CONCERTED ACTION
ENERGY PERFORMANCE
OF BUILDINGS

# EPBD implementation in The Netherlands

## STATUS AT THE END OF 2012

## 1. Introduction

**In The Netherlands, the implementation of the Energy Performance of Buildings Directive (EPBD) is the overall responsibility of the Ministry of the Interior and Kingdom Relations. NL Agency, the Dutch energy agency is the executive body for the implementation process.**

The EPBD has been gradually implemented in The Netherlands over recent years. The date of implementation of the Directive as to the Energy Performance Certificate (EPC) was the 1st of January 2008. For social housing companies, this was one year later, on the provision of the completion of the certification of their entire building stock. Public buildings are required to always have a valid EPC since the 1st of January 2009. The first major update of the EPC scheme was introduced on the 1st of January 2010. The next major update of the EPC scheme, incorporating requirements from the EPBD recast, is planned in the course of 2013/2014.

For the implementation of the inspection of heating systems, The Netherlands has chosen to do so by means of a voluntary scheme. The inspection of air-conditioning systems is currently dispersed amongst different parts of national law. A new law on this subject is under development and planned to be implemented in the course of 2013/2014, taking into account the EPBD recast.

In September 2012, the Dutch national plan to encourage Nearly Zero-Energy Buildings (NZEB) was submitted to both the European Commission and the Dutch Parliament. The plan sketches a strategy to achieve NZEBs at the end of 2018 for public buildings and 2020 for other new buildings respectively.

New requirements that relate to technical building systems, such as minimum system requirements, will be transposed into national law in 2013.

## 2. Energy performance requirements

Energy Performance (EP) requirements have been in place for new buildings in The Netherlands since 1995 and are updated on a regular basis towards NZEB by 2020. In 2011 and 2012 a study was performed to establish cost-optimal minimum requirements for existing buildings. These requirements will come into effect in 2013/2014.

Table 1 gives an overview of the EP requirements for both the residential and the non-residential sector for the period 1995 – 2020, indicating that the so-called EP coefficient was and will be tightened for both sectors every couple of years. Future requirements are however subject to political decision.

### 2.1 Progress and current status

The so called Energy Performance Standard (EPN), established in 1995, was replaced in July 2012 by a new standard, the Energy Performance Standard for Buildings (EPG). The EPG (Figure 2) combines both the residential and the non-residential standards into one new and updated standard. The Dutch building legislation sets an integral requirement for the energy efficiency of new buildings and major renovations of existing buildings. Included in the integral requirement is a


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***Figure 1: EPBD Logo.***

*National Websites* *www.energielabelgebouw.nl*
*www.rijksoverheid.nl/onderwerpen/energielabel-woning*


***Figure 2: Energy Performance Standard for Buildings (EPG) or NEN 7120.***

calculation of the building performance, taking into account the current level of insulation (roof, walls, floor, windows) and installation (heating, cooling, hot water, ventilation, lighting). Table 1 gives an overview of this EP requirement for new buildings in both the residential and the non-residential sector. This is expressed in an EP coefficient which can be calculated with the new EPG, expressed in terms of primary energy. This coefficient is a dimensionless number to indicate the energy efficiency of a new building. Next to the integral building requirements, also minimum requirements for building components are in place. The current minimum requirement for all building envelop parts is Rc = 3.5 $m^2$.K/W. For windows (including framework) a maximum U-value of 1.65 W/$m^2$.K currently applies. These minimum requirements apply to new buildings as well as major renovations of existing buildings. Every couple of years, both sets of requirements are evaluated in terms of their cost effectiveness, among other aspects, and, if possible, the requirements are tightened. The Dutch policy for new buildings hereby already incorporates most of the requirements resulting from the EPBD recast towards NZEB in 2020. As another intermediate step towards NZEB the minimum Rc-value for (new) building envelope parts is intended to be tightened to Rc = 5 $m^2$.K/W in 2015.

Apart from cost-effective requirements for new buildings, in order to meet the recast EPBD equirements, also a set of cost-effective EP requirements was developed for building components in existing buildings, both residential and non-residential. The requirements for existing buildings are still under discussion and will become mandatory in the course of 2013/2014.

### 2.2 Format of national transposition and implementation of existing regulations

Preceding the implementation of the original EPBD directive, a Decree (BEG) and Regulation (REG) on the EP of buildings were published in 2006 (Figure 3). These publications still regulate the conditions on which an EPC is issued. A Quality Assurance (QA) scheme was also appointed in these publications. The QA scheme is built on a national quality standard for energy consultants and qualified auditors: 'BRL9500' for QA on the certification of buildings by qualified assessors, and 'BRL9501' for QA on accredited software. The original standard or methodology for non-residential buildings was published as an ISSO 75 publication, and the original standard or methodology for residential buildings was published as an ISSO 82 publication. Another ISSO publication, ISSO 54, covers the accreditation of software.

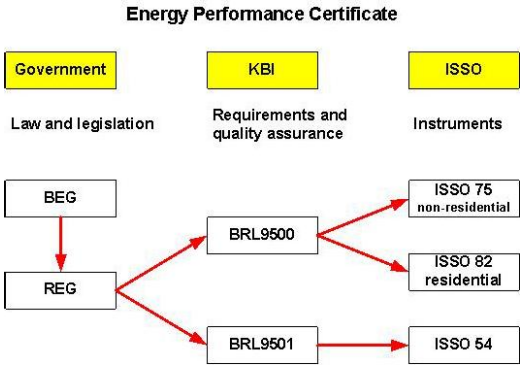



***Figure 3: Legal context of the EPC.***

A new standard for the calculation of EP requirements (EPG) was developed for several reasons. First of all, the aim of this standard was to combine the residential and non-residential standards. Secondly, the new standard meets the current CEN standards and was set up in a way to be ready for the future path towards NZEB, therefore allowing new and innovative techniques to be easily rewarded. Through a system of audited quality declarations, innovative

***Table 1: Energy Performance requirements for new buildings, overview 1995 - 2020.***

| | Residential | Non-residential building categories (different function types) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Year** | **Dwellings** | **Meeting** | **Detention** | **Health, clinical** | **Health, non-clinical** | **Offices** | **Lodging** | **Educational** | **Sports** | **Retail** |
| **1995** | 1.4 | 3.4 | 2.3 | 4.7 | 2.0 | 1.9 | 2.4 | 1.5 | 2.8 | 3.6 |
| **1998** | 1.2 | | | | | | | | | |
| **2000** | 1.0 | 2.4 | 2.2 | 3.8 | 1.8 | 1.6 | 2.1 | 1.5 | 2.2 | 3.5 |
| **2003** | | 2.2 | 1.9 | 3.6 | 1.5 | 1.5 | 1.9 | 1.4 | 1.8 | 3.4 |
| **2006** | 0.8 | | | | | | | | | |
| **2009** | | 2.0 | 1.8 | 2.6 | 1.0 | 1.1 | 1.8 | 1.3 | 1.8 | 2.6 |
| **2011** | 0.6 | | | | | | | | | |
| **2015** | 0.4* | | | | | | | | | |
| **2017** | | -50%* | -50%* | -50%* | -50%* | -50%* | -50%* | -50%* | -50%* | -50%* |
| **2018/ 2020** | Nearly zero* | Nearly zero* | Nearly zero* | Nearly zero* | Nearly zero* | Nearly zero* | Nearly zero* | Nearly zero* | Nearly zero* | Nearly zero* |

** indicates future national policy intention*

techniques, or high-performance measurements that are currently not a part of the standard, can be rewarded and included in the calculation. Lastly, the new standard is developed with the possibility to expand to include in the future also existing buildings. The Energy Performance Standard for Buildings (EPG) is in place since the 1st of July 2012.

A substandard of the EPG is the newly developed Energy Performance Standard for alternative systems, such as district or block heating and decentralised energy supply systems based on energy from renewable sources. This so-called EMG standard for 'area measures' can be used in combination with the EPG and is also in place for new buildings since July 2012.

Both EPG and EMG are currently used by architects and building developers to calculate and meet new building requirements, as set in the national building decree (Bouwbesluit). From the beginning of 2013, the software that is used for these calculations must meet a new set of QA requirements that are laid out in the updated software assessment guideline BRL9501. Also, the QA guidelines for assessors, as laid out in the BRL9500, are updated to meet the new EPG and EMG standards.

Minimum cost-effective building requirements for existing buildings were developed in 2011 and 2012 based on the existing standard for EPCs. This simplified Energy Performance Advice Standard (EPA) has been in use to determine the energy performance of national buildings for the purpose of energy performance certification since 2008. The minimum requirements for existing buildings are component based and will be published in the national building code (Bouwbesluit) in 2013/2014.

In order to meet requirements for technical building systems, a set of minimum system requirements was also developed during 2011 and 2012 for heating, hot water, air-conditioning and ventilation systems in both residential and non-residential buildings. These cost-effective minimum system requirements will also be published in the national building decree (Bouwbesluit) in 2013/2014.

Training of experts is currently available based on the existing standards for new and existing buildings. As the same standards are used to determine minimum requirements and EPCs, also the training for both objectives is largely in accordance.

### 2.3 Cost-optimal procedure for setting EP requirements

Minimum EP requirements for new buildings, both residential and non-residential and major renovations of existing buildings, have been in place in The Netherlands since 1995. The so-called Energy Performance coefficient is determined using the appropriate standard for new buildings, which currently is the Energy Performance of Buildings Standard (EPG) that has been in place since the 1st of July 2012, and if applicable, combined with the Energy Performance Standard for area measures (EMG).

Dutch policy aims to tighten the requirements for new buildings every couple of years, as shown in Table 1 and Figure 4. Over the years, the Energy Performance coefficient for residential buildings has been tightened from 1.4 at the start in 1995, to 0.6 from January 2011 onwards. Building companies have agreed with the Dutch government on a further tightening of the requirements in the near future, in order to move towards NZEB in 2018 and 2020. The Energy Performance coefficient requirement for the residential sector is scheduled to decrease to 0.4 in 2015. For the non-residential sector, this requirement is scheduled to be lessened by 50% by 2017 compared to the requirements of 2007.

Apart from the integral requirement for new buildings, also minimum requirements for building components are in place. In 2012 a study was performed to examine more stringent cost-optimal minimum requirements for new buildings. As a result, minimum requirements for building components have been partially updated in 2013: Rc-values for building envelope parts were tightened from 2.5 to 3.5 $m^2$.K/W; the U-value for glazing was tightened from 2.2 to 1.65 W/$m^2$.°C. Further tightening is scheduled to take place in 2015 (Rc-values for building envelope parts = 5 $m^2$.K/W).

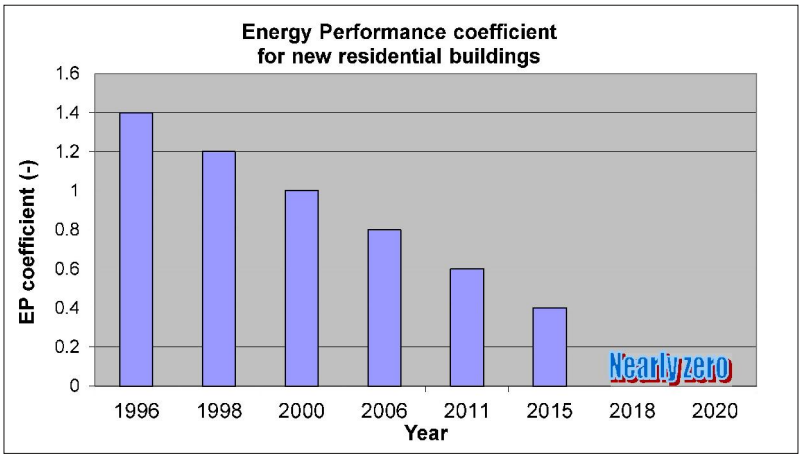



***Figure 4: EP coefficient for new residential buildings, towards NZEB.***

Also, during 2011 and 2012, a study was performed to examine the cost-optimal level of minimum requirements for building components of existing buildings. In this study, minimum system requirements were determined also for heating systems, hot water systems, ventilation and air-conditioning systems. As a result, minimum requirements for existing buildings will be introduced in the Dutch building legislation through the adaptation of an updated building decree (Bouwbesluit), which is expected in 2013/2014.

### 2.4 Action plan for progression to NZEB

The government encourages the development of NZEBs by:

- setting clear goals for all stakeholders and establishing clear legislation;
- acquiring a broad support among all stakeholders, including residents and building users;
- appraisal of collective solutions;
- stimulating sufficient knowledge to all actors;
- stimulating cooperation in the chain (i.e., optimising performance of the construction sector through continuous improvement: cooperation of chain partners and stakeholders in the building process);
- providing room for experimentation, e.g., facilitating low-energy use pilot projects;
- encouraging good government orchestration;
- taking action as 'Launching Customer' (the exemplary role of the public sector).

Jointly with the building and construction sector, this will be the route the government must follow to achieve NZEBs over the next eight years. Several activities are already underway. The building and construction sector joined with government ministries to form the 'Lente Akkoord' in 2008. The 'Lente Akkoord' is a covenant of the new buildings sector, aimed at reducing the energy consumption of new buildings over time, towards NZEB in 2020. In this signed agreement between the public and private sectors, a number of mutual efforts have been agreed to reduce the energy use of new buildings by the year 2015 by at least 50% compared to 2007 levels.

The definition of a NZEB is determined by the new Standard for Energy Performance of Buildings (EPG) that was introduced in 2012, in combination with the Standard for Energy Performance of area measures (EMG). It is argued that a zero-energy building has an EP coefficient equal or close to zero. The aim is to set requirements that will allow reaching close to zero energy needs at the end of 2018 (public buildings), and 2020 (other buidlings), respectively. This level will then be defined as a nearly zero-energy performance. Studies to be performed in upcoming years will have to define the exact level of nearly-zero in The Netherlands.

The exact value of the EP coefficient that will be used for NZEB cannot yet be determined. At least two future studies are foreseen to get a better indication of the feasibility and costs of an intermediate tightening of the EP coefficient, whereupon the cost-effectiveness of the nearly zero-energy level has to be determined.

## 3. Energy performance certificates

The EPC has been in place in The Netherlands since the beginning of 2008. During the period from 2008 until the end of 2012 over 2.4 million residential EPCs were issued, covering over 30% of the residential building stock. In the non-residential sector, a total of nearly 15,000 EPCs were issued in the same period, mainly for offices, retail and shops or shopping malls, covering an estimated 30-35 million $m^2$ surface area (Figures 5, 7-9).

### 3.1 Progress and current status on sale or rental of buildings

The EPC is the most visible aspect of the EPBD. This document assigns an Energy Performance Indicator (EPI) to residential and non-residential buildings including building units and it lists individually tailored cost-effective measures for improving their energy performance.

The EPC consists of a minimum of 3 pages. On the first page, the EP class indicator of the building is indicated (Figure 6). The current indicator runs from $A^{++}$ (many energy saving measures taken) to G (many energy saving measures possible), where EP class A is equal to the EP level of new buildings from the year 2000 and onwards. The EP class indicator is determined by the calculated EPI that can be found on page three of the EPC. On the front page, furthermore, the standardised annual primary energy use in MJ is displayed, including a sub-division into electricity (kWh), gas ($m^3$) and heat (GJ). The EPC for non-residential buildings also displays the annual $CO_2$ emission. The first page also mentions the building type for which the

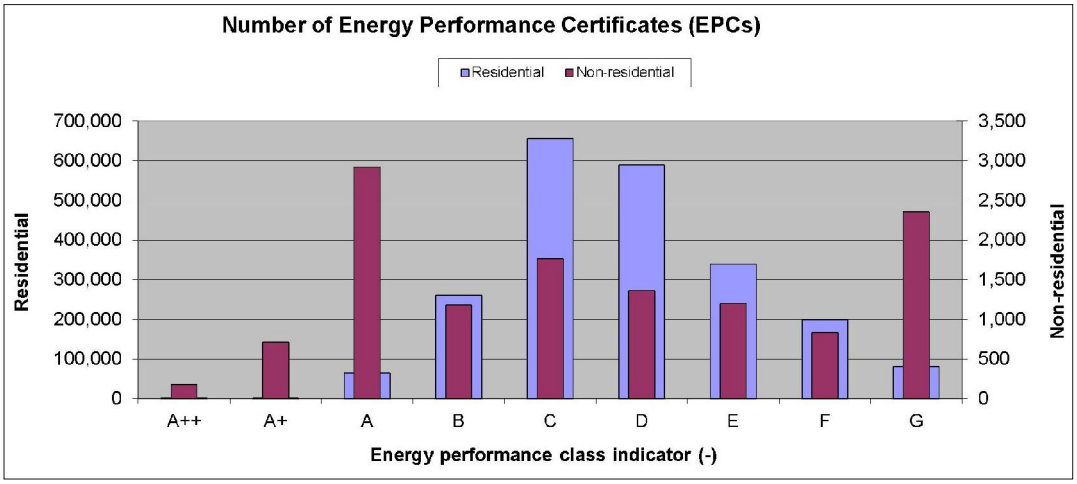



***Figure 5: Number of EPCs in 2008-2012, residential and non-residential.***

energy certificate is issued, the assessor of the certificate and the expiration date (with a maximum validity of 10 years).

The energy saving measures that are recommended for a specific building are described on page 2 of the certificate. Suggested improvements include a short general description for each energy-saving measure. Page 3 gives a description on how the EPI is calculated, according to a standardised methodology.

In December 2006 the 'Decree on Energy Performance of Buildings' (BEG) as well as the 'Regulation on Energy Performance of Buildings' (REG) were legally implemented in The Netherlands. This enabled The Netherlands to develop an EPC specifically tailored for existing buildings. The EPC first came into force on the 1st of January 2008. This EPC can also be used for new buildings. However, in order to display the low EP levels of new buildings in a more distinguished way, it is expected that in the course of 2013/2014 current energy label classes will be extended from A++ to A++++.

For each building or building unit, an EPI is calculated according to a fixed methodology. This is a dimensionless number expressing the energy efficiency of the building in relation to its type and size. An EP class indicator is then assigned based on the EP calculation. Certificates can only be issued by qualified assessors. There are voluntary educational programs for assessors, but examination by a national board is mandatory. The assessors who may issue an EPC must meet certain minimum qualifications, including the ability to assess the quality and condition of materials, building envelope parts and installations present in a building. A list of qualified assessors is permanently updated and always available online for the public at the website of KBI, the Dutch QA association (*www.kbi.nl*).

Certification of existing residential and non-residential buildings started on the 1st of January 2008 and is mandatory when a building or building unit is sold or rented out. The owner must present a valid EPC at the moment of transaction. This involves a qualified assessor to visit the property and assess the building, in terms of the type and quality of constructions and installations. The qualified assessor will then calculate the EPI with an accredited software program and issue the EPC. This is done by sending an automated report to the central database managed by NL Agency, which returns a unique identification number for each certificate that can then be printed.

Although it is mandatory by law to have an EPC at the moment of transaction, there is currently no penalty for not having an EPC at the moment of transaction. The compliance level is highest in the social housing market where social housing


***Figure 6: Front layout of the EPC with an A++ indicator.***

***Figure 7: Growth of number of residential EPCs.***

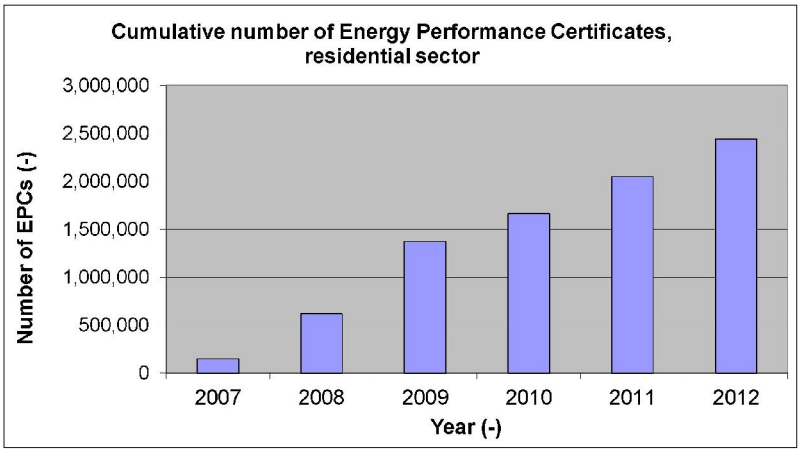



***Figure 8: Growth of number of non-residential EPCs.***

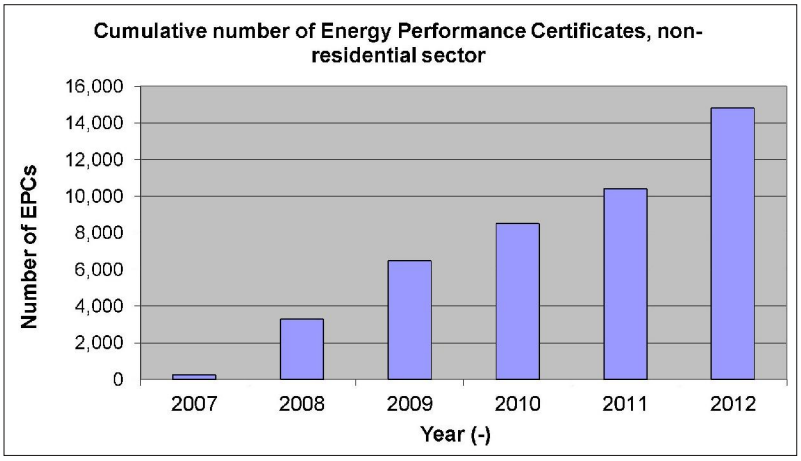
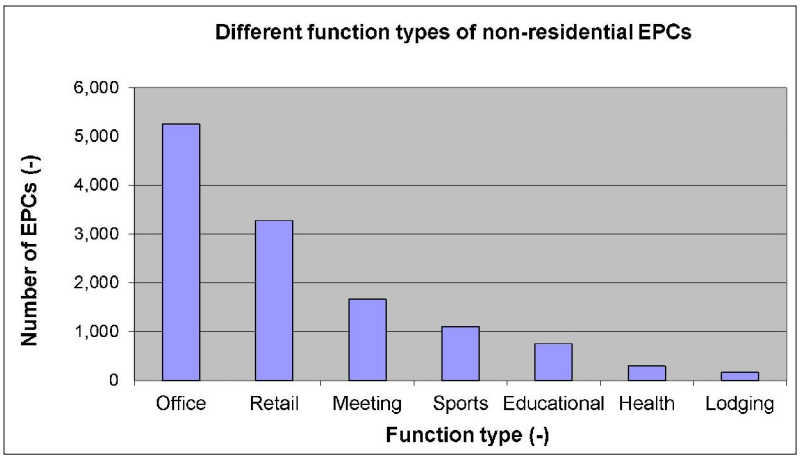



***Figure 9: Function types of non-residential EPCs.***




corporations have an incentive to issue EPCs for their buildings and units. A better EPC means that the social housing corporations can ask for a higher maximum rental price by law, if this is feasible for that particular location. So, there is not only incentive to issue EPCs, it is even encouraged to take energy saving measures and improve the EP of dwellings.

For other market sectors, such as the private sector, including non-residential buildings, the Dutch government is still studying and discussing the best possible type of sanctioning to achieve a high compliance also in these sectors. A new law was proposed to the Parliament in 2012, but was rejected in November 2012.

Sanctioning of assessors takes place through the QA scheme (BRL9500). At the end of 2012, a total number of 193 companies (with a multitude of registered people) were certified to issue EPCs for residential buildings, and 104 companies for non-residential EPCs. For the residential sector, in the course of 2012, a total number of 50 companies was penalised. This meant additional checks and inspections by certified institutions, after too many critical deviations in EP calculations, leading in 3 cases to the loss of licence. In the non-residential sector, in 2012, a total of 17 companies were penalised, of which 2 lost their licence in the end.

### 3.2 Progress and current status on public and large buildings visited by the public

The EPC is widely applied in public and governmental buildings. Results from early 2010 show that, from a random sample of 365 public buildings, a number of 254 buildings would need to display the EPC. Further research showed that approximately 70% of buildings actually had an EPC displayed, or was in the process of certifying the building. About one year earlier, a similar random check was done and the result then was that only about 30-35% of the buildings had the EPC displayed, or were in the process of acquiring it.

Checks on the compliance of applying for an EPC and displaying it when available are done by a governmental inspection authority, the 'Inspectie leefomgeving en transport' (ILenT). It is important to know that the checks are done without pre-announcement, so that results are quite reliable. There are no sanctions involved at this stage yet, so this is purely done to check compliance and evaluate if, and whether, sanctions are necessary.

### 3.3 Implementation of mandatory advertising requirement – status

Advertising the Energy Performance class indicator, when a certificate is available, is not mandatory at the moment in The Netherlands. However, for a very small number of buildings that is for sale, this is already done on a voluntary basis. When analysing the largest website of joined real estate agents (*www.funda.nl*), in the residential sector about 2% of houses that are for sale at the end of 2012 have an EPC available. However, not all of these houses actually need to have an EPC,

because there will, more than likely, be some monumental buildings amongst the buildings for sale, which slightly increases the actual percentage where the EPC is displayed. Research in recent years showed that approximately 15-20% of houses that are sold in one year, actually have an EPC available at the transaction moment.

### 3.4 Information campaigns

Public awareness concerning the EPBD and in particular the EPC in The Netherlands, is the main responsibility of the Ministry of the Interior and Kingdom Relations. Evolving out of the entry into force of the EPBD and implementation of the EPC in 2008, a national information campaign was launched in The Netherlands at the end of 2007 and repeated again in the spring of 2008. The campaign consisted of short commercials on radio and television, items in housing programs, advertisements in national newspapers and a campaign website with guidelines to inform the broad public ('Postbus 51').

In 2009 and 2010, a more general campaign ran to raise public awareness on the topic of energy saving in the built environment. Under the current circumstances, at the end of 2012 it is not possible to have such large national campaigns, because of budget cuts and other restraints. However, both NL Agency and the consumer information organisation 'Milieu Centraal' offer continuous information about the implementation of the EPBD guideline, the EPC and other subjects, through their websites, in workshops and brochures, with online tools like the 'Energiebesparingsverkenner' (energy savings scout) *www.energiebesparingsverkenner.nl* or *www.verbeteruwhuis.nl*, and through social media (Figures 10 & 11). The main NL Agency website which acts as a portal to other sources of information is *www.energielabelgebouw.nl*.

## 4. Inspection requirements - heating systems, air-conditioning

In The Netherlands, the implementation of inspection requirements is different for heating systems and air-conditioning (AC) systems. Whereas the inspection of AC systems is done by means of legal implementation, the inspection of heating systems is based on a voluntary system. This approach was already opted for in 2006 because a large number of heating systems are already inspected and replaced on a voluntary basis, so there is no need to regulate this by law.

***Figure 10: EPC information folder.***


### 4.1 Progress and current status on heating systems

Inspections of heating systems are not regulated by new legislation, because already a large number of systems is regularly being checked. It is estimated that in the social housing sector there is nearly full coverage of maintenance and inspections by professional companies, without the need for legislation to do so. For larger systems, mainly in the non-residential sector, there already is a law in place that forces the owner to do regular inspections. So it is mainly for the private residential market that additional activities are necessary and under development in order to stimulate home owners to have their heating system inspected on a regular basis. The heating systems manufacturing association (VFK) and the representative organisation for installers (Uneto-VNI) are collaborating where, with the support of the government and public consumer organisations, they are currently developing an inspection with the focus aimed at both energy saving potential as well as safety.

***Figure 11: EPC information card.***


***Figure 12: Market share of different heating systems for the residential sector.***

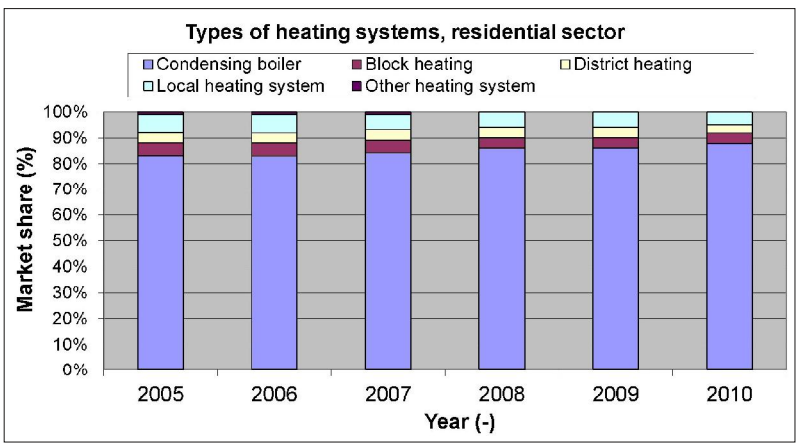
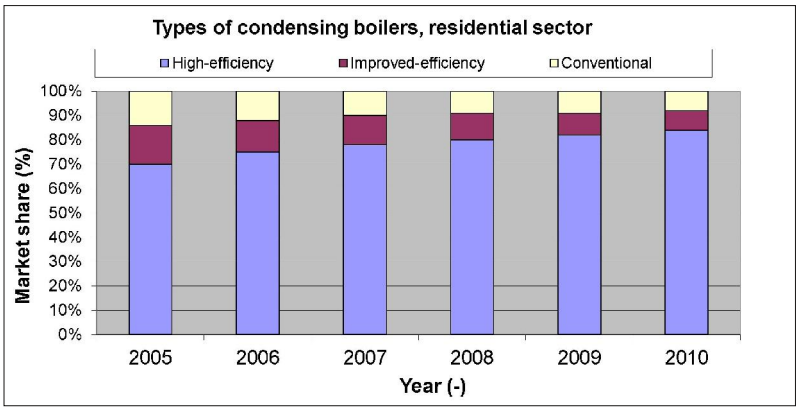


***Figure 13: Coverage of high-efficiency condensing boilers in the residential sector.***




After a number of deadly and other accidents, there is a lot of attention to safety issues relating to carbon monoxide poisoning. For this reason, safety organisations and insurance companies are interested in this new voluntary inspection as well.

**4.2 Progress and current status on AC systems**

New regulations are in preparation in The Netherlands to enforce regular inspections of AC systems. These regulations are laid out in a part of the law that, had it been enacted at the end of 2012, would have introduced an adequate system of sanctioning to the EPC, as described in paragraph 3.1. However, this law was rejected by the Parliament. It is expected that the regular AC inspections will be taken up in a different part of the legislation and still be implemented in the course of 2013/2014.

According to the current proposal submitted to the Parliament, the inspections will have to be carried out every 5 years for all AC systems with an effective output over 12 kW (total per building). The inspections must be carried out by Qualified Experts (QEs). Training and examination for these experts are currently under development. Precise requirements are therefore not available yet. The purpose of the inspection for an expert is to determine whether an improvement of the energy performence of the system is possible. This will lead to a report that contains an assessment of the efficiency of the AC system, as well as an evaluation of the capacity in relation to the cooling needs of the building. The user or owner of the AC system will receive advice on possible improvements to the system, the need to replace the system and possible alternative solutions. The reports will be stored in a central database.

## 5. Conclusions and future plans

Implementation of the Energy Performance of Buildings Directive (EPBD) is progressing in The Netherlands, despite turbulent political times. A new law that was in preparation to transpose a number of provisions from the recast EPBD has been rejected by the Parliament at the end of 2012. In the beginning of 2013, the Ministry of the Interior and Kingdom relations will start to work on a new law. Positive progress can be seen in other areas, such as the implementation strategy towards Nearly Zero-Energy Buildings (NZEBs), where The Netherlands already has relevant legislation in place since 1995. Energy Performance (EP) requirements will be further tightened in the next couple of years, not only for new buildings, but also for existing buildings. A lot of effort is put into the inspections of air-conditioning (AC) systems and heating systems, whereas the first will be implemented into national legislation and the second is expected to succeed on a voluntary basis.

Communication will be the keyword in a lot of projects relating to the EPBD in the near future with the aim of actually stimulating building owners to take energy saving measures following the certification of a building, or the inspections of an installation. One of the main concerns in the residential sector will be to ensure that home-owners expenditures remain affordable. In the non-residential sector, and in the social housing sector, the Energy Performance Certificate (EPC) is considered a useful benchmarking tool where one can distinguish oneself from competitors with an energy efficient building stock.

The Concerted Action (CA) EPBD will remain of great value to The Netherlands in upcoming years to share best practices and learn from other Member States (MS) experiences.

***Figure 14: Advisory tool for inspection of an air-conditioning system.***

Co-funded by the Intelligent Energy Europe Programme of the European Union



The content of this report is included in the book “Implementing the Energy Performance of Buildings Directive (EPBD)”, ISBN 978-972-8646-27-1,
© ADENE 2013 (pages 275-282)

More details on the IEE Programme can be found at
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This individual report and the full book of national reports 2012 can be downloaded from www.epbd-ca.eu and also from www.buildup.eu