Green Residential Buildings Methodology Assessment Document

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nationale nederlanden

CFP GREEN BUILDINGS

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NN Group is an international financial services company, active in 20 countries, with a strong presence in a number of European countries and Japan. The Group provides retirement services, pensions, insurance, investments and banking to approximately 18 million customers, and employs more than 15,000 people. NN Group includes Nationale-Nederlanden, NN, NN Investment Partners, ABN AMRO Insurance, Movir, AZL, BeFrank and OHRA. NN Group has established a Sustainability Bond Framework under which NN Group can issue green, social or sustainability bonds to finance and/or refinance a portfolio of Eligible Green or Social Assets ('Eligible Asset Portfolio') in accordance with the ICMA Green and Social Bond Principles, the ICMA Sustainability Bond Guidelines, and market standards.

Intent of this document

CFP has been asked to provide consulting services to develop a methodology to define the top 15% low-carbon residential buildings in the Netherlands. In accordance with the Climate Bond Initiative ('CBI') Low-Carbon Building Standard as well as market practice, the top 15% low-carbon residential buildings in the Dutch context have been measured via Energy Performance Certificates ('EPC')[1] for residential buildings, with EPC rating A automatically belonging to the top 15%[2]. However, the country's building stock evolves over time, and over the past years the number of buildings with EPC rating A has increased in the Netherlands. Therefore, it is important to redefine the top 15% on a regular basis.

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)
2 In accordance with Climate Bond Initiative Low-Carbon Buildings Standard for Residential Buildings in The Netherlands

EPC labels in the Netherlands

Energy Performance Certificates are important instruments that should contribute to the enhancement of the energy performance of buildings. The certificate can potentially influence builders and real estate owners to build with greater energy efficiency and implement energy saving measures in renovation projects.

As a consequence of the 2002 European Energy Performance of Buildings Directive (2002/91/EC), EU Member States have to implement Energy Performance Certificates. EPCs play a central role in the context of Article 20 (2) EPBD. The EPBD asks Member States to provide information on the energy performance of buildings to the owner(s) or tenant(s). The information includes the EPC, and the inspection report on which the EPC is based. The recast of the EPBD (Directive 2010/31/EU) in 2010 increased even further the policy attention and the importance of EPCs. An EPC label indicates how energy-efficient a home is and which energy-saving measures are still possible. The energy label letter is determined on the basis of fossil energy consumption, expressed in kilowatt hours per square meter per year (kWh / m^2.yr). The label classes for homes run from A to G. Homes with an A label are the most energy efficient, homes with a G label are the least energy efficient. 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 chart below.

EPC rating	Registered certificates	Provisional certificates	Total certificates	% of total certificates
A	1.217.535	348.807	1.556.342	19,3%
B	766.976	556.302	1.323.278	16,3%
C	1.197.784	988.184	2.185.932	27,0%
D	586.674	265.766	852.440	10,5%
E	339.387	332.333	671.720	8,3%
F	206.800	420.701	627.501	7,8%
G	177.280	691.882	869.102	10,7%
Total	4.492.436	3.603.939	8.096.375	100,0%

Table 1: Energy performance certificates in The Netherlands[3]

3 Source for EPC labels: https://www.ep-online.nl/

On 31 December 2020, 4.492.436 residential buildings in the Netherlands have a registered EPC.

Of these buildings, 1.217.535 are registered with an EPC rating A (15% of the Dutch residential registered and provisional EPC's). Energy performance certificates are calculated or validated by certified energy advisors and audited organizations[4]. To calculate the percentage of EPC A rated houses as a percentage of the total residential building stock, there are some limitations:

- The amount of registered and provisional certificates is based on the database of EP-Online. This database is owned and maintained by The Netherlands Enterprise Agency (RVO). All Energy Performance Certificates are registered in this database. The database includes certificates of multi-purpose buildings (e.g. office combined with housing) and houses with a recreational purpose. The Kadaster[5] (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[6].

The impact of both limitations on the definition of the top 15% low-carbon residential buildings in the Netherlands is rather insubstantial.

4 Certified energy advisors are registered at QBis: https://www.qbisnl.nl/zoeken/hoofd/Energie-advies
5 https://www.kadaster.nl/
6 CBS: Centraal Bureau voor de Statistiek

Provisional EPC ratings for buildings without a registered energy label

The energy efficiency of existing homes can be determined using three different methods:

- The provisional energy label provided by the Dutch government;
- A calculation made at a distance by a certified energy advisor and based on the most important building characteristics and;
- The more extensive calculation at location (which takes into consideration about 150 characteristics of the building), resulting in the Energy Index.

The last two methods result in a registered certificate.

The rest of the residential buildings in The Netherlands does not have a registered energy label (yet). This category amounts to 44,5% of the total amount of certificates in the Netherlands. In 2015, all non-labelled residential buildings were allocated with provisional energy certificates. These provisional certificates are defined by the Dutch government and are based on building characteristics such as the building year and the type of building.

All buildings built in the Netherlands after 2006 automatically received a provisional EPC rating A, if a registered EPC was not provided. In practice, 94,2% of all provisional labels A built after 2006, also lead to a registered label A. Because this is a relatively high percentage, we therefore include the provisional certificates in the calculation for the determination of the top 15%.

Dutch building regulation requirements

Combined with the provisional energy certificates, the number of buildings with an EPC-rating A will be 19% of the total residential building stock. As a consequence the top 15% performing residential buildings in the Netherlands falls within the EPC A category and thus a further breakdown is required.

Development of the EPC requirements

The Dutch Building Regulation sets out energy efficiency requirements for different building types. As an example, the Dutch Building Code 2000 requires an EPC score of at least 1,0. The correspondence between Building Codes and EPC score is shown in the graph. Over time the Dutch Building Regulation became more stringent in terms of energy-efficiency and sustainability requirements for new buildings. Therefore, new buildings built according to the most recent regulation are likely to have improved efficiency levels compared to older buildings built in accordance with older regulation. Since 19% of the residential buildings have an EPC rating of A, we suggest to use the building's year of construction as extra criterion for the establishment of the top 15%.

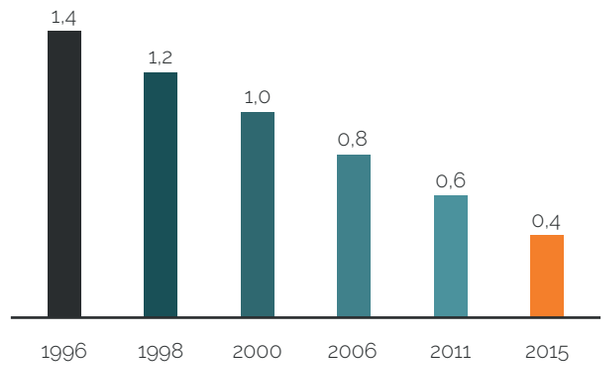

Figure 1: EPC norm per year (according to building code)

Development of the top 15%

It is important to define in which year the 15% line will be drawn. By the end of 2020, there were 7.815.000 residential buildings in the Netherlands. Of these buildings 15% (1.172.250) were built in the period 2003-2020. This does not automatically mean that as a building year of construction is a sufficient criterion for the following reasons:

- Not all buildings built since year-end 2002 have an EPC A rating. In accordance with de NN Group Sustainability Bond Framework, Dutch residential properties should have an EPC A rating in order to be eligible for green financing purposes. Therefore, the residential stock that is taken into consideration for the Framework is limited to residential properties with EPC rating A and it excludes all those buildings built after year-end 2002 that have a EPC rating B or worse.
- To develop a methodologic approach that is applicable for the next years, CFP has taken into account the estimated building stock growth in the upcoming years, based on national governmental data.

The table on the right shows the newly built buildings in the period 2000-2024, based on the Kadaster database. This database was compared to the database of EPC's from EP-Online to match the newly built houses with the EPCs[7].

The table also shows the amount of EPC ratings B-G and the amount of buildings that are within the criteria of the Framework (only residential buildings with EPC label A are in scope).

Period	New built houses	EPC B-G registered	Buildings with EPC A[8]
2000	74.774	18.359	56.415
2001	77.181	16.780	60.401
2002	71.143	14.578	56.565
2003	64.102	12.495	51.607
2004	69.832	12.350	57.482
2005	71.541	14.597	56.944
2006	77.103	7.999	69.104
2007	85.201	6.173	79.028
2008	84.174	6.605	77.569
2009	87.835	6.045	81.790
2010	60.556	4.926	55.630
2011	62.199	5.399	56.800
2012	48.668	3.419	45.249
2013	49.311	3.870	45.441
2014	45.170	2.186	42.984
2015	48.381	998	47.383
2016	54.849	1.824	53.025
2017	62.982	840	62.142
2018	66.585	1.187	65.398
2019	71.548	1.644	69.904
2020	69.000	3.448	65.552
2021	77.000	-	77.000
2022	80.000	-	80.000
2023	80.000	-	80.000
2024	80.000	-	80.000

Table 2: Match between building year of construction and EPC label for all residential buildings built in the period 2000-2024

7 Kadaster and EP-Online are updated daily, however Kadaster does not include exact information on building month, therefore CFP uses year-end data when performing the calculations.

8 Eligibility Criteria in the Framework. In fact, for Dutch residential properties built prior to 31 December 2020, only existing residential buildings with an Energy Performance Certificate (EPC) label "A" AND belonging to the top 15% low-carbon residential buildings in The Netherlands are selected.

In the period 2002-2020 there are 1.139.597 buildings that meet both criteria: EPC label A and building year of construction 2002. Taking the building stock growth of the next years into consideration, we can assume that the criterion for the building year will shift to 2005 in 2023. The table below shows the development of the building year of construction as criterion. In 2024, the criteria for EPC A and building year should possibly be revised, because the combination of both criteria does not meet the top 15% requirement.

When selecting eligible existing Dutch residential buildings, NN Group will follow the Eligibility Criteria defined in the Use of Proceeds section of its Framework (Dutch existing residential buildings must have an EPC label A and must belong to the top 15% low-carbon residential buildings in the Netherlands). NN Group is aware of the top 15% evolving over time due to new buildings being built and added to the building stock. Therefor NN Group has chosen 2005 as the building year criterion.

Assessment year[9]	Building year of construction	Residential building stock	Buildings in scope (EPC label A only)	% of building stock
2020	2002	7.815.000	1.139.597	14,6%
2021	2003	7.892.000	1.160.032	14,7%
2022	2004	7.972.000	1.188.425	14,9%
2023	2005	8.052.000	1.210.943	15,0%
2024	2006	8.132.000	1.233.999	15,2%

Table 3: Evolution of the top 15% low-carbon residential buildings in the Netherlands (2020-2024)

9 Calculations are performed using real or estimated year end data.

BENG – 10% requirements for new buildings

On 1 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 energy performance certificates 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 energy performance certificate 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[10]**	**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

10 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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