

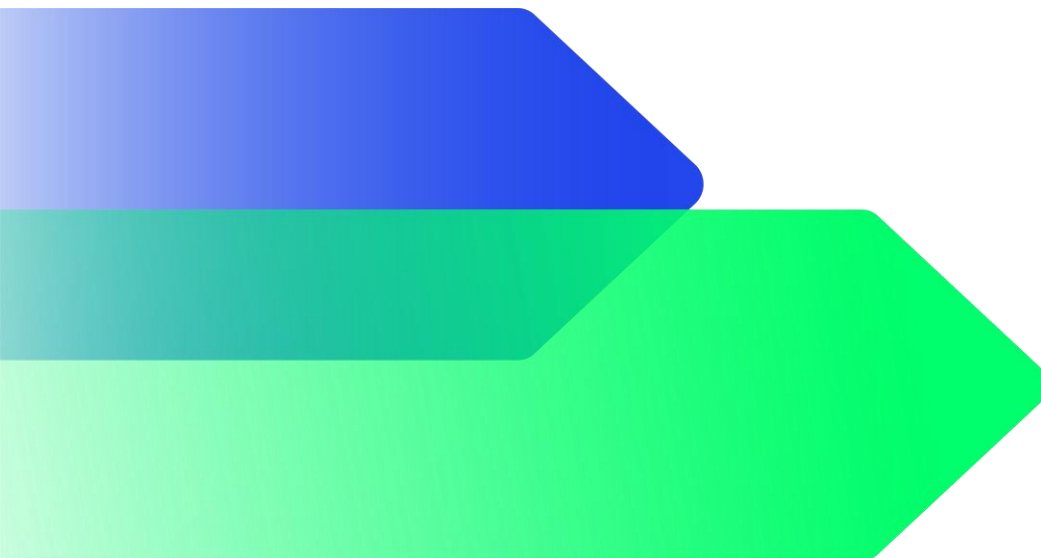


**DNB BANK ASA**

# **Green Bond Impact Assessment**

For eligible renewable energy assets under the DNB Green Finance Framework.

**March 2024**





**The Carbon Trust's mission is to  
accelerate the move to a decarbonised future.**

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# Abbreviations

<b>BESS</b>	Battery Energy Storage Systems
<b>GBP</b>	Green Bond Principles
<b>GHG</b>	Greenhouse Gas Emissions
<b>GLP</b>	Green Loan Principles
<b>ICMA</b>	International Capital Markets Association
<b>IFI</b>	International Financial Institutions Working Group on Greenhouse Gas Accounting
<b>PCAF</b>	Partnership for Carbon Accounting Financials
<b>RE</b>	Renewable Energy
<b>SDG</b>	Sustainable Development Goals
<b>WBCSD</b>	World Business Council for Sustainable Development

# Introduction

## DNB Green Bond Overview

DNB Bank ASA is Norway's largest financial services group and one of the largest in the Nordic region in terms of market capitalisation. As Norway's largest financial services group, DNB plays an important role in the sustainable transition in Norway, and internationally in certain sectors.

In alignment with DNB's sustainable ambitions, they have established a Green Finance Framework<sup>1</sup> ("**Framework**") to be able to issue Green Finance Instruments to finance and refinance assets and projects that contribute to the transition to a low-carbon economy. The objective of the Framework is to promote further investments into assets that will assist in reaching the targets set forth by the Paris Climate Agreement, the EU Environmental Objectives and the UN SDGs that conform to the sustainable finance principles listed below:

- ICMA Green Bond Principles ("**GBP**") of June 2021 (with June 2022 Appendix 1)<sup>2</sup>

DNB engaged Sustainalytics to review the DNB Bank ASA Green Finance Framework, dated September 2023, and provide a second-party opinion on the Framework's environmental credentials and its alignment with the Green Bond Principles 2021 (GBP).<sup>3</sup>

The GBP are a set of voluntary guidelines that recommend transparency and disclosure, and promote integrity in the development of the sustainable finance market by clarifying the approach for issuing sustainable instruments. The Framework therefore has four key components for each sustainable issuance, which DNB asserts that it will adopt:

1. Use of Proceeds,
2. Process for Project Evaluation and Selection,
3. Management of Proceeds, and,
4. Reporting.

DNB, at its discretion but in accordance with the Principles, will allocate an amount equal to the net proceeds from Green Finance Instruments issued by DNB will be used to finance and/or refinance a portfolio of "Eligible Green Loans" as defined by the eligibility criteria.

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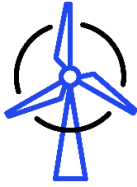
<sup>1</sup> DNB Green Finance Framework 2023

<sup>2</sup> ICMA Green Bond Principles, (June 2021)

<sup>3</sup> Second-Party Opinion Sustainalytics

The Eligible Green Loan Categories include:

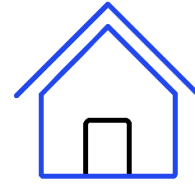
## Eligible Green Loan Categories



**Renewable Energy**



**Clean Transportation**



**Green Buildings**

**Figure 1: Eligible Green Project Categories**

For clarity, the Carbon Trust has been engaged to support the development of the impact assessment calculations for Eligible Green Loans under the Renewable Energy category, only. This impact assessment report therefore covers only the Renewable Energy asset category of DNB's green portfolio.

## Reporting Principles

Reporting of the environmental impacts of green bonds is evolving and is still a relatively new concept. However, the Carbon Trust is committed to reporting on the method used to calculate the avoided GHG emissions based on:

- PCAF's The Global GHG Accounting and Reporting Standard for the Financial Industry (November 2020), Chapter 5.3 Project Finance<sup>4</sup>,
- Climate Bonds Standard V3.0<sup>5</sup>,
- WBCSD Guidance on Avoided Emissions<sup>6</sup>,
- IFI GHG Accounting for Grid Connected Renewable Energy Projects (July 2019)<sup>7</sup>,
- Green Loan Principles (Feb 2023),<sup>8</sup>
- Green Bond Principles, Voluntary Process Guidelines for Issuing Green Bonds (2021)<sup>9</sup>, and,

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<sup>4</sup> The Global GHG Accounting and Reporting Standard for the Financial Industry (Dec 2022)

<sup>5</sup> Climate Bonds Standard V3.0 | Climate Bonds Initiative

<sup>6</sup> WBCSD Guidance on Avoided Emissions (Mar 2023)

<sup>7</sup> IFI GHG Accounting for Grid Connected Renewable Energy Projects (July 2019)

<sup>8</sup> Green Loan Principles (Feb 2023),

<sup>9</sup> Green Bond Principles, Voluntary Process Guidelines for Issuing Green Bonds (2021)

- ICMA Harmonised Framework for Impact Reporting (2023)<sup>10</sup>

## Scope of Calculations and Reporting

Where feasible, DNB intends to report on the environmental impact of the Eligible Green Loans financed by Green Finance Instruments. For each Green Eligible Category, the impact report may provide:

- A description of relevant green projects;
- The breakdown of green projects by nature of what is being financed (financial assets); and
- Impact metrics regarding projects' environmental impact as outlined in DNB's Framework.

DNB intends to report on the environmental impact of the Eligible Green Loans on an annual basis, covering the previous 12-month period<sup>11</sup> and considers any dynamic changes in the assets financed that occur from one reporting period to another.

## Avoided Emissions

Avoided emissions form a core component of the impact assessment. Measuring them provides insight into the wider positive impact in the form of GHG emissions avoided as a result of the solutions deployed in comparison to a baseline reference scenario. Existing as a subsection of avoided emissions, this assessment will also consider the enablement from a solution (product/service) and whether that allows for the same or similar function to be performed with significantly less GHG emissions. By providing these solutions, companies enable avoided emissions in the wider system, outside of their value chain. Avoided emissions, along with the entire impact assessment will be calculated on a year-by-year basis.

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<sup>10</sup> Handbook Harmonised framework for impact reporting (June 2023)

<sup>11</sup> For certain projects, the most recent available data is from the 12-month period starting January 31, 2022 and ending December 31, 2022. Where this is the case, the projects will be clearly marked and noted within the impact report.



At the core of the avoided emissions assessment, is the reference scenario. The reference scenario looks to establish the context of the deployed proceeds and what is directly being replaced/reduced as a result of financing activities. The reference scenario must be a credible counterfactual to reflect the reality of the region. Where avoided emissions are calculated, the reference scenario will be described in each of the relevant sector methodology sections. This is summarised in the graph and equation below:

$$\text{Avoided emissions} = \sum \text{Reference Scenario Emissions} - \text{Solution Emissions}$$

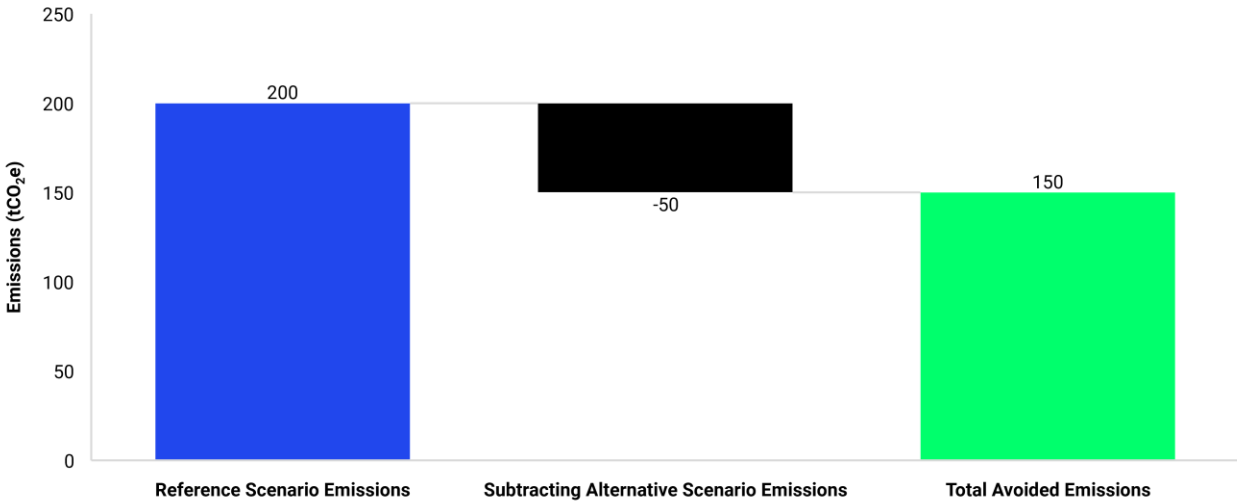


Figure 2: Example of Avoided Emissions Calculation

### DNB Avoided Emissions and Attribution

When carrying out the impact assessment, an attribution factor is applied to all assets in line with the Partnership for Carbon Accounting Financials (“PCAF”) methodologies. This helps understand the share of DNB’s exposure relative to the impact of the project.

This is summarised in the equation below:

$$\text{Project Avoided Emissions} = \text{Attribution Factor} \times \text{Project Emissions}$$

In the process of considering capital for allocation under the green financing instruments, DNB will discount the portion of the Eligible Green Projects that have been deployed by one or several other issuers.

The calculation of the attribution of emissions and avoidance takes the outstanding investment amount and divides it against the total project value. This is summarised in the equation below:

$$\text{Attribution Factor} = \frac{\text{DNB Outstanding Investment Amount}}{\text{Total Project Value}}$$

## DNB Green Bond Impact Highlights

Of the **36.1 billion** NOK outstanding loan balance, **57 of the 86** projects are currently **operational** and the remaining **29** are still **under construction**.



7 mixed renewables projects totalling an installed capacity of 25,720 MWe\*.



15 hydro projects have received financing with a total of 573,091 tCO<sub>2</sub>e of attributed avoided emissions.



31 wind (onshore and offshore) projects have received financing, generating 769,685 tCO<sub>2</sub>e of attributed avoided emissions.



30 solar PV projects have received financing with an attributed avoided emissions of 1,649,913 tCO<sub>2</sub>e.



3 battery energy storage projects have received financing with a total attributed avoided emissions of 745 tCO<sub>2</sub>e.

**Total outstanding loan balance (NOK)**

**36.1 billion**

**Operational avoided emissions per Norwegian Krone invested in (kgCO<sub>2</sub>e/NOK)**

**0.07**

**Number of Eligible Projects**

**86**

**Operational Attributed Avoided Emissions (tCO<sub>2</sub>e)**

**2.1 million**

**Under Construction Estimated Attributed Avoided Emissions (tCO<sub>2</sub>e)**

**1.2 million**

**Total Attributed Avoided Emissions (tCO<sub>2</sub>e)**

**3.2 million**

\* Megawatt electric (MWe) refers to one million watts of electric capacity and Megawatt (MW) refers to one million watts of electricity. These have been used interchangeably in the reporting YoY.

# Sector Breakdown of Eligible Green Asset Register

The following section will present the results of the impact assessment on a category-by-category basis, covering all projects included in the 37.3 billion NOK outstanding loan amount. All results are provided as the attributed value, along with a qualitative description of the impact. All results presented below include the actual and/or expected scope 1 and 2 emissions for both operational and under-construction projects.

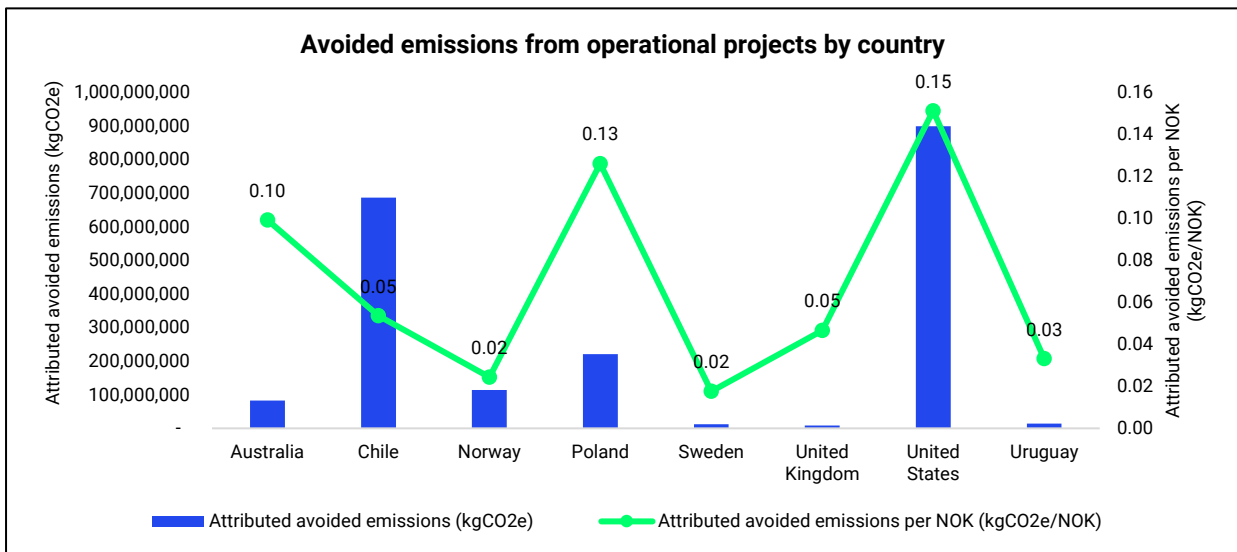
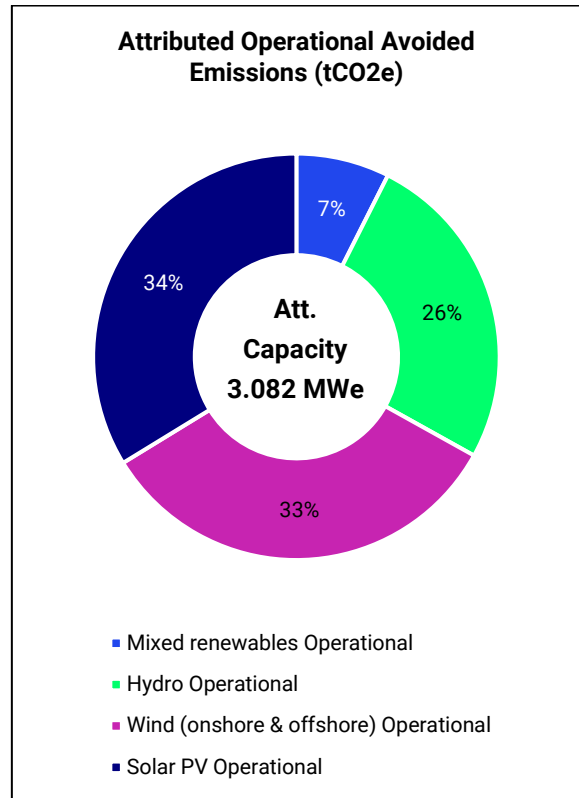
In line with the Framework, the Sector Breakdown will focus on the environmental impact of the projects.

## Renewable Energy



In 2023, the global RE capacity grew by nearly 50%, which is the highest growth rate over the past two decades.<sup>12</sup> Given current policies and

market conditions, it is projected that global renewable capacity will reach 7,300 GW by 2028. This growth trend would result in a global capacity increase of 2.5 times its current level by 2030, however, the International Energy Agency (IEA) has expressed that global capacity needs to increase threefold to meet 2050 net-zero targets.<sup>13</sup>



<sup>12</sup> Renewables – Global Energy Review 2023 – Analysis - IEA

<sup>13</sup> Renewables – Global Energy Review 2023 – Analysis - IEA

### Solar PV Impact

As of 2023, solar PV alone accounted for 75% of renewable capacity additions worldwide.<sup>14</sup> DNB has contributed to this global figure by raising finance for 30 solar PV projects located in three countries, with a combined capacity of 6,206 MWe.

Just above 50% of these projects are operational, with the total RE capacity of these solar PV projects being 2753.8 MWe. DNB has also provided financing to 13 Solar PV projects which are expected to become operational throughout 2024/2025. This will increase the RE generation by 3,452 MWe.

<b>Number of Projects:</b>	30
<b>Relevant Project Locations:</b>	Chile, Poland, US
<b>Total Capacity of Renewable Energy Plants (MWe):</b>	6,206
<b>Attributed Annual Renewable Energy Generation (MWh):</b>	3,169,334
<b>Attributed Annual Avoided Emissions (tCO<sub>2</sub>e):</b>	1,649,913

### Wind (Onshore & Offshore) Impact

While 2022 was the third best year ever for wind capacity – with 78 GW added globally – the average annual generation growth rate needs to increase by approximately 17% by 2030 to reach the IEA’s Net Zero Emissions by 2050 Scenario.<sup>15,16</sup>

DNB has financed a total of 31 onshore and offshore wind projects globally, of which two countries are in the top five markets for new wind installations – Sweden and the United States.<sup>17</sup> These projects are both operational and under construction, generating 3,592.1MWe and 6,471 MWe of electricity, respectively.

<b>Number of Projects:</b>	31
<b>Relevant Project Locations:</b>	Chile, Sweden, Norway, Poland, United Kingdom, United States, Uruguay
<b>Total Capacity of Renewable Energy Plants (MWe):</b>	10,063
<b>Attributed Annual Renewable Energy Generation (MWh):</b>	1,578,445
<b>Attributed Annual Avoided Emissions (tCO<sub>2</sub>e):</b>	769,685

### Mixed Renewable Impact

To accompany the single RE projects, DNB has also funded 7 mixed RE projects, 5 of which are operational and 2 which are still under construction. The impact of these projects is substantial, generating a combined total energy capacity of 5,793 MWe, 86% of which is coming from operational plants.

<sup>14</sup> Solar PV – Global Energy Review 2023 – Analysis - IEA

<sup>15</sup> IEA – Wind

<sup>16</sup> GWEC – Global Wind Report 2023

<sup>17</sup> GWEC – Global Wind Report 2023

<b>Number of Projects:</b>	7
<b>Relevant Project Locations:</b>	Australia, Chile, United States
<b>Total Capacity of Renewable Energy Plants (MWe):</b>	5,793
<b>Attributed Annual Renewable Energy Generation (MWh):</b>	331,020
<b>Attributed Annual Avoided Emissions (tCO<sub>2e</sub>):</b>	211,363

<b>Relevant Project Locations:</b>	Chile, Norway, United States
<b>Total Capacity of Renewable Energy Plants (MWe):</b>	3,658
<b>Attributed Annual Renewable Energy Generation (MWh):</b>	3,417,098
<b>Attributed Annual Avoided Emissions (tCO<sub>2e</sub>):</b>	573,091

### Hydropower Impact

Hydropower is a key pillar of decarbonising the global energy system and accelerating the transition to achieve climate ambitions globally. This is not only due to its ability to generate substantial amounts of low-carbon electricity but also because of its unparalleled flexibility and storage compared to other sources of energy.<sup>18</sup>

DNB has provided financing to 15 hydropower plants located across three countries – Chile, Norway, and the United States. The operational plants are currently generating 3,127 MWe of RE, with the potential to increase to 3,658 MWe once the projects under construction become operational.

<b>Number of Projects:</b>	15
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### Energy Efficiency

#### Battery Energy Storage Impact



The extensive utilisation and projected increases in RE generation, in addition to increased electricity demand, will pose challenges for power grids. Grid-scale

storage, such as battery energy storage systems (BESS), will be crucial for effectively managing grid stability and reliability amidst fluctuations in renewable energy output and electricity demand.<sup>19</sup>

Although only 2 out of the 3 BESS plants DNB is currently financing are operational, these plants possess an estimated electrical storage capacity of 2,000 MWh and a total export of 400,000 MWh.<sup>20</sup>

<sup>18</sup> IEA – Hydropower

<sup>19</sup> IEA – Energy Storage 2023

<sup>20</sup> These estimates were calculated based on electric capacity (Mwe), and proxies for roundtrip efficiency and on-grid expected power storage capacity (hours). Additional information on the methodology pertaining to these estimates can be found in the [DNB Green Bond Impact Assessment Methodology 2023](#) document on DNB’s website.

When the remaining BESS project becomes operational, these figures will increase to 2,740 MWh and 548,000 MWh, respectively.

<b>Number of Projects:</b>	3
<b>Relevant Project Locations:</b>	Australia, United States
<b>Electrical Storage Capacity (MWh):</b>	2,740
<b>Net Export (MWh)<sup>21</sup></b>	548,000
<b>Attributed Annual Avoided Emissions (tCO<sub>2</sub>e):</b>	29,379

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<sup>21</sup> Considering an assumed round trip efficiency of 85%

## Appendix 1: Detailed Results

### 1.1. Summary of the Impact of DNB’s Eligible Pipeline Portfolio – Total Amount of Operational and Under Construction Projects

Category	No. of Eligible Projects	Total outstanding balance (million NOK)	Total Capacity (Mwe)	Attributed Capacity (MWe)	Total Production (MWh)	Attributed Production (MWh)	Total Avoided Emissions (tCO <sub>2</sub> e)	Attributed Avoided Emissions (tCO <sub>2</sub> e)	Attributed Avoided Emissions (%)
<b>Renewable Energy</b>	<b>83</b>	<b>35,232.7</b>	<b>25,720</b>	<b>4,243</b>	<b>60,092,353</b>	<b>8,495,897</b>	<b>30,990,099</b>	<b>3,204,052</b>	<b>99%</b>
Mixed renewables	7	2,219.0	5,793	135	13,370,667	331,020	8,975,722	211,363	7%
Hydro	15	7,293.4	3,658	1,360	12,082,193	3,417,098	2,267,556	573,091	18%
Wind (onshore & offshore)	31	10,169.9	10,063	583	22,445,054	1,578,445	13,875,651	769,685	24%
Solar PV	30	15,550.4	6,206	2,165	12,194,440	3,169,334	5,871,170	1,649,913	51%
<b>Battery Storage</b>	<b>3</b>	<b>912.7</b>	<b>685</b>	<b>48</b>	<b>-</b>	<b>-</b>	<b>225,280</b>	<b>29,379</b>	<b>1%</b>
Asset 1, 2 & 3	3	912.7	685	48	-	-	225,280	29,379	0%
<b>Total</b>	<b>86</b>	<b>36,145.4</b>	<b>26,405</b>	<b>4,291</b>	<b>60,092,353</b>	<b>8,495,897</b>	<b>31,2151,379</b>	<b>3,233,431</b>	<b>1%</b>

## 1.2. Summary of the Impact of DNB’s Eligible Pipeline Portfolio – Total Amount of Operational Projects

Category	No. of Eligible Projects	Total outstanding balance (million NOK)	Total Capacity (Mwe)	Attributed Capacity (MWe)	Total Production (MWh)	Attributed Production (MWh)	Total Avoided Emissions (tCO <sub>2e</sub> )	Attributed Avoided Emissions (tCO <sub>2e</sub> )	Attributed Avoided Emissions (%)
<b>Renewable Energy</b>	<b>55</b>	<b>27,372.1</b>	<b>14,444</b>	<b>3,082</b>	<b>37,244,753</b>	<b>6,322,253</b>	<b>15,795,054</b>	<b>2,040,927</b>	<b>99%</b>
Mixed renewables	5	1,541	4,971	99	11,111,462	230,984	7,616,055	151,812	7%
Hydro	14	6,625	3,127	1,339	10,082,193	3,341,264	954,343	523,298	25%
Wind (onshore & offshore)	19	8,022	3,592	499	11,883,313	1,465,571	5,204,404	677,136	33%
Solar PV	17	11,184	2,754	1,145	4,167,786	1,284,434	2,020,251	688,682	33%
<b>Battery Storage</b>	<b>2</b>	<b>907.3</b>	<b>500</b>	<b>46</b>	<b>-</b>	<b>-</b>	<b>176,837</b>	<b>28,941</b>	<b>1%</b>
Asset 1, 2 & 3	2	907.3	500	46	-	-	176,837	28,941	0%
<b>Total</b>	<b>57</b>	<b>28,279.4</b>	<b>14,944</b>	<b>3,128</b>	<b>37,244,753</b>	<b>6,322,253</b>	<b>15,971,891</b>	<b>2,069,868</b>	<b>1%</b>



### 1.3. Summary of the Estimated Impact of DNB’s Eligible Pipeline Portfolio – Total Amount of Under Construction Projects

Category	No. of Eligible Projects	Total outstanding balance (million NOK)	Total Capacity (Mwe)	Attributed Capacity (MWe)	Total Production (MWh)	Attributed Production (MWh)	Total Avoided Emissions (tCO <sub>2</sub> e)	Attributed Avoided Emissions (tCO <sub>2</sub> e)	Attributed Avoided Emissions (%)
<b>Renewable Energy</b>	<b>28</b>	<b>7,860.6</b>	<b>11,276</b>	<b>1,161</b>	<b>22,847,600</b>	<b>2,173,644</b>	<b>15,195,045</b>	<b>1,163,125</b>	<b>100%</b>
Mixed renewables	2	678	822	36	2,259,205	100,036	1,359,667	1,359,667	5%
Hydro	1	668	531	20	2,000,000	75,834	954,343	1,313,212	4%
Wind (onshore & offshore)	12	2,148	6,471	84	10,561,741	112,874	1,313,212	8,671,247	8%
Solar PV	13	4,366	3,452	1,020	8,026,654	1,884,900	5,204,404	3,850,919	83%
<b>Battery Storage</b>	<b>1</b>	<b>5.4</b>	<b>185</b>	<b>2</b>	<b>-</b>	<b>-</b>	<b>48,444</b>	<b>438</b>	<b>0%</b>
Asset 1, 2 & 3	1	5.4	185	2	-	n.a	48,444	438	0%
<b>Total</b>	<b>29</b>	<b>7,866.0</b>	<b>11,461</b>	<b>1,163</b>	<b>22,847,600</b>	<b>2,173,644</b>	<b>15,243,489</b>	<b>1,163,563</b>	<b>100%</b>

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