



Energy research Centre of the Netherlands

Financing energy saving measures in the Dutch social housing sector

WP2 report to the InoFin project

M. ten Donkelaar

Y.H.A. Boerakker

B. Jablonska

C. Tigchelaar

Acknowledgement

This report is the result of a study provided within Work Package 2 of the project ‘Innovative Financing of Social Housing Refurbishment in the Enlarged Europe’ (InoFin). This project is supported by the European Commission under the Intelligent Energy Europe Programme. We are grateful to the European Commission for part funding this work. The study is jointly conducted by the InoFin project team and is registered under ECN project number 7.7735. This present report contains a study of the social housing sector in the Netherlands that aims at extracting experience in relation to energy refurbishment in the sector.

Abstract

This report gives an overview of housing refurbishments in the social housing sector in the Netherlands. As the social housing stock in the Netherlands is almost completely owned by social housing associations, most refurbishment projects are carried out by housing associations themselves and are largely influenced by the regulatory and financial framework in which they operate.

Housing refurbishments, both of the social housing stock and of owner-occupied dwellings, have also been supported by the government since the late seventies, starting with support for single measures such as wall insulation. During the nineties support was aimed at more integrated approaches leading to an increase of the energy performance of new houses and the already existing building stock. This was stimulated by regulation, setting minimum energy performance standards, as well as by financial support. After 2002 a number of these financial instruments were cut back or completely abolished. This has led to a need to look for alternative financing mechanisms for increasing the energy efficiency, both for private house-owners as well as housing associations.

Contents

Contents	3
List of tables	5
List of figures	5
Summary	6
1. Introduction	11
2. The social housing stock in the Netherlands	12
2.1 Basic facts regarding the national housing stock	12
2.2 Information about energy related expenditures	14
3. Regulatory framework	16
3.1 Housing policy documents	16
3.2 Housing regulation	17
3.3 Energy /heat supply regulation	19
3.3.1 Heat supply regulation	19
3.3.2 The role of municipalities	20
3.4 EU Directive on Energy Performance in Buildings	20
3.4.1 Current status in the Netherlands	21
3.4.2 EPBD Implementation in connection to national regulation and policy	21
3.4.3 Future building regulation	23
4. Institutional framework	24
4.1 Housing associations	24
4.1.1 Refurbishments	24
4.1.2 Tenant representation	25
4.1.3 Anticipated future developments	25
4.2 Financing of social housing refurbishment	25
4.2.1 Financing constructions in the past	25
4.2.2 Financing of housing associations today	26
4.2.3 Alternative ways of financing	26
4.3 Energy efficiency initiatives of municipalities	27
5. Financial support for housing refurbishment	29
5.1 Energy conservation programmes in the Netherlands in the seventies and eighties	29
5.1.1 National Insulation Programme	29
5.1.2 Other support programmes	30
5.2 Energy conservation programmes in the Netherlands in the nineties	31
5.3 Present energy conservation programmes in the Netherlands	32
5.3.1 EIA and EINP	32
5.3.2 TELI	32
5.3.3 Temporary grant scheme for CO2 reduction	33
5.3.4 Green Financing	33
6. Private sector initiatives	35
6.1 Financial constructions of social housing companies	35
6.1.1 Conventional financing	35
6.1.2 Energy account via the housing association	36
6.1.3 Energy supply company as the executive party	36
6.1.4 Energy Performance Contract	37

6.1.5	Living Expenses Guarantee	38
6.2	Activities of energy suppliers	39
6.3	Innovative financing example - the PPM formula	39
6.3.1	Mortgages higher than the 'mortgage quotum' for new dwellings	40
6.3.2	Energy efficiency investments in the social housing sector	40
6.3.3	Motives for the development of an innovative financing scheme	41
6.3.4	The Seinen approach abroad	43
7.	Description of projects	44
7.1	Veenendaal-	44
7.2	Dronten	45
7.3	Project examples of Seinen Projectontwikkeling	46
8.	Description of drivers and barriers	48
8.1	Overview of main barriers to social housing refurbishment	48
8.1.1	Financial barriers for tenants	48
8.1.2	Financial barriers for housing associations	48
8.1.3	Information barriers for tenants	48
8.1.4	Information barriers for housing associations	49
8.1.5	Social barriers for tenants	49
8.1.6	Social barriers for housing associations	49
8.1.7	Barriers on a national level	49
8.2	Overview of main drivers to social housing refurbishment	50
8.2.1	Regulatory and institutional drivers	50
8.2.2	Financial drivers	50
8.2.3	Social drivers	51
9.	Conclusions and recommendations	52
9.1	Main conclusions	52
9.2	Recommendations	52
9.2.1	Recommendations for housing associations	52
9.2.2	Recommendations on a national policy level	53
9.2.3	Value of the Dutch example to the InoFin project	53
	References	55
Appendix A	Abbreviations and programmes	57

List of tables

Table 2.1	<i>Basic facts about housing in the Netherlands (2000)</i>	12
Table 2.2	<i>Division of apartments in the Netherlands</i>	12
Table 2.3	<i>Division of single family homes in the Netherlands</i>	13
Table 2.4	<i>Apartment characteristics in the Netherlands</i>	13
Table 2.5	<i>Type of heating in dwellings</i>	13
Table 2.6	<i>Development of prices of main energy carriers</i>	14
Table 2.7	<i>Energy tax rates for 2004-2006</i>	14
Table 2.8	<i>Energy expenses differentiation income classes in 2000</i>	14
Table 2.9	<i>Energy costs based on apartment category</i>	15

List of figures

Figure 3.1	<i>Housing regulatory framework for social and commercial rental</i>	17
------------	--	----

Summary

This report gives an overview of housing refurbishments in the social housing sector in the Netherlands. It aims at extracting experience in relation to energy refurbishment of social housing in new EU Member States and Candidate Countries. Experiences with social housing refurbishment in the Netherlands, Denmark and Germany are here used as an example for possible projects in the Czech Republic, Poland, Slovakia, Latvia and Bulgaria. This study is part of a European survey under the InoFin Project supported by the Intelligent Energy for Europe Programme.

In the Netherlands a significant part of the housing stock is owned by social housing associations providing housing to lower and middle-income households. Although not strictly defined, one can say that social housing in the Netherlands is the housing stock owned by social housing associations. Of the total number of dwellings of 6.8 million, about 2.36 million are part of the social housing stock.

Because of a large natural gas reserves in the Netherlands, around 99% of dwellings are heated by natural gas. District heating has a less significant share in space heating in the Netherlands, although it is regaining attention due to its environmental benefits. Individual central heating systems are used in the majority of dwellings. The penetration of individual central heating systems has increased to 82%, decreasing the share of single heaters and heating systems per housing block. Cooling systems are not commonly used in the Netherlands yet. In 2001 mobile cooling units were available in 1.5% of the dwellings in the Netherlands. The energy use in apartments has gradually decreased during the past decades. Apartments build up to the fifties have an energy performance well over 90 kWh/m², the energy performance of dwellings built after 1995 decreased to below 60 kWh/m².

Regulatory framework

Housing in the Netherlands is strictly regulated within a number of acts and decrees. The main acts/decrees related to housing in general and social housing in particular are:

- *The Housing Act*, which includes all aspects of building and housing such as building and demolition prescriptions, building permits, government supervision and minimum standards of dwellings. The act obliges municipalities to set up specific regulations for building and refurbishment. Under the Housing Act, so-called permitted organisations are appointed to build social houses (housing associations).
- *The Act on Rental Prices of Habitation*, which regulates in detail the maximum rent price for all habitation. On the basis of all sorts of objective criteria, House Assessment Points can be awarded to dwellings. These House Assessment Points determine the rental price of the dwelling. With refurbishment the amount of House Assessment Points and the rents can be increased. The act obliges the minister of housing to determine a maximum rent increase. This percentage is derived from inflation-indexes and is only applicable to rents up to a certain threshold (under € 604 per month in 2006).
- *The Decree on social housing maintenance* regulates the obligations and responsibilities of social housing associations in detail. It elaborates the rules set in the housing act for ‘permitted organisations’.
- *The Rent Bonus Act* regulates subsidies that low-income tenants receive for renting. If tenants are eligible for a rent bonus the amount of the bonus depends on:
 - The income and resources of the tenants.
 - The rental price of the dwelling.

Rent bonuses can only be granted if the rent of a dwelling does not exceed the yearly set maximum for social housing (€ 604 per month in 2006).

From a technical and energy performance perspective new houses as well as refurbishments are covered within the *Building Code*, which is derived from the housing act, contains some specific rules on energy saving within new-to-build dwellings. Minimal standards are formulated for insulation quality of walls, floors, ceilings, doors and windows. Next to these standards for specific parts the Energy Performance Standard (EPN) regulates the energy use of entire buildings. The standard says, to obtain a construction permit, the energy-use of a dwelling may not exceed a certain coefficient (EPC). This coefficient must be calculated in a prescribed way. The energy standard for residential buildings does only apply to new-to-build houses or when a house is (almost) completely replaced in a refurbishment project.

The system of House Assessment Points that determines the rents of social housing in the Netherlands is linked to a maximum rent for a certain category of social rental houses. But, for example, an insulation measure is not linked to the Point System, which means that investments in this measure cannot be used to increase the rent. This may refrain housing associations from making such an investment.

The aforementioned regulatory framework already includes the main articles of the European Energy Performance Directive of Buildings (EPBD). The main element that remains to be implemented is Article 7 (building certification). The objective is that the certification duty shall be embedded in the law (by means of a complete modification of Dutch building law) in January 2007.

Institutional framework

Housing associations own nearly the whole social housing stock in the Netherlands, making them practically the only provider of social housing. Housing associations can decide independently to invest in energy reduction measures, on a small or a large scale, without the approval of any public authority. There are no specific energy standards for social housing in the Netherlands, other than the standards valid for all dwellings.

Housing refurbishments are not strictly regulated. The way they are carried out differs for each case. Refurbishment can be divided in small, large and district scale. Small changes within dwellings or small expansions can be made without a building permit. For larger scale housing refurbishments a building permit is compulsory.

In general both municipalities and associations are involved in district-scale refurbishments. Often commercial real estate developers are also involved. Usually, most of the costs are covered by the developer and/or cooperative. It is quiet common that refurbishment is combined with new dwelling construction, especially when commercial developers are involved. The sale of these new houses provides the financial means necessary for refurbishment. At the same time it helps to attract higher income people into low-class neighbourhoods.

Today housing associations in the Netherlands have relatively large financial means available for refurbishment and construction of new social housing. Housing associations generate their resources mainly by investments on the capital market, from rents and by selling part of the housing stock (the value of which has increased considerably during the last decade). To a great extent, they finance their investments in real estates by loans from the capital market. Many housing associations have an ambitious program for building new houses and substantial parts of the property will be restructured and investments will be done in the maintenance of old city quarters.

The Dutch Municipality Bank (BNG) is one of the main financiers of the housing associations. This bank is specialised in long-term loans (>10 years) against attractive interest rates, making it a more attractive financial institute than commercial banks. Together with guarantees of the

Dutch Guarantee Fund for Social Housing (WSW) loans from the BNG are an attractive form of financing for construction and maintenance of the building stock.

Financial framework

Energy conservation became a hot issue in the Netherlands at the time of first and second oil crises in the seventies. Energy saving in the residential sector was one of the main issues in the policy plans and grant programmes that have been developed since then. Programmes developed during the seventies and eighties were:

- The *National Insulation Program* (NIP) was operated from 1978 to 1987. Energy saving measures such as grants for insulation of existing dwellings or for condensing boilers were subsidised. In 1982, grants for owner occupied houses came to an end, whereas grants for rental houses continued. Within this programme, a total amount of 1.67 billion NLG¹ has been spent. It is not completely clear how much of this money was spent on insulation. As result of the NIP in total 1.82 million dwellings have been insulated with grants (and an additional 1.5 million dwellings without grants). The total accumulated natural gas savings are estimated at 9.9 billion m³, and a saving for every following year of 1.47 billion m³.
- The '*National Hunt for Cracks*'. By advertising on television, on radio, in newspapers and brochures, the government tried to motivate residents to tighten their dwellings from uncontrolled air leaks. This led to massive application of polyurethane foam in houses, but often led to worsening indoor climate conditions. The '*National Hunt for Cracks*' is an example of a campaign with an important negative effect on the indoor climate.

During the nineties a number of new programmes were introduced:

- Between 2000 and 2004, the energy agency NOVEM ran the so-called *Energy Premium Scheme*. This grant scheme was intended for energy saving measures in existing buildings and connected to the EPA (*Energy Performance Advice*). After an inspection, the EPA evaluated the energy performance of the building and issues an Energy Index. Moreover, an EPA advisor defined a parcel of energy saving measures, which can be applied in the house. If, afterwards, any advised measure was carried out, it was be eligible for a grant. The list of measures eligible for a subsidy was reviewed each year to subsidise only the best available technologies.
- Energy utilities have been involved in energy efficiency measures for Dutch households during the nineties (up to the year 2000). In 1991 the energy industry together with the Ministry of Economic Affairs launched the *Environmental Action Plan* (MAP). The main focus of the MAP was on addressing the energy use of small-scale end-users through advisory services and subsidy schemes for energy conservation.
- The *EIA* (Energy Investment Deduction) and the *EINP* (Energy Investment Deduction for Non Profit Organisations) support(ed) investments in energy saving technologies in the service sector. The EIA enables private companies to deduct part of the investment costs of certain technologies from the fiscal profit of the company. This way the EIA forms a kind of investment grant. Investments in the non-profit sector have been supported through a special programme, the EINP. Housing associations, usually non-profit organisations, have made use of the EINP programme which ran from 1995 to 2002.
- *Green Funds Scheme* - For private house-owners or housing associations wishing to build or reconstruct houses it is possible to receive a mortgage with a lower interest rate when a significantly higher energy performance can be reached than the existing EPC standard. Such a 'green mortgage' has been made possible under the Green Funds Scheme. The Green Funds Scheme is a government tax incentive instrument whereby private money is used for investment projects with environmental benefits, such as sustainable buildings. Investing in the Green Funds Scheme means that individual investors lend their own 'cheap' money to the banks, at a lower interest rate. The 'green banks' can then offer cheaper loans to environmental projects. This encourages the implementation of innovative environmental projects

¹ 1 NLG (Dutch guilder) = 0.4538 EUR.

that are less profitable than ‘conventional’ projects but, in this way, can still be realised. Investors receive a lower interest rate when investing in a green fund, but they receive a tax deduction on their interests.

- Through the *TELI programme*, the government encourages low-income household to implement energy saving measures. Low-income households often live in old, badly insulated dwellings. These households usually spend little money on insulation or on energy efficient appliances, while the savings from energy efficiency are very welcome. Grants from the TELI programme can be used for projects that inform, advice or help low income households with energy saving and energy efficiency. Grants amount maximally € 460,000 per project.

Private sector initiatives

In the Netherlands, housing refurbishment is mainly undertaken by housing associations themselves, sometimes combined with government support, sometimes only based on own funding. When housing associations are financing refurbishment themselves, they have a number of possibilities of how to finance the refurbishment costs. Five possible ways of financing can be distinguished:

1. Conventional financing. Tenants will be completely/partly charged for the investment by means of the rent increase. Here the House Assessment Point System determines whether the refurbishment can be completely covered by the rent increase. Main problem with this system is that tenants see their rent increased directly, but the decrease of energy costs much later, as they pay a fixed amount each month (corrected once a year for actual consumption).
2. Energy accounts through the housing cooperative. A housing association invests in refurbishment and at the same time agrees on a collective agreement with the energy supplier (negotiating lower rates than a single tenant could get). Tenants pay the energy bill to the cooperative. As a result, they will find their housing and energy costs on one bill, showing rent increase and energy costs decrease.
3. Energy supply company as the executive party. A housing association selects an energy supply company to directly manage the energy supply on its premises. E.g. the energy supplier replaces a boiler in a housing block by a new one and the tenant leases/hires the boiler from the energy supplier. Through the new boiler energy costs are decreased and the energy supplier uses this amount of money to finance additional energy saving measures. This is a suitable construction when housing cooperative owns a collective (block) heating system.
4. Energy Performance Contract. Investments and accompanying services regarding the realization and monitoring of energy saving measures are financed from the generated savings on energy consumption. The contract is closed among tenants, housing association and an external party for a longer period (approximately 10 years). The energy performance contract is mostly focused on (collective) energy supply with accompanying energy management/administration.
5. Living Expenses Guarantee. Housing association gives tenants a guarantee that the total living expenses (consisting of the rent and secondary expenses like energy costs, cable and telephone) during a certain period of time will not increase more than a common inflation rate. This removes the rent increase barriers for tenants.

Although most housing associations chose a more conventional way of financing (e.g. option 1 or 2), examples do exist of refurbishments carried out together with energy supply companies. There is an example of a housing cooperative in the city of Tilburg that guaranteed to its tenants that living expenses would not increase after refurbishment, which actually was the case.

A clear example of a new financing scheme in new houses is realised through the so-called PPM-formula of Seinen Projects - a housing development company. The PPM-formula makes it possible to borrow an additional amount of money, on top of the mortgage quatum. This additional amount of money is also considered to be part of the mortgage with the same tax conditions as the rest of the mortgage. This additional amount of money should, however, be exclusively reserved for investments in energy efficiency and renewable energy measures. When do-

ing so, the costs of living of the new house owner will decrease due to a decrease in energy costs. This mechanism makes a higher mortgage quatum possible, as long as the additional amount of money is spent on energy efficiency measures. At present, this mechanism is only applied by Seinen Projects in cooperation with the ABNAMRO Bank.

For refurbishments in rental dwellings, financing energy efficiency investments through the mortgage is not an option. Here leasing constructions can be applied and a few examples do already exist in the Netherlands, one of them applied by Seinen Projects. When a housing association undertakes a refurbishment they are limited in the rent increase, which limits the pay-back of the investment. When a leasing company offers the energy efficient equipment to the consumers separately, the limited rent increase is not an issue. The tenant pays a fixed price to the leasing company and in return will see its energy bill decreased. This scheme is also attractive for the housing association as it will have its apartments refurbished without having to take care of any investment.

Main conclusion of this Netherlands country review is that almost all social housing is owned by social housing associations. For refurbishments, a number of grant schemes were available during the seventies and eighties, but a large number of these schemes have been stopped during the last few years for budgetary reasons. For this reason, housing associations are forced to make use of their own resources or apply for credits at banks. Refurbishment increases the lifetime of dwellings and therefore it guarantees additional revenues for housing associations from the rents. This way a large number of these projects can be cost effective in the long-term.

1. Introduction

This report contains a study of the social housing sector in the Netherlands and the way energy efficiency refurbishment is financed and organised. It aims at extracting experiences from the Netherlands in relation to energy efficiency refurbishment in the (social) housing sector. These experiences will provide valuable input for planned housing refurbishments in the countries of Central and Eastern Europe. The potential for improving energy efficiency is enormous in these countries, but several (financial and organisational) barriers prevent large-scale refurbishments from taking place.

This review is part of the European InoFin Project supported by the Intelligent Energy for Europe Programme. InoFin aims at designing tailored financing schemes for social housing in the enlarged European Union. Experiences with social housing refurbishment in the Netherlands, Denmark and Germany are here used as an example for possible refurbishment projects in the Czech Republic, Poland, Slovakia, Latvia and Bulgaria.

This report includes an overview of the situation with housing refurbishment in the Netherlands. This overview is carried out according to a standardised format used for all the eight abovementioned countries and contains the following issues:

- Facts about the (social) housing stock in the Netherlands, including changing dwelling characteristics during the last decades, the ownership structure and the financial situation of the average tenants.
- A description of the housing regulatory framework including the main building and rental acts, regulation aimed at energy efficiency in the build environment and the implementation of the EU Energy Performance of Buildings Directive (EPBD) in the Dutch regulatory framework.
- A description of the institutional framework, such as the housing associations who are providing housing to a significant part of the Dutch households.
- An overview of different government support programmes for energy efficiency improvements of the housing sector, introduced since the late seventies.
- An overview of private initiatives taking place in the field of housing refurbishments, including mechanisms of financing refurbishments by housing associations.
- A description of three specific refurbishment projects.
- Based on the previous chapters an overview of drivers and barriers to increasing energy efficiency in the social housing sector.
- A number of recommendations to finance energy efficiency improvements in the social housing sector.

2. The social housing stock in the Netherlands

This chapter presents the main facts of the housing stock in the Netherlands and specifically the social housing sector. Apart from the basic housing facts it includes data about ownership structure and apartment characteristics such as the energy performance per period of construction and the type of heating used².

2.1 Basic facts regarding the national housing stock

In the Netherlands there is no strict definition for social housing. In general, social housing is seen as housing owned by social housing associations.³ These associations play a very important role in Dutch housing and they possess over half the housing stock in the Netherlands. During the last decade, however, a trend towards selling social housing stock can be noticed and this is expected to continue in the near future. Table 2.1 shows the basic facts about housing in the Netherlands.

Table 2.1 *Basic facts about housing in the Netherlands (2000)*

Total number of inhabitants (x1000)	15,863
Total no. of households/total no. of dwellings (x1000) ⁴	6,801
Average no. of inhabitants per dwelling	2.3
No. of single family homes (x1000)	4,669
No. of apartments (x1000)	1,921
No. of dwellings in social housing (x1000)	2,362

Source: KWR, 2000/CBS.

Dutch social housing is not limited to apartments. Single family homes form more than half of the dwellings in the social housing sector. Table 2.2. and Table 2.3 show the division of apartments and single family homes respectively per period of construction based on ownership. Apartment characteristics such as floor space and energy demand are shown in Table 2.4. Statistics do not provide similar data for single family homes.

Table 2.2 *Division of apartments in the Netherlands*

Period of construction	No. of individual apartments (x1000)	Of which: Owner occupied (x1000)	Rental (x1000)	Commercial rental (x1000)	Apartments in social housing sector (x1000)
<1930	308	58	250	123	127
1931-1959	375	64	312	94	218
1960-1980	708	118	590	141	449
1981-1995	429	71	358	72	286
1995-2000	202	37	63	15	48
Total	1,921	347	1,573	445	1,129

Source: KWR, 2000.

² Some information is available in more recent statistics, but a complete overview of all data was only available for the year 2000.

³ A small percentage of houses is owned by institutional investors and suitable for people with a low- and middle-class income. These houses were not considered in this report.

⁴ Private households (without institutions like nursing homes and others).

Table 2.3 *Division of single family homes in the Netherlands*

Period of construction	No. of single family homes (x1000)	Of which: Owner occupied (x1000)	Rental (x1000)	Commercial rental (x1000)	Single family homes in social housing sector (x1000)
<1930	773	530	243	128	115
1931-1959	839	527	312	55	257
1960-1980	1,702	1,074	628	72	557
1981-1995	1,105	763	342	63	279
1995-2000	250	217	33	7	26
Total	4,669	3,110	1,559	325	1,234

Source: KWR, 2000.

Table 2.4 *Apartment characteristics in the Netherlands*

Period of construction	Average floor space All individual apartments	Average floor space Social housing apartments	Average energy demand (kWh/m ²) ⁵ Apartments	Average energy demand (kWh/m ²) Social housing apartments
<1930	63	57	100	101
1931-1959	63	56	87	91
1960-1980	62	61	86	86
1981-1995	71	65	66	70
1995-2000	80	66	50	62
Total	65	61	82	83

Source: KWR, 2000.

Although small, there are differences in quality between average and social housing⁶. Social houses are a bit smaller and use more energy per m². The differences are more profound in apartments constructed after 1995. In this period the share of social apartments in total construction numbers was smaller than in other periods. Commercially rented apartments have more floor space which also influence the energy use per m² in a positive way.

Because of large natural gas reserves in the Netherlands, just about all dwellings are heated by gas-fuelled systems. District heating is not an important heating system in the Netherlands, although it is regaining attention because of its perceived environmental benefits. Individual central heating systems are used in the majority of dwellings. The figures in Table 2.5 represent the situation in the year 2000. Meanwhile the penetration of individual central heating systems exceeds 82% to the detriment of single heaters and heating systems per housing block (SenterNovem, 2006a). Air conditioning systems are not commonly used in the Netherlands yet. In 2001 mobile cooling units were available in 1.5% of the dwellings in the Netherlands (Annalise SVP, 2003).

Table 2.5 *Type of heating in dwellings*

Heating type	% (2000)	Main fuel type (%)		
		Natural gas	Fuel oil	Other
District heating	3.2	100		
Central heating				
• Per housing block	6.7	100		
• Per dwelling	79.2	99.5	0.5	
Single heaters	10.3	99	1	

Source: SenterNovem, 2006a.

⁵ Average energy demand includes demand for space heating and domestic hot water.

⁶ Social houses form around 40% of the housing stock and significantly influence the average housing characteristics.

2.2 Information about energy related expenditures

Natural gas prices have more than doubled since 2000 and also influence the price of district heating (almost completely gas-based) and electricity production (about 50% gas-based). Table 2.6 shows the development of energy prices in the Netherlands. Whether or not this rising of cost will continue depends largely on oil-price developments.

Table 2.6 *Development of prices of main energy carriers*

Energy carrier	2003	2004	2005	2006
Prices €ct/kWh				
Electricity	0.14	0.15	0.17	0.18
District heat ⁷	0.13*	0.15*	0.16*	+ 0.20
Natural gas	0.10	0.11	0.12	0.15
Fuel oil	0.22	0.24	0.29	

Source: SenterNovem, Cijfers en tabellen 2006/www.NUON.nl⁸.

On all energy carriers a VAT rate of 19% is charged. Since 1996 also an energy tax is charged (mainly to household consumers). Its aim is to stimulate the reduction of energy consumption. Table 2.7 shows the energy tax rates for the years 2004-2006. To compensate higher expenses every household receives € 197 per connection (price level 2006) via its energy-bill. As this compensation is fixed, it is more beneficial to households with relatively low energy consumption.

Table 2.7 *Energy tax rates for 2004-2006*

		2004	2005	2006
Natural gas (€ct/m ³)	0 - 5,000 m ³	14.29	14.94	15.07
	5,000 - 170,000 m ³	7.27	10.19	12.38
Electricity (€ct/kWh)	0 - 10,000 kWh	6.54	6.99	7.05
	10,000 - 50,000 kWh	2.12	2.63	3.43

Source: Ministry of Finance, Belastingtarieven.

Table 2.8 *Energy expenses differentiation income classes in 2000*

Income class	Total expenses	Expenses in 2000			
		Natural gas [€]	Electricity	Natural gas [% of total expenses]	Electricity
1st 20%-group (lowest)	12685	305	225	24	18
2nd 20%-groep	17290	395	285	23	17
3rd 20%-groep	23260	430	360	18	16
4th 20%-groep	29840	490	445	16	15
5th 20%-groep (highest)	40665	585	540	14	13
Homeowners	31170	545	460	17	15
Tenants	17810	330	280	19	16

Source: CBS.

Table 2.8 shows the relation between income and energy expenses. High-income people use more energy but pay a smaller share of their income on energy. The figures in Table 2.8 are from the year 2000. Table 2.9 contains figures from 2005 and 2006 differentiated by apartment construction period. The difference between the two tables shows again the huge increase in energy costs. For example, the average gas costs for 2006 are € 805 (average for all households),

⁷ 2003, 2004 and 2005 calculated based on gas price change, price 2006 from NUON.

⁸ Prices are without VAT and energy tax.

while in the year 2000, the average homeowner paid € 545 and the average tenant paid € 330 per year.

Table 2.9 *Energy costs based on apartment category*

	<1930	1931-1959	1960-1980	1980-1995	>1995	Average/ year	Average/ month
Gas use 2005 (m ³) ⁹	1319	1124	1122	893	692	1201	100
Gas Costs (€) (price level 2005 € 0,53/m ³)	699	596	595	473	367	637	53
Gas Costs (€) (price level 2006 € 0,67/m ³)	884	753	752	598	464	805	67
Electricity (€)	-	-	-	-	-	720	60
Total (€)						1524	127

Note: Gas and electricity prices are including VAT and energy tax.

Although energy costs cover about 5% of the average household income in the Netherlands, energy poverty is increasing. In 2006 about 0.33% of household consumers (24,000 consumers) was not able to pay the energy bill and got disconnected from the gas and electricity network (Steenwijk, 2006). Municipalities do have the possibility to give extra aid to low income people in special occasions. There is not a special financial aid to reduce energy costs. In case of severe debts, municipalities can mediate between energy supplier and consumer to settle an arrangement to pay off (part of) the debts gradually. The national government started a program to reduce the energy expenses for low-income people. To achieve this, grants are offered to organisations that actively help reducing energy use, for instance by giving instructions. No direct financial bonuses are offered to households (see also Section 5.2).

⁹ Gas use without the use of gas for cooking.

3. Regulatory framework

This chapter shows the regulatory framework in the Netherlands in the field of housing. This includes a description of the general housing regulatory framework, the main housing policy documents and specific regulation aimed at social housing. This chapter also specifically addresses energy performance regulation, including the implementation of the Energy Performance of Buildings Directive (EPBD). A specific Section includes heat supply regulation as supply of district heating is mainly connected to the housing sector.

3.1 Housing policy documents

The Housing Act of 1901 is still the leading document of the Dutch housing policy. Together with the Spatial Planning Act the Housing Act states the obligations and rights of the stakeholders responsible for housing. Both acts give municipalities the possibility to develop new housing districts. It regulates dwelling quality, social housing prices and stock of dwellings.

Housing related issues are discussed in a number of different policy documents. In 2000 the Ministry of Housing, Spatial Planning and the Environment presented its view on housing in a policy document called: 'What People Want, Where People Live'. In this document five main policy issues are discussed (Ministry of VROM, 2001):

- Inhabitants should be more involved with regards to their own dwelling and neighbourhood, for instance by stimulating house ownership.
- Low-income classes should receive better chances on the housing market. For instance by making it possible for low-income groups to buy a house.
- More specific houses should be constructed for people in need of special care. For instance specific houses in which elderly and disabled people can live on their own.
- Improvement of urban living quality. For instance by large-scale refurbishment of old city quarters.
- Meet wishes for green/rural living. For instance by increasing parks in cities.

The quality of city districts is seen as inferior to districts in towns or villages. To improve these urban areas the national government set up a program for Urban Refurbishment Investment (ISV). The program contains objectives on four subjects (Ministry of VROM, 2006b):

- Create a better balance between supply and demand on the housing market.
- Improvement of the living environment by reducing pollution and increasing the surface of green areas.
- Optimise the use of construction space.
- Improve the general attractiveness, the safety and facilities of new and existing neighbourhoods.

Municipalities can receive grants from the national government for projects, which help to achieve one or more of these objectives. Municipalities do not need to carry out these projects themselves. Most of the time project developers or housing associations are the main actor in development plans.

3.2 Housing regulation

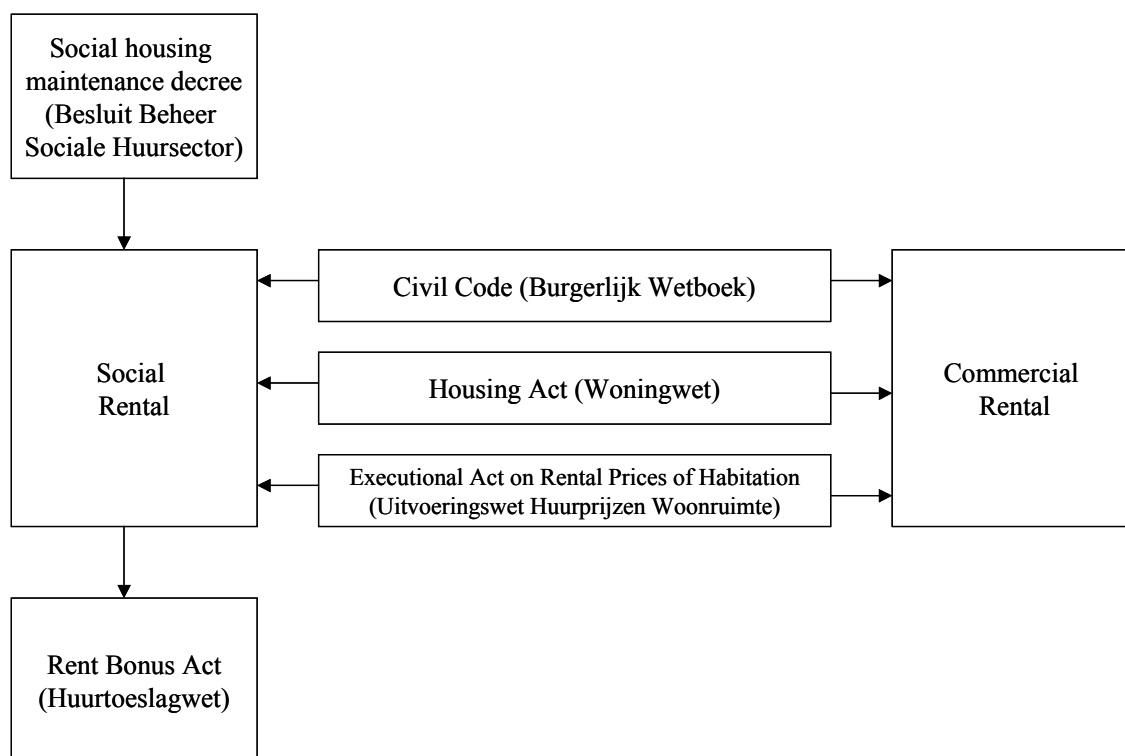


Figure 3.1 *Housing regulatory framework for social and commercial rental*

Housing in the Netherlands is strictly regulated within several acts and decrees. The most important regulation is schematically shown in Figure 3.1. Renting in general is regulated within¹⁰:

- *The Civil Code (Burgerlijk Wetboek)*, in which basic rights and obligations for house-owners and tenants are formulated.
- *The Housing Act (Woningwet)*, which is more profound than the Civil Code. The act contains several chapters, which discuss all aspects of building and housing such as building and demolition prescriptions, building permits, government supervision and minimum standards for dwellings. The act obliges municipalities to set up specific regulations for building and refurbishment. The municipality decides what scale of refurbishment may maximally be executed with a construction permit and the municipality is also responsible for granting these permits. One chapter regulates the provision of housing. Furthermore, the act obliges municipalities to investigate housing needs and to plan new constructions in order to suffice these needs. Under strict conditions associations and foundations (housing associations) can become a so-called '*permitted organisation*'. These organisations then become privileged to build social houses.
- *The Executorial Act on Rental Prices of Habitation (Uitvoeringswet Huurprijzen Woonruimte)*, which regulates in detail the maximum rent price for all habitation. On the basis of all sorts of objective criteria, House Assessment Points (*Woonwaardepunten*) can be awarded to dwellings. The act also gives authority to a rental commission. If the house-owner and tenant disagree on the fair rental price, the commission determines the maximum rental price on the basis of awarded House Assessment Points. With refurbishment the amount of House Assessment Points and the rental price can be increased. The act obliges the minister of housing to determine a maximum rent increase percentage, each year. This percentage is derived from inflation-indexes and is only applicable to rents up to a certain threshold (under € 604 per month in 2006).

¹⁰ The acts and regulation texts (in Dutch) can be found at www.wetten.nl.

There is additional regulation in place directed at social housing.

- The *Decree on social housing maintenance (Besluit Beheer Sociale Huursector)* regulates the obligations and responsibilities of social housing associations in detail. It elaborates the rules set in the Housing Act for 'permitted organisations'. In brief the decree states that permitted organisations:
 - Are only allowed to operate in order to serve the interest of housing in general including construction, refurbishment, maintenance, renting, improving neighbourhoods etc.
 - Should operate on a non-profit basis.
 - Should be independent organisations in general and independent of municipalities in specific.
 - When assigning accommodation, permitted organisations should give priority to those groups in need of a dwelling that cannot easily accommodate themselves autonomously, because of low income or other causes.
 - Should construct or obtain dwellings in a way that as many of these house hunters as possible can rent a dwelling.
 - Should rent dwellings in a way that aims to minimize the use of government *rent-bonuses*.
 - Can only increase rent prices with inflation + 0.4% each year (Article 15a BBSH), unless refurbishments have been carried out to improve the quality of the dwelling (and will increase the number of House Assessment Points).
- The *Rent Bonus Act (Huurtoeslagwet)* regulates allowances that low-income tenants receive for renting. If tenants are eligible for a rent bonus the amount of the bonus depends on:
 - The income and resources of the tenants.
 - The rental price of the dwelling.

Rent-bonuses will only be granted to tenants if the rent of a dwelling does not exceed the yearly set maximum for social housing (€ 604 per month in 2006).

From a technical and energy performance perspective new houses as well as refurbishments are covered within:

- *The Building Code (Bouwbesluit)*, which is derived from the housing act, contains some specific rules on energy saving within new-to-build dwellings. Minimal standards are formulated with regard to insulation quality of walls, floors, ceilings, doors and windows. Apart from these standards for specific parts, the Energy Performance Standard (EPN) regulates the energy use of entire buildings. The standard says, to obtain a construction permit, the energy-use of a dwelling may not exceed a certain coefficient (EPC). This coefficient must be calculated in a prescribed way (see also Section 3.4). The energy standard for residential buildings does only apply to new-to-build houses or when a house is (almost) completely replaced in a refurbishment project.

The abovementioned (social) housing regulations have consequences for the investment in energy savings by housing associations. These consequences concern the autonomy and compensation of energy saving investments.

Autonomy

A lot of autonomy is given to housing associations within Dutch housing regulation. They can decide to invest in energy reduction measures, on a small or a large scale, without the approval of any public authority. On the other hand, authorities cannot force associations to make these investments. There are no specific energy standards for social housing in the Netherlands, other than the standards valid for all houses.

Compensation of energy saving investments

Housing regulation limits the possibility to compensate energy-saving investments with higher rental prices in three ways:

- Rental price calculations are based on House Assessment Points. In practice energy saving measures are only awarded with a small number of points, which allow only a small increase of rents. Points can be retrieved successively for double-glazing, and insulation measures in cavity walls, floors, roofs and facades, with a maximum of 15 points. One point represents between € 4 and € 4.30 of rent increase a month. A maximum rent increase of over € 60/month could therefore be possible, however, in practice it is much lower. For example, only the presence of insulation counts for points, not the quality of it. This means that replacing low quality insulation for high quality insulation does not lead to an increase of the amount of House Assessment Points. As most of the social houses in the Netherlands are already insulated in some way, measures improving the insulation will not be awarded with extra House Assessment Points. Of other energy-saving measures, only condensing boilers and double-glazing are awarded with extra points.
- The Ministry of Housing, Spatial Planning and the Environment determines the maximum autonomous increase of rents. For 2006 the maximum rent increase for dwellings owned by housing association was 3.2%.
- For tenants, to receive rent-bonuses, rental prices may not exceed a fixed maximum. So associations cannot increase rents above this maximum without harming the tenant's interests.

Associations are obliged by law to offer affordable dwellings. They will have to find a balance between low rental prices and low energy costs. In the near future, the implementation of energy performance certificates in the framework of the EPBD may somehow be connected to the House-Assessment Point system. This may give housing association more space in increasing rents in dwellings with an above average energy performance (see also Section 3.4.3).

3.3 Energy /heat supply regulation

3.3.1 Heat supply regulation

Most dwellings in the Netherlands are heated with individual central heating systems fuelled by natural gas. Nevertheless, district heating is quite common, especially in major cities (Amsterdam, Rotterdam, Utrecht). Nowadays collective heating systems are in the spotlights again, because of its environmental benefits. Although about 250,000 households are connected to district heating systems, heat costs are not formally regulated yet (Tweede Kamer, 2005).

Since the 1980's an informal heat cost regulation system is in use. At that time the public energy suppliers decided to base heat cost rates on the total costs a comparable household would make for heating with an individual central heating system on natural gas. This *Not More Than Usual* (NMDA) principle is normative for most district heating systems in the Netherlands run by energy companies. Housing associations also run collective heating systems, mainly in apartment buildings. These associations are only allowed to charge heat rates based on real made expenses to their customers.

The NMDA principle was originally set up to protect households from unlimited heat costs. Nowadays energy companies are being criticized, because they are suspected by some to misuse the principle. Energy suppliers, which are privatized, are blamed to calculate the NMDA principle in a non-transparent and incorrect way to raise profits. Many district-heat consumers claim they pay more than the average user of an individual central heating system. That is why energy suppliers are suspected to have huge profit margins. Especially because sometimes district heating systems (especially modern ones) can be run against significantly lower costs than central heating.

To protect heat consumers, the Dutch parliament is currently discussing an act to regulate heat costs. This Heat Act will have to regulate heat costs in two ways. Instead of deriving district heat costs from individual heating systems, they must be based on real costs made by the energy-supplier raised by a (pre-determined) reasonable profit. Despite these cost-based rates the total heat costs for household are limited to the level of costs for individual heating systems. Because of this, the act formalises the NMDA principle. A transparent and reasonable NMDA principle should fix the maximum heat costs.

The proposed act is still under discussion in parliament. It is not sure whether the bill will be accepted unchanged. If accepted the bill will also regulate heat supply, to secure heat consumers will always be supplied with heat, even if suppliers become bankrupt. This is not regulated yet.

3.3.2 The role of municipalities

Municipalities do not have a formal role in regulating heat costs, but in practice they are very much involved. They often are the (former) owner of district heating systems and they have to decide if new houses will be connected to district heating. Municipalities often take part in negotiations and thus influence the heat costs for households.

Despite the fact that municipalities are not obliged to elaborate municipal energy plans, most municipalities have adopted a municipal energy saving policy. Energy saving in dwellings forms a part of these policies. In new city districts, on municipality-owned construction grounds, strict extra standards are enforced by local governments, which exceed national targets set in the buildings degree. Some municipalities stimulate energy saving measures in existing dwellings, with grants for solar energy appliances, information programmes or other measures. Other information about initiatives of municipalities can be found in Section 4.3).

3.4 EU Directive on Energy Performance in Buildings

The main contents of *Directive 2002/91/EC* on the Energy Performance of Buildings (elements to be adopted by the Member States before January 4, 2006) are:

- Art. 3 - *Adoption of a methodology* - MS shall apply a methodology of calculation of the energy performance of buildings on the basis of the general framework set out in the Annex.
- Art. 4 - *Setting of energy performance requirements* - MS shall take the necessary measures to ensure that minimum energy performance requirements for buildings are set, based on the methodology referred to in Article 3. When setting requirements, MS may differentiate between new and existing buildings and different categories of buildings.
- Art. 5 - *New buildings* - MS shall take the necessary measures to ensure that new buildings meet the minimum energy performance requirements referred to in Article 4. ... For new buildings with a floor area >1000 m² the feasibility of alternative systems such as RE, CHP, DH and heat pumps should be considered and taken into account before construction.
- Art. 6 - *Existing buildings* - MS ... when buildings with a total floor area >1000 m² undergo major renovation, their energy performance is upgraded in order to meet minimum requirements in so far as this is ... feasible. ... The requirements may be set either for the renovated building as a whole or for the renovated systems or components when these are part of a renovation ...
- Art. 7 - *Energy performance certificate* - (1) MS shall ensure that, when buildings are constructed, sold or rented out, an energy performance certificate is made available to the owner or by the owner to the prospective buyer or tenant, ... (2) The energy performance certificate for buildings shall include reference values such as current legal standards and benchmarks in order to make it possible for consumers to compare and assess the energy performance of the building. The certificate shall be accompanied by recommendations for the cost-effective improvement of the energy performance.
- Art. 8 - *Inspection of boilers* - establishing regular inspection of boilers.

- Art. 9 - Inspection of AC systems - establishing regular inspection of AC systems.
- Art. 10. Independent experts - MS shall ensure that the certification of buildings, ... and the inspection of boilers and AC systems are carried out by independent experts.

3.4.1 Current status in the Netherlands

Articles 3, 4, 5, 6 and 10 of the EPBD have been already implemented in Dutch legislation. The compliance with Article 6 is guaranteed by means of the Building Code. Articles 7 and 9 have not yet been implemented and Article 8 has been partly implemented. Article 8a, concerning the periodical inspection and maintenance regime of boilers with installed capacity higher than 100 kW, has already been included in the Law on Environmental Protection (SenterNovem, 2005).

The implementation of the remaining EPBD instruments still requires certain adjustments of the regulatory framework. This applies to the Housing Law, the Law on Environmental Protection and the Building Code. This is a time consuming process, as the proposals have to be presented to the Cabinet, the Board of States and the Parliament first. The intention is that the certification duty shall be embedded in the law (by means of a complete modification of Dutch building law) in January 2007.

The implementation of the remaining Articles will, according to the government, substantially increase the administrative costs for citizens. At the same time, the Dutch government aims at decreasing administrative costs by 25% in the cabinet period. For this reason the government originally wanted to postpone the implementation of the EPBD and in the meantime investigate the possibility to integrate the remaining Articles with other energy saving measures. According to the government, implementation of the EPBD together with other instruments, like white certificates, would increase its impact. Therefore, the Netherlands applied for an extension of the implementation of the EPBD. In November 2005, the Dutch minister of Housing, Spatial Planning and the Environment officially asked for this extension of the implementation of the EPBD (Ministry of VROM, 2005). According to this letter the Dutch government remains fully committed to implement all elements of the EPBD, but will require additional time for implementation and at the same time ensure that administrative costs will not increase too much.

Nevertheless, the European Commission reminded the Dutch government of the fact that they did not meet the formal deadline of January 4, 2006, and did not accept the reasons for postponing the implementation. The Minister of Housing, Spatial Planning and the Environment decided thereupon that the official implementation of the remaining Articles 7, 8 and 9 of the EPBD in the new Regulation Energy Performance of Buildings (REG) would come into effect by January 1, 2007. The actual implementation of the directive will be ready in a later stage because activities as the qualification, accreditation of experts for issuing certificates will require some time (Ministry of VROM, 2006a).

3.4.2 EPBD Implementation in connection to national regulation and policy

For new buildings, a minimum energy performance standard exists since 1995. The currently used *Energy Performance Standard* (EPN) takes into account all kinds of common energy use in the house, including heating, cooling, ventilation, domestic hot water, lighting, pumps, and elevators, and is based on standard habitat patterns for a one-family row house with a correction for the size of the dwelling (Uyterlinde, 2002).

This energy performance of a building is expressed by the EPC (Energy Performance Coefficient), which has been implemented in 1995. The calculation issues an Energy Index (EI), which requires a certain theoretical energy performance. For new dwellings, the EPC has been sharpened from the original value of 1.4 in 1995 to 1.2 in 1998, further to 1.0 in 2002 and re-

cently to 0.8 in 2006. An EPC of 1.0 means the overall annual consumption of around 1000 m³ of natural gas equivalent (Uyterlinde, 2002).

New buildings have to comply with the EPC and the Building Code, which requires certain insulation values of building constructions. The requirements at this moment are that the closed constructions have to reach at least a U-value of 0.38 W/m²K (or thermal resistance of R_c = 2.5 m²K/W), which means quite a good insulation. Open constructions like windows and doors have to be equipped with double glass.

Comparing the energy standards in the neighbouring countries, one can conclude that the energy standards in Germany are similar to a little higher, in Belgium similar to a little lower and in Great Britain lower than in the Netherlands.

To prove the compliance with the minimal standards, the EPC calculation has to be submitted to the Building Inspection Department of the municipality in order to obtain a building permit. The Building Inspection Department checks the compliance with the Building Code as well. There is no regulation regarding monitoring or inspections when the building is put into operation. However, the Building Inspection Department can carry out a random inspection on a building site (Beerepoot, 2002).

Regarding new buildings, the EPC does not apply to parts of a house like storerooms, garages and sun lounges, as these spaces are often not heated and are not or poorly insulated. There is an ongoing discussion regarding the exemption from EPC of new houses built in town centre locations. As for existing buildings, there is no regulation that would require complying with the EPC. A major refurbishment has to meet the standards set in the Building Code, which applies to their thermal resistance as well, but it is not required to reach the EPC of 0.8 for new buildings. The municipality decides if the given refurbishment is categorised as a “major” refurbishment or not.

Within the EPBD, the Netherlands aims at an exemption for certain building categories. The first one concerns buildings built under the EPN regime (Energy Performance Standard - the EPC is part of it). It is expected that the building permit shall serve as an energy certificate for a period of, at maximum, ten years. The second category involves houses for which a certified EPA (*Energy Performance Advice*) has been issued. The expected validity period of an EPA certificate will be ten years, the same time span as for older certificates. The EPA was introduced in 2000, as a voluntary scheme to measure the energy performance for existing residential buildings. An EPA advisor carries out an inspection of a house and uses the EPA software to state the energy performance of the building and calculate an Energy Index (EI). The Energy Index is not influenced by the form and size of the building. The EPA is currently being adjusted for the use in the EPBD. There is an ongoing study regarding the lowering of administration costs and increasing the benefits connected with implementation of the EPBD. Qualitative aspects like data collection methodology and competence of advisors have to be improved as well.

The methodology has not been applied yet as whole. As the EPA for residential houses regards, for many buildings the Energy Index has been already issued (around 400,000 since 2002). This has happened in the period of 2000-2004, when carrying out an EPA (introduced in 2000) was a pre-condition for receiving grants for certain energy saving measures under the Energy Premium Scheme (EPR). Many private persons and housing associations have made use of this scheme. The EPR has been terminated in 2004, resulting in a rapid decline of the number of EPAs carried out by private house owners.

On the other hand, there are a number of housing associations, which have already nearly all their housing stock equipped with the EPA. This in order to map the energy performance of their housing stock, in consideration of the coming EPBD obligation to certify the houses (the

problem is that the current EPA-methodology is not yet certified and it is not sure if it will be certified in the present form) and because the large-scale execution of EPA means lower costs.

Although the grants within the Energy Premium Scheme have been cancelled in 2004, enterprises, housing associations included, could still make use of certain governmental project-based grants (see also Chapter 5). The EPAs of houses earmarked for refurbishment have been often a part of such a project. Objectives included in the EPAs, aiming at lowering the average Energy Index by a certain percentage in a large amount of housing stock have been included in environmental plans of many municipalities.

The EPA cannot yet be considered as a market tool, which would influence the buyer of a house or which would be used by the estate agency when offering houses for sale. To reach this, a large-scale campaign would be necessary, certain new regulations, as well as a clear energy label (this label is being developed within EPBD), which is understood by the large majority of house-owners and tenants.

3.4.3 Future building regulation

The EPA methodology described above has been developed exclusively by Dutch experts and is perfectly suited to the national needs. So far, only about 10% of the dwellings in the Netherlands (650,000) are equipped with an EPA certificate. Introducing the certificate to the remaining housing stock means a large investment of both housing associations and private homeowners.

As described before, the Dutch government would like to decrease administrative costs (of regulations like the EPBD) for the Dutch households. Therefore, a number of options are analysed whereby the certification instrument is combined with other instruments leading to energy efficiency improvement of buildings.

An example is the introduction of white certificates. The Dutch government would like to implement White Certificates as an additional incentive for end-users as well as energy companies to reduce energy consumption (Ministry of Economic Affairs, 2005). This system is in preparation now, but additional preparation is necessary so that the white certificates gain a legal basis. A possible linking of the energy certificate with white certificates, creating a need of really improving the energy performance of a given building is considered.

Another possibility is to link the system of House Assessment Points with the energy certificates (Hoogelander, 2006). When these instruments will be linked, housing associations will have the possibility increase the number of House Assessment Points in dwellings with a relatively high energy performance. As a result, rents of these dwellings may be increased compared to the rents in dwellings with a relatively lower energy performance. For the tenants, living in these energy efficient dwellings will still be attractive as their energy costs will be lower as in dwellings with lower energy performance.

4. Institutional framework

Housing associations are the main organisations providing social housing in the Netherlands. This chapter describes their role, the way they are financed and how they finance housing refurbishments.

4.1 Housing associations

Social housing exists already for more than 100 years in the Netherlands. In 1901, the Dutch Housing law has been passed, which included social housing. During this time, many aspects of social housing have undergone a long development to the status quo of today. The character of financing policy has changed as well. Housing associations own nearly the whole social housing stock in the Netherlands, making them practically the only provider of social housing.

Apart from social housing, there is another type of rental housing in the Netherlands, so-called rental houses of institutional investors (like banks). These houses are intended for a target group with middle income (the gross yearly income should be approximately 55 times the monthly rent) and with job security. The owners - institutional investors, provide for the maintenance of this housing stock¹¹.

Aedes, the Dutch federation of social housing organizations, was founded January 1, 1999 after the merger of two social housing federations. Aedes is promoting the interests of practically every social housing organisation in the Netherlands. Together, Aedes members manage 2.4 million dwellings, which represent 40 percent of the total housing stock. Aedes participates in CECODHAS in order to promote the interests of social housing organisations in Europe.

Dutch social housing associations were privatized in 1995. By then most municipalities that also owned social houses themselves disposed their possessions to social housing associations. This limited the role of municipalities in social housing policy to three specific aspects:

- investigate the local need for social houses and facilitate housing associations to meet this need by providing sites for construction and other necessary facilities,
- hand out building permits and preserve the quality of houses this way,
- if necessary, distribute national subsidies for large-scale refurbishment projects.

4.1.1 Refurbishments

As already mentioned in Chapter 3 housing refurbishments are not strictly regulated. The way they are carried out differs for each case. Refurbishment can be divided in small, large and district scale. Small changes within dwellings or small expansions can be made without a building permit. For larger scale housing refurbishments a building permit is compulsory. In general both municipalities and associations are involved in district-scale refurbishments. Often commercial real estate developers are also involved. Usually, most of the costs are covered by the developer and/or cooperative. It is quiet common that refurbishment is combined with new dwelling construction, especially when commercial developers are involved. The sale of these new houses provides the financial means necessary for refurbishment. At the same time it helps to attract higher income people into low-class neighbourhoods.

¹¹ This type of housing will not be mentioned further in this report as it falls out of the scope of social housing.

4.1.2 Tenant representation

Tenants are organised and represented in different ways. On a national level tenants are protected by a Rental Commission. This commission regulates and controls the maximum rent that can be asked. Most associations have gained experience with refurbishment and therefore they know it is important to often consult tenants if refurbishment takes place.

Recently, because of changing regulation, many housing associations changed from a society status to foundations. In their role as societies, their members represented the tenants' interests. Now most associations have become foundations, the representing tasks are often taken over by special tenants societies. These societies mostly represent the interests of tenants of a single co-operative. These societies have (informal or formal) influence on the associations' policy. The society sometimes has representatives in the associations' board of commissioners. The Tenant Union is a national group representing the tenants' interests.

4.1.3 Anticipated future developments

Housing associations have a very strong position on the social housing market and it is not likely that this will change in the coming years. There is nevertheless a discussion about the role associations should play on the housing market. Especially the fact that several housing associations are also renting dwellings in the more expensive category (above the € 604 threshold for social housing) is a point of discussion. To prevent that housing associations may have certain market benefits (given their non-profit status) compared to other market parties operating in the housing sector, it is possible that the European Commission subsequently the national government will set additional regulations to limit development of services provided by associations other than those directly related to social housing (VROM-Raad, 2006). This could also restrict the possibilities of associations to offer other, e.g. energy, services.

4.2 Financing of social housing refurbishment

4.2.1 Financing constructions in the past

For a number of decades, financing of social housing refurbishment was organised under a special agreement between the government and housing associations. The government guaranteed to provide grants, or, in fact, loans, if the whole amount would be paid back. Paying back the loans did not pose any problems for housing associations as they could allocate the investment costs into the rents. Most refurbishments led to decreasing energy costs, compensating the rent increase for the tenants.

In the 1980s, the financial relation between government and housing associations changed considerably. Because of new economic regulation regarding the national budget, the government could not guarantee credits to housing associations anymore. The national social housing federations NCIV and NRW initiated the establishment of the WSW (Dutch Guarantee Fund for Social Housing). The most important objective of the WSW was to improve the access of housing associations to the capital market.

After the second energy crisis in the 1980's, the government drew up rules regarding the provision of grants. For example grants for the refurbishment of housing stock belonging to housing associations were applicable only to projects where also insulation of constructions was included, since this is one of the most cost-effective energy saving measures.

At the end of 1995, the government, housing associations, NCIV and NWR (merged in 1999 to AEDES) and the VNG (Association of Dutch Municipalities) made a specific financial settlement. As a result of this financial settlement, the government withdrew the structural subsidies

and cancelled the debts of housing associations. Housing associations became far less dependent on the government, the new financial settlement broke up the financial relation between the social housing associations and the government. From then on, housing associations had to take their own financial responsibility and risk regarding the investments, financing and exploitation of the real estate. Today most housing associations possess significant own capital themselves, built up gradually during the years. Therefore housing associations are able to finance numerous investments from own capital.

4.2.2 Financing of housing associations today

Today, housing associations generate their resources through three different sources, (I) by investments on the capital market, (II) from rents and (III) by selling part of the housing stock (the value of which has increased considerably during the last decade). At the same time many housing associations have an ambitious program for building new houses and substantial parts of the property will be restructured and investments will be done in the maintenance of old city quarters. This cannot be financed from own sources only, meaning that housing associations are expected to address the capital market frequently in the coming years. When doing so, the WSW, the Dutch Municipality Bank and ColonnadeDuHAF have an important role in financing.

Dutch Guarantee Fund for Social Housing (WSW)

The WSW acts as guarantor for investments of housing associations in the construction and maintenance of their building stock. The WSW is backed by the state and by municipalities. Through the WSW, the credit risk is split up to all WSW members. This way the housing association branch is collectively stronger, meaning that housing associations have access to credits with relatively favourable interests. In 2005 a record sum of € 7.2 billion in loans has been issued, guaranteed by the WSW. The total amount of credits guaranteed by the WSW today amounts to up to € 56 billion. The increase in loan amount is most likely due to higher building production and intensification of urban renewal, as well as historically low interest rates.

Dutch Municipality Bank (BNG)

The Dutch Municipality Bank (BNG) is one of the main financiers of the housing associations. Granting of credits and loans at the BNG is rapidly increasing. Especially the number and size of long-term loans have been increased. The bank has a leading position in financing of projects of housing associations.

ColonnadeDuHAF

Housing associations can, next to the BNG, enlist the financial means at the public capital market through *ColonnadeDuHAF* (merger of Colonnade and DuHAF in 2001). This organization is an intermediary that applies for financial loans for housing associations. By means of joining the financing demand of associations, the financing means can be attracted at the international capital market.

The private bank market is less interesting for housing associations. Banks are willing to give a credit, but they require sufficient guarantee, especially for large long-term investments. The administration costs of a private bank credit are too high for housing associations and banks are rarely willing to finance projects for the full 100%. The guarantees of the WSW (Dutch Guarantee Fund for Social Housing) are not sufficient for private banks.

4.2.3 Alternative ways of financing

Other ways to generate financial means or gaining credits at preferable interest rates, housing associations can establish collective treasuries or finance their refurbishment projects through matching.

Collective treasury of housing associations

Many housing associations finance their assets by loans. On average, the interest costs form 60% of the total operating expenses of a housing association. The treasury administration, which includes mainly watching over interest rates and bank tariffs, is an important part of the business process. In order to lower the costs of the treasury administration and make it as efficient and optimal as possible, associations join their forces and choose for a collective treasury. This can, above all, lead to a further co-operation among housing corporations, like for example a fellowship financing. A housing association does not lose its autonomy when participating in a collective treasury. The co-operation is exclusively focused on the use of the available expertise, information systems regarding the market and the treasury software.

Matching

Matching means that housing associations finance their construction and refurbishment plans together. There are various forms of matching. The most common is the support of the colleague-association through directly investing in the estates, as well as the fellowship lending at the market tariffs. Matching is politically a hot issue in the Netherlands and it involves mostly social housing projects.

Matching is also possible through the Guarantee Fund for Urban Renewal (GSV). Other recent matching forms are joint investments with other associations out of a limited partnership, or taking part in the debenture stock of the Fund for Housing Investments (Wif). AEDES organises a matching market, where housing associations can present themselves and their project plans, for which they search investors or associations with investment capacity.

National Sale Permitted Agency (LVTI)

Another way to generate financial means is selling of housings stock. For a housing association, this is often not a simple task. The sale can take a long time because of low circulation of the estates and worse conditions for sale on the market. In case the LTVI is put into service, housing associations can have the financial means quickly at their disposal.

The LVTI purchases houses of the housing associations and sells these subsequently to the tenants and other occupants at the moment when the current tenants leave. In this way, housing associations have directly the financial means for their investment tasks (new housing estates and refurbishment) at their disposal.

Financing energy efficiency investments

There are a number of pilot projects carried out as examples of energy saving measures taken during refurbishment of social housing, which have been subsidized by the government and by financial sources of the European Commission. In Chapter 6 an overview of possible schemes, both new and conventional, of financing energy saving measures is presented.

4.3 Energy efficiency initiatives of municipalities

Municipalities in the Netherlands have undertaken numerous activities towards promoting energy efficiency during the last decade. One of them is the BANS agreement (Ministry of VROM, 2002).

BANS (Management Agreement New Style) is an agreement between the government, the association of provinces (IPO) and the association of Municipalities (VNG). BANS is an agreement to implement climate policy on different management levels. Based on BANS the government, IPO and VNG signed the Climate Agreement (Klimaatconvenant) on 18 February 2002. This agreement obliges municipalities to contribute to the reduction of greenhouse gas emissions. The municipalities can decide themselves what their level of ambition on reduction

of greenhouse gases will be. The reason for not defining general emission reduction objectives is that local situations and local opportunities may differ from municipality to municipality.

Two instruments have been developed to assist municipalities in choosing the right level of ambition:

1. The Climate Scan
2. The Climate Policy Menu.

Both the Climate Scan and the Climate Policy Menu have a focus of five years.

BANS has defined that municipalities can receive grants for the implementation of Climate Policy actions. Whether they receive any grant depends on the level of ambition of the municipality, defined through the Climate Policy Menu. In order to receive grants, municipalities have at least to implement measures for saving energy in dwellings (both in new and existing dwellings) and have the intention to implement renewable energy. Therefore, BANS grants stimulate (indirectly) refurbishment of existing (social) housing. The subsidies the municipalities receive can only be used for personnel costs, research and communication. Unfortunately, there are no numbers available of the effect of the BANS grants on the refurbishment of social dwellings.

5. Financial support for housing refurbishment

Energy efficiency refurbishment has been financed by public funds for a number of years in the Netherlands. This chapter describes the type of programmes that have existed in the Netherlands since the seventies.

5.1 Energy conservation programmes in the Netherlands in the seventies and eighties

Energy conservation became a hot issue in the Netherlands at the time of first and second oil crises in the seventies. Energy saving in the residential sector was one of the main issues in the policy plans and grant programmes developed by then. An overview of the main policy papers and programmes is given below.

In the *White Paper Energy Policy* (published in 1979) a large energy conservation programme was proposed. This conservation programme consisted of: insulation requirements, information campaigns (e.g. the 'be wise with energy' campaign), research programmes, advice schemes and demonstration projects.

The *National Environmental Policy Plan* (NMP), published in 1989, included together with the 1990 White Paper on Energy Saving, new plans in the field of energy conservation, leading to an annual energy efficiency improvement of 2% until the year 2000. Improving energy efficiency would be one of the major ways to reduce CO₂ emission in the Netherlands annually by 2%. The annual budget for energy conservation rose from NLG 250 million to NLG 650 million¹² in 1990 (which is 0.13% of the GNP), mainly due to new grant schemes.

In 1984, *building standards* related to energy efficiency were included in the law (*Building Code*) and energy performance standards were introduced in the mid nineties. The below mentioned programmes have been the first attempts on the way to the current complex programmes and policy.

5.1.1 National Insulation Programme

The National Insulation Program (NIP) ran from 1978 to 1987. Energy saving measures within this program were mainly focused on existing dwellings. The following activities took place within the NIP:

- Grants for insulation of existing dwellings
- Loans for insulating dwellings
- Financial support for developing an insulation plan
- Stimulation of the implementation of condensing boilers
- Several information programs.

In 1982, grants for owner occupied houses came to an end, whereas grants for rental houses continued. Within this programme, a total amount of NLG 1.67 billion has been spent. It is not completely clear how much of this money was spent on insulation.

As result of the NIP in total 1,821,000 dwellings have been insulated with grants (and an additional 1.5 million dwellings without grants). The total accumulated natural gas savings are estimated at 9.9 billion m³, and a saving for every following year of 1.47 billion m³.

¹² 1 NLG (Dutch guilder) = 0.4538 EUR.

The National Insulation Programme has been considered to be a success for a number of reasons. The evaluation of the programmes by Ivem (1997) gives two major reasons. (I) First of all, the goal of the program (insulation of dwellings) was also feasible without grants, the revenues of insulation were higher than the costs. (II) Another reason was that the program started in a period of increasing energy prices, so there was large support for energy saving measures. Another reason for the success was the large-scale approach (a lot of attention for different target groups and good promotion by mass media). Also very important was the monitoring of the program and - if necessary - adaptation of the plan in order to become more effective. (Ivem, 1997).

So insulation took also place without grants. It is not possible to find out in how far other elements of the NIP (e.g. information programmes) were of influence in the insulation. The Steering group NIP concludes that the programme was successful. It seems however that part of the houses that were insulated would have also done this without grants. Nevertheless, we can conclude that the program was successful as it initiated large-scale insulation. Putting an end to insulation grants in an earlier stage might have made the programme more cost-effective, preventing free-rider effects that apparently took place.

5.1.2 Other support programmes

'National Hunt for Cracks'

Another programme taking place in the seventies and eighties was the so-called 'National Hunt for Cracks'. By advertising on television, on radio, in newspapers and brochures, the government tried to motivate residents to tighten their dwellings from uncontrolled air leaks. Practical experience has learned that the campaign succeeded in one way: in thousands of houses polyurethane foam was applied in huge amounts. However, this led to reduced natural air ventilation and introduced many problems like dampness, fungi, wood rot, over-concentration of radon-emissions and even health problems. The 'National Hunt for Cracks' is an example of a campaign with an important negative effect on the indoor climate. As a solution balanced air ventilation has been applied since 1985. Today, balanced air ventilation is always connected to heat recovery (up to 90%).

E'novation Programme

This programme, running from 1988-1993, intended to show that housing refurbishment and energy conservation in the housing stock built after the war are compatible and that this combination leads to convenient and attractive dwellings. In total 21 projects were carried out, involving about 3,000 dwellings in total. The programme showed that a great deal of energy can be saved (40 to 50% on space heating) and extra comfort can be attained by carrying out insulation measures and installing double-glazing. It appeared that the costs of living (the sum of rent and energy costs) increased slightly in most dwellings after the refurbishment. The rent increase resulting from refurbishment and energy saving measures was almost always compensated by the energy saving effects.

'E-team' Programme

A number of public utilities operated in the 'E-team' programme, in which low-income households have been assisted by consultants with information and by implementing small technical measures to save energy. Adding a small charge on the gas and electricity price financed the activities of the E-teams.

National research programme for solar energy

In 1978 also a national research programme for solar energy has started. The main goal of the programme was to reach a contribution of solar energy of at least 1% of total energy consumption in 2010. For houses, the solar hot water collector has been developed into a technically

good product. Yet, costs of this type of collector were too high until the nineties. Therefore, solar collectors were only incidentally applied in new houses in the late seventies and eighties.

5.2 Energy conservation programmes in the Netherlands in the nineties

At the end of the 1980s, the government decided to cut numerous budgets, but also initiated other initiatives and programmes. At the same time a decentralization policy was initiated which gave municipalities a larger responsibility.

Energy Certificates

In the early nineties a number of utilities started to use the so-called 'Energy Certificate'. The certificate was developed as an information instrument, with the aim to encourage energy conservation measures by house-owners. House-owners were asked to fill in a form stating how many energy conservation measures have been taken. If a minimum of 7 out of 10 possible measures were listed, the house received an 'Energy Certificate'. If the score was below 7, an 'Energy Report' was provided stating what additional conservation measures could be taken to be eligible for the certificate. The programme was designed by the insulation industry, the public utilities and NOVEM (national energy agency). Participation was on a voluntary basis.

Apart from being an information instrument, the Energy Certificate had a policy supporting function as well. The energy supplier received information about the kind and the number of energy saving measures in the dwellings in its region. Through this information it was possible to take targeted actions, like information campaigns, boiler replacements and pre-financing. The house-owners were informed about the level of insulation of dwellings and the quality of the heating system. This information might lead to taking more energy saving measures, and to the change of behaviour regarding heating and ventilation.

At that time the value of the Energy Certificate to the owner was debatable. The Energy Certificate gave the dwelling higher economical value, as the energy performance could be shown to a future owner. Energy Certificates were not used that much at that time to enable the validation of this assumption. Due to the upcoming implementation of the EPBD the energy certificate is gaining much more attention now. As this will be a mandatory measure, more attention will also be given to a country-wide information campaign to explain the use and value of the label.

EPR - Energy Premium Scheme

Between 2000 and 2004, NOVEM ran the so-called Energy Premium Scheme. This instrument was intended for energy saving measures in existing buildings and connected to the still existing EPA (Energy Performance Advice). The EPA works as follows: an independent advisor evaluates the energy performance of the building, gives a so-called EPA advice and issues an Energy Index. Moreover, an EPA advisor defines a parcel of energy saving measures, which can be applied in the house. Up to 2004 a number of those measures were eligible for a subsidy, based on a list of measures that was regularly updated. This way only the best available technologies have been subsidised. At the end of 2003, grants for energy saving measures for private persons have been stopped, mainly due to the economic decline and following cuttings in government budgets.

MAP

Energy utilities have been involved in energy efficiency measures for Dutch households since the beginning of the nineties. In 1991 the (then still public) energy utilities together with the Ministry of Economic Affairs launched the Environmental Action Plan (MAP). The MAP was revised several times resulting in MAP I, MAP II and MAP 2000 (the last revision) that was running until the year 2000. The overall target of the MAP 2000 was a reduction of 17 million tonnes of CO₂, of which 3.1 million tonnes from the household sector.

The main focus of the MAP was on addressing the energy use of small-scale end-users through advisory services and subsidy schemes for energy conservation. The MAP was financed by a MAP-levy of a maximum of 2% of the energy tariff. The specific target groups were households, public and office buildings and industry. The MAP included grants for energy efficiency and renewable energy investments in the residential sector, the service sector and industry. Within the MAP (Environment Action Plan) grants were made available for energy saving measures and for energy advice in the residential sector. Another important aspect of the MAP was a multi-media campaign to make consumers (more) conscious of possible energy savings.

Examples of energy saving measures that were subsidized are insulation, heating, solar boilers, energy efficient lighting, energy efficient refrigerators and washing machines. In the period 1995-2000 about € 108 million of subsidies were granted to the residential sector (about 34% was granted to electrical devices, lighting and high efficiency boilers and the rest was mainly granted to insulation measures). The programme ended in the year 2000.

5.3 Present energy conservation programmes in the Netherlands

At present there are far less energy conservation programmes in the field of (social) housing than in the past. Examples of the remaining programmes are shown below.

5.3.1 EIA and EINP

The EIA (Energy Investment Deduction) and the EINP (Energy Investment Deduction for Non Profit Organisations) support(ed) energy saving investments in the service sector. Investments in the private sector have been supported by the EIA. Investments in the non-profit sector have been supported by the EINP. Housing corporations usually are non-profit organizations, and therefore they may make use of the EINP. Sometimes housing corporations are registered as a private company (Ltd.), which makes them eligible for the EIA. The EIA has been introduced in 1997 and is still continued to date, the EINP ran from 1995 to 2002 only.

Due to the EIA, less income tax or corporate tax is paid when investing in energy saving measures or in the implementation of sustainable energy. Due to the EIA it is allowed to subtract 44% of the investment costs from the fiscal profit. The financial advantage depends on the amount of tax that the company has to pay without the EIA. Energy efficiency investments in buildings are one of the categories eligible for support under the EIA. Grants will only be provided if the investments meet the requirements from the 'energy list' (www.senternovem.nl/EIA), a list of qualified technologies.

In the period 1997-2002 in total € 100 million were granted to the service sector for the EIA and € 130 million were granted to the non-profit sector (EINP). Of the EIA and EINP budget 60% was used for installations (like lighting and condensing boilers) and about 40% was used to improve the quality of glazing. The total effect of the EIA and the EINP between 1995 and 2002 has been estimated to a reduction of 0.8 million tons of CO₂. It is not clear what part of this CO₂ reduction has been realised by social housing corporations (Ecofys, 2002).

5.3.2 TELI

The government stimulates low-income household to implement energy saving measures. Low-income households often live in old, badly insulated dwellings. These households usually spend little money on insulation or on energy efficient appliances, while the savings from energy efficiency are very welcome. Therefore, the 'Grant Regulation Energy Saving for Low Income Households' (TELI) has been introduced (Ministry of VROM, 2006c). Grants from the TELI programme can be used for projects that inform, advice or help low income households with energy saving and energy efficiency. Grants amount maximally € 460,000 per project. In 2002 and

2003 there have been two tenders, granted to 17 projects. A third tender for the TELI programme has been issued in May 2006.

5.3.3 Temporary grant scheme for CO₂ reduction

On 27 July 2006 the Temporary grant scheme for CO₂ reduction in built areas came into force. Grant applications could be submitted from this date onwards. The Ministry of Housing, Spatial Planning and the Environment (VROM) has allocated a budget of € 33 million for this scheme, which is intended to promote large-scale investments in energy savings for existing buildings. The scheme will have to contribute to accelerated CO₂ reduction in both a financially controllable and cost-effective way.

SenterNovem was commissioned by VROM to implement the grant scheme. Grants can be requested for existing buildings including residential buildings. A CO₂ reduction of at least 20 tons per project per year applies. The maximum grant per project is € 1 million. Eligible improvements (at least two) are described in a list issued with the scheme, which includes various types of insulation, HR++ glass and facilities such as solar energy boilers or heat pumps. Citizens can only utilize the scheme collectively, for example as part of a Home Owners' Association.

5.3.4 Green Financing

For private house-owners or housing associations wishing to build or reconstruct houses it is possible to receive a mortgage with a lower interest rate when the house has a significantly higher energy performance than the mandatory standard, the EPC (see Chapter 3). Such a 'green mortgage' has been made possible under the so-called Green Funds Scheme. The Green Funds Scheme is a government tax incentive instrument whereby private money is used for investment projects with environmental benefits, such as sustainable building. Investing in the Green Funds Scheme means that individual investors lend their own 'cheap' money to the banks, at a lower interest rate. The 'green banks' can then offer cheaper loans to environmental projects. This encourages the implementation of innovative environmental projects that are less profitable than 'conventional' projects but, in this way, can still be realised.

Sustainable housing construction is one of the major project types eligible for green finance. The programme started in 1996 for investments in new residential houses. It was extended with the possibility to use in office buildings in 1998 and extended again for investments in housing refurbishment (*houses built before 1980*) in 1999. Per year a maximum of 5,000 new dwellings and 5,000 existing dwellings (for refurbishment) are eligible to receive financing. These eligible projects include construction of new residences and converting non-residential buildings for residential use and refurbishing houses built before 1980. These dwellings must comply with the requirements of the Sustainable Building Assessment Guide and achieve a specified assessment score. The construction costs of each house should not exceed € 272,268. Green financing is limited to € 34,034 per house for a period of 10 years¹³. In most cases this green mortgage is combined with a regular mortgage.

Housing projects wishing to qualify for the scheme must first request a 'green certificate', which is a kind of sustainability test. SenterNovem issues these green certificates on behalf of the Ministry of VROM. Houses eligible under the green financing should have a EPC value that is 0.2 points lower than the minimum for new buildings (EPC value up to 2005 was 1, since January 1, 2006 it has been lowered to 0.8).

¹³ For housing reconstruction an additional lower threshold of € 22,689 per project exists.

The interest rate of the mortgage is around 1% lower than with a regular mortgage. Banks are able to offer lower interest rates as the capital originates from so-called green investments. These green investment funds offer tax deductions for the investors and remain therefore attractive at lower interest rates. All major banks in the Netherlands offer a green mortgage financed through a green investment fund.

This green mortgage can both be used by private house-owners as by housing corporations. The financial limit of € 34,034 per dwelling means that a housing cooperative can use this favourable loan for more dwellings at once. Given the maximum time of the mortgage of 10 years, the scheme is more favourable for housing associations than for private owners (regularly having mortgages for 25-30 years).

Application for a green certificate

The applicant has to choose a bank with a green fund where he/she hand over a project plan plus an investment plan. This has to be done before the actual construction work starts. The bank applies for a green certificate at SenterNovem. SenterNovem will decide within a period of 2 to 8 weeks whether the project is eligible. If yes, both the bank and the client receive a copy of the green certificate. The certificate is valid for a period of 10 years.

There are strict criteria for receiving a green certificate. Only projects using technologies and materials that are more efficient and environmentally sound than the state-of-the-art will be eligible for financing. Projects applying for finance need to:

1. Implement a mandatory number of technologies from a basic list of technologies.
2. Add a number of technologies from a list of voluntary measures. Each technology/-measure/approach receives a certain number of points and each project should at least receive a minimum score.

This means that projects are only eligible for green financing when they implement a minimum number of energy efficient technologies. This makes the investment usually higher than when using only conventional technologies.

Results

Between 1996 and 2001 about € 2 mln has been spent on green investments through the Green Funds Scheme. Of this amount about 9% was spent on green sustainable building investments (other projects included renewable energy, ecological farming, soil sanitation etc.). Data show the following trends:

- Between 1996 and 2002 a total number of 407 projects in the buildings sector received a green certificate.
- Total invested capital was € 400 mln.
- Refurbishment/construction of 11,600 dwellings took place which is equal to 2% of the total new building stock.
- The number of projects grew steadily between 1995 and 2000, after which a slow decrease was seen.
- In 2000, a total number of 2,559 dwellings received a 'green certificate', which was the highest during the project so far. This means that in none of the years, the maximum no. of 5,000 dwellings to receive a green certificate was reached.

This slow decrease after the year 2000 could partly be explained by the decrease in newly build buildings. However, not all buildings that would have been eligible for a green certificate, applied for this. E.g. in 2001 14% of the very low energy buildings did not use green financing. A reason could be that project developers do not always have direct benefit from green financing. Another reason for the lower interest in the scheme is that the threshold of € 272,268 per house is relatively low in the more urbanised west of the Netherlands where real estate prices are relatively high.

6. Private sector initiatives

This chapter includes ways to finance energy saving in the residential sector through private initiatives (including those of social housing associations themselves) and initiatives of other private companies, such as energy suppliers.

6.1 Financial constructions of social housing companies

In this chapter an overview is included of financing energy efficiency investments in social housing by housing associations, some of them carried out with or by (private) third parties. An overview of financing energy efficiency investments by social housing associations has been made by SenterNovem (Novem, 2003). The examples show financial constructions that are used by housing associations investing in energy efficiency, such as:

0. Conventional financing
0. Energy accounts through the housing cooperative
0. Energy supply company as the executive party
0. Energy Performance Contract
0. Living Expenses Guarantee.

The first two options, ‘conventional financing’ and ‘energy accounts through the housing cooperative’ are commonly used. The other options are relatively new, although examples of the use of these mechanisms exist in the Netherlands.

6.1.1 Conventional financing

This is the most common way of financing housing refurbishment and energy efficiency investments. With conventional financing, it is necessary to decide which part of the investment should be allocated to the different actors. There are three possibilities:

1. Tenants will be charged for the entire investment by means of the rent increase. The so-called dynamic costs price rent methodology calculates the rent based on an estimated lifetime of the facilities, the expected yearly rent increase, the rent and the additional maintenance of the new facilities.
2. The owner will cover part of the investment. The part that is not covered by the owner will be covered through the rent increase.
3. If the rent already reaches the maximal reasonable rent (maximal rent allowed for a certain category of houses and tenants), the owner may not allocate this investment into rents at the moment of the implementation of measures. According to the House Assessment Point System, the house will get more points through valuing insulation glass, cavity insulation and other measures, which will make a rent increase possible (if still under the maximal reasonable rent). The rent can be as well increased by occupier mutations in dwellings, because new tenants have no other choice than to accept the new rent.

For all these options, a housing association arranges a credit at a financial institution of which the3 the installation companies will be paid. Tenants pay monthly rents and (most likely) a lower energy bill to the energy supply company. Only tenants have insight in the total living expenses (rent and energy costs), the housing association does not. In summary:

- The housing association claims costs of energy saving measures from tenants.
- Energy expenses are not connected to the investment and the rent increase.
- Energy savings are not guaranteed.

- No cost advantage for a collective energy purchase.
- Possible additional costs of the energy saving measure are covered by the housing association.

Conventional financing has as major advantage that it is a simple and well-known financing construction for housing associations, when the costs are covered directly by the user. It may, however, create resistance of tenants due to rent increase and the fact that energy savings cannot be guaranteed. The housing cooperative does not centrally administer changes in living expenses, so possible energy savings remain unknown.

This financing construction is applicable when extensive maintenance has to take place as well as maintenance before new occupiers move into the apartment (occupier mutation maintenance). In this last case, new occupiers have no choice than to accept the rent increase. The House Assessment Point System gives a range, however, within which the rent can be increased.

6.1.2 Energy account via the housing association

The resistance of the tenants towards refurbishment can be decreased if the energy account will be administrated by the housing association, and the rent and the energy costs will be shown on one invoice. This is already common practise in housing blocks with collective central heating. If the monthly payment for energy costs is at the same time and by the same amount lowered as the monthly rent is increased, the total living expenses per month stay the same.

Due to liberalization of the energy market, for the housing association is it possible to purchase energy on a large scale, on behalf of its tenants. The housing association can, representing a large number of consumers, negotiate a more preferable price than single households. This generates a costs advantage, which can be calculated into the rents. The housing association makes a specific agreement with its tenants, which includes an agreement on the purchase of energy on behalf of the tenants at as low prices as possible. The savings on energy purchase costs will be used for implementation of energy saving measures, and that these savings will be divided over investments on the housing association level, partly on the building complex level and partly on the individual apartment level. As for the financing, this construction is the same as the conventional financing, with the only difference that the savings on energy purchase costs generate some financial space that can be used for investments in energy efficiency. The tenants receive one living expenses account with the rent and energy costs mentioned.

This mechanism will reduce the resistance from tenants as an overall cost advantage is achieved. Moreover, housing associations gain insight into the energy consumption and energy costs. This information can be used for other building complexes, where the housing association plans to implement energy saving measures. Nevertheless, no guarantee can be given for the amount of energy savings.

This financing construction is applicable at extensive as well as occupant mutation maintenance. Houses in which no energy measures have been applied (yet) can contribute their savings on energy purchase costs to energy saving measures in another building complex, owned by the given housing association.

6.1.3 Energy supply company as the executive party

A housing association can consider to select, by means of a tender, an energy supply company for supply of energy to the tenants and savings on energy purchase costs for the financing of energy saving measures. At first, this construction is suited only for measures, which are not inseparable from the house (for example - insulation not, heating measures yes).

For example, an energy supply company replaces an old boiler in a housing block for a new condensing boiler. The tenant leases/hires the boiler from the energy supply company. This means that the housing association should decrease the rent, because the boiler remains the property of the energy supply company and has to be excluded from the valuing according to the House Assessment Point System.

The housing association makes the following agreement with the tenants:

- The housing association selects, together with tenants, an energy supply company.
- The energy supply company delivers by order of the housing association energy to tenants at as low as possible prices.
- The savings on energy purchase costs will be used for implementation of energy saving measures and that on the account of the energy supply company.
- The lease/hire costs will be compensated by savings on energy purchase costs and savings on energy consumption, beginning from the date of implementation of measures.

A part of the co-operation between a housing association and an energy supply company can be a bonus/malus regulation¹⁴ regarding the extent of measures to be introduced. The investments are financed by the energy supply company; the housing association is a mediator and watches over the made agreements.

In this mechanism the investments are financed by the energy supply company; the housing association is a mediator and watches over the made agreements.

- Energy savings are not guaranteed.
- Tenants have insight into energy and energy purchase cost savings.
- A bonus/malus system regarding saving results is applicable for the energy supply company.
- Especially applicable to installation measures.
- Costs of measures can be (partly) financed by energy savings and on energy purchase costs.

This mechanism has a number of advantages. Tenants are usually positive towards such a system as they have a concrete cost advantage and insights into savings (rent and energy costs are shown on one account). The housing association does not finance the extra investments from own money and has no extra administrative costs.

A disadvantage of this system is that when alteration of existing facilities (e.g. a boiler) takes place, this construction has influence on the rent contract. An extra effort is required from the energy supply company, not every company is offering such services.

This financing construction is applicable at extensive as well as mutation maintenance. In a case of an extensive maintenance, clear agreements should be made between a housing association and an energy supply company as regards the measures to be taken and the moment of their realization.

6.1.4 Energy Performance Contract

Within this construction, investments and accompanying services regarding the realization and monitoring of energy saving measures are financed from the generated savings on energy consumption. The contract is closed among tenants, housing association and an external party for a longer period (approximately 10 years). The energy performance contract is mostly focused on (collective) energy supply with accompanying energy management/administration.

¹⁴ Under a bonus/malus system rewards are given and penalties are imposed if the performance is respectively higher or lower than agreed.

An external party is responsible for a good balancing and monitoring of the installation. Because the installation is watchfully pursued, it can be well balanced and an optimal energy saving result can be reached. This means that the investment can be paid back faster.

In this case, the housing association has no investment costs and the present rent can be maintained. Energy costs are paid to the energy supply company that realizes an optimal package of energy saving measures, which are financed from energy savings and savings on energy purchase costs. The rent for the tenant is not increased after the investments have been realised. The energy supplier is paid from energy saving and may contain a bonus/malus component as well. This way, energy savings can be guaranteed.

The main feature, making this mechanism different from the ones before, is the fact that costs of energy saving measures and of the energy management/administration are paid from energy savings and savings on energy purchase costs. This mechanism is especially applicable to collective installations and energy supply.

Main advantage for the tenant is that rents do not have to be increased after the implementation of energy saving measures. Moreover, the tenants see their living expenses (rent and energy costs) on one account, including overview of savings by implemented measures. The housing association does not have to finance extra investments and has no extra administration costs. The implemented measures are managed/administrated by the energy supplier.

Such a system cannot be used everywhere, because the monitoring is an important pre-condition. Then there still are a limited number of companies offering these services in the Netherlands. This financing construction is applicable for extensive maintenance, and especially when collective heating installations are involved. A special facility management is, among other things, responsible for managing complaints and failures. Energy supply companies fulfil often the role of the facility management.

Example

Arpas Energy contracting, a daughter company of the Dutch energy supplier Essent, pre-finances energy saving measures at housing associations and guarantees the level of energy savings. Arpas usually starts a refurbishment project with a feasibility study, after which in a contract a certain level of energy efficiency is agreed (SenterNovem, 2006b).

6.1.5 Living Expenses Guarantee

Under this financing mechanism a housing association gives tenants a guarantee that the total living expenses (consisting of the rent and secondary expenses like energy costs, cable and telephone) during a certain period of time will not increase more than at common inflation rate. This removes the rent increase barriers for tenants. It is assumed that the energy costs will not increase more than the normal inflation rate and that the living behaviour of the tenant will not change. An important pre-condition is that the exploitation of houses is long enough, as a result of which investments with longer lifetime and payback time become feasible.

The guarantee and a long lifetime make it possible for the housing association to discount the investments into a limited increase of the rent, which is compensated by energy savings. The tenant obtains a guarantee that the total living expenses will not increase. The energy supply company charges the tenant the real energy consumption. Due to the implementation of energy saving measures, the energy costs will be lower than before. In case that the total living expenses become higher than before the realization of energy saving measures, the difference is at the expenses of the housing association.

In order to manage the guarantee correctly, an inventory of the current energy consumption and appliances of tenants is necessary, as well as of existing and potential energy saving measures.

The housing association and tenants have to make good agreements over the guarantee in case the living behaviour is changed and energy prices increase more than the inflation rate. The guarantee will expire when the heating behaviour is changed or when a new appliance is purchased.

To summarise, within this mechanism, housing associations claim the investment costs of energy saving measures at tenants, but the savings are guaranteed, as well as the maximum living expenses. The system is only applicable, however, in case that measures with very favourable energy savings can be implemented. Strongly increasing energy prices limit the use of such a system as this will not be beneficial for the housing association to cover the expenses of strongly increasing energy prices.

Example

An example of combining refurbishment with guaranteed energy savings can be found in the city of Tilburg (building complex Groenwoud). The housing cooperative has given a guarantee to the tenants that the total living expenses will not increase after refurbishment (Novem, 2002).

6.2 Activities of energy suppliers

After the DSM (Demand Side Management) programmes carried out in the nineties in the framework of the MAP programme (see Section 5.2), such programmes practically came to a standstill within the new liberalised energy market. New energy service programmes and related activities of energy suppliers started only recently. The main reason for energy suppliers to undertake this kind of activities is to distinguish themselves from their competitors, which is coming more and more important in the free energy market. The most common types are maintenance contracts for heating boilers, other examples of services directly aimed at households are:

- Purchase of Compact Fluorescent lights against a discount (NUON).
- Energy certification of buildings, both for private house-owners as housing associations (Es-sent and other energy companies).
- Purchase of solar boilers, directly or through rent or leasing contracts (ENECO). House owners or tenants can purchase a solar boiler from their energy supplier, directly or through a rent or lease contract:
 - With a lease contract, both purchase of the solar boiler and the installation costs can be paid through monthly instalments. Finally, the boiler will become property of the house-owner. Additional benefit of a financial lease contract is that the rent is deductible from the income tax¹⁵.
 - With a rent contract, the boiler will not become the property of the occupier and is actually ‘rented’.

6.3 Innovative financing example - the PPM formula

The financing construction developed, tested and applied by the housing development company Seinen Projectontwikkeling (*hereafter referred to as Seinen*) is called the PPM-formula (Per-Petuum Mobile formula). This financing construction contributes to a reduction of the financial burden - through investments in energy efficiency - when a house is bought or renovated. According to the developer, the PPM is a financial approach for energy-related investments. According to Seinen: “*The basis for the formula is that financial resources have to be combined with fiscal and financial solutions that take care that the financial burden for the resident does not increase. In fact, the goal is to decrease the financial burden*”.

¹⁵ This only holds when house-owners have a lease contract (not for tenants). Reason is that the boiler is seen as part of the real estate and will increase the value of the house.

6.3.1 Mortgages higher than the 'mortgage quotum' for new dwellings

The majority of people that wish to buy a house in the Netherlands apply for a mortgage at a bank. A mortgage is limited to a certain amount of money, depending on income of the person(s) who are applying for it; this is the so-called 'woonquotum' (mortgage quotum). The EU and the Nederlandsche Bank prohibit mortgages higher than the mortgage quotum.

Most residents will use a mortgage to buy and/or renovate a house. Any financial means left after the purchase of the house is often used to invest in a new kitchen or bathroom. Consequently, often no money is left to invest in improvement of the energy efficiency of the house or to invest in renewable energy. Seinen realised that there could be an alternative way to finance energy efficiency measures by making it possible to borrow an additional amount of money, on top of the mortgage quotum. This additional amount of money is also considered to be part of the mortgage with the same tax conditions as the rest of the mortgage. This additional money is solely reserved for investments in energy efficiency and renewable energy measures.

Banks might allow this because - on a monthly base - the monthly financial burden for the resident will decrease due to the investments in energy efficiency that lower the energy bill. I.e. the monthly financial burden will decrease due to this additional amount of money that is borrowed. For new (to) build dwellings this decrease will equal to € 100-120/month, in existing buildings this decrease can be as high as € 700/month. It is, however, only allowed to use this additional amount of money for investments in energy efficiency measures and renewable energy, and not for other purposes.

Until now, it was not allowed by the EC and by the Nederlandsche Bank to obtain a mortgage higher than the mortgage quotum. But after intensive discussion and testing by the Nederlandsche Bank and the Dutch tax authorities, Seinen received permission for his projects to exceed the mortgage quotum by an additional budget for energy savings and renewable energy. So far no other financial institution or housing development company has gained permission for this financial construction.

6.3.2 Energy efficiency investments in the social housing sector

There are different versions of the PPM (all these versions are checked by the Tax Authority, the Nederlandsche Bank, ABNAmro and an independent auditor) aimed at e.g. new dwellings, the refurbishment of older (owner-occupied dwellings) and for the refurbishment of rental dwellings. The focus of this analysis will be on the PPM for social housing agencies. Use of the PPM depends on the type of social housing agencies, those without profit making activities and those with profit making activities.

Non-profit social housing agencies

Through the 'EIA' (Energy investment Deduction, Section 5.2), investments in energy efficient technologies can be deducted from corporate tax. But this is only possible for organisations that make profit. Most social housing agencies, however, are non-profit organisations and therefore cannot make use of the instrument. For these housing agencies energy saving measures and renewable energy can be applied by a lease construction. Most banks do not favour lease(-like) constructions, an exception is Amstellease, a full daughter of the ABNAmro bank. Amstellease usually allows only lease constructions of at least € 1 million but Seinen obtained the permission from Amstellease to use lease constructions for amounts of money less than € 1 million, whereas other project developers do not have this opportunity.

The role of Seinen is to control the whole refurbishment project and to act as an intermediary between the different actors. If the leasing construction is applied, during the first ten years the energy saving measures and/or the renewable energy installations will be the property of the

leasing company. After 10 years the ownership of the installations is handed over to the residents, as by SenterNovem only a 10-year leasing construction is allowed.

Social housing agencies are allowed to raise the rent when they improve the energy performance of the dwelling, but the increase of rent is limited through the Act on Rental Prices and the House Assessment Point System (see also Section 3.2).

The law states that the rent may be increased when the roof becomes insulated. However, the amount the rent may be raised is the same for different qualities of insulation. I.e., if the quality of a roof, that has already been insulated, is improved, an additional increase of the rent is not allowed. Therefore, it will be Amstellease (through Seinen as intermediary) - and not the social housing agency - that offers an energy package (so that no increase of rent is necessary) through a leasing construction. The costs for an energy package will be about € 20-30 per month. The savings are about € 60-70 per month, making it attractive for the residents to lease an energy package. Also for the social housing agencies this construction is very attractive, the quality of their building stock improves, not needing to make any additional investments. An additional advantage will be that after the EPBD is implemented in the Netherlands, these houses will receive an energy label with an enhanced performance compared to the situation without the energy package.

Social housing agencies - profit

Social housing agencies that make profit often have a private corporation that has to pay corporate tax. In this case Seinen helps the corporation to apply for a grant through the EIA. Also green financing is used (see Section 5.3.4). Leasing is not needed, because money of the corporation can be used (and therefore administrative costs for the leasing construction can be saved).

Seinen has organised several hearings for the residents of social housing to explain the product that will be offered (namely, the energy package). And Seinen also offers for these housing agencies an energy package (for the same reason as for the non-profit housing organisations). One reason for Seinen to be present at the hearings is because it might be easier for an outsider to convince the residents, than it might be for the social housing agencies.

6.3.3 Motives for the development of an innovative financing scheme

A major reason for Seinen to develop such an innovative financing scheme is that nowadays there is strong competition in the construction sector. This innovative scheme was a way to distinguish themselves from their competitors. The PPM does not generate much additional profit for Seinen, but many provinces now have confidence in the service they offer, which may be beneficial for future projects. The personal interest of Mr. Seinen (manager) was also an important driver to develop such a financing scheme. Seinen is often testing new products from the ABNAmro Bank before they are introduced on the market. Because of this testing function, good working relations between Seinen and the ABNAmro Bank were already realised in the past. One other important aspect of the 'Seinen approach' is that the whole production chain has been optimised, which lead to cheaper construction methods. Due to the cheaper construction methods (the risk of) the mortgage becomes much lower, as does the time needed to pay-off the mortgage¹⁶. Therefore, the mortgage can also be used for people older than e.g. 50 years.

Usual steps in the refurbishment process

1. Seinen is approached by a municipality or social housing cooperation and decides whether to be partner in the project.
2. An investigation of the neighbourhood takes place, looking what saving measures need to be taken. The objective is that the Energy Performance on Location (EPL¹⁷) is at least 6. An

¹⁶ Or the monthly payments can be reduced, depending on the preference of the inhabitant.

¹⁷ The EPL is an instrument to indicate the quality of a neighbourhood with respect to energy use.

EPL of 6 is the same value that an average new construction side would have, when the houses on this building side fulfil the performance standards between 2000 and 2005.

3. Public hearings are started by Seinen for the people in the neighbourhood, presenting the plans and the financial construction.
4. Per dwelling an expert makes an inventory of the saving measures that can be taken.
5. The residents are offered an energy package and they decide themselves whether they like to participate or not.

Cooperation with Seinen

Seinen is cooperating with different actors (construction companies etc.), but the requirements that new partners have to fulfil are very strict. Companies that use concrete as construction material, will not be accepted as partner, as Mr. Seinen does not consider concrete buildings as environmental friendly. Even very large construction companies have changed their way of working to fulfil the requirements of Seinen. So, the 'Seinen Approach' seems to be very successful.

Seinen has also optimised the whole construction chain. The building contractor only has the tasks of a 'construction company'. Tasks that are usually performed by the building contractor (e.g. purchase, the decision of balanced ventilation, etc.) will be performed by Seinen. Consequently, the building contractor will have a smaller profit margin than usual. Instead, this additional money is used to pay additional construction experts, making more complex constructions possible.

Not only the role of the building contractor is restricted, but also the role of the architect. The architect is only allowed to make the first drawings. A constructor will make the final drawings. The constructor adapts the first drawings so that they are easy (and therefore also cheaper) to reproduce. In the end, the design can be used several times. So, to reduce costs, it is very important to adapt the total construction chain.

Involvement of local authorities

Seinen has involved provincial authorities into his work for a number of reasons:

- When the authorities believe in the 'Seinen approach', the credibility of the Seinen Approach will increase.
- The provincial authorities can convince the municipalities or social housing agencies. This makes the process more efficient to Seinen.
- If large-scale projects can be realised on provincial level, economies of scale can help to decrease overall construction costs.

Innovative technologies/approach

The success of the Seinen approach not only depends on the PPM, but on the general way of working of Seinen.

- When renovating dwellings, not only energy is taken into account, but also the indoor climate (ventilation, moisture) and if necessary also these aspects are improved.
- Products are bought straight from the manufacturer, which will lead to lower costs.
- The goal of Seinen is to construct dwellings with an Energy Performance Standard (EPC, see Chapter 3.4) of 0.2 (national standard is 0.8 and the lower the EPC the better). The last realised energy project had an EPC of 0.1.

Apart from the implementation of energy efficient housing projects, Mr. Seinen has organised an industrial 'think tank', involving many industrial partners like banks, construction companies and manufacturers of different components (air and installation technology, insulation material etc.). The objective of the think tank is to develop an integrative solution, which makes optimizing processes possible and lead to easy and cheap solutions for new energy efficient buildings.

6.3.4 The Seinen approach abroad

It is difficult to say whether the approach of Seinen can be copied abroad. This depends on a number of local features, such as:

- The type of tax regulation in place.
- What actor can take care of the investments.
- The attitude of banks towards energy efficiency projects.

The ABNAMro Bank is a bank with extensive international activities and could be a possible partner for development of a comparable approach abroad. A requirement to have a successful approach abroad is to find favourable financing and to establish some form of cooperation between (local/regional) authorities and business.

7. Description of projects

In this chapter three examples of housing refurbishment are described. The first and the second example describe typical refurbishment projects carried out at a Dutch housing cooperative. The third example, based on a visit and interview at the Seinen Projectontwikkeling company, describes the use of special financing mechanisms, such as extending mortgages with energy efficiency investments, applied by this company at a number of places in the Netherlands.

7.1 Veenendaal-

Between July 2000 and March 2002 Patrimonium Woonstichting, a Dutch housing cooperative, refurbished two apartment buildings each containing 75 dwellings with a floor area of 95-100 m². With this refurbishment they had three goals in mind.

1. Replacement of an out-of-date heating system.
2. Lengthen the life span of the buildings with 15 years.
3. Accomplish major energy savings.

The refurbishment plan originates in the need to replace the worn out collective heating boiler. Instead of simply replacing the old boiler for a new one, the housing cooperative made use of this change to combine it with several other improvements.

The refurbishment project

The project started with the replacement of the old boilers with new, very efficient condensing boilers. The old heating pipe system and radiators were not well suited for these new boilers. To improve energy savings, new piping and radiators, adjusted for the new heat capacity, were installed. The hot tap water supply was also changed. Electric boilers and geysers were replaced with a collective system combined with individual solar water heaters (2.25 m² each) for every apartment. A universal control unit was installed. This unit controls the room temperature (room thermostat) and minimal tap water temperature. It also monitors the heat obtained per apartment for individual payment. To improve living conditions, a balanced mechanical ventilation system was installed in all dwellings. The housing cooperative gave tenants the opportunity to suggest other improvements in their apartment, such as a new kitchen unit, so these could be combined with the other construction works.

Before and after refurbishment, space heating was and is based on a collective system, maintained by the housing cooperative. They were and are responsible for charging the heat taken by the tenants. This requires a good monitoring system. Because of this, the cooperative has good insight to the effects of the energy saving measures. The use of natural gas before refurbishment was about 1450 m³ on average per dwelling.¹⁸ Because of the measures taken this decreased with about 30%. In kWh/m² this means about 125 kWh/m² before and 90 kWh/m² after refurbishment.

Financial aspects of the project

The total costs for the project were € 1.24 million. The average costs per apartment were € 8,327 (excl. VAT about € 85/m²). An amount of € 1,044 per apartment was subsidized because of the use of solar energy. The remaining investments were done by the housing cooperative. Their benefit from the refurbishment is mainly the lifetime extension of about 15 years. This means revenues from rents for an additional 15 years. Because of this integral approach no rent increase was necessary to finance the refurbishment.

¹⁸ Before the refurbishment, in some apartments, hot tap water was made with an electric boiler. The electricity, expressed in gas equivalents, is included in the average gas consumption. Cooking gas is also included.

Creating support with the tenants

At first the tenants were not enthusiastic about large-scale refurbishments. They were satisfied with their apartments, their neighbourhood and their comfort. Plans for refurbishment came as a surprise for some tenants. Intensive consultation with tenant representatives showed them the comfort improvement and financial benefits of the project. Comfort is improved because of a more optimal space heating with smaller radiators, better measure and control equipment, more living space in the kitchen without boiler or geyser, no toxic emissions from a geyser in kitchen, unlimited hot tap water and better air quality because of ventilation. Financial benefits came from a decrease in gas use and no electricity use for hot tap water. Tenants have to pay their heat in advance. The cooperative promised beforehand they would charge less in advance directly after the refurbishment. This convinced people that the project would really be beneficial for them. To limit the nuisance from construction works, all construction work inside a single apartment was concentrated in two days. To achieve this, the new heating pipes were not build inside apartments or boxrooms, but on top of the building roofs. With this method a large part of the heating system could be constructed without any discomfort for the tenants.

Main drivers leading to success

The integral and strategic approach is the main driver for success in this project. Energy saving is seen as part of a broader goal to lengthen the life span of buildings. This generates income and saves investments on the long term, which can be used to finance the improvements. This Quality profile approach (*strategisch voorraadbeheer*) is becoming more common by housing associations in the Netherlands. Creating support with tenants is another driver for success. This support was obtained with a considered approach and good information supply.

Re-applicability

All technical installations are well available and conventional. The implementation differs on some points from conventional methods, for instance the two-day approach and the choice to improve already satisfactory apartments. But both the technical installation as well as the implementation can be copied in other projects, in the Netherlands or abroad, without major problems. Lengthening the exploitation of buildings can be a good approach to generate money for energy-saving investments.

7.2 Dronten

In the town of Dronten the Dutch housing cooperative OFW (Oost Flevoland Woondiesten) has already anticipated on the implementation of the EPBD. They have developed energy certificates for their whole building stock, about 4000 dwellings. The certification is used for strategic decisions in maintenance. Dwellings with high energy use (F label) are refurbished first. OFW is situated in the Flevopolder, land area that has been developed after World War II from the former Zuiderzee (part of the sea). A third of the building stock of OFW is built in the period 1960-1970 when little insulation was used. From these 1800 dwellings now 600 houses are refurbished, for example the project that is described below.

In the project Walvisstraat some 109 dwellings are refurbished (ca. 116 m² per dwelling). In this case there are single family homes with only double glass in the windows on the ground floor and some insulation of the front facade. None of the houses had a central heating system but only local heating based on natural gas and an electric boiler for tap water heating. Therefore, the energy consumption in the houses was relatively high, e.g. average annual consumption of natural gas before refurbishment was about 3000 m³ per dwelling and an additional 4600 kWh electricity consumption for the boiler.

In the refurbishment project all houses received a mechanical ventilation system, insulation of windows, roof, front and floor and a central heating system per dwelling with a very efficient

condensing boiler. After refurbishment the annual use of natural gas decreased with 1400 m³. For warm water heating only 500 m³ is needed. Because of the measures taken the energy use decreased from 270 kWh/m² before to 160 kWh/m² after refurbishment. The energy performance of the houses is upgraded from an F to a B label. With a balanced ventilation system with heat recovery it is possible to save an additional 500 m³ of natural gas and to go to an A label (122 kWh/m²).

The costs of the project were € 61,000 per dwelling (incl. VAT, about € 440/m² excl VAT). That is not only for energy saving measures but also for a new kitchen and bathroom. Because of lengthen the life span of the houses with 40 years there is a financial gap of € 5,000 (not received from the rents in the coming 40 years). Nevertheless, investments in refurbishments remain much lower than when building new dwellings.

Present tenants pay no rent increase after the refurbishment, so they are obliged to cooperate within the project. Only new tenants pay rent increase, but this is maximised by the House Assessment Point System. The Ministry of Housing has plans to change this system and the labelling and the energy certificates will be taken into account in this system. This will be a very important decision for OFW and other housing associations, with a rent increase of € 100 per month OFW can invest € 23,000. Most important in this case is that OFW anticipates on the implementation of the EPBD. OFW uses the labelling of their building stock to give priority to energy saving in maintenance.

OFW is a little organisation. To create innovative solutions and to gain knowledge from outside they work with a tender system for contracts. They ask three construction companies to make a proposal for a project like the refurbishment that is described above. The construction companies contract an architect (and not the other way round!), so from the beginning there is a building team. All construction companies were asked to work out three refurbishment options, a basic option that solves the problem, but also a luxury option and an optimal one. OFW has so nine options to choose for a project. The two construction companies that have not been contracted were paid for their proposal.

7.3 Project examples of Seinen Projectontwikkeling

The examples below are projects developed by Seinen Projectontwikkeling (see also Section 6.3).

ZwaagWesteinde

In Zwaag Westeinde dwellings have been constructed with a wooden frame and with an insulation of about Rc=6.3. Construction costs of these dwellings are around € 150,000. On top of this an energy package is realised with a value of € 30,000, which means that the total mortgage comes to € 180,000. Especially for starters on the estate market, € 180,000 may be higher than their mortgage quatum. With the Seinen construction (which makes the additional mortgage of € 30,000 possible), dwellings can be realised almost energy neutrally¹⁹.

This leads to the following example:

- A mortgage of € 180,000 leads to a monthly interest of 440 €/month (relief and tax payment included), the major costs being:

- Monthly interest costs	€ 440
- Monthly gas costs	€ 0
- Monthly costs of electrical heat pumps and PV installation	€ 30
- MEP subsidy ²⁰	€ - 20

¹⁹ Energy neutrally means here that the consumption of (fossil-fuel based) energy carriers is lower or equal to the energy production through e.g. PV panels.

²⁰ The MEP-subsidy is a premium for renewable electricity.

This means that besides the 440 €/month for the mortgage, only additional energy costs of 10 €/month need to be paid ²¹.

Other examples

In a project in Groningen (Lewenborg), dwellings from the 1960/70's are refurbished. These dwellings are privately owned, but they are comparable with social housing dwellings (terraced houses). Energy saving measures/renewable energy installations that are implemented are:

- Weather stripping and thermopane (insulation material)
- Regulation of the central heating system
- Prevention of thermal bridges
- Wall and roof insulation
- Integration of PV-panels
- Integration of solar gas boilers
- Balanced ventilation.

In the neighbourhood Lewenborg many houses were in poor condition (concrete constructions, bad insulation and ventilation, problems with moisture). These terraced houses had an average gas use of 6500 m³/year, due to moisture. Further problems were the existence of thermal bridges and pipes without insulation. The problems were solved through the installation of a balanced ventilation system, a solar boiler and PV panels. This did not only mean energy savings, but also an improvement in comfort and health aspects.

²¹ Based on a national subsidy of 4% on the project, given by the National Government.

8. Description of drivers and barriers

This chapter gives an overview of the main drivers and barriers to social housing refurbishment. The barriers are split out to barriers faced by tenants and those by housing associations.

8.1 Overview of main barriers to social housing refurbishment

8.1.1 Financial barriers for tenants

One of the most frequent barriers to the implementation of energy efficiency measures is the resulting rent increase. The rent is usually increased immediately after the implementation of measures, but payments for energy, usually covered through fixed advance payments, will decrease much later. In case the energy tariffs increase at the same time, tenants will not really notice the financial advantage of energy savings.

A special group of tenants are those from weak social groups. These groups are usually eligible for a rent allowance and are offered apartments/houses with relatively low rents (approx. 400 €/month). As rent allowances are not given for apartments/houses with a rent above a certain level,²² rent increase as a result of energy efficiency measures could mean that tenants would get less or no subsidy at all.

8.1.2 Financial barriers for housing associations

Housing associations usually calculate so-called 'bare rent' and not 'total living expenses' of a tenant. This is an obstacle for implementation of energy saving measures, which are partially covered in rent increase. This can result in a house that will be difficult to offer on the market, because the (higher) 'bare rent' and not the (lower) 'total living expenses' are the criterion. The rent of houses from the associations' core housing stock can be increased only in a limited extent. This stock has to be kept available for low-income groups. The result is that low-income groups live often in houses of a moderate energy quality.

The energy quality of dwellings is only marginally valued in the House Assessment Point System, which is a tool for determination of minimal and maximal reasonable rent. The rent can only move within a limited range after implementation of energy efficiency measures. The consequence is that the price-quality index, as seen by this valuing system, is worsened. Often, a great part of investments cannot be discounted in rents and there are no sufficient grants available to cover a part of them. It means that a housing association has to finance a part of investments itself, resulting in a financial gap.

8.1.3 Information barriers for tenants

Many energy saving measures have been carried out since the seventies, but not all of them with satisfying results. Examples are insulation of cavity walls, which have been not suitable for insulation or too much focus on tightening cracks and seams, which resulted in moisture problems. Tenants who can recall these problems do not have much confidence in energy saving measures.

Other examples are the installation of a central heating boiler with radiators that requires more living space than local heating, and the longer time needed for water to heat up when using a

²² This level/threshold is decided by the municipality of a given town.

boiler. Some tenants might be sensitive to these changes. The ease of operation of new technologies is also important to older inhabitants. Several examples exist of doubts and prejudices tenants have against new technologies, e.g. “central heating boilers will use more energy than local gas stoves, because the whole house is being heated”, and “solar collectors are of little use because it is often cloudy in the Netherlands”.

When selecting a rental house, tenants look at aspects like surroundings, social security, floor plan and the equipment of the house. Indoor climate and comfort, as well as energy saving measures, are rarely important considerations and not seen as ways to improve comfort.

8.1.4 Information barriers for housing associations

Also among housing associations many prejudices remain towards certain technologies. In the past problems regularly occurred with moisture and ventilation. Because of this, technical service departments are reluctant to make houses air tight, to implement insulation glazing (it means airtight window frames), insulate cavity walls and install balanced ventilation systems.

Insufficient knowledge on energy saving measures remains another important barrier. Technical departments have usually some knowledge but other departments like financial, estate policy or renting departments mostly not. This means that during maintenance activities, energy saving measures are not given a priority.

8.1.5 Social barriers for tenants

Far not all Dutch people feel yet that they have a certain social responsibility regarding energy saving. Then there are tenants who point out that other tenants in the building do not take part in energy saving, and that is why the rent increases.

Another important social barrier among tenants (often heard of) is related to nuisance during refurbishment. Refurbishment activities mean that there is a mess in the house and builders bring about noise nuisance as well. Often, tenants have to deal several months with this nuisance, because the activities do not follow subsequently after each other. During the realisation of some measures, tenants are supposed to be at home. Especially working tenants will have to use their leave to be able to stay at home. If the activities do not follow subsequently after each other, this can mean several days of leave.

8.1.6 Social barriers for housing associations

The role of social housing in national energy saving targets is not sufficiently recognised. Housing associations rarely use the possibility to interfere and reduce electricity consumption. A weak point in the past used to be the communication between housing associations and the tenants, not being able to sufficiently communicate the need for energy efficiency measures. This often resulted in frustration among tenants.

Implementation of energy saving measures is usually no main issue in the policy of housing associations, where the focus often remains on living comfort and security in a residential area. Energy saving has little priority and tenants do not ask for it either. Housing associations have often little insight in energy consumption of building complexes and energy quality is not sufficiently monitored; often, housing associations do not feel the need for it.

8.1.7 Barriers on a national level

There are a number of barriers from a more aggregated perspective, related to the national policy and regulatory framework. These are mainly related to regulatory uncertainties:

- The implementation of the EPBD. Although the Netherlands was one of the initiators of the Directive, the implementation has been delayed for political reasons. The wish to limit the administrative burden on the residential sector was more important in that respect..
- Uncertainties around grant schemes and other instruments like white certificates. Grant schemes, as operated during the eighties and nineties had always a temporary duration. Since 2002 a number of them have been cancelled for budgetary reasons. There are plans to introduce a system of white certificates, but no concrete actions are known yet.

Both issues create uncertainties among developers and other stakeholders in the social housing sector. Measures/investments backed by financial support always give more certainty to the stakeholders involved.

8.2 Overview of main drivers to social housing refurbishment

Apart from the aforementioned barriers, there are a number of drivers, both on the side of the tenants as on the side of the housing cooperative that on the other hand may lead to more attention for housing refurbishment.

8.2.1 Regulatory and institutional drivers

- Implementation of the EPBD, although delayed in the Netherlands, will introduce energy performance labels for all houses when constructed, rented or sold. Some housing associations already see it as a big advantage today to offer dwellings with high energy efficiency to new tenants.
- Information and grant schemes available at the energy agency SenterNovem. SenterNovem is regularly publishing information material about possibilities for housing associations to invest in energy efficiency. In the past SenterNovem also managed a number of grant schemes that both housing associations and single households could use (see also Chapter 5). These funds have been significantly reduced, however.

8.2.2 Financial drivers

Among the most powerful financial drivers are the increasing prices of gas and electricity. This means that the household budget to be spent on the energy bill is steadily increasing. Energy related expenditures for households have increased with almost 40% during the last five years. Trends for the near future show that the prices of the main energy carriers (gas, oil, electricity) will keep increasing. This means that this driver will remain important. In the Netherlands, the Dutch system of energy taxes, introduced in 1997, already gives an incentive to households to use energy efficiently.

An important financial driver for housing associations to invest in energy efficiency may be lower occupation of the social housing blocks in the future. This is gradually becoming an issue in regions with less economic activity, e.g. the south (Limburg) and Northern provinces. Apartments upgraded to increased energy performance will more easily be rented. This is not an issue, however, in the more populous West of the country (Gerardu, 2006).

For the housing association, refurbishment means an extension of lifetime for apartments. As shown in the examples of Chapter 7, extension of the building lifetime leads to revenues from the rents for an additional 30-40 years, which in itself is a driver important enough to start refurbishment at all. Or as one housing association stated, refurbishment of old apartments is cheaper than building new flats.

8.2.3 Social drivers

Energy efficiency is gaining more importance due to the threat of climate change and the recently occurring problems around security of energy supply. Environmental consciousness is important, although not the most important driver.

An increasing number of good project experiences and dissemination of information among other stakeholders in the (social) housing sector may be a right motive for others to undertake similar projects.

Housing associations investing in refurbishment often have another major reason to do so. Dwellings in need of refurbishment, often built in the 1960/70s are often located in quarters with a lower quality of living. A number of these dwellings are now occupied by older people, who are used to live there for tens of years and do not require any additional comfort. When these older people leave, the dwellings can often only be rented to lower income people who have no money to live anywhere else. So not refurbishing these older dwellings means, apart from a shorter lifetime, that they become occupied by low-income people only. Refurbishment of these dwellings and often of whole housing blocks at once will certainly lead to improvement of whole living quarters making it more attractive for a mix of people from different income classes and ages (families with children, older people etc.) to live there.

The possibility of improving the quality of whole city quarters is therefore apart from a powerful social driver also a potential financial driver. Dwellings of a higher quality in a (high-) quality neighbourhood will more easily be rented against a higher rent, and generally diminishing the chance of low occupation.

9. Conclusions and recommendations

9.1 Main conclusions

This report has provided an overview of the social housing sector in the Netherlands and the way the sector deals with housing refurbishments. Social housing, meaning the dwellings owned by housing associations, covers 40% of all dwellings in the Netherlands, and have therefore a significant impact on energy use in the build environment. Improving energy efficiency in the social housing sector is therefore of major importance.

Investments in energy efficiency of the social housing stock usually take place together with complete housing refurbishments. Main reason for housing associations to undertake refurbishment including energy efficiency measures is first of all the extension of the lifetime of the building. Major energy efficiency improvements such as insulation, installation of high-efficiency glazing and replacement of boilers lead to improved comfort and often also to a significant decrease of energy costs for the tenants. The growing attention for energy efficiency, due to increasing energy prices and the upcoming implementation of the EPBD and housing certification, makes this a growing necessity.

When starting with housing refurbishment, housing associations face a number of barriers. First of all is it not always possible to increase the rent in such a way that the refurbishment project pays of. The system of House Assessment Points limits the rent increase when introducing certain equipment and technology (boilers, insulation etc.). Furthermore, tenants will not always favour refurbishment when it means significant rent increase.

To finance refurbishment, housing associations in the Netherlands could make use of a number of grant schemes that have been introduced since the late seventies. These grant schemes started with support for single measures such as wall insulation (e.g. the National Insulation Programme). During the nineties support became aimed at more integrated approaches (e.g. the Green Funds Scheme). A cut-back in budgets of these grant schemes after 2002 meant that housing associations need to look for alternative financing mechanisms for increasing energy efficiency of their dwellings. Examples of new financing mechanisms where housing associations cooperate with private actors, sometimes with certain energy savings agreed upfront, have already been established. The main driver for housing associations is, as can be seen from the refurbishment project examples, that refurbishment leads to the extension of lifetime of the dwellings, meaning additional revenues from the rents for another 30-40 years and improvement of the quality of city quarters as a whole.

9.2 Recommendations

Based on the conclusions and given the barriers and drivers mentioned in the previous chapter a number of recommendations to housing associations can be given as well as a number of policy recommendations to policy makers.

9.2.1 Recommendations for housing associations

Refurbishments or regular maintenance are usually aimed at extending the lifetime of dwellings. This creates revenues from the rent for an additional number of years, making a large number of investments cost effective, including energy saving measures. Therefore housing associations should:

- Combine regular maintenance with energy saving measures. If the moment of realization of energy saving measures is the same as the moment when the necessary maintenance has to be carried out, only the extra investment needs to be attributed to the energy savings. For example, regular changing of old window frames and glazing will usually be paid from a maintenance budget. The extra investment in high efficiency glazing can be paid by means of a separate financing construction.
- Integrate the energy bill with the rent of the tenant after refurbishment. In this situation the tenant receives an energy consumption account and he/she can compare the rent increase directly with decrease of costs due to energy savings and/or savings on energy purchase costs. This clear overview of living expenses will result in increased trust by the tenant as the tenant will enjoy the advantages of applied measures immediately.
- Use incentives in contracts with energy supply companies and installation companies, such as a bonus/malus system or an agreement on minimal energy efficiency improvements to be realised. It encourages inventiveness of the third party in order to realize optimal solutions.
- Show good examples from refurbishment projects to the outside world. Potential tenants might prefer to live in refurbished rental dwellings, especially in times of rising energy prices.
- The new building certificate, implemented in the framework of the EPBD, will provide tenants and housing owners information about the energy use of a certain dwelling. Apart from that, housing associations should provide their tenants examples of monthly energy costs and of possible measures they can take themselves to reduce energy costs.

9.2.2 Recommendations on a national policy level

Given the extensive policy and regulatory framework in place related to social housing, national and local policy makers may influence the level of energy efficiency investments taking place. Therefore, national and local policy makers should:

- Enable and extend the use of (innovative) financing instruments for housing refurbishments. Examples are tax deductions for energy efficiency investments, lower interest rates for (green) investments, leasing constructions and possibilities to increase the mortgage when investing in additional energy efficiency measures.
- Give priority to implementation of the EPBD and related legislation. This includes the training of certified advisors providing calculations for the building certificate but also information campaigns towards housing associations and tenants about building certification and other elements of the directive.
- Integrate the Housing Assessment Point System with the EPBD certificates. In other words, rent increase should to a certain extent be proportional to the increase of energy performance in a given dwelling. A higher energy certificate value will lead to decrease of energy costs of the dwellings, meaning that the total living costs of the tenants may still decrease, even with increased rents.
- The system of rent allowances currently in place in the Netherlands should be replaced by living cost allowances based on total monthly costs for rents and energy use.
- Give priority to the development of policy initiatives that can be linked to the EPBD certificate system, like white certificates.

9.2.3 Value of the Dutch example to the InoFin project

This report to the InoFin project, which includes an overview of experiences with social housing refurbishment and investments in energy efficiency measures in the Netherlands, aimed at providing input to new refurbishment practices in the social housing sectors of the new EU Member States.

An overview of the social housing sector in the countries participating in the InoFin project is given in the report *'Financing Social Housing Refurbishment in the Enlarged Europe'* (Ten

Donkelaar, 2006). This report shows that the structure of the social housing sector differs largely per country and that the Dutch example of social housing cooperatives is relatively unique. Nevertheless, one important lesson for energy efficiency refurbishment in the Netherlands is useful for a number of other countries. Refurbishment projects used to be largely dependent on public grants in the past but they could not count on them anymore in recent years. Now that these funds have largely diminished, housing associations have found new ways to finance energy efficiency measures, using private capital. Although it used to be more complicated for housing associations to receive private credits from banks, a system of guarantees and special financial institutions (e.g. the Dutch Guarantee Fund for Social Housing and the Dutch Municipality Bank) does exist that enables housing associations to receive a loan for energy efficiency refurbishment.

Refurbishment of housing in private ownership is usually merely based on the initiative of the owners. But also here, a tailored financial scheme such as the PPM formula or different leasing constructions, makes it possible for private home-owners to upgrade the energy performance of their real estate more than they would do with own financial sources or regular loans and mortgages only.

References

- Aedes (2002): *Woningcorporaties en hun financiering*. Compact 13, Aedes, Hilversum.
- AnnaLise SVP (2003): *Meer airco's in Nederlandse huishoudens*.
http://www.svp.nl/Nieuwsbrieven/SVP_Special_september.htm/.
- Beerepoot, M. (2002): *Energy regulations for new buildings*. Delft University of Technology, Delft, the Netherlands.
- Donkelaar, M. ten (2006): *Financing Social Housing Refurbishment in an Enlarged Europe*. Overview report for the InoFin project (*draft version, in preparation*). Energy research Centre of the Netherlands (ECN), Petten.
- Ecofys (2002): *Evaluatie van het klimaatbeleid in de gebouwde omgeving 1995-2000*, Ecofys.
- Hoogelander, K.J. (2006): *Van vrijwillig Energieprestatieadvies naar verplicht Energieprestatiecertificaat*. Presentation at 'Studiedag Energiecertificatie Brussel', 30 June 2006.
- Ivem (1997): *Analyse en evaluatie van beleidsinstrumenten voor energiebesparing*. Oudshoff, B.C. *et al.*, Groningen.
- KWR (2000): *Kwalitatieve Woningregistratie*. (database). Ministerie van VROM
- Ministry of Economic Affairs (2005): *Energierapport - Nu voor later*, Publicatienummer 05E01, 's Gravenhage.
- Ministry of VROM (2001): *Nota Wonen: Mensen, Wensen, Wonen: Wonen in de 21e eeuw*.
- Ministry of VROM (2002): *Subsidieregeling BANS Klimaatconvenant*.
- Ministry of VROM (2005): *Informatieverzoek inzake Richtlijn 2002/91 inzake energieprestaties van gebouwen - antwoord NL*.
- Ministry of VROM (2006a): *Europese richtlijn energieprestaties van gebouwen*.
- Ministry of VROM (2006b): *Dossier Investeringsbudget Stedelijke Vernieuwing: Vraag en antwoord ISV-2*, <http://www.vrom.nl/pagina.html?id=16444>.
- Ministry of VROM (2006c): *Dossier Subsidie Energiebesparing Lage Inkomens*.
<http://www.vrom.nl/pagina.html?id=10430>.
- Novem (2003): *Woonlasten centraal; Energiebesparing in corporatiewoningen*.
- Novem (2002): *Energiebesparing in corporatiewoningen - Voorbeelden uit de praktijk*.
- Tweede Kamer der Staten Generaal (2005): *Stadsverwarming*. vergaderjaar 2004-2005, 30150, KST87120, SDU Uitgevers, 's Gravenhage, 2005.
- SenterNovem (2004): *The Green Funds Scheme - Annual Report 2003*.
- SenterNovem (2005): *Alle gebouwen een verhelderd label*. [Http://www.senternovem.nl/](http://www.senternovem.nl/)
- SenterNovem (2006a): *Cijfers en tabellen*.
- SenterNovem (2006b): *Financieringsconstructies energiebesparing bestaande woningbouw*.
[Http://www.senternovem.nl/kompas/woningbouw/financieringsmogelijkheden/index.asp](http://www.senternovem.nl/kompas/woningbouw/financieringsmogelijkheden/index.asp)
- Steenwijk, J. (2006): *Duizenden Nederlanders leven bij kaarslicht - Te weinig geld voor gas en licht*. *Het Parool*, 28 January 2006.

Uyterlinde, M.A. *et al.* (2002): *Energy Performance certification and Labelling in the Lithuanian Building Sector*. ECN-C--02-081. Energy research Centre of the Netherlands (ECN), Petten.

VROM-Raad (2006): *Voorbij of vooruit?: Woningcorporaties aan zet*. Ministerie van VROM, Den Haag.

William Gerardu (2006): SenterNovem, personal communication, April 2006.

Appendix A Abbreviations and programmes

BANS	Management Agreement New Style	Bestuurs Akkoord Nieuwe Stijl
BNG	Dutch Municipality Bank	Bank Nederlandse Gemeenten
	Climate Agreement	Klimaatconvenant
	CO ₂ emission reduction tender regulation	CO ₂ -tenderregeling
EIA	EnergieInvesteringsAftrek	Energy Investment Deduction
EINP	EnergieInvesteringsAftrek voor Non-Profit organisaties	Energy Investment Deduction for Non Profit Organisations
EPA	Energy Performance Advice	Energieprestatieadvies
EPC	Energy Performance Coefficient	Energieprestatiecoefficient
EPL	Energy Performance on Location	Energieprestatie op locatie
EPN	Energy Performance Norm	Energieprestatienorm
EPR	Energy Premium Scheme	Energie Premie Regeling
GSV	Guarantee Fund for Urban Renewal	Garantie Fonds voor de Stedelijke Vernieuwing
IPO	Association of provinces	Interprovinciaal Overleg Orgaan
ISV	Investment Budget Urban Renewal	Investeringsbudget Stedelijke Vernieuwing
LVTI	National Sale Permitted Agency	Landelijke Verkoop Toegelaten Instelling
MAP	Environment Action Plan	MilieuActiePlan
	Menu for Climate Policy	Menukaart Klimaatbeleid
MEP	Environmental Quality of the Electricity Supply	Milieukwaliteit Elektriciteitsproductie
NIP	National Insulation Program	Nationaal Isolatie Programma
NMDA	Not More Than Usual <i>principle</i>	Niet Meer Dan Anders <i>principe</i>
NMP	National Environmental Policy Plan	Nationaal Milieubeleidsplan
REG	Regulation Energy Performance in buildings	Regeling Energieprestatie Gebouwen
TELI	Grant Regulation Energy saving for low income households	subsidieregeling Energiebesparing voor huishoudens met lage inkomens
VAMIL	Regulation for arbitrary debiting of environmental investments	Regeling Willekeurige Afschrijving Milieu investeringen
VNG	Association of Municipalities	Vereniging Nederlandse Gemeenten
Wif	Fund for housing investments	Wooninvesteringsfonds
WSW	Dutch Guarantee Fund for Social Housing	Waarborgfonds Sociale Woningbouw