REPORT

Green Portfolio Impact Assessment 2023

CLIENT

SpareBank 1 Ringerike Hadeland

SUBJECT

Impact assessment- energy efficient residential buildings, renewable energy and forestry

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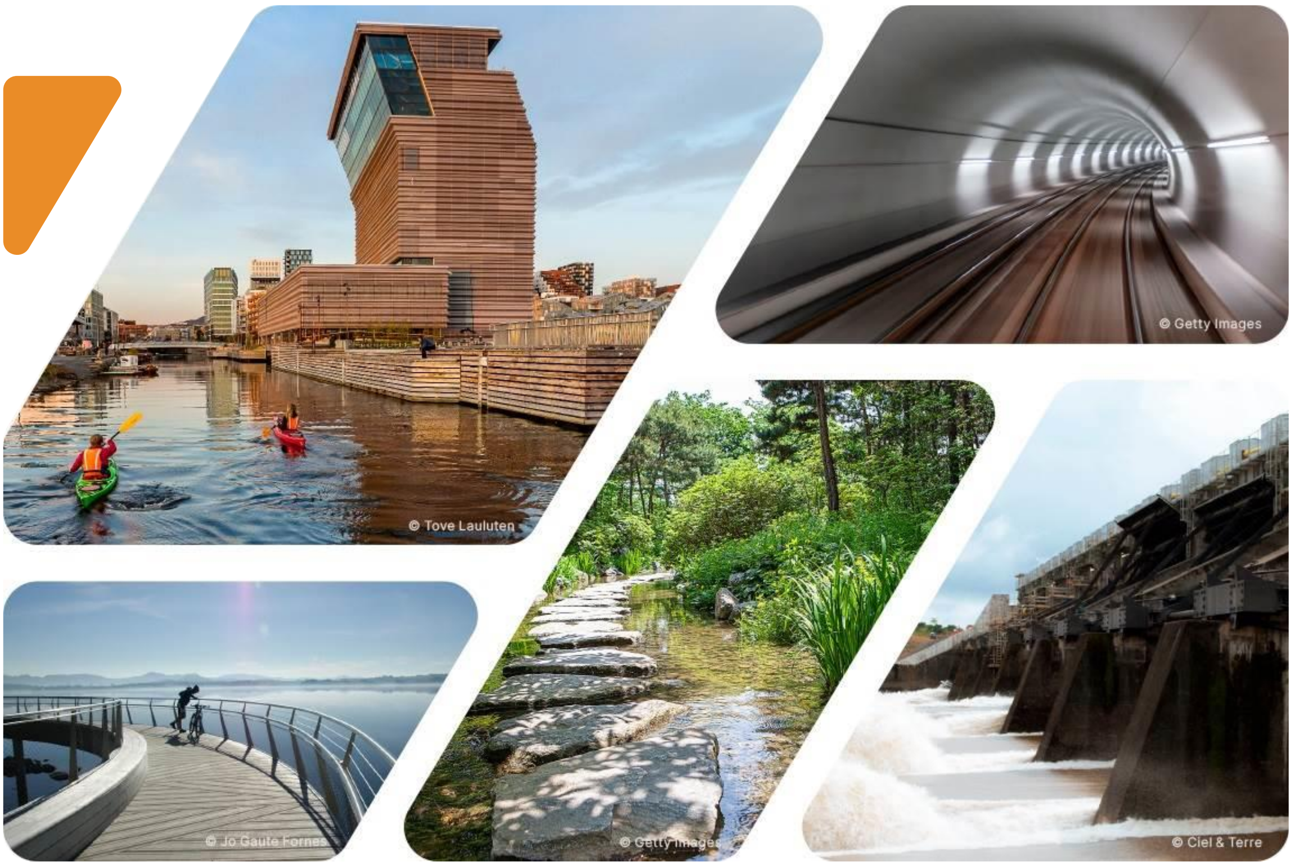

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SUBJECT	Impact assessment- energy efficient residential buildings, renewable energy and forestry	ACCESSIBILITY	Open
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In summary, the assessed impact is significant for all examined asset classes in the SpareBank 1 Ringerike Hadeland portfolio qualifying according to the bank's green bond criteria.

The total impact of the assets in the portfolio is 71 thousand tonnes CO_2-eq/year. This table sums up the impact in rounded numbers:

Energy efficient residential buildings	*1,200 tonnes CO_2-eq/year*
Renewable energy	*8,400 tonnes CO_2-eq/year*
Sustainable forestry	*61,400 tonnes CO_2-eq/year*
Total	***71,000 tonnes CO_2-eq/year***

When scaled by the banks share of financing, the impact is estimated to 42 thousand tonnes CO_2-eq/year:

Energy efficient residential buildings	*600 tonnes CO_2-eq/year*
Renewable energy	*8,400 tonnes CO_2-eq/year*
Sustainable forestry	*33,300 tonnes CO_2-eq/year*
Total	***42,300 tonnes CO_2-eq/year***

Note that the impact of renewable energy assets in the table above is not scaled by the bank's engagement.

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1 Introduction

Assignment

On assignment from SpareBank 1 Ringerike Hadeland, Multiconsult has assessed the impact of the part of the bank's loan portfolio eligible for green bonds.

In this document we briefly describe SpareBank 1 Ringerike Hadeland's green bond qualification criteria and the result of an analysis of the bank's loan portfolio. More detailed information about the eligibility criteria is available on the bank's website[1].

1.1 Electricity demand and production

The eligible assets are either producing renewable energy and delivering it into the existing power system or using electricity from the same system, except for the forestry assets. The energy consumption of Norwegian buildings is predominantly electricity, with some district heating and bioenergy.

In 2023, renewables accounted for 98 percent of the total (154 TWh) Norwegian electricity production, the final two percent being thermal power production from natural gas, biomass, and waste heat[2]. Figure 1-1, which is based on numbers from the Association of Issuing Bodies, shows that the Norwegian production mix in 2023 resulted in emissions of 0 gCO_2/kWh. In the figure, the production mix is included for other selected European states for comparison.

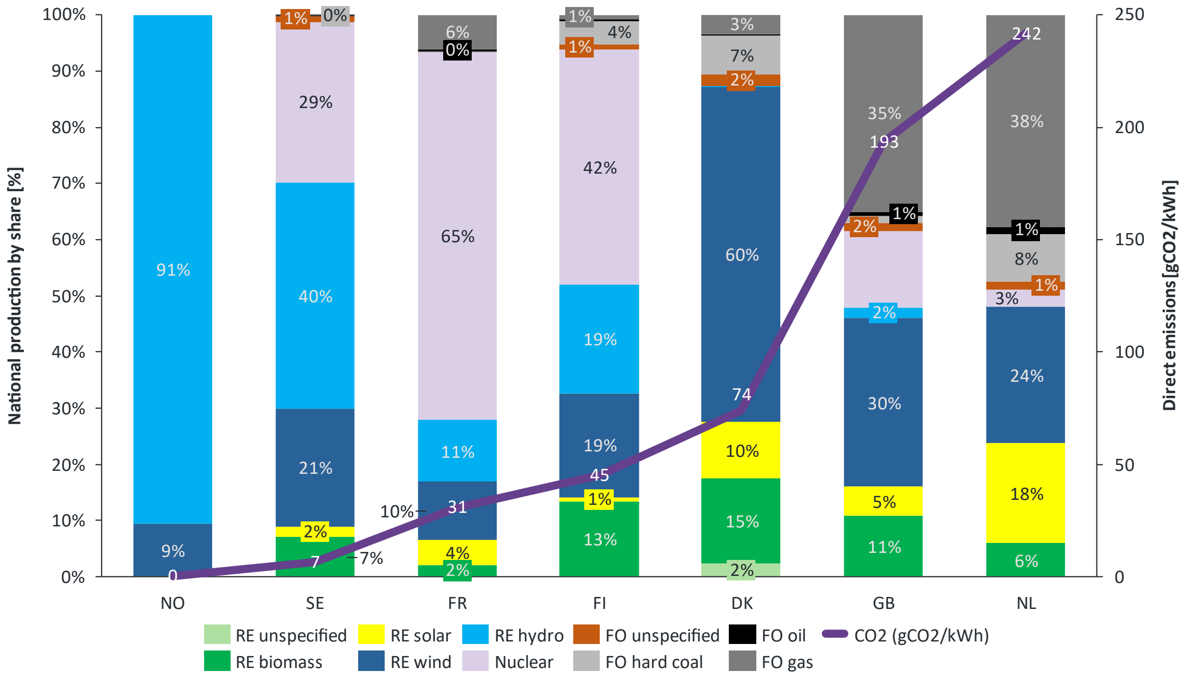

Figure 1-1 National electricity production mix in some selected countries (Source: European Residual Mixes 2023, Association of Issuing Bodies[3]).

[1] https://www.sparebank1.no/nb/ringerike-hadeland/om-oss/investor.html
[2] Statistics Norway Table 08307: Production, imports, exports and consumption of electric energy (GWh) 1950 - 2023, 2024
[3] https://www.aib-net.org/facts/european-residual-mix, 2024

As Figure 1-1 shows, emissions from power production varies between countries. Due to the interconnection of the power grid, the placement of the system boundary for power production heavily influences the greenhouse gas (GHG) emission factor associated with said production. To demonstrate how the choice of system boundary between Norway only or Europe as a whole, and type of emission factor, influence the results, the impact assessments are here presented based on several emission factors.

1.2 Emission factors for energy efficient buildings

The CO_2-emissions resulting from 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 factor used in this green portfolio impact assessment reflects an average in the buildings lifetime, assuming a decarbonisation of the European energy system.

Finans Norge released a guidance document for calculation of financed GHG emissions in 2023, including recommendations for grid factors to be used[4]. To demonstrate how emissions vary depending on grid factor, the two recommended grid factors from The Norwegian Water Resources and Energy Directorate (NVE) are included. That is, the most recent Norwegian physically delivered electricity for 2023[5] and the Norwegian residual mix for 2023[6]. The Norwegian residual mix is calculated by the Association of Issuing Bodies, which is the organization responsible for developing and promoting the European Energy Certificate System (EECS)[7].

The grid factors are summarized in Table 1-1 below and described in more detail in the following sub-sections.

To calculate the impact on climate gas emissions, the grid factors are applied to all electricity consumption in the residential buildings in the portfolio eligible for green bonds. Electricity is, as mentioned, the dominant energy carrier to Norwegian residential buildings, but the energy mix also includes other energy carriers such as bioenergy 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 1-1.

[4] https://www.finansnorge.no/dokumenter/maler-og-veiledere/veileder-for-beregning-av-finansierte-klimagassutslipp/, 2024
[5] https://www.nve.no/energi/energisystem/kraftproduksjon/hvor-kommer-stroemmen-fra/, 2024
[6] https://www.aib-net.org/facts/european-residual-mix/2023, 2024
[7] https://www.aib-net.org/, 2024

Table 1-1 Electricity production GHG factors (CO_2-eq) without and with influx of other heating sources for buildings in three scenarios. (Source: NS 3720:2018, Table A. 1, NVE[5], AIB[6])

Scenario	Description	Emission factor electricity [gCO_2/kWh]	Emission factor incl. other heating sources [gCO_2/kWh][8]
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	115
Norwegian NVE physically delivered electricity 2023	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	15	15
Norwegian NVE residual mix 2023	Market-based residual mix for Norway with a European marketplace	599	495

1.2.1 European (EU27+ UK+ Norway) electricity mix over the lifetime of the buildings

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. This factor is location-based.

The mentioned standard calculates, on a life-cycle basis, the average CO_2- factor for the next 60 years according to a European (EU27+ UK+ Norway) system boundary, as described in Table 1-1.

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 Norway only emission factor. Using the European mix instead of the Norway only mix, is then a more conservative approach.

The European electricity 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 emission 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).

1.2.2 Norwegian physically delivered electricity 2023

NVE calculates a climate declaration for physically delivered electricity for the previous year[9]. This factor represents electricity consumed in Norway, accounting for emissions from net import and export of electricity from neighbouring countries and these countries' average

[8] Multiconsult. Based on building code assignments for DiBK, 2015.

annual emission factors. The most recent grid factor is 15 gCO_2-eq/kWh for 2023[9]. This is also a location-based grid factor.

1.2.3 Norwegian residual mix 2023

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[10] and Association of Issuing Bodies[11]. 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 599 gCO_2-eq/kWh for 2023[11].

1.3 Emission factors for renewable energy production

For renewable energy, the impact calculations compare the emissions from hydropower to the emissions of grid electricity. The difference between the two is considered the avoided emissions per produced unit of electricity. The electricity emission factors from Table 1-1 are used as baseline for the calculations. The location-based mix for Europe have been used in previous analyses, and the location-based and market-based mixes for Norway are introduced for comparison. The resulting factors are described more in subsection 3.4.1.

[9] https://www.nve.no/energi/energisystem/kraftproduksjon/hvor-kommer-stroemmen-fra/, 2024
[10] https://www.nve.no/energy-supply/electricity-disclosure/?ref=mainmenu, 2024
[11] https://www.aib-net.org/facts/european-residual-mix/2023, 2024

2 Energy efficient residential buildings

2.1 Eligibility criteria

Eligibility in this impact assessment for existing residential buildings in the SpareBank 1 Ringerike Hadeland portfolio is identified against an Energy Performance Certificate (EPC) criterion and a refurbishment criterion as formulated below.

Existing residential buildings:

- Built between 2019-2021 with current standard (TEK17) and EPC A
- Built between 2012-2018 with current standard (TEK10) and EPC A or B
- Built before 2012 with relevant standard (TEK07 or earlier) and EPC A or B or C

Refurbished buildings:

- ENOVA supported projects and solutions.
- Professional technical consultations, energy audits and management services related to the improvement of energy performance of buildings.
- Renovations leading to minimum 30 percent energy efficiency improvements, measured in specific energy (kWh/m^2) compared to the calculated label based on the building code in the year of construction.

OR

- Renovation leading to at least a two-step improvement in the EPC-label relative to the calculated label based on the building code in the year of construction. A lower threshold is set at an achieved EPC D.

Due to the availability of data on refurbished buildings in the portfolio, this impact assessment considers a building eligible under the refurbishment criteria if its specific delivered energy demand (kWh/m^2), based on its EPC label, is at least 30 percent lower than the building's calculated energy demand according to the building code in effect at the year of construction. A lower threshold is set at an EPC rating of D.

Note that Sparebank 1 Ringerike Hadeland also have an eligibility criterion for new buildings. However, data is not available to check whether or not the buildings built in 2021 or later are performing 20 percent better than the energy efficiency standards in the TEK17 code. This criterion is not assessed in this impact assessment.

The bank's Green Bond Framework does however make reference to an upcoming national definition of nearly zero-energy buildings (NZEB), which was first published in January 2023 with a correction issued in January 2024[12]. The definition is not directly linked to the EPC system, but detailed EPC data may assist the bank identifying qualifying buildings in their portfolio. A comparison of the definition and the EPC system indicate that buildings built according to the current building code, TEK17, and an energy label A, qualify under NZEB-10 percent in Norway.

[12] https://www.regjeringen.no/contentassets/296636deecef419590fe6b5668fe196f/23-12-korrigert-veiledning-om-beregning-av-primarenergibehov-og-nesten-nullenergibygg.pdf, 2024

New residential buildings from 2022 or later with EPC A are therefore presented separately in the later tables and included in impact assessment.

2.2 Impact assessment – Residential buildings

The eligible residential buildings in SpareBank 1 Ringerike Hadeland's portfolio are estimated to amount to 85,000 square meters. The available data include reliable area for most objects. For objects where this data is not available, the area per dwelling is calculated based on average unit area derived from national statistics[13].

Eligibility is first checked against the EPC criterion. The remaining buildings are checked against the refurbishment criterion, so no double counting of objects will occur.

As Table 2-1 shows, there are 624 eligible dwellings in SpareBank 1 Ringerike Hadeland's portfolio. The major part, 547 objects, are existing buildings eligible through the EPC criterion. Of these, 17 percent have energy label A, and the rest have energy labels B and C. The final 77 are buildings with EPC D eligible based on the refurbishment criterion described in section 2.1. Table 2-2 shows corresponding calculated building areas for the eligible buildings.

Table 2-1 Number of eligible objects under each sub-criterion.

	No. of units					
	EPC A >2021	EPC A <2021	EPC B <2019	EPC C <2012	EPC D <1989 (refurbishment)	Total
Apartments	24	48	91	46	27	236
Small residential buildings	5	17	195	121	50	388
Total	29	65	286	167	77	624

Table 2-2 Calculated buildings areas for eligible objects.

	Area qualifying buildings in portfolio [m^2]					
	EPC A >2021	EPC A <2021	EPC B <2019	EPC C <2012	EPC D <1989 (refurbishment)	Total
Apartments	1,957	3,544	6,413	3,045	2,107	15,109
Small residential buildings	750	3,472	34,010	19,408	10,629	67,519
Total	2,707	7,016	40,423	22,453	12,736	85,335

Based on the calculated figures in Table 2-2, the energy efficiency of the residential portfolio is estimated. Not all residential buildings are necessarily included in one single bond issuance.

For each eligible object, impact is calculated by finding the reduction in energy demand compared to the baseline of an average building from the entire building stock, due to the eligible building being more energy efficient. The calculated average specific energy demand of the

[13] Table 06513: Dwellings, by type of building and utility floor space

residential Norwegian building stock, separated on apartments and small residential buildings, is 202 kWh/m^2 and 257 kWh/m^2, respectively. As only half of all Norwegian dwellings have a registered EPC, these average specific energy demands of the Norwegian residential building stock are used as baseline for the buildings qualifying according to the EPC criterion.

For the impact calculations for the EPC criterion, the specific energy demand for eligible buildings is estimated from the achieved energy label, based on the energy grade scale[14]. This demand is compared against the baseline as described above. The reduction in energy demand is multiplied with the area of the eligible asset and the emission factors from Table 1-1, and summed up for all the units.

For buildings qualifying on the refurbishment criterion, the difference between achieved energy label and assumed original energy label based on the year of construction is similarly multiplied with dwelling area and emission factors and summed up.

Table 2-3 indicates how much more energy efficient the eligible part of the portfolio is compared to the average residential Norwegian building stock. It also presents how much the calculated reduction in energy demand constitutes in avoided CO_2-emissions. A proportional relationship is expected between energy consumption and emissions. The avoided emissions are calculated using the three emission factors described in section 1.2: European NS 3720:2018 electricity mix, and NVE's grid factors for Norway only, representing physically delivered electricity and the residual mix for 2023. The impact is presented both in total and scaled by the bank's engagement, as represented by the loan-to-value ratio.

Table 2-3 Performance of eligible objects compared to baseline of average residential building stock. (Sources: public statistics, Statistics Norway, enova.no/energimerking, Multiconsult)

	Avoided energy compared to baseline [GWh/year]	Avoided CO_2-emissions compared to baseline [tonnes CO_2-eq/year]		
		European lifetime mix	Norwegian physically delivered el. 2023	Norwegian residual mix 2023
Eligible buildings in portfolio	10.5	1,205	162	5,191
Eligible buildings in portfolio – scaled by engagement	5.1	590	79	2,540

[14] https://www.enova.no/energimerking/om-energimerkeordningen/om-energiattesten/karakterskalaen/, 2024

3 Renewable energy

3.1 General description

Hydropower has been the dominant power production technology in Norway since the beginning of the industrialisation. Today, hydropower remains a crucial component of the national energy mix, accounting for 89 percent of the national electricity production in 2023.

Power production development in Norway is strictly regulated and subject to licencing and is overseen by Norwegian Water Resources and Energy Directorate (NVE), a directorate under the Ministry of Energy. Licenses grant rights to build and run power production installations under explicit conditions and rules of operation. NVE puts particular emphasis on preserving the environment. The Norwegian section of the NVE website provides detailed information about the various requirements for different types of projects[15].

Data about Norwegian assets are available from NVE, as all assets are subject to licencing.

3.2 Eligibility

Hydropower plants in SpareBank 1 Ringerike Hadeland's portfolio qualify for green bonds if they are small-scale hydropower projects (less than 25 MW) and large-scale projects (more than 25 MW) with either:

- life cycle emissions of less than 100 gCO_2-eq/kWh, or
- power density greater than 5 W/m^2.

In addition, the bank qualifies biomass (chip firing) projects with:

- life cycle emissions of less than 100 gCO_2-eq/kWh, or
- achieved public funding support from Enova

Bioenergy projects are however not included in this assessment.

3.2.1 Hydropower

The main eligibility criteria are in line with the Climate Bonds Initiative (CBI) criteria and the EU Taxonomy. For Norwegian hydropower these criteria are easily fulfilled and most assets overperform.

- All run-of-river power stations have no or negligible negative impact on GHG emissions
- Due to the cold climate, Norwegian reservoirs are not exposed to cyclic revegetation of impoundment, and hence the negative impacts on GHG emissions from these reservoirs are very small
- Hydropower stations with high hydraulic head and/or relatively small impounded area have high power density, meaning a high ratio between capacity and impounded area

The adaptation and resilience component in CBI hydropower eligibility criteria and the EU Taxonomy's "Do no significant harm" (DNSH) criteria, addressing environmental and social issues, is in the Norwegian context to a large degree covered by the rigid relevant requirements

[15] https://www.nve.no/konsesjonssaker/konsesjonsbehandling-av-vannkraft/

in the Norwegian regulation of energy plants. All Norwegian hydropower assets conform to very high standards regarding environmental and social impact. Portfolio alignment with DNSH requirements has not been assessed in detail.

3.3 Eligible assets in the portfolio

Sparebank 1 Ringerike Hadeland's eligble assets have low to negligible GHG emission related to construction and operation of the renewable power plants.

The renewable energy power stations in SpareBank 1 Ringerike Hadeland's portfolio are small run-of-river plants and hence have higher power density of several thousand W/m^2.

3.4 Emission factors and production estimates

3.4.1 CO_2 emissions from renewable energy power production

All renewable power production facilities have a negative impact on GHG emissions. Instead of calculating the individual impact on GHG emissions for the hydropower stations in the portfolio, we refer to Association of Issuing Bodies (AIB)[16]. AIB, as referred to by NVE[17], has used an emission factor of 6 gCO_2/kWh for all European hydropower in their calculations of the European residual mix. The value is based on a life-cycle analysis where all upstream and downstream effects in the whole value chain for power production are included.

In subsequent assessments we are using the AIB emission factors for hydropower assets, even though the factors are reported higher than in other credible sources in Norwegian context. For instance, Østfoldforskning[18] calculated the life-cycle emissions of Norwegian hydropower across all categories to 3.33 gCO_2-eq/kWh.

The SpareBank 1 Ringerike Hadeland portfolio consists of run-of-river plants, and the AIB emission factor is therefore regarded as conservative in an impact assessment setting. The positive impact of hydropower assets is 130 gCO_2/kWh compared to the baseline of 136 gCO_2/kWh from Table 1-1.

Given the Norwegian electricity mix for physically delivered electricity of 15 gCO_2/kWh from Table 1-1, the positive impact for hydropower will be 9 gCO_2/kWh compared to the baseline. Similarly, the positive impact for the Norwegian residual mix of 599 gCO_2/kWh from Table 1-1, will be 593 gCO_2/kWh.

3.4.2 Power production estimates

Actual and planned power production has been provided by the bank and verified by Multiconsult using the NVE's hydropower database[19].

3.5 Impact assessment- Renewable energy

The eligible plants in SpareBank 1 Ringerike Hadeland's portfolio are expected to produce about 65 GWh per year. The available data from the bank and open sources include:

[16] https://www.aib-net.org/, 2024
[17] https://www.nve.no/norwegian-energy-regulatory-authority/retail-market/electricity-disclosure-2018/, 2019
[18] https://norsus.no/wp-content/uploads/AR-01.19-The-inventory-and-life-cycle-data-for-Norwegian-hydroelectricity.pdf
[19] https://www.nve.no/energiforsyning/kraftproduksjon/vannkraft/vannkraftdatabase/, 2024

- Type of plant
- Installed capacity [MW]
- Estimated or recorded production [GWh]

To cross-check the data, the planned power production for the asset has been attained from the NVE's hydropower database[20] or licencing documents where the estimate is somewhat higher. Due to the often-overestimated annual production in small hydropower, the impact is conservatively calculated based on the lowest estimate.

Table 3-1 shows the capacity and expected production for the renewable energy assets in the bank's portfolio.

Table 3-1 Capacity and expected production of eligible hydropower plants.

	Total capacity [MW]	Expected production power companies [GWh/year]	Expected production NVE [GWh/year]
Small run-of-river	12.5	65	70.4

Table 3-2 summarises the expected renewable energy produced by the eligible assets in the portfolio in an average year and the resulting avoided CO_2 emissions from the energy production. Avoided emissions are presented based on all three emission factors from Table 1-1.

Table 3-2 Power production and estimated positive impact on GHG-emissions (CO_2-eq).

	Expected production [GWh/year]	Avoided emissions compared to baseline [tonnes CO_2-eq/year]		
		European lifetime mix	Norwegian physically delivered el. 2023	Norwegian residual mix 2023
Eligible hydropower plants in the portfolio	65	8,450	585	38,545

[20] https://www.nve.no/energiforsyning/kraftproduksjon/vannkraft/vannkraftdatabase/, 2024

4 Sustainable Forestry

4.1 General description

Forests cover around 14 million hectares (140,000 km^2), or 44 percent of Norway's land area. Of this, approximately 8.6 million hectares consist of productive forest, with the most economically significant tree species being spruce, pine, and birch[21].

The standing forest in Norway is an important factor in the Norwegian climate gas accounting that is reported on an annual basis to the United Nations as required by the UN Framework Convention on Climatic Change and the Kyoto Protocol. In 2022, the total annual carbon sequestration (storage) by the Norwegian forest amounted to 17.9 million tonnes CO_2-equivalents. While considering CO_2 emissions caused by forest and peat land conversion, the net sequestration was estimated at 13.7 million tonnes. This represents 28 percent of the total Norwegian CO_2 emissions[22].

Both CO_2 sequestration and carbon stored in the forest biomass has been steadily increasing since the 1920s, because of active forest management since 1945 and especially in the period 1955 – 1992. Trees planted in this period have been, and still partly are, in healthy growth, while logging has remained relatively stable with some increases in quantity over the last years. In the future, the CO_2 sequestration is expected to drop towards 2050 and then stabilize, for again to increase towards 2100. That is due to the combined effect of logging and replanting and the fact that climate change and increased temperatures will lead to an increased growth rate for the forest.

Norwegian obligations through international agreements related to sustainable forestry have been included in Norwegian regulation, including criteria for sustainable forestry negotiated in the European forest cooperation. The purpose of the Norwegian Forestry Act is to promote sustainable management of forest resources and to ensure biodiversity, consideration for the landscape, outdoor life, and cultural values. The Forestry Act applies to all forests. The Biodiversity Act in Norway contains provisions on the protection of forests and special provisions on priority species and selected habitat types to ensure important environmental values, including in forests.

4.2 Eligibility

According to SpareBank 1 Ringerike Hadeland's green bond framework, loans to finance or refinance forest activities or projects aligned with environmentally responsible forest management are eligible for green bonds, including:

- Loans to reforestation, planting of new forest
- Rehabilitation of degraded lands to facilitate reforestation

All forest land must be certified in accordance with the FSC or PEFC standard (either at individual or group level).

Close to all commercially managed forests in Norway are certified according to ISO 14001, where compliance with the Norwegian PEFC Forest Standard (Living Forest Standard) is one of

[21] https://www.skogbruk.nibio.no/skogen-i-norge, 2021
[22] https://miljostatus.miljodirektoratet.no/tema/klima/norske-utslipp-av-klimagasser/utslipp-og-opptak-fra-skog-og-arealbruk/

the main qualification criteria. This makes it highly likely that the forests in the bank's forest-based portfolio are PEFC certified. Nothing has come to the Consultant's attention whilst assessing the forestry portfolio that would suggest otherwise.

It is reasonable to assume that the bank's forestry-based assets will fall into the category Existing Forest Management in the EU Taxonomy. According to the Technical Annex, FSC and PEFC certified forestry operations are likely to meet the Sustainable Forest Management requirement, hence the forestry-based assets are probably in compliance with criterion 1. Considering that most forest properties in Norway have forest manage plans in place, makes it likely that criterion 2 and 3 will be fulfilled. This is because the information provided in the forestry management plans normally will allow for establishment of a verified GHG balance baseline and a demonstration of consistency and steady progress with respect to carbon storage.

With regards to fulfilling the requirements of the Forestry Criteria of CBI, it is equally likely that the forest-based loan assets fulfil the requirements of PEFC certification. Uncertainty remains regarding compliance with the climate adaptation and resilience checklist of CBI's Forestry Criteria, which requires a mandatory climate change risks assessment and a plan to mitigate any identified risk.

4.3 Impact Assessment - Forestry

An actively and well managed forested area may bring benefits in the form of carbon sequestration, recreational space, and wildlife preservation. The focus in this high-level evaluation of the forest green loan assets is the mitigation of climate change impacts that these assets potentially represent.

The SpareBank 1 Ringerike Hadeland portfolio contains forest properties for which the bank has provided information about the main species of tree and forest area. The forests are assumed to be standing forests, not recently cut.

According to figures from the climate gas accounts for forests prepared by NIBIO[23], lowland forests in Norway amounted to a total area of 14,988,000 hectares (ha) and a carbon stock of 452 million tonnes of CO_2. This equals 30.2 tonnes of CO_2 storage per hectare of forest. The table below presents the calculated carbon storage the green loan assets represent.

Table 4-1 Present carbon storage by SpareBank 1 Ringerike Hadeland's green loan portfolio (CO_2-eq).

Type of forest	Area [ha]	GHG storage [tonnes/ha]	Total GHG storage of forest assets [tonnes]
Spruce and pine	12,600	30.2	379,100

As can be read from Table 4-1, the present carbon storage of the green loan portfolio of SpareBank 1 Ringerike Hadeland is estimated at almost 0.4 million tonnes CO_2-equivalents.

In a publication from Bioforsk (now NIBIO), the average carbon sequestration capacity is estimated to be 1.33 tonnes of carbon per ha per year which corresponds to 4.88 tonnes of CO_2

[23] https://www.skogbruk.nibio.no/klimagassregnskapet-for-norske-skoger

per ha[24]. In Table 4-2 below, the annual carbon sequestration capacity of the green loan portfolio has been estimated.

Table 4-2 Estimated annual carbon sequestration by the green loan portfolio.

Type of forest	Area [ha]	Annual CO_2 sequestration [tonnes/ha]	Estimated annual increase in CO_2 storage [tonnes]	
			In total	Scaled by bank's share of financing
Spruce and pine	12,600	4.88+	61,360	33,350

[24] A. Grønlund,. K. Bjørkelo, G. Hylen and S. Tomter (2010). CO_2-opptak i jord og vegetasjon i Norge. Lagring, opptak og utslipp av CO_2 og andre klimagasser.