EU Taxonomy Alignment Methodology Document for Green Residential Buildings in The Netherlands

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VAN LANSCHOT KEMPEN

CFP GREEN BUILDINGS

Table of content

Company Profile

Van Lanschot Kempen is an independent wealth manager with a strong specialist position in the market. Van Lanschot Kempen made a clear choice for wealth management, targeting private, wholesale, institutional and investment banking clients and is specialising in the preservation and creation of wealth in a sustainable way.

Purpose of this document

Van Lanschot Kempen has established a Green Bond Framework ("the Framework") under which Green Bonds instruments can be issued to finance or refinance green loans on Van Lanschot Kempen's balance sheet in alignment with the ICMA Green Bond Principles, the EU Taxonomy and market standards. Due to the nature of Van Lanschot Kempen, the main Green Eligible Loans in the Green Bond Framework are green buildings, which includes mortgages on low-carbon residential buildings in the Netherlands.

These Green Eligible Loans are selected based on compliance with eligibility criteria in the Framework, which follow the EU Taxonomy criteria on a best effort basis. The purpose of this document is to provide a methodology explaining the implications of the EU Taxonomy criteria on the selection of Green Eligible Loans. Annex I (Climate Change Mitigation) of the EU Taxonomy Delegated Regulation from June 2021, chapter 7.7, formulates the Technical Screening Criteria for sustainable buildings for "Substantial contribution to climate change mitigation" as follows:

- *For buildings built before 31st December 2020, the building has at least an Energy Performance Certificate (EPC) class A. As an alternative, the building is within the top 15% of the national or regional building stock expressed as operational Primary Energy Demand (PED) and demonstrated by adequate evidence, which at least compares the performance of the relevant asset to the performance of the national or regional stock built before 31st December 2021 and at least distinguishes between residential and non-residential buildings.*
- *For the construction of new buildings as of 2021, the PED needs to be at least 10% lower than the threshold set for nearly zero-energy building (NZEB) requirements.*

PED refers to the quantity of energy required to obtain the total amount of energy that a dwelling demands from fossil fuels such as gas and electricity. The higher the number of residents or the bigger the living space, the greater the PED. To achieve the required PED of a residential building, sustainability and retrofitting strategies are essential to reduce primary energy consumption and improve the energy rating.

CFP has been asked to provide consulting services to develop a methodology to define the top 15% most energy-efficient residential buildings, as well as to determine the residential buildings with at least an EPC rating A, in the Netherlands and the definition of the NZEB minus 10%. CFP was not asked to investigate the Do No Significant Harm (DNSH) criteria, such as climate change adaptation.

The following methodology report outlines how CFP has defined the top 15% of the residential building stock.

Executive Summary

Green residential buildings within the top 15% of the national or regional building stock expressed as operational PED in the Dutch context have been determined as follows:

- 17.6% of all residential buildings have a registered EPC[1] rating A.
- Newly built residential buildings since 2006 should qualify for energy label A+ in most cases and belong to the top 15% (<105 kWh/m²/year).
- As the building stock evolves over time, and more energy-efficient buildings are constructed, it is recommended to redefine the top 15% regularly.

[1] In the Netherlands, the definition EPC is also used for the building code for new buildings. In this study, the term EPC is used as definition of the energy certificate ("energielabel" in Dutch)

EPC labels in the Netherlands

EPC labels are an important instrument that should contribute to enhancing the energy performance of buildings. The certificate can potentially influence builders and real estate owners to increase energy efficiency and implement energy-saving measures in renovation projects.

EPCs have become a requirement for EU Member States to implement as a consequence of the 2002 European Energy Performance of Buildings Directive (EPBD) (2002/91/EC). EPCs play a central role within the context of this directive which requires Member States to provide information on the energy performance of buildings to the owner(s) or tenant(s). To illustrate and confirm the energy performance of buildings, an EPC must be published alongside an inspection report on which the EPC is based. The importance of EPCs has increased throughout the years, notably due to the recast of the EBPD in 2010.

An EPC label therefore aims to indicate how energy-efficient a home is and which energy-saving measures can be implemented. The assigned letter of an energy label is determined based on fossil energy consumption, expressed in kilowatt-hours per square meter per year (kWh/m^2/year). The label classes for homes run from A to G. Homes with the label A are the most energy-efficient (maximum PED of 160 kWh/m^2/year), and houses labelled G are the least energy efficient. A building with an energy label A+++ can be identified as a nearly zero-energy building (NZEB). The label also provides an overview of housing characteristics, such as the housing type, insulation, glazing, and heating. The current situation of EPC ratings in the Netherlands is described in the table below.

EPC rating	EPC Score	PED in kWh/m^2/year	Registered certificates	% of total certificates	% of total building stock
A	<1.20	0 < PED < 160	1,409,239	30.1%	17.6%
B	1.21-1.40	160 < PED < 190	781,388	16.7%	9.8%
C	1.41-1.80	190 < PED < 250	1,205,171	25.8%	15.1%
D	1.81-2.10	250 < PED < 290	557,100	11.9%	7.0%
E	2.11-2.40	290 < PED < 335	329,198	7.0%	4.1%
F	2.41-2.70	335 < PED < 380	204,680	4.4%	2.6%
G	>2.70 >	380	190,426	4.1%	2.4%
Total			4,677,202	100.0%	58.4%

Table 1: EPCs in The Netherlands[2]

[2] Source for EPC labels: https://www.ep-online.nl/

Table 1 shows that EPC A labels account for 17.6% of the Dutch residential buildings stock. This exceeds the top 15% of the national or regional building stock expressed as operational PED, therefore it is necessary to define which buildings belong to the top 15%.

Registered certificates

By the end of 2021, 4.7 million residential buildings in the Netherlands have a registered EPC. Of these buildings, 1.4 million are registered with an EPC rating A. The energy efficiency of existing residential buildings can be determined using three different methods:

a) A more extensive calculation at location (which considers around 150 building characteristics), resulting in the EPC or PED score.

b) A calculation made at a distance, by a certified energy advisor and based on the most important building characteristics and (this method was used until December 2020);

c) The provisional energy label provided by the Dutch government.

These first two methods result in a registered certificate, with an EPC which is calculated by certified energy advisors and validated by audited organisations. The provisional energy labels are no longer valid as of 1st January 2021.

In 2015, all non-labelled residential buildings were allocated with provisional energy certificates. The Dutch government defines these provisional certificates and are based on building characteristics such as the construction year and the type of building. All buildings built in the Netherlands after 2006 received a provisional EPC rating A if a registered EPC was not provided. In practice, 94.2% of these provisional certificates also lead to a registered label A.

To calculate the percentage of EPC A rated dwellings as a percentage of the total residential building stock, there are some limitations. The impact, however, of both limitations on the definition of the top 15% green residential buildings in the Netherlands is negligible.

- The quantity of registered and provisional certificates is based on the EP-Online database. This database is owned and maintained by the Netherlands Enterprise Agency (RVO) and includes all EPCs. The database includes certificates of multi-purpose buildings (e.g., office combined with housing) and houses with a recreational purpose. The Kadaster[3] (national Land Registry Office) does not include these buildings in the residential building stock.

- The total residential building stock also includes national and regional monumental buildings.Monumental buildings might have an EPC label, however it is not mandatory. There are 31,637 national residential monuments and 55,801 regional monuments, according to CBS[4].

[3] https://www.kadaster.nl/

[4] CBS: Centraal Bureau voor de Statistiek. Most recent data is used, which origins from April 2021.

Determining the top 15% of regional residential building stock

When selecting a year of construction, it is recommended to align it with the year a new Building Code is introduced. This is because buildings will have an improved energy efficiency in order to comply with the Building Code requirements. The Building Code that was introduced in 2006 requires an EPC score of 0.8 or lower, which corresponds to an EPC rating of A+. This EPC score is based on the NEN7120, which describes the methodology for determining the EPC score.

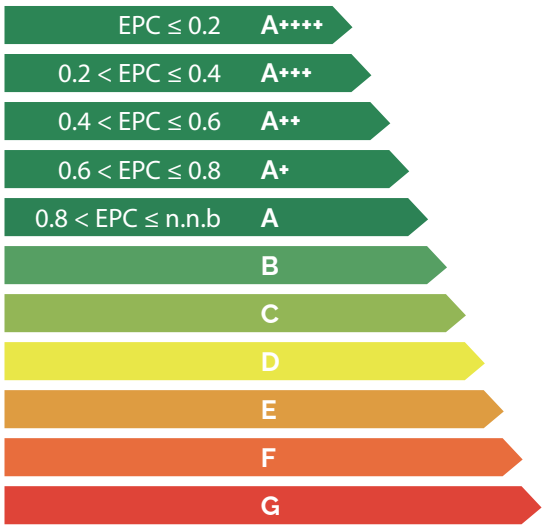

Figure 1: Correspondence between EPC scores and energy labels

Development of the EPC requirements

The Dutch Building Regulation sets out energy efficiency requirements for different building types using an EPC score. For example, the Dutch Building Code 2000 requires an EPC score of 1.0 or lower.

These EPC scores of buildings improve based on the introduction of a new Building Code. The correspondence between building years and the EPC score is shown in Table 1 and the values in Figure 2. Over time, the Dutch Building Regulation became more stringent in energy-efficiency and sustainability requirements for new buildings, resulting in a more efficient PED. Therefore, new buildings built according to the most recent regulation are likely to have improved efficiency compared to older buildings complying with older regulations. Therefore, the building's year of construction can be used to define the top 15% of most energy-efficient residential buildings in the Netherlands.

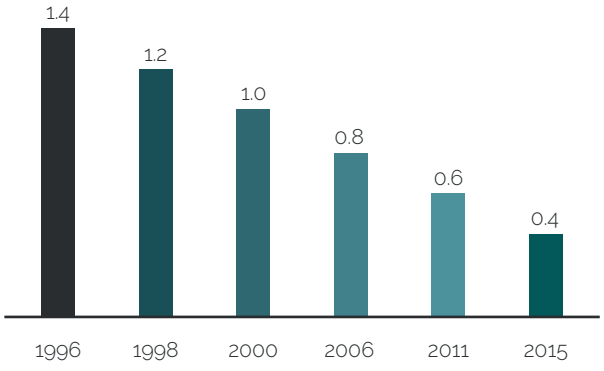

Figure 2: EPC score per year (according to building code)

Since 1st January 2021, the NEN7120 has been replaced by the NTA8800. The NTA8800 also calculates the EPC score, but uses the PED. Table 2 shows the limits of the energy label classes according to the NTA8800. These limits are expressed in PED.

Although both methodologies of the NEN7120 and NTA8800 are not entirely comparable, the expected PED of an EPC A+ would be below 105 kWh/m².

The table on the right lists new buildings built between 2000 and 2025[5], based on the Kadaster database.

The table shows that the houses built between 2006 and 2020 represent 12.2% of the total Dutch building stock, which means that this part of the buildings stock will not exceed 15% of the market.

Period	New build houses	Period	New build houses
2000	74,774	2014	45,170
2001	77,181	2015	48,381
2002	71,143	2016	54,849
2003	64,102	2017	62,982
2004	69,832	2018	66,585
2005	71,541	2019	71,548
2006	77,103	2020	69,985
2007	85,201	2021	68,633
2008	84,174	2022	77,000
2009	87,835	2023	80,000
2010	60,556	2024	80,000
2011	62,199	2025	80,000
2012	48,668	2026	80,000
2013	49,311		

Table 3: All residential buildings built between 2000 and 2025

A++++	A+++	A++	A+	A	B	C	D	E	F	G
<0.00	50.00	75.00	105.00	160.00	190.00	250.00	290.00	335.00	380.00	>380.00

Table 2: Primary Energy Demand per m² per energy label.

[5] To develop a methodologic approach that is applicable and sufficient for the following years, CFP has included the estimated building stock growth in the upcoming years, based on national governmental data.

Considering the building stock growth of the following years, we can assume that the criterion for the building year can be used until and including the assessment year of 2023. The table below shows the development of the year of construction as a criterion. For the assessment year 2024, it is expected to revise the cut-off year to stay within the top 15%.

Conclusion of the top 15% expressed as Primary Energy Demand

Eligible existing residential buildings must have an EPC rating of A or an operational PED that belongs to the top 15% green residential buildings. To define the top 15% most energy-efficient buildings in the Netherlands, a cut-off building year of construction can be selected as criterion. By selecting a cut-off building year of construction of 2006, it is possible to align with the stricter requirements that were imposed by the Building Code of 2006.

Residential buildings built after 2006 comply with an EPC score of 0.8 or lower, which in most cases, corresponds to an EPC certificate A+. This translates into a selection of buildings with a PED of <105 kWh/m²/year. Currently, buildings built as per 2006 account for 13% of the total buildings stock, which is within the top 15%. However, the top 15% is evolving due to new buildings being built and thus being added to the building stock. Therefore, it is expected to redefine the top 15% in for the assessment year 2024.

Assessment year[6]	Cut-off building year of construction	Residential building stock	Buildings in scope	% of building stock
2021	2006	8,005,000	1,043,180	13.0%
2022	2006	8,082,000	1,120,180	13.9%
2023	2006	8,162,000	1,200,180	14.7%
2024	2006	8,242,000	1,280,180	15.5%

Table 4: Evolution of the top 15% green residential buildings in the Netherlands (2021-2024)

[6] Calculations are performed using real or estimated year end data.

BENG – 10% requirements for new buildings

On 1st January 2021 the NTA8800 was introduced in the Netherlands and included the BENG regulations. These regulations replace the EPC regulations for new buildings and the energy index for existing building. This means that every newly built house has to meet the BENG criteria instead of the EPC regulations.

BENG stands for 'nearly energy-neutral buildings' ("Bijna Energieneutrale Gebouwen" in Dutch). All new buildings must meet these regulations. They are derived from and are in line with the European Energy Performance of Buildings Directive. The BENG regulations for new buildings make a distinction in three different criteria: BENG 1, BENG 2 and BENG 3.

- **BENG 1:** Maximum energy demand in kWh per square meter per year.

  This indicator focuses particularly on the demand for heating and cooling. The design of the building, the amount of insulation and orientation of the building are key in calculating the energy demand.

- **BENG 2:** Maximum primary fossil energy usage in kWh per square meter per year.

  This indicator is the sum of all energy related aspects of a building. This includes heating, cooling, heating systems for water and mechanical or natural air ventilation. When energy is generated locally with, for instance, solar panels, the amount of generated energy can be deducted from this indicator.

- **BENG 3:** Percentage renewable energy that is generated specifically at the building area.

  The method for the calculations is the most important difference between the EPC and the NTA8800. Both methods contain strict regulations in order to improve the sustainability of buildings. Insulation is still important and electrical heating with heat pumps is in both cases considered better than heating with gas.

The generation of renewable energy on-site, such as solar energy, still has a positive impact on the energy performance rating.

The NTA8800 also changes the regulations for energy certificates for existing buildings. The new calculation for existing buildings is most comparable with the BENG 2 calculation for new buildings. Instead of using an index as outcome of the calculation, the NTA8800 uses the primary fossil energy usage measured in kWh/m², for both new and existing building certificates.

The EU Taxonomy introduces a criterion that qualifies buildings that outperform the NZEB requirements by at least 10% in primary energy.

In the case of the Netherlands, this is best presented in terms of BENG 2 and the 10% improvement displayed in the table below.

The EPCs from before 2021 are still comparable to the BENG regulations that are applicable since 2021. The outcome of the BENG calculation still leads to an EPC and the label also provides an overview of housing characteristics, such as the housing type, insulation, glazing and heating.

Type of residential building	**Maximum primary fossil energy usage[7]**	**10% improvement**
Ground bases houses	30 kWh / m² / per year	27 kWh / m2 / per year
Flats and apartments	50 kWh / m² / per year	45 kWh / m2 / per year

Table 4: BENG 2 requirements for new buildings and 10% improvement

[7] In accordance with the EU Taxonomy, new buildings built as of 1 January 2021 are Taxonomy-aligned if the net primary energy demand of the new construction is at least 10% lower than the primary energy demand resulting from the relevant NZEB requirements. When referring to primary fossil energy consumption, the system losses (such as pipe losses during heating), auxiliary energy (such as pumps) and the efficiency of the generators (such as the central heating boiler) are included. This is not the case with energy demand.

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