KBN Kommunalbanken Norway

# ENVIRONMENTAL IMPACT REPORT 2017

Kommunalbanken AS

# WELCOME TO KBN'S GREEN BOND IMPACT REPORT

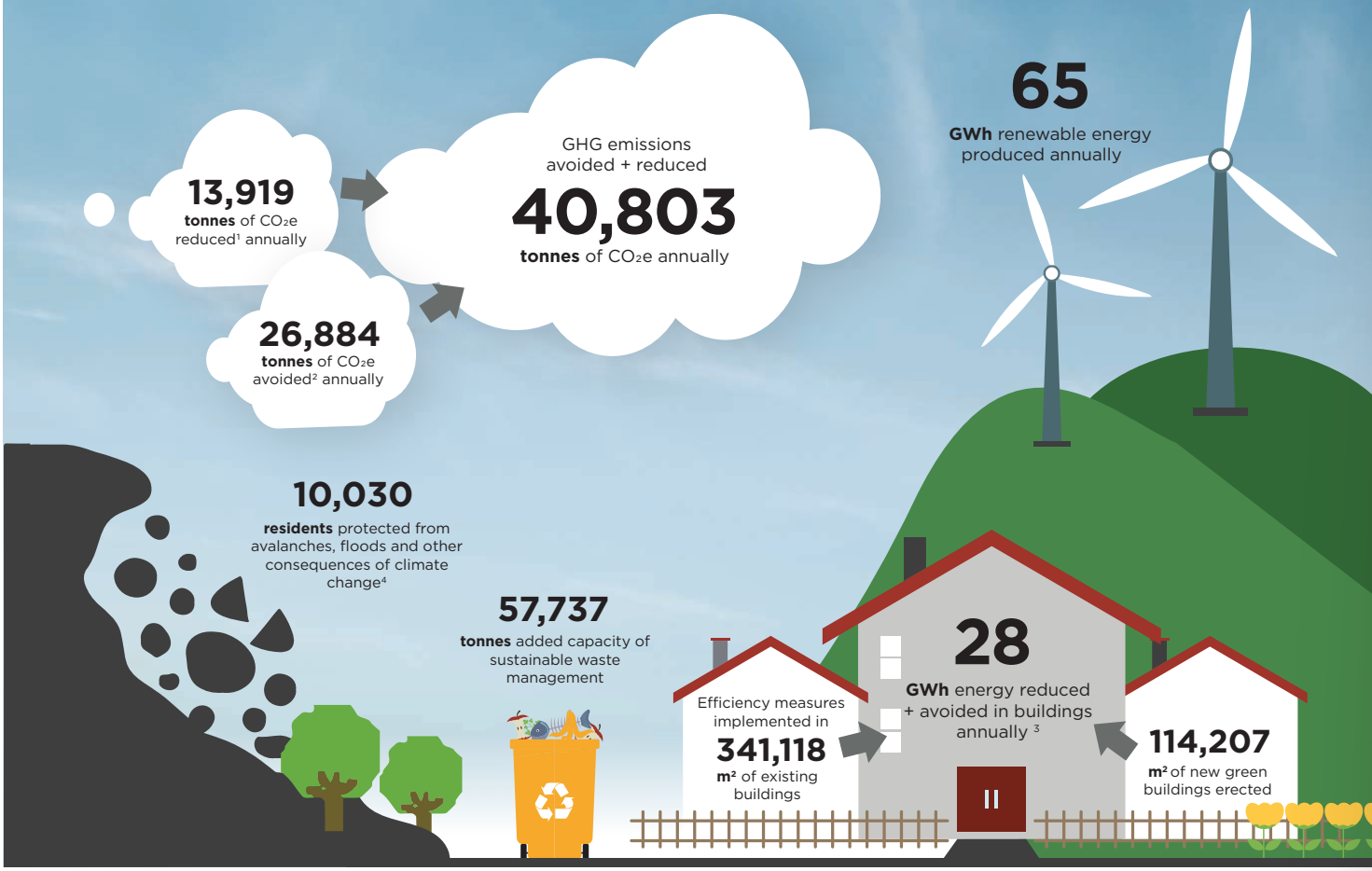
**By the end of 2017, KBN had a total of 11.5 billion Norwegian Kroner, equivalent to 1.4 billion US dollars, outstanding in green loans to investments that are aligned with our Green Bond Framework.**

This report presents projects financed with KBN's green loans, and their respectieve environmental impact and the supplementary Selection Criteria.

| GREEN BONDS | GREEN LOANS |
|---|---|
| USD **1.17** bn | USD **1.40** bn |
| OUTSTANDING GREEN BONDS | OUTSTANDING LENDING TO GREEN PROJECTS |

*Per 31. December 2017. Exchange rate: 1 USD= 8.2 NOK*

## CLIMATE AND ENVIRONMENTAL IMPACT OF OUR GREEN LOANS




*1. From projects within categories Energy Efficiency & Low-carbon Transportation.*

*2. From projects within categories New Green buildings & Renewable energy.*

*3. 20,826,114 kWh energy reduced from energy efficiency measures; 7,063,343 kWh energy avoided in new green buildings.*

*4. Number of residents in municipalities where climate change adaptation measures have been implemented.*

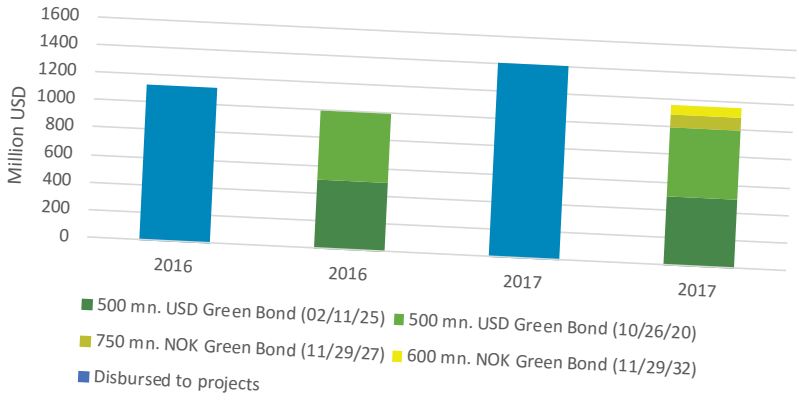
KBN Kommunalbanken Norway

# IMPACT REPORT IN SHORT

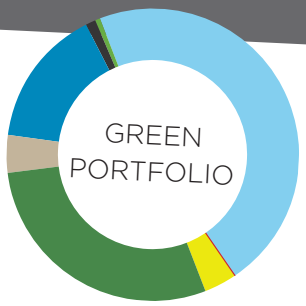
AS OF 31 DECEMBER 2017


KBN Norway's impact reporting is conducted according to the principles and methodology presented in the *Position Paper on Green Bonds Impact Reporting* developed by a group of Nordic public sector green bond issuers, including KBN.

## OUTSTANDING GREEN BOND ISSUANCES AND GREEN PROJECT LENDING




## GREEN PORTFOLIO



| | |
|---|---|
| New green buildings | 29.1 % |
| Waste management | 4.2 % |
| Water- and wastewater management | 15.2 % |
| Energy efficiency | 1.2 % |
| Sustainable land use | 0.4 % |
| Low-carbon transportation | 46.4 % |
| Climate change adaptation | 0.1 % |
| Renewable energy | 3.4 % |

## PROJECT PORTFOLIO & IMPACT OVERVIEW

| Project category | Outstanding amounts to projects, in NOK | $CO_2$ emissions avoided/reduced annually | Impact, tonnes $CO_2e$ per million NOK |
|---|---|---|---|
| New green buildings | 3,347,346,087 | 3,309 | 1 |
| Energy efficiency | 139,477,400 | 7,949 | 57 |
| Renewable energy | 391,103,300 | 23,575 | 60 |
| Low-carbon transportation | 5,334,536,892 | 5,970 | 1 |
| Waste management | 481,617,595 | n/a | n/a |
| Water- and wastewater management | 1,742,852,945 | n/a | n/a |
| Climate change adaptation | 15,805,000 | n/a | n/a |
| Sustainable land use | 44,447,060 | n/a | n/a |
| **SUM** | **11,497,186,279** | **40,803** | |

| **Impact attributable to green bond investors**<br>*Total outstanding green bonds divided by total outstanding disbursed to projects* | **83 %** |
|---|---|
| Where of impact attributable to Green Bond USD 500 mn (02/11/25) | 36 % |
| Where of impact attributable to Green Bond USD 500 mn (10/26/20) | 36 % |
| Where of impact attributable to Green Bond NOK 750 mn (11/29/27) | 7 % |
| Where of impact attributable to Green Bond NOK 600 mn (11/29/32) | 5% |

Currency conversion: 1 USD = 8.2 NOK
$CO_2e$ = $CO_2$ equivalents, calculated according to GWP100 (Global Warming Potentials with a 100-year time horizon) from the IPCC Second Assessment Report.

## USE OF PROCEEDS

KBN's Green Project portfolio exclusively consists of loans to Norwegian municipalities and county councils/regions. Each loan is selected according to KBN's Green Bond Framework and the supplementary Selection Criteria.

## KEY REPORTING METHODOLOGY

A project's impact is calculated based on the disbursed and outstanding green loan to a project as a share of the total project cost. For the share of green loans financed with green bonds, please refer to the table "Impact attributable to green bond investors". KBN reports on a portfolio basis, and in Norwegian Kroner (NOK). For this document, the reporting period ends on 31 December 2017.

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Photo: Vemund Hagen

## MAIN CONTENT



## LIST OF PROJECTS



## CASES



KBN Kommunalbanken Norway

**KOMMUNALBANKEN NORWAY (KBN) FINANCES IMPORTANT WELFARE SERVICES THROUGH PROVIDING CREDIT TO THE LOCAL AUTHORITIES IN NORWAY.**

KBN's mandate is to provide the local government sector with stable and cost efficient long-term financing. KBN's lending to the local government sector is funded by issuing securities in the international capital markets, maintaining the highest possible credit rating of AAA/Aaa.

Measured by total assets, KBN is Norway's third largest financial institution with loans to nearly all of the country's municipalities. KBN is a wholly owned state company. Our vision is to be a long-term partner for local welfare.

# THE FINANCE SECTOR MAY PLAY A PIVOTAL ROLE IN THE LOW-CARBON TRANSITION

**BY SIGBJØRN BIRKELAND**
CHEIF FINANCIAL MARKETS OFFICER, KBN

"When money changes direction, that's when things happen", said Enova's CEO Nils Kristian Nakstad at the Enova conference in Trondheim at the end of January. He referred to KBN's green lending as a good example of this. Two days later the EU's High-Level Expert Group on Sustainable Finance (HLEG) published its report, which included recommendations on how capital flows can be directed towards sustainable investment and how climate risk in the financial system can be addressed.

The EU Commission believes that the financial sector will play a key role in helping Europe to achieve the targets in the Paris Agreement. The scale of investment involved in order to achieve the 2030 target of a 40% reduction in emissions is estimated to be a staggering additional EUR 180 billion every year. If this is to happen, then as Nils Kristian Nakstad said, a lot of money needs to change direction.

This report contributes to the debate by showing how investors' money finds its way from bond issues earmarked for climate friendly investments (green bonds) to specific projects in the Norwegian local government sector. KBN is Norway's second largest issuer of green bonds, and we are the only financial institution that offers preferential interest rates for lending to sustainable investments by Norwegian municipalities and county authorities (green loans). In order to qualify for a green loan from KBN, a project must be part of the solution for transforming Norway into a low-emission society. Our Green Bond framework has received the highest rating of "Dark Green" from the Centre for International Climate Research (CICERO). At the close of 2017, KBN's outstanding loans to projects that satisfied these criteria totalled NOK 11.5 billion.

Over the course of 2017 we made loans to 47 projects. Our portfolio includes projects varying in size from NOK 2 million to NOK 5,270 million in municipalities and county authorities throughout Norway with populations between 201 and 278,556. Our green loans finance investments that play an essential role in reducing greenhouse gas emissions in Norwegian local communities. It is also important that these investments make a big difference at the local level. For example in 2017 we financed a number of quayside power packs that not only help to reduce the climate footprint of maritime transport but also reduce local air pollution. A study carried out by Bellona, Siemens, Nelfo and Elektroforeningen showed that when a large cruise ship is in port for eight hours it produces the same level of NOx emissions as 10,000 cars driving from Oslo to Trondheim.

This year's Environmental Impact Report is the second report by KBN, and we are very pleased to report that the climate impact of the projects we financed in 2017, measured in terms of tonnes of CO2 avoided or reduced annually, is around 75 % larger than in 2016. KBN is committed to playing a leading role in green finance and being a driving force for investment in green projects. In


Sigbjørn Birkeland, Cheif Financial Markets Officer at KBN. Foto: Jo Straube

2017 KBN was elected to the Executive Committee of the Green Bond Principles, which is the leading international standards authority for green bonds, and we also collaborated with nine other Nordic issuers of green bonds to produce a unified reporting framework, 'Nordic Public Sector Issuers: Position Paper on Green Bonds Impact Reporting'. The methodology set out in this framework provides the basis for the impact calculations in our report.

Sustainable finance is quickly moving higher up the international agenda. The message from the EU Commission is very clear - the financial system can play a key role in the green shift. I am confident that KBN is well-positioned to play its role in the changes that need to take place.

We hope our report will be of interest to both Norwegian and international investors and to decision takers in Norwegian municipalities and county authorities. ■■

# KBN GREEN BONDS

Since 2010, KBN has issued green bonds and have today four outstanding Green bonds that amount to USD 1 billion and NOK 1.35 billion respectively.

In June 2016, KBN updated its Green Bond programme and was rewarded a Dark Green shading by CICERO.

**BOND RATINGS**

STANDARD &POOR'S **AAA**

MOODY'S **Aaa**

COMPOSITE **AAA**

**OUTSTANDING GREEN BONDS**

| ISSUE DATE | AMOUNT ISSUED | MATURITY | COUPON | ISIN |
|---|---|---|---|---|
| 11.02.2015 | USD 500 million | 11.02.2025 | 2,125 % | XS1188118100<br>US50048MBX74 |
| 26.10.2016 | USD 500 million | 26.10.2020 | 1,375 % | XS1508672828<br>US50048MCD02 |
| 29.11.2017 | NOK 750 million | 29.11.2027 | 2,20 % | NO0010811276 |
| 29.11.2017 | NOK 500 million | 29.11.2032 | 2,00 % | NO0010811284 |

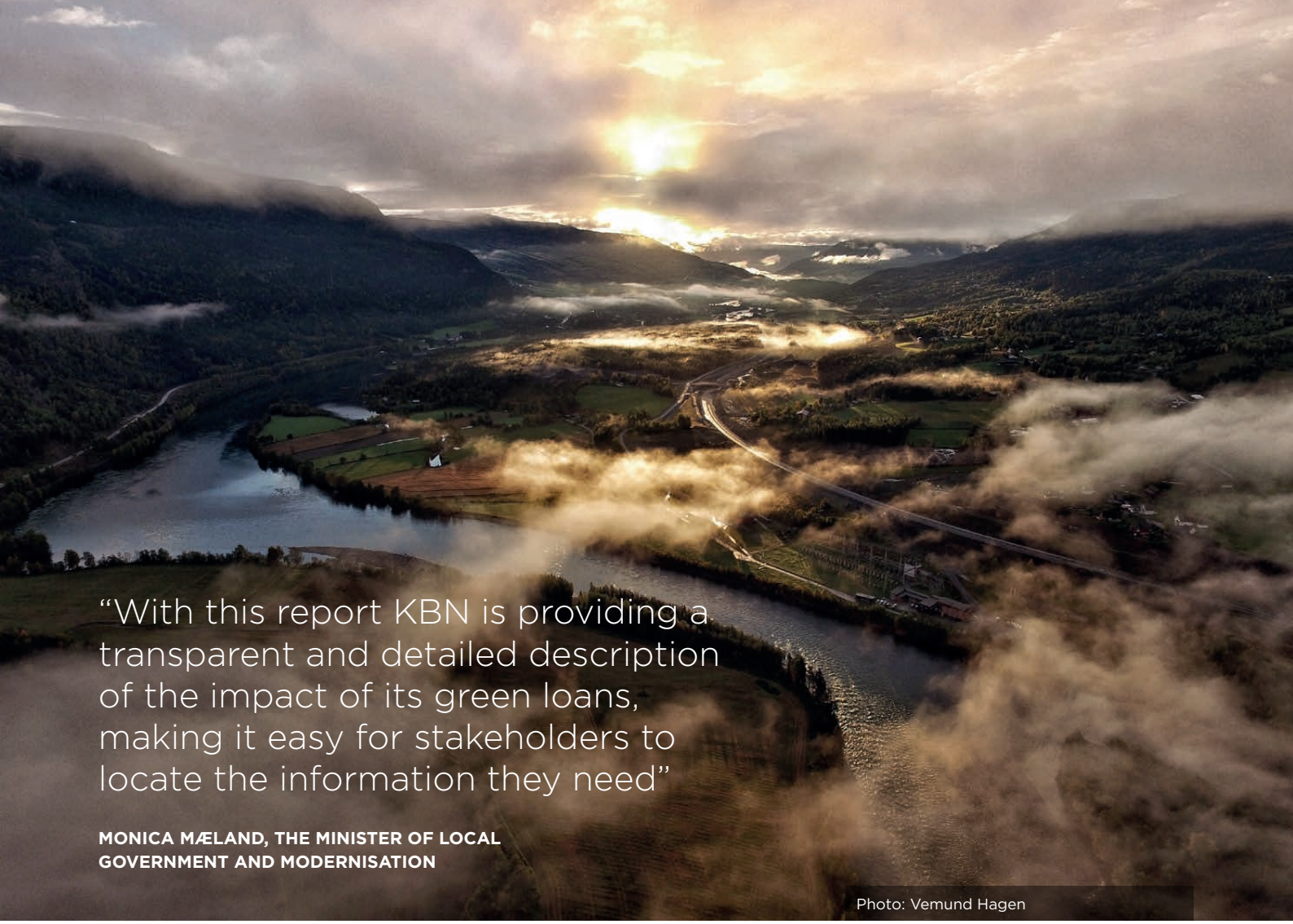
KBN's first green bond issuance, a 3y USD 500 million bond issued in 2013, matured in 2016. KBN has raised green funding since 2010; the first years were aimed at Japanese households in the Uridashi market.

**THIRD PARTY EVALUATION**

°CICERO Senter for klimaforskning

The Center for International Climate Research (CICERO), the leading provider of independent, science-based evaluations of the frameworks of green bond issuers, has assessed the environmental robustness of the June 2016 version of KBN's Green Bond Framework. We are proud to have received the rating "dark green", which is the highest possible rating from CICERO. This rating indicates the majority of projects financed through KBN's green bonds are "projects and solutions that realise the long-term vision of a low-carbon and climate-resilient future already today"

| | |
|---|---|
| **DARK GREEN** | Projects and solutions that already realise the long-term vision of a low-carbon and climate-resilient future. Typically, this will entail zero-emission solutions and governance structures taht integrate environmental concerns tino all activities. Ecample projects include renewable energy pojects such as solar or wind. |
| **MEDIUM GREEN** | Projects and solutions that represent steps towards the long term vision, but are not quite there yet. Example projects include sustainable buildings with good (but not excellent) energy efficiency ratings. |
| **LIGHT GREEN** | Projects and solutions that are environmentally friendly but are not by themselves a part of the long term vision. Example projects include energy efficiency improvements in fossil-based industry tat result in short-term reductions of greenhouse gas emissions, and diesel-fueles buses. |
| **BROWN** | Projects that are in opposition to the long-term vision of a low-carbon and climate-resilient future. |



"With this report KBN is providing a transparent and detailed description of the impact of its green loans, making it easy for stakeholders to locate the information they need"

**MONICA MÆLAND, THE MINISTER OF LOCAL GOVERNMENT AND MODERNISATION**

Photo: Vemund Hagen

## ACKNOWLEDGEMENTS

■■ "I am pleased that KBN has taken a leading role in green finance in Norway. Green finance is an important instrument in relation to Norway achieving its national target of becoming a low-carbon society", comments Monica Mæland, the Minister of Local Government and Modernisation. KBN is the largest Norwegian issuer of green bonds and offers a reduced interest rate for ambitious green investments across Norway. KBN's framework has been awarded the best possible rating, "dark green", by the independent climate research centre CICERO, which means investors and other stakeholders can be certain that KBN's green bonds finance investment in projects in line with Norway's national target for the country to become a low-carbon society by 2050.

With this report KBN is providing a transparent and detailed description of the impact of its green loans, making it easy for stakeholders to locate the information they need. We want KBN to continue to be a driving force in the development of the market for green financing and to increase the proportion of its lending that is for green projects."

*– Monica Mæland, the Minister of Local Government and Modernisation*

■■ "We are proud to be part of financing the green policy shift in Norway through investing in KBNs green bonds. We value the reporting standard that KBN has had an active role in developing. The report provides transparency on key measures and an assessment of the impact on the environment of the projects we are funding. We believe this is important to further develop the green bond market, and to motivate both new issuers and investors."

*– Mette Cecilie Skaug, Portfolio Manager at Oslo Pensjonsforsikring AS*

■■ "Municipalities have an important role in a transition to a more sustainable economy. KBN is a great example of an issuer with climate focus and a regular issuer of Green bonds. AP2 invests in green bonds in order to source investment to climate mitigation projects and also to benefit from increased transparency and knowledge of the issuer. KBN's environmental impact report is a great example of reporting on Green Bonds where we as an investor get a clear overview and understanding of investments at a project level and also on the environmental impact."

*– Lars Lindblom, Portfolio Manager, Global Fixed Income, Green Bonds Second Swedish National Pension Fund/ AP2*

■■ "The response to KBN's Green Bond program from investors worldwide is testament to the strength of the institution's overall Green Bond Framework and the level of detail in the Impact Report. Quality reporting is an excellent vehicle for enhancing investor engagement and KBN has been successful in broadening its investor base through the Green bond program, most recently in its home currency of Norwegian kroner."

*– Ben Powell, Climate & Sustainable Financial Solutions, SEB*

# KEY REPORTING METHODOLOGY

We report in accordance with "Nordic Public Sector Issuers: position paper on green bonds impact reporting".

In 2017 KBN launched a position paper on environmental impact reporting in collaboration with nine other Nordic issuers of green bonds. This report is based on the guidelines contained in the position paper.


**KBN Norway's impact reporting** is conducted according to the principles and methodology presented in the Position Paper on Green Bonds Impact Reporting developed by a group of Nordic public sector green bond issuers, including KBN.

**THE CENTRAL PRINCIPLES OF OUR ENVIRONMENTAL IMPACT REPORTING ARE:**

- A project's impact is calculated on the basis of the proportion of the total investment cost that was financed by KBN.
- The minimum requirements stipulated in the relevant Norwegian guidelines are used as a reference point for calculations.
- We base our calculations on projected (ex-ante) values.
- The report quantifies emissions levels and emissions reductions for emissions in scopes 1 and 2 as defined by the Greenhouse Gas Protocol, which is to say direct emissions from projects and indirect emissions from the production of electricity and/or district heating.
- Emissions levels and emissions reductions for emissions in scope 3 (indirect emissions from the production of materials and other input factors) are assessed when awarding a green loan, but are not quantified in the 2017 report due to the significant uncertainties involved in such calculations.
- The amount of energy produced, the amount of energy saved, or the amount of energy consumption avoided, are converted to greenhouse gas emissions reductions and savings using an emission factor for electricity production in mainland EU and Norway (380g of CO2/kWh).
- We also report non-quantifiable information about projects in the portfolio.
- We report climate and environment impacts on a yearly basis.


“Norway is committed to a target of an at least 40 % reduction of greenhouse gas emissions by 2030 compared to 1990 levels”
NORWAY’S NATIONALLY DETERMINED CONTRIBUTION TO THE PARIS AGREEMENT

# PROJECT CATEGORIES

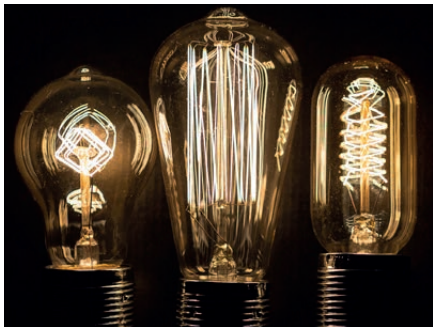
Following KBN Green Bond Framework updated in June 2016, Green Loans may be granted to eight different categories of projects:

## 1 NEW GREEN BUILDINGS

The category includes new, climate-smart and energy efficient buildings. Eligible projects may satisfy industry norms of 'energy-plus' or 'near-zero energy' buildings or receive the grading 'Excellent' or 'Outstanding' on the BREEAM-NOR classification system. Alternately, the building has a verifiable energy demand that is 20 percent lower than in a built-to-code reference project. In the assessment of a project's eligibility, the environmental profile of building materials is also taken into consideration.

## 2 ENERGY EFFICIENCY

Projects within this category reduce the energy requirements of existing buildings and phase out their use of fossil energy sources. Examples of projects include energy-conservation measures such as fitting additional insulation, replacing windows, installing hot-water heating, heat pumps, and central operational control systems. Renovating buildings to improve their energy efficiency. Replacing oil and gas boilers.



## 3 RENEWABLE ENERGY

Investments in this category are intended to reap the energy potential of the sun, the wind, the ground, the sea, biomaterials and other renewable energy carriers, and thereby to replace energy produced from fossil fuels and other energy sources that produce greenhouse gases. Projects include solar farms, geothermal wells, wind farms, wave power plants, fossil-fuel-free district heating plants.

## 4 LOW-CARBON TRANSPORTATION

Transport solutions that produce minimal or zero emissions, with no fossil fuels used. Examples of projects are public transportation systems, pedestrian- and cycle paths, bicycle parks, charging points for electric vehicles, fueling stations for renewable fuels, purchase of non-fossil run vehicles for municipal vehicle fleet.

## WASTE MANAGEMENT 5

Investments in this category are intended to ensure sustainable, energy efficient and resource-saving waste management. Eligible projects include the construction of new or ambitious reconstruction of existing waste management facilities; biogas plants, waste collection systems that minimise transport requirements, garbage trucks that run on renewable fuels, and carbon capture plants.

## WATER AND WASTEWATER MANAGEMENT 6

The purpose of projects in this category is to construct water and wastewater systems that are dimensioned to accommodate population growth and higher precipitation levels, and that apply innovative technologies to make good use of the resources contained in wastewater. Examples of projects are significant upgrades to water and wastewater networks, water treatment plants, treatment of discharges to watercourses, construction of biogas plants, and investment in energy and heat recovery from water and wastewater networks.

## CLIMATE CHANGE ADAPTATION 7

Investments in this category are intended to improve local adaptation to climate change. This includes facilities and installations to manage urban runoff, floods, landslides, avalanches, rising sea levels, and other challenges due to changed weather and climate conditions.

## SUSTAINABLE LAND USE 8

This category covers a range of projects that intend to ensure sustainable use of land. This may include projects such as restoration of biodiversity, planting forests, cleaning up of POPs and other pollutants, developing land into recreational space, facilitating walking, cycling and public transportation solutions.

**CATEGORY**

# NEW GREEN BUILDINGS

The category includes new, climate-smart and energy efficient buildings. Eligible projects may satisfy industry norms of 'energy-plus' or 'near-zero energy' buildings or receive the grading 'Excellent' or 'Outstanding' on the BREEAM-NOR classification system. Alternately, the building has a verifiable energy demand that is 20 percent lower than in a built-to-code reference project. In the assessment of a project's eligibility, the environmental profile of building materials is also taken into consideration.

**KBN GREEN LOANS TO NEW GREEN BUILDINGS**

| | | |
|---|---|---|
| Total outstanding* | 3 347 346 088 | **NOK** |

**ESTIMATED ANNUAL IMPACT OF GREEN LOANS**

| | | |
|---|---|---|
| Energy use avoided | 7 063 362 | **kWh** |
| Energy produced | 1 644 364 | **kWh** |
| GHG emissions avoided | 3 293 | **tonnes $CO_2e$** |

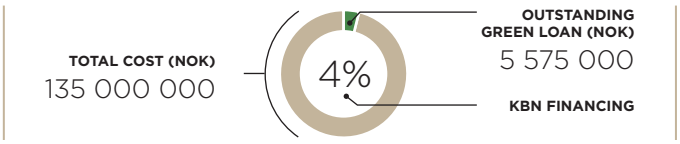
** In 2017, 83 percent of KBN's outstanding Green Loans portfolio was financed with green bonds. Hence, green bond investors who wish to calculate their share of impacts should depart from these figures. The share of outstanding green loans financed through green bonds may vary from one year to the other.*

## SPORTS FACILITY AT LYSTLUNDEN

### HORTEN MUNICIPALITY, VESTFOLD

Last disbursement: **2017**
Completion: **2019**

■■ Sports facility constructed according to the passive house standard. Heating system based on solar thermal energy and sea water heat pump.



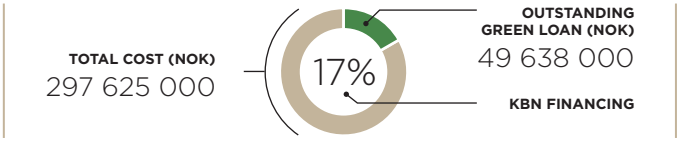

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **8 231** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **3** |

## GRANLY SCHOOL

### HORTEN MUNICIPALITY, VESTFOLD

Last disbursement: **2017**
Completion: **2018**

■■ New elementary school for 580 pupils. Constructed according to the 'passive house' standard. Heated with geothermal heat pumps. The facility includes a school garden.



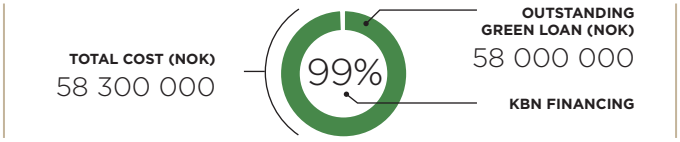

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **36 425** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **14** |

## ROSENVIK PUBLIC HOUSING

### ORKDAL MUNICIPALITY, TRØNDELAG

Last disbursement: **2017**
Completion: **2017**

■■ Assisted living homes and public housing in apartment complex constructed in mass timber. Locally produced cladding. The complex is heated by excess heat from a nearby smelting plant.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **115 546** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **44** |

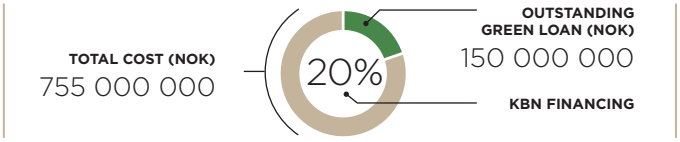
## HORTEN HIGH SCHOOL

### VESTFOLD COUNTY COUNCIL, VESTFOLD

Last disbursement: **2017**
Completion: **2019**

■■ New high school with a capacity of 1200 students. Constructed mainly in wooden materials. The building is to be BREEAM-NOR Outstanding certified, and will be energy positive (by FutureBuilt's definition) thanks to energy produced by solar (PV) panels on the roofs.

SEE CASE ON PAGE 14



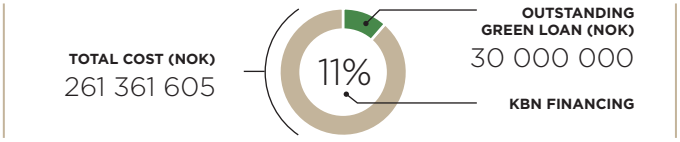

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **197 666** |
| Energy produced annually, in kWh: | **178 748** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **143** |

## FLESBERG MUNICIPALITY – FLESBERG SCHOOL WITH ATHLETIC FACILITIES AND SWIMMING POOL

### FLESBERG MUNICIPALITY, BUSKERUD

Last disbursement: **2017**
Completion: **2019**

■■ Elementary- and middle school with a capacity of up to 420 students. The project also includes sports and swimming facilities, all constructed in mass timber.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **39 166** |
| Energy produced annually, in kWh: | **14 202** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **20** |

Horten high school. Illustration: Brick Visual/ LINK arkitektur

CASE

# ENERGY-POSITIVE SCHOOL IN HORTEN RAISES THE BAR FOR THE REGION



**VESTFOLD COUNTY COUNCIL, VESTFOLD**

At the start of the school year in August 2019, 1,200 students in Horten will find themselves in a new, green, state-of-the-art school in the middle of Lystlunden city park. The energy-positive school is built in wood and will be certified according to the strict BREEAM NOR Outstanding standard.

PLEASE SEE PAGE 13 FOR FINANCIAL DETAILS

Horten high school. Illustration: Brick Visual/ LINK arkitektur

## Significant environmental impact

The environmental ambitions are high and permeate the entire project. Calculations show a total reduction of 3,400 tonnes of CO2 from the construction process, equivalent to 43,000 iPhone Xs - or half a million steaks of beef. In addition the school produces more, renewable energy than it consumes.

> "The surplus energy from the school will be used to charge electric cars and bikes for students and employees. In addition, we are working to implement autonomous electric buses from hubs in Horten city center to the school," says Christian Egeberg, Property Manager in Vestfold County.

In order to realise the ambitions, decisions regarding construction materials, insulation and heat sources have been crucial. Solid wood, recycled steel, low-energy lightning, and recyclable ground heat help reduce the environmental footprint.

Every opportunity to reduce the climate impact is utilized. For example, the roof is covered by 3,470 square metres of solar panels. The construction process also followed the BREEAM NOR Outstandingstandard, which sets environmental and sustainability requirements all the way from the engineering process to the construction's final completion.

## Will benefit the community

The school will be available to Horten's residents, and especially Horten's youth. Large parts of the building and the outdoor area will be open 24/7, and will be accessible and organised for different activities.

> "This is a ripple effect-project. The environment is taken into consideration in other local projects as well. The new sports facility in Horten will harness solar energy and store it in wells during the winter. It is far from certain that this would have been realised before Horten High School raised the bar," says Egeberg.

The school is funded by Vestfold County through KBN's green loans and has received financial support from Enova and Klimasats. Veidekke AS is the contractor.

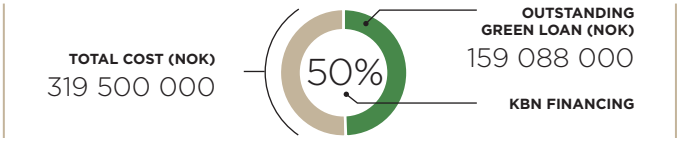
When the 18,000 m2 school is ready to be used, the hope is that it will be a model building that inspires other construction projects to reduce their impact, both during and after the building's construction.

## KONGSVINGER MIDDLE SCHOOL

### KONGSVINGER MUNICIPALITY, HEDMARK

Last disbursement: **2017**
Completion: **2018**

■■ Middle school constructed in mass timber. The school will accommodate 720 students, replacing four existing school buildings. The building is to be BREEAM-NOR Very Good certified.



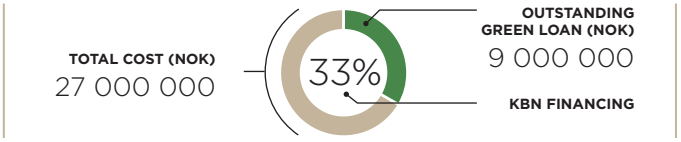

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **112 830** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **43** |

## FLÅ DAY CARE CENTRE

### FLÅ MUNICIPALITY, BUSKERUD

Last disbursement: **2017**
Completion: **2018**

■■ Flå day care centre is being expanded with four new sections in a mass timber construction connected to the existing building.



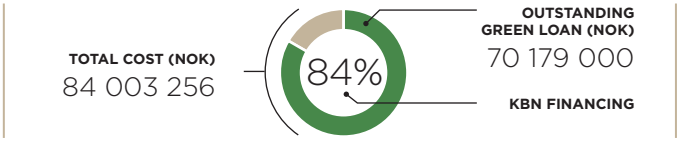

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **1 423** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **0** |

## LENANGEN PRIMARY SCHOOL

### HORTEN MUNICIPALITY, VESTFOLD

Last disbursement: **2017**
Completion: **2018**

■■ School building for 60 students, built in mass timber.



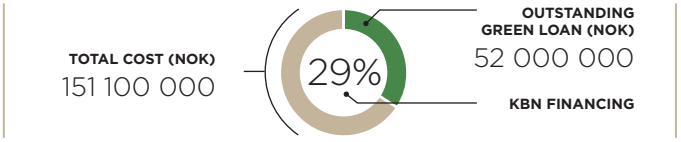

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **877** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **0** |

## ROMSDAL HIGH SCHOOL

### MØRE OG ROMSDAL COUNTY COUNCIL, MØRE OG ROMSDAL

Last disbursement: **2017**
Completion: **2017**

■■ New Romsdal high school with a capacity of 800 students will be constructed in mass timber. Energy efficient 'low-tech' ventilation system. Heating and cooling generated on-site through 32 geothermal wells.



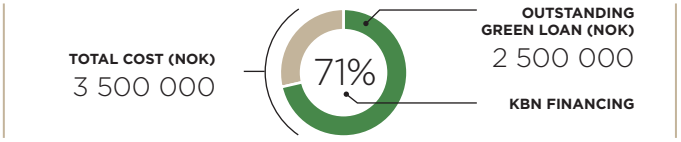

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **139 477** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **53** |

## PASSIVE HOUSE CONSTRUCTION PROJECT FOR HIGH SCHOOL STUDENTS

### ÅFJORD MUNICIPALITY, TRØNDELAG

Last disbursement: **2017**
Completion: **2017**

■■ Two assisted living homes built according to the 'passive house' standard, constructed by students enrolled in the building construction program at Åfjord High School.



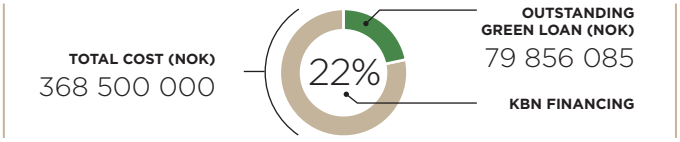

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **4 394** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **2** |

## HOPPERN PRIMARY SCHOOL AND ATHLETIC FACILITY

**MOSS MUNICIPALITY, ØSTFOLD**

Last disbursement: **2017**
Completion: **2019**

■■ School building and athletic facility, both constructed in mass timber. The school has a capacity of 450 students.



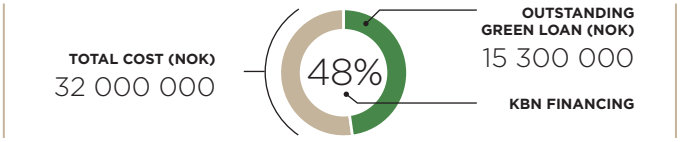

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **49 036** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **2** |

## ASSISTED LIVING HOMES

**EID MUNICIPALITY, SOGN OG FJORDANE**

Last disbursement: **2017**
Completion: **2019**

■■ Apartment building with 11 assisted living homes, built in mass timber. Heating through fjord-based district heating.



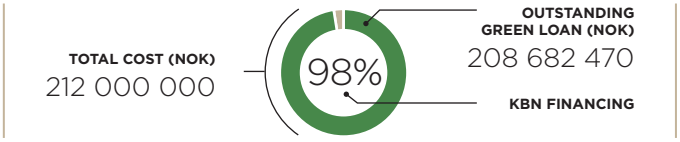

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **43 662** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **17** |

## HOMMELVIK MIDDLE SCHOOL

**MALVIK MUNICIPALITY, TRØNDELAG**

Last disbursement: **2017**
Completion: **2017**

■■ Middle school building constructed in low-emission materials, including cladding from locally sourced pine trees. The building will have room for 400 students, replacing an old building from 1966. Geothermal heat pumps covers 90 percent of heat demand



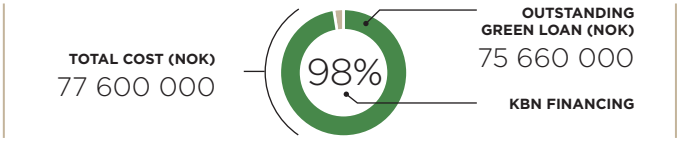

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **273 241** |
| Energy produced annually, in kWh: | **202 659** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **181** |

## KISTEFOSSDAMMEN DAY CARE CENTRE

**ASKER MUNICIPALITY, AKERSHUS**

Last disbursement: **2016**
Completion: **2017**

■■ Day care centre accommodating up to 100 children. Extensive use of timber in the building construction and facades. The building is Norway's first public energy-positive 'plus house' (as defined by FutureBuilt). The building is self-sufficient in renewable energy produced by three energy wells and 300 m2 high-efficiency solar cells integrated in the roof construction.



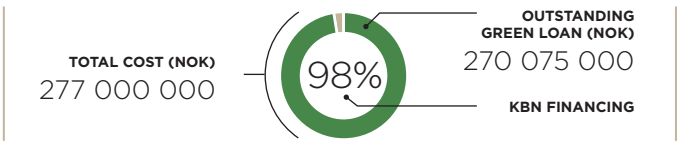

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **118 950** |
| Energy produced annually, in kWh: | **44 237** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **62** |

## HOLMEN INDOOR POOL

**ASKER MUNICIPALITY, AKERSHUS**

Last disbursement: **2016**
Completion: **2017**

■■ One of Norway's most energy efficient swimming pools with innovative building technology and solutions. 80 percent of the facility's energy consumption is covered by renewable energy produced on-site through geothermal heat pumps, solar (PV) panels and solar thermal energy.



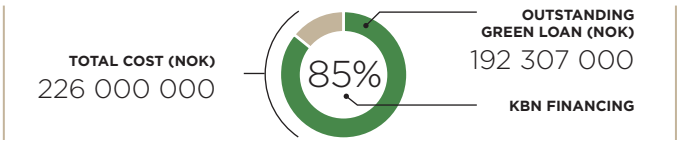

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **1 177 267** |
| Energy produced annually, in kWh: | **1 199 458** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **903** |

## ULLERUD HEALTH CENTRE

### FROGN MUNICIPALITY, AKERSHUS

Last disbursement: **2016**
Completion: **2017**

■■ Norway's largest health care building constructed in mass timber. The 12,000-sqm building includes a nursing home for 108 patients, a rehabilitation centre, as well as a café and day care centre for the elderly.



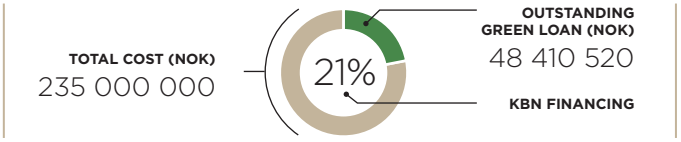

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **1 041 521** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **396** |

## ÅSLY SCHOOL

### RISSA MUNICIPALITY, SØR-TRØNDELAG

Last disbursement: **2015**
Completion: **2016**

■■ Elementary- and middle school accommodating 400 students. Constructed according to the passive house standard.



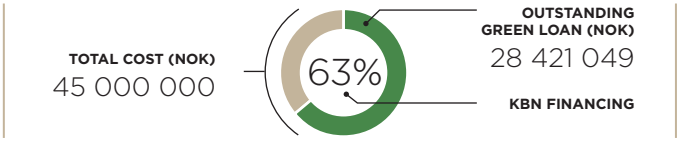

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **74 309** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **28** |

## EMERGENCY SERVICES BUILDING

### RISSA MUNICIPALITY, SØR-TRØNDELAG

Last disbursement: **2015**
Completion: **2016**

■■ Co-located fire- and ambulance stations to a single energy-efficient building. The office section satisfies 'passive house' building standard.



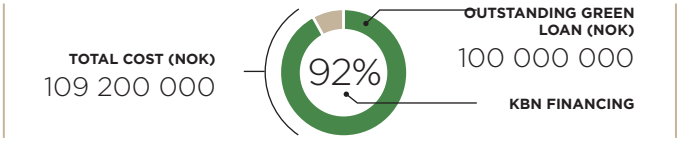

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **65 197** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **25** |

## FARSUND MUNICIPALITY

### ALCOA SPORTS FACILITY, VEST-AGDER

Last disbursement: **2014**
Completion: **2016**

■■ Multi-use sports facility and year-round grass pitch, with 97 percent of heat demand covered by excess heat from nearby Alcoa aluminium factory. Energy efficient building.



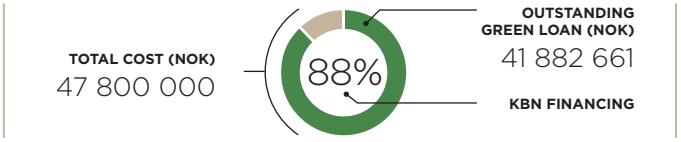

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **377 747** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **144** |

## ØDEGÅRDEN DAY CARE CENTRE

### OPPEGÅRD MUNICIPALITY, AKERSHUS

Last disbursement: **2014**
Completion: **2014**

■■ Day care for 100 children, built according to the 'passive house' standard. Heating and cooling from geothermal wells. Six units, accommodating 100 children. "Green roof" with vegetation absorbing rainwater and providing insulation.



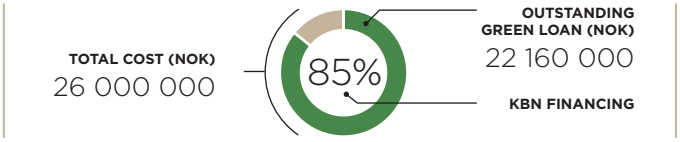

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **153 326** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **58** |

## AUGESTAD DAY CARE CENTRE

**OPPEGÅRD MUNICIPALITY, AKERSHUS**

Last disbursement: **2014**
Completion: **2014**

■■ Day care centre for 36 children, constructed according to 'passive house' standard. Heated through geothermal heat pumps.



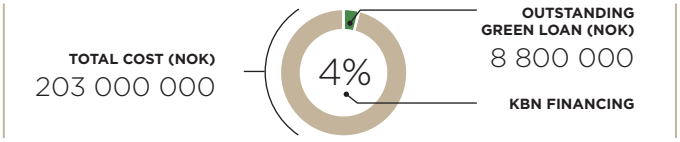

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **2 148** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2$e: | **1** |

## NEW SECTION, HØYÅS NURSING HOME

**OPPEGÅRD MUNICIPALITY, AKERSHUS**

Last disbursement: **2014**
Completion: **2015**

■■ Extension to existing nursing home, constructed according to the 'passive house' standard. Heated through geothermal heat pumps. The new section utilises the eRom system, a welfare technology system with touch screens in every room.



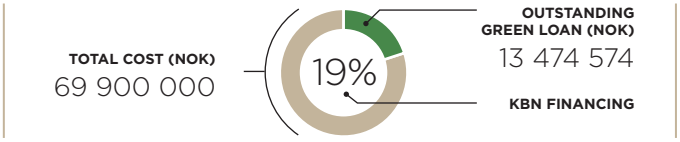

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **24 007** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2$e: | **9** |

## TORRIDAL ELEMENTARY SCHOOL

**KRISTIANSAND MUNICIPALITY, VEST-AGDER**

Last disbursement: **2014**
Completion: **2015**

■■ Elementary school meeting the requirements in the 'passive house' standard. Capacity of up to 200 students.



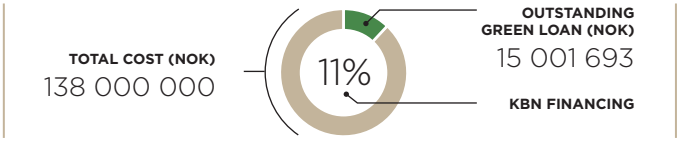

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **20 349** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2$e: | **8** |

## FAGERHOLT PRIMARY SCHOOL

**KRISTIANSAND MUNICIPALITY, VEST-AGDER**

Last disbursement: **2014**
Completion: **2016**

■■ School building constructed meeting the 'passive house' standard. Capacity of up to 500 students.



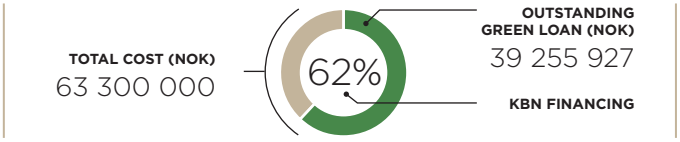

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **35 990** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2$e: | **14** |

## HELLEMYR SPORTS CENTRE

**KRISTIANSAND MUNICIPALITY, VEST-AGDER**

Last disbursement: **2014**
Completion: **2015**

■■ Sports centre constructed as a 'passive house' with an estimated energy load of less than half of the energy requirements in the building code. Extensive use of low-emission materials, such as timber trusses and pillars.



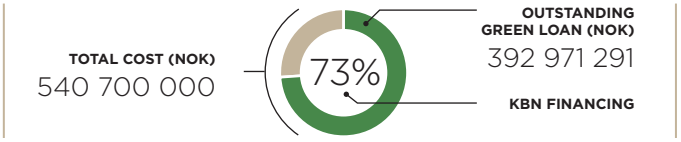

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **316 757** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2$e: | **120** |

## CITY HALL

### KRISTIANSAND MUNICIPALITY, VEST-AGDER

Last disbursement: **2014**
Completion: **2014**

■■ 9,600 sqm. of new constructions and renovation of 5,600 sqm., including structures listed in the heritage register. Water-borne heating system, where the base load is excess heat from the municipality's on-site data centre. Seawater-based cooling system. The project as a whole realises a 50 percent reduction in emissions compared to a reference project.



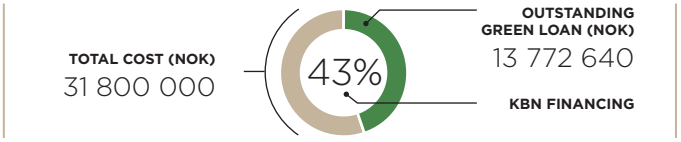

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **645 985** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **246** |

## GREVERUDÅSEN ASSISTED LIVING HOMES

### OPPEGÅRD MUNICIPALITY, AKERSHUS

Last disbursement: **2013**
Completion: **2013**

■■ Assisted living residences for people with disabilities. Built in line with the 'passive house' standard. Connected to district heating system.



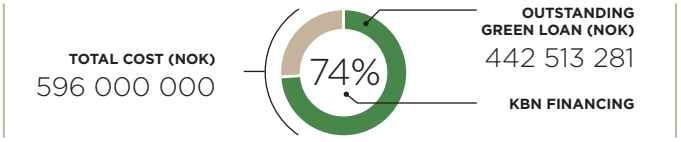

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **36 658** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **14** |

## AQUARAMA WATER PARK

### KRISTIANSAND MUNICIPALITY, VEST-AGDER

Last disbursement: **2013**
Completion: **2013**

■■ Low-energy facility housing a community water park, swimming pools, fitness and sports centres, and various public health services. Heated through district heating and recycled heat from ventilation.



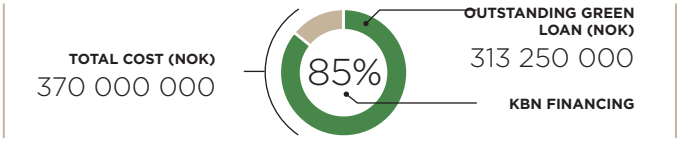

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **1 113 708** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **423** |

## KIRKENES SCHOOL

### SØR-VARANGER MUNICIPALITY, FINNMARK

Last disbursement: **2012**
Completion: **2012**

■■ Primary- and middle school with a significantly low energy demand, considering climate conditions in the northernmost part of Norway. Replaces a number of old buildings.



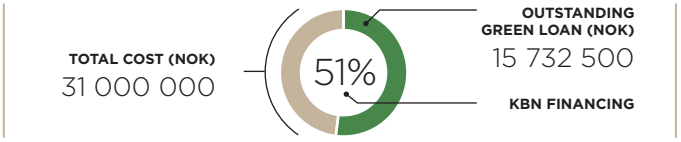

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **314 943** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **120** |

## OFFICE BUILDING

### ROMERIKE AVFALLSFOREDLING IKS, AKERSHUS

Last disbursement: **2012**
Completion: **2013**

■■ Office premises for Romerike Avfallsforedling's new sorting and recycling facility. Partly constructed in recycled building materials. Meets the 'passive house' requirements.



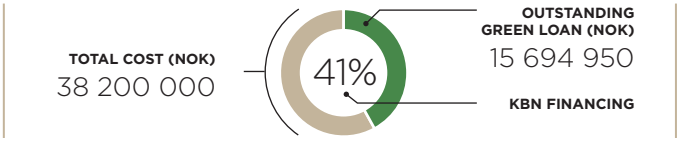

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **42 950** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **16** |

## ØVRE SLETTEHEIA DAY CARE CENTRE

**KRISTIANSAND MUNICIPALITY, VEST-AGDER**

Last disbursement: **2012**
Completion: **2012**

■■ Day care constructed as low-energy building with roof-mounted solar (PV) panels. Low-emission cellulose insulation. Heating from water-to-water groundwater heat pump.



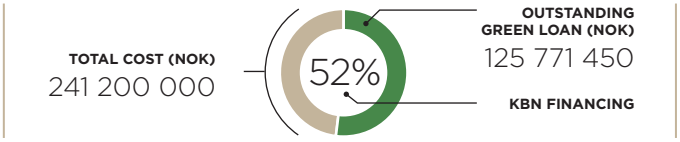

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **23 561** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **9** |

## HOKKSUND MIDDLE SCHOOL

**ØVRE EIKER MUNICIPALITY, BUSKERUD**

Last disbursement: **2011**
Completion: **2012**

■■ School building built to satisfy the 'passive house' standard, with a capacity of up to 405 students. Partly constructed in timber.



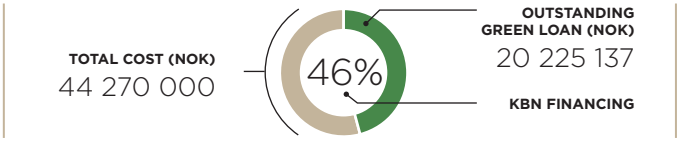

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **110 389** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **42** |

## MØLLESTUA DAY CARE CENTRE

**KRISTIANSAND MUNICIPALITY, VEST-AGDER**

Last disbursement: **2011**
Completion: **2011**

■■ 'Passive-house' day care centre building for up to 100 children. On-site renewable energy production from 300 sq.m. solar (PV) panels and 26 sq. m. of thermal solar panels on the roof. Constructed using low-carbon concrete.



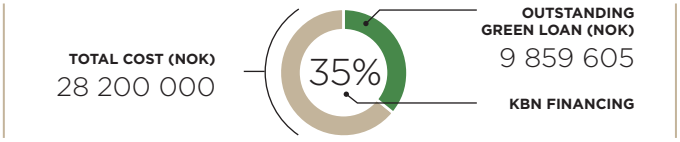

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **56 458** |
| Energy produced annually, in kWh: | **5 060** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **23** |

## FJELL DAY CARE CENTRE

**DRAMMEN MUNICIPALITY, BUSKERUD**

Last disbursement: **2010**
Completion: **2011**

■■ Day care centre constructed in mass timber, according to the 'passive house' standard. Capacity of up to 90 children. The building is heated through ground source heat pumps.



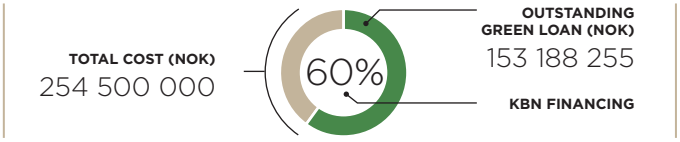

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **21 118** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **8** |

## MARIENLYST SCHOOL

**DRAMMEN MUNICIPALITY, BUSKERUD**

Last disbursement: **2010**
Completion: **2011**

■■ First school in Norway to be constructed according to the 'passive house' standard. Capacity of up 560 students. Heating through district heating. Compact building with a central location that reduces the need for transportation.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy avoided annually: | **268 050** |
| Energy produced annually, in kWh: | **0** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **102** |

Photo: Daniel Foster

**CATEGORY**

# ENERGY EFFICIENCY

Projects within this category reduce the energy requirements of existing buildings and phase out their use of fossil energy sources. Examples of projects include energy-conservation measures such as fitting additional insulation, replacing windows, installing hot-water heating, heat pumps, and central operational control systems. Renovating buildings to improve their energy efficiency. Replacing oil and gas boilers.

**KBN GREEN LOANS TO ENERGY EFFICIENCY PROJECTS**

| | | |
|---|---|---|
| Total outstanding* | 149 427 400 | **NOK** |

**ESTIMATED ANNUAL IMPACT OF GREEN LOANS**

| | | |
|---|---|---|
| Energy savings | 20 826 113 | **kWh** |
| GHG emissions avoided | 7 950 | **tonnes $CO_2e$** |

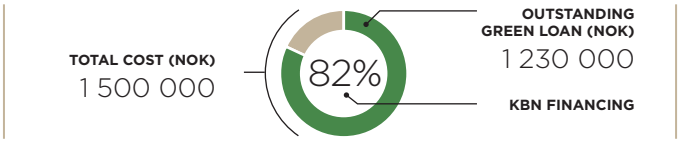
** In 2017, 83 percent of KBN's outstanding Green Loans portfolio was financed with green bonds. Hence, green bond investors who wish to calculate their share of impacts should depart from these figures. The share of outstanding green loans financed through green bonds may vary from one year to the other.*

## LED OUTDOOR LIGHTING

### HORTEN MUNICIPALITY, VESTFOLD

Last disbursement: **2017**
Completion: **2017**

■■ Light fixtures outside municipal buildings are upgraded and replaced with LED lighting.



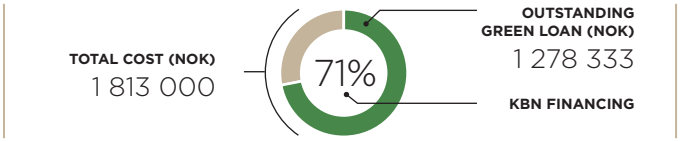

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **31** |
| Energy savings, in kWh: | **82 000** |

## BIO-BASED HEATING

### RØMSKOG MUNICIPALITY, TRØNDELAG

Last disbursement: **2017**
Completion: **2017**

■■ Replacing traditional oil-based heating with bio-based heating in school, nursing home, and town hall.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **35** |
| Energy savings, in kWh: | **-** |

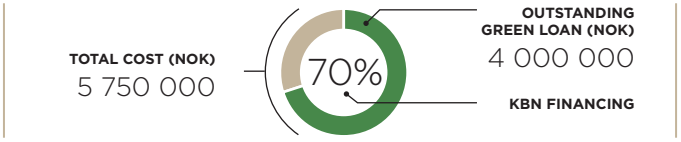
## ENERGY EFFICIENCY PROJECT SIRATUN

### UTSIRA MUNICIPALITY, ROGALAND

Last disbursement: **2017**
Completion: **2017**

■■ Energy efficiency project, including water-borne heating system with heat pumps and new lighting in the municipal building, Siratun.

SEE CASE ON PAGE 23



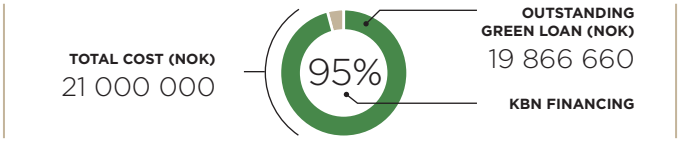

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **49** |
| Energy savings, in kWh: | **129 391** |

## ENERGY EFFICIENCY THROUGH EPC

### JEVNAKER MUNICIPALITY, OPPLAND

Last disbursement: **2017**
Completion: **2017**

■■ Energy efficiency measures implemented through energy performance contract (EPC).



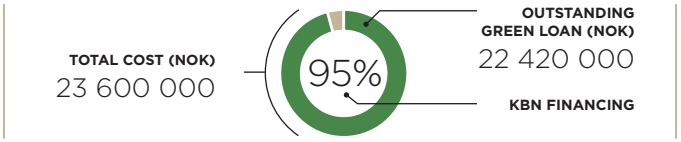

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **722** |
| Energy savings, in kWh: | **1 899 351** |

## ENERGY EFFICIENCY THROUGH EPC

### SANDEFJORD MUNICIPALITY, VESTFOLD

Last disbursement: **2016**
Completion: **2018**

■■ Improving energy efficiency in 18 public buildings through energy performance contract (EPC). The project includes phasing-out of fossil energy sources.



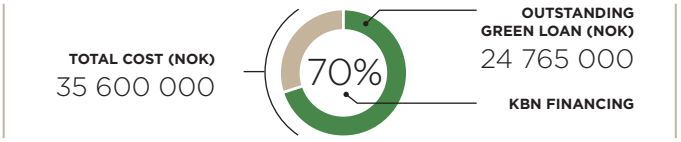

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **1 119** |
| Energy savings, in kWh: | **2 945 000** |

## ENERGY EFFICIENCY PROJECT

### ASKER MUNICIPALITY, AKERSHUS

Last disbursement: **2016**
Completion: **2018**

■■ Energy efficiency measures and phasing-out of fossil fuels in public buildings. The project includes several innovative solutions such as utilising excess heat from the production of skating ice, to heat swimming pools.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **1 454** |
| Energy savings, in kWh: | **3 826 053** |

Photo: Stian Øyen

CASE

# NORWAY'S SMALLEST MUNICIPALITY SAVES BIG

Siratun, the local municipal hall at the island of Utsira had poor indoor climate and high energy costs. Recently it was transformed into a modern, energy-efficient building, financed by KBN's green loans.



**UTSIRA MUNICIPALITY, ROGALAND**

PLEASE SEE PAGE 22 FOR FINANCIAL DETAILS

Rehabilitation of Siratun

Siratun

The large, red municipal hall of Siratun is an important gathering place for the residents of Utsira. However, the building, which houses a swimming pool, sporting facility, infirmary and the local administration office, was outdated.

> "We had high energy costs and a terrible indoor climate. At the same time, Utsira Municipality has adopted an ambitious climate and energy plan, with renovations of Siratun being the first point of order. With green loans from KBN, we have been able to finance the upgrade," says Utsira's Chief Municipal Executive, Bjørn Aadnesen.

According to the executive, the municipality can expect strong results.

> "We'll save 260-300,000 kWh, and about as many Norwegian kroner. For Norway's smallest municipality with its 201 inhabitants, this is a significant sum and a large cut in emissions. In addition, we'll have a fantastic indoor climate for employees and patients," he says.

## Wants to lead the way in green solutions

Utsira may be the smallest municipality, but its green ambitions are high. The ferry boat between Utsira and the mainland will be electrified. A land-based fish farm run by solar cells and hydrogen is to be established, where waste will be converted into biogas.

The projects are financed by Rogaland County, Enova, Utsira Municipality, and with green loans from KBN.

## Save money and the environment

Aadnesen recommends other municipalities to review the energy use of municipal buildings.

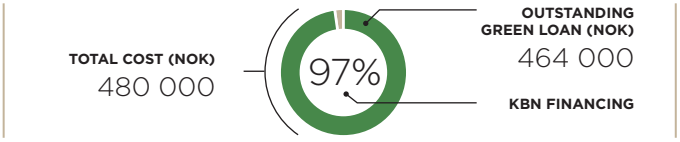
> "Evaluating old buildings with old-fashioned modes of operation can lead to significant savings. Bring in expertise and carry out an energy review of municipal buildings. The Siratun construction will last another 50-100 years as long as we upgrade and modernise, as we now have with KBN's help," Aadnesen concludes.

## LED OUTDOOR LIGHTING

### BARDU MUNICIPALITY, TROMS

Last disbursement: **2016**
Completion: **2017**

■■ Bardu Municipality is replacing 10% of existing street light fixtures with LED fixtures



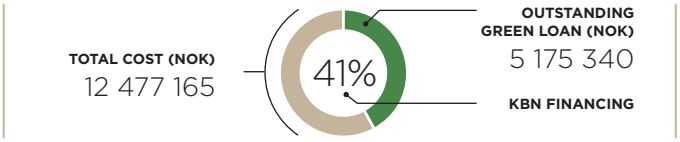

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **5** |
| Energy savings, in kWh: | **12 760** |

## REDUCING ENERGY CONSUMTION OF PUBLIC BUILDINGS

### RENDALEN MUNICIPALITY, HEDMARK

Last disbursement: **2016**
Completion: **2018**

■■ Reducing energy consumption in 11 municipal buildings, carried out through an energy performance contract (EPC).



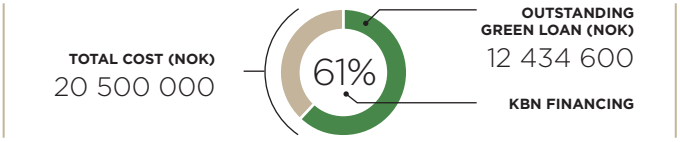

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **287** |
| Energy savings, in kWh: | **754 183** |

## ENERGY EFFICIENCY MEASURES IN BUILDINGS AND WATER WORKS

### SPYDEBERG MUNICIPALITY, ØSTFOLD

Last disbursement: **2016**
Completion: **2016**

■■ Improving energy efficiency in nine public buildings and two waterworks. The project phases out two oil-based heating systems.



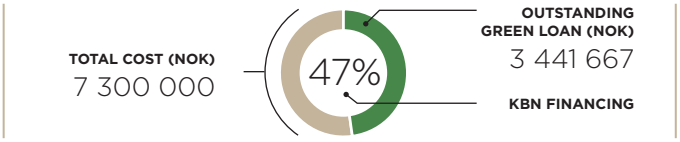

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **536** |
| Energy savings, in kWh: | **1 410 119** |

## ENERGY EFFICIENCY THROUGH EPC

### SURNADAL MUNICIPALITY, MØRE OG ROMSDAL

Last disbursement: **2015**
Completion: **2017**

■■ Energy efficiency project with guaranteed results through energy performance contract (EPC). This covers the town hall, Surnadal middle school, and other public buildings.



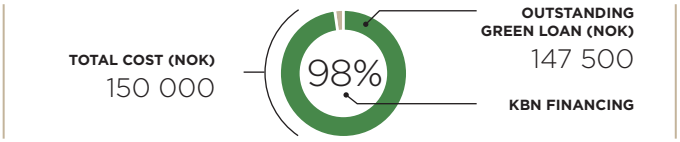

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **220** |
| Energy savings, in kWh: | **578 395** |

## LED OUTDOOR LIGHTING

### SURNADAL MUNICIPALITY, ROGALAND

Last disbursement: **2015**
Completion: **2017**

■■ Replacing traditional light fixtures with LED lights.



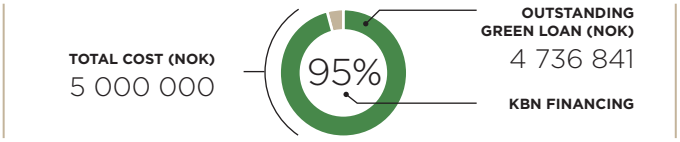

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **3** |
| Energy savings, in kWh: | **6 982** |

## ENERGY PERFORMANCE PROJECT

### RISSA MUNICIPALITY, TRØNDELAG

Last disbursement: **2014**
Completion: **2015**

■■ Improving energy efficiency in five buildings through an energy performance contract (EPC).



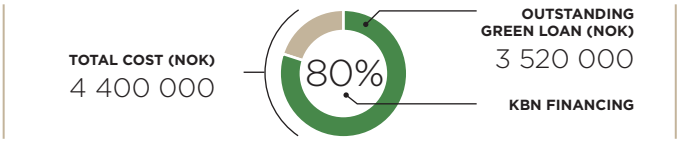

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **559** |
| Energy savings, in kWh: | **1 472 037** |

## CENTRAL OPERATIONAL CONTROL SYSTEM

### OPPEGÅRD MUNICIPALITY, AKERSHUS

Last disbursement: **2014**
Completion: **2014**

■■ Monitoring and controlling energy consumption in municipal buildings through a central operational control system.



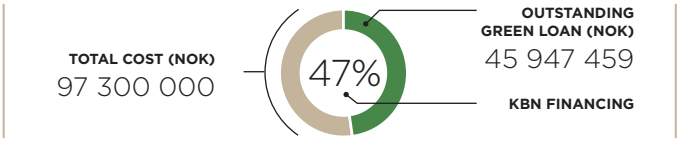

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **59** |
| Energy savings, in kWh: | **154 248** |

## ENERGY EFFICIENCY AND FOSSIL-FREE HEATING

### KRISTIANSAND MUNICIPALITY, VEST-AGDER

Last disbursement: **2014**
Completion: **2016**

■■ Light fixtures outside municipal buildings are upgraded and replaced with LED lighting.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Corresponds to emissions avoided annually in tonnes of $CO_2$: | **2 871** |
| Energy savings, in kWh: | **7 555 594** |

Grødaland Biogas Plant
Photo: IVAR IKS

**CATEGORY**

# RENEWABLE ENERGY

Investments in this category are intended to reap the energy potential of the sun, the wind, the ground, the sea, biomaterials and other renewable energy carriers, and thereby to replace energy produced from fossil fuels and other energy sources that produce greenhouse gases. Projects include solar farms, geothermal wells, wind farms, wave power plants, fossil-fuel-free district heating plants.

### KBN GREEN LOANS TO RENEWABLE ENERGY

| | | |
|---|---|---|
| Total outstanding* | 391 103 300 | **NOK** |

### ESTIMATED ANNUAL IMPACT OF GREEN LOANS

| | | |
|---|---|---|
| Energy produced | 62 043 572 | **kWh** |
| GHG emissions avoided | 23 576 | **tonnes $CO_2e$** |

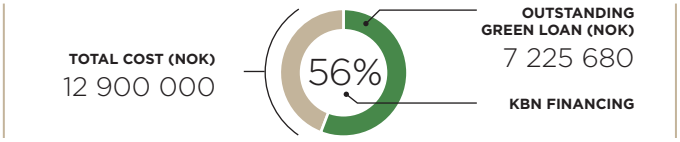
** In 2017, 83 percent of KBN's outstanding Green Loans portfolio was financed with green bonds. Hence, green bond investors who wish to calculate their share of impacts should depart from these figures. The share of outstanding green loans financed through green bonds may vary from one year to the other.*

## FJORD-BASED DISTRICT HEATING

### EID FJORDVARME KF, SOGN OG FJORDANE

Last disbursement: **2017**
Completion: **2017**

■■ District heating system based on low-temperature (8 to 12 degrees Celsius) seawater collected 50 metres below fjord surface and fed into heat exchangers. The installation supplies more than 100 000 square metres of buildings in central Nordfjordeid with affordable and environmentally friendly heat and cooling.



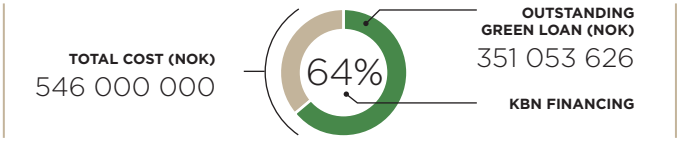

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy produced annually, in kWh: | **4 649 081** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **1 767** |

## GRØDALAND BIOGAS PLANT

### IVAR IKS, ROGALAND

Last disbursement: **2017**
Completion: **2017**

■■ Plant for biogas production based on sewage sludge and organic waste. The biogas feeds into the regional gas network. The facilities also include an 8 MW steam heat production plant incinerating de-watered bio residue and timer waste.



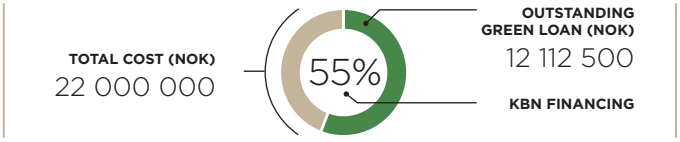

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy produced annually, in kWh: | **57 223 027** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **21 745** |

## FRØYA GJENVINNINGSSTASJON

### HAMOS FORVALTNING IKS, TRØNDELAG

Last disbursement: **2017**
Completion: **2017**

■■ New recycling facility with 600 square metres of solar (PV) panels on walls and roof. Research project on energy storage in thermal wells, together with SINTEF research centre.



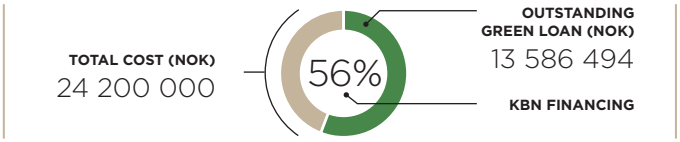

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy produced annually, in kWh: | **46 798** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **18** |

## SANDBAKKEN RECYCLING FACILITY

### HVALER MUNICIPALITY, ØSTFOLD

Last disbursement: **2016**
Completion: **2016**

■■ Recycling facility producing its own energy through 1,200 square metres of solar (PV) panels and four micro windmills. Excess power is stored in batteries until needed.



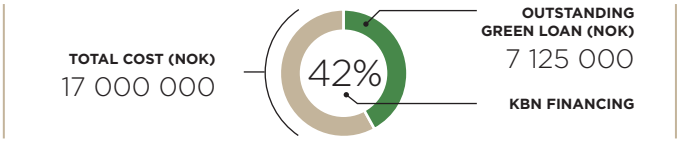

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy produced annually, in kWh: | **112 092** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **41** |

## PV PLANT AT ORKDAL WASTE TRANSFER FACILITY

### HAMOS FORVALTNING IKS, TRØNDELAG

Last disbursement: **2016**
Completion: **2016**

■■ Waste transfer hall with 200 square metres of solar (PV) panels in the façade. Upon replacement of machinery, electric loaders will be purchased.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Energy produced annually, in kWh: | **12 574** |
| Corresponds to GHG emissions avoided annually, in tonnes of $CO_2e$: | **5** |

Bergen Light Rail
Photo: Paul S. Amundsen

**CATEGORY**

# LOW-CARBON TRANSPORTATION

Transport solutions that produce minimal or zero emissions, with no fossil fuels used. Examples of projects are public transportation systems, pedestrian- and cycle paths, bicycle parks, charging points for electric vehicles, fueling stations for renewable fuels, purchase of non-fossil run vehicles for municipal vehicle fleet.

**KBN GREEN LOANS TO LOW-CARBON TRANSPORTATION**

| | | |
|---|---|---|
| Total outstanding* | 5 334 536 892 | **NOK** |

**ESTIMATED ANNUAL IMPACT OF GREEN LOANS**

| | | |
|---|---|---|
| Reduced/avoided emissions | 5 970 | **tonnes $CO_2e$** |

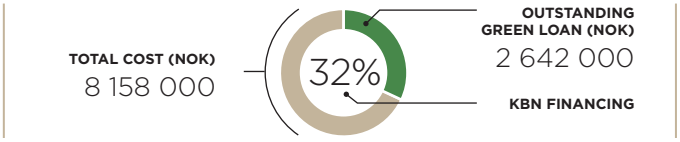
** In 2017, 83 percent of KBN's outstanding Green Loans portfolio was financed with green bonds. Hence, green bond investors who wish to calculate their share of impacts should depart from these figures. The share of outstanding green loans financed through green bonds may vary from one year to the other.*

## SHORE-SIDE POWER SUPPLY

### PORT OF HARSTAD, NORDLAND

Last disbursement: **2017**
Completion: **2018**

■■ Mobile shore-side power supply for ships at berth. Can service four docks.
The installation will reduce local air pollution in the town of Harstad. The town port saw approx. 1840 dockings by ships exceeding a gross tonnage of 100 in 2016.



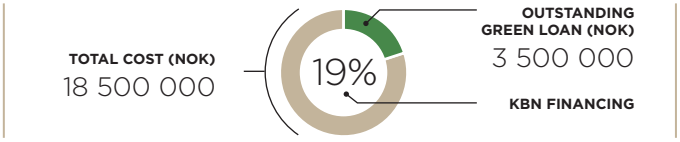

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of CO2e | **0** |

## BIOGAS VEHICLES

### HORTEN MUNICIPALITY, VESTFOLD

Last disbursement: **2017**
Completion: **2018**

■■ Purchase of biogas vehicles for the municipality's car fleet. A new fuelling station for liquid biogas is also established, see separate project. Biogas does not contain sulphur or other harmful substances, and the exhaust is virtually odourless. 70 to 90 cars will be replaced within two years.



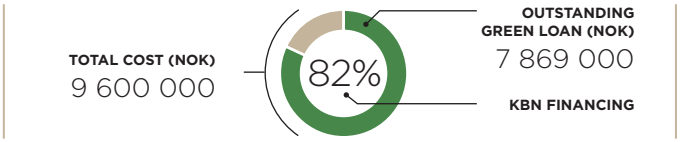

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of $CO_2e$ | **0** |

## RENEWABLE ENERGY FUELLING STATION

### HORTEN MUNICIPALITY, VESTFOLD

Last disbursement: **2017**
Completion: **2017**

■■ Fuelling station providing liquid biogas (LBG) for municipal vehicles as well as privately owned vehicles. The renewable fuel is to be generated from organic waste and sewage sludge at Greve biogas plant, which Horten co-owns together with neighbouring municipalities.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of $CO_2e$ | **213** |

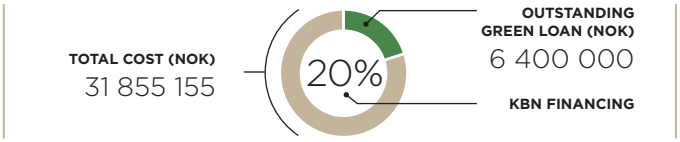
## SHORE-SIDE POWER SUPPLY

### PORT OF BÅTSFJORD, FINNMARK

Last disbursement: **2017**
Completion: **2018**

■■ Mobile shore-side power supply and charging capacity for up to 44 large vessels along four public harbour fronts. The power is generated locally by newly established municipal wind turbines. Electrifying the harbour reduces $CO_2$ emissions, local air pollution, and noise pollution.

SEE CASE ON PAGE 30



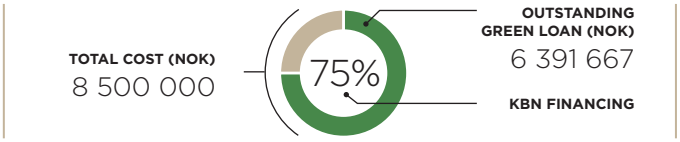

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of $CO_2e$ | **1** |

## FOOT- AND BIKE PATH

### RØMSKOG MUNICIPALITY, ØSTFOLD

Last disbursement: **2017**
Completion: **2017**

■■ 700 metres of foot- and bike path connecting the school and the town hall to residential areas.
Safe and environmentally friendly transport to school and work.



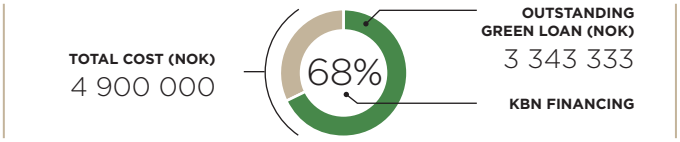

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of $CO_2e$ | **0** |

## SVARTVATNET - FOOTPATH AND RECREATIONAL AREA

### SURNADAL MUNICIPALITY, MØRE OG ROMSDAL

Last disbursement: **2017**
Completion: **2017**

■■ Public road transformed into recreational area with foot and bike path.
The project's aim is to reduce car traffic and increase the number of students walking or biking to school.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of $CO_2e$ | **0** |

Båtsfjord, Neptunbukta,
Photo: Gøran Nilsen

CASE

# ELECTRIFICATION OF BÅTSFJORD HARBOUR



**PORT OF BÅTSFJORD, FINNMARK**

Before the end of 2018, both the residents of Båtsfjord and those docking at the arctic harbour will be able to enjoy less noise and less local air pollution.

PLEASE SEE PAGE 29 FOR FINANCIAL DETAILS

Unloading of wind turbines

Båtsfjord Harbour is one of the largest fishing harbours in Norway

With support from Enova and green loans from KBN, one of the largest fishing harbours in Norway will be supplied with electricity from local wind power. The electrification will serve 44 ships at a time with power from Hamnefjell Wind.

> "We see immediate positive effects, and locally we notice reduced noise emissions. At the same time, we help reduce climate emissions, which is a global problem, and that feels good, says Øystein Jørgensen, Head of Båtsfjord Havn KF.

## A necessity

> "For us, this is about solving an absolute need. Since the harbour is situated in the middle of the village, we had a huge problem with noise from auxiliary engines, and we look forward to resolving this," says Jørgensen.

He says that both locals and the staff at the port, as well as the boats docking at the harbour, greatly appreciate the project.

> "Those docking boats are very happy. A large portion of them live here in Båtsfjord, and now they don't have to feel like they are a burden for the local community when the harbour is electrified."

## Provides competitiveness

Jørgensen believes the project will increase the competitiveness of the port and help promote Båtsfjord as a service port for the fishing industry in the Barents Sea.

> "We expect at least a 20% increase in landing volume, as we can offer power from land, the harbour is dredged and therefore deeper, and as local services are expanding," he says.

## Green profile

Båtsfjord Harbour wishes to contribute to the municipality's green profile and is implementing several climate-friendly measures, in addition to the electrification. This includes expanding the central warehouse, expanding and upgrading the oil depot according to environmental and emissions requirements, and taking part in the initiative "Fishing for litter" against marine littering. The electrification of the harbouris schedueled to be completed by the end of 2018.

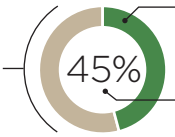
## CHARGING POINTS FOR ELECTRIC VEHICLES IN THE HVALER COMMUNITY

**HVALER MUNICIPALITY, VESTFOLD**

Last disbursement: **2016**
Completion: **2017**

■■ Improvements to infrastructure of charging points for electric cars and plug-in hybrids. Facilitating the transition to electric vehicles, both for the public sector and private residents, is part of the municipality's target to be climate neutral by 2030.

TOTAL COST (NOK)
1 050 000




OUTSTANDING GREEN LOAN (NOK)
482 366

KBN FINANCING

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of CO2e | **0** |

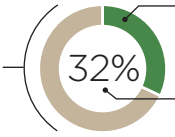
## TRAIN STATION MOUNTAIN LIFT

**HOLMESTRAND MUNICIPALITY, VESTFOLD**

Last disbursement: **2016**
Completion: **2016**

■■ 70-metre lift from residential area on mountain plateau, to Holmestrand train station. The objective is to reduce car use and increase the use of public transportation, as well as biking and walking. The lift makes train commuting more attractive to the approx. 3,000 people who live within a 20-minute bike ride from the station.

TOTAL COST (NOK)
64 500 000




OUTSTANDING GREEN LOAN (NOK)
20 405 365

KBN FINANCING

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of CO2e | **0** |

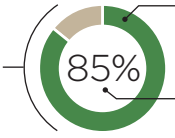
## PEDESTRIAN AND BICYCLE PATH

**OPPEGÅRD MUNICIPALITY, AKERSHUS**

Last disbursement: **2014**
Completion: **2014**

■■ 530-metre walkway and bike path, bicycle parking, improved bike lanes, purchase of electric bicycles.

TOTAL COST (NOK)
8 700 000




OUTSTANDING GREEN LOAN (NOK)
7 379 560

KBN FINANCING

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of CO2e | **0** |

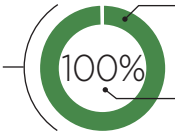
## BERGEN LIGHT RAIL

**BERGEN BOMPENGESELSKAP AS, HORDALAND**

Last disbursement: **2014**
Completion: **2017**

■■ Electric light rail service, representing an efficient and environmentally friendly public transport service in Bergen. The line carries around 12 million passengers a year

TOTAL COST (NOK)
5 270 000 000




OUTSTANDING GREEN LOAN (NOK)
5 270 000 000

KBN FINANCING

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of CO2e | **5 753** |

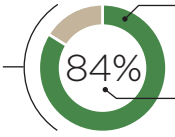
## ELECTRIC VEHICLES FOR THE HOME CARE SERVICE

**OPPEGÅRD MUNICIPALITY, AKERSHUS**

Last disbursement: **2013**
Completion: **2014**

■■ 29 vehicles used by the municipality's home care service to be replaced with electric vehicles.
Emission reductions calculated from 10,000 fossil-driven car kilometres per vehicle per year replaced with electricity.

TOTAL COST (NOK)
7 300 000




OUTSTANDING GREEN LOAN (NOK)
6 123 600

KBN FINANCING

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Reduced or avoided emissions annually, in tonnes of CO2e | **3** |

New sorting facility, ROAF, Akershus
Photo: Tom-Egil Jensen

**CATEGORY**

# WASTE MANAGEMENT

Investments in this category are intended to ensure sustainable, energy efficient and resource-saving waste management. Eligible projects include the construction of new or ambitious reconstruction of existing waste management facilities; biogas plants, waste collection systems that minimise transport requirements, garbage trucks that run on renewable fuels, and carbon capture plants.

**KBN GREEN LOANS TO WASTE MANAGEMENT PROJECTS**

| | |
|---|---|
| Total outstanding* | 481 617 595 **NOK** |

**ESTIMATED ANNUAL IMPACT OF GREEN LOANS**

| | |
|---|---|
| Increase in capacity | 57 737 **tonnes** |

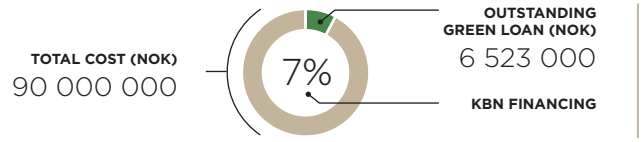
** In 2017, 83 percent of KBN's outstanding Green Loans portfolio was financed with green bonds. Hence, green bond investors who wish to calculate their share of impacts should depart from these figures. The share of outstanding green loans financed through green bonds may vary from one year to the other.*

## PRE-PROJECT FOR NEW WASTE FACILITY

### LONGYEARBYEN COMMUNITY COUNCIL, TROMS

Last disbursement: **2017**
Completion: **2018**

■■ Building a new waste management facility in Svalbard is necessary, as the existing facility has reached its maximum capacity. This pre-project examines solutions for energy and resource efficient waste management solutions.



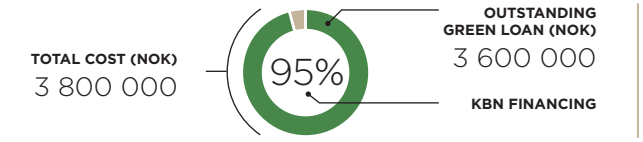

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **0** |

## NEW RECYCLING FACILITY

### DYRØY MUNICIPALITY, TROMS

Last disbursement: **2017**
Completion: **2018**

■■ Establishing a new recycling facility in Dyrøy municipality. A more efficient sorting system ensures a higher recycling rate and better utilization of resources. The facility will service up to 650 households.



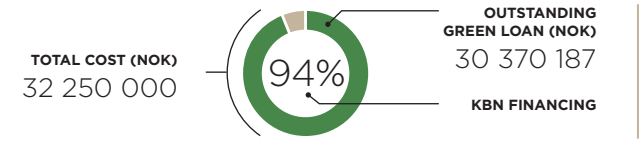

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **474** |

## NEW WASTE COLLECTION EQUIPMENT

### SIRKULA IKS, HEDMARK

Last disbursement: **2017**
Completion: **2017**

■■ Waste collection equipment to service 42,000 residents in Hedmark county.



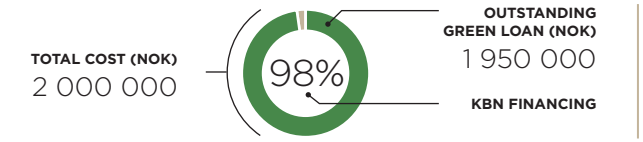

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **0** |

## IMPROVING LOGISTICS FOR RECYCLING TIMBER

### SIMAS IKS, SOGN OG FJORDANE

Last disbursement: **2017**
Completion: **2017**

■■ Establishing a storage facility to improve the logistics of transferring recycled timber. The objective is to transition the transportation of timber from trucks to boats.
To make this process possible, the recycled timber has to be stored over longer periods.



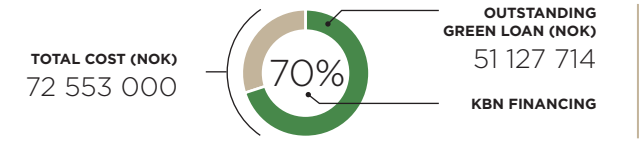

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **2 438** |

## HEGGVIN WASTE TREATMENT FACILITY

### SIRKULA IKS, HEDMARK

Last disbursement: **2016**
Completion: **2017**

■■ Expanding and upgrading the existing waste treatment facility. The facility includes environmentally friendly treatment of hazardous waste. The upgrade will increase the capacity and improve the waste sorting system and utilize the gases released from the landfill and reduce emissions into the atmosphere.



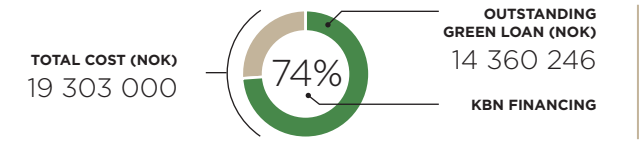

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **0** |

## RECYCLING FACILITIES

### SIRKULA IKS, OPPLAND

Last disbursement: **2016**
Completion: **2017**

■■ Upgrading five recycling facilities serving 40,000 customers



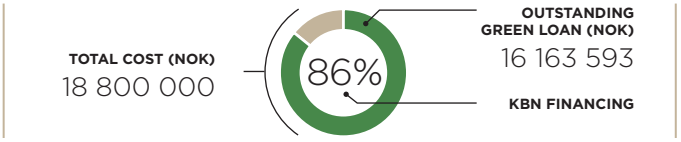

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **0** |

## GÅLÅSHOLMEN RECYCLING FACILITY

### SIRKULA IKS, OPPLAND

Last disbursement: **2016**
Completion: **2016**

■■ Recycling facility for garden waste. Garden waste disposed in nature significantly increases the risk of spreading non-native plant species. The facility will expand to include a high-tech recycling facility and resale outlet.Sirkula produces and sells plant soil from the garden waste that can replace environmentally degrading, peat-based plant soil. In 2016, the facility produced 2,000 tons of soil.



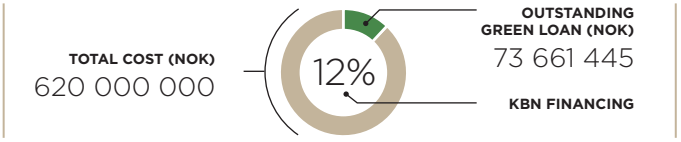

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **17 195** |

## FORUS WASTE SORTING FACILITY

### IVAR, ROGALAND

Last disbursement: **2016**
Completion: **2019**

■■ New large waste sorting facility, including 20 new sorting machines with infrared detection to ensure a high recycling rate of 75%. The sorting facility will increase the recovery of plastic materials from 7% to 100%. The plastic waste was previously sent to Germany for processing. It will now be extruded into plastic granules at the Forus facility.



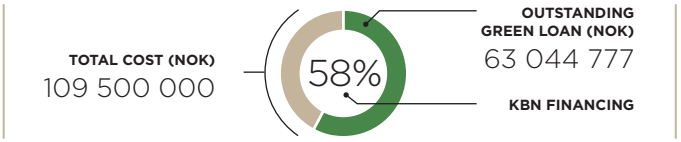

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **3 089** |

## NEW RECYCLING FACILITIES

### SØRE SUNNMØRE REINHALDSVERK IKS, SOGN OG FJORDANE

Last disbursement: **2015**
Completion: **2018**

■■ Constructing three modern recycling stations including new administration buildings and renovation of the old recycling facilities. The roof will have solar panels and essentially be energy neutral. 30,000 kWh reduction of energy used at the facilities annually. Wet organic waste has previously been combusted with residual waste. In the new facility, biogas will be produced by using the filtered waste.



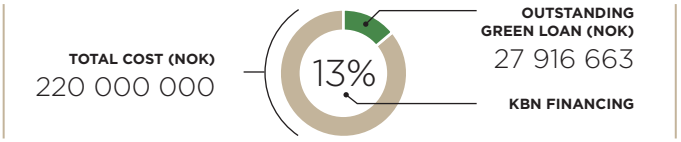

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **7 250** |

## PRE-TREATMENT FACILITY FOR ORGANIC WASTE

### IVAR IKS, ROGALAND

Last disbursement: **2014**
Completion: **2017**

■■ Facility that prepares organic waste for biogas production. Replaces previous composting plant. 67% increase in capacity for receiving organic waste, which opens up for treating new sources of waste, including previously unusable fish production residue.



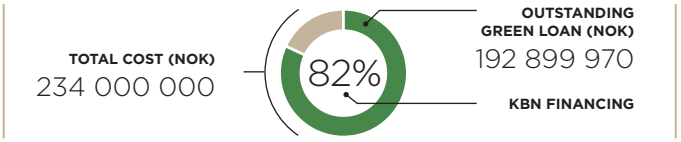

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **2 560** |

## NEW SORTING FACILITY

### ROAF, AKERSHUS

Last disbursement: **2013**
Completion: **2014**

■■ New major sorting facility with state-of-the-art waste sorting equipment, serving 126,500 households. First facility in the world with fully automated sorting of plastics from residual waste. Sorting machines can distinguish between five different types of plastic. Bagged food waste is sorted using laser optics and used in biogas production.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in waste management capacity, in tonnes: | **24 731** |

IVAR supplies drinking water and treats waste water from 340.000 residents. The drinking water is subject to the most stringent requirements related to the quality of hygienic water. Photo: IVAR IKS

**CATEGORY**

# WATER AND WASTEWATER MANAGEMENT

The purpose of projects in this category is to construct water and wastewater systems that are dimensioned to accommodate population growth and higher precipitation levels, and that apply innovative technologies to make good use of the resources contained in wastewater. Examples of projects are significant upgrades to water and wastewater networks, water treatment plants, treatment of discharges to watercourses, construction of biogas plants, and investment in energy and heat recovery from water and wastewater networks.

**KBN GREEN LOANS TO WATER & WASTEWATER MANAGEMENT PROJECTS**

| | | |
|---|---|---|
| Total outstanding* | 1 742 889 953 | **NOK** |

**ESTIMATED ANNUAL IMPACT OF GREEN LOANS**

| | | |
|---|---|---|
| Increase in capacity | 295 910 | **Population equivalents** |

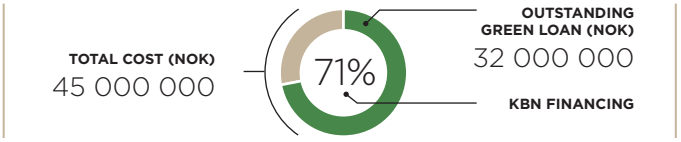
** In 2017, 83 percent of KBN's outstanding Green Loans portfolio was financed with green bonds. Hence, green bond investors who wish to calculate their share of impacts should depart from these figures. The share of outstanding green loans financed through green bonds may vary from one year to the other.*

## NEW TREATMENT PLANT PRODUCTION

### LINDÅS MUNICIPALITY, HORDALAND

Last disbursement: **2017**
Completion: **2018**

■■ New treatment plant for drinking water production.Combines raw water supply and industrial supply in drinking water production.



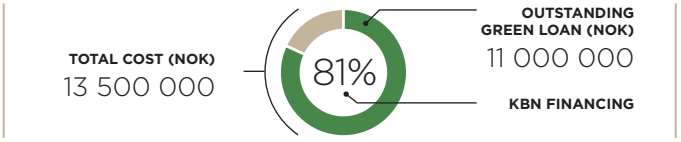

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **8 520** |

## HJELTNES SEWAGE TREATMENT SYSTEM

### ULVIK HERAD, HORDALAND

Last disbursement: **2017**
Completion: **2018**

■■ The current treatment technology at the Hjeltnes treatment plant is unsatisfactory. The new project includes better treatment technology and will link the facility to a central operational system (SD facility) to record operating data. A representative sampling for the inlet and outlet of sludge will be recorded, with automatic sample collections controlled by the SD plant.



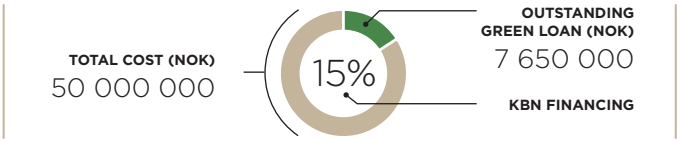

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **1 218** |

## NEW WATERWORKS

### DYRØY MUNICIPALITY, TROMS

Last disbursement: **2017**
Completion: **2019**

■■ The new waterworks will provide clean water to all residents in the municipality. The recidents have previously had problems with low quality on drinking water.
A SD-facility reduces energy consumption.



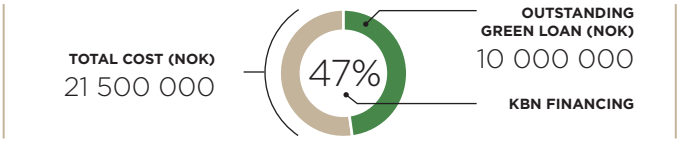

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **26** |

## SKEIE TREATMENT PLANT

### HAEGEBOSTAD MUNICIPALITY, VEST-AGDER

Last disbursement: **2017**
Completion: **2017**

■■ New sewage treatment plant with high-pressure system that reduces the sludge output. The sludge will be used in the production of soil-improving materials. Energy efficient facility where waste heat is collected from sedimentation pools. Focuses on energy efficient LED lighting with movement sensors.



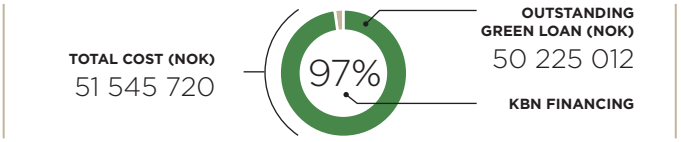

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **395** |

## UPGRADING OF VA INFRASTRUCTURE

### BALSFJORD MUNICIPALITY, TROMS

Last disbursement: **2017**
Completion: **2017**

■■ Upgrading and upsizing of water and wastewater facilities.. 2800 meters of water pipe and 5400 meter of waste pipe will be replaced in addition to associated pumping stations



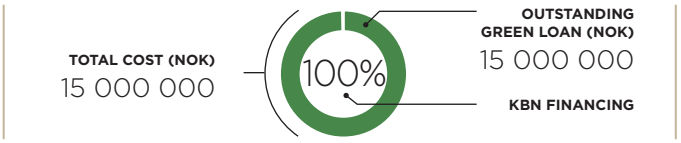

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **0** |

## RESEARCH PROJECT - NEW TREATMENT PLANT

### SØNDRE FOLLO RENSEANLEGG IKS, HEDMARK

Last disbursement: **2017**
Completion: **2021**

■■ Research-based pre-project for a new treatment plant in Follo, in cooperation with the Norwegian University of Life Sciences at Ås. The ambition is to develop the most energy-friendly treatment plant in Norway.



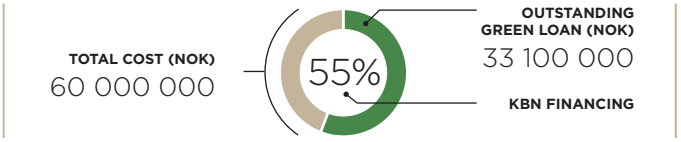

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **0** |

## NEW MUNICIPAL WATER SOURCE AT HORNINDALSVATN

**EID MUNICIPALITY, SOGN OG FJORDANE**

Last disbursement: **2017**
Completion: **2018**

■■ Developing Hornindalsvatnet as a new water source for Nordfjordeid waterworks.



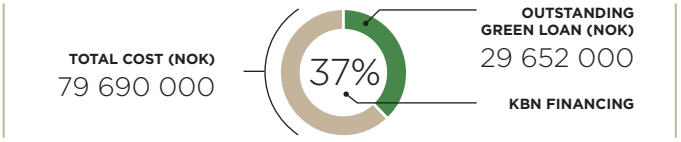

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **2 758** |

## HOLMESTRAND TREATMENT PLANT

**HOLMESTRAND MUNICIPALITY, VESTFOLD**

Last disbursement: **2017**
Completion: **2018**

■■ Upgradation of existing treatment plant for wastewater. The investment includes installing bio-treatment for removing organic matter, and increasing the capacity of the plant.



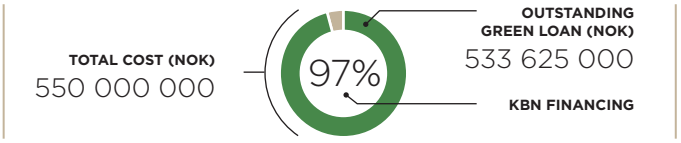

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **2 433** |

## NEW TREATMENT PLANT

**MIRA IKS, AKERSHUS**

Last disbursement: **2017**
Completion: **2017**

■■ New treatment plant for three fast-growing municipalities in the Larger Oslo Region. The plant is prepared for sludge treatment and biogas production.
The project involves 35 km of pipes, seven pump stations and four stormwater basins.



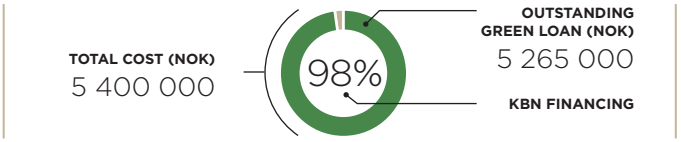

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **61 124** |

## TREATMENT SOLUTION FOR SMALL SEWAGE SYSTEMS

**SØNDRE HELGELAND MILJØVERK, NORDLAND**

Last disbursement: **2017**
Completion: **2017**

■■ Research-based project aimed at reducing emissions from small sewage systems with limited space for treatment facilities. Untreated wastewater has previously been released into the fjord. Construction phase 1, will remove heavy metals from the wastewater. Phase 2, which will remove organic compounds, is scheduled for 2020.



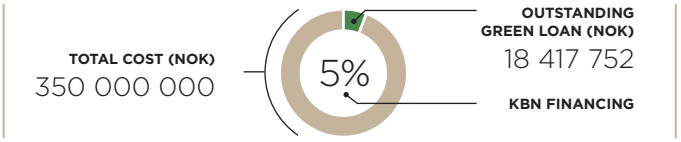

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **39 975** |

## NEW WATER TREATMENT FACILITY

**HIAS IKS, HEDMARK**

Last disbursement: **2017**
Completion: **2021**

■■ New, energy efficient water treatment facility for the fast-growing Hamar region.
The treatment process at the new facility includes chemical treatment with direct filtration, UV treatment and chlorination.



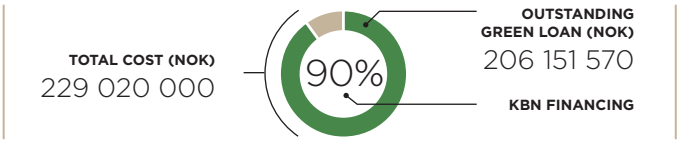

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **1 894** |

## SAFE WATER SUPPLY IN THE HAMAR REGION

**HIAS IKS, HEDMARK**

Last disbursement: **2017**
Completion: **2018**

■■ Improving reliability in the regional water supply system by establishing a dual water distribution system, a new water pressure zone system and emergency power supply for all pumping stations.



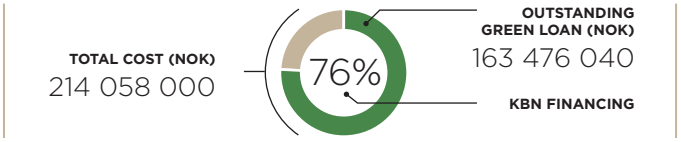

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **0** |

## UPGRADING WASTEWATER TREATMENT

### HIAS IKS

Last disbursement: **2017**
Completion: **2017**

■■ Upgrading wastewater treatment plant to support population growth and increased industrial activity in the area. The investment includes a biological treatment process that releases phosphorus and other nutrients that are chemically bound in the current chemical treatment process.



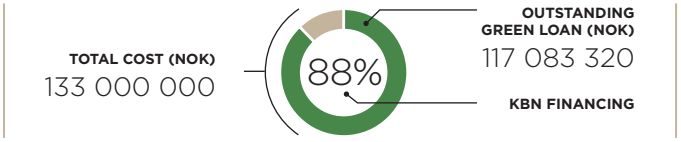

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **0** |

## WASTEWATER TREATMENT PLANT

### TØNSBERG RENSEANLEGG IKS, VESTFOLD

Last disbursement: **2017**
Completion: **2018**

■■ New treatment plant for wastewater from five municipalities. In terms of biological oxygen demand (BOD), treatment efficiency increases from 45% to 90%, and emissions are reduced by 1,000 tonnes annually. For chemical oxygen demand (COD) the treatment efficiency increases from 35% to 85% and emissions are reduced by 2,500 tonnes annually.



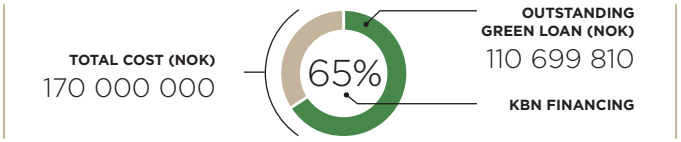

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **79 229** |

## FURNESFJORDEN UNDERWATER PIPELINE

### HIAS IKS, HEDMARK

Last disbursement: **2016**
Completion: **2018**

■■ A 25 km long underwater pipeline that doubles the wastewater transfer capacity through Norway's largest lake, Mjøsa. The pipeline, which is installed 30-70 metres underwater, comprises Norway's most comprehensive underwater wastewater pipeline project. Reduces the risk of leaks and subsequent pollution and eutrophication in Mjøsa, which has a vulnerable ecosystem and provides drinking water for 80,000 residents.



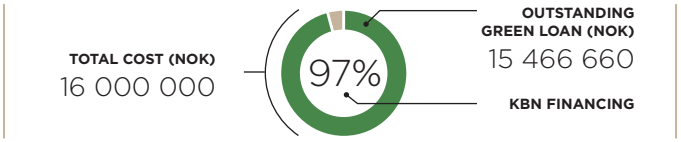

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **4 558** |

## WATER PIPELINE NORDLI-FINNKROKEN

### BARDU KOMMUNE, TROMS

Last disbursement: **2016**
Completion: **2016**

■■ Connecting water plants to secure the water supply for the municipalities of Bardu and Måselv. Utilize natural elevation differences to reduce the energy used to pump water compared to earlier solution. 75,000 kWh reduced energy consumption at the pumping station



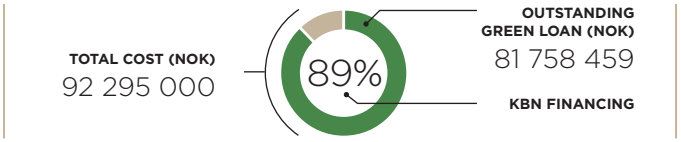

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **4 350** |

## UPGRADING WATER- AND WASTEWATER MANAGEMENT SYSTEM

### OPPEGÅRD MUNICIPALITY, AKERSHUS

Last disbursement: **2015**
Completion: **2015**

■■ Refurbishing of wastewater system and improvements to water supply network. Upgrading water supply facility, including installing UV treatment system.
3,115 metres of wastewater pipes and 3,258 metres of water supply pipes replaced.



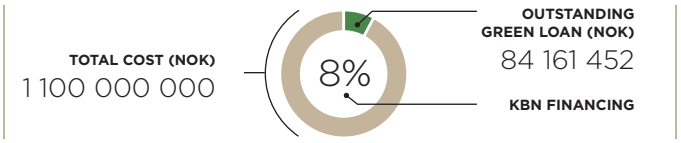

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **0** |

## WATER TREATMENT FACILITY

### IVAR IKS, ROGALAND

Last disbursement: **2014**
Completion: **2018**

■■ Upgrading the main water treatment facility, Langevatn, for the Stavanger region. The facility is designed factoring in an anticipated population growth of 100,000 residents by 2050 The investment includes a comprehensive treatment process with ozone treatment and bio-filtration, which is necessary to ensure high water quality and hygiene in an increasingly warm and wet climate.



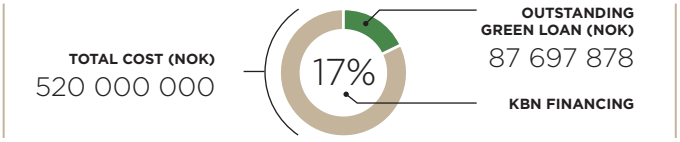

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **7 651** |

## CENTRAL WASTEWATER TREATMENT FACILITY FOR THE STAVANGER REGION

**IVAR IKS, ROGALAND**

Last disbursement: **2014**
Completion: **2016**

■■ Expansion of the central wastewater treatment facility at Nord-Jæren due to strong population growth in the Stavanger region. The investment includes a biological treatment process, a separate biogas plant, and a production line for producing fertiliser pellets from the biological residue.



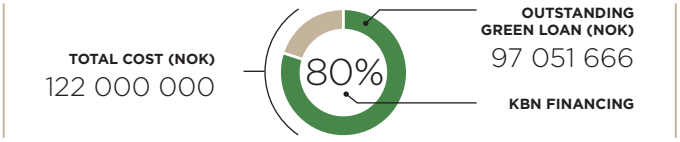

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **26 984** |

## DUAL WATER DISTRIBUTION TO ISLAND COMMUNITIES

**IVAR IKS, ROGALAND**

Last disbursement: **2014**
Completion: **2014**

■■ Establishing dual water distribution to the island communities in Rennesøy and Finnøy municipalities, using a 20 km underwater pipeline.



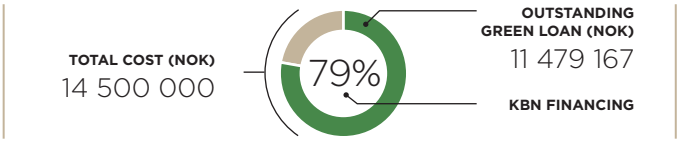

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **0** |

## NEW NÆRBØ TREATMENT PLANT

**IVAR IKS, ROGALAND**

Last disbursement: **2012**
Completion: **2012**

■■ Upgrading the wastewater treatment facility at Nærbø in response to increased volumes from a growing population and increased industrial activity.



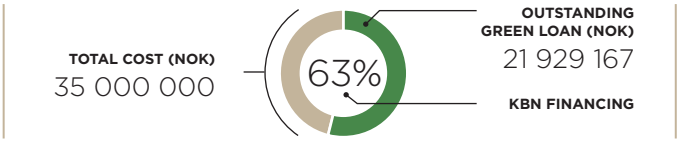

| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **4 671** |

## EXPANSION OF GRØDALAND WASTEWATER TREATMENT PLANT

**IVAR IKS, ROGALAND**

Last disbursement: **2012**
Completion: **2012**

■■ The existing treatment plant is expanded with a new, large flotation storage in order to handle increasing volumes of industrial wastewater.
The treatment plant is designed to facilitate biogas production from the residual sewage waste.




| ESTIMATED IMPACT ATTRIBUTABLE TO GREEN LOAN | |
|---|---|
| Increase in capacity, in person equivalents: | **50 124** |

KBN Green loans finance measures improving climate resilience in local communities. The small town of Kvam in Oppland county was hit by devastating floods twice in three years; in 2011 and 2013. Photo: Håkon Mosvold Larsen, NTB Scanpix

**CATEGORY**

# CLIMATE CHANGE ADAPTATION

Investments in this category are intended to improve local adaptation to climate change. This includes facilities and installations to manage urban runoff, floods, landslides, avalanches, rising sea levels, and other challenges due to changed weather and climate conditions.

**KBN GREEN LOANS TO CLIMATE CHANGE ADAPTATION**

| | |
|---|---|
| Total outstanding | 15 805 000 **NOK** |

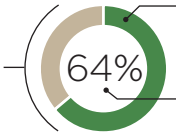
## FLOOD CONTROL MEASURES, ISDAMMEN LAKE

### LONGYEARBYEN COMMUNITY COUNCIL, TROMS

Last disbursement: **2017**
Completion: **2017**

■■ Flood control and new spillway construction for Isdammen lake, the drinking water resource on Svalbard. These measures will secure safe drinking water for the Svalbard community, and prevent flooding of nearby roads.

**TOTAL COST (NOK)**
20 000 000




**OUTSTANDING GREEN LOAN (NOK)**
12 730 000

**KBN FINANCING**

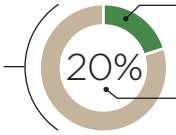
## LANDSLIDE PREVENTION AND FLOOD CONTROL MEASURES, NORDDAL RIVER

### ÅFJORD MUNICIPALITY, TRØNDELAG

Last disbursement: **2017**
Completion: **2017**

■■ Flood- and landslide prevention measures along the Norddal River in central Åfjord.

**TOTAL COST (NOK)**
4 000 000




**OUTSTANDING GREEN LOAN (NOK)**
800 000

**KBN FINANCING**

## TSUNAMI ALERTING SYSTEM

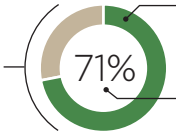
### ÅKNES/TAFJORD BEREDSKAP IKS, MØRE OG ROMSDAL

Last disbursement: **2017**
Completion: **2017**

■■ Population-alerting system with seven siren masts, warning the population in the coastal municipality of Sykkylven about potential tsunamis caused by rockslides from surrounding unstable mountain terrain.

SEE CASE ON PAGE 42

**TOTAL COST (NOK)**
3 200 000




**OUTSTANDING GREEN LOAN (NOK)**
2 275 000

**KBN FINANCING**

Photo: Åge Kjølås

CASE

# CLIMATE CHANGE INCREASES THE RISK OF LANDSLIDES

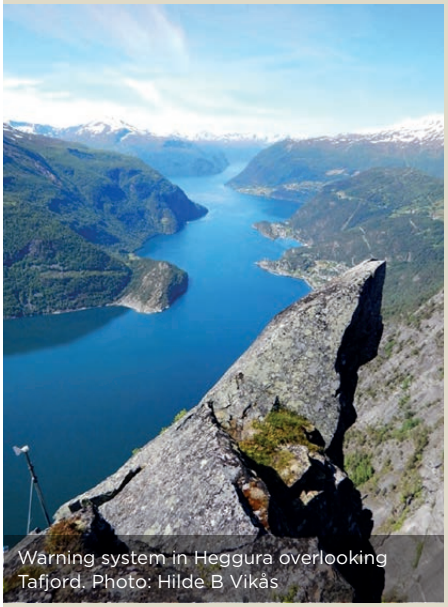
Residents along Storfjord in Møre og Romsdal, Norway, have always been aware that, at any moment, a landslide could set off from the steep surrounding mountainsides. Climate changes increase the risk.



**ÅKNES/TAFJORD BEREDSKAP IKS / MØRE OG ROMSDAL**

PLEASE SEE PAGE 41 FOR FINANCIAL DETAILS

Åkneset



Warning system in Heggura overlooking Tafjord. Photo: Hilde B Vikås

A landslide from the unstable mountain range, Åknes, could form an 80-metre tidal wave, destroying everything in its path. In 2017, KBN's green loans financed seven sirens that can alert the residents in the case of a landslide.

### Climate adaptation is increasingly common and important

Climate change is creating new requirements for the alert systems that ensure people's safety. The weather is becoming wilder and wetter, and the increased rainfall speeds up the risk for landslides all over Norway. The infrastructure, thus, needs to be rectified and adapted to face the climate change.

> "We have concrete evidence that increased rainfall affects unstable mountains like Mannen in the municipality of Rauma. Åknes and Hegguraksla is affected by the same forces. That is why we are now installing seven new sirens," says Steinar Belsby at Åknes/Tafjord Emergency Response.

### Provides important sense of security

The sirens will warn residents with sound and speech 72 hours prior to the landslide taking place, so that people are able to evacuate.

> "The sirens are meant to be heard clearly wherever you are in the municipality. It is an important additional security element that complements the SMS alert, and it is important for people's sense of security," says Belsby.

### Finally time for sirens in Sykkylven

Other local municipalities along the Storfjord have already installed 25 sirens, but due to financial issues, Sykkylven has postponed the investment. However, in 2017, they decided to finance the sirens through green loans in KBN.

> "KBN had the best and most affordable loan for our project. We're pleased with the dialogue and feedback from KBN," says Belsby.

Photo: Kevin Utting

## CATEGORY

# SUSTAINABLE LAND USE

This category covers a range of projects that intend to ensure sustainable use of land. This may include projects such as restoration of biodiversity, planting forests, cleaning up of POPs and other pollutants, developing land into recreational space, facilitating walking, cycling and public transportation solutions.

### KBN GREEN LOANS TO SUSTAINABLE LAND USE

| | |
|---|---|
| Total outstanding | 44 447 060 **NOK** |

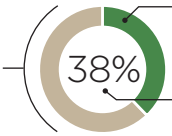
### PROJECT 'CLEAN TROMSØYSUND'

**TROMSØ HARBOUR, TROMS**

Last disbursement: **2014**
Completion: **2016**

■■ Major project to rehabilitate the polluted seabed in the strait outside the arctic city of Tromsø. 95,000 m3 contaminated seabed sediments have been dredged and placed in steel cylinders, which will be used in the construction of an expanded harbour facility. 653 kg PAHs and 3.8 kg PCBs have been extracted. Persistent organic pollutants (POPs) are reduced by 75%. The project ensures unpolluted living conditions for fish and other marine species, as well as a better local environment for human residents.

**TOTAL COST (NOK)**
129 104 000




**OUTSTANDING GREEN LOAN (NOK)**
44 447 060

**KBN FINANCING**

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