REPORT

# DNB Green Buildings portfolio - Impact assessment

CLIENT

DNB Bank ASA

SUBJECT

Impact assessment Norwegian Green residential buildings

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# REPORT

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# 1 Introduction

On assignment from DNB, Multiconsult has assessed the impact of the part of DNB's residential building loan portfolio eligible for green bonds according to DNB's Green Bonds Framework[1]. In this document we briefly describe DNB's green bond qualification criteria, the evidence for the criteria and the result of an analysis of the loan portfolio of DNB.

# 2 Eligibility criteria Green Residential Buildings

## 2.1 New residential buildings NZEB-10 percent - criteria for buildings finished since December 31st, 2020

The EU Taxonomy for sustainable activities distinguishes between new and existing buildings, with criteria dependent on whether the building is completed before or after 31 December 2020. The technical screening criteria for new buildings requires the building to have an energy performance, described in primary energy demand, at least 10 percent lower than the threshold set in the national definition of a nearly zero-energy building (NZEB). The energy performance is to be documented by an Energy Performance Certificate (EPC).

Multiconsult has assessed the performance of new buildings and how the most energy efficient buildings may be identified in the bank's loan portfolio on the back of the national NZEB definition of January 2023. As the building code and the national EPCs are key to understanding the NZEB definition and to efficiently identify buildings complying to a new build criterion for green buildings, some background information on these and how the Norwegian residential building stock perform today is included below.

The Norwegian national definition of NZEB was published in January 2023[2] with a correction issued in January 2024[3]. The NZEB definition has clear references to the building code TEK17, and in practical terms, the definition is no stricter than TEK17. The difference lies in a) a shift of system boundary to delivered energy and by introducing primary energy factors, and b) an exclusion of energy demand related to lighting and technical equipment.

The definition introduces primary energy factors, set to 1 for all energy carriers. Table 1 shows the NZEB thresholds for residential buildings where specific primary energy demand as presented in the published guidance paper. It is to be noted that the threshold for small residential buildings is influenced by the heated utility floor space of the building by a factor (1,600/heated utility floor space).

*Table 1 Specific primary energy demand. (Source: guidance paper[3])*

| Building category | Specific energy demand- Nearly zero-energy building (NZEB) |
|---|---|
| **Small residential buildings** | $(76 + 1600/m^2)$ $kWh/m^2$ |
| **Apartment buildings** | 67 $kWh/m^2$ |

1 https://www.ir.dnb.no/funding-and-rating/green-bond-framework, 2024
2 https://www.regjeringen.no/no/aktuelt/rettleiing-om-utrekning-av-primarenergibehov-i-bygningar-og-energirammer-for-nesten-nullenergibygningar/id2961158/, 2023
3 https://www.regjeringen.no/contentassets/296636deecef419590fe6b5668fe196f/23-12-korrigert-veiledning-om-beregning-av-primarenergibehov-og-nesten-nullenergibygg.pdf, 2024

For residential buildings, the specific energy demand threshold is related to, but not directly comparable to, the requirements in the building code (Figure 4) as energy demand for lighting and technical equipment is excluded in the NZEB definition. This demand is, however, fixed values in both the building code calculations and in the EPC energy label calculations, hence, can be added or subtracted in conversions between the two systems.

Since parts of the energy demand are excluded from the NZEB definition, a 10 percent improvement is smaller in absolute terms than it would be if all consumption were to be included in the definition. As demand related to lighting and technical equipment is fixed, the improvement can only come from efficiency measures related to the remaining demand.

***Identifying the buildings with performance at NZEB-10 percent or better***

***Documentation by NZEB definition referenced standard***

One way to document an NZEB-10 percent energy performance, is to present results from calculation in accordance with Norwegian Standard NS 3031:2014 *Calculation of energy performance of buildings - Method and data*. These calculations are required for all new buildings and a central part of the required documentation to get a building permit and certification of completion. This is however documentation that is not easily available in public registers, hence for banks. It is also not easily accessible information for non-experts unless clear descriptions of results relevant for the NZEB definition is presented.

***Documentation by EPC data***

Another, and more practical and available option for identifying qualifying objects in a bank's portfolio, is to retrieve sufficient data from the EPC database combined with data on dwelling size. Where reliable area data is not available to the bank, the national average in the building statistics may be used. This is also more in-line with documentation requirement in EU taxonomy Annex 1. The Norwegian EPC system is not yet using primary energy, but this might be included in an upcoming change in the EPC system. Since the information accompanying the NZEB definition set national primary energy factors to 1 (one) flat for all energy carriers, it is a fair assumption that specific net delivered energy in the EPC system is equal to specific primary energy demand in the NZEB definition.

The energy label (A to G) in the EPC system is based on calculated net delivered energy, including the efficiencies of the building's energy system (power, heat pump, district energy, solar energy etc.). Table 2 describes how the limit values are dependent on the area of the dwelling. The building codes are defined by calculated net energy demand, not including the building's energy system and requirements independent of dwelling area. Both systems include all standard consumption, also lighting and technical equipment.

*Table 2 EPC labels limit values for residential building categories and dependency on building area. (Source: enova.no/energimerking)*

| **Building categories** | **Calculated delivered energy pr m² heated space (kWh/m² BRA)** | | | | | | |
|---|---|---|---|---|---|---|---|
| | **A** | **B** | **C** | **D** | **E** | **F** | **G** |
| | Lower than or equal to | Lower than or equal to | Lower than or equal to | Lower than or equal to | Lower than or equal to | Lower than or equal to | No limit |
| Detached or semi-detached residential dwelling | 95 | 120 | 145 | 175 | 205 | 250 | >F |
| Sqm. adjustment | +800/A | +1600/A | +2500/A | +4100/A | +5800/A | +8000/A | |
| Appartments | 85 | 95 | 110 | 135 | 160 | 200 | >F |
| Sqm. adjustment | +600/A | +1000/A | +1500/A | +2200/A | +3000/A | +4000/A | |

The EPC database administrator (Enova) has recently opened for sharing more detailed information from the database with banks, including calculated specific net delivered energy. This enables translation between the specific energy demand in the NZEB definition and the specific net delivered energy available in the energy performance certificate, adding the fixed values for lighting and technical equipment.

In Figure 1 the columns describe the thresholds in the EPC system for labels A, B and C where area correction is applied for a small residential building with heated area of 166 m$^2$, a single apartment of 65 m$^2$ and an apartment building of 2,000 m$^2$. The lines indicate the calculated NZEB and NZEB-10 percent thresholds calculated by adding the fixed values for lighting and technical equipment. Table 3 gives a more granular picture including more dwelling and building sizes.

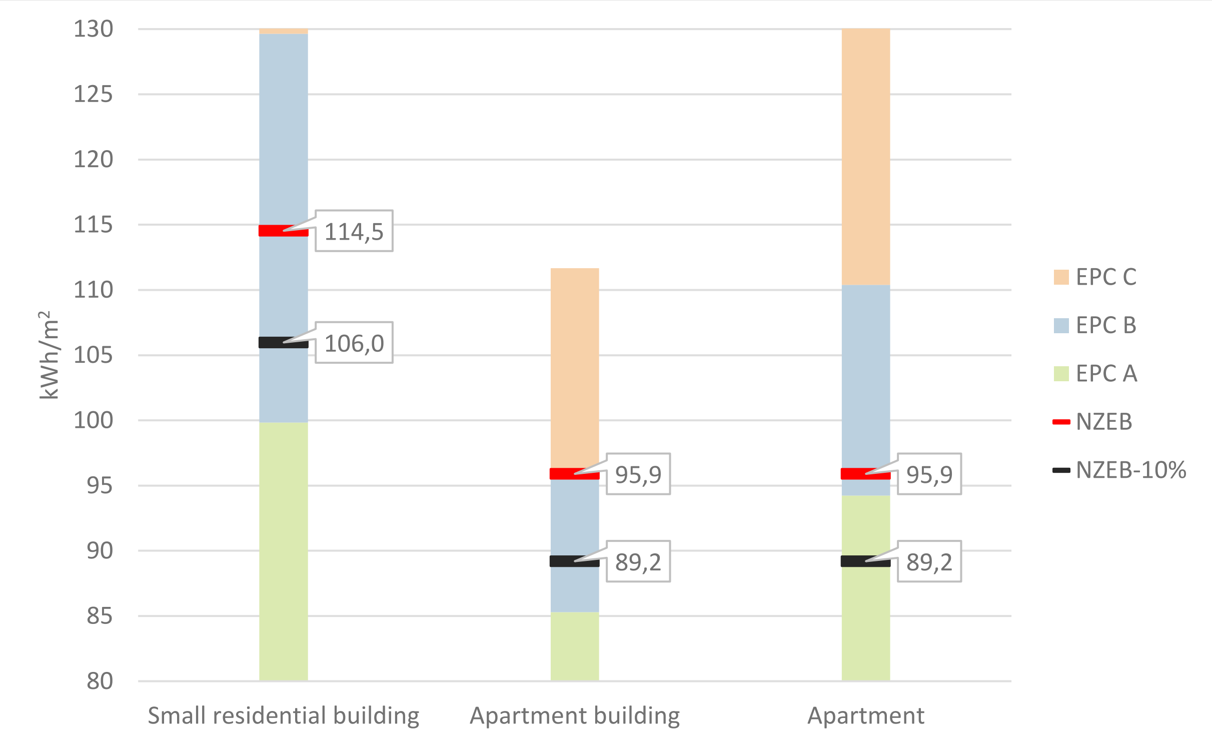


*Figure 1 Energy performance with reference to the national definition of NZEB and NZEB-10 percent compared to limit values in the EPC system (values dependent on dwelling area).*

*Table 3 Qualifying EPC labels dependent on dwelling area.*

| Limit values specific energy demand [kWh/m²] | | | |
|---|---|---|---|
| **Small residential buildings** | | | |
| **Area unit [m²]** | NZEB-10 percent made comparable to EPC | EPC A | EPC B |
| **50** | 126 | 111 | 152 |
| **100** | 112 | 103 | 136 |
| **150** | 107 | 100 | 131 |
| **200** | 105 | 99 | 128 |
| **250** | 103 | 98 | 126 |
| **300** | 102 | 98 | 125 |
| | | | |
| **Apartments (EPC available, but no NZEB definition established at apartment level)** | | | |
| **Area unit [m²]** | NZEB-10 percent made comparable to EPC | EPC A | EPC B |
| **50** | 89 | 97 | 115 |
| **75** | 89 | 93 | 108 |
| **100** | 89 | 91 | 105 |
| **125** | 89 | 90 | 103 |
| **150** | 89 | 89 | 102 |
| **175** | 89 | 88 | 101 |
| | | | |
| **Apartment buildings (NZEB definition in place, but no (very few) EPCs at building level)** | | | |
| **Area unit [m²]** | NZEB-10 percent made comparable to EPC | EPC A | EPC B |
| **500** | 89 | 86 | 97 |
| **2,000** | 89 | 85 | 96 |
| **5,000** | 89 | 85 | 95 |

The thresholds in Figure 1 are calculated based on standard values for lighting and technical equipment in the Norwegian standards and average building areas found in building statistics for 2021. Due to the area correction factor, the threshold can be calculated individually for all objects in the portfolio based on actual area. For apartments, the NZEB-lines in the figure are constant but the EPC thresholds dependent on apartment size. For small residential buildings, both NZEB and EPC energy label thresholds are dependent on the size of the dwelling.

For small residential buildings, the dwelling size specific NZEB threshold is found by inserting the buildings heated utility floor space area in the area correction factor. Adding the fixed values for lighting and technical equipment, the value is comparable to the specific net delivered energy given in the EPC-system.

A complicating factor for apartments in a bank's portfolio when using the EPC data to identify qualifying objects, is the fact that the NZEB definition, as is the case for the building code calculations, considers the whole building as one unit and not the sum of individual apartments. In the current EPC system, each apartment is labelled individually. The EPC limit values reflect individual apartments sharing walls with heated area, as other apartments, and consequently are lower than what is the case for buildings. There is an area correction factor in the EPC label calculations, but not in the building code and NZEB calculations for apartment buildings. Using the individual apartment area correction factor in the EPC system results in an NZEB threshold, converted to EPC terms, much stricter than for all other building categories. In an upcoming change in the EPC system, the whole apartment building is anticipated to be labelled as a unit. This will simplify the conversion between the EPC system and the NZEB definition, however, energy certificates based on the current system will be around for many years as the period of validity is 10 years. There are, however, also today exemptions. The EPC regulation opens for establishing certificates for apartments based on calculations for the apartment building as one unit, and this is when all apartments are smaller than 50 $m^2$. The area correction is then based on the building's total area and not the sum of apartments only. Assuming this approach may also be used for all apartment buildings, the "apartment" column in Figure 1 illustrates EPC thresholds using an average apartment building size derived from 2021 building data from Statistics Norway.

### *2.1.1 Eligibility small residential buildings*

- Small residential buildings completed since 31 December 2020 with energy label A, or energy label B with specific delivered energy demand below the defined threshold, qualify on the new-build criterion NZEB-10 percent.

The EPC energy label A limit values, as described in specific energy demand in Figure 1 and Table 3, are for all small residential buildings independent of building size below NZEB-10 percent. Hence, an energy label A is sufficient to identify green buildings of this category. As illustrated by the above analysis, only qualifying small residential EPC A buildings is a conservative approach, as some EPC B buildings also would qualify. The more granular specific delivered energy demand is made available from the EPC system and can supplement the straightforward qualifying label A buildings in the green pool with some buildings with energy label B.

The practical approach utilizing detailed data on the building can be illustrated as in Figure 2.

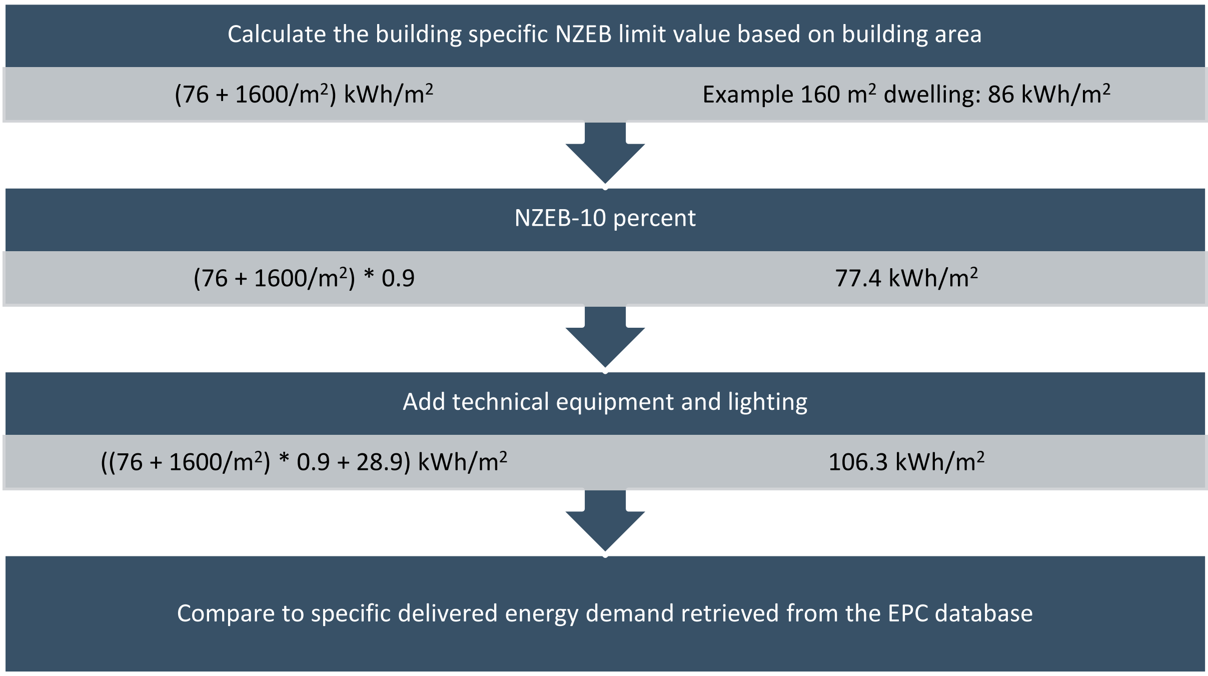


*Figure 2 How to compare NZEB-10 percent to specific energy demand from the EPC system for small residential buildings.*

#### 2.1.2 Eligibility apartments and apartment buildings

With energy label only available on apartment level, and not building level, an EPC A energy label is alone not sufficient to identify a NZEB-10 percent performance of an apartment without additional assumptions. An apartment building may even in the current EPC system be analysed and provided a certificate and an energy label as one unit, and the last rows in Table 3 illustrate that for such a case the energy label A would be sufficient to identify and qualify apartment buildings, and the apartments within. In the same manner, the specific delivered energy demand retrieved for each apartment, in addition to area of apartment and building, can be combined to qualify even some apartments with energy label B.

As illustrated in Figure 1, there are two potential approaches to understanding and comparing the NZEB definition and the EPC data. One is ignoring the difference that lies in the NZEB-definition relating to the whole building while the EPC system relates to individual apartments (“apartment” column in Figure 1). The practical approach utilizing detailed EPC data on the individual apartment can then be described by Step 1 in Figure 3 and compare this value to the specific delivered energy retrieved from the EPC database. Step 1 is independent of apartment and apartment building size and translates the NZEB-10 percent threshold to a limit value comparable to the specific delivered energy in the EPC system.

As an alternative, considering that apartment buildings also in the EPC system may be considered as one unit, and expand this approach beyond apartment buildings with only small apartments, Step 2 in Figure 3 can be applied in addition to Step 1. This requires information on EPC energy label, apartment area and apartment building area, here illustrated by an apartment of 65 m$^2$ just qualifying for an EPC A placed in a 2,000 m$^2$ building. The implications of an area correction factor diminish for large buildings, as illustrated in Table 3 hence opening for using average values from national statistics instead of precise area data. Apartment area is available in the EPC database.

STEP 1

**NZEB limit value for apartment buildings**

67 kWh/m²

↓

**NZEB-10 percent**

67 kWh/m² *0.9 — 60.3 kWh/m²

↓

**Add technical equipment and lighting**

(67*0.9 + 28.9) kWh/m² — 89.2 kWh/m²

STEP 2

**Specific delivered energy demand retrieved from the EPC database**

Example 65 m² apartment with EPC A in a 2,000 m² building: 94.2 kWh/m²

↓

**Remove apartment area correction factor**

Calculation dependent on EPC label (Table 2) — 85 kWh/m²

↓

**Add apartment building area correction factor**

Calculation dependent on EPC label (Table 2) for 2,000 m² building — 85.3 kWh/m²

↓

**Compare specific delivered energy demand to limit value from step 1 (89.2 kWh/m²)**

*Figure 3 How to compare NZEB-10 percent to specific energy demand from the EPC system for apartments.*

## 2.2 Existing residential buildings that comply with the Norwegian building code of 2010 (TEK10) and later codes

Existing Norwegian residential buildings that comply with the Norwegian building code of 2010 (TEK10) and later codes are eligible for green bonds as all these buildings have significantly better energy standards and account for less than 15 percent of the residential building stock. A two-year lag between implementation of a new building code and the buildings built under that code has been accounted for[4].

The methodology to select the qualifying assets is based on Climate Bonds Initiative (CBI) taxonomy, where no more than the top 15 percent most energy efficient buildings are considered eligible. DNB's baseline and criterion are in line with the CBI baseline methodology for energy efficient residential buildings for Norwegian conditions published in spring 2018[5].

The DNB criterion is also well within the top 15 percent EU Taxonomy criteria for Climate Change Mitigation under the EU economic activity "Acquisition and Ownership of Buildings"[6].

As of 2023, 12 percent of all Norwegian residential buildings are eligible according to the DNB criterion, including buildings completed after December 31, 2020.

Changes in the Norwegian building code have consistently over several decades resulted in more energy efficient buildings. Figure 4 illustrates how the calculated net energy demand declines with decreasing age of the buildings. Note that, for residential buildings, there was no change between TEK07 and TEK10 with respect to energy efficiency requirements.

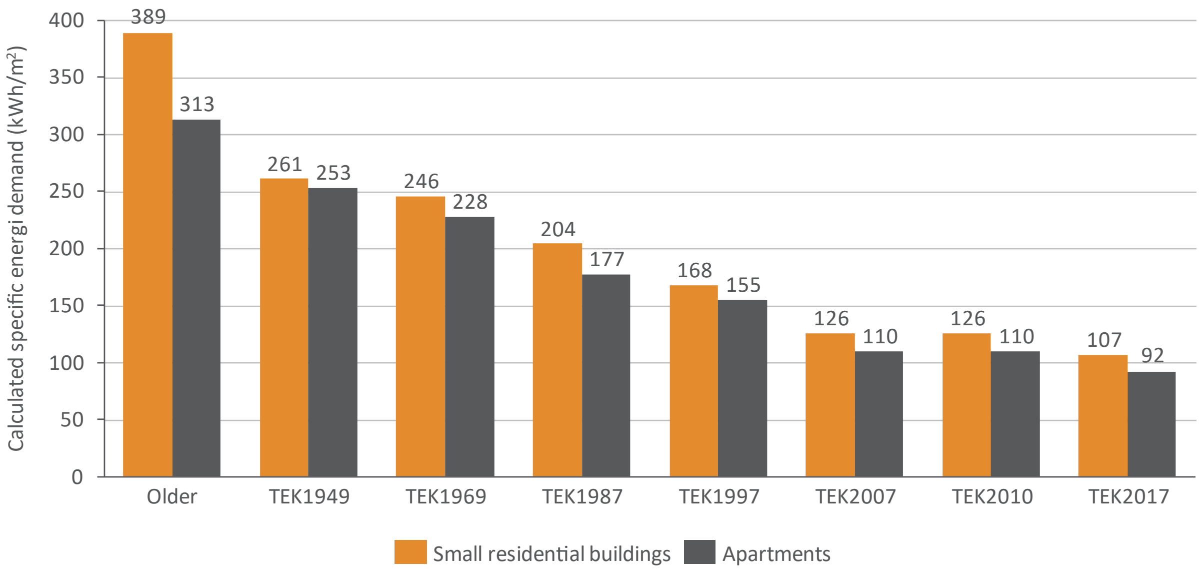


*Figure 4 Development in calculated specific net energy demand based on building code and building tradition. (Source: Multiconsult, simulated in SIMIEN)*

Figure 5 shows how the Norwegian residential building stock is distributed by age. The figure shows how buildings finished in 2012 and later (and built according to TEK10 and TEK17) amount to 12.4 percent of the total stock.

[4] TEK10 was implemented in July 2010, however since the energy requirements were unchanged from TEK07 to TEK10 it is a very robust assumption that all buildings finished in 2012 or later have used energy requirements according to TEK10.

[5] The CBI criteria allows for including small residential buildings built under TEK07. These buildings are however not included in the DNB Green Bonds Framework.

[6] https://ec.europa.eu/sustainable-finance-taxonomy/activities/activity/356/view, 2024

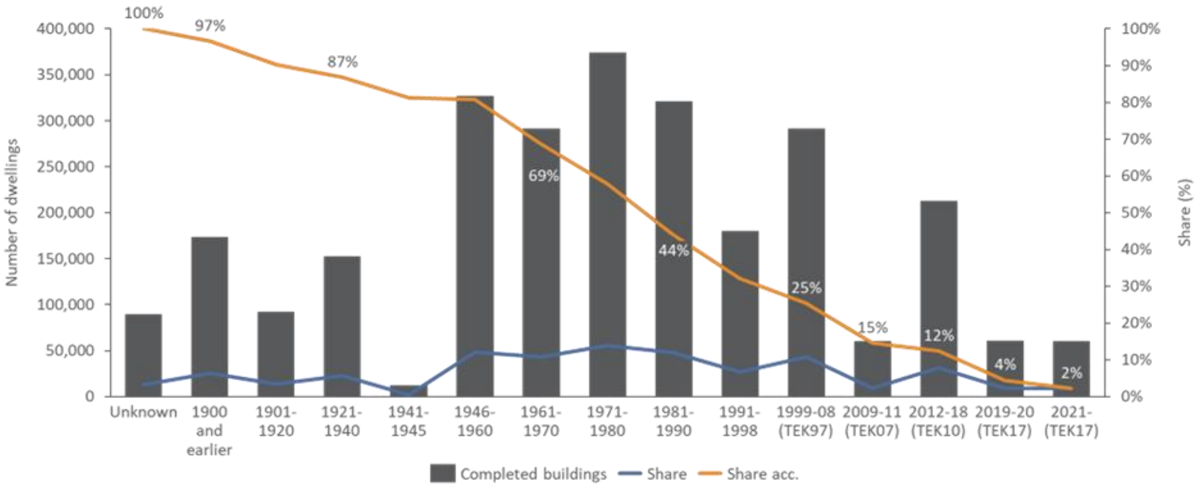


*Figure 5 Age and building code distribution of dwellings. (Source: Statistics Norway and Multiconsult, 2023)*

Combining the information on the calculated energy demand related to building code in Figure 4 and information on the residential building stock in Figure 5, the calculated average specific energy demand on the Norwegian residential building stock is 251 kWh/m$^2$. Building code TEK10 and TEK17 gives an average specific energy demand for existing dwellings, weighted for actual stock, of 114 kWh/m$^2$.

Hence, compared to the average residential building stock, the existing buildings built according to building code TEK10 and TEK17 gives a calculated specific energy demand reduction of 54 percent.

# 3 Grid factors for impact assessment

The $CO_2$-emissions resulting from in use energy demand in residential buildings depends to a large degree on the age of the building. This again is due to two factors: the differences in energy efficiency requirements in the building code, and development in the predominant solutions and energy sources for heating in new buildings. Examples of the latter are direct electric heating, several types of heat pumps, bioenergy, and district heating. The share of fossil fuel is very low and declining.

Since the Norwegian buildings are predominantly heated by electricity, the placement of the system boundary for power production heavily influences the emission factor. Since the financed qualifying objects in the portfolio are rather new, and expected to have a 60-year life, the impact is considered best illustrated by the yearly average $CO_2$-emissions in their lifetime. The main grid factors used in this green portfolio impact assessment reflects an average in the buildings lifetime, assuming a decarbonisation in the European energy system. This differs from the grid factors previously used in the total portfolio energy efficiency analysis that are based on current emission factors from Norwegian and European electricity production.

Finans Norge recently released a guidance document for calculation of financed greenhouse gas emissions, including recommendations for grid factors to be used[7]. To demonstrate how emissions vary depending on grid factor and for clarity if comparing avoided emissions from the green portfolio with total portfolio calculations, the two recommended grid factors from The Norwegian Water Resources and Energy Directorate (NVE) are included. That is the Norwegian physically delivered electricity for 2022[8] and the Norwegian residual mix, as calculated by the Association of Issuing Bodies for 2022[9]. The grid factors are summarized in Table 4 and described more in detail in the following sub-sections.

*Table 4 Electricity production greenhouse gas factors ($CO_2$-eq) with and without influx of other heating sources for buildings in three scenarios. (Source: NS 3720:2018, Table A.1, NVE[8], AIB[9])*

| Scenario | Description | Emission factor electricity | Emission factor considering other heating sources[10] |
|---|---|---|---|
| **European (EU27+ UK+ Norway) NS 3720:2018 electricity mix** | Location-based electricity mix with wide system boundary including EU countries, UK and Norway, average emissions over building's 60-year lifetime | 136 $gCO_2$/kWh | 115 $gCO_2$/kWh[11] |
| **Norwegian NVE physically delivered electricity 2022** | Location-based production mix with narrow system boundary of Norway only but including net export/ import only to neighbouring countries and average annual emission factors | 19 $gCO_2$/kWh | 19 $gCO_2$/kWh |
| **Norwegian NVE residual mix 2022** | Market-based residual mix for Norway with a European marketplace | 502 $gCO_2$/kWh | 416 $gCO_2$/kWh |

To calculate the impact on climate gas emissions, the grid factors are applied to all electricity consumption in all residential buildings. Electricity is, as mentioned, the dominant energy carrier to

[7] https://www.finansnorge.no/dokumenter/maler-og-veiledere/veileder-for-beregning-av-finansierte-klimagassutslipp/, 2024
[8] https://www.nve.no/energi/energisystem/kraftproduksjon/hvor-kommer-stroemmen-fra/, 2024
[9] https://www.aib-net.org/facts/european-residual-mix, 2023
[10] Multiconsult. Based on building code assignments for DiBK (2015).
[11] This is higher than the 111 $gCO_2$/kWh used in 2023 impact assessments, due to correction of the allocation of heating sources between small residential buildings and apartments. 124 $gCO_2$/kWh has also been used in previous impact assessments. The current factor is lower due to a decreased share of fossil fuels in heating following the ban from 2020 (https://lovdata.no/dokument/SF/forskrift/2018-06-28-1060).

Norwegian residential buildings, but the energy mix also includes other energy carriers such as bio energy and district heating. The influx of other energy sources for heating purposes is applied to all electricity emission factors resulting in the "Emission factor considering other heating sources", found in the rightmost column in Table 4.

### *3.1.1 European (EU27+ UK+ Norway) and Norwegian electricity mix over building's lifetime*

Using a life-cycle analysis (LCA), the Norwegian Standard NS 3720:2018 "Method for greenhouse gas calculations for buildings" considers international trade of electricity and the fact that consumption and grid factor does not necessarily mirror domestic production. The grid factor, as average in the lifetime of an asset, is based on a linear trajectory from the current grid factor to a close to zero emission factor in 2050 and steady until the end of the lifetime. These factors are location-based.

The mentioned standard calculates, on a life-cycle basis, the average $CO_2$- factor for the next 60 years, according to European (EU27+ UK+ Norway) system boundary, as described in Table 4.

Calculations in previous impact assessments have been based on the European (EU27+ UK+ Norway) NS 3720:2018 factor in Table 4. Norway is part of a larger, integrated European power grid, and import and export of electricity throughout the year means not all electricity consumed in Norway is produced here. The standard also calculates the equivalent Norway only emission factor. Using the European mix instead of the Norway only mix, is then a more conservative approach.

The European factor is 136 $gCO_2$-eq/kWh, which constitutes the GHG emission intensity baseline for energy use in buildings with a life span of 50-60 years and assuming that the $CO_2$-factor of the European power production mix is close to zero in 2050. This value is comparable to the equivalent determined in Nordic Public Sector Issuers: Position Paper on Green Bonds Impact Reporting (January 2020).

### *3.1.2 Norwegian physically delivered electricity 2022*

NVE calculates a climate declaration for physically delivered electricity for the previous year. This factor represents electricity consumed in Norway, accounting for emissions from net import and export of electricity from neighbouring countries and these countries' average annual emission factors. For 2022, this grid factor is 19 $gCO_2$-eq/kWh. This is also a location-based grid factor.

### *3.1.3 Norwegian residual mix 2022*

Certificates of origin, direct power purchase agreements or other documentation of which power has been purchased for the buildings in the portfolio is not available to the bank. There is also no basis for making assumptions on the share of the energy consumed by the buildings in the portfolio that has been purchased with Guarantees of Origin. An alternative market-based grid factor for Norway is then the electricity disclosure published by NVE[12] and Association of Issuing Bodies[13]. This is the electricity residual mix of the country, which shows the sources of the electricity supply that is not covered with Guarantees of Origin, considering a European marketplace for electricity. Guarantees of Origin are not very widespread in the Norwegian electricity end-user market, resulting in a high emission factor of 502 $gCO_2$-eq/kWh for 2022.

[12] https://www.nve.no/energy-supply/electricity-disclosure/?ref=mainmenu, 2024
[13] As calculated by AIB. Lower than Norwegian residual mix due to larger share of electricity usage covered by Guarantees of Origin.

# 4 Green portfolio analysis and impact assessment

## 4.1 Eligible buildings and avoided emissions

The 41,643 eligible buildings in DNB Bank and DNB Boligkreditt portfolio as of 31st of December 2023 are estimated to amount to 4.5 million square meters. These include objects previously part of the Sbanken portfolio. The available data do not include reliable area per object. Area per dwelling is calculated based on average area derived from national statistics (Statistics Norway[14]). The area is calculated based on the assumption that the residents in the portfolio are equivalent to the average Norwegian residential building stock.

*Table 5 Eligible objects and calculated building areas.*

| | Building code | No. of objects | Average area per unit | Area qualifying buildings in portfolio |
|---|---|---|---|---|
| **Apartments** | TEK17 and EPC Label A (built 01.01.21 to 31.12.23) | 566 | 72 $m^2$ | 40,752 $m^2$ |
| | TEK17 (built before 31.12.20) | 4,902 | 72 $m^2$ | 352,944 $m^2$ |
| | TEK10 (built before 31.12.20) | 17,667 | 72 $m^2$ | 1,272,024 $m^2$ |
| **Small residential buildings** | TEK17 and EPC Label A (built 01.01.21 to 31.12.23) | 120 | 146 $m^2$ | 17,524 $m^2$ |
| | TEK17 (built before 31.12.20) | 3,110 | 152 $m^2$ | 472,786 $m^2$ |
| | TEK10 (built before 31.12.20) | 15,278 | 153 $m^2$ | 2,343,658 $m^2$ |
| **Sum** | | **41,643** | | **4,499,688 $m^2$** |

The average energy demand for the qualifying TEK10 and TEK17 buildings in the Norwegian residential building stock is 114 kWh/$m^2$, apartments and small residential buildings combined. To calculate impact, the reduction of energy demand from the average 251 kWh/$m^2$ of the total residential building stock to 114 kWh/$m^2$ is multiplied with the area of eligible assets and the emission factors from Table 4. A proportional relationship is expected between energy consumption and emissions in impact calculations.

Note that specific delivered energy demand from the EPC database is not available to check whether the buildings built in 2021 and later are performing better than the NZEB-10 percent criteria as described in section 2.1. The number of units and areas are presented separately in the table above for information, but in the impact assessment below, the TEK17 built after 01.01.2021 units are included as performing no better than the TEK17 standard.

Table 7 indicates how much more energy efficient the eligible part of the portfolio is compared to the baseline of the average residential Norwegian building stock. The area and avoided energy usage of the eligible buildings are also shown as scaled by the bank's share of financing by the loan-to-value ratio.

[14] Statistics Norway Table 06513: Dwellings, by type of building and utility floor space, 2023

*Table 6 Area of eligible buildings in the portfolio and corresponding savings in energy usage compared to the average residential building stock in Norway – in total and scaled by bank's share of financing.*

| | Area | Avoided energy usage compared to baseline |
|---|---|---|
| **Eligible buildings in portfolio** | 4.5 million $m^2$ | 613 GWh/year |
| **Eligible buildings in portfolio – scaled by the bank's share of financing** | 2.2 million $m^2$ | 293 GWh/year |

Table 7 presents how much the calculated reductions in energy demand from Table 6 constitutes in $CO_2$-emissions using the three emission factors described in section 3: European NS 3720:2018 electricity mix used in previous analyses, and NVE's grid factors for only Norway, representing physically delivered electricity and the residual mix for 2022.

*Table 7 Avoided emissions ($CO_2$-eq) of eligible objects in the portfolio compared to baseline. Using grid factors European mix over the buildings' lifetime, Norwegian physically delivered electricity mix and Norwegian residual mix.*

| | Emission factor[15] | Avoided $CO_2$-emissions | Avoided $CO_2$-emissions – scaled |
|---|---|---|---|
| **Eligible buildings – European lifetime mix** | 115 $gCO_2$/kWh | 70,410 tonnes $CO_2$/year | 33,680 tonnes $CO_2$/year |
| **Eligible buildings – Norwegian physically delivered el. 2022** | 19 $gCO_2$/kWh | 11,420 tonnes $CO_2$/year | 5,460 tonnes $CO_2$/year |
| **Eligible buildings – Norwegian residual mix 2022** | 416 $gCO_2$/kWh | 254,920 tonnes $CO_2$/year | 121,950 tonnes $CO_2$/year |

[15] Taking into consideration other heating sources than electricity, see section 3.

## 4.2 Impact reporting sheet December 2023

**DNB Bank & Boligkreditt Green Covered Bond and Senior Bond Impact Reporting**

Portfolio date: 31st of December 2023

| Eligible Project Category | Signed Amount | Share of Total Financing | Eligibility for Green Bonds | Annual Site Energy Savings | Annual CO2 Emission Avoidance |
|---|---|---|---|---|---|
| **a/** | **b/** | **c/** | **d/** | **e/** | **e/** |
| **Residential Green Buildings** | **NOK** | **%** | **%** | **MWh** | **tCO2** |
| New residential buildings in Norway - Norwegian physically delivered electricity mix | 114,437,314,871 | 100 | 100 | 613 | 11,420 |
| New residential buildings in Norway - European lifetime mix | 114,437,314,871 | 100 | 100 | 613 | 70,410 |

Portfolio based green bond report according to the Harmonized Framework for Impact Reporting

**a/** Eligible category
**b/** Signed amount represents the amount legally committed by the issuer for the portfolio or portfolio components eligible for Green Bond financing
**c/** This is the share of the total portfolio cost that is financed by the issuer
**d/** This is the share of the total portfolio costs that is Green Bond eligible
**e/** Impact indicators
-Site energy savings calculated using the difference between the top 12% of buildings and the national building stock bechmarks
-Annual CO2 emission avoidance using Norwegian physically delivered electricity mix 2022.