OPPORTUNITIES FOR THE INTEGRATION OF ENERGY CONSERVATION IN THE ASSET MANAGEMENT OF LANDLORDS

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Keywords: sustainable building, energy conservation, existing stock, asset management, housing associations, EPBD, energy labeling

Summary

CO2 reduction by means of energy conservation is an important topic in the Dutch governmental environmental policies. With new construction accounting for a fraction of the total building stock, existing dwellings are of great importance in the Dutch sustainable building policies. With 35% of the total housing stock in the Netherlands, the social rented sector, and therefore housing associations, could play a major role in energy conservation. However, the large energy conservation potential that is present in the existing stock owned by the housing associations is only to a minor extent exploited.

Barriers and incentives for housing associations to implement energy conservation into their asset management are taken into account. From 2006 the European EPBD (Energy Performance Building Directive) legislation should be implemented in the European Member States. The consequences and resulting opportunities of the European EPBD legislation are considered in relation with the asset management of housing associations. This paper presents a method for housing associations to implement energy conservation in their asset management, in order to come to an integration of energy conservation measures into their maintenance and renovation practice.

1. Introduction

In 1997, the developed nations agreed in the Kyoto Protocol to limit their greenhouse gas emissions, relative to the levels emitted in 1990. The residential and tertiary sectors, of which the major part consists of buildings, account for more than 40% of the final energy consumption in the European Community (Bourdeau, 1999) and, therefore, the built environment is an important target of the environmental policies resulting from the Kyoto Protocol. As these residential and tertiary sectors are expanding and consequently its energy consumption (and thus CO_2 -emission) is bound to increase, the reduction of energy consumption in the built environment becomes evident.

Following the Kyoto protocol, the Dutch government has decided upon an annual energy conservation of 10% in 2010 with respect to the energy consumption in 1990. In the Netherlands, a lot of progress has been made in reducing CO_2 -emissions in new buildings. However, annual new construction accounts with less than 1% for just a minor part of the total Dutch building stock. This percentage of annual new construction is similar in other European countries where it is generally below 1%. Besides its large size, the existing building stock has a low energy performance caused by poor insulation values and aged heating installations. The energy consumption in existing dwellings exceeds that of new dwellings by far and, therefore, a large potential in energy conservation is available in the existing building stock (Thomsen and Sunikka, 2001).

Housing associations could play an important role in fulfilling the commitments concerning the reduction of CO_2 -emissions following the Kyoto protocol, if they would be able to improve the energy performance of their housing asset. In order to improve the energy performance of their asset, housing associations could incorporate the aspect energy conservation in their policy, from strategic level down to the realisation stage where the actual measures are carried out. This paper elaborates on the energy conservation activities of Dutch housing associations and presents a method for housing associations to integrate the aspect energy conservation in their asset management.

In the next section the social rented sector and the Dutch housing stock will be described. The energy conservation activities of Dutch housing associations are discussed in section three and the European Energy Performance of Buildings Directive and its consequences and opportunities for housing associations will be elaborated on in section four. Based on these consequences and opportunities resulting from the EPBD, a method for housing associations to implement the aspect energy conservation in their asset management will be introduced in section six, but beforehand a general outline of asset management will be presented in section five. This paper will be finalised with a conclusion in section seven.

2. The Dutch social rented sector

When set within an international context, social rented housing in the Netherlands can be characterised by its relatively large share of the housing stock, a relatively large proportion of dwellings for middle-income households and, more or less as a consequence, a large variety of tenants in socio-economic respect (see Table 1; Van Kempen and Priemus, 2002). With an asset of roughly one third of the total housing stock, Dutch housing associations own a considerable part of the total housing stock and, therefore, are major players in the Dutch real estate market. They are not-for-profit organisations, which are obliged to operate in the interest of housing, in particular by providing decent, affordable housing to lower-income households. In Table 2, some of their characteristics have been summarised.

Table 1 Division of the housing stock by tenure in the Netherlands, 1 January 2002 *Source: Ministry of VROM (2004)*

	Social rented	***Private rented***	***Owner-occupied***
Percentage of total housing stock	35%	11%	54%

Table 2 Some characteristics of housing associations in the Netherlands, 1 January 2002 *Source: Ministry of VROM (2004)*

Total housing stock	6.7 million
Number of housing associations	552
Number of social rented dwellings	2.3 million
Dwellings per landlord (average)	4,220

A large part of the Dutch social housing stock, of which the majority consists of multi-family housing, has been built in the timeframe from the Second World War until the 1970's (table 3).

Table 3 Age and differentiation of the Dutch social rented stock *Source: CFV (2003)*

Year of construction:	***until 1945***	***1945-1959***	***1960-1969***	***1970-1979***	***1980-1989***	***1990-1999***	***2000 and beyond***
Netherlands %	9.7	16.1	19.4	19.6	21.9	10.9	2.4

Housing type:	***Single family***	***Multi family without elevator***	***Multi family with elevator***	***High-rise (from 5 stories)***	***Other type***
Netherlands %	45.4	28.8	12.4	9.0	4.4

The energy performance of the dwellings in the social rented stock built before 1971 is relatively low compared to today's standards (VROM, 2002). For example, the insulation facilities in the social housing stock have significantly increased in the dwellings built after 1970 (Table 4).

Table 4 Presence of insulation facilities in the Dutch social housing stock in the year 2000 *Source: Ministry of VROM (2002)*

	Double glazing	***Insulated facade***	***Roof insulation***	***Ground floor insulation***
Until 1946	58%	25%	32%	9%
1946-1970	61%	34%	38%	6%
After 1970	79%	82%	85%	59%

3. Energy conservation activities of Dutch housing associations

Since social housing accounts for a significant segment of the housing sector in many European countries, and because housing associations are able to steer the development of their housing asset centralised from within the organisation, this asset management is of great importance to the success or failure of the governmental environmental policies.

In spite of this opportunity the current practice in asset management shows that energy conservation is within the vast majority of Dutch housing associations only a consideration in the final realisation stage of the decision making process. A survey conducted at 384 housing associations in 1997, shows that the environmental quality of the dwellings is one of the least important considerations for housing associations in the management of their housing asset (Straub, 2001). A study conducted in 2002 (Spapen and Jonkers, 2002) shows that although energy conservation is more often considered by housing associations than found in the 1997 study, it does not have a high priority. The 2002 study shows that in half of the housing associations that participated in the survey, energy conservation measures are part of the yearly maintenance, but these measures aren't implemented as frequently when considered apart from other activities. A recently conducted survey with a similar aim and questioning as the 1997 study (Vijverberg, 2005), shows that the consideration 'sustainable quality of the dwellings' even is of slightly less importance in the asset management of Dutch housing associations than found in the 1997 study.

In the execution of their asset management with regard to the aspect energy conservation, housing associations are confronted with several organisational, financial and technical barriers, which prevent the implementation of energy conservation measures on a larger scale. Generally speaking, it is often more difficult and expensive to introduce environmental improvements in existing dwellings than it is to incorporate them in new buildings (Sunikka and Boon, 2002)

For housing associations, financial obstacles form the most important bottleneck in sustainable building. Concerning the investments in energy conservation, the expected profitability is virtually the only real consideration. In general, sustainable building suffers from the imago of being expensive and within many housing associations the notion that energy conservation measures aren't profitable is present (Spapen and Jonkers, 2002; Boon et al., 2004). This notion is rooted in the fact that extra investments in energy conservation are hard to link to financial return in the exploitation. In this respect there is the well-known dilemma that the tenant profits from the landlord's investments in energy conservation measures. Contrary to the prevailing ideas about the lacking profitability of energy conservation measures, several studies show that investments in sustainability and/or energy conservation are indeed profitable, when the benefits in the exploitation and technical maintenance are taken into account (Boon et al., 2004) as well as the increased value of the dwelling. Weismann (2000) states that on the average housing associations do have sufficient financial means to invest in sustainability, but problems concern the tenants who cannot or are not willing to accept a possible increase in housing costs.

Another barrier for implementation is related to the necessary cooperation of the tenants. When implementing measures in the case of major renovation, a housing association has to assure itself from a 70% majority of the present tenants, in order to be legally able to carry out the measures (Spapen and Jonkers, 2002). Tenant participation from an early stage on poses opportunities in this respect. (Suschek-Berger and Ornetzeder, 2004).

Due to barriers such as these, housing associations still do not implement environmental measures in practice on a large scale and the measures that are being implemented tend to be based on building regulations only (Sunikka and Boon, 2002). Consequently, the large energy conservation potential that is present in the existing stock owned by housing associations is only exploited to a minor extent. Though, this situation is slightly changing for many housing associations investments in energy conservation are no longer solely related to energy costs, but the contribution of energy conservation measures to the differentiation of the housing stock and aspects like comfort, health and safety are also taken into account (NOVEM, 2003). For example, when a door is placed to prevent draught at the formerly open entrance of an

estate, this increases the safety level as well. Another example is the placement of HR++ glazing that, apart from the energy conservation, also increases the comfort level and the security of the dwelling.

4. Energy Performance of Buildings Directive

An important forthcoming development that will have its impact on the policy of housing associations is initiated from the European Union (EPBD, 2002). The EPBD (Energy Performance of Buildings Directive) from December 2002 is the European guideline for the energy performance of buildings and is a crucial part of the EU strategy of the EU to comply with her obligations regarding the Kyoto Protocol. Based on the CO_2-reduction policy of the EU, targets have been set for the building sector. The objective is to promote the improvement of the energy performance of buildings within the European Community, taking into account outdoor climatic and local conditions, as well as indoor climate requirements and cost-effectiveness. The measures are aimed at energy consumers. The EPBD legislation will in the European member states result in a strong emphasis of the building regulations on minimizing energy consumption.

The EPBD prescribes the use of an Energy Performance Certificate (EPC). This Energy Performance Certificate gives insight in the energy performance of a building and presents proposals for improvement of the energy performance of it. Detailed implementation is left to the member states, thus allowing each member state to choose the regime that corresponds best to its particular situation. As stated in the EPBD, from January 2006 when renovating a building larger than 1.000 m^2 an Energy Performance Certificate should be provided and the energy performance of the building should be upgraded to meet minimum requirements in so far as this is technically, functionally and economically feasible. Furthermore, from January 2006 when a dwelling is built, sold or rented out, an Energy Performance Certificate should be supplied obligatory. Both new and existing buildings must be certificated. The validity of the certificate shall not exceed 10 years. The member states of the EU are obliged to alter their national legislation to meet the standards of the directive. Apart from the requirements concerning the improvement of the energy performance in new construction and major renovations, the EPBD prescribes that public buildings should have its Energy Performance Certificate prominently placed and clearly visible to the public. Furthermore, installations for heating and air-conditioning in existing buildings should be inspected regularly and the feasibility of the use of renewable energy options in new buildings with a total useful floor area over 1000 m2 should be taken into account before construction starts.

The Dutch government intends to implement the EPBD by basing it as much as possible on existing requirements and policy instruments (Geel, 2004). An important existing policy instrument in this respect is the EPA, the Energy Performance Advice. The Dutch government introduced this policy instrument in 1998. With an EPA, an owner is able to acquire insight in the present energy performance of his dwelling and the possibilities for improvement of the energy conservation. Based on an inspection of the dwelling(s) by an EPA-consultant, the optimum between energy conservation measures and costs is determined. The Energy Performance Certificate prescribed by the EPBD will be based on the EPA instrument and in coherence an Energy Label for dwellings will be introduced (Geel, 2004). This Energy Label will have a classification ‘A’ to ‘G’ concerning the energy performance of the dwelling, where a dwelling with Energy Label ‘A’ has the best energy performance.

The consequences of the forthcoming EPBD legislation pose opportunities for housing associations. Following the new legislation housing associations have to hand over the Energy Performance Certificate every time they let a dwelling to a new tenant. This implies that housing associations will be able to develop a clear and detailed insight in the energy performance of their entire housing stock, posing opportunities for housing associations to use this information about their housing stock in their asset management. In the appraisal of the Energy Label tenants play an important role and therefore the improvement of the energy performance of a dwelling by means of energy conservation measures should foremost be considered with regard to aspects as comfort, health, indoor climate, finances and/or safety (Pel and Donze, 2004). In this respect, the housing association could well deploy the Energy Label as a simple means to promote energy conservation to their tenants and integrate the Energy Labelling system in their asset management.

5. Asset management

Landlords have to take decisions about the development of their stock in order to avoid vacancies, to keep their housing stock in line with the present and future tenants’ demands and to keep their stock in a proper physical state. The framework of the decision-making processes involved is referred to as the ‘asset management’ of the landlord. In general, landlords develop their asset management based on an integrated vision on developments on the housing market, target groups, technical considerations and financial position. They can take decisions about the future of their stock on the basis of market potential and market differentiation.

The concept of asset management is relatively new in the social housing practice. Asset management stems from the private sector where it is concerned with an analysis of the performance of an organisation's asset in support of decisions about holding, selling and repositioning. In private sector asset management, the emphasis is on optimising financial performance. In the social rented sector asset management, financial performance is not necessarily – or mostly not – the primary criteria for management decisions. The key-question for social landlords is how to reach their social housing objectives efficiently (Gruis and Nieboer, 2004).

In many European countries, national social housing policies are subject to a transformation process that is part of a more general trend towards privatisation and decentralisation of public services. These developments have led to a more market oriented social housing management (Gruis and Nieboer, 2004). The changes in the Dutch social housing policy took place in the 1990's and have set considerable challenges for the asset management of the housing associations. During the last 10 years, Dutch housing associations were transformed from operational, task-oriented organisations into 'social entrepreneurs' and had to operate in a more strategic, market oriented way. As a result, the sector is, more than in the past, responsive to innovations to support management decisions. This might create a favourable climate for the development of strategies on relatively new issues. Sustainable housing management can be seen as one of these (Nieboer, 2004).

6. Asset management and energy labelling

Although Energy Labels, as prescribed in the EPBD, are new to housing managers, the use of labels in order to allocate investments in housing is not. In housing asset management, there are several domains in which labels are used in order to indicate what must be done with the respective estate or dwelling, or what its future state must be. In this section, we go into the use of labels in these fields.

6.1 Formulation of labels

There are many types of labels, each related to one or several aspects of stock policy. These labels can be divided into the following categories:

1. Labels referring to the future situation of the stock — In most cases these labels are related to physical quality standards like technical condition, the energy performance of the dwelling reflected in the Energy Label, floor area, and amenities (e.g. size of kitchen unit, number of wash basins, wall tiles in the bathroom, central heating). Nevertheless, labels related to non-physical aspects, such as rent and target group (e.g. homes for the elderly), can also be used.
2. Labels referring to the process or the strategy towards the desired future situation — These labels are related either to maintenance and improvement measures or to sale arrangements. Examples of labels related to maintenance and improvement measures are consolidation, upgrading, refurbishment and demolition.

Combinations of the two types are conceivable as well. In these cases the two types can be interdependent. For instance, consolidation is not possible if the desired quality standard of an estate is higher that the present situation, because some kind of improvement is necessary in that case. An example of a combination of labels is given in the next table. In this example '+'-signs are used to indicate categories of quality (the more '+'-signs the higher the quality standard).

Table 5 Combination of labels referring to desired physical quality and labels referring to process or strategy

group of dwellings	**present physical quality**	***label referring to desired physical quality (i.e. energy performance)***	***label referring to process or strategy***
estate 1	+++	+++	consolidation, regular maintenance
estate 2	++	+++	small improvement
estate 3	+	+++	extensive refurbishment or redevelopment
estate 4	+	++	small improvement
.....	.....	.....	.....

Labels must refer to subjects that are considered as relevant and important for the asset management. Examples of these domains are listed below (cf. Heeger & Van der Haak, 2001). As we see, energy performance is added as a relevant domain:

- Physical modification
- Energy performance
- Technical quality
- Rent or sale
- Rent policy
- Exploitation period
- Living environment, social management
- Target group, lettability
- Convenience, luxury

The labels related to energy performance can be chosen in strict accordance with European or national regulations (for instance A, B, C, D or 1, 2 3 etc.) In addition, more specific labels can be formulated, indicating the measures that must be taken to reach a certain energy performance.

The choice of labels can depend on the choice of another label. This applies in particular in situations in which labels on physical measures are involved. For instance, if demolition is foreseen within 5 years, it has no use to attain an A label for energy use. If a reduction of energy consumption is desired, consolidation is an unlikely option.

The resulting energy conservation measures could be linked to the desired energy performance, for example an estate that is marked to have an energy performance of Energy Label A could have a heat pump, HR++ glazing and an energy efficient boiler fitted while and estate that is marked as having Energy Label B could only have HR++ glazing and an energy efficient boiler fitted.

6.2 Product groups: labels for convenience and luxury

Among the various types of labels, labels that reflect a level of performance, just as energy labels do, are especially interesting in the context of this paper. In this respect, labels for convenience and luxury are appropriate examples. In this approach, not so much the Energy Label itself as related aspects like comfort level, health and indoor climate could find a place.

Thinking in terms of convenience and luxury does not have a long history in Dutch social housing. Traditionally, housing need has been captured in terms of number of rooms, technical quality, multi or single family homes and, for certain groups like the aged or the disabled, the presence of specific amenities in or around the dwelling. Vacancy rates in the late 1980s and the early 1990s showed, however, that housing maintenance and renewal is not only a question of technical life span, but also of economic life span. Because of this, new classifications of the housing stock have been developed. While traditionally technical management was driven mostly by a regular maintenance planning cycle, diversification of the physical quality of the dwellings is used more and more as an instrument to adapt the stock to the large variety of individual housing preferences.

The housing association of AWV, an housing association with about 11,000 homes in Amsterdam, has developed a classification related to convenience of the dwelling, like floor area and amenities (e.g. size of kitchen unit, number of wash basins, wall tiles in the bathroom, central heating). Using this classification, the AWV has assessed the present situation of its estates and has formulated the desired situation. In doing so, the AWV tries to structure its efforts to raise the average standard of its housing portfolio, which is one of its most important objectives.

Table 6 Quality classification of housing association AWV (partial overview) *Source: AWV, Amsterdam*

	Standard	Standard Plus	Comfort
General			
Description	Based on minimum requirements.	Describes the minimum requirements that must be met by all homes in the future.	Homes of high quality and service. Target groups are higher-income households, traditional families and the better-off elderly.
Criteria	All criteria must be met.	At least 25 of the 28 criteria must be met.	At least 23 of the 28 criteria must be met. Floor area requirements must be met anyway.
Floor area			
floor area according to national Housing Quality Rate (specified by number of rooms)	(no requirements)	Inner city / Outskirts 1r >= 25 m² / 1r >= 30 m² 2r >= 35 m² / 2r >= 40 m² 3r >= 45 m² / 3r >= 50 m² 4r >= 55 m² / 4r >= 60 m² 5r >= 65 m² / 5r >= 70 m² 6+r >=75 m² / 6+r>= 80 m²	Inner city / Outskirts 1r >= 30 m² / 1r >= 35 m² 2r >= 41 m² / 2r >= 46 m² 3r >= 52 m² / 3r >= 57 m² 4r >= 63 m² / 4r >= 68 m² 5r >= 74 m² / 5r >= 79 m² 6+r >=85 m² / 6+r >= 90 m²
Kitchen			
length of kitchen unit	(no requirements)	at least 170 cm	at least 220 cm
top cupboards	(no requirements)	at least 2	at least 4
space for household appliances	at least 60 cm for refrigerator (with gas cooker on it)	at least 120 cm in total for refrigerator and gas cooker/furnace	at least 180 cm for refrigerator, gas cooker/furnace and dishwasher (or washing machine) (homes with 1 or 2 rooms: at least 120 cm)
connections	gas, water, sewer, 3 rim-earth sockets	gas, water, sewer, 3 rim-earth sockets, if space available also connection for washing machine	gas, water, sewer, 4 rim-earth sockets, connection for dishwasher and/or washing machine
tiling	(no requirements)	near gas cooker and kitchen unit	near gas cooker and kitchen unit

7. Conclusion

The Energy Labelling that results from the EPBD legislation could be considered as an opportunity for housing associations to incorporate energy conservation in their asset management. The method presented in this paper deploys labels to allocate investments and, therefore, the Energy Label system could be incorporated well in the asset management. With regard to the implementation of energy conservation measures, it is important that housing associations emphasize to their tenants related aspects such as the improved comfort level, the increased safety and the lower additional costs for energy and, in addition, that the housing associations consider the actual measures in relation to these aspects. However, the strategies to facilitate the implementation of the energy conservation policy, i.e. the strategies to overcome the barriers encountered by housing associations, require much further research.

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