Report

Green Portfolio Impact Assessment 2026

CLIENT

SpareBank 1 Boligkreditt

SUBJECT

Impact assessment – energy-efficient residential buildings

DATE / REVISION: 26 August 2026 / 01

PORTFOLIO DATA: 30 June 2026

DOCUMENT CODE: 10276246-01-TVF-RAP-002

Multiconsult

Multiconsult

Report

PROJECT	Green Portfolio Impact Assessment 2026	DOCUMENT CODE	10276246-01-TVF-RAP-002
SUBJECT	Impact assessment – energy-efficient residential buildings	ACCESSIBILITY	Open
CLIENT	SpareBank 1 Boligkreditt	PROJECT MANAGER	Are Grongstad
CONTACT	Eivind Hegelstad	PREPARED BY	Kjersti Rustad Kvisberg, Are Grongstad
		RESPONSIBLE UNIT	10105080 Renewable Energy Advisory Services

01	26.08.2026	Revision requested by client	Multiple authors	KJRK	AREG
00	20.08.2026	First version	Multiple authors	KJRK	AREG
REV.	DATE	DESCRIPTION	PREPARED BY	CHECKED BY	APPROVED BY

TABLE OF CONTENTS

1 Introduction

On assignment from SpareBank 1 Boligkreditt (SpaBol), Multiconsult has assessed the impact of the bank's loan portfolio of residential buildings eligible for green bonds.

In this document we briefly describe SpaBol's green bond qualification criteria and the analysis results of the loan portfolio. The eligibility criteria and the green portfolio impact assessment results are described in section 3 and 4. More detailed documentation on methodologies and eligibility criteria is made available on SpaBol's website [1].

2 Emission factors for impact assessment

The CO_2 emissions resulting from energy demand in buildings depend to a large degree on building age. This is due to two factors: differences in energy efficiency requirements in the building code, and development in the predominant solutions and energy sources for heating in new buildings.

Multiconsult considers these two aspects when calculating the greenhouse gas (GHG) emission factors to be used in the green portfolio impact assessments. This section first presents general statistics on energy usage in Norwegian buildings and the Norwegian electricity production, before presenting the grid factors used in the subsequent sections.

2.1 Electricity demand and production

The eligible assets use electricity from the power grid. The energy consumption of Norwegian buildings is predominantly electricity, with some district heating and bioenergy. The share of fossil fuel is very low and declining.

Renewables accounted for approximately 99 percent of the total (162 TW) Norwegian electricity production in 2025, the final percentage being thermal power production from natural gas, biomass, and waste heat [2] [3]. The fuel mix in Norwegian district heating production (7.5 TWh) included only three percent from fossil fuels (oil and gas) in 2025 [4].

Figure 2-1, which is based on numbers from the Association of Issuing Bodies, shows that the Norwegian production mix in 2025 resulted in emissions of 6 gCO_2/kWh [5]. In the figure, the production mix is included for other selected European states for comparison.

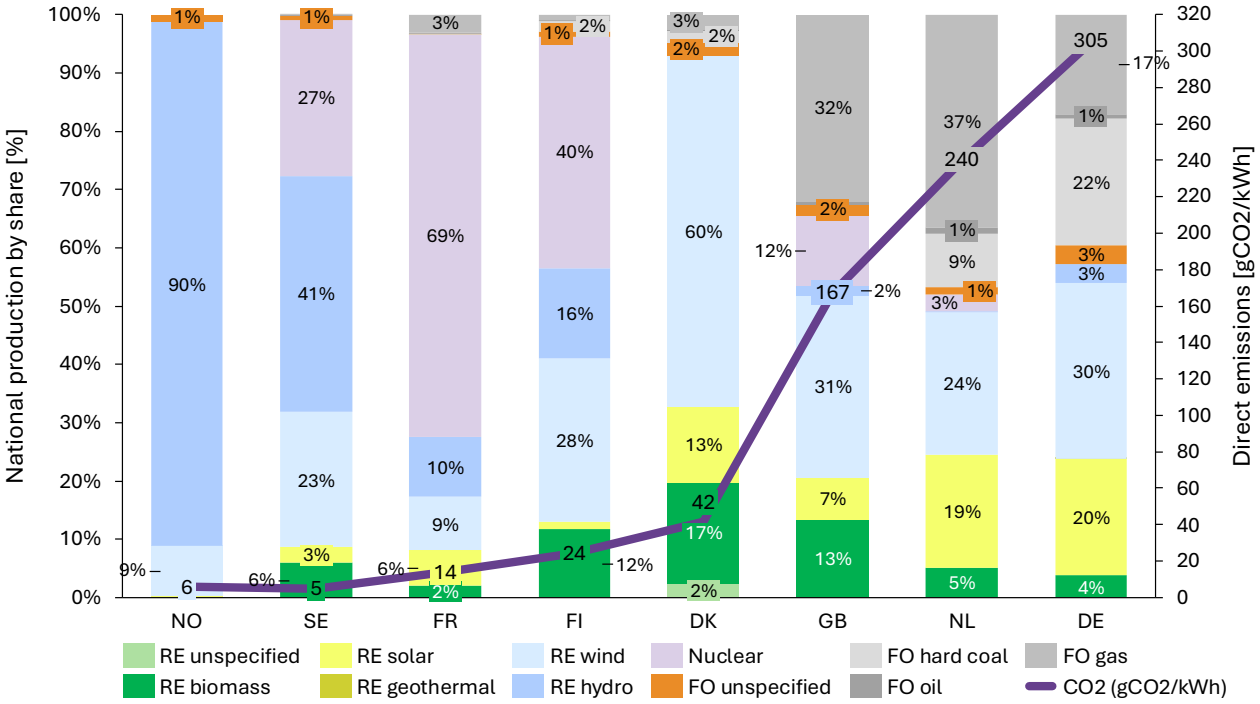

Figure 2-1 National electricity production mix in selected European countries. Source: [6]

As Figure 2-1 shows, emissions from power production vary between countries. Due to the interconnection of the power grid, the placement of the system boundary for power production heavily influences the GHG emission factor associated with said production. To demonstrate how the choice of system boundary – whether limited to Norway or expanded to Europe as a whole – and the selection of emission factors influence the results, the impact assessments in this report are presented using several different emission factors; cf subsection 2.2.

2.2 Emission factors for impact assessment of buildings

This subsection outlines the emission factors used in the assessment of the green bond eligible part of SpaBol's building portfolio.

Since Norwegian buildings are predominantly heated by electricity, the placement of the system boundary for power production heavily influences the emission factor. As 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 factor used in this green portfolio impact assessment reflects an average in the building's lifetime, assuming decarbonisation in the European energy system.

Finans Norge released a guidance document for the calculation of financed GHG emissions in 2023, including recommendations for grid factors to be used [7]. To demonstrate how emissions vary depending on grid factor, a recommended grid factor from the Norwegian Water Resources and Energy Directorate (NVE) is included, derived from the most recent data for physically delivered electricity in Norway for 2025 [8].

The two grid factors are summarized in Table 2-1 below and described in more detail in the following subsections.

Table 2-1 Electricity production GHG factors (CO2-eq) with and without influx of other heating sources for buildings in two scenarios. (Source: NS 3720:2018, Table A. 1, NVE [8]*)*

Scenario	Description	Emission factor electricity [gCO_2/kWh]	Emission factor incl. other heating sources [gCO_2/kWh] [10]
European (EU27+ UK+ Norway) NS 3720:2018 electricity mix over lifetime	Location-based electricity mix with wide system boundary including EU countries, UK and Norway, average emissions over building's 60-year lifetime	136	115
Norwegian NVE physically delivered electricity 2025	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	9	11

To calculate the impact on GHG emissions, the grid factors are applied to all electricity consumption in the buildings in the portfolio eligible for green bonds. Electricity is, as mentioned, the dominant energy carrier to Norwegian buildings, but the energy mix also includes other energy carriers such as bioenergy and district heating. The influx of different energy sources for heating purposes is applied to the electricity emission factors [10], resulting in the "Emission factor considering other heating sources", found in the rightmost column in Table 2-1.

2.2.1 European (EU27+ UK+ Norway) electricity mix over lifetime

Using a life-cycle analysis, the Norwegian Standard NS 3720:2018 *Method for greenhouse gas calculations for buildings* [11] considers international trade in electricity and the fact that consumption and grid factors do not necessarily mirror domestic production. The resulting grid factors, as averaged over the lifetime of an asset, are 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 of the buildings.

The mentioned standard calculates, on a life-cycle basis, the average emission factors for the next 60 years according to a European (EU27+ UK+ Norway) system boundary, as described in Table 2-1.

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 Norwegian mix emission factor. However, in this analysis, we apply only the European mix factor, as it represents a more conservative approach.

The European electricity factor is 136 gCO2-eq/kWh, which constitutes the GHG emission intensity baseline for energy use in buildings with a life span of 60 years and assuming that the CO2 emission factor of the European power production mix is close to zero by 2050. This is a location-based emission factor, and the value is comparable to the equivalent determined in Nordic Public Sector Issuers: Position Paper on Green Bonds Impact Reporting (January 2020).

2.2.2 Norwegian physically delivered electricity

NVE calculates a climate declaration for physically delivered electricity for the previous year [8]. 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 2025, this grid factor is 9 gCO_2-eq/kWh [8]. This is also a location-based grid factor.

3 Eligibility criteria

Residential buildings are eligible for green bonds if they meet the EU Taxonomy Regulation 2020/852 and contribute to climate change mitigation as per that Regulations Article 9, and which is further detailed in the EU Commissions Delegated Regulation 2021/2139 (technical screening criteria): 7.7 Acquisition and ownership of buildings:

i. Buildings built in 2021 or later:

- Buildings complying with the relevant NZEB-10 percent threshold.

ii. Buildings built before 2021:

- Buildings with EPC A label or within the top 15 percent low carbon buildings in Norway.

3.1 Criterion i: Buildings built in 2021 or later

The EU Taxonomy for sustainable activities distinguishes between new and existing buildings, with criteria dependent on whether the buildings are completed before or after 31 December 2020. The technical screening criteria for new buildings require the buildings to have an energy performance, described in terms of primary energy demand, at least 10 percent lower than the threshold set in the national definition of a NZEB. The energy performance is to be documented by an EPC. The Norwegian national definition of NZEB was published in January 2023 [12] with a correction issued in January 2024 [13]. Table 3-1 shows the thresholds for residential buildings according to the Norwegian national NZEB definition.

Table 3-1 Thresholds for NZEB specific primary energy demand. Source: [14, 15]

Building category	Specific primary energy demand for NZEB [kWh/m^2]
Small residential buildings	(76 + 1,600/A)
Apartment buildings	67

The thresholds in the table indicate the building's primary energy demand and are based on calculated net delivered energy according to the Norwegian Standard NS 3031:2014, multiplied with a primary energy factor of 1.0 for all energy carriers [16]. In practical terms, this means that calculated primary energy demand equals calculated net delivered energy.

On January 1, 2026, Norway introduced a revised Energy Performance Certificate (EPC) scheme, based on amendments to the EPC Regulations and the updated calculation methodology defined in NS 3031:2025. The Norwegian Ministry of Energy (ED) is currently developing revised energy performance requirements for the Norwegian Building Regulations (TEK), which are expected to be based on NS 3031:2025 and aligned with the revised approach to weighting different energy sources under the new EPC scheme. The revised TEK requirements are expected to form the basis for a new national definition of nearly zero-energy buildings (NZEB), replacing the current NZEB definition.

3.2 Criterion ii: Buildings built before 2021

On April 28, 2026, ED published official thresholds for the top 15% and 30% most energy-efficient buildings in the Norwegian building stock across various building categories. The thresholds are based on the revised calculation methodology defined in NS 3031:2025 and incorporate the new weighting factors for different energy sources introduced under the revised Norwegian EPC scheme. As a result, the thresholds are directly aligned with the revised methodology for assessing building energy

performance and provide an updated benchmark for identifying energy-efficient buildings. The publication supports the implementation of the EU Taxonomy technical screening criteria in Norway by providing a transparent and nationally consistent basis for assessing the energy performance of existing buildings.

A building is considered eligible if it either achieves an EPC rating A or meets the official thresholds for the top 15 percent most energy-efficient buildings in the Norwegian building stock; cf Table 3-2.

Table 3-2 Thresholds for the top 15 percent most energy efficient residential buildings in the Norwegian building stock. Source: [17]

Building category	Calculated specific weighted net delivered energy per m^2 heated utility area [kWh/m^2]
Apartments	95
Small residential buildings	150

4 Green portfolio analysis and impact assessment

SpaBol's green loan portfolio consists of residential buildings that meet the criteria as formulated in section 3. SpaBol has assessed its portfolio against the aforementioned eligibility criteria through a third-party provider and has provided Multiconsult with the eligible portion of the portfolio. The portfolio dataset provided by SpaBol contains building type, area, loan balance, energy demand and the relevant criteria for each object. Where missing, the area per residence is based on averages derived from national statistics [18].

4.1 Baseline

Changes in the Norwegian building code have, over several decades, consistently resulted in more energy efficient buildings. Figure 4-1 illustrates how the calculated net energy demand declines with decreasing building age.

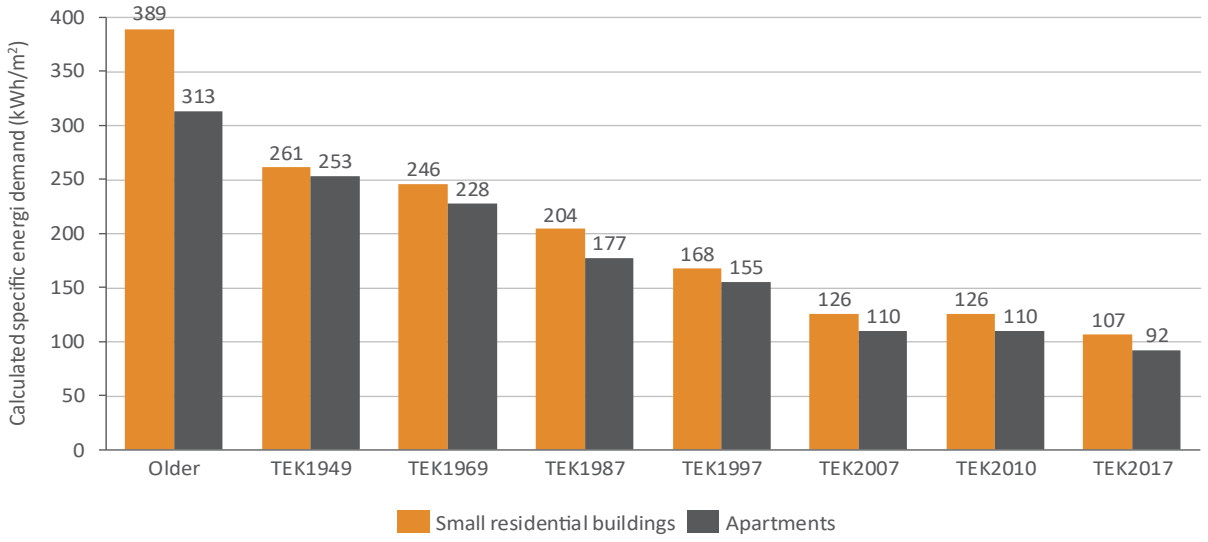

Figure 4-1 Development in calculated specific net energy demand based on building code and building tradition. Source: Multiconsult, SIMIEN simulations

Figure 4-2 shows the age distribution of the total Norwegian residential building stock.

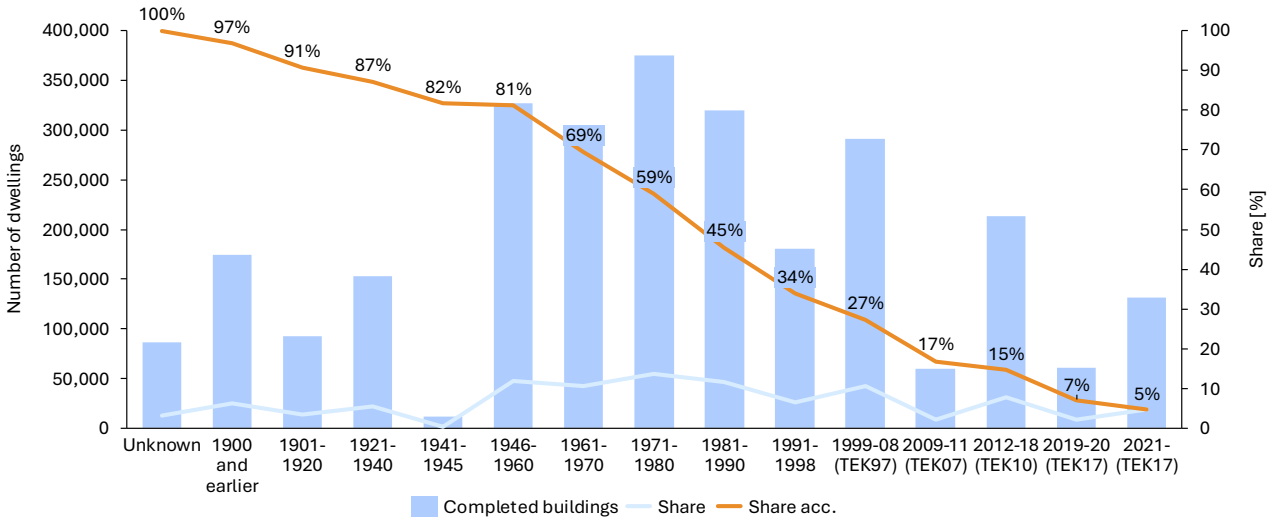

Figure 4-2 Age and building code distribution of dwellings. Source: [18], Multiconsult

By combining the calculated energy demand based on building code requirements in Figure 4-1 with the characteristics of the Norwegian residential building stock in Figure 4-2, the average specific energy demand of the residential building stock is calculated to be 199 kWh/m^2 for apartments and 256 kWh/m^2 for small residential buildings; cf Table 4-1. This baseline is used in calculations of avoided energy usage and greenhouse gas (GHG) emissions in subsection 4.3.

Table 4-1 Energy demand (kWh/m^2) per year of the residential Norwegian building stock. Source: [19]

Building category	Average total stock (baseline) [kWh/m^2/year]
Apartments	199
Small residential buildings	256

4.2 Eligible buildings

As presented in Table 4-2 and Table 4-3, the 32,715 eligible residential buildings in SpaBol's portfolio are estimated to amount to approximately 5.3 million square meters. The majority of the objects are eligible through the EPC A/top 15 percent criterion.

Table 4-2 Eligible residential objects in SpaBol's portfolio.

	Number of qualifying buildings in portfolio			
	2021 or later: NZEB	Older than 2021: EPC A	Older than 2021: TOP 15%	Sum eligible buildings
Apartments	708	791	6,749	8,248
Small residential buildings	1,600	228	22,639	24,467
Total	**2,308**	**1,019**	**29,388**	**32,715**

Table 4-3 Calculated area of qualifying residential buildings in SpaBol's portfolio.

	Calculated area of qualifying buildings in portfolio [m^2]			
	2021 or later: NZEB	Older than 2021: EPC A	Older than 2021: TOP 15%	Sum eligible buildings
Apartments	60,300	57,936	601,374	719,610
Small residential buildings	287,142	43,871	4,265,615	4,596,628
Total	**347,442**	**101,807**	**4,866,989**	**5,316,238**

4.3 Avoided emissions and impact

For each eligible object, impact is calculated by finding the reduction in energy demand and related emissions compared to the baseline of an average building from the entire building stock[1] presented in Table 4-1. The reduction in energy demand is calculated as the difference between the estimated specific weighted net delivered energy usage of each eligible object and the baseline. The reduction in energy demand is then multiplied by the area of the eligible asset from Table 4-3 and the emission factors considering heating sources from Table 2-1, and finally summed up for all the residential objects. A proportional relationship is expected between energy consumption and emissions in impact calculations. Not all residential buildings are necessarily included in one single bond issuance.

[1] The average of all Norwegian dwellings in existence

Table 4-4 indicates how much more energy efficient the eligible part of the portfolio is compared to the average residential Norwegian building stock. The table also presents how much the calculated reduction in energy demand constitutes in GHG emissions.

Table 4-4 Avoided energy demand and emissions (CO_2-eq) of eligible residential buildings in the portfolio compared to average building stock using the emission factors from Table 2-1.

	Avoided energy demand compared to baseline [GWh/year]	Avoided CO_2 emissions compared to baseline [tonnes CO_2-eq/year]	
		European (EU27 + UK + Norway) NS 3720:2018 electricity mix	Norwegian NVE physically delivered electricity 2025
NZEB	52.1	5,970	560
EPC A	11.5	1,320	120
TOP 15 percent	600.1	68,840	6,510
Total eligible buildings	**663.7**	**76,130**	**7,190**

Table 4-5 presents the total energy demand and related emissions of the eligible residential portfolio.

Table 4-5 Total energy demand and emissions (CO2-eq) of eligible residential buildings in the portfolio.

	Total energy demand [GWh/year]	Total CO_2 emissions [tonnes CO_2-eq/year]	
		European (EU27 + UK + Norway) NS 3720:2018 electricity mix	Norwegian NVE physically delivered electricity 2025
NZEB	33.3	3,820	360
EPC A	11.3	1,300	120
TOP 15 percent	613.1	70,320	6,650
Total eligible buildings	**657.7**	**75,440**	**7,130**

5 References

[1] Sparebank 1 Boligkreditt, “Green Bond Framework and in particular the issuers EuGB Fact Sheet alongside the paper Methodology for identifying green buildings,” January 2024. [Online]. Available: https://spabol.sparebank1.no/green-bonds.

[2] Statistics Norway, “Elektrisitet - Statistikkbanken kildetabell 14091,” [Online]. Available: https://www.ssb.no/energi-og-industri/energi/statistikk/elektrisitet.

[3] Statistics Norway (SSB), “Table 08307: Production, imports, exports and consumption of electric energy (GWh), by contents and year,” [Online]. Available: https://www.ssb.no/en/statbank/table/08307.

[4] Norsk Fjernvarme, “Fjernvarme - Energikilder 2025,” 2026. [Online]. Available: https://www.fjernkontrollen.no/. [Accessed 29 07 2026].

[5] Association of Issuing Bodies, “European Residual Mixes 2025,” Association of Issuing Bodies, Brussels, 2026.

[6] The Association of Issuing Bodies (AIB), “Residual Mixes and European Attribute Mix of 2025,” 2026. [Online]. Available: https://www.aib-net.org/facts/european-residual-mix/2025.

[7] Finans Norge, “Veileder for beregning av finansierte klimagassutslipp,” 2024. [Online]. Available: https://www.finansnorge.no/dokumenter/maler-og-veiledere/veileder-for-beregning-av-finansierte-klimagassutslipp/.

[8] NVE, “Strømdeklarasjoner,” 2026. [Online]. Available: https://www.nve.no/energi/energisystem/energibruk/stroemdeklarasjoner/.

[9] Multiconsult, “Based on building code assignments for DiBK, 2015,” 2015. [Online].

[10] SN/K 356 Klimagassberegninger for bygg, “NS 3720:2018 Metode for klimagassberegninger for bygninger,” Standard Norge, Oslo, 2018.

[11] Regjeringen/Kommunal- og distriktsdepartementet, “Taksonomien – maler for rapportering og retting av veiledning om primærenergifaktorer,” 2023. [Online]. Available: https://www.regjeringen.no/no/aktuelt/rettleiing-om-utrekning-av-primarenergibehov-i-bygningar-og-energirammer-for-nesten-nullenergibygningar/id2961158/.

[12] Regjeringen/Finansdepartementet, “Taksonomien – maler for rapportering og retting av veiledning om primærenergifaktorer,” 2024. [Online]. Available: https://www.regjeringen.no/no/aktuelt/taksonomien-maler-for-rapportering-og-retting-av-veiledning-om-primarenergifaktorer/id3021759/.

[13] Kommunal- og distriktsdepartementet, “Veiledning om beregning av primærenergibehov i bygninger og energirammer for nesten nullenergibygninger,” 12 01 2024. [Online]. Available: https://www.regjeringen.no/no/aktuelt/taksonomien-maler-for-rapportering-og-retting-av-veiledning-om-primarenergifaktorer/id3021759/.

[14] Kommunal- og distriktsdepartementet, “Rettleiing om utrekning av primærenergibehov i bygningar og energirammer for nesten nullenergibygningar,” 31 01 2023. [Online]. Available: https://www.regjeringen.no/no/aktuelt/rettleiing-om-utrekning-av-primarenergibehov-i-bygningar-og-energirammer-for-nesten-nullenergibygningar/id2961158.

[15] SN/K 34 Bygningers energiytelse, “NS 3031:2014 Beregninger av bygningers energiytelse - Metode og data,” Standard Norge, Oslo, 2014.

[16] Norwegian Ministry of Energy, “Taksonomien: Terskelverdier for energieffektivitet i bygninger,” 28 April 2026. [Online]. Available: https://www.regjeringen.no/no/aktuelt/taksonomien-terskelverdier-for-energieffektivitet-i-bygninger/id3108066/.

[17] Statistics Norway, “06513: Dwellings, by type of building and utility floor space (M) 2007 - 2024,” 12 03 2024. [Online]. Available: https://www.ssb.no/en/statbank/table/06513.

[18] SSB, Multiconsult.