy Saving Results). Since 2010, when the monitor became operational, housing associations report their stock to Aedes in the beginning of each calendar year accounting for the situation on December 31st of the previous year. Housing associations are not obliged to participate in the monitor, so the number of homes for which data are available varies from year to year. Nevertheless, the monitor covers each year a large part of the sector, approximately 50-60%.

Results from the monitor show that the improvement of the energy performance of the non-profit rental housing stock is too slow to attain the agreed level in 2020. If the current improvement pace would continue until 2020, the Energy Index will be 1.41 by then (see linear projection in figure 1).

FIGURE 1 AROUND HERE

Results from the monitor also show that many homes have been improved in a relatively short period. In the years 2011 through 2014, 41% of the homes have undergone an improvement of the energy performance (Filippidou *et al.*, 2017).

FIGURE 2 AROUND HERE

At the same time, however, most improvements are small. In half of the improved dwellings, only one single measure is applied. Examples of such measures are insulating one or more parts of the external envelope, and replacing or adding installations. In only 3% of the homes more than three measures are applied (see figure 2). This low number of energy measures per dwelling goes hand in hand with a domination of conventional measures (e.g. replacing an old for a more efficient boiler, replacing single glass for double or HR++ glass). This is, by the way, not unique for the Netherlands, but has also been found in a recent study in the UK social housing sector (Swan *et al.*, 2013a).

These results show that the number of so-called deep energy renovations is small. Cluett and Amann (2014, pp. 6-7) show that there are different definitions about what the term “deep” in this respect means: some take a minimum of 30-50% site energy saving, whereas others mention a minimum of 75%. Rysanek and Choudhary (2013, p. 324) state that “deep-energy retrofits are considered large-scale refurbishments that make significant alterations to a building's architectural design, componentry, and operations towards effecting major energy savings (upwards of 50%)”. For the purpose of this paper, it is not necessary to define an exact minimum share of energy savings, but it is essential that a substantial share is attained, up to even Passivhaus or energy neutral standards rather than savings of 50%. Advocates of such deep energy renovations, notably those who are involved in a program to developing and promoting so-called Net Zero Energy Refurbishments, argue for a radical change of the above-mentioned situation of small improvements. Many of them contend that deep renovations are the most appropriate (if not the only) way to substantially reducing energy consumption and that the developments and proliferation of energy renovation concepts is the best way forward. Others, however, do not see this as realistic and argue that reality forces us to proceed on the path of small interventions (see e.g. Priemus’ (2014) reaction on the program for Net Zero Energy Refurbishments, and Galvin and Sunikka-Blank (2017) on the policy debate in Germany). This raises the question to what extent this path must be taken as a ‘fact of life’. We return to this debate later in this paper.

1.2 Problem statement and research question

In the existing literature on the uptake of energy investments by housing providers, various explanations are given on the sectorial level, the organisational level and the individual (building) project level. As for the sectorial level, Van Bueren and Priemus (2002), for example, mentioned the strongly fragmented decision-making structure of the building sector, which increases the risk that investments are abandoned if any party does not cooperate. Crabtree and Hes (2009) stated that the disaggregation and piecemeal nature of innovation within the building industry is underpinned by unfamiliarity with new technologies, a lack of consistent legislation and pricing and unclear channels of communication – thus leading to the application of conventional measures.

To these aspects regarding the sector level can be added more contextual aspects, such as the legal, political and economic circumstances in which the housing providers (and their contractors) have to operate (see e.g. Milligan *et al.*, 2012; Boelhouwer and Priemus, 2014). This context may have considerable impact not only at the sectorial level, but also at lower geographical levels, for example on the core values of the organisations, their intrinsic motivation to invest in energy efficiency and the budgetary possibilities to do that. Section 2.1 will address the relevant developments that affected the Dutch social housing sector in the last decades.

Explanations at the project level often refer to financial issues such as costs and payback times and the cooperation of the tenants (e.g. Baek and Park, 2012; Stieß and Dunkelberg, 2013; Friege and Chappin, 2014). Sorrell *et al.* (2004, p. 10) distinguish several other economic barriers to energy efficiency projects, namely financial risk (for example, uncertainty about the payback time), imperfect information (for example, on potential opportunities), hidden costs and limited access to capital.

A particular economic problem in the improvement of the energy efficiency of rental housing is the ‘split incentive’ – which prevents investing players from appropriating the benefits of the investment (see e.g. Sorrell *et al.*, 2004; Hoppe and Lulofs, 2008). In the case of energy efficiency, the investment has to come from the owner, but he does not reap the benefits of lower energy costs, because the energy bills are paid by the tenants. The tenants, on the other hand, cannot benefit from a rise in the value of the property (supposing that there is such an increase), because they do not own it. A logical solution would be to incorporate the investment costs in the rent, but rent regulations may prohibit this and, moreover, raising rents can undermine the willingness of the tenants to cooperate, which may be essential if investment plans require their approval.

Apart from the context in which energy-related decisions are made, the practices in which such decisions are embedded can be an influential factor. This embeddedness can be illustrated at different levels. At the level of individual households, Ellsworth-Krebs (2015; 2016) shows the embeddedness of energy-related decisions in daily household practices regarding heating behaviour. On a macro, government policy level, Jensen (2012) uses the term ‘regimes’ to denote the importance of a policy environment that facilitates or hampers

the development and implementation of energy policies. Stephenson *et al.* (2010) include various levels in their so-called Energy Cultures framework, in which practices, material culture and cognitive norms are linked. Quoting Seyfang and Smith (2007, p. 588) they state that “entrenched cognitive, social, economic, institutional and technological processes lock us into trajectories and lock out sustainable alternatives” (p. 6121).

During the last decades several studies have been published that go into organisational barriers to energy investment. Already in the 1990s, DeCanio (1993) pointed out that incentives and control prevalent in an organisation can lead to rationally suboptimal collective outcomes, even if the individuals within the organisation “may all be rational seekers after their own interest” (p. 907). He stated, confirmed by several later authors (e.g. Flyvbjerg, 2002; Reay and Hinings, 2009; Nieboer, 2011), that an organisation consists of several internal players, each developing their own strategies, rather than as one body, pursuing one coherent strategy and speaking with one voice. These strategies can be in line with and supplementary to each other, but they can also clash. Lutzenhiser (1994) and again DeCanio (1993) pointed out that the latter situation can seriously hamper policies to improve energy efficiency. This is confirmed more recently by Swan *et al.* (2013b), who stated that although UK social housing providers generally regard sustainable retrofits as important, there are other organisational priorities that are “facts of life that aspirations will come up against” (p. 532).

The impact of institutional barriers to the proliferation of sustainable technologies is extensively dealt with in literature. Negro *et al.* (2012) give an overview of what they call “systemic problems” (p. 3837), among which they distinguish “hard institutional problems”, such as lack of continuity and long-term regulations, inconsistent policy and misalignment of policy levels (see for this misalignment also Palm, 2013), and “soft institutional problems”, such as lack of legitimacy and social acceptance and the (non-)facilitation of low carbon innovations.

This study sheds more light on the above-mentioned debate regarding deep energy renovation versus small steps debate from a related, often overlooked organisational viewpoint, namely the way in which housing providers conceive and implement their

portfolio and asset management strategies. In doing so, they structure their investments (whether or not in energy performance) and facilitate (or do not facilitate) the adoption of energy innovations. Because of this structuring and, as one may call, embedding aspect, we expect these strategies to be the driving forces for individual investment projects, but at the same time we test this assumption by investigating this relationship. From the general organisational investment strategies, the paper seeks explanations for the dominance of the relatively small energy improvements per dwelling and investigates the room for a more concentrated allocation of budget resources. The main research question is: to what extent can the number of energy measures per dwelling be explained from the general portfolio and asset management strategies of Dutch housing associations?

The paper is structured as follows. In the following section, we go into general developments regarding investment planning in the Dutch non-profit housing sector in the last 20 to 30 years, which have shown considerable changes. In this section we also deal with the categories in which investments are usually included and which are, in practice, an important structuring factor in the asset management of the housing providers in the sector. In section 3, the research method is described. In section 4, the results are presented. In section 5, finally, conclusions are drawn.

2. Investment planning in Dutch non-profit housing

2.1 Sectorial developments in the last decades

Investments in dwellings in the Dutch non-profit housing sector were highly regulated by the government in the first decades after the Second World War. Until the 1980s, public loans and subsidies were available for new building and renovation, and maintenance budgets were regulated. This changed in the 1990s, when the sector was financially liberalised and individual housing associations had, in financial terms, to stand on their own two feet (Priemus *et al.*, 1999; Priemus, 2001), entailing an considerably increased need for the development of an own portfolio and asset management. This need was further increased by the fact that Dutch housing associations had, compared to most other

counterparts in Europe, a large policy autonomy with respect to government supervision and sale possibilities (Gruis *et al.*, 2009) and were dependent on sales to cross subsidise social investments (Gruis and Nieboer, 2006). Another factor was that the economic conditions for more market-based activities were very favourable, which was mainly due to increasing real estate prices in the 1990s and early 2000s. Most housing associations embarked on extensive redevelopment schemes to modernize their portfolio, thereby making use of internal cross subsidisation through sales and gains from commercial activities (Milligan *et al.*, 2012). The favourable financial position of the sector also gave rise to political discussions about its social performance, which was said to be too low given its financial means. The national covenants to bring the housing stock to a relatively high energy performance level (see section 1) can be seen as a result of this debate.

Remarkably, the covenants were agreed in a time when investments in the modernisation of the housing stock had been severely reduced as a consequence of the global financial crisis (BZK, 2015). This means that, compared to pre-crisis years, a smaller part of the energy improvement of the housing stock could be gained by demolition and new building, and a bigger part had to be gained by improvements in the existing stock. In recent years, the context for the housing associations also dramatically changed because of national regulations following political mistrust towards the sector (Boelhouwer and Priemus, 2014). Social activities are no longer exempted from tax since 2008; a new property tax is in force since 2013. In addition, the new Housing Act, adopted in March 2015, implies a strong focus on the provision of affordable housing for low-income households and many restrictions on other activities, e.g. restriction of the budget for liveability issues, limitations on the development of real estate for commercial purposes and of non-residential real estate for non-commercial purposes (schools, community buildings, public libraries, reception centres etc.) and an obligation to obtain a consent from (among others) the local authority for activities that the European Commission does not regard as a Service of General Economic Interest (Aedes, 2015). Energy investments are not directly affected by these new regulations, but can be indirectly affected because these measures reduce the room for investments in general.

In the last decade, when energy saving had got a higher place on the political agenda, national government's instruments towards the housing sector focussed mainly on

arranging covenants with the main (national) players in the field. Since July 2014, there is a subsidy for the more affordable homes in the social housing sector (*Stimuleringsregeling energieprestatie huursector* – Regulation for stimulating energy performance rental sector), which housing associations (and any other landlord) can receive if they carry out investments that improve the energy performance level of the respective home(s) by at least three energy label categories. This regulation, however, suffered from irregularities in the first year of its existence, making it rather unpopular. As a consequence it did not have a substantial effect on the energy investments during the fieldwork period (October and November 2015).

2.2 Investment categories

Unlike institutional real estate investors, non-profit housing providers mostly perform portfolio, asset and property management themselves. Although the execution of new building and renovation work is nearly always outsourced and although this is often also true for the vast majority of maintenance works in the Netherlands (Straub and van Mossel, 2007) and also elsewhere (see e.g. Lam, 2008), the preparation and planning of these works is mostly carried out in-house. Straub (2012: 188) states that maintenance services of (non-profit) housing providers are usually divided into three managerial processes, namely:

- “1. Planned (preventive) maintenance: activities scheduled at regular intervals;
2. Reactive maintenance: realised on residents’ initiatives (complaints), often after breakdowns (also called responsive maintenance or daily maintenance); and
3. Void repairs: maintenance realised in between tenancy periods.”

In addition to these processes, improvement projects can be mentioned, in which not only deficits or gaps with the original standards are solved, but also an addition to the original standard is realized (Straub, 2012: 187). Renovation is a prominent example of this type of projects. Earlier studies in the Netherlands have indicated that energy investments are notably included in renovations, planned preventive maintenance and, to a smaller extent, void repairs (Nieboer *et al.*, 2012). In the next two sections, we will return to these combinations of energy investments with other investments.

3. Method

For the study 12 housing associations have been selected and interviewed. It was chosen for interviews, because this research method gives room for expressing the underlying opinions, views and contexts for the decisions on energy investments. From an earlier study, held in 2012 (Nieboer *et al.*, 2013a,b), we expected that a big minority of all housing associations had not formulated an energy investment policy, which makes it plausible that these organisations did not have many own experiences about various ways to invest in the energy performance of their stock, and were therefore less appropriate as respondents for this research. For this reason, we did not apply a random selection, but selected housing associations from which we expected more advanced energy investment policies. We chose them among the members of an existing platform on technical management and also from a group of housing associations that, according to an own telephonic investigation done in 2012, had improved the energy performance of a relatively big share of their housing portfolio. The group of selected housing associations contains both relatively rich and relatively poor organisations. Most of the organisations are, even to Dutch standards, relatively big (10 out of 12 have more than 10,000 homes and 5 have even more than 30,000 homes, whereas the national average is around 6,600 ‘housing units’ (homes plus other dwelling units) (BZK, 2016). Using the SHAERE data, we selected both organisations that had carried out deep renovations and organisations that had not, in order to ensure that housing associations with different energy investment policies were represented. At each organisation, we spoke with persons which were responsible for the implementation of energy policies into investment planning, for example heads of real estate planning. While acknowledging that there can be competing strategies within an organisation, we focussed on the actual ways in which housing associations structure their investments, and confined ourselves to the stated underlying policy strategies. The topics in the interviews were:

- the energy policies and ambitions of the respective organisation;

- the types of investment (notably renovation, planned preventive maintenance, void repairs and possible separate investment ‘flows’) in which the energy investments are included;
- the room for selective deep energy renovations.

The interviews took place in October 2015; one interview was conducted in November 2015.

4. Results

This section is structured around two of the main issues regarding the portfolio and asset management of the housing associations, namely the policy aims concerning the energy performance of the housing stock and the inclusion of the energy investments in the categories outlined in section 2.2.

As for the policy aims regarding the energy performance of their housing stock, all 12 interviewed housing associations have such aims. Table 1 presents them.

TABLE 1 AROUND HERE

Phasing out the most inefficient homes is relatively popular among the interviewed housing associations: 7 out of the 12 housing associations aim at this. An also relatively often mentioned goal (4 times) is to attain an average label B for the total portfolio. With this aim the respective housing associations apply the national covenant agreement of an average label B for the national stock directly to themselves. Some housing associations, however, state that they had lower targets (such as an average of label C) because of insufficient financial means. The years in which the aims have to be attained vary between 2018 and 2025.

There is no general answer to the question if the interviewed housing associations will attain their own goals. A majority of them stated that they are on track, but four of them, especially (again) the less affluent organisations, explicitly said that their investment budgets are too small to attain the national or local goals regarding the energy performance of their stock.

Except from the replacement of boilers and so-called ‘open’ heating installations (e.g. geysers, gas heaters), energy investments are hardly executed separately, but nearly always combined with other more or less planned forms of investment. The moments at which the interviewed housing associations take measures to improve the energy performance of their homes is presented in table 2.

TABLE 2 AROUND HERE

Most interviewed housing associations combine energy investments with planned preventive maintenance (mentioned by 10 of the 12 selected organisations) and renovations (mentioned 8 times). Combination with void repairs has also been mentioned, but less often (5 times).

The number of 8 housing associations including energy measures in their renovations may suggest that 4 housing associations do not, but this suggestion would be false. Instead, it indicates that these housing associations do not ‘wait’ for a renovation moment and that they intend to attain their energy objectives by taking the necessary measures at other moments.

Table 3 presents how the housing association ‘allocate’ their measures between the more or less fixed investment moments mentioned in table 2 (renovation, planned preventive maintenance and void repair).

TABLE 3 AROUND HERE

From table 2 we already know that the interviewed housing associations show different policies regarding the investment moments that they use to carry out their energy

investment plans. Table 3 shows that usually (in 9 out of 12 cases) two of the mentioned three moments are used, but in different combinations. As for the renovations, there is always a package of measures applied that varies per home. This is also true for the planned preventive maintenance of some housing associations, but here we also observe more specified selections of measures, such as (extra) insulation of building elements. Remarkable is that there are housing associations (e.g. H) that carry out measures for upgrading to a high energy efficiency level are carried out during renovations, whereas other housing associations (e.g. J) have included such measures in their planned preventive maintenance. Not surprisingly, void repairs mostly include single measures, such as boiler replacement or interior insulation, or (other) relatively minor works to smooth away some quality arrears.

It is important to note that housing associations can be highly selective in the measures that they take: building elements are usually replaced at the end of their lifespan, meaning that early write-off hardly takes place, even if this would result in a notable improvement of the energy performance. So, unlike table 2 could suggest, 'natural' moments of replacement must rather be seen as a criterion for selecting measures than as an additional investment type. Especially this is an important explanation for the small number of measures per dwelling.

The interviewed housing associations think different about including deep energy renovations. In general, these investments are not very popular. Eight of the interviewed housing associations have not included such renovations in their investment planning. The most important reason given is that the costs are high. These housing associations feel that a disproportional part of the available budget would be spent on a few housing estates and besides on only one quality aspect. Other arguments brought forward are the uncertain energy savings (in terms of both demand and money), and the risk of wrong use of installations by tenants due to the unfamiliarity with these devices.

The other four housing associations argue that different homes are and also should be treated differently, and that deep energy renovations can be executed if the technical and market prospects (notably life expectancy and expected demand in the future) of the respective dwellings allow this. These organisations carry out experiments with zero-energy renovations or plan to do so in the near future. It must be added, however, that most

of these projects have an experimental character and the number of homes involved is only a small share of the total portfolio. It is possible that we witness here an innovation that is still in its early days and that is awaiting its breakthrough, but although the interviews confirm the early days of the innovation, they do not show signs of a massive uptake in the near future.

5. Conclusions

The regular investment practice seems to be a good explanation factor for the overall picture of small steps in the improvement of the energy performance of the non-profit housing stock in the Netherlands. Most interviewed housing associations combine energy investments with planned preventive maintenance and around half of them do this with void repairs. These two investment types, however, are not very suitable for large-scale investments. Renovations are more appropriate, but they rarely take place, too little to have a serious impact on the average number of measures per dwelling. Although many housing associations are, in their official policies, inclined to make big steps forward in the (average) energy performance of their stock, they seem to strongly dislike early write-offs and additional investment schemes. In practice, energy investments have to be embedded in regular investment schemes and have to follow general decision criteria such as the lifespan of the respective building element and the market position of the respective dwelling. In this approach, the main choice is *not* between many small interventions or selective deep renovations, because all housing associations broadly invest in their portfolio. The question which divides the housing associations is rather: which investment room is available for deep retrofits as well?

Because of the embeddedness of energy investments in current investment policies and practices of the housing associations, there seems little room for acceleration of energy performance improvement on the short term.

Having said this, it must be stated that the importance of general investment practices does not exclude other factors, which have not been the central subject of this paper. One of the main other factors mentioned in the interviews is the economic and political context, which

caused a rapid reduction in project development possibilities and in investment budgets. In turn, this led to a more negative attitude towards heavy investments, which was further aggravated by a growing consciousness that the resulting energy savings are mostly lower than predicted on the basis of current models (e.g. Majcen *et al.*, 2013).

In addition, deep energy renovations are mostly seen as innovations, which could be suitable for individual experiments, but not (yet) for wide application. This may change when this kind of renovations will be more generally recognised, but to date this is not the case. It would be helpful that zero-energy renovations, although still in their infancy, but developing rapidly, will continue to follow the current trend of decreasing expenses. However, it must be admitted that even then, (pre)financing of the measures remains a barrier for investments (e.g. Sorrell *et al.*, 2004). For this reason, a step-by-step renovation (see e.g. Enseling and Greiff, 2004) could be more practical, although this approach bears the risk of preventing further improvements, the so-called locked-in effect. A possible policy instrument to prevent or at least mitigate this effect is a Building Renovation Passport, which is defined as a “document - in electronic or paper format - outlining a long-term (up to 15 or 20 years) step-by-step renovation roadmap for a specific building” (Fabbri *et al.*, 2016: 6). Experiments with this instrument now take place in Germany, France and Belgium. Further research is needed to evaluate this instrument and, more in general, to assess the size of this risk and the efficiency of the step-by-step approach compared to other approaches.

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