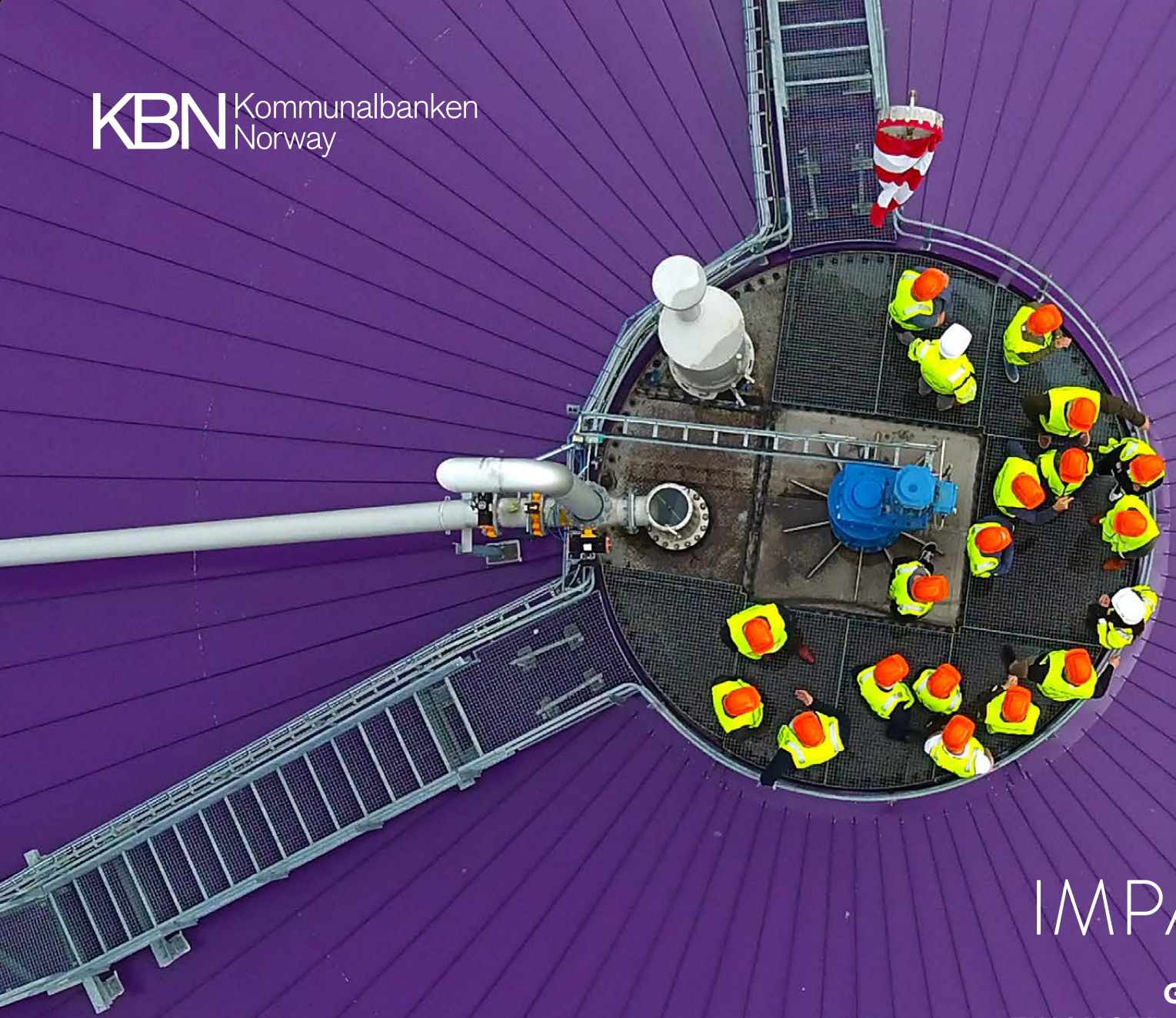
KBN Kommunalbanken Norway



IMPACT REPORT

GREEN INVESTMENTS FINANCED WITH GREEN BONDS 2018

Kommunalbanken AS

KBN's IMPACT REPORT

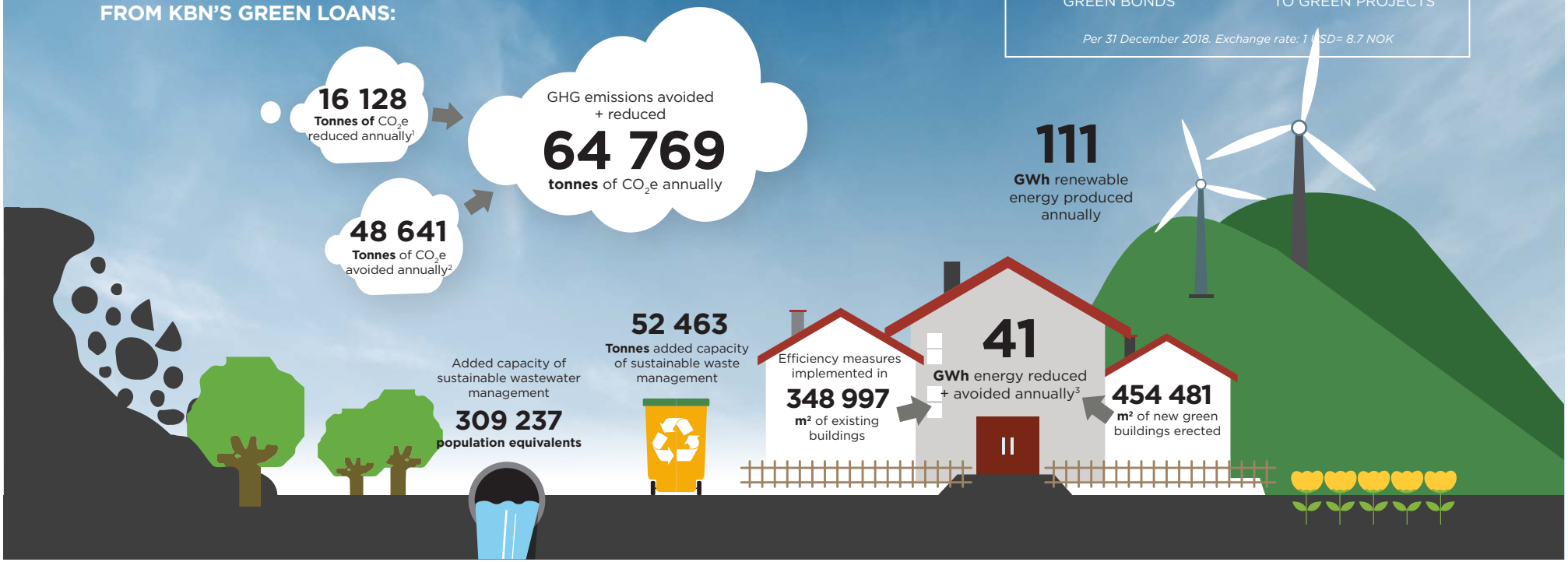
By the end of 2018, KBN had a total 18.8 billion Norwegian kroner, equivalent to 2.16 billion dollars, outstanding in green loans to investments that are aligned with our Green Bond Framework. Green loans are given a discounted interest rate and are meant as an incentive for sustainable investments in the local government sector.

This report presents projects financed with KBN's green loans.

GREEN BONDS	GREEN LOANS
USD **1.48** bn.	USD **2.16** bn.
OUTSTANDING GREEN BONDS	OUTSTANDING LENDING TO GREEN PROJECTS

Per 31 December 2018. Exchange rate: 1 USD= 8.7 NOK

ESTIMATED ENVIRONMENTAL IMPACT FROM KBN'S GREEN LOANS:



1. From projects within categories Energy Efficiency & Low-carbon Transportation, as well as projects within the category Waste management that have a direct emission-reducing impact.

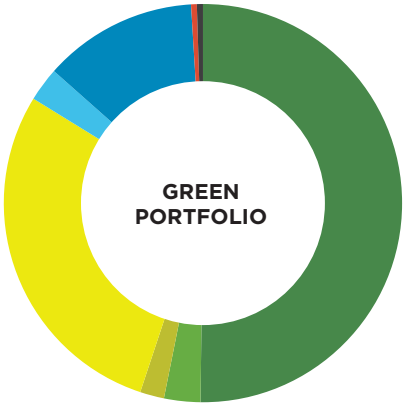
2. From projects within categories New Green buildings & Renewable Energy, as well as projects within the category Waste management that reduce the use of, or produce, energy.

3. 24,233 MWh energy reduced from energy efficiency measures; 16 763 MWh energy avoided in new green buildings, when compared to reference building built according to the national building code.

All CO_2 calculations are based on an emission factor of 380 g CO_2 per kWh of electricity, which is the emission factor recommended in the «Nordic Public Sector Issuers' Position Paper on Green Bonds Impact Reporting». CO_2 calculations for electricity using other emission factors can be found on p. 8 in this report.

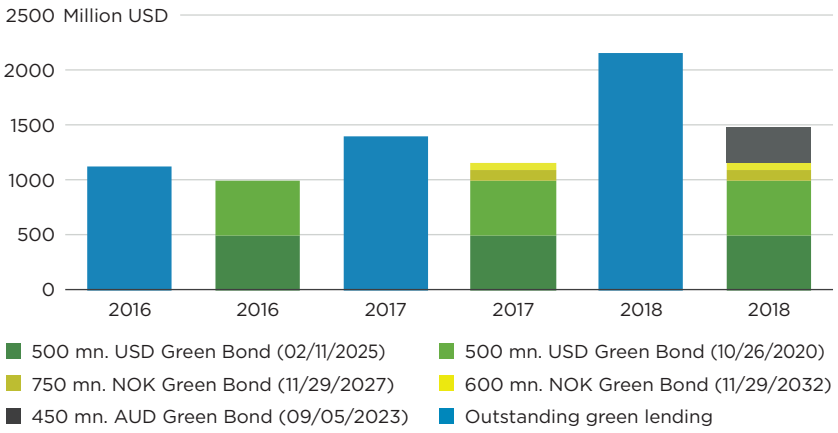
SUMMARY

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.



New green buildings	50.2%
Renewable energy	2.9%
Energy efficiency	2.0%
Low-carbon transportation	28.7%
Waste management	2.7%
Water and wastewater management	12.5%
Sustainable land use	0.5%
Climate change adaptation	0.5%

OUTSTANDING GREEN BOND ISSUANCES AND GREEN PROJECT LENDING



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	9 430 727	7 086	0.8
Renewable energy	554 036	40 855	73.7
Energy efficiency	367 321	9 206	25.1
Low-carbon transportation	5 389 633	6 892	1.3
Waste management	517 287	30	15.0
Water and wastewater management	2 348 562		N/a
Sustainable land use	87 655		N/a
Climate change adaptation	92 332		N/a
TOTAL	**18 787 553**		

Impact attributable to green bond investors Total outstanding green bonds divided by total outstanding disbursed to projects	**68%**
Where of impact attributable to Green Bond USD 500 mn (02/11/2025)	**23%**
Where of impact attributable to Green Bond USD 500 mn (10/26/2020)	**23%**
Where of impact attributable to Green Bond NOK 750 mn (11/29/2027)	**4%**
Where of impact attributable to Green Bond NOK 600 mn (11/29/2032)	**3%**
Where of impact attributable to Green Bond AUD 450 mn (09/05/2023)	**15%**

TABLE OF CONTENTS

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.

KBN Kommunalbanken Norway

Cover image is from Greve Biogas in Vestfold. Read about the plant on page 26.

MAIN CONTENT

LIST OF PROJECTS

CASES

Information about the projects is collected from KBN's customers. The information has been reviewed by KBN but has not been verified by KBN or a third party. Calculations of CO_2 impact from buildings, energy efficiency measures and renewable energy production are done by KBN. We do our best to ensure the quality of the information provided; however, the reader should be aware that there is uncertainty related to estimating climate and environmental impact from investments.

KBN's GREEN PROJECT PORTFOLIO INCREASED BY FIFTY PERCENT IN 2018

BY SIGBJØRN BIRKELAND
CHEIF FINANCIAL MARKETS OFFICER, KBN

Climate change is global, and policy responses are mostly national, but the consequences are local. The endeavours of municipalities are instrumental in adopting and transforming Norway to a resilient, low carbon future. Indeed, the large increase in KBN green loans indicates that Norwegian municipalities are stepping up their climate efforts.

The Arctic is warming about twice as fast as the rest of the world, and Svalbard is located in an area that is warming more quickly than the rest of the Arctic. If human greenhouse gas emissions continue at the same rate as today, increasing year by year, the average temperature in Svalbard toward the end of the century will be almost 10oC higher than in 1971-2000 ("Climate in Svalbard 2100"). This will have major consequences for its nature and population. One of the loans KBN granted in 2018 was for important climate change adaptation measures in Svalbard.

Even if mainland Norway is not warming as quickly as Svalbard, the consequences of climate change are also apparent there, particularly as a result of higher and more intense precipitation. Norwegian municipalities are confronting climate change and have invested significantly in buildings and infrastructure that are more climate-resilient. It is therefore pleasing to see strong growth in demand for KBN's green loans: KBN's portfolio of outstanding green loans grew by a sizeable 60% in 2018 relative to 2017, with KBN granting green loans totalling NOK 7.3 billion for 84 projects over the year. In total, its green lending contributed to the reduction and avoidance of 65,000 tonnes of CO_2 emissions.

KBN's green lending for investment in local-government welfare services makes an important contribution to the transition to a low-carbon future and to adaptations to climate change across Norway. We have helped finance:

- The construction of 444,431m^2 of new green buildings
- Energy efficiency improvements for 348,997m^2 of existing building stock
- Capacity increases to water and wastewater management systems equivalent to new capacity for 309,000 people
- The production of 107 GWh of local, renewable energy

KBN's 2018 Environmental Impact Report builds further on the joint Nordic guidelines for this type of investment. KBN has played an important role in the development of international standards for impact reporting thanks to its position on the executive committee of the Green Bond Principles and its role in the development of the Nordic guide to impact reporting, which was updated in January 2019.

KBN has in this report for the first time integrated the UN's Sustainable Development Goals into its impact reporting in order to highlight the positive contribution our green bonds make to the achievement of these goals.

KBN's green bonds are issued in the international capital markets and finance green projects across Norway. Investor demand for green bonds has grown strongly in recent years. KBN is the most active Norwegian issuer of green bonds. In 2018 we became the first Nordic issuer to use the Australian green bond market. Australia is witnessing changes to its climate, and a strong desire to contribute to climate-friendly investments resulted in a very successful transaction for KBN.

The amount of investment required to catch up with climate change is enormous. Through its green lending program, KBN wants to facilitate its customers' transition to a low-carbon society, as well as enabling climate-conscious investors to buy a world-class product. ■■

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

KBN GREEN BONDS

KBN has been a repeat issuer of public green bonds since 2013. By the end of 2018, the five outstanding Green bonds amount to USD 1.48 billion.

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

BOND RATINGS

AAA STANDARD &POOR'S

Aaa MOODY'S

OUTSTANDING GREEN BONDS

ISSUE DATE	AMOUNT ISSUED	MATURITY	COUPON	ISIN
02/11/2015	USD 500 million	02/11/2025	2.125%	XS1188118100 US50048MBX74
10/25/2016	USD 500 million	10/26/2020	1.375%	XS1508672828 US50048MCD02
11/29/2017	NOK 750 million	11/29/2027	2.200%	NO0010811276
11/29/2017	NOK 600 million	11/29/2032	2.000%	NO0010811284
09/05/2018	AUD 450 million	09/05/2023	2.700%	AU3CB0256162

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

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"

CICERO

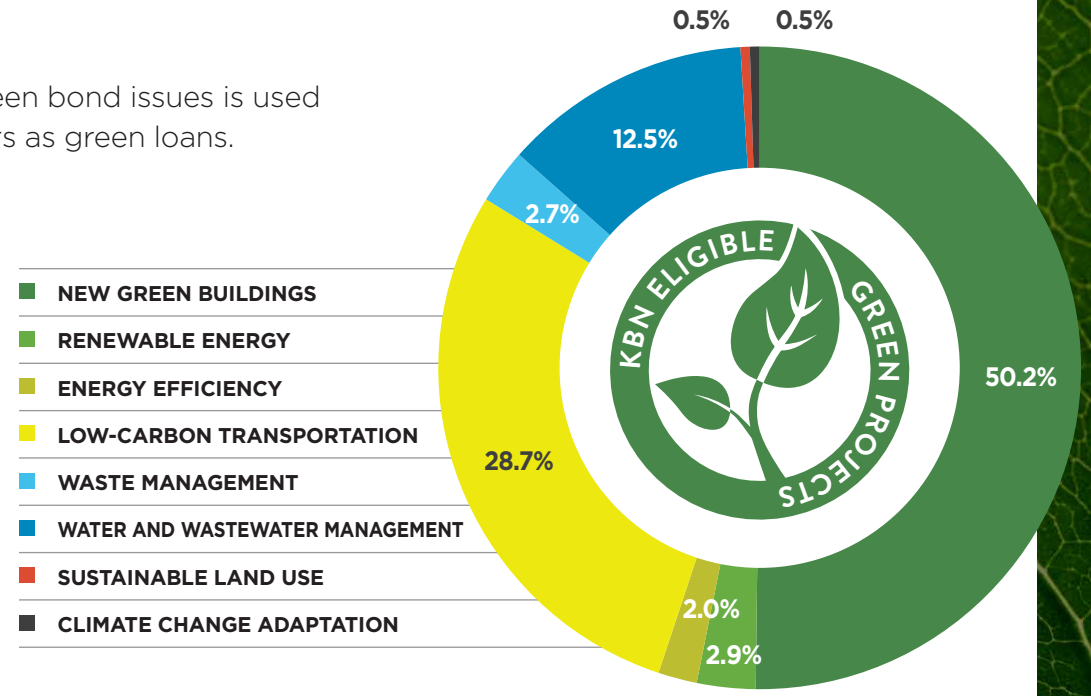
DARK GREEN	Projects and solutions that already realise the long-term vision of a low-carbon and climate-resilient future. Typically, this will entail zero-emission solutions and governance structures taht integrate environmental concerns tino all activities. Ecample projects include renewable energy 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.

GREEN LENDING

All the funding raised by KBN's green bond issues is used exclusively for lending to customers as green loans.

KBN has offered green loans, financed by the issuance of green bonds, since 2010.

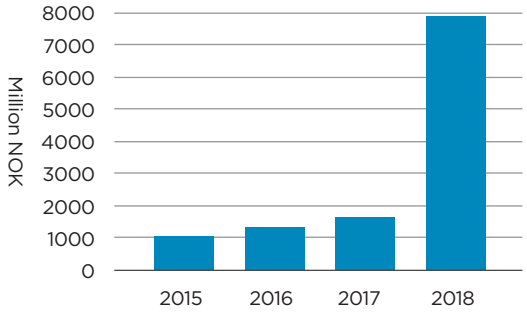
Green loans are available for projects that fall into any of the following eight categories:



Investments are assessed in accordance with a criteria set that specifies separate criteria for each of the categories. The criteria document is available on KBN's website.

Green loans are made available at a lower interest rate than the rate charged on KBN's normal loans.
KBN experienced strong growth in demand for green loans in 2018. Between the end of 2017 and the end of 2018, the outstanding value of the green loan portfolio increased by 50%.

DISBURSED GREEN LOANS, PER YEAR



KBN'S PORTFOLIO OF GREEN LOANS HAS FINANCED ...

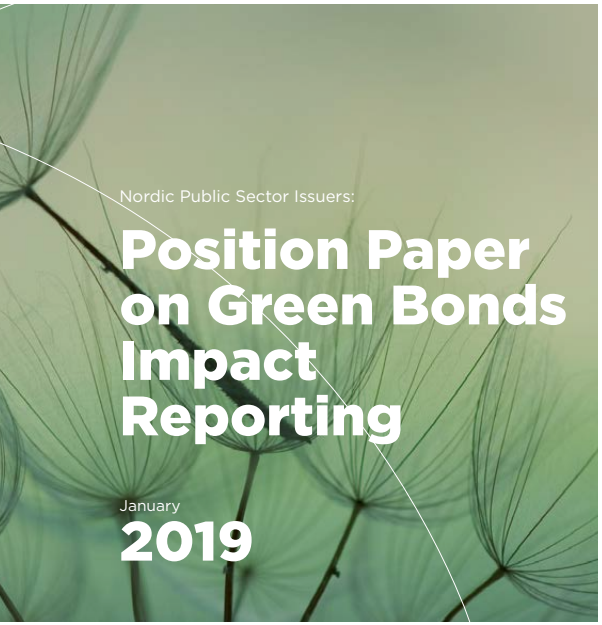
- 176 projects carried out by 94 municipalities, county authorities and publicly-owned companies
- 85 new projects in 2018
- The investments range from a loan totalling NOK 150,000 for new LED street lighting in Surnadal through to a loan of NOK 5.3 billion to finance the Bergen Light Rail system.

THE PROJECTS MAKE AN IMPORTANT CONTRIBUTION TO RESPONDING AND ADAPTING TO CLIMATE CHANGE THROUGHOUT NORWAY:

- Construction of 444,431 m² of new green buildings
- Energy efficiency improvements to 348,997 m² of existing buildings
- Increase in water and wastewater treatment capacity equivalent to capacity for 309,000 additional people
- Production of 107 GWh of local, renewable energy
- Important climate change adaptations in locations from Bryne in the west to Svalbard in the north

KEY REPORTING PRINCIPLES

KBN contributed to "Nordic Public Sector Issuers: Position Paper on Green Bonds Impact Reporting"*, which KBN uses as the basis for its environmental impact reporting.



*) https://www.kommunalbanken.no/media/545579/npsi_position_paper_2019_final.pdf

The principles set out in the Position Paper are intended to enable organisations to commit to delivering transparent and consistent environmental impact reporting that is useful to investors and other stakeholders, while ensuring that the reporting process is manageable for even relatively small organisations.

THE MOST IMPORTANT PRINCIPLES FOR OUR REPORTS ARE:

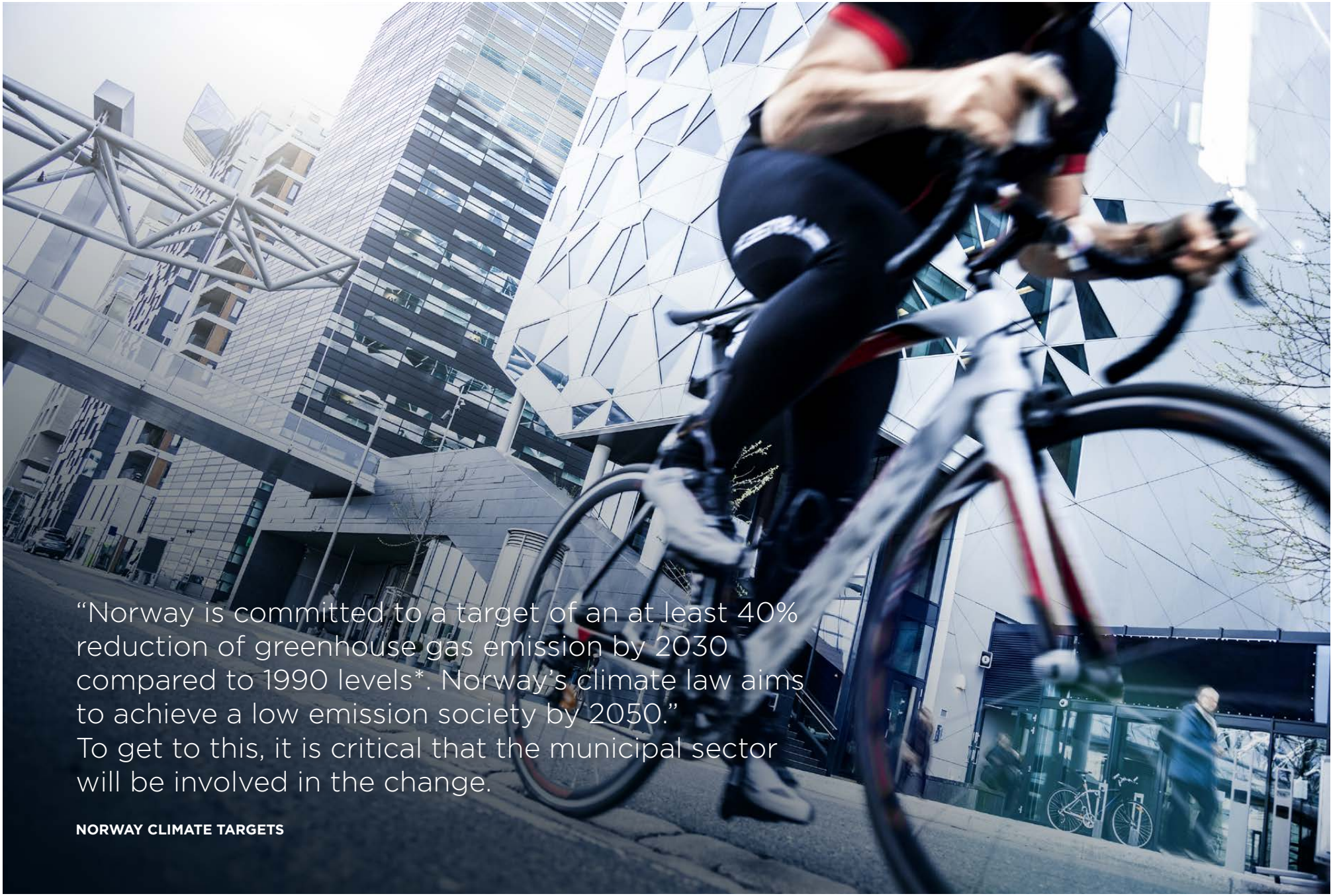
- Our reports include information at the project level, category level and portfolio level.
- Each environmental impact we report relates to the proportion of the project we financed. If, for example, we provided half the financing for a project, we report half of the project's environmental impact.
- All investments we finance with green bonds form part of a combined green portfolio. The table on p. 3 shows what proportion of this portfolio each of KBN's green bond issues has financed.
- We report the expected impact of projects (ex ante), but we may in future report actual impacts (ex post).
- We report on key indicators, such as the amount of greenhouse gas emissions that will be avoided, the amount by which greenhouse gas emissions will be reduced, or the amount by which energy consumption will decrease, as relevant. Separate indicators have also been developed for each individual project category.
- Our reporting is centred around the net benefit of each project relative either to the situation prior to the project's completion or to a reference scenario, as appropriate. As reference scenarios we use the relevant regulatory requirements, e.g. Norway's building regulations (TEK).
- Our reporting is limited to emissions and emissions reductions that fall under Scopes 1 and 2, i.e. direct greenhouse gas emissions and indirect greenhouse gas emissions from the production of energy, as defined in the Greenhouse Gas Protocol.
- Electricity, whether used as part of a project, saved through a project, or its consumption avoided through a project, is converted into CO_2 emissions using an emissions factor for the continental EU plus Norway. This factor has been selected because of a desire for a common factor to be applied to all Nordic counties, the electricity networks of which are closely connected to the rest of Europe. In 2018, this factor was 380 grams of CO_2 per kilowatt hour. The table to the right provides more information on the environmental impact of the green project portfolio if different emission factors are applied.
- From 2018, our reporting also indicates to which of the UN's Sustainable Development Goals the various project categories make a contribution.

GRID FACTORS: GHG IMPACT CALCULATIONS

From renewable energy production and energy reduced/avoided calculated using different emissions factors for electricity

Category	Reduction in energy consumption/energy consumption avoided in MWh	Renewable energy produced in MWh	Reduction in CO_2e emissions or amount of CO_2e emissions avoided in tonnes using different emissions factors (KG of CO_2 equivalents per kWh)		
			0.38 [1]	0.128 [2]	0.047 [3]
Energy efficiency	24 233		9 208	3 102	1 139
Renewable energy		107 510	40 854	13 761	5 053
New green buildings	16 763	1 835	7 067	2 381	874
Waste management	22	1 819	700	236	87
Total	41 018 MWh	111 164 MWh	57 829 tonnes	19 480 tonnes	7 153 tonnes

1. 0.38 kg CO_2/kWh: Continental EU plus Norway, based on national emissions factors gathered by the international financial institutions behind the "Working towards a harmonized framework for impact reporting" document. This is the emissions factor recommended in the Nordic Position Paper, cf. p.23 in the Position Paper for more information on this calculation.
2. 0.128 kg CO_2/kWh: Nordic Supply Mix, rolling five-year interval. Source: Asplan Viak https://www.asplanviak.no/aktuelt/2016/02/03/nordisk-stroem-blir-renere/
3. 0.047kg CO_2/kWh: Norwegian Supply Mix, rolling five-year interval. Source: Asplan Viak https://www.asplanviak.no/aktuelt/2016/02/03/nordisk-stroem-blir-renere/



"Norway is committed to a target of an at least 40% reduction of greenhouse gas emission by 2030 compared to 1990 levels*. Norway's climate law aims to achieve a low emission society by 2050."
To get to this, it is critical that the municipal sector will be involved in the change.

NORWAY CLIMATE TARGETS

** Norway's climate law*

MUNICIPALITIES' EXPOSURE TO CLIMATE RISK

Climate policies and the consequences of climate change will be felt by large and small communities. Local authorities have to come to terms with this.

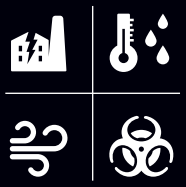
BY THE NORWEGIAN CLIMATE FOUNDATION

Up until now, a very large proportion of the work that businesses and public sector organisations have done on climate change has been about how they can cut their own greenhouse gas emissions. Talking about climate risk involves reversing this perspective: What will climate change and stricter climate policies mean for society and for business and industry?

Climate risk can be divided into:

- **Physical risk**
- **Transition risk**
- **Liability risk**

PHYSICAL RISK



Physical risk concerns the costs associated with physical damage caused by climate change. Physical risk can either be acute or chronic. Acute physical risk relates to storms and severe weather, which is to say extreme weather events. Climate change means that such events will happen more frequently. Municipalities need to produce plans that ensure that buildings and other infrastructure can withstand more extreme weather.

Chronic physical risk refers to the long-term effects of a changed climate, both in Norway and elsewhere in the world. The conditions needed to produce food may be significantly impacted. Areas intended for residential development may be declared unfit for settlement due to the risk of flooding and slush avalanches. An area's water quality may deteriorate. Over the longer term, rising sea levels may become a problem.

TRANSITION RISK

Transition risk concerns the changes that will take place as the world moves towards cutting its greenhouse gas emissions, e.g. by significantly reducing fossil fuel usage. This will represent a massive adjustment that will alter the framework in which businesses operate at both the micro and macro levels. Transition risk is often broken down into four different groups: policies and regulations, technology, markets and reputation.

Policies and regulations can be decisions at the global level such as the Paris Agreement, or alternatively decisions taken by Norway or by the EU/EEA. Decisions taken at the local or regional level can also be very important, e.g. decisions to ban certain types of fuel or to restrict driving in towns and cities.

New *technology* also creates risk. Cheap solar energy is outcompeting fossil fuel energy in many parts of the world. Electric cars will cause the combustion engine to disappear over time.

The combination of policies and regulations on the one hand and new technology on the other is causing *market conditions* to change, with new markets for low-carbon technologies being created at the same time as old technologies decrease in value. Climate risk thus represents both a threat and an opportunity in terms of jobs and value creation.

A sector, company or product's reputation is also an important factor. Attracting the best work force or environmentally aware consumers can be difficult for a company that is highly dependent on fossil fuels. Municipalities that do not adjust are at risk of becoming less attractive.

LIABILITY RISK

Liability risk relates to claims for compensation and legal proceedings that can result from decisions or failures to take decisions that are in some way related to climate policies and climate change. Different versions of climate-related legal proceedings are being brought around the world. This is relevant to Norwegian municipalities, which are responsible for making adaptations to climate change, providing a functioning wastewater network and managing surface water.

KBN'S WORK ON CLIMATE RISK

As the main provider of loans to local authorities in Norway, KBN wishes to shed a light on climate-related risks to which municipalities are exposed.

In 2018 we entered into a collaboration with the CICERO Center for International Climate Research and the Norwegian Climate Foundation to develop and share knowledge about municipalities' exposure to climate risk. The collaboration involves developing a climate risk tool for Norway's municipalities and an information pamphlet, as well as setting up a newsletter on climate risk. The tool will be published on Kommunalbanken.no/Klimarisiko in the first half of 2019.

In 2019 KBN will map its own exposure to climate risk with a view to reporting in accordance with the TCFD framework. Climate risk-related factors will also to a larger extent be considered in the assessment of green loan applications.

GOVERNANCE

In order for an investment to receive financing through KBN's green bonds, it must go through an approval process for green loans. The approval process and criteria are quality-checked at several levels.

APPROVAL PROCESS

1. The customer submits an application for a green loan to KBN for one or more specific projects. The customer completes a separate application form for each project category. Applicants have to provide as much documentary evidence as possible for the information they are required to include in the application.

2. The application is received by KBN's customer team. The customer's account manager makes an initial assessment of whether the project is in line with KBN's set of criteria for green loans and writes a recommendation on whether or not the application should be approved.

3. The application and the account manager's recommendation are forward to KBN's internal panel of climate controllers. The climate control function always comprises four people who have special knowledge of or training in climate matters, the environment and sustainability. Two of the four climate controllers assess the recommendation and prepare a final verdict as to whether or not to approve the application. The customer receives a response to its application within three days of its receipt by KBN.

4. If the project is approved, the customer is offered a green loan with a lower interest rate. Once the loan has been accepted, the project is included in KBN's green lending portfolio.

QUALITY CONTROL

The green loan approval process has to be quick. The process is therefore internal, although it has good quality-control routines. The quality-control process consists of the following:

1. KBN's Green Bond Framework, which also defines the processes for the granting of green loans, the payment of funds and how they are reported, has undergone a third-party review from the CICERO Center for International Climate Research. CICERO has rated KBN's framework 'Dark green', which signifies that the investments KBN finances are in line with the 2050 climate targets.

2. KBN's criteria set that defines which projects can be awarded green loans was produced in collaboration with KBN's committee of green experts. This committee consists of specialists* from industry organisations, environmental organisations, relevant government agencies and the local government sector. The committee meets yearly to assess the need to update the set of criteria.

** In 2018 KBN's green expert committee comprised representatives from the Norwegian Environment Agency, the state-owned enterprise Enova, Hordaland County Municipality, Asker Municipality, the Norwegian Association of Local and Regional Authorities and the Zero Emission Resource Organisation (ZERO), a climate foundation.*

KBN'S GREEN LENDING MAKES A CONTRIBUTION TO ACHIEVING THE UNITED NATIONS' SUSTAINABLE DEVELOPMENT GOALS

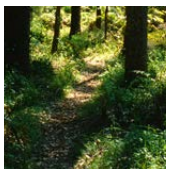
We set strict requirements for the sustainability of the projects that are to be financed by green lending from KBN. This means that these projects make an important contribution when Norwegian local communities work towards supporting the UN's Sustainable Development Goals.

The following table explains which Sustainable Development Goals are supported by the various categories of project financed by green lending*. Information on our analysis of which detailed objectives are supported by the categories of project can be found in the commentary on each category in this report.










NEW GREEN BUILDINGS

The buildings we finance help to reduce energy consumption and support the use of more sustainable building materials.

RENEWABLE ENERGY

Green lending finances investments such as biogas facilities and renewable heating sources for buildings that help to replace fossil fuels.

ENERGY EFFICIENCY

Energy efficiency measures that help to reduce greenhouse gas emissions and release energy for the electrification of other sectors.

LOW-CARBON TRANSPORTATION

Green lending finances projects that support the electrification of public transport and goods transport both on land and water, as well as providing facilities for pedestrians and cyclists.

WASTE MANAGEMENT

Investment in waste management facilities that help to improve the rate of recycling and facilitate more climate-friendly management of waste resources.

WATER AND WASTEWATER MANAGEMENT

The projects we finance help to ensure the availability of safe drinking water and reduce pollution from wastewater.

SUSTAINABLE LAND USE

We finance land-use projects that help to facilitate safe, inclusive and sustainable places and promote healthy ecosystems.

CLIMATE CHANGE ADAPTATION

Investment in climate change adaptation helps to equip local societies to cope with extreme weather and other consequences of climate change.

** This summary has been produced on the basis of "SDG mapping – Nordic position paper categories" in the Nordic Public Sector Issuers: Position Paper on Green Bonds Impact Reporting. See page 20: https://www.kommunalbanken.no/media/545579/npsi_position_paper_2019_final.pdf*

PROJECTS

NEW GREEN BUILDINGS

New buildings financed by KBN's green loans comply with at least one out of two main criteria: The building should have an estimated net energy demand that is 20 per cent below requirements in the national building code[1], or it is constructed mainly with the use of low-emission materials such as wood, low-carbon concrete or recycled steel.

Reported impact is calculated based on the relative energy efficiency of the individual buildings, compared to requirements in the national building code. We do not currently quantify the climate impact of sustainable material

73 NUMBER OF PROJECTS FINANCED, TOTAL

46 NUMBER OF PROJECTS FINANCED, 2018

KBN GREEN LOANS TO NEW GREEN BUILDINGS

Total outstanding, in 1000 NOK	9 962 842

ESTIMATED ANNUAL IMPACT ATTRIBUTABLE TO GREEN LOANS*

Energy use avoided	16 815 MWh
Energy produced	1 835 MWh
GHG emissions avoided	7 086 tonnes CO_2e

1. - INet energy demand in the building is compared with the energy frames in § 14-2. Requirements for energy efficiency in Building Technology regulations. See https://dibk.no/byggeregler/byggteknisk-forskrift-tek17/14/14-2/

**In 2018, 68 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.*

UN SDG TARGETS RELEVANT TO NEW GREEN BUILDINGS

Ensure access to affordable, reliable, sustainable and modern energy

Target 7.3 By 2030, double the global rate of improvement in energy efficiency

Ensure sustainable consumption and production patterns

Target 12.2 By 2030, achieve the sustainable management and efficient use of natural resources

NEW GREEN BUILDINGS

Customer	Project name	Last disburse-ment	Com-pletion	Description	Disbursed green loan (1000 NOK)	Outstand-ing green loan (1000 NOK)	Total cost (1000 NOK)	KBN financing	Heated area in m²	Estimated annual impact, KBNs share		
										Energy avoided annually	Energy pro-duced annually, in kWh	GHG emissions avoided
Bærum municipality	Oksenøya centre	2018	2022	A local centre that will include an elementary school with five parallel forms in each year, a nursery for 300 children, a multi-use sports hall, an artificial grass playing field and outdoor sports facilities, as well as a residential care centre with 150 places. The centre is a FutureBuilt model project that will be BREEAM-NOR certified as "Excellent", with the option to be Outstanding and plus-energy certified.	21 700	21 700	1 340 500	2%	30000	Project planning phase	-	-
Søndre Land municipality	Hovli care home	2018	2020	A new care home in mass timber with 104 residential rooms, as well as premises for home care services and a day care centre. 90% of heat demand met by bio energy, with the remainder met by heat recovered from air conditioning.	100 000	100 000	457 000	22%		-	-	-
Halden municipality	Bergheim dementia centre	2018	2018	New residential dementia centre with 96 apartments and day care provision for a further 24 people. Built in mass timber, with the primary source of heating being geothermal wells distributed via waterborne underfloor heating. Structure to require 20% less energy than a TEK16 reference building.	100 000	100 000	341 000	29%	10200	122 041	-	46
Halden municipality	Kongeveien school	2018	2018	A new elementary school built in mass timber with space for 600 pupils and 80 employees. Primary source of heating is geothermal wells distributed via waterborne underfloor heating.	150 000	150 000	190 000	79%	6700	111 079	-	42
Steinkjerbygg KF	Lø nursery	2018	2019	New nursery. Mass timber structure and compliance with passive-house standard planned.	40 000	40 000	40 000	100%	1300	58 500	-	22
Steinkjerbygg KF	Mære nursery	2018	2019	New nursery. Mass timber structure and compliance with passive-house standard planned.	40 000	40 000	40 000	100%	1300	58 500	-	22
Steinkjerbygg KF	Mære elementary school	2018	2019	New elementary school dimensioned for 250 pupils. Mass timber structure and compliance with the passive-house standard planned.	100 000	100 000	100 000	100%	3000	120 000	-	46
Bærum municipality	Jarenga nursery	2018	2020	New nursery with space for 160 children. The building will as a minimum be BREEAM-NOR certified as "Very Good".	10 000	10 000	94 000	11%	3485	Project planning phase	-	-
Bærum municipality	Carpe Diem dementia village	2018	2020	A dementia village with 158 institutional places built to the passive-house standard. The building will be connected to a district heating system and will have its own solar panels. Fossil-fuel-free construction site.	179 200	179 200	735 500	24%	18000	322 341	93 413	158
Nesodden municipality	Skoklefall sheltered housing units	2018	2020	Sheltered housing with 15 units and a dementia facility staffed 24/7 with 28 places. Heating and cooling through geothermal wells.	24 000	24 000	94 200	25%	4718	54 092	144 245	75.4

NEW GREEN BUILDINGS

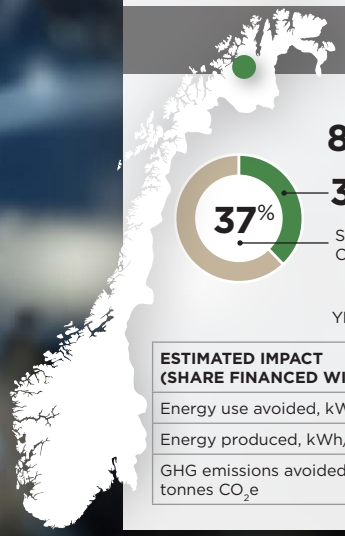
Customer	Project name	Last disburse-ment	Com-pletion	Description	Disbursed green loan (1000 NOK)	Outstand-ing green loan (1000 NOK)	Total cost (1000 NOK)	KBN financing	Heated area in m²	Estimated annual impact, KBNs share		
										Energy avoided annually	Energy pro-duced annually, in kWh	GHG emissions avoided
The City of Oslo	Renovating Slemdal school	2018	2020	The school will be expanded from having three forms in each year to four forms, with space for 728 pupils. Environmentally friendly solutions such as solar panels and geothermal wells will be emphasised, and the building will comply with the passive-house standard.	500 000	500 000	526 000	95%	10130	361 461	74 144	165.5
Kvæfjord municipality	Kveldrov health centre	2018	2020	New health centre with co-located municipal services. Energy-efficient building with waterborne heating in almost every room provided by an air-to-water heat pump.	47 000	47 000	126 800	37%	2098	47 347	-	18
Agder Renovasjon IKS	New administration building, weighbridge booth and vehicle access	2018	2019	A new administration building built to the passive-house standard. Environmentally friendly façade in timber with solar panels that will meet a significant proportion of the energy needed for lighting and electric car charging points. 50% lower energy requirement compared with a standard reference building.	32 000	20 000	44 200	45%	1100	19 910	-	7.6
Steinkjerbygg KF	New Steikjner elementary school with sports hall	2018	2019	New school building built to the passive-house standard dimensioned for 400 pupils. The super structure largely made of mass timber and glulam. Greenhouse gas emissions from material usage 25% lower compared with a standard reference building.	250 000	250 000	250 000	100%	6500	227 500	-	86.5
Ulvik council	Ulvik nursing home	2018	2019	New, energy-efficient nursing home built to the passive-house standard, with fjord-based heating/cooling.	25 000	25 000	109 000	23%	2640	35 906	-	13.6
Østfoldbadet AS	Østfoldbadet swimming pool and outdoor swimming complex	2018	2019	Upgrading of existing swimming pool (5,600 sq.m.) and extension (2,700 sq.m.). The building will, in total, have an estimated reduction in energy demand of 35 percent compared to a reference project.	144 000	144 000	153 100	94%	8300	2 560 585	-	973
Nord-Odal municipality	Combined bank, library and apartment complex	2018	2020	Library, bank premises, meeting places and ten apartments. Iconic building in mass timber with underfloor heating and hot water via a heat pump with energy wells as the source of heat.	62 000	62 000	147 000	42%	2715	35 850	-	13.6
Skaun municipality	Skaun elementary school and cultural venue	2018	2019	School dimensioned for 540 pupils, as well as a public library, a cultural venue and a sports hall. Structure to generate at least 30% less greenhouse gas emissions and to consume 40% less energy than a standard reference building.	100 000	100 000	356 000	28%	9200	89 933	-	34.2
Flatås idrettslag	Flatåshallen	2018	2018	Combined multi-use sports hall and football hall with district heating, outdoor LED lighting system and granule-free artificial grass surface.	67 000	67 000	94 000	71%	5851	50 045	-	19
Eid Industrihus KF	Sagastad knowledge centre	2018	2018	A knowledge centre with an environmentally friendly vision that uses solar panels and fjord-based heating/cooling. Timber used extensively in construction process.	25 900	25 572	28 000	91%	1134	16 571	-	6.3

CASE

FINNMARK'S FIRST CARE CENTRE IN MASS TIMBER

When Alta municipality decided to build a new care centre in the middle of town, it chose to use environmentally friendly mass timber. The care centre consists of 60 sheltered housing units and 108 nursing home places spread across a total of five buildings. It is calculated that a total of 4,000m³ of mass timber will be required.

The use of mass timber will help reduce greenhouse gas emissions, and mass timber is manufactured in a more energy-efficient way and is a renewable material. It is also cheap to manufacture! The building will benefit from modern energy solutions, including energy wells that will meet 50% of the building's total energy requirements. The centre will make a good contribution to the sustainable society of the future.



ALTA CARE CENTRE, ALTA MUNICIPALITY

898 TOTAL COST, MILLION NOK

333 OUTSTANDING GREEN LOAN, MILLION NOK

SHARE FINANCED WITH OUTSTANDING GREEN LOAN

YEAR OF COMPLETION: 2020

ESTIMATED IMPACT (SHARE FINANCED WITH GREEN LOAN)	
Energy use avoided, kWh/year	**282 944**
Energy produced, kWh/year	**535 457**
GHG emissions avoided, tonnes CO_2e	**311**

Illustration: Stein Halvorsen Arkitekter AS

NEW GREEN BUILDINGS

Customer	Project name	Last disburse-ment	Com-pletion	Description	Disbursed green loan (1000 NOK)	Outstand-ing green loan (1000 NOK)	Total cost (1000 NOK)	KBN financing	Heated area in m²	Estimated annual impact, KBNs share		
										Energy avoided annually	Energy pro-duced annually, in kWh	GHG emissions avoided
Horten municipality	Idrettshall i Lystlunden	2018	2019	New sports hall constructed to the passive-house standard. Heating system based on a seawater heat pump and solar collectors.	5 575	5 416	135 000	4%	4400	3 583	-	1.4
Flesberg municipality	Flesberg school with sports hall and swimming pool	2018	2019	New school building for 420 pupils with a sports hall and a swimming pool. Built in mass timber.	160 000	160 000	261 362	61%	8572	194 161	73 466	101.7
Trondheim municipality	Lade school with sports hall	2018	2018	New school dimensioned for 740 pupils built in mass timber to the passive-house standard. The school is connected to the district heating network and uses waterborne heating.	360 000	360 000	360 000	100%	10591	600 046	-	228
Elverum municipality	Ydalir school and nursery	2018	2019	The school will have space for 350 pupils. Mass timber structure, built to the passive-house standard. BREEAM-NOR certification planned.	144 793	144 793	384 286	38%	6800	99 094	-	37,7
Jevnaker municipality	Bergerbakken school with sports hall	2018	2018	New school with space for 420 pupils with a sports hall built in mass timber.	54 473	54 473	128 000	43%	2095	13 373	-	5
Bærum municipality	Levre elementary school	2018	2020	New elementary school dimensioned for 800 pupils built in low-carbon concrete, recycled steel and sustainable wood. Solar cells in the facade.	-	-	-	-	-	-	-	-
Bærum municipality	Lindelia residential care centre	2018	2020	Residential care centre with 132 institutional places, a day care centre and a café. The area will also have ten sheltered housing units and two transitional homes. The buildings will be connected to a district heating and cooling system and built to the passive-house standard.	144 800	144 800	475 000	30%	13898	165 231	-	62.8
Bærum kommune	Bekkestua elementary school	2018	2019	A new elementary school with four parallel forms in each year that will be BREEAM-NOR certified as "Very Good". The building will be built with minimal fossil fuel usage, a measure that the municipality anticipates will save 83 tonnes of CO_2.	219 500	219 500	350 000	63%	9650	157 955	-	60
Oslo kommune	Renovating and extending Hasle school	2018	2019	Renovating a protected centrally located building and constructing a new building to the passive-house standard. The school's capacity will be expanded from 480 pupils to 870.	500 000	500 000	520 100	96%	7800	489 271	-	185.9
Oppegård municipality	Sheltered housing units, Edvard Griegs vei	2018	2019	Construction of 72 sheltered housing units, a day care centre and a café, as well as a base for home care services. Structure will be in mass timber and low-carbon concrete and will comply with the passive-house standard. Heating provided by district heating.	210 320	210 320	390 500	54%	8682	224 450	-	85.3

NEW GREEN BUILDINGS

Customer	Project name	Last disburse-ment	Com-pletion	Description	Disbursed green loan (1000 NOK)	Outstand-ing green loan (1000 NOK)	Total cost (1000 NOK)	KBN financing	Heated area in m²	Estimated annual impact, KBNs share		
										Energy avoided annually	Energy pro-duced annually, in kWh	GHG emissions avoided
Kvænangen municipality	Kvænangen elementary and lower secondary school with sports hall	2018	2019	A new school with a multi-use sports hall, dimensioned for 195 pupils. Built in mass timber.	71 355	70 346	122 600	57%	4800	119 827	-	45.53
Tvedestrand municipality	New upper secondary school with sports hall	2018	2020	The school has been dimensioned for approximately 700 pupils. Mass timber structure, built to the plus-house standard.	89 784	88 288	230 000	38%	5650	252 666	120 369	141.8
Alta municipality	Alta care centre	2018	2020	Care centre with a mass timber structure. 168 places. Ground-source heating will meet 50% of energy requirements.	336 000	333 917	898 000	37%	18 559	282 944	535 457	311
Sel municipality	"Otta brygge": Homes for people with disabilities	2018	2019	Mass timber building with 16 sheltered housing units. District heating used.	21 300	20 945	62 000	34%	1750	62 075	-	23.6
Sør-Odal municipality	"School of the future"	2018	2019	New school building with space for 900 pupils as well as a multi-use sports hall. Mass timber structure, built to the passive-house standard. BREEAM-NOR certified as "Very Good".	99 000	99 000	367 000	27%	10750	197 191	-	74.9
Lyngen municipality	Leangen school	2018	2018	A new school building in mass timber dimensioned for 60 pupils.	74 471	72 717	84 003	87%	1750	909	-	0.35
Vestfold county authority	New Horten upper secondary school	2018	2019	A new upper secondary school for 1,200 pupils. Structure, walls and roof made out of timber. The building will be BREEAM-NOR certified as "Outstanding" and will satisfy FutureBuilt's definition of an energy-plus building through the use of solar panels on the roof, among other measures.	455 000	455 000	755 000	60%	16863	599 586	538 611	432.51
Kongsvinger municipality	Kongsvinger lower secondary school	2018	2018	A new lower secondary school in mass timber dimensioned for 720 pupils. The school replaces four previous lower secondary schools and is BREEAM-NOR certified as "Very Good".	319 500	314 197	319 500	98%	10300	222 839	-	84.68
Flå municipality	Flå nursery	2018	2018	Flå nursery has been extended through the construction of four new sections. Constructed in mass timber and heated using a heat pump.	26 000	25 412	27 000	94%	854	4 019	-	1.5
Moss municipality	New Hoppern school with sports hall	2018	2019	New school building for 450 pupils with a sports hall. Mass timber structure built to passive-house standard. BREEAM-NOR certified as "Very Good".	245 856	243 004	368 500	66%	6374	107 184	76 186	69.7
Nærøy municipality	New Kolvereid school	2018	2018	School building for 315 pupils as well as a public library. Mass timber structure, built to passive-house standard.	49 790	49 790	128 800	39%	3174	39 508	-	15
Eid municipality	Sheltered housing units	2018	2019	Eleven sheltered housing units built in mass timber with staff facilities and garages. Heated using heat pumps connected to a fjord-based district heating network.	30 000	29 363	34 700	85%	1200	77 275	-	29.4

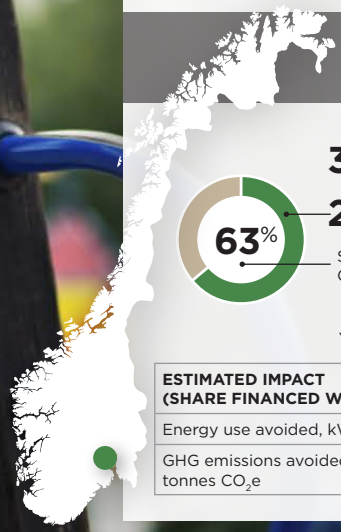
NEW GREEN BUILDINGS

Customer	Project name	Last disburse-ment	Com-pletion	Description	Disbursed green loan (1000 NOK)	Outstand-ing green loan (1000 NOK)	Total cost (1000 NOK)	KBN financing	Heated area in m²	Estimated annual impact, KBNs share		
										Energy avoided annually	Energy pro-duced annually, in kWh	GHG emissions avoided
Molde og Romsdal Havn IKS/ Molde Havnevesen KF	New harbour building in Molde	2018	2017	New office building built with low energy consumption and low-emission materials. Heating need met by heat pumps with air and water as energy sources.	10 000	10 000	30 000	33%	838	10 335	-	4
Bærum municipality	Nansenparken nursery	2018	2018	A new 200-place nursery built to the passive-house standard. The building will be connected to a new vacuum facility for waste and will use district heating and cooling as well as its own solar panels. It will be designed to make it easy to drop off and collect children by metro and bike.	137 100	137 100	145 000	95%	3770	329 013	21 609	133.2
The City of Oslo	New Holmen school with sports hall	2018	2018	A new elementary school dimensioned for 654 pupils. Flexible structure that will permit expansion in future. The building will comply with the passive-house standard and will have an 'A' rating for energy efficiency.	500 000	500 000	522 800	96%	10300	362 510	-	137.8
Enebakk municipality	Ytre Enebakk school	2018	2018	School for 800 pupils and a multi-use sports hall. Mass timber structure, built to the passive-house standard.	284 000	284 000	350 000	81%	8036	187 034	-	71.1
Malvik municipality	Hommelvik lower secondary school	2017	2017	New lower secondary school for 400 pupils. Energy-efficient building with outer cladding in ore-pine. 90% of heat demand met by geothermal heating.	211 902	202 244	212 000	95%	5574	264 811	106 350	141
Orkdal municipality	Rosenvik public housing complex	2017	2017	Apartment complex with sheltered housing units and municipal homes constructed in mass timber and clad in locally produced cladding. The municipality emphasised local materials and rail transportation. The building is heated using excess heat from a nearby smelting plant.	58 000	56 343	58 300	97%	1132	112 244	-	42.7
Møre and Romsdal County Authority	Romsdal upper secondary school	2017	2017	New upper secondary school for 800 pupils. Mass timber used throughout the building, including in load-bearing structures. Energy-efficient, "low-tech" ventilation system. Heated and cooled using 32 geothermal wells.	210 300	205 263	520 000	39%	12000	189 474	-	72
Horten municipality	Granly school	2017	2018	New elementary school constructed to the passive-house standard with space for 580 pupils. Heating based on geothermal heat pumps. The school has lots of outdoor areas and its own school garden.	49 638	48 220	297 625	16%	8736	35 384	-	13.4
Åfjord municipality	Passive house project for upper secondary school pupils	2017	2017	Two municipal homes built to the passive-house standard by students enrolled in the building construction program at Åfjord Upper Secondary School, giving the pupils training in this construction technique.	2 500	2 417	3 500	69%	132	4 247	-	1.6

CASE

FOSSIL-FREE BUILDING SITE

When Bærum decided to build the municipality's largest elementary school, which will have a total floor area of 10,000m^2, it set a requirement in the tender process for the building site to be fossil-fuel-free. This means that traditional diesel-driven machines will have as far as possible to be replaced by electric machines and machines that run on biofuels, and that heaters and dehumidifiers will have to run on district heating, electricity, hydrogen or bio energy. This is enabling the municipality to deliver a building site that is 90-95% fossil-fuel-free and has cut the greenhouse gas emissions from the construction process by an estimated 83 tonnes of CO_2.
The building itself is energy efficient and will be BREEAM-NOR certified. This project is a good example of the municipality using its power of procurement to speed up the shift to environmentally friendly solutions.



BEKKESTUA ELEMENTARY, SCHOOL
BÆRUM MUNICIPALITY

350 TOTAL COST, MILLION NOK

220 OUTSTANDING GREEN LOAN, MILLION NOK

63% SHARE FINANCED WITH OUTSTANDING GREEN LOAN

YEAR OF COMPLETION: 2019

ESTIMATED IMPACT (SHARE FINANCED WITH GREEN LOAN)	
Energy use avoided, kWh/year	**157 955**
GHG emissions avoided, tonnes CO_2e	**60**

Foto: Illustrasjon, iStock

NEW GREEN BUILDINGS

Customer	Project name	Last disburse-ment	Com-pletion	Description	Disbursed green loan (1000 NOK)	Outstand-ing green loan (1000 NOK)	Total cost (1000 NOK)	KBN financing	Heated area in m²	Estimated annual impact, KBNs share		
										Energy avoided annually	Energy pro-duced annually, in kWh	GHG emissions avoided
Asker municipality	Kistefossdammen nursery	2016	2017	Nursery with space for 100 children, built to a significant extent in timber. The building is the first plus-energy building built by the public sector in Norway (FutureBuilt's definition). Supplied with 100% local renewable energy from energy wells and integrated solar panels.	77 600	73 720	77 600	95%	1220	115 900	42 883	60.3
Asker municipality	Holmen swimming pool	2016	2017	One of Norway's most energy-efficient swimming pools. 80% of the facility's energy consumption is met by local renewable energy from geothermal heat pumps, solar panels and solar thermal panels.	277 000	263 150	277 000	95%	4121	2 348 970	-	892.6
Frogn municipality	Ullerud health centre	2016	2017	The largest health centre in Norway to be constructed in mass timber. The building includes a 108-bed nursing home, a learning, mastery and rehabilitation centre, a day centre for the elderly and a central kitchen.	192 307	192 307	226 000	85%	12000	1 041 521	-	395.8
Indre Fosen municipality	Emergency services building	2015	2016	Co-location of fire and ambulance stations in one energy-efficient building.	30 000	27 388	45 000	61%	1200	62 809	-	23.9
Indre Fosen municipality	New Åsly school	2015	2016	A new elementary and lower secondary school with space for 400 pupils. Meets the passive-house standard.	51 100	46 640	235 000	20%	7200	71 607	-	27.2
Kristiansand municipality	Fagerholt school	2014	2016	School for 500 pupils built to the passive-house standard.	16 700	14 153	138 000	10%	5056	33 952	-	12.9
Kristiansand municipality	Torridal school	2014	2015	Elementary school with outer cladding in timber, satisfies the passive-house standard. The school has space for 200 pupils.	15 000	12 712	69 900	18%	2000	19 197	-	7.3
Kristiansand municipality	Hellemyr multi-use sports hall	2014	2015	Built using climate-friendly building materials and satisfies the passive-house standard.	43 700	37 034	63 300	59%	5532	298 828	-	113.6
Kristiansand municipality	Town Hall Quarter	2014	2014	New buildings and renovation of existing buildings, including some protected buildings. The heat demand is met by heat recovered from the municipality's data centre as well as by district heating. Free cooling for the data centre and buildings is based on using cold seawater from Byfjorden.	459 505	370 274	540 700	68%	13071	608 674	-	231.3
Oppegård municipality	Ødegården nursery	2014	2014	Nursery building built to the passive-house standard with space for 100 children. The building is heated and cooled using energy wells.	46 200	40 478	47 800	85%	1488	148 183	-	56.3
Farsund municipality	Alcoa environmental park	2014	2014	Multi-use sports hall and year-round artificial grass pitch, with 97% of the heating needs supplied by excess heat from the nearby Alcoa aluminium factory. Energy-efficient building.	100 000	100 000	109 200	92%	5500	373 782	-	142

NEW GREEN BUILDINGS

Customer	Project name	Last disburse-ment	Com-pletion	Description	Disbursed green loan (1000 NOK)	Outstand-ing green loan (1000 NOK)	Total cost (1000 NOK)	KBN financing	Heated area in m²	Estimated annual impact, KBNs share		
										Energy avoided annually	Energy pro-duced annually, in kWh	GHG emissions avoided
Oppegård municipality	New wing Høyås nursing home	2014	2015	Extension to existing nursing home built to the passive-house standard. Accommodation for 32 residents. Ground source heating.	10 000	8 475	203 000	4%	6000	23 120	-	8.8
Oppegård municipality	Augestad nursery	2014	2014	Nursery building built to the passive-house standard with space for 36 children. The building is heated using geothermal energy distributed through under-floor heating.	26 000	21 315	26 000	82%	420	2 066	-	0.5
Kristiansand municipality	Aquarama water park	2013	2013	Low-energy swimming pool and bathing facility with a fitness centre, sports hall, and various public health services. The building uses district heating and heat recovery from ventilation.	536 680	418 528	596 000	70%	15000	1 049 121	-	399
Oppegård municipality	Greverudåsen sheltered housing	2013	2014	Sheltered housing for people with functional impairments. Built to the passive-house standard, heated using district heating.	16 396	13 240	31 800	42%	920	35 239	-	13.4
Romerike avfallsforedling IKS	Administration building	2012	2013	Administration building built to the passive-house standard in connection with a new sorting and recycling facility. Constructed in part with recycled building materials.	21 700	14 648	31 000	47%	1050	39 988	-	15.2
Kristiansand municipality	Øvre Sletteheia nursery	2012	2012	Nursery constructed as a low-energy building with solar panels on parts of the roof. Heated using deep water bore holes with a water-to-water heat pump.	18 799	14 657	38 200	38%	1082	22 003	-	8
Sør-Varanger municipality	Kirkenes elementary and lower secondary school	2012	2012	The new school replaces a number of old buildings and reduces energy consumption significantly.	358 000	304 300	370 000	82%	12400	305 945	-	116.3
Øvre Eiker municipality	Hokksund elementary school	2011	2012	Elementary school built to the passive-house standard with space for 405 pupils. Part timber construction.	160 000	120 419	241 200	50%	7300	105 692	-	40.2
Kristiansand municipality	Møllestua nursery	2011	2011	Passive-house nursery for 100 children. The building is self-sufficient in terms of energy for some of the year thanks to use of solar panels and solar captors. Low-carbon concrete in foundations and floor.	25 216	19 233	44 270	43%	1261	53 687	-	20.0
Drammen municipality	Fjell nursery	2011	2010	Nursery for 90 children built in mass timber to the passive-house standard. Building heated using low-temperature waterborne underfloor heating, as well as by a heat pump connected to geothermal wells.	15 963	8 921	28 200	32%	755	19 107	-	7.3
Drammen municipality	Marienlyst school	2011	2010	First school in Norway to be constructed to the passive-house standard. Space for 560 pupils. Heat demand met by a mini district heating system.	248 019	138 599	254 500	54%	6454	242 521	-	92.2

PROJECTS

RENEWABLE ENERGY

KBN finances investments that reap the energy potential of the sun, the wind, the ground, the sea, biomaterials and other renewable energy carriers, as well as waste. Such investments thereby to replace energy sources that produce greenhouse gases. The projects must be fossil-free in their operations. For district heating systems, we allow mineral-based back-up solutions for security reasons.

Impact estimates are based on the assumption that produced energy is emission-free[1] and substitutes electricity from the grid, unless otherwise stated.

8 NUMBER OF PROJECTS FINANCED, TOTAL

3 NUMBER OF PROJECTS FINANCED, 2018

KBN GREEN LOANS TO NEW RENEWABLE ENERGY

Total outstanding, in 1000 NOK	554 036

ESTIMATED ANNUAL IMPACT ATTRIBUTABLE TO GREEN LOANS*

Energy produced	107 510 MWh
GHG emissions avoided	40 855 tonnes CO_2e

*In 2018, 68 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.

1. - In scopes 1 and 2 as defined by the Greenhouse Gas Protocol, which are the emission scopes covered by this report.

UN SDG TARGETS RELEVANT TO RENEWABLE ENERGY

Ensure access to affordable, reliable, sustainable and modern energy

Target 7.2 By 2030, increase substantially the share of renewable energy in the global energy mix

RENEWABLE ENERGY

Customer	Project name	Last disburse-ment	Com-pletion	Description	Total disbursed green loan (1000 NOK)	Green loan outstand-ing (1000 NOK)	Total cost	Proportion financed by green loan	Estimated impact, KBN share		
									Installed capacity, kW	Expected annual energy production, kWh	Estimated an-nual reduction in greenhouse gas emissions
Dyrøy energi AS	Sorting facility for timber waste for bio energy	2018	2018	Increasing the capacity of a biofuel-based district heating plant. Improving the feeding system and refurbishing a boiler, as well as adaptations to enable 15% of biofuel to come from chippings produced from waste timber from a nearby waste reception facility.	2 800	2 753	2 800	98.33 %	-	295 000	112
Time municipality	New energy plant for City Hall area	2018	2018	A new heating plant based on bio pellets. Replacement for little-used gas boiler.	4 000	4 000	6 600	61%	303	1 272 727	484
Tønsberg municipality	Greve biogas: "The magic factory"	2018	2017	Facility for producing biogas based on biowaste from households and industry as well as manure. The biogas product primarily replaces fossil fuels used by busses, refuse trucks and other vehicles, but can also secondarily be used for heating.	170 000	170 000	240 000	71%	-	46 041 667	17 496
Eid Fjordvarme KF	Fjord-based district heating	2017	2017	District heating system based on low-temperature fjord water and heat exchangers that supplies more than 100,000m^2 of buildings in central Nordfjordeid.	7 385	6 978	12 900	54%	2 705	4 489 927	1 706
IVAR IKS	Grødaland biogas plant	2017	2017	A plant for producing biogas based on sewage sludge, waste food and other organic waste. Biofuel plant for steam heat production based on de-watered bio residue and timber waste.	367 200	338 948	546 000	62.08%	548	55 249 828	20 995
HAMOS Forvlatning IKS	Frøya recycling centre	2017	2017	Solar panels on walls and roof of a new waste recycling facility.	12 500	11 488	22 000	52.22%	47	44 384	17
Hvaler municipality	Sandbakken recycling centre	2016	2016	A recycling centre that produces its own energy through 1,200m^2 of solar panels and four micro wind turbines. The excess power is stored in batteries and can be used when required.	14 055	13 118	24 200	54%	-	104 619	40
HAMOS Forvaltning IKS	Orkdal waste transfer facility	2016	2016	Waste transfer facility with a 200m^2 solar panel plant on its façade. When the facility's machinery needs replacing, electric loaders will be purchased.	7 500	6 750	17 000	39.71%	12	11 912	5

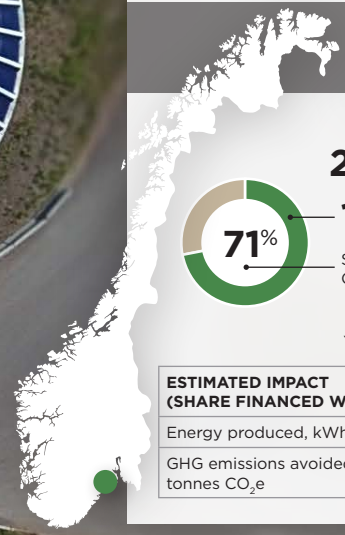
CASE

FOOD WASTE AND MANURE BEING TURNED INTO FUEL

"The magic factory" in Vestfold is at the cutting edge of bio energy production in Norway. The facility conjures up biogas equivalent to 6.5 million litres of diesel from 60 000 tonnes of food waste and 65 000 tonnes of manure, while also producing 110 000 tonnes of bio-fertiliser. This has helped cut synthetic fertiliser sales in Vestfold by 2 500 tonnes a year.

The facility has made it possible for the area's refuse trucks and buses to run on food waste and manure. Greve biogas is helping to reduce greenhouse gas emissions and air pollution. Value is being created by using waste as a resource, and the factory is a good step in the global shift towards renewable energy.

GREVE BIOGAS: "THE MAGIC FACTORY", TØNSBERG MUNICIPALITY



240 TOTAL COST, MILLION NOK

170 OUTSTANDING GREEN LOAN, MILLION NOK

SHARE FINANCED WITH OUTSTANDING GREEN LOAN

YEAR OF COMPLETION: 2017

ESTIMATED IMPACT (SHARE FINANCED WITH GREEN LOAN)	
Energy produced, kWh/year	**46 041 667**
GHG emissions avoided, tonnes CO_2e	**17 496**

Photo: Greve Biogass

PROJECTS

ENERGY EFFICIENCY

Improving the energy efficiency of existing buildings and energy-demanding infrastructure is an important step on the way to a low-carbon society. KBN finances investments that reduce energy consumption by at least 25 per cent compared to the situation prior to the investment and/or phase out fossil energy sources and other unsustainable energy solutions.

Impact is calculated by comparing energy consumption before the investment, to the estimated energy use after investment.

21 NUMBER OF PROJECTS FINANCED, TOTAL

8 NUMBER OF PROJECTS FINANCED, 2018

KBN GREEN LOANS TO ENERGY EFFICIENCY

Total outstanding, in 1000 NOK	367 321

ESTIMATED ANNUAL IMPACT ATTRIBUTABLE TO GREEN LOANS*

Energy savings	24 233 MWh
GHG emissions avoided	9 206 tonnes CO_2e

*In 2018, 68 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.

UN SDG TARGETS RELEVANT TO ENERGY EFFICIENCY

Ensure access to affordable, reliable, sustainable and modern energy

Target 7.3 By 2030, double the global rate of improvement in energy efficiency

Build resilient infrastructure, promote sustainable industrialization and foster innovation

Target 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

ENERGY EFFICIENCY

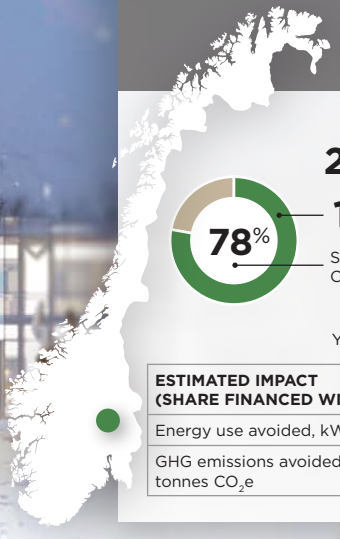
Customer	Project name	Last disburse-ment	Comle-tion	Description	Total disbursed green loan (1000 NOK)	Green loan outstand-ing (1000 NOK)	Total cost	Proportion financed by green loan	Estimated impact, KBN share		
									Heated surface area included in the project (KBN)	Reduction in annual energy requirements (khW)	Estimated an-nual reduction in greenhouse gas emissions (tonnes of CO_2)
Gjøvik Rådhus AS	Renovation of Gjøvik City Hall	2018	2018	Introduction of district heating and new technology for temperature management. These improvements will produce a reduction in energy consumption of around 70%.	175 000	175 000	225 000	78%	8 401	2 485 216	944
Sel municipality	Replacing street lighting	2018	2018	New LED technology and management system that will reduce energy consumption by over 25%.	1 620	1 593	2 000	80%	5 018	62 286	24
Flatanger municipality	Energy solution for Flatanger's new nursing and caring centre	2018	2019	Energy efficiency improvements through replacement of oil heating with geothermal heating and a central operational control system.	15 000	14 750	15 000	98%	2 776	255 667	97
Surnadal municipality	Heating/ cooling pump at Kulturhuset	2018	2018	A new and more efficient heating/cooling pump that reuses heat from the cooling system.	600	600	600	100%	3 300	50 000	19
Rendalen municipality	Energy-saving measures across 11 municipal buildings	2018	2018	Energy-saving measures will be implemented at municipal buildings as an energy performance contract (EPC). The project involves implementing 60 energy-saving measures of varying sizes across purpose-built buildings in the municipality.	9 056	9 056	12 477	73%	10 286	1 319 650	501
Bærum municipality	Improving the energy efficiency of road lighting	2018	2018	Replacing traditional road lighting with LED lighting.	22 500	22 500	24 700	91%	-	-	-
Nesodden municipality	LED street lighting	2018	2018	Old street lighting replaced with more energy-efficient lighting.	1 600	1 600	2 000	80%	-	864 000	328
Steinkjerbygg KF	Inn Trøndelag healthcare and emergency centre	2018	2019	New control system that will reduce energy consumption.	4 000	4 000	4 000	100%			
Horten municipality	LED outdoor lighting	2017	2017	Old light fittings outside municipal buildings upgraded to LED lighting.	1 230	1 195	1 500	80%	-	79 657	30
Rømskog municipality	Bio heating	2017	2017	Traditional oil heating system replaced with bio heating in buildings.	1 300	1 235	1 813	68%	3 120	-	-
Utsira municipality	Siratun energy efficiency project	2017	2017	Energy efficiency project that includes waterborne heating, heat pumps and new lighting in Siratun's municipal administration building.	4 000	3 900	5 750	68%	766	126 157	48
Surnadal municipality	Energy efficiency measures for municipal buildings	2017	2017	Increasing the energy efficiency of Surnadal's municipal administration building, elementary school and other municipal buildings.	3 500	3 325	7 300	46%	12 786	558 789	212
Surnadal municipality	LED lighting	2017	2020	Replacing street lights with LED fittings.	150	143	150	95%	-	6 745	2.6

CASE

THE ENERGY SOLUTIONS OF TOMORROW FOR AN OLD CITY HALL

When Gjøvik Rådhus AS realised the City Hall's indoor climate and design needed improving, it decided on a comprehensive technical renovation of the building. It set ambitious targets with regard to quality, energy consumption and recycling. The project is subject to targets to ensure the building is BREEAM-NOR certified as "Very Good". The new solution replaces oil and electric boilers with district heating. Central operating technology will help improve air quality and temperatures and will reduce energy consumption. The City Hall will meet the requirements of tomorrow in terms of functionality, efficiency and adaptations, and is an example of how a building can be renovated in an environmentally beneficial manner.

RENOVATION OF GJØVIK CITY HALL, GJØVIK RÅDHUS AS



225 TOTAL COST, MILLION NOK

175 OUTSTANDING GREEN LOAN, MILLION NOK

SHARE FINANCED WITH OUTSTANDING GREEN LOAN

YEAR OF COMPLETION: 2018

ESTIMATED IMPACT (SHARE FINANCED WITH GREEN LOAN)	
Energy use avoided, kWh/year	**2 485 216**
GHG emissions avoided, tonnes CO_2e	**944**

Illustration: Kontur AS

ENERGY EFFICIENCY

Customer	Project name	Last disburse-ment	Comle-tion	Description	Total disbursed green loan (1000 NOK)	Green loan outstand-ing (1000 NOK)	Total cost	Proportion financed by green loan	Estimated impact, KBN share		
									Heated surface area included in the project (KBN)	Reduction in annual energy requirements (khW)	Estimated an-nual reduction in greenhouse gas emissions (tonnes of CO_2)
Sandefjord municipality	EPC project	2017	2018	Increasing the energy efficiency of 18 buildings through an energy performance contract. Phasing out the use of fossil fuels in five buildings, monitoring energy consumption, upgrading ventilation and water-to-air heat recovery.	23 600	21 240	23 600	90%	28 000	2 790 000	1 060
Asker municipality	Energy efficiency project for public buildings	2016	2016	Energy efficiency project involving a number of innovative solutions, such as using waste heat from producing ice for an ice rink to heat a swimming pool and phasing out fossil fuel usage from several buildings.	25 400	24 130	35 600	68%	33 890	3 727 949	1 417
Bardu municipality	LED street lighting	2016	2017	Replacing 10% of the municipality's traditional street lights with LED fittings.	480	448	480	93%	-	12	-
Jevnaker municipality	Improving energy efficiency with an EPC contract	2016	2016	Improving the energy efficiency of a number of long-use buildings. New solutions will ensure more stable operation of technical equipment.	21 000	19 167	21 000	91%	29 989	1 832 428	696
Spydeberg municipality	Energy efficiency improvements (EPC) in buildings and a water treatment plant	2016	2016	Improving the energy efficiency of nine municipal buildings and a water treatment plant. The project involves a range of energy efficiency measures, such as additional insulation, the installation of heat pumps and setting up an energy monitoring system and a central operational control system.	12 780	12 089	20 500	59%	20 463	1 370 949	521
Indre Fosen municipality	Improving energy efficiency through an EPC contract	2015	2015	Improved energy efficiency and phasing out of fossil fuels in a municipal property. Heating oil consumption reduced by 98%, representing a significant reduction in climate gas emissions.	5 000	4 565	5 000	91%	15 815	1 418 508	539
Kristiansand municipality	Energy efficiency improvements and phasing out of oil heating	2014	2016	Energy efficiency improvements and phasing out fossil fuel usage in municipal buildings. Consumption of heating oil reduced by 98%, significantly reducing greenhouse gas emissions.	54 500	43 397	97 300	45%	156 103	7 136 133	2 712
Oppegård municipality	Central operational control system	2014	2014	Energy efficiency project that will connect the municipality's purpose-built buildings to a central operational control system.	4 000	3 390	4 400	77%	18 284	148 551	56

Photo: Paul Sigve

PROJECTS

LOW-CARBON TRANSPORTATION

For Norway to meet its climate commitments, emissions from the transport sector must be reduced dramatically over the next few years. KBN finances fossil-free transportation projects on land and on water, as well as infrastructure for pedestrians and bicycles.

18 NUMBER OF PROJECTS FINANCED, TOTAL

8 NUMBER OF PROJECTS FINANCED, 2018

KBN GREEN LOANS TO NEW LOW-CARBON TRANSPORTATION

Total outstanding, in 1000 NOK	5 389 633

ESTIMATED ANNUAL IMPACT ATTRIBUTABLE TO GREEN LOANS*

Reduced/avoided emissions	9 206 tonnes CO_2e

*In 2018, 68 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.

UN SDG TARGETS RELEVANT TO LOW-CARBON TRANSPORTATION

Build resilient infrastructure, promote sustainable industrialization and foster innovation

Target 9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and human well-being, with a focus on affordable and equitable access for all

Target 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities

Make cities inclusive, safe, resilient and sustainable

Target 11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons

Target 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

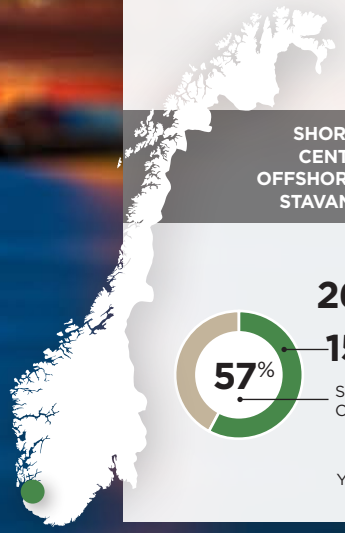
LOW-CARBON TRANSPORTATION

Customer	Project name	Last disbursement	Completion	Description	Total disbursed (1000 NOK)	Green loan outstanding (1000 NOK)	Total cost (1000 NOK9	Proportion financed by green loan	Estimated impact, KBN share Estimated annual reduction in greenhouse gas emissions (tonnes)
Sel municipality	Charging station for electric cars	2018	2018	Installation of charging points in area with many holiday houses. It is estimated that these will be used by 10,000 people.	320	315	400	79%	-
Nesodden municipality	Charging station for electric cars	2018	2019	Facilitating use of electric cars by installing 32 charging points.	800	800	1 400	57%	-
Nesodden municipality	Electric bikes for municipal employees	2018	2018	Procurement of 88 electric bikes for municipal employees, potentially significantly reducing car usage.	1 367	1 367	1 500	91%	-
Stavangerregionen Havn IKS	Shore-side power supply in central Stavanger and an offshore terminal in Risavika	2018	2019	Installation of two shore-side power systems with six quay posts. Will help docked vessels to move from using fossil fuels to green energy. Reduction in local pollution.	15 333	15 333	26 833	57%	-
Bærum municipality	Replacing municipal car fleet	2018	2018	Expanding the fleet of electric vehicles for municipal employees by around 35 cars. The electric car fleet helps reduce emissions and frees up parking spaces. The average mileage per car is estimated to be 15,000 km/year.	10 000	10 000	10 000	100%	26
Surnadal kommune	Svartvatnet: footpath and recreational area	2018	2020	Conversion of roadway into a foot and cycle path in central Surnadal to reduce car traffic and to make it easier for people to walk or cycle to school and work. Free school transport will be reduced as a consequence of the footpath, and 500 pupils will use the footpath every day.	7 300	7 130	11 500	62%	-
Nesodden municipality	Coastal path	2018	2019	Creation of a 4-4.5km coastal path that will help promote cycling and walking as well as leisure activities.	640	640	2 400	27%	
Time municipality	Foot and cycle paths	2018	2018	Creation of foot and cycle paths that make it safe to walk and cycle along a county road that is also a route to school. A bridge over water connects cycle lanes on the east and west side.	25 000	25 000	43 000	58%	-
Harstad havn KF	Shore-side power supply	2017	2018	Container-based, shore-side mobile power supply for use on four quays.	2 642	2 378	8 158	29%	331
Horten municipality	Biogas cars	2017	2018	Purchasing of 24 biogas cars for the municipal car fleet. CO_2 impact is recognised as part of the filling station project.	3 500	3 400	18 500	18%	-
Horten municipality	Construction of energy filling station and gas operations	2017	2017	Energy filling station for liquefied biogas (LBG) for municipal and private vehicles. The biogas is produced from food waste and sewage sludge at Greve biogas plant.	7 869	7 644	9 600	80%	207

CASE

SHORE-SIDE POWER SIGNIFI-CANTLY REDUCING EMISSIONS FROM SHIPPING

The shipping industry's activities along the coast of Norway are responsible for sizeable greenhouse gas emissions and significant local air pollution in port towns. A research report has demonstrated that shore-based power supplies in the 28 largest ports in Norway would save the country 356 000 tonnes of CO_2 emissions per year. 7% of the greenhouse gas emissions produced by the shipping industry are produced by docked ships. Stavangerregionen Havn IKS is taking a proactive approach and building two shore-side power supply systems with a total of six quay posts. The facilities will help docked ships to move from using fossil fuels to green energy delivered by a local power company. The measure will also benefit the local environment and climate!



SHORE-SIDE POWER SUPPLY IN CENTRAL STAVANGER AND AN OFFSHORE TERMINAL IN RISAVIKA, STAVANGERREGIONEN HAVN IKS

26,8 TOTAL COST, MILLION NOK

15,3 OUTSTANDING GREEN LOAN, MILLION NOK

SHARE FINANCED WITH OUTSTANDING GREEN LOAN

YEAR OF COMPLETION: 2019

Photo: Illustration, iStock

LOW-CARBON TRANSPORTATION

Customer	Project name	Last disbursement	Completion	Description	Total disbursed (1000 NOK)	Green loan outstanding (1000 NOK)	Total cost (1000 NOK9	Proportion financed by green loan	Estimated impact, KBN share Estimated annual reduction in greenhouse gas emissions (tonnes)
Båtsfjord Havn KF	Electrification	2017	2018	Shore-side power supply and charging points for up to 44 large vessels along four public quay fronts. The electricity is generated by newly installed wind turbines located in the municipality. The port electrification will reduce CO_2 emissions and local air pollution, as well as reducing noise.	6 400	6 080	31 855	19%	573
Rømskog municipality	Foot and cycle paths	2017	2017	Creation of 700m of foot and cycle paths connecting the school and municipal administration building to residential areas that will be used by approximately 200 school children and employees.	6 500	6 175	8 500	73%	-
Hvaler municipality	Electric vehicle charging points for community in Hvaler	2016	2017	Improvements to infrastructure for charging of electric cars and plug-in hybrid cars, comprising 14 charging points at the town hall and two fast charging points at other locations in the municipality.	499	465	1 050	44%	-
Holmestrand municipality	Mountain lift to train station	2016	2016	Installation of lift service connecting mountain plateau to underpass leading to Holmestrand train station. The lift will make travelling by train more attractive for 3,000 people who live within 20 minutes' cycle ride of the station.	24 650	19 916	64 500	31%	-
Oppegård municipality	Electric cars for the home care service	2014	2014	29 cars used by the municipality's home care service replaced with electric cars.	7 290	5 887	7 300	81%	3
Ferde AS	Bergen light rail	2014	2017	Electric light rail service, representing an efficient and environmentally friendly public transport service in Bergen. The line delivered 12.6 million passenger journeys in 2017.	5 270 000	5 270 000	5 270 000	100%	5 753
Oppegård municipality	Foot and cycle paths	2014	2014	Creation of 530m of foot and cycle paths and bicycle parking, improving bike lanes and procurement of electric bikes.	8 509	7 103	8 700	82%	-

PROJECTS

WASTE MANAGEMENT

KBN finances investments that ensure sustainable management of waste, so that the resources found in waste may be utilised in the best possible way. To be eligible for a green loan, the investment should represent best practice within waste management and -treatment, taken into consideration the regional context of the project.

16 NUMBER OF PROJECTS FINANCED, TOTAL

4 NUMBER OF PROJECTS FINANCED, 2018

KBN GREEN LOANS TO WASTE MANAGEMENT

Total outstanding, in 1000 NOK	517 287

ESTIMATED ANNUAL IMPACT ATTRIBUTABLE TO GREEN LOANS*

Increase in capacity	52 463 tonn

*In 2018, 68 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.

UN SDG TARGETS RELEVANT TO WASTE MANAGEMENT

Make cities inclusive, safe, resilient and sustainable

Target 11.6 By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management

Ensure sustainable consumption and production patterns

Target 12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment

Target 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse

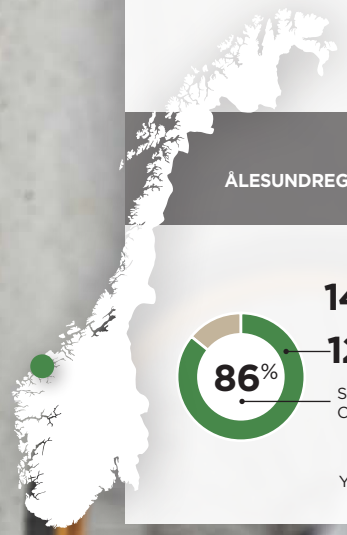
WASTE MANAGEMENT

Customer	Project name	Disbursement year	Completion	Description	Total disbursed green loan (1000 NOK)	Green loan outstanding (1000 NOK)	Total cost	Proportion financed by green loan	Estimated impact, KBN share	
									Increase in capacity	Other comments
Sel municipality	New recycling facility in Heidal	2018	2019	New recycling station as part of work to increase recycling rate.	400	393	817	48%	-	-
Haugaland Interkommunale Miljøverk IKS	Recycling centres, reception facility and modifications to landfill gas plant	2018	2018	Building a waste reception facility to improve disposal of hazardous waste and work to optimise the existing landfill gas plant so it is operational at all times. Will help reduce carbon dioxide and methane emissions.	2 070	2 070	3 450	60%	-	-
Ålesundregionen Interkommunale Miljøselskap IKS (ÅRIM)	Introduction of new collection scheme	2018	2018	Collection scheme for food waste and glass and metal packaging, as well as measures at recycling centres to increase recycling.	14 400	12 343	14 400	86%	-	-
Renovasjon i Grenland IKS	Pasadalen recycling centre	2018	2018	New recycling centre as part of work to increase recycling rate.	11 400	11 020	36 000	31%	4 286	-
Longyearbyen Community Council	Feasibility study for a new waste facility	2017	2018	Feasibility study for a new waste facility with the target of ensuring Longyearbyen is at least as good at resource and environment waste management as mainland Norway. The new facility to be moved out of the centre of the town in accordance with a new municipal zoning plan.	6 523	6 197	90 000	7%	-	-
Dyrøy municipality	Building a recycling centre	2017	2018	A new recycling centre with a better sorting system that will ensure a higher recycling rate and better resource utilisation. The facility will process waste from 650 households.	3 600	3 456	3 800	91%	455	Expected annual energy production: 1 818 947 kWh
Simas IKS	Logistics solution for recycling timber	2017	2017	A new logistics solution for timber waste. This solution makes it possible to store timber taken to a recycling centre for longer periods so that larger loads can be transported by boat instead of by lorry as today.	2 000	1 850	2 000	93%	2 313	Reduced/avoided CO_2e annually: 30 tonnes CO_2e
Sirkula IKS	Waste collection	2017	2017	Equipment for collecting waste from 42,000 customers in Hedmark county.	31 979	28 176	32 250	87%	-	-
Sirkula IKS	Recycling facilities	2016	2017	Upgrading five recycling facilities for waste from 40,000 customers.	14 452	12 317	19 303	64%	-	-
Sirkula IKS	Gålåsholmen	2016	2015	Reception facility for garden waste, which will later be expanded to include high-tech recycling equipment. The facility will function as a recycling centre and re-sale outlet for products including compost produced by Sirkula.	17 721	15 326	18 800	82%	16 400	-

CASE

HOME COLLECTION OF GLASS AND METAL PACKAGING INCREASING RECYCLING

In the Ålesund region, ÅRIM, an environment company, is introducing a collection scheme for glass and metal packaging across twelve municipalities. The scheme is delivering results: it seems that people who have a separate bin separate out 30% more packaging from their rubbish than before. Even if there is a degree of uncertainty surrounding the figures because they are from the introductory period, the company has concluded that people separate out glass and metal packaging from their rubbish to a greater extent when they have a dedicated bin for it. Glass and metal are valuable resources that can be recycled endlessly without losing value. ÅRIM's collection scheme is a good measure for extracting the largest amount of resources possible from rubbish.



INTRODUCTION OF NEW COLLECTION SCHEME, ÅLESUNDREGIONEN INTERKOMMUNALE MILJØSELSKAP IKS

14,4 TOTAL COST, MILLION NOK

12,3 OUTSTANDING GREEN LOAN, MILLION NOK

SHARE FINANCED WITH OUTSTANDING GREEN LOAN

YEAR OF COMPLETION: 2018

Photo: ÅRIM/Kristin Støylen

WASTE MANAGEMENT

Customer	Project name	Disbursement year	Completion	Description	Total disbursed green loan (1000 NOK)	Green loan outstanding (1000 NOK)	Total cost	Proportion financed by green loan	Estimated impact, KBN share	
									Increase in capacity	Other comments
Sirkula IKS	Heggevin waste treatment facility	2016	2015	A new waste treatment facility for environmentally treating sand sludge, ash, polystyrene and hazardous waste. Associated landfill site so that landfill gasses can be used and so reduce emissions.	60 793	51 786	72 553	71%	-	-
IVAR IKS	Forus waste sorting facility	2015	2019	A new, large sorting facility for waste. New technology will ensure a very high material recovery rate of 75% and will increase the recovery of plastic materials from 7% to 100%.	82 200	71 044	620 000	11%	2 979	-
Vefas IKS	New composting facility	2015	2017	New facility for composting wet organic waste.	11 500	10 368	70 000	15%	-	-
Søre Sunnmøre Reinhaldsverik IKS	New recycling centres	2015	2018	Three new recycling centres, a new administration building and upgrading the sorting facilities. The administration building will have solar panels on its roof and will be virtually energy-neutral. This will reduce the facilities' annual energy consumption by 30,000 kWh.	84 000	80 239	109 500	73%	-	Reduced/avoided CO_2e annually: 8 tonnes CO_2e Reduction of energy used annually: 21 983 kWh
IVAR IKS	Pre-treatment facility for organic waste	2014	2017	A facility that prepares organic waste for biogas production. Replaces previous composting plant. The facility increases the intake capacity for organic waste by 67%, with benefits including the possibility of using fish waste for which there is otherwise no use.	31 000	26 937	220 000	12%	2 470	-
Romerike Avfallsforedling IKS	New sorting facility	2013	2014	Big, new sorting facility with hi-tech sorting equipment. The facility is the first in the world to sort plastic materials from residual waste entirely automatically.	234 000	183 767	234 000	79%	23 560	-

PROJECTS

WATER AND WASTEWATER MANAGEMENT

Facing a future with more heavy rainfalls, but also longer dry periods and lower-quality water resources, Norway is in pressing need of upgraded infrastructure for water and wastewater. KBN finances investments that utilise modern technology to improve water safety, reduce emissions from the treatment of water and wastewater, and adapt the wastewater system to the changing climate. Projects which main purpose is to generate energy from wastewater may be found under the category Renewable Energy.

33 NUMBER OF PROJECTS FINANCED, TOTAL

13 NUMBER OF PROJECTS FINANCED, 2018

KBN GREEN LOANS TO WATER AND WASTEWATER MANAGEMENT

Total outstanding, in 1000 NOK	2 348 562

ESTIMATED ANNUAL IMPACT ATTRIBUTABLE TO GREEN LOANS*

Increase in capacity	309 237 population equivalents

*In 2018, 68 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.

UN SDG TARGETS RELEVANT TO WATER AND WASTEWATER MANAGEMENT

Ensure access to water and sanitation for all

Target 6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all

Target 6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally

Target 6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity

Conserve and sustainably use the oceans, seas and marine resources

Target 14.1 By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution

WATER AND WASTEWATER MANAGEMENT

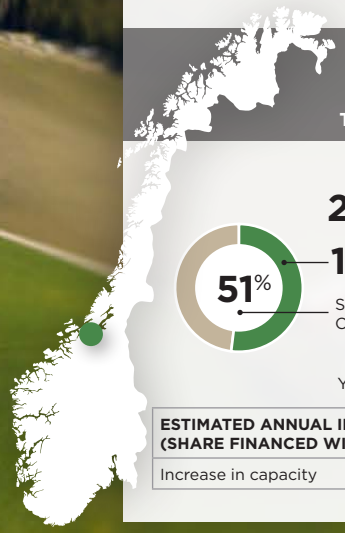
Customer	Project name	Last disburse-ment	Com-pletion	Description	Total disbursed (1000 NOK9	Green loan outstand-ing (1000 NOK)	Total cost (1000 NOK)	Proportion financed by green loan	Estimated impact, KBN share
									Capacity increase
Rømskog municipaliy	New wastewater network	2018	2018	New pipe network for sewage and wastewater which will significantly improve the standard of sewage treatment in the municipality. The new network will also collect grey water that previously went to land disposal.	8 900	8 900	18 602	48%	30
Trondheim municipaliy	Joint water and wastewater facility for Trondheim and Klæbu	2018	2021	New joint water and wastewater facility that will provide greater capacity and reduce local discharges. The facility is dimensioned with allowance for climate change and local climate change adaptation measures.	140 000	140 000	274 000	51%	3577
Hias IKS	Water transportation and treatment	2018	2018	Upgrading the water supply in the Hamar region. The project comprises installing a dual water supply, a new zone system for water pressure and emergency back-up power for all pumping stations.	246 268	219 494	275 000	80%	-
Rødven Vassverk SA	Drilling of new wells	2018	2018	Drilling of two new wells to increase capacity.	600	585	600	98%	-
Fjell Vatn, Avløp og Renovasjon AS (FjellVAR)	Storanipa wastewater treatment facility	2018	2019	A new wastewater treatment plan with energy recovery solutions such as heat pumps and solar panels.	163 600	161 447	456 000	35%	17703
Nesodden municipality	Upgrades to management of water and wastewater	2018	2019	Implementation of a range of measures to upgrade water and wastewater management. Dimensioned using a climate factor of 1.4 to take into account future increases in precipitation, with runoff water processed separately from the wastewater treatment system.	40 000	40 000	40 000	100%	-
Grane municipality	New wastewater treatment facility	2018	2020	A new treatment facility will replace a facility that dates from 1980 which does not satisfy current requirements. The facility will reduce the amount of phosphorus contained in the feed water by at least 90%. The sludge produced by the facility will be sent for conversion into compost.	14 100	14 100	14 100	100%	200
Skjervøy municipality	Refurbishing water and wastewater pipes	2018	2022	Increasing the capacity of the wastewater system to address increased levels of runoff water. The measures include separating runoff water and wastewater, installing a separate pipe for runoff water, and setting up a central operational control system to improve control.	8 200	8 200	32 000	26%	-
Lyngen municipality	Upgrades to management of water and wastewater	2018	2021	Upgrades that will enhance water supply security and the treatment of wastewater that is currently released untreated. Dimensions of pipe network to be increased to cope with increase in levels of precipitation.	11 500	11 500	11 500	100%	-
Surnadal municipality	Kvanne and Stangvik waterworks	2018	2021	A new, modern waterworks for a section of the municipality which has not previously had a municipal waterworks, as well as construction of a wastewater network. The area has had problems with its water supply due to climate change.	7 000	7 000	27 000	26%	104
Krødsherad municipality	New Noresund treatment plant and underwater pipeline	2018	2020	The new treatment plant is being built with chemical and biological treatment systems and has strict release requirements for phosphorus and bacteria. This will lead to lower discharge levels to the local environment and Krøderfjorden. Management systems will automate some aspects of the plant's operations. A 3km underwater pipeline will be installed between Noresund and Bjøre to take wastewater to the new treatment facility.	12 000	12 000	112 056	11%	1071

CASE

COLLABORATION DELIVERS ENVIRONMENTAL BENEFITS

The capacity of the water and wastewater systems of the municipalities of Trondheim and Klæbu needed increasing, while the level of treatment also needed improving. These requirements were met by creating a new treatment facility and transfer pipelines to a larger facility in Trondheim.

The project is a good example of the benefits of collaboration. The shared solution solves the challenge of having adequate water reserves and makes the water supply more secure. It also helps to make the river Nid cleaner by reducing discharge into it and will facilitate the future task of improving small private drainage arrangements, which will in turn help the streams become habitable for fish again.



SHARED TRONDHEIM-KLÆBU WATER AND WASTEWATER FACILITY, TRONDHEIM MUNICIPALITY

270 TOTAL COST, MILLION NOK

140 OUTSTANDING GREEN LOAN, MILLION NOK

SHARE FINANCED WITH OUTSTANDING GREEN LOAN

YEAR OF COMPLETION: 2021

ESTIMATED ANNUAL IMPACT (SHARE FINANCED WITH GREEN LOAN)	
Increase in capacity	**3 577**

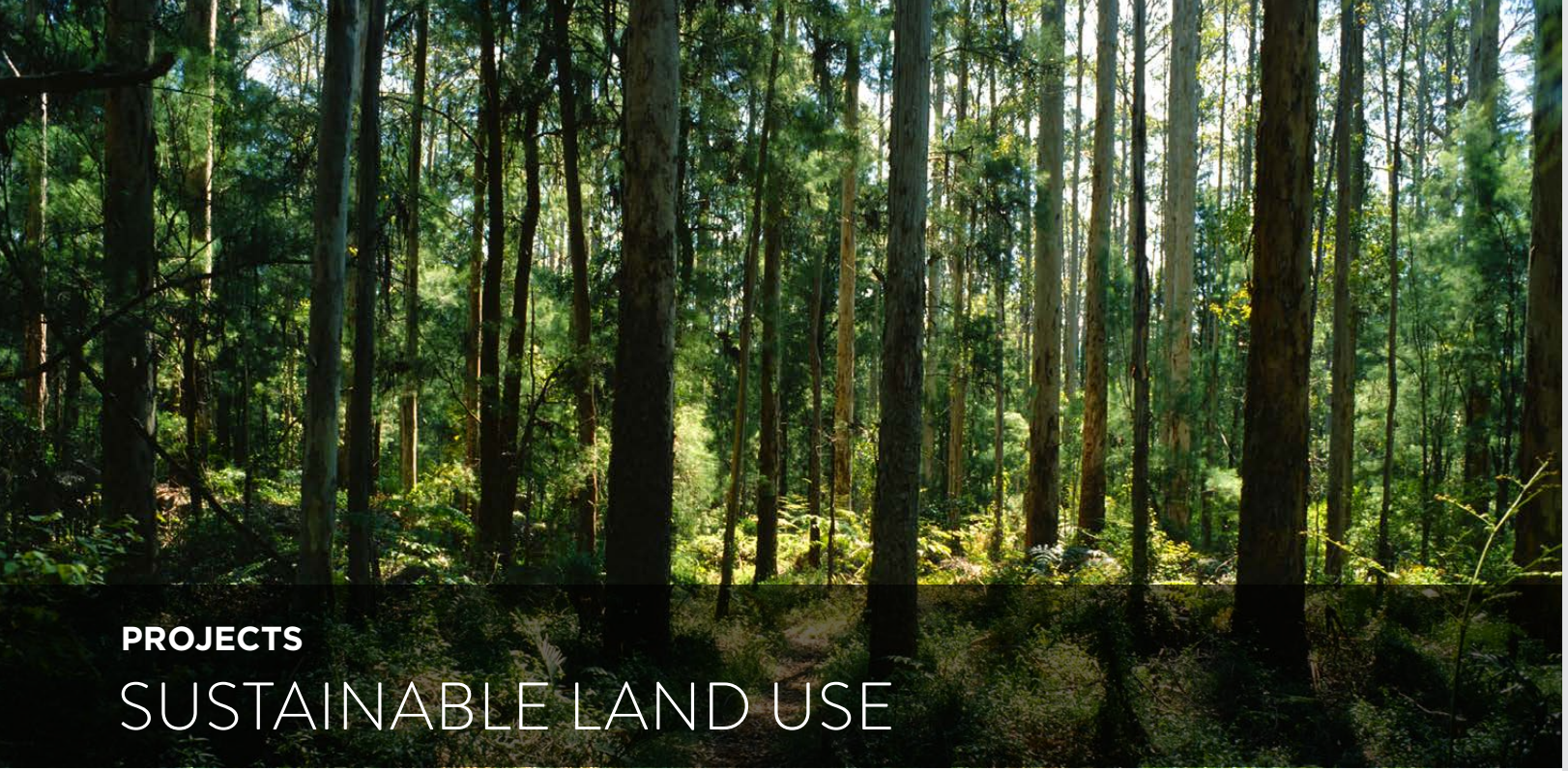
Photo: Carl-Erik Eriksson, Trondheim Municipality

WATER AND WASTEWATER MANAGEMENT

Customer	Project name	Last disburse-ment	Com-pletion	Description	Total disbursed (1000 NOK9	Green loan outstand-ing (1000 NOK)	Total cost (1000 NOK)	Proportion financed by green loan	Estimated impact, KBN share
									Capacity increase
Bærum municipality	Separating and strengthening wastewater network	2018	2018	Measures to address growing challenges presented by surface water runoff. Replacing a shared pipe by laying 6km of pipe for surface water and 7km for wastewater.	10 000	10 000	10 000	100%	-
Lindås municipality	Water treatment facility	2018	2018	A new, future-oriented water treatment facility for producing drinking water. The facility makes good use of resources and avoids the need for alternative large-scale long-distance pumping solutions to be built.	116 600	115 533	132 000	88%	10503
Dyrøy municipality	New Dyrøy waterworks	2017	2019	New waterworks for inhabitants of Dyrøya, who have previously experienced problems with the purity of their water.	3 900	3 744	50 000	7%	-
Ulvik council	Hjeltnes wastewater treatment facility	2017	2018	Upgrading a treatment facility that dates from 1990 with a new sludge separator and greater capacity, among other measures. System for waste gas clean-up.	11 000	10 450	13 500	77%	1157
Hægebostad municipality	Skeie treatment facility	2017	2017	New energy efficient sewage treatment facility with high-pressure system that reduces sludge output. The sludge will be used in the production of soil improving material.	10 000	9 750	21 500	45%	385
Balsfjord municipality	Upgrading water and wastewater infrastructure	2017	2017	Upgrading and up-sizing to address increase in precipitation levels. Replacement of 2.8km of water main and 5.4km of wastewater main, as well as replacing associated pumping stations.	62 092	58 455	65 000	90%	-
Søndre Follo Renseanlegg IKS	Research study into new treatment facility	2017	2021	Research-based feasibility study in collaboration with the Norwegian University of Life Sciences regarding a new treatment facility, including assessment of different treatment solutions and dimensions.	15 000	15 000	15 000	100%	-
Eid municipality	Hornindalsvatn Lake as new municipal water supply	2017	2018	Developing Hornindalsvatn Lake as a new water source for Nordfjordeid waterworks.	39 100	38 270	60 000	64%	3 189
Holmestrand municipality	Holmestrand treatment facility	2017	2018	Expanding a water treatment facility to address population growth and an increase in water treatment demand. Installing a biological treatment stage and increasing the facility's capacity, as well as facilitating its expansion.	30 000	28 875	79 690	36%	2 371
Søndre Helgeland Miljøverk IKS	Research-based treatment solution	2017	2017	The removal of heavy metals is the first stage of a research-based development project being undertaken in collaboration with the Norwegian University of Science and Technology. The project as a whole is about reducing emissions from small wastewater systems with limited space for treatment facilities.	5 400	4 860	5 400	90%	36 900
Midtre Romerike avløpsselskap (MIRA IKS)	New wastewater treatment facility	2017	2016	A new wastewater treatment facility equipped to process sludge and to produce biogas. The project also includes a 35km pipe network, seven pumping stations and four retention basins to manage rainwater.	593 000	564 217	600 000	94%	59243
HIAS IKS	New water treatment facility in Hamar	2016	2021	The water treatment process at the new facility will consist of chemical treatment with direct filtration, UV treatment and chlorination. A new treatment process is required because the quality of the untreated water in lake Mjøsa is being adversely affected by climate change.	47 280	43 926	350 000	13%	4 518

WATER AND WASTEWATER MANAGEMENT

Customer	Project name	Last disburse-ment	Com-pletion	Description	Total disbursed (1000 NOK9	Green loan outstand-ing (1000 NOK)	Total cost (1000 NOK)	Proportion financed by green loan	Estimated impact, KBN share
									Capacity increase
HIAS IKS	Upgrading treatment facility	2016	2017	Upgrading HIAS's main treatment facility to address population growth and increased commercial activity in the Hamar area. Introducing an entirely biological treatment process that releases phosphorus and other nutrients that are chemically bonded due to the current chemical treatment process.	181 000	156 606	214 058	73%	-
HIAS IKS	Underwater pipeline under Furnesfjorden	2016	2018	New underwater pipeline that doubles the wastewater transfer capacity through lake Mjøsa. The pipeline will avoid the risk of leaks and eutrophication of Mjøsa, which has a vulnerable ecosystem and is a source of drinking water for 80,000 people.	114 000	107 530	170 000	63%	4 428
Bardu municipality	Water pipeline from Nordli to Finnkroken	2016	2016	New pipeline to connect existing waterworks and to secure water supply for Bardu and Målselv municipalities. Makes use of natural difference in height to drastically reduce energy used to pump water relative to previous solution. Reduction of 75,000 kWh in the energy requirement for the pumping station.	16 000	14 933	16 000	93%	4200
Oppegård municipality	Upgrading water and wastewater infrastructure	2015	2015	Refurbishment of wastewater system and improvements to water supply network. Upgrading of waterworks, including installation of UV treatment.	92 295	78 876	92 295	85%	-
IVAR IKS	Langevatn water treatment facility	2014	2018	Introduction of a more extensive treatment process including ozone treatment and bio filtration that are essential to ensure satisfactory water quality and hygiene standards in anticipation of warmer and wetter climatic conditions in the future.	93 500	81 187	1 100 000	7%	7381
IVAR IKS	Central treatment facility for Nord-Jæren	2014	2016	Expansion due to strong population growth. Previous chemical treatment process replaced with biological treatment. Separate biogas plant as well as a fertiliser factory that produces fertiliser pellets from biological residue.	104 200	83 950	520 000	16%	25 831
IVAR IKS	Dual water supply for island communities	2014	2014	New dual water supply to the island communities in Rennesøy and Finnøy municipalities, via a 20km undersea pipeline.	189 500	157 375	189 500	83%	-
Tønsberg Renseanlegg IKS	New treatment facility	2014	2018	New treatment plant for wastewater from five municipalities that will significantly increase treatment capacity and reduce emissions.	126 500	110 147	133 000	83%	74 536
IVAR IKS	New Nærbø treatment facility	2012	2012	Upgrading a treatment facility so that it can cope with expected population growth of 100,000 people by 2050.	14 500	10 875	14 500	75%	4 425
IVAR IKS	Expansion of Grødaland treatment facility	2012	2012	Expansion of the existing treatment facility with a new, large flotation stage in order to handle a high level of wastewater from industrial activities. Arrangements being made at the same time for biogas production from sewage sludge.	27 700	20 775	35 000	59%	47 486



PROJECTS

SUSTAINABLE LAND USE

In order to achieve a climate-resilient, low-carbon society, emission reductions should be seen in connection with climate change adaptation and healthy eco systems. KBN's green loans may finance projects where areas are developed with care for both nature and the climate.

2 NUMBER OF PROJECTS FINANCED, TOTAL

1 NUMBER OF PROJECTS FINANCED, 2018

KBN GREEN LOANS TO SUSTAINABLE LAND USE

Total outstanding, in 1000 NOK	87 655

UN SDG TARGETS RELEVANT TO SUSTAINABLE LAND USE

Make cities inclusive, safe, resilient and sustainable

Target 11.3 By 2030, enhance inclusive and sustainable urbanization and capacity for participatory, integrated and sustainable human settlement planning and management in all countries

Target 11.7 By 2030, provide universal access to safe, inclusive and accessible, green and public spaces, in particular for women and children, older persons and persons with disabilities

Conserve and sustainably use the oceans, seas and marine resources

Target 14.2 By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and take action for their restoration in order to achieve healthy and productive oceans

Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss

Target 15.1 By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forests, wetlands, mountains and drylands, in line with obligations under international agreements

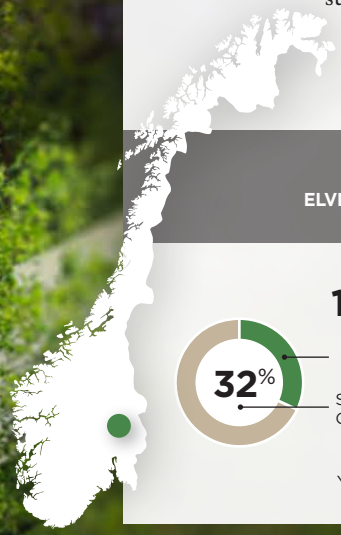
SUSTAINABLE LAND USE

Customer	Project name	Last disburse-ment	Com-pletion	Description	Total disbursed green loan (1000 NOK)	Green loan outstand-ing (1000 NOK)	Total cost	Proportion financed by green loan	Area the project includes (m^2)
Elverum Tomteselskap AS	Ydalir: District of the future in Elverum	2018	2019	A new, environmentally friendly district within walking distance of central Elverum. The investment comprises infrastructure adaptations and preparing residential areas for sale. It will be built as part of a Zero Emission Neighbourhood (ZEN), meaning developers will have to meet strict environmental requirements.	110 000	45 000	140 000	32%	300 000
Tromsø Harbour	Project "Clean Tromsøysund"	2016	2016	Major project to clean the polluted seabed outside Tromsø. The project will help to reduce the level of organic pollutants by 75%.	48 686	42 655	129 104	33%	100 000

CASE

NORWAY'S FIRST ZERO-EMISSION NEIGHBOURHOOD

Elverum municipality has seen strong population growth in recent decades, and it is now finding space for new residents by converting an old sand quarry into a new, climate-neutral district. An energy-efficient elementary school and nursery will open in autumn 2019 and, over the course of the next 10-15 years, between 800 and 1,000 residential units will be built to the passive-house standard or better. This is one of seven zero-emission areas that will function as pilots for a research project called "Zero Emission Neighbourhoods" being undertaken by the Norwegian University of Science and Technology and SINTEF. The forward-looking forested municipality of Elverum is inspiring others to think about innovation, green issues and efficiency. Buildings are responsible for approximately 40% of energy consumption in Norway, and therefore land use projects such as Ydalir will be important to transitioning to a low-carbon society.



YDALIR: DISTRICT OF THE FUTURE IN ELVERUM, ELVERUM TOMTESELSKAP AND ELVERUM MUNICIPALITY

140 TOTAL COST, MILLION NOK

45 OUTSTANDING GREEN LOAN, MILLION NOK

SHARE FINANCED WITH OUTSTANDING GREEN LOAN

YEAR OF COMPLETION: 2019

Photo: Elverum Vekst

PROJECTS

CLIMATE CHANGE ADAPTATION

Local authorities are at the frontline in the battle against the negative consequences of climate change, be it acute weather events or chronically changing climate conditions. This category includes projects which main purpose is climate change adaptation.

5 NUMBER OF PROJECTS FINANCED, TOTAL

2 NUMBER OF PROJECTS FINANCED, 2018

KBN GREEN LOANS TO CLIMATE CHANGE ADAPTION

Total outstanding, in 1000 NOK	92 332

UN SDG TARGETS RELEVANT TO CLIMATE CHANGE ADAPTATION

Ensure healthy lives and promote well-being for all at all ages

Target 3d Strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks

Make cities inclusive, safe, resilient and sustainable

Target 11.5 By 2030, significantly reduce the number of deaths and the number of people affected and substantially decrease the direct economic losses relative to global gross domestic product caused by disasters, including water-related disasters, with a focus on protecting the poor and people in vulnerable situations

Take urgent action to combat climate change and its impacts

Target 13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries

CLIMATE CHANGE ADAPTATION

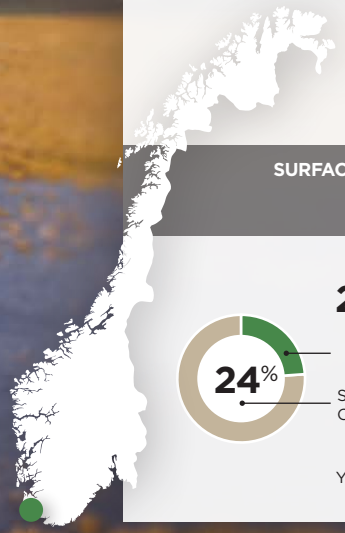
Customer	Project name	Last disburse-ment	Com-pletion	Description	Total dis-bursed green loan (1000 NOK)	Green loan outstanding (1000 NOK)	Total cost	Proportion financed by green loan
Time municipality	Surface runoff management in Bryne	2018	2022	Climate change adaptations in response to continual flooding of cellars and fields. Measures that have been implemented include developing a retention basin and replacing 70 tanks to separate surface water from wastewater.	50 000	50 000	210 000 000	24%
Bærum municipality	Opening of Dælibakken brook	2018	2019	Opening of a brook that previously ran in a pipe. The measure increases the capacity of the brook to divert rainwater and creates a more attractive area in which to go for a walk.	27 000	27 000	28 000 000	96%
Longyearbyen Community Council	New spillway, Isdammen Lake	2017	2017	Construction of a new flood diversion system and elevation of dam crest and road. The new spillway will ensure a safe water supply and prevent flooding of nearby roads.	13 050	12 398	20 000 000	62%
Åfjord municipality	Landslide prevention, Norddal river	2017	2017	Landslide and flood prevention measures that protect the areas along the river from being hollowed out in the event of floods.	800	773	4 000 000	19%
Åknes/Tafjord Beredskap IKS	Typhoon/tsunami alert system	2017	2017	Seven siren masts to alert the population of Sykkylven of potential tsunamis caused by rockslides from unstable mountain terrain.	2 275	2 161	3 200 000	68%

CASE

AN ANSWER TO FREQUENT FLOODING

Climate change is leading to heavier and more frequent precipitation that in turn causes surface water challenges in the form of floods. When precipitation does not find its way down the drain, it can cause extensive damage to the environment, infrastructure and, in the worst cases, to people's health. Without preventative measures, this can be very costly.

Bryne in Rogaland is a flat area that has had problems with water and wastewater entering into cellars as well as flooding fields right outside the centre of town. In response, Time municipality has implemented a range of measures to take the pressure off the pipe systems. The measures will be both financially beneficial – and will also help protect the municipality's natural areas.



SURFACE RUNOFF MANAGEMENT IN BRYNE, TIME MUNICIPALITY

210 TOTAL COST, MILLION NOK

50 OUTSTANDING GREEN LOAN, MILLION NOK

SHARE FINANCED WITH OUTSTANDING GREEN LOAN

YEAR OF COMPLETION: 2022

Photo: Illustration iStock

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