CREATING AN ENERGY EFFICIENT MORTGAGE FOR EUROPE

BUILDING ASSESSMENT BRIEFING: THE NETHERLANDS
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INTRODUCTION

Green loans have been available for quite some time in the Netherlands, starting in the 1990s. The incentive of a lower interest rate and higher loan to value ratio (LTV) can raise the awareness and willingness of potential homeowners to choose new low energy (net-zero) and sustainable homes and deep renovations of existing homes. A common language and metric will give a better understanding of the qualities of a green building. Financial incentives connected to the rating of green buildings will give additional and even more convincing stimuli. The aim of the EeMAP project for The Netherlands is to develop this language, a metric for all parties involved in development and transactions of new and existing homes: project developers, mortgage banks, real estate agents, valuers, home owners, suppliers of renovation products and concepts. This paper will present an overview of the initiatives launched over the past years and lessons learned in The Netherlands.

DUTCH HOUSING AND MORTGAGE MARKET

Housing stock in The Netherlands

In The Netherlands there are some 7.6 million homes. 4.25 million are owner-occupied, housing associations and investors rent out 3.35 million. From this 7.6 million, 4.9 million are single-family homes, 2.7 million in apartment buildings. Broken down per age: 1.45 million were constructed before 1945, 2.5 million between 1965 and 1975 and 3.65 million after 1975. According to reports of the Dutch Association of Banks (NVB) 3.5 million of the privately owned homes (81%) have a mortgage, with an average mortgage of €258.000 and a debt of in total 600 billion euro. Rabobank, ABN AMRO and ING are the largest mortgage banks with a market share of 51.5%.

Green mortgages

Discounts of LTV standard for green mortgages are related to the Energy Performance Certificate (usually called Energy Label in The Netherlands) of an existing home, in a scale from G to A. New houses have to comply with a minimum Energy Performance Coefficient (called EPC), of 0.4. To compare new and existing homes (new homes have always an A label), the label scale is extended to A++++.

In the 1990s, buyers could get a discount of 1.0% on a part of their mortgage for a new home (30,000 Euro/75,000 Gulden at that time), if the project complied with the national sustainability checklist. This proposition was not widely used: only a few banks offered their proposition and complying with the checklist was an intense and expensive job, which most project developers did not do.

Nowadays the main banks offer green mortgages for both new and existing homes. According to an approval by the Ministry of Housing, homeowners are allowed to have a 27,000 Euro higher mortgage for net-zero houses and 9,000 euro for houses with a low EPC or A++ label.

- ABN AMRO: 0.2% discount on the interest rate for new homes, of existing homes with an A+ label or better.
- Rabobank: 0.5% discount for 10 years for new homes that perform 50% better than national standards.
- Triodos: Interest rate based on the energy label; see the table below, offering a maximum discount of 0.6%. Additionally a discount of 0.2% can be offered for the best performing homes (low in the A label class).

Dutch housing stock: in m² (left), age (above), ownership (right) and single/multi family (below)
Additionally, banks offer green loans for individual measures, without undergoing the procedures and transaction costs of a new mortgage. For instance at greenloans05, part of ABN AMRO.

Green loans for commercial buildings

Green loans are also available for commercial buildings, and some banks offer services around the green loans, for instance the 5-step approach by ING Real Estate Finance:

- A free quick scan/ self assessment with an app
- An free energy consultation when the energy cost savings as predicted by the app are larger than 15,000 euro per year
- 100% financing of the sustainability measures
- 0.5% discount on the interest rate
- A free Energy Label, when this label is C or better

Rabobank offers the Impact Loan, developed with the EIB. For the eligibility of buildings the BREEAM scheme is used (3 star or above). ABN AMRO offers Green Bonds. Account managers of these large banks and valuers are trained to discuss the result of the app and give the initial advice on the measures and the loan.

All banks use the same app to make clients aware of their energy savings potential, developed by a DGBC member, in their own look-and-feel. The banks send a link to the building of the owner and financed by the bank. The basic data is prefilled, based on open data sources (function, size, age). The clients are asked to answer some simple questions on their building and the app generates energy efficiency measures including the investment cost and payback time. In the case of ABN AMRO, clients are also able to choose a supplier for the implementation of the measures that come out of the scan and ask for a site visit and final offer.

### Triodos: interest rate versus Energy Label, January 2018

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<td>1 year</td>
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### Legislation for offices

From 2023 offices will be required to have a minimum C level Energy Label. Because of this, ING does not provide loans for offices below a C rating as from 2018, and asks for a plan to renovate the asset. Some even look beyond 2023, because this C level is the first step, and tighter regulations are expected, on the way to meeting the requirements of the Paris agreement.

The Government is also considering minimum levels or minimum measures for other building types. Recently the new Government set the target of 49% CO2 reduction by 2030, which will have big consequences for all sectors, including the building sector.
ENERGY PERFORMANCE SYSTEM

In the Dutch Energy Performance system for new and existing homes separate indicators are used. For new homes the Energy Performance Coefficient is used, called EPC. Today the maximum allowed EPC for new homes is 0.4. For existing homes an Energy Label is communicated. This label is based on an Energy Index. The labeling system for existing homes consists of three steps:

1. For every home in The Netherlands, a preliminary certificate/ label is calculated, based on typology, year of construction etc. These are displayed in a central database. A login to this database is provided to every homeowner.

2. Homeowners are asked to check and complete (approximately 10 questions) the preliminary certificate and send this self-assessment to a certified auditor. The auditor has to check whether additional measures are implemented, for instance by checking the bill of a PV system. The auditor will issue a final certificate, and the status will change in the national database.

3. An Energy Label including an Energy Advice report. This was originally the Energy Label process, but considered too expensive. In this case the consultant will visit the home, check and measure the data on 150 items and will issue a certificate, including suggestions to improve the EPC.

In the rental sector (private sector, housing associations) a detailed calculation according to step 3 is required, because an Energy Label has an impact on the maximum allowed lease of the house. It is allowed to charge higher lease prices for more efficient homes.

As of January 2016, 2.9 million homes have an Energy Label, according to step 2 and 3. See the figures above and left.

ORGANISATIONS INVOLVED

Organisations involved in developing the method, training and certification are:

- NEN: Standardisation body, responsible for the Energy Performance Standard, for both new and existing building, and both for housing and commercial/ public buildings (NEN 7120). Currently this standard is being updated in order to comply with the EPBD NZEB requirements as from 1-1-2021.
- ISSO: Developer of the inspection methodology for housing (EPA-W) and commercial and public buildings (EPA-U).
- KVI NL: Scheme owner of the inspection methodology. KVI NL keep records of qualified consultants and certifying bodies and performs audits at training institutes
- Certifying bodies: Audit the EPA consultants and auditors via sample checks so they can maintain the qualification to do audits and advice.
- RvA (national accreditation body): Audits the certifying bodies to maintain their qualification.
Training institutes: Offer training for two qualifications: to become EPA-W/U Auditor or EPA W/U Consultant.

CITO: Central organisation that takes the exams for all parties that offer EPA trainings, in three parts: 1. General; 2. Inspection and 3. Use of the software tools. Part 3 is required to become an EPA Consultant.

**AVAILABILITY OF DATA**

The Netherlands Enterprise Agency (RvO) keeps the central Energy Label database. Both data of preliminary qualifications (step 1) as well as data of official certified buildings (step 2/3) are available as open data. This open data is used by organisations to stimulate homeowners, for instance see Energielabelatlas®. Underlying data of the homes and the qualification is not public, such as insulation degree, boiler type etc. Some initiatives combine the open Energy Label data with other open data sources, such as the shape and orientation of the roof. By combining these data sources, they calculate the options for improving the energy performance, some even including a cost/benefit analyses and link to suppliers.

Discussions have been started on the actual energy consumption of buildings. To the end user a certificate gives a suggestion of the energy consumption, but measurements show that a A-building often does not perform better than an G-building. There are explanations for this (indoor temperature, comfort level, occupancy rates). Currently energy consumption data is available at block level (15 houses), see the image below left.

In an energy advice report, the auditor is asked to enter the energy consumption of a dwelling. This does not influence the certificate, but the pay back time of the measures proposed in the report. From this report, it is known that the energy consumption of the worst dwellings with an E, F or G certificate, is exaggerated. The method assumes homes are centrally heated at 20 degrees, whereas in reality these homes have local/room heating systems, usually only in operation when the room is used.

**RELATION OF THE ENERGY LABEL AND THE VALUE OF A HOUSE**

Research has been done by the University of Tilburg (prof. Dirk Brounen) on the relation between the Energy Label and the value and transaction time and sales prices of a house. A positive relation between a better certificate and a higher value and shorter transaction time can be identified. E, F and G labeled dwellings have an average longer selling time than D-labeled, whereas as A and B labeled dwellings are sold earlier. Recent research by Brounen demonstrates that the brown discount of G labeled homes is larger than the green premium. Consumers seem to avoid the high energy cost of the worst labeled houses.

Both the EPC for new homes and the Energy Label for existing homes are based on calculations. Calculations and the Dutch NEN 7120 standard are based on CEN standards. Currently a new version of the standard is under development (NTA 8800 working group) and the existing Dutch standards and CEN standards are inventoried again, to align as much as possible.

**RELATION BETWEEN ENERGY LABEL AND CONSUMPTION**

Both the EPC for new homes and the Energy Label for existing homes are based on calculations. Calculations and the Dutch NEN 7120 standard are based on CEN standards. Currently a new version of the standard is under development (NTA 8800 working group) and the existing Dutch standards and CEN standards are inventoried again, to align as much as possible.
Research has been done on the actual energy consumption in relation to the Energy Label of homes, for instance by the Technical University of Delft[^10], for homes owned by housing associations in Amsterdam. The explanation of this difference between the calculated energy consumption according to the standard and the actual consumption lies in the level of comfort in the house. The standard assumes households heat the home up to 20 degrees, in all rooms. In the worst labeled houses this central heating system is often not installed, and people cannot afford to heat the house for the whole day at 20 degrees.

Recently CBS and ECN[^11] have done the same exercise for commercial and public buildings. Again, especially for heating, the relation between the Energy Label level and the energy consumption was low, especially for heating. A start-up of the utility Engie, ENolis[^12], offers services to analyse 5-minute user data in commercial buildings and find savings in better energy management, to let the building perform as it should do. Still, opening hours and occupancy rate have a big influence, which is not included or differentiated in the standards for calculation of Energy Labels.

For several years one-stop-shop concepts have been in place in The Netherlands. In the 1990s these concepts were launched for new technologies such as PV panels and solar thermal collectors. Mainly because the existing installers did not know about the technology, and many did not even offer these products. And if a client persisted, the installers offered these at high prices and in the end were not able to install the products properly.

These one-stop-shop concepts nowadays offer integral packages for the renovation of a home, up to net zero. They are often coordinated by local authorities, sometimes via web-based tools. For instance Verbeter uw Huis[^13], Bespaar Lokaal[^14], Reimarkt[^15] an energy savings shop located in some cities, and Susteen[^16], working for local authorities and banks.
Energy consumption data is available via the metering departments of the grid operators. The data is aggregated and the finest level of detail available is postal codes (street level). This information is visualized on websites, as for instance the site form the PICO17 project. In this project a consortium of research companies, grid operators and GIS companies, combine data relevant for energy advice. For instance energy consumption, roof angle, Energy Labels, availability of waste heat, energy storage potential of the ground etc.

**SMART METERS**

Local grid operators are responsible for the rollout of smart meters in homes and small commercial buildings. For large buildings the market is liberalised and building owners can choose their own metering company. The initial planning was to have the rollout of smart meters at the consumers finished by the end of 2020. An energy reduction of 3.5% was targeted. First analyses by PBL18 show a savings percentage of only 1%. Discussions have started to provide displays to raise the awareness of consumers.

Some people refuse to have the smart meters installed in their house. Privacy is one of the reasons, the accuracy another, electromagnetic radiation, and finally, meters are also refused by people with PV systems on their roofs. Traditional analog meters rotate counterclockwise, so energy produced can compensate energy supplied by the utility. In this net metering situation, people get the same price for energy produced, including taxes. In the long run, the government and utilities want to change this, because of the costs when the penetration of PV systems increases. In the end consumers cannot refuse a smart meter, but in the case of objections on the grounds of privacy, metering companies can disable the ‘smart’ elements to make them ‘dumb’.
GOING BEYOND ENERGY

Previously, the National Package Sustainable Measures was used for green mortgages in homes. This was a holistic checklist of some 150 fixed and optional measures, where a minimum score was required. Currently banks use an Energy label only for green mortgages. For green bonds for new homes\textsuperscript{20}, the government requires that projects comply with a low EPC (2 categories: 35\% lower than required and net-zero) and use sustainably sourced timber.

DGBC is working on a holistic Home Quality Mark, an easy to use certification scheme, appealing to the end users. The process of this system is similar to the steps in acquiring an Energy Label:

1. Based on automated Data: Users can for example enter the property’s zip code and the system will use existing open data platforms (e.g. Google) to search for information on aspects such as location and existing transport options, completing questions in the assessment automatically.

2. A self-assessment: A point score is allocated based on already obtained building certificates, such as the Energy Label and Woonkeur (label on accessibility) and a tick box questionnaire that the homeowner, or buyer/seller completes, provides a series of closed questions and potential answers, for example what type of heating is present (central, local or none).

3. An audited certificate: review of the self-assessment by an certified auditor, preferably a professional that already assesses the house to keep the cost low (valuer, Energy Label auditor).

For commercial buildings national and international ratings system are used for green bonds and loans: The Dutch GPR, BREEAM-NL and LEED. For instance in the MIA\textsuperscript{21} tax deduction regulation for green buildings, 2 categories are defined with an increasing profit based on a 4 and 5 star BREEAM rating, or an equivalent in the other rating systems.

Priorities of homeowners

Although we see an increasing effect of Energy Labels, the property value in The Netherlands is only influenced by the energy performance. A saying amongst real estate brokers is that the location always comes first. These location-based aspects are included in valuation systems. In the labeling scheme DGBC is developing and in similar schemes in the UK and Ireland (HQM, HPI) the location is also considered as one of the sustainability categories, for instance when it comes to amenities nearby, public transport, pollution, flooding etc. On the scale of the house itself, apart from energy, health and wellbeing is a category that appeals to the consumer. In these labeling schemes, sustainability is translated into the quality or characteristics of a house. In the end a higher quality will have an impact in the value of a house.

RETROFIT BEST PRACTICES

A well-known Dutch initiative is the Energiesprong\textsuperscript{22}. The basic idea is to implement deep renovations for social homes, up to the zero-on-the-meter level. This implies a very well insulated envelope, an all-electric heating system and a PV system that covers the yearly demand for building and occupier energy. 50 parties participate in the program. The ambition is to drive the generally traditional building sector to innovative products, prefabricated and highly industrialized components such as façade and roof components, a bathroom unit and a heating, hot water and ventilation unit. This enables the contractors to do the renovation in a few days, even with the tenants in the home or on a short vacation. The second ambition of the industrialized approach is to reduce investment cost and to keep the total cost for the tenant at the level from before the renovation. Therefore a performance contract is developed, which allows the housing association to ask for higher leases because of the guaranteed lower energy bills of the tenants. Special attention has been paid on the renovation of kitchens and bathrooms, as this motivates homeowners and tenants to renovate their house or to accept an offer of the housing association.

Prefabricated installations unit
CONCLUSIONS

Green mortage products are already available in The Netherlands. For a further growth of green mortgages and the awareness for greener and low energy homes, the following barriers need to be addressed:

- **Awareness of the homeowners:** Energy is not the main interest for consumers when looking at a new house or at moments of refurbishments. Other aspects such as comfort, the location and safety are more important. These qualities often go hand-in-hand with low energy and can be considered as aspects of a better or more sustainable home. A holistic uniform Home Quality Mark will give the consumer a better insight in these qualities and can be the basis for a green mortgages system. In the end these aspect influence the value of a house and therefore the risk of the financers.

- **Awareness of the professionals:** Many professionals, such as real estate agents, account managers of banks and valuers are involved in transactions of new and existing homes. They can be the ambassadors of sustainable homes. Targeted training, information and evidence (higher sales prices, shorter transaction time) and user-friendly tools are required to involve these parties.

- **Initiatives to overcome the pay back times for deep renovations:** The payback times of deep renovations are often longer than the period owners live in a house (on average 7 years in The Netherlands). In the recent statement of the new Dutch Government the intention was expressed to make home-complex financing possible, so owners can invest in measures with long payback periods, and transfer the loan to the new owner if they sell the property.
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