

# **Kommuninvest Green Bonds Impact Report**

December 2020



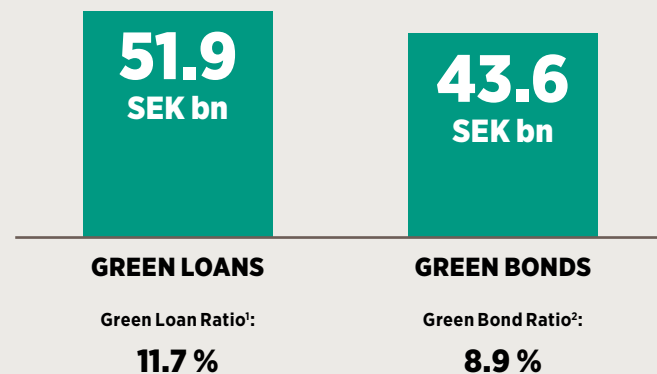
KOMMUNINVEST

# This report in brief

Report on 416 Swedish local government investment projects financed by Kommuninvest Green Bonds as of year-end 2020.

At 31 December 2020, Kommuninvest had disbursed a total of SEK 51.9 (40.3) billion, equivalent to USD 6.3/EUR 5.2 billion, in Green Loans to investment projects aligned with our Green Bond Framework.

This report presents the expected impacts of these projects, the governance process to verify and select them and the impact reporting methodology we apply. Unless otherwise indicated, the reported impact is Scope 1 and 2 according to the Greenhouse Gas Protocol. Impact is reported for the aggregated portfolio of eligible assets as of 31 December 2020.



1) Total amount of Green Loans divided by total loan portfolio.

2) Total amount of Green Bonds outstanding divided by total amount of debt outstanding.



Annual greenhouse gas (GHG) emissions savings

**642,875** tCO<sub>2</sub>

**604,532 tCO<sub>2</sub>**  
avoided annual emissions<sup>3</sup>

**38,343 tCO<sub>2</sub>**  
reduced annual emissions<sup>4</sup>

**14.6 tCO<sub>2</sub> per SEK mn**

**Impact**  
(relevant to 85 % of Green  
Loan disbursements)



**3.1** TWh  
Annual renewable  
energy generation,  
incl. rooftop solar cells  
on buildings

**111.5** GWh  
Energy savings from  
energy efficiency projects



**367,577**  
Increase in number of people supplied by water  
and wastewater facilities, p.e.

(Total number of p.e. affected by  
the investments, not the share financed)



**163**  
**tonnes per year**  
Reduced nitrogen  
emissions from water and  
wastewater facilities

Energy savings in green buildings

**49.4** GWh

Whereof avoided  
energy use<sup>3</sup>  
**41.8 GWh**

Whereof reduced  
energy use<sup>4</sup>  
**7.7 GWh**



3) Refers to a baseline/alternative reference scenario.

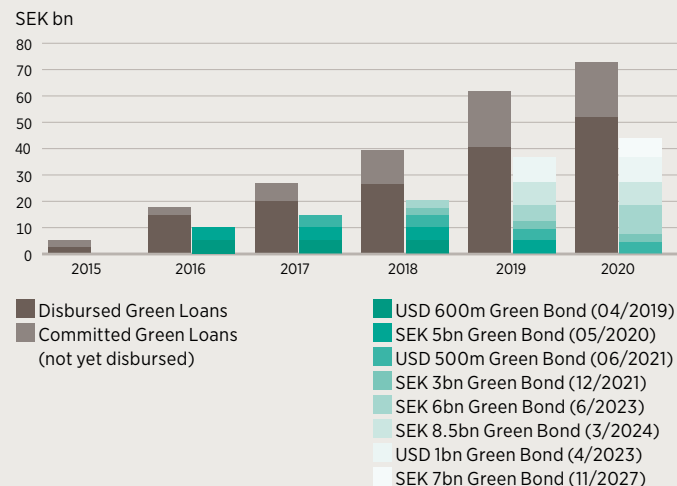
4) Refers to a direct or absolute reduction in operation.



# Executive Summary

as of 31 Dec 2020

## Green project portfolio distribution

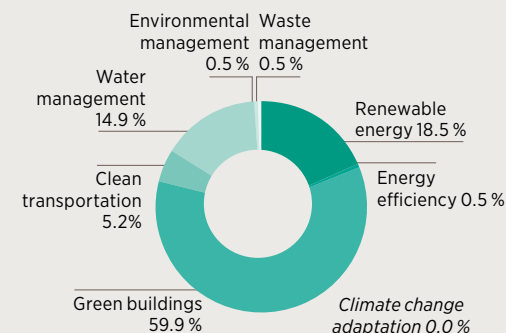


## Basic information

<b>Green Bond Frameworks applied</b>	Report comprises projects financed under GB frameworks dated March 2018, January 2016 and May 2015
<b>Related Green Bond ISIN(s)</b>	XS1383831648 (RegS) / US50046PAU93 (144A); XS1814404577; XS1897258098; XS1968465572; XS2081157401 (RegS) / US50046PBL85 (144A); XS2259127269
<b>External verifier of allocation report</b>	KPMG
<b>Reporting period</b>	Reporting for calendar year 2020. Comprises all eligible projects financed from GB programme start in 2015 until year-end 2020.
<b>Report publication date</b>	March 25, 2021
<b>Frequency of reporting</b>	Annual
<b>Next reporting planned for</b>	March 2022
<b>Reporting approach</b>	Portfolio-based and project-by-project reporting

## Green project portfolio distribution

based on disbursed amounts



## CO<sub>2</sub> impact and Green indicators

based on outstanding disbursed amounts<sup>1</sup>

Project category	GHG emissions reduced/avoided, tonnes CO <sub>2</sub> e/year	Outstanding disbursed amounts to projects, SEK mn	Impact, tonnes CO <sub>2</sub> e per SEK mn
Renewable energy	597,086	9,607	62
Green buildings	7,228	31,097	0.2
Energy efficiency	22,119	251	88
Clean transportation	15,291	2,683	6
Waste management	1,151	248	5
Water management	n/a	7,739	n/a
Climate change adaptation	n/a	16	n/a
Environmental management	n/a	246	n/a
<b>Total</b>	<b>642,875</b>	<b>51,887</b>	<b>n/a</b>
<b>Disbursed amounts with CO<sub>2</sub> impact</b>		<b>43,886</b>	
<b>Impact, tonnes CO<sub>2</sub>e per SEK mn</b>			<b>14.6</b>
<b>Annual renewable energy generation, GWh</b>		<b>3,092,108 MWh p.a.</b>	
<b>Annual energy reduced/avoided, MWh</b>		<b>160,957 MWh p.a.</b>	

<sup>1</sup>) This table presents the calculated impact in terms of CO<sub>2</sub> reduced or avoided. Aggregated project data reported represent both ex-ante estimates and ex-post outcomes. Reporting methodology presented on pages 48–58. The complete project-by-project reporting is available in spreadsheet format at [kommuninvest.se](http://kommuninvest.se) ==> For investors ==> Green Bonds ==> Impact Reporting.

## Impact attributable to green bond investors<sup>1</sup>

Whereof impact attributable to Green Bond USD 500m, maturing 1 June, 2021	83%
Whereof impact attributable to Green Bond SEK 3bn, maturing 15 December, 2021	8%
Whereof impact attributable to Green Bond USD 1bn, maturing 24 April, 2023	6%
Whereof impact attributable to Green Bond SEK 11 bn, maturing 1 June, 2023	19%
Whereof impact attributable to Green Bond SEK 8.5bn, maturing 27 March, 2024	21%
Whereof impact attributable to Green Bond SEK 7bn, maturing 26 Nov, 2027	16%
Whereof impact attributable to Green Bond SEK 7bn, maturing 26 Nov, 2027	13%

<sup>1</sup>) Total amount of outstanding green bonds divided by total outstanding disbursed amounts to projects (in SEK).

## Key facts

- ➔ This report outlines the allocation of Green Bond proceeds to Green Loans that finance eligible green investment projects in Swedish municipalities and regions. Each investment project has been selected, reviewed and approved according to the process outlined on page 17. The complete framework is available online.
- ➔ As part of the annual impact reporting process, we may identify investment projects which no longer comply with framework requirements. Such projects are excluded from the reporting. We also consolidate those Green Loans that correspond to the same physical investment project. This process affects the number of reported projects, the disbursed Green Loan volume and the Green Loan Ratio. This report totals 416 projects at year-end 2020, compared with 431 projects reported in the Annual Accounts.
- ➔ Kommuninvest reports on a portfolio basis in Swedish kronor (SEK). F/X rate as per the date of Green Bonds issuance.
- ➔ Kommuninvest reports impact based on the share of the project's total investment cost financed with Green Loans. Impacts are based on outstanding disbursed amounts to projects (net of redemptions).
- ➔ Reporting is undertaken in accordance with recommendations outlined in the Nordic Public Sector Issuers: *Position Paper on Green Bonds Impact Reporting*.

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## About Kommuninvest

Kommuninvest is a Swedish municipal cooperation set up in 1986 to provide cost-efficient and sustainable financing for local government investments in housing, infrastructure, schools, hospitals etc. The cooperation comprises 292 out of Sweden's 310 local governments, of which 278 municipalities and 14 county councils/regions. Kommuninvest is the largest lender to the Swedish local government sector and the sixth largest credit institution in Sweden. At year-end 2019, total assets were SEK 527 billion (USD 64.4 billion<sup>1)</sup>, with a loan portfolio of SEK 446 billion (USD 54.4 billion). The head office is located in Örebro.

<sup>1)</sup> USD/SEK= 8.1886 as of 31 Dec, 2020

## About this report

This report was written and compiled by: **Björn Bergstrand**, Head of Sustainability, **Jens Enocsson**, Sustainability Analyst, and **Erik Törnblom**, Analyst

Any errors, omissions or otherwise are our responsibility. Project impact reporting is based on data collected from financed projects during Q1-2021. The data has been reviewed by Kommuninvest however their accuracy has not been verified by neither Kommuninvest nor a third party. Climate impact calculations have been made by Kommuninvest, and their accuracy has not been verified by a third party. The information has been reviewed and approved for publication by the Kommuninvest Environmental Committee, whose members are presented on page 17.



# Green Bonds

Green Bonds outstanding

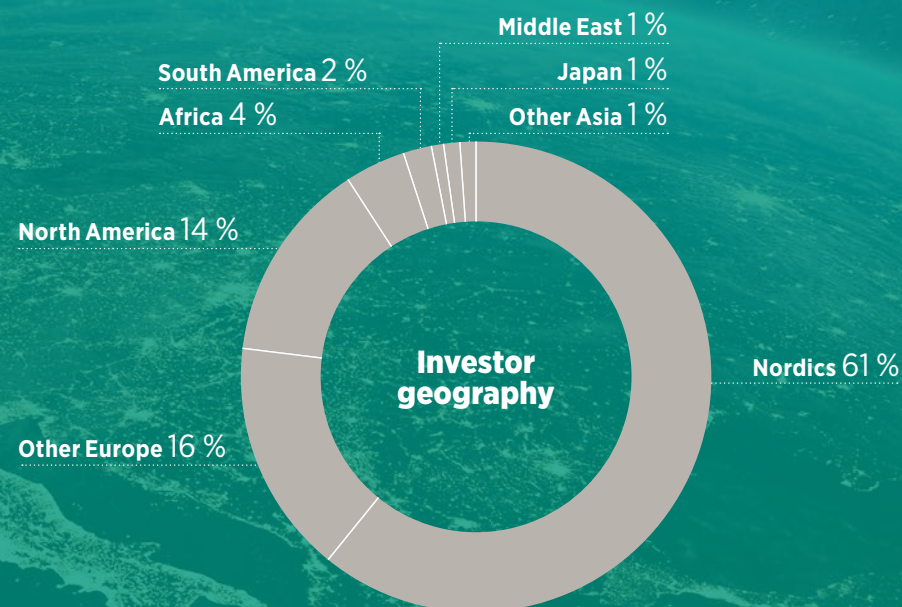
# 43.6

Billion SEK

Green Bond Ratio

# 8.9 %

(share of funding)



Kommuninvest issued its first green bond in 2016 and has since evolved to become one of the largest Nordic green bond issuers. Demand for our issuances is broad-based, encompassing dedicated green investors across the globe.

At year-end 2020, the equivalent of SEK 43.6 billion was outstanding in six green bonds denominated in SEK and USD. This makes us Sweden's largest issuer of green bonds. The green bond framework allows financing in eight project categories. In the second opinion from CICERO, four of these are characterized as "dark green", signaling investment projects aligned with the 2050 climate targets. Overall, the framework has a "medium green" shading.

## Outstanding green bonds

Issue date	Amount issued	Maturity	Coupon	ISIN
23 May, 2017	USD 500 mn	1 June, 2021	1.875% (semi-annually)	XS1618289802 (RegS) US50049GAB86 (144A)
30 April, 2018	SEK 3 billion	15 Dec, 2021	0.125% (annually)	XS1814404577
23 Oct, 2018; 17 Sep, 2019; 27 May, 2020*	SEK 11 billion	1 June, 2023	0.625% (annually)	XS1897258098
27 March, 2019; 18 June, 2019**	SEK 8.5 billion	27 May, 2024	0.375% (annually)	XS1968465572
20 Nov, 2019	USD 1 billion	24 April, 2024	1.625% (semi-annually)	XS2081157401 (RegS) US50046PBL85 (144A)
19 Nov, 2020	SEK 7 billion	26 Novr, 2027	0.250% (annually)	XS2259127269

\* SEK 3 billion was issued in 2018 and the bond was subsequently tapped for SEK 3 billion and SEK 5 billion, respectively.

\*\* SEK 3.5 billion was issued in 2019 and the bond was subsequently tapped for SEK 5 billion.

# Green Loans

## Green Loans

(disbursed and outstanding)

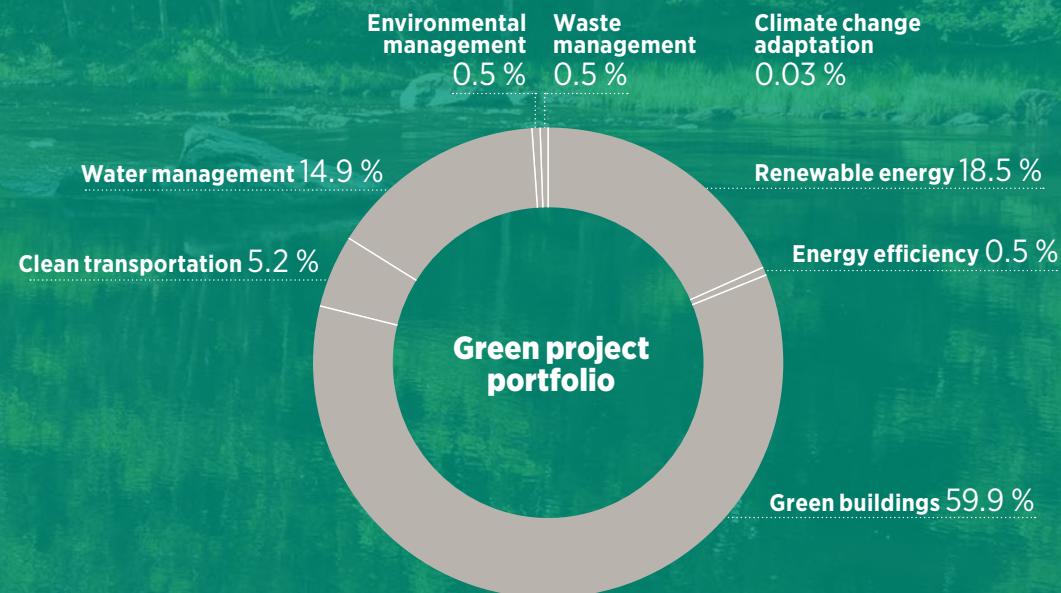
# 51.9

Billion SEK

## Green Loan Ratio

(share of lending)

# 11.7 %

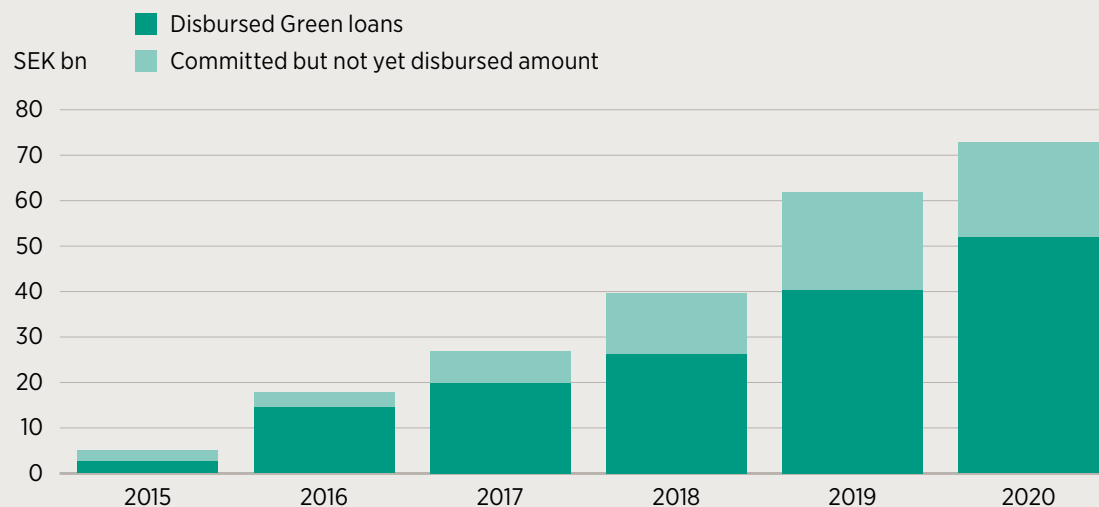


In 2015, Kommuninvest began offering reduced-rate Green Loans for investments that contribute to addressing local and regional climate and environmental objectives. The Green Loans are financed by green bonds.

The demand for Green Loans has increased substantially since launch, outpacing the general borrowing trend amongst Swedish municipalities and regions. In 2020, Kommuninvest's Green Loan portfolio increased by SEK 11.6 billion to a total of SEK 51.9 billion (based on disbursed amounts).

Growth of the Green Loan portfolio accounted for 32 percent of Kommuninvest's total lending growth, contributing to increasing the Green Loan Ratio to 11.7 (10.1) percent.

## Green loans 2015–2020





# 2020 in review

Growth in Green Loan disbursements (net)

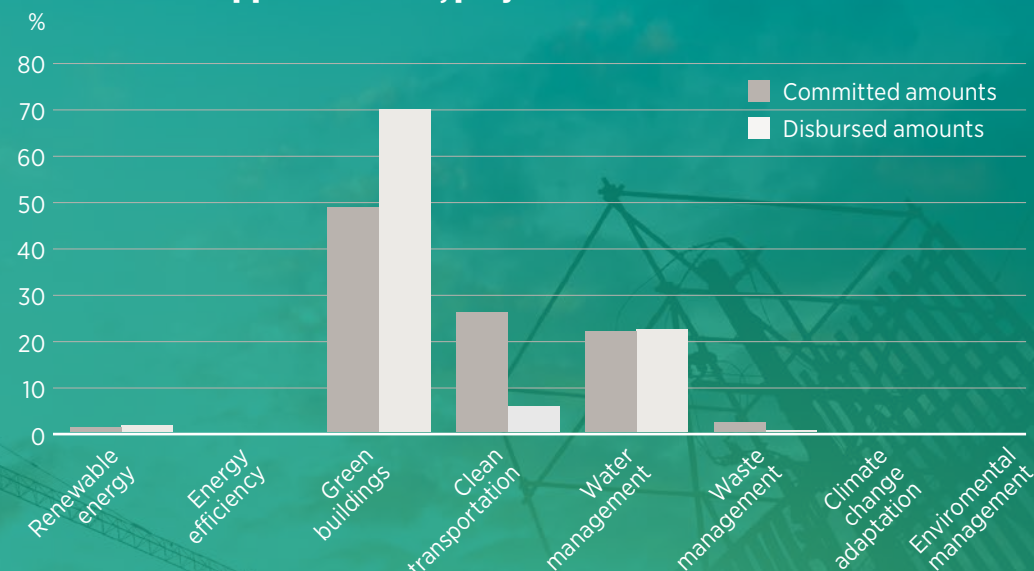
# 11.7

Billion SEK

Green bonds issued

# 2

Green loan approvals 2020, project distribution



2020 was another strong year for Kommuninvest's green financing framework. 88 investment projects were awarded Green Loan status and total Green Loan disbursements increased by 29 percent to SEK 51.9 (40.3) billion.

Two green bonds for a total of SEK 12 billion were issued. The SEK 7 billion green bond was the largest one issued in SEK by Kommuninvest so far, and the second largest issued to date in SEK among public sector issuers.

In order to accelerate the green transition in property construction, the largest Green Loan category, Kommuninvest has co-financed a project to promote use of life cycle requirements in public procurement. During 2020, new financing requirements for green buildings were developed, so that the climate-impact from the construction phase is addressed by eligible projects. The new requirements have been implemented from January 2021, complementing existing requirements for low energy use.

## Leveraging our Green Bonds framework

Kommuninvest participates in selected activities to support local government transition work toward climate-neutrality and Sweden becoming a fossil-free welfare nation, some are highlighted outlined below. They are typically cross-sector, multi-disciplinary collaborations where Kommuninvest provides the sustainable finance perspective.

- ➔ Developing a guideline for public sector housing companies: how to integrate a life cycle perspective in public procurement for housing construction. Cooperation with Public Housing Sweden and green research institute IVL.
- ➔ Developing new financing requirements for Green Buildings based on the above.
- ➔ Joining the Viable Cities strategic innovation programme and participating in the development of principles for long-term climate investment plans for cities.



# Green finance 2.0

**Green finance is becoming more deeply ingrained into the municipal finance fabric. Leveraging its potential to catalyze the transition in cities and communities is key.**

**K**ommuninvest celebrated the five-year anniversary of its green financing programme on a positive note. In 2020, 88 new green investment projects in Swedish cities and regions were approved, bringing the total to over 400 projects that are now financed with Kommuninvest Green Loans. As this report shows, this will bring significant benefits to the environment and to the climate.

It is also evidence of the programme being well received by Kommuninvest's members and clients – during the year, Green Loan disbursements grew by nearly 30 percent. From our daily work inside the local governments, we can see how transition instruments like Green Loans are becoming more deeply integrated into long-term planning, investment plans and governance. This is encouraging.

We also note that Kommuninvest utilizes its green financing programme as a tool to support the transition at the city and regional levels. It has joined Viable Cities, a Swedish strategic innovation programme, as a member, and now participates in pioneering work focusing on the development of climate investment plans in key cities. A

collaborative effort undertaken together with Public Housing Sweden has resulted in the development of new green financing requirements, designed to foster smarter and more sustainable property construction. The new requirements are being implemented from 2021.

As we have stated before, green investments must encompass all levels of society and they must be facilitated by a supportive regulatory framework. During 2020, committee members have been closely involved in responding to the proposal for a Delegated Act on the EU Taxonomy, with the aim of making it feasible to implement into green financing frameworks.

Again, we want to thank green bond investors for your continued support of the green transition in Swedish local governments. First and foremost, it is the strong demand for Green Loans at the local level which has resulted in the success of the programme. As of year-end 2020, it had enabled the issuance of eleven Green Bonds since inception and the Green Loan Ratio to grow to 12 percent. In the process, Kommuninvest has become Sweden's largest issuer of Green Bonds.



The Kommuninvest Green Bonds Environmental Committee: Susanne Arneborg, Municipality of Borås; Patrik Stenman, Kommuninvest; Marta Fallgren, Region Uppsala; Björn Söderlundh, Kommuninvest; Ann Sörman, Kommuninvest; Andreas Hagnell, Swedish Association of Local Authorities and Regions; Hanna Ryman, Municipality of Örebro; Lisa Järner, City of Mölndal.

**We welcome your feedback,  
please send an e-mail to:  
[sustainability@kommuninvest.se](mailto:sustainability@kommuninvest.se)**

# The role of Swedish local governments

**The municipalities and regions are the backbone of the Swedish welfare state, providing core welfare services and supportive infrastructure including housing. Kommuninvest's financing solutions foster efficient use of tax revenues, financial stability and the local government sector's work with Agenda 2030.**

The municipalities and regions are responsible for the most central social services that Swedish citizens encounter, including healthcare, education and residential care. They also play a central role in the basic social infrastructure, in the form of housing, energy supply, public transport, water management, waste management, etc.

## How we generate sustainable values

Through lending to municipalities and regions, Kommuninvest establishes conditions for the expansion of Swedish welfare, increases the stability of local government finances and contributes to a more sustainable Sweden. By "pooling" local government borrowing needs and channelling them through a single organisation, economies of scale can be achieved, while keeping management costs down. Kommuninvest plays a similar role for the local government sector as the National Debt Office does for the central government and its authorities.

At year-end 2020, Kommuninvest had

292 out of Sweden's 310 local governments as members/owners and accounted for nearly 60 percent of their external financing. As the largest lender to the sector by far, we generate both direct and indirect values.

Crucially, the financing solutions, knowledge and debt management tools we provide benefit financial stability in Swedish municipalities and regions and help develop members' debt management expertise. Accordingly, essential investments in welfare and sustainability can be made more efficiently and at a lower cost to taxpayers.

Specifically, we support our members' sustainability work with financing products clearly focused on environmental and social sustainability. Green Loans were launched in 2015 and accounted for 12 percent of Kommuninvest's lending at year-end 2020. Social Sustainability Loans have been introduced in a pilot phase during 2020 and four loans and SEK 463 million in committed funding had been approved by the end of the year.



## A fossil-free welfare nation

Local government actors play a key role in advancing Swedish efforts towards Agenda 2030 and the global goals, in terms of both environmental change and societal issues.

Sweden aims to be one of the world's first fossil fuel-free welfare nations, and a leading contributor to implementing the 2030 Agenda for Sustainable Development and its objectives (the Sustainable Development Goals, the SDGs). Given the broad mandate of Sweden's cities and regions, they play a key role in realizing these ambitions.

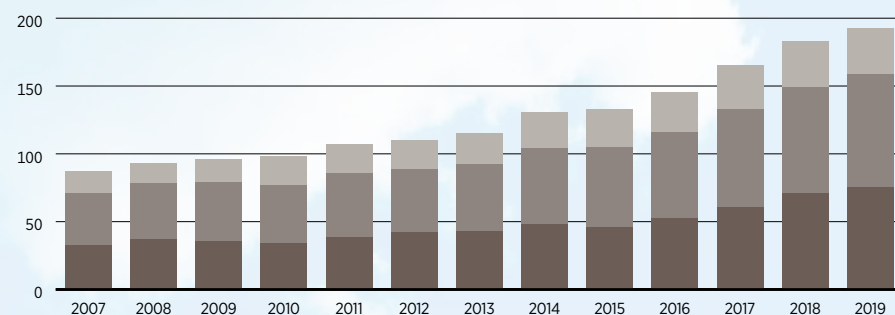
By 2030, Sweden aims to have reduced its carbon emissions by 63 percent compared with 1990; by 2045 Sweden should have no net emissions of greenhouse gases into the atmosphere.



**Find out more in our Sustainability Report 2020. See pages 14-26 of the Annual Report. [kommuninvest.org](https://kommuninvest.org)**

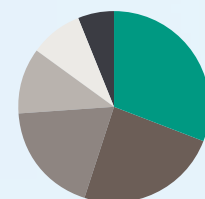
## Local government investment volumes, total

SEK bn



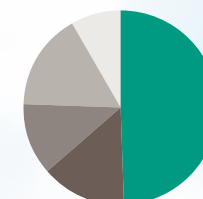
■ Municipalities  
 ■ Municipal companies  
 ■ County councils/regions and their companies

## Municipal investments, distribution (2019)



■ Properties 31 %  
 ■ Housing 24 %  
 ■ Infrastructure 18 %  
 ■ Water/sewerage 11 %  
 ■ Energy 10 %  
 ■ Other 6 %

## Regional investments, distribution (2019)



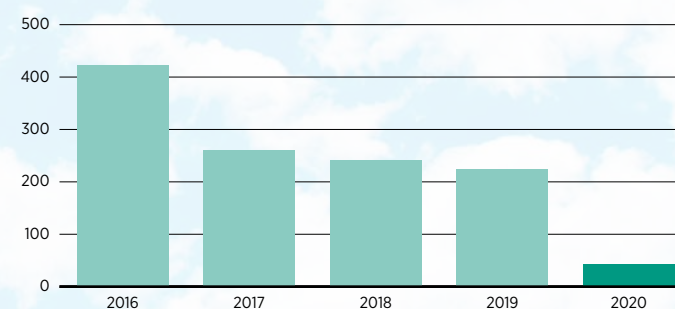
■ Properties 49 %  
 ■ Infrastructure 14 %  
 ■ Medical equipment 12 %  
 ■ Public transport 16 %  
 ■ Other 8 %

## ESG Ratings:

### Ranked among the top public credit institutions

	Rating	Rating Category	Peer Group Comparison
	B-	Prime	Top 5 out of 78 issuers rated
	AA	n/a	Maintained 2nd highest rating since 2017
	9.1	Negligible ESG risk	Top 12 out of 74 peers

## CO<sub>2</sub> emissions from business travel, tonnes



Source: Big Travel, with processing by Kommuninvest (emission values have been multiplied by a so-called RFI factor of 1.9 for the aviation industry's high altitude effects).



**Green indicators – Kommuninvest Group**

	Unit	2020	2019	2018
<b>Energy consumption</b>				
Total energy consumption (in buildings)	kWh	518,793	616,853	620,069
– of which, electricity	kWh	334,963	385,980	368,596
– of which, heating	kWh	183,830	230,873	251,473
Total CO <sub>2</sub> impact of energy consumption (in buildings)	Tonnes	119	142	138
– of which, from electricity consumption <sup>1</sup>	Tonnes	106	122	116
– of which, from heating <sup>2</sup>	Tonnes	13	20	22
Proportion of renewable energy in energy consumption of electricity	%	100	56	56
Change in electricity consumption compared to the preceding year	%	-13	5	10
Proportion of renewable energy in energy consumption for heating	%	100	95	95
Total office space	m <sup>2</sup>	2,217	2,217	2,217
Total energy consumption per square metre	kWh/m <sup>2</sup>	234	278	280
Total energy consumption per employee	kWh	5,037	6,107	6,392
<b>Resource usage</b>				
Purchased office paper	Tonnes	0.39	0.45	0.50
– of which sustainability labelled paper (PEFC) <sup>3</sup>	Tonnes	0.33	0.45	0.50
Proportion of sustainability labelled office paper, of total purchases	%	84	100	100
Total paper consumption per employee	Kg	3.8	4.5	5.2
Paper recycling, incl. purchased and delivered paper	Tonnes	1.6	2.0	2.0
CO <sub>2</sub> emissions avoided through recycling <sup>4</sup>	Tonnes	2.3	2.7	3.3
<b>Business travel</b>				
Total business travel	Km	228,922	911,699	948,470
Total business travel per employee	Km	2,223	9,027	9,778
Total air travel	Km	90,363	493,063	521,771
Rail travel in Sweden	Km	120,241	364,616	353,914
Total CO <sub>2</sub> emissions from business travel	Tonnes	43	225	242
CO <sub>2</sub> emissions from business travel, per employee <sup>5</sup>	Tonnes	0.42	2.2	2.5
<b>Total climate footprint</b>				
Total climate footprint of the operations <sup>6</sup>	Tonnes	162	367	380
Total climate footprint per employee, CO <sub>2</sub> e	Tonnes	1.6	3.6	3.9

1) As opposed to applying an attributional or accounting assessment, based on data averages, to calculate Kommuninvest's impact as an organisation, we use a consequential approach, in line with our reporting of impact for green bonds. Such an approach aims to describe how emissions will change in response to an added activity on the margin, and is aligned recommendations outlined in the Nordic Position Paper on Green Bonds Impact Reporting. The climate impact from Kommuninvest's own electricity consumption is therefore calculated applying an emissions factor for electricity of 315g CO<sub>2</sub>e/kWh, a factor that is significantly higher than the average for the Swedish grid. The reported values are within Scope 2, in accordance with the Greenhouse Gas Protocol.

2) The climate impact from heating, calculated applying an emissions factor for district heating in the Municipality of Örebro of 87 g CO<sub>2</sub>e/kWh, in accordance with our approach for green bonds impact reporting. The reported values are within Scope 2, in accordance with the Greenhouse Gas Protocol.

3) Although the remaining quantity of office paper purchased in 2020 is environmentally friendly, it is not sustainability-labelled (PEFC).

4) The emissions avoided through recycling over the year break down between 855 kg plastics, 634 kg paper, 607 kg iron, and 160 kg alternative raw materials, source: Stena Recycling. Kommuninvest does not include emissions avoided by recycling resources, as the climate impact of the purchases in question has not been calculated.

5) As of 2019, Kommuninvest takes into account a so-called RFI factor of 1.9 in emissions calculations regarding the high altitude effects of air travel, in accordance with Tricorona's calculation method and based on research at the Chalmers University of Technology (Kamb et al, 2018). Previously published emission values have been adjusted.

6) Includes CO<sub>2</sub> emissions from energy consumption, resource consumption and business travel. All emissions are included in Scope 1 and Scope 2 and emissions from business travel are included in Scope 3.



*Ann Sörman,  
Financial Advisor*



*Björn Söderlundh,  
Head of Lending*



*Daniel Nykvist,  
Deputy Head of Lending*



*Erik Törnblom,  
Analyst*



*Tobias Landström,  
Deputy Head of Debt  
Management*



*Patrik Stenman,  
Financial Advisor*



*Theodora Batan,  
Custom Support Specialist*



*Björn Bergstrand,  
Head of Sustainability*



*Jens Enocsson,  
Sustainability Analyst*

The Kommuninvest Green Bonds and Green Loans Programme engages numerous staff across company functions, including lending, debt management, investor relations, sustainability, communications, IT, and research.

The smaller group of people presented here are more deeply involved in the Programme. The Programme is co-led by Björn Söderlundh, Head of Lending and Björn Bergstrand, Head of Sustainability.

# Share of financing and refinancing

**Kommuninvest green bond proceeds are used for financing of Green Loans, which in turn are used for new financing and refinancing of eligible investment projects. New financing is defined as the committed volume of Green Loans during the reporting year. Refinancing is defined as the committed volume of Green Loans before the reporting year.**

## Bottoms-up model, starting with the projects

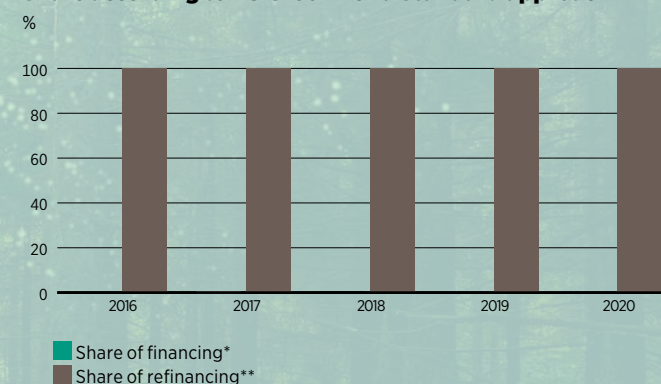
Kommuninvest deploys a bottom-up approach to green financing, whereby eligible investment projects are identified and pre-financed first, and green bonds are issued as the second step. This approach, we believe, has a number of distinct advantages:

- i) It enables Kommuninvest to manage its green framework in a conservative manner, with the size of the portfolio of approved Eligible Projects guiding the volume of Green Bonds issuance. As a rule, Kommuninvest aims for aggregated Green Bond Proceeds not to exceed total disbursements to Green Loans.
- ii) It provides investors with transparency regarding which Eligible Projects the Green Bonds will finance, including the composition of green assets, as well as assurance that Green Bond proceeds will be matched to actual Green Loan disbursements.

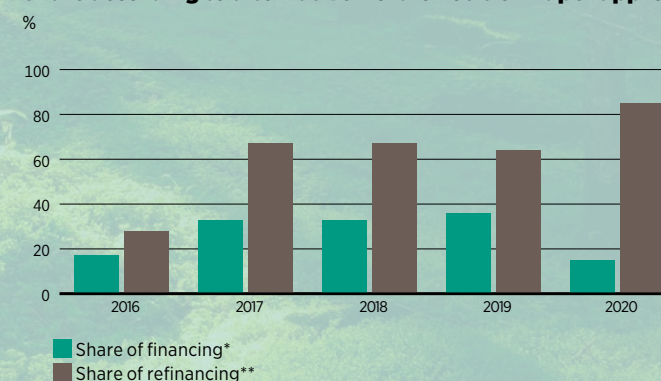
## Reporting according to alternative approach

We report the share of financing and refinancing according to the alternative approach proposed in the Nordic Position Paper on Green Bonds Impact Reporting. We use this alternative approach because we find that the proposed reporting approach according to the EU Green Bond Standard, which is based on allocated amounts, is not directly applicable to our issuance model.

Share according to EU Green Bond Standard approach



Share according to alternative Nordic Position Paper approach





## Share of financing and refinancing: EU GBS approach & Nordic Position Paper approach

	2015	2016	2017	2018	2019	2020
<b>Kommuninvest Green Bonds Framework</b>						
Status per end of reporting year						
Committed amount in Green Loans, SEK billion	5.0	17.8	26.6	39.7	61.8	73.0
Disbursed amount in Green Loans, SEK billion	2.6	14.5	19.9	25.8	40.3	51.9
<b>Share of financing/refinancing: EU Green Bond Standard approach</b>						
Share of financing (allocated amount to projects financed after bond issuance)*		0%	0%	0%	0%	0%
Share of refinancing (allocated amount to projects financed before bond issuance)		100%	100%	100%	100%	100%
<b>Share of financing/refinancing: alternative Nordic Position Paper approach</b>						
Share of financing (committed amount** to projects during the year of reporting)		72%	33%	33%	36%	15%
Share of refinancing (committed amount** to projects before the year of reporting)		28%	67%	67%	64%	85%

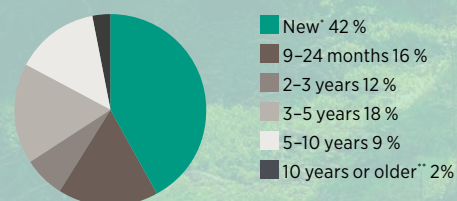
\* Share of financing will always be 0%, given Kommuninvest's issuance model where green bonds are issued in relation to the total volume of outstanding disbursed (allocated) Green Loans.

\*\* Committed amount is chosen over disbursed (allocated) amount, as the committed amount also captures disbursements that will be made in the future.

## Age distribution of Eligible Projects

as of 31 Dec 2020

based on project completion date and disbursed outstanding amounts

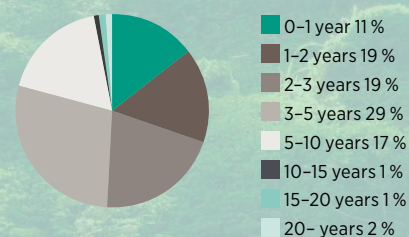


\*) Planned, on-going or a maximum of nine months has passed since completion

\*\*) Adjusted to include projects where project completion date refers to date of transaction (#12, #51, #144 - acquisition finance for hydro power stations).

## Maturity profile Green Loans

as of 31 Dec 2020





# Key reporting methodology

**Kommuninvest reports impact from financed green investment projects based on jointly established Nordic guidelines, which build on and complement international recommendations.**

Since 2016, a group of Nordic public sector green bond issuers cooperate on impact reporting topics, with the aim of harmonising and advancing reporting practices across the Nordic region. The results of this work have been published in a Position Paper on Green Bonds Impact Reporting,

launched in October 2017 and most recently updated in February 2020. These Nordic reporting guidelines builds on and complement international recommendations, as outlined by the Green Bond Principles.



Kommuninvest's impact reporting is carried out in accordance with the principles and methodology presented in the Position Paper on Green Bonds Impact Reporting. The Position paper has been developed by a group of Nordic public sector green bond issuers, initiated and led by Kommuninvest.

## Key reporting principles

- ➔ A project's impact is quantified based on the share of the investment cost that has been financed by Kommuninvest and on Green Loans disbursed and outstanding.
- ➔ Calculations are based on projected (ex-ante) values; unless actual outcomes (ex-post) are available.
- ➔ Projects which no longer comply with the requirements of the Green Bonds framework are excluded from the reporting.
- ➔ CO<sub>2</sub> emissions and emissions reductions are reported as scopes 1 and 2 as defined by the Greenhouse Gas Protocol, ie. direct emissions from projects and indirect emissions from the production of electricity and/or district heating.
- ➔ Energy production, energy savings and other sustainable activities are converted into greenhouse gas emissions savings using an emission factor for electricity production in mainland EU and Norway of 315 CO<sub>2</sub>/kWh. Please see page 46 for further information about baseline choices.
- ➔ We report impact from activities financed by green bonds on a yearly basis.



## COMMITTEE MEMBERS

- 1 **Susanne Arneborg**, Strategic Urban Planner, Municipality of Borås
- 2 **Patrik Stenman**, Client Relationship Manager, Kommuninvest
- 3 **Marta Fallgren**, Environmental Manager, Uppsala County Council
- 4 **Björn Söderlundh**, Head of Lending, Kommuninvest
- 5 **Ann Sörman**, Client Relationship Manager, Kommuninvest
- 6 **Andreas Hagnell**, Senior Advisor Environment and Energy, Swedish Association of Local Authorities and Regions (SALAR)
- 7 **Hanna Ryman**, Sustainability Manager, Municipality of Örebro
- 8 **Lisa Järner**, Environmental Coordinator, City of Mölndal

# Project evaluation and selection

**Green Loan applications are reviewed and finally approved by an advisory committee – the Kommuninvest Green Bonds Environmental Committee – comprising Swedish local government climate specialists.**

**INVESTMENT PROJECTS** are initially identified, verified and selected by the environmental functions and treasury departments in Kommuninvest's member municipalities and regions. Eligible projects are then screened by Kommuninvest's Lending department, and, on at least a quarterly basis, reviewed and finally approved by consensus vote in the Kommuninvest

Green Bonds Environmental Committee.

The Committee consists of representatives from the environmental function of at least two member municipalities and regions, environmental experts from other relevant public sector organisations or academia/non-governmental organization, and from Kommuninvest's management and lending group.



## ASSURANCE REPORT PUBLISHED ANNUALLY

Kommuninvest regularly publishes an external assurance report regarding its Green Bonds Framework, in line with the recommendations of the Green Bond Principles. The report, performed by our external auditor, provides assurance on the management of proceeds obtained from the issuance of green bonds. Green Bond proceeds and disbursements to Green Loans are tracked by Kommuninvest according to internal instructions.



# Project categories

Kommuninvest Green Bonds finance investment projects in Sweden undertaken by our member municipalities and regions. We finance projects within eight areas of investment and subject to meeting pre-determined sustainability criteria.

The following pages present an overview of the green project categories and their impact, as well as lists of the approved projects which were approved during 2020. The complete project-by-project reporting, covering all investment projects in the Green Loan portfolio as of year-end 2020, is available at the Green Bonds section of Kommuninvests website, [kommuninvest.se](https://kommuninvest.se)

## All projects must

Promote the transition to a low-carbon and climate-resilient society

- ✓ Be part of the systematic environmental work in the applicant municipality or region
- ✓ Be related to Sweden's national environmental objectives, or to regional environmental goals
- ✓ Target either mitigation of climate change, adaptation to climate change, or be a project related to environmental management in other areas than climate change



### Renewable energy 20

Facilitating implementation of renewable energy sources



### Energy efficiency in energy systems 21

Reducing energy requirements in existing energy systems



### Green buildings 22

Low-energy buildings for residential and non-residential use



### Clean transportation 23

Transport solutions that result in minimal or zero emissions



### Waste management 24

Measures to increase reuse and recycling, minimize waste and improve energy recovery



### Water and wastewater management 25

Water and wastewater investments with a climate and environmental profile



### Climate change adaptation 26

Making local communities better adapted to current and future climate change, including reducing physical climate risk.


























### Environmental management 27

Ensuring sustainable land use, including biodiversity restoration and cleaning up of harmful substances.

# Alignment with the SDGs and EU objectives

Investment projects financed by Kommuninvest Green Bonds form important contributions to the work of Swedish local government towards the Sustainable Development Goals and the EU's environmental objectives.

Category	SDGs	EU Environmental Objectives	Total # projects	New projects in 2020	Renewable energy production (MWh/year)	Energy reduced and avoided (MWh/year)	GHG emissions reduced/avoided, tonnes CO <sub>2</sub> e/year <sup>1</sup>	Committed Green Loans, SEK million	Disbursed Green Loans, SEK million
Renewable energy	 	Climate change mitigation	55	7	3,091,506	n/a	597,086	12,589	9,607
Energy efficiency	   	Climate change mitigation	8	0	n/a	111,541	22,119	302	251
Green buildings	   	Climate change mitigation	258	55	602	49,416	7,228	40,811	31,097
Clean transportation	  	Climate change mitigation	17	4	n/a	n/a	15,291	6,284	2,683
Waste management	 	Transition to a circular economy, waste prevention, and recycling	10	4	n/a	n/a	1,151	456	248
Water management	 	Sustainable use and protection of water and marine resources	60	18	n/a	n/a	n/a	12,130	7,739
Climate change adaptation	  	Climate change adaptation	1	0	n/a	n/a	n/a	16	16
Environmental management	  	Protection of healthy ecosystems	7	0	n/a	n/a	n/a	369	246
<b>Total</b>			<b>416</b>	<b>88</b>	<b>3,092,108</b>	<b>160,957</b>	<b>642,875</b>	<b>72,957</b>	<b>51,887</b>

<sup>1)</sup> A number of Green Loans refer to the same physical investment project. As a consequence, Kommuninvest's detailed project by project reporting, available at [kommuninvest.se](https://kommuninvest.se), lists 416 physical investment projects, compared with 421 applications for financing.

## PROJECTS

# Renewable energy

Investments in this category aim to reap the energy potential of the wind, the sun, the ground, the sea, biomaterials and other renewable energy carriers, and to replace non-sustainable energy sources. Projects include production and distribution of renewable energy including wind, wave, solar, hydro, geothermal, bioenergy, biogas and excess heat.

### Green loans to Renewable energy

Total number of projects:

55

Total amounts disbursed and outstanding:

9,607 MSEK

### Estimated annual impact of Green Loans<sup>1</sup>

Estimated installed effect (total): 27,808 MW

Estimated annual energy production: 3,091,506 MWh

Greenhouse gas emissions avoided, per year: 597,086 tonnes CO<sub>2</sub>e

1) Refers to the Green Loan share of project impacts. The impact attributable to Green Bond investors is presented on page 3.





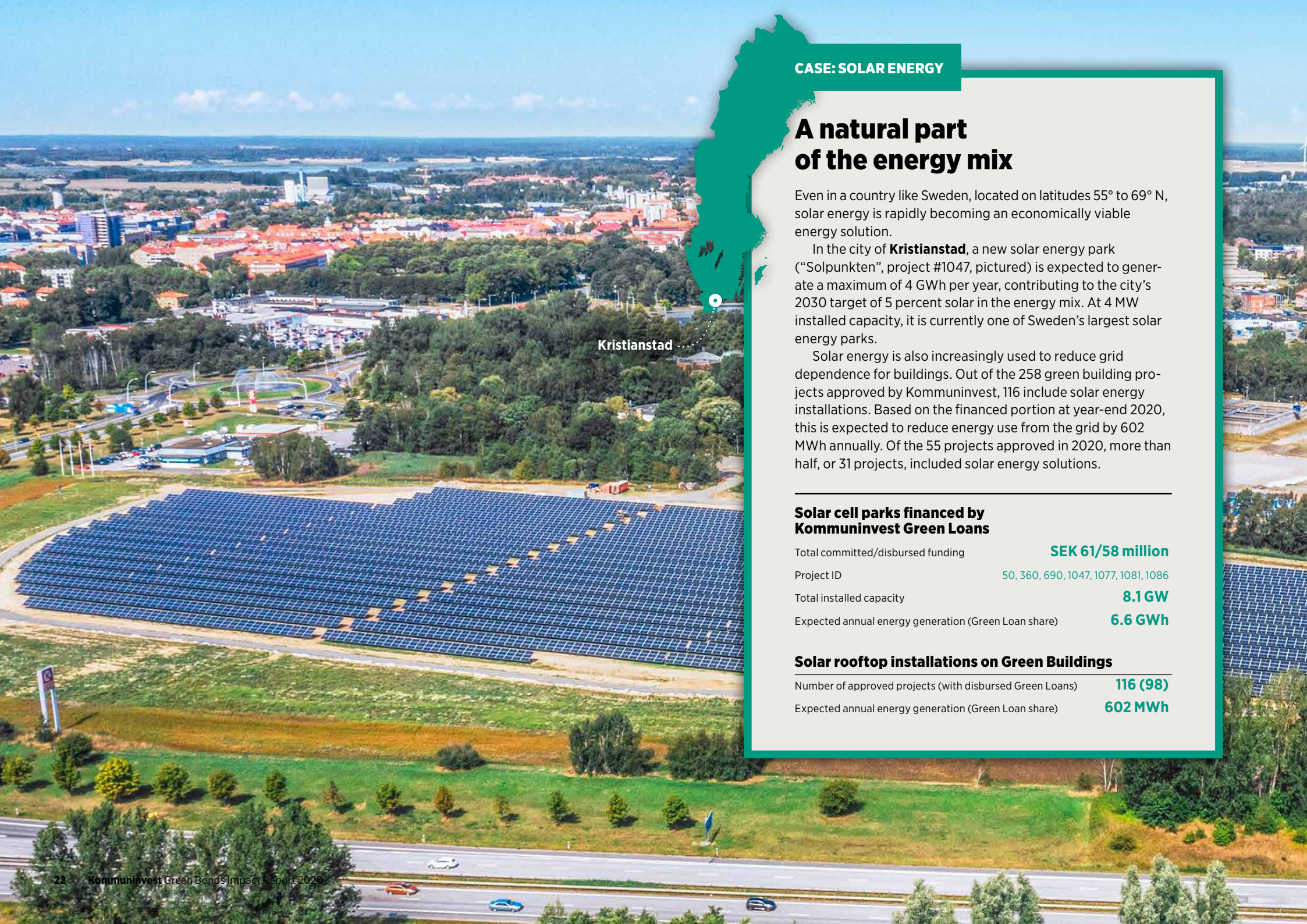
**PROJECTS**

## Renewable energy: Projects approved in 2020

Borrower	Project ID	Sub-category	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share	
								Renewable energy generation, MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e
Tingsryds Energi AB	1023	District Heating	New boiler plant to increase capacity and eliminate the need for fossil-based peak heat production.	2021	0	15	0	0	0
Trollhättan Energi Aktiebolag	1026	District Heating	New residual heat conduction pipes that will take advantage of previously unused waste heat, estimated to about 70,000 MWh / year.	2017	0%	59	0	0	0
C-4 Energi Aktiebolag	1047	Solar Power	Solar park construction, primarily supplying households and industries in the municipality. Max. estimated production 4 GWh per year.	2020	89%	25	25	3,571	1,125
Värnamo Energi AB	1048	District Heating	New installation of biofuel-based boiler, to replace oil boilers and heat pumps. A steam boiler has also been installed, replacing gas for industrial heat delivery.	2020	65%	61	40	14,396	1,201
Leva Vatten AB	1077	Solar Power	New solar park located next to the city's sewage treatment plant, and supplying 60-70% of the plant's electricity need, corresponding to -115,000 KWh annually.	2020	0%	1	0	0	0
Karlskrona Municipality	1081	Solar Power	Installation of solar cells on a former waste deposit ("Gullbernadeponin").	2019	0%	1	0	0	0
Karlskrona Municipality	1085	Solar Power	Solar cell installation at the preschool Spandelstorps gård.	2021	0%	1	0	0	0

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)





Kristianstad

## CASE: SOLAR ENERGY

### A natural part of the energy mix

Even in a country like Sweden, located on latitudes 55° to 69° N, solar energy is rapidly becoming an economically viable energy solution.

In the city of **Kristianstad**, a new solar energy park (“Solpunkten”, project #1047, pictured) is expected to generate a maximum of 4 GWh per year, contributing to the city’s 2030 target of 5 percent solar in the energy mix. At 4 MW installed capacity, it is currently one of Sweden’s largest solar energy parks.

Solar energy is also increasingly used to reduce grid dependence for buildings. Out of the 258 green building projects approved by Kommuninvest, 116 include solar energy installations. Based on the financed portion at year-end 2020, this is expected to reduce energy use from the grid by 602 MWh annually. Of the 55 projects approved in 2020, more than half, or 31 projects, included solar energy solutions.

#### Solar cell parks financed by Kommuninvest Green Loans

Total committed/disbursed funding	SEK 61/58 million
Project ID	50, 360, 690, 1047, 1077, 1081, 1086
Total installed capacity	8.1 GW
Expected annual energy generation (Green Loan share)	6.6 GWh

#### Solar rooftop installations on Green Buildings

Number of approved projects (with disbursed Green Loans)	116 (98)
Expected annual energy generation (Green Loan share)	602 MWh



## PROJECTS

# Energy efficiency in energy systems

Projects within this category reduce the energy requirements in existing (predominantly fossil-free) energy systems and phase out the use of fossil energy sources. Projects may be related to district heating/cooling, electricity grids/smart grids, energy recovery and storage.

## Green loans to energy efficiency

Total number of projects:

8

Total amounts disbursed and outstanding:

251 MSEK

## Estimated annual impact of Green Loans<sup>1</sup>

Total energy savings:	111,541 MWh
- whereof Avoided energy use <sup>2</sup>	0 MWh
- whereof Reduced energy use <sup>3</sup>	111,541 MWh

Greenhouse gas emissions reduced, per year :

22,119 tonnes CO<sub>2</sub>e

<sup>1</sup> Refers to the Green Loan share of project impacts. The impact attributable to Green Bond investors is presented on page 3.

<sup>2</sup> Avoided energy use refers to a baseline/alternative reference scenario. Net value, inclusive of energy production in green buildings.

<sup>3</sup> Reduced energy use refers to a direct or absolute reduction in operation.





## PROJECTS

# Green buildings

New or existing residential (multi-family) or non-residential buildings. Residential buildings must have an energy performance per sq.m. of at least 15 percent below the Swedish building code; for non-residential buildings this requirement is at least 20 percent. Major renovations of buildings must lead to at least 30 percent less energy use per sq.m. per year (or to compliance with the Swedish building code); energy efficiency measures in partial systems to at least 30 percent less energy use.

## Green loans to green buildings

Total number of projects:

**258**

Total amounts disbursed and outstanding:

**31,097 MSEK**

## Estimated annual impact of Green Loans<sup>1</sup>

Total energy savings:	<b>49,416 MWh</b>
- whereof avoided energy use <sup>2</sup>	41,763 MWh
- whereof reduced energy use <sup>3</sup>	7,653 MWh
Energy production in buildings:	<b>602 MWh</b>
Greenhouse gas emissions savings, per year :	<b>7,228 tonnes CO<sub>2</sub>e</b>
- whereof avoided/reduced CO <sub>2</sub> e	6,295 / 933 tonnes

<sup>1</sup> Refers to the Green Loan share of project impacts. The impact attributable to Green Bond investors is presented on page 3.

<sup>2</sup> Avoided energy use refers to a baseline/alternative reference scenario. Net value, inclusive of energy production in green buildings.

<sup>3</sup> Reduced energy use refers to a direct or absolute reduction in operation.



The Unica preschool in Mariestad municipality (project ID #80).

**PROJECTS**

## Green buildings: Projects approved in 2020

Borrower	Project ID	Sub-category	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
								Renewable energy generation, MWh	Energy savings, MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e
Hässleholms Industribyggnadsaktiebolag (Hässleholm Industrial Property Company)	783	New buildings	Construction of 1,500 sq.m. of office space, built according to Environmental Building certification Silver.	2018	100%	47	47	0	60	9
Växjö Fastighetsförvaltning AB (Växjö Property Company)	853	New buildings	New preschool (Vallenviken) built with a solid wood frame, a sedum roof and a stormwater detention vault.	2019	0%	34	0	0	0	0
Vadstena Fastighets AB (Vadstena Municipal Property Company)	895	New buildings	Construction of 'safe housing' for elderly, with the objective of being 100% fossil-free in operation, including property management.	2021	0%	55	0	0	0	0
Hässleholms Industribyggnadsaktiebolag (Hässleholm Industrial Property Company)	943	Major renovations	Renovation of an existing property, including improved control and cooling equipment, rooftop solar cells and two charging stations for electric vehicles.	2019	100%	19	19	0	68	12
AB Kristianstadsbyggen	985	Energy efficiency	Construction of energy-efficient multi-family housing unit (Orren), including individual water meters.	2019	98%	24	24	0	17	2
AB Kristianstadsbyggen	986	New buildings	Construction of energy-efficient multi-family housing unit according to Kombohus concept, including individual water meters and solar cells.	2019	99%	48	48	0	21	2
AB Kristianstadsbyggen	987	New buildings	Construction of energy-efficient multi-family housing unit according to Kombohus concept, including individual water meters.	2018	100%	67	67	0	62	6
Stiftelsen Bollebygds Hyresbostäder (Bollebygd Municipal Housing Company)	988	New buildings	24 new apartments located in three different buildings. Rooftop solar cells and charging posts for electrical cars.	2020	100%	52	52	3	81	7

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)



**PROJECTS**

## Green buildings: Projects approved in 2020

Borrower	Project ID	Sub-category	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
								Renewable energy generation, MWh	Energy savings, MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e
Eksta Bostadsaktiebolag	992	New buildings	New care and nursing home.	2020	44%	280	123	25	170	16
Kommunfastigheter i Arboga AB	993	New buildings	New housing for people with functional variations, built according to Environmental Building certification Silver. Wood construction, rooftop solar cells.	2020	100%	30	30	5	33	4
Tidaholm Municipality	996	New buildings	Construction of a new school (Rosenbergsskolan) for children aged 6-12.	2020	87%	153	133	26	348	39
Piteå Municipality	997	New buildings	Preschool (Strömnäsbacken) with 340 sq.m. solar cells on the roof.	2021	99%	70	70	0	72	5
Hammarö Municipality	999	New buildings	Construction of a new school (Bärstadsskolan) for children aged 6-12.	2014	100%	165	165	0	97	31
Hultsfred Municipality	1000	New buildings	Construction of a new school building, including a new energy-efficient kitchen.	2021	41%	52	21	0	22	7
Hultsfred Municipality	1001	New buildings	Construction of new preschool, built according to Environmental Building certification Silver, with rooftop solar cells.	2021	0%	100	0	0	0	0
Region Örebro Län	1002	New buildings	New building at the Örebro University Hospital. Geothermal heating and cooling, excess heat from research freezers used to preheat hot water. Rooftop solar cells. Stormwater detention vault will reduce burden on municipal stormwater system in case of torrential rain.	2022	10%	300	30	3	17	5

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**PROJECTS**

## Green buildings: Projects approved in 2020

Borrower	Project ID	Sub-category	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
								Renewable energy generation, MWh	Energy savings, MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e
Nordanstig Municipality	1005	Major renovations	Deep renovations of a portfolio of municipal buildings totalling 33,764 sq.m., aiming at rapidly decreasing energy use. Additionally, climate-hazardous building materials will be replaced and the indoor environment will be improved.	2023	0%	88	0	0	0	0
Eslövs Bostads AB (Eslöv Municipal Housing Company)	1008	New buildings	Multi-family housing with 81 new apartments, built according to Environmental Building certification Silver. Including bicycle and car pools, centrally located close to train station.	2021	96%	200	200	11	196	18
Falköping Municipality	1010	New buildings	Construction of a new preschool (Trollet).	2019	0%	30	0	0	0	0
Falköping Municipality	1011	New buildings	Construction of a new preschool (Urd).	2019	0%	28	0	0	0	0
Sala Municipality	1012	New buildings	New preschool (Ranta), built according to Environmental Building certification Silver. Rooftop solar cells.	2019	0%	89	0	0	0	0
Timrå Municipality	1014	New buildings	New indoor swimming pool facility, with future possibility for heat recovery from greywater and backwash water as well as rooftop solar panels.	2022	0%	250	0	0	0	0
Kristianstad Municipality	1018	New buildings	New preschool (Tvegård), built according to Environmental Building certification Silver. Building materials chosen for reduced chemical content and life cycle environmental impact. Rooftop solar cells.	2020	98%	82	80	17	100	11

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**PROJECTS**

## Green buildings: Projects approved in 2020

Borrower	Project ID	Sub-category	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
								Renewable energy generation, MWh	Energy savings, MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e
Kristianstad Municipality	1019	New buildings	Construction of a new preschool (Hjärtebacke), built according to Environmental Building certification Silver. Carefully considered building materials regarding the chemical content and environmental impact during the life cycle. Rooftop solar cells.	2021	100%	108	108	19	78	8
Kristianstad Municipality	1020	New buildings	Construction of a new preschool (Arkelstorp), built according to Environmental Building certification Silver. Carefully considered building materials regarding the chemical content and environmental impact during the life cycle. Rooftop solar cells.	2020	100%	72	72	5	50	16
Skellefteå Municipality	1024	New buildings	Construction of a new preschool (Bergsbyn), built according to Environmental Building certification Silver. Carefully considered building materials regarding the chemical content and environmental impact during the life cycle. Rooftop solar cells.	2021	100%	45	45	17	109	12
Skellefteå Municipality	1025	New buildings	Construction of a new preschool (Brännan), built according to Environmental Building certification Silver. Carefully considered building materials regarding the chemical content and environmental impact during the life cycle. Rooftop solar cells.	2021	100%	48	48	17	109	12
Falköping Municipality	1027	New buildings	Construction of a new preschool (Mössebergskolan), constructed with a solid wood frame.	2019	0%	13	0	0	0	0
Hjo Municipality	1028	New buildings	Construction of a new school (Estrid Ericsson school), built according to Environmental Building certification Silver. Sedum roof (partially) and rooftop solar cells.	2021	0%	120	0	0	0	0

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**PROJECTS**

## Green buildings: Projects approved in 2020

Borrower	Project ID	Sub-category	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
								Renewable energy generation, MWh	Energy savings, MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e
Svenljunga Verksamhetslokaler AB (Svenljunga Municipal Property Company)	1029	New buildings	Construction of a new preschool (Svedjan). Carefully considered building materials regarding the chemical content and environmental impact during the life cycle. Rooftop solar cells.	2021	100%	40	40	14	36	4
Karlshamn Municipality	1041	New buildings	Construction of a new school building (Mörrum) to replace older one. Built according to Environmental Building certification Silver. Carefully considered building materials and focus on biodiversity in outdoor environment. Rooftop solar cells.	2022	0%	200	0	0	0	0
Karlshamn Municipality	1042	New buildings	New, more energy-efficient ice rink replacing one constructed in the 1960s, and expected to reduce energy consumption by about half. Rooftop solar cells.	2020	83%	100	100	16	61	19
Osby Municipality	1044	New buildings	Construction of a new preschool (Skogsgården). Rooftop solar cells.	2020	0%	87	0	0	0	0
Rättvik Fastigheter AB	1045	New buildings	Construction of a new school (Nyhed school).	2020	90%	65	59	0	98	10
Torsby Municipality	1049	New buildings	New housing for people with functional variations, 12 apartments. Rooftop solar cells.	2021	0%	31	0	0	0	0
Leksandbostäder AB (Leksand Municipal Housing Company)	1053	New buildings	New construction of multi-family housing. Rooftop solar cells.	2019	55%	63	50	18	99	10
Törebodabostäder AB (Töreboda Municipal Housing Company)	1054	New buildings	New construction of multi-family housing.	2020	98%	150	150	31	182	57

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**PROJECTS**

## Green buildings: Projects approved in 2020

Borrower	Project ID	Sub-category	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
								Renewable energy generation, MWh	Energy savings, MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e
Falköping Municipality	1056	New buildings	Expansion of existing school building (Vindängen), using wood walls.	2020	78%	90	76	10	100	12
Falköping Municipality	1057	New buildings	Construction of a new preschool (Kinnarp), built with wood frame.	2020	0%	38	0	0	0	0
AB Ängelholmslokaler (Ängelholm Municipal Property Company)	1058	New buildings	Construction of a new school (Villan), built according to Environmental Building certification Gold.	2022	83%	250	250	0	262	32
Österlenhem AB (Tomelilla Municipal Housing Company)	1059	New buildings	Two new residential buildings, containing 16 apartments each, one of which for people with functional variations.	2019	0%	45	0	0	0	0
Boden Science Park Fastighets AB (Boden Science Park Property Company)	1061	New buildings	Construction of a combined office and education facility, comprising higher vocational education, education in gaming development, high school education and offices and business premises. Build according to Environmental Building certification Silver.	2020	100%	180	180	0	167	15
Eskilstuna Kommunfastigheter AB (Eskilstuna Municipal Property Company)	1062	New buildings	Construction of a new public swimming facility (Munktebadet).	2016	0%	200	0	0	0	0
Kalmarhem AB	1063	New buildings	Construction of new housing for the elderly. Rooftop solar cells.	2022	67%	200	135	6	101	10
Kalmarhem AB	1064	New buildings	New construction of multi-family housing. Rooftop solar cells.	2022	100%	190	190	20	340	37

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)



**PROJECTS**

## Green buildings: Projects approved in 2020

Borrower	Project ID	Sub-category	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
								Renewable energy generation, MWh	Energy savings, MWh	GHG-emissions reduced/ avoided, tCO <sub>2</sub> e
Varberg Municipality	1066	New buildings	New swimming facility with a number of technical features to reduce energy use for heating, ventilation and water use as well as increase recycling of water. About 70% of the water used as bathing water will be reintroduced after it has been purified with ultrafilters.	2021	62%	447	279	0	130	17
Hässleholms Industri- byggnadsaktiebolag (Hässleholm Industrial Property Company)	1069	New buildings	New construction of office space, built according to Environmental Building certification Gold regarding energy use and energy sources. Rooftop solar cells.	2021	28%	100	28	3	38	5
Kalmar Municipality	1070	Major renovations	Renovation of a school gymnasium (Djurängsskolan).	2020	0%	1	0	0	0	0
Kalmar Municipality	1071	New buildings	Construction of a new public ice rink, where heated areas to a large degree are heated using excess heat from cooling machines.	2021	66%	185	122	10	117	33
Växjö kommun- företag AB	1074	New buildings	New construction of a police building, containing training facilities and offices for police education.	2018	37%	44	20	3	38	3
Varberg Municipality	1078	Major renovations	Renovation of Arena Varberg, certified according to Miljöbyggnad Silver. Half of the ventilation units equipped with a heat recovery system. Two beehives with associated information signs placed on the property, to spread knowledge about the bees' role in nature. EV charging stations installed and lighting is continuously being switched to LED lighting.	2020	0%	70	0	0	0	0

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)

**PROJECTS**

## Green buildings: Projects approved in 2020

Borrower	Project ID	Sub-category	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
								Renewable energy generation, MWh	Energy savings, MWh	GHG-emissions reduced/ avoided, tCO <sub>2</sub> e
Kraftstaden Fastigheter Trollhättan AB	1079	New buildings	New preschool (Loket) was built according to the environmental certification system Miljöbyggnad 3.0 with silver grade, the building has received a preliminary certification.	2020	98%	52	52	0	41	4
Kraftstaden Fastigheter Trollhättan AB	1080	New buildings	New preschool (Vällingklockan) was built according to the environmental certification system Miljöbyggnad 3.0 with silver grade, the building has received a preliminary certification.	2020	99%	57	57	0	52	5
Boden Municipality	1082	New buildings	New preschool (Lunda) where the construction product database was used as a starting point when choosing building materials. Solar cells will be placed on the roof of the property.	2021	0%	50	0	0	0	0
Årehus AB	1090	New buildings	New school (Duved) built with a wooden core frame. A lifecycle analysis for different choices of frames was carried out to assess the most environmentally friendly alternatives.	2022	7%	60	21	0	21	3

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)



Duved

## CASE: GREEN BUILDINGS

# Life cycle approach favors wood construction

The renovation and expansion of the school in **Duved**, a village in the Åre ski resort area, will increase its capacity from 400 to 800 students and includes a new cooking kitchen, lunch room and library. The adjoining sports facilities will also be renovated and expanded.

A life cycle assessment (LCA) of building materials was performed at an early stage in the project, to compare the difference between a wood construction and one using traditional materials including concrete. Using wood would result in 27 percent less CO<sub>2</sub> being emitted for the construction and end phase, equivalent to 12 kg CO<sub>2</sub> per sq.m.

The new parts of the school will thus be constructed with a wooden frame in cross laminated timber. Cross laminated timber constructions result in solid structural rigidity and a high durability to weight relation. The project targets Environmental Building certification Silver.

### Client: Årehus AB (Åre Municipal Housing Company)

Project category:

**Green buildings**

Objectives: Replacing existing trains to increase capacity and offer better traveling experience; adding more trains to regional fleets to meet demand for clean transport alternative.

Total investment:

**SEK 284 million**

Green loans from Kommuninvest (committed):

**SEK 60 million**

Green loans from Kommuninvest (disbursed):

**SEK 21 million**

Completed (year):

**2022**

Total energy use/year: 62 kWh/m<sup>2</sup>

Total energy requirement (BBR25): 80 kWh/m<sup>2</sup>

Estimated CO<sub>2</sub> emissions reductions (in use): 3 tonnes CO<sub>2</sub> e per year

Avoided CO<sub>2</sub> emissions in construction & end phases: 128 tonnes CO<sub>2</sub> e



## PROJECTS

# Clean transportation

Transport solutions that result in minimal or zero emissions. Project examples may include trains, underground, trams and hybrid buses. Also infrastructure supporting public transportation and other sustainable transportation, such as pedestrian and cycle paths, charging points for electric vehicles and fueling stations for renewable fuels.

### Green loans to clean transportation

Total number of projects:

17

Total amounts disbursed and outstanding:

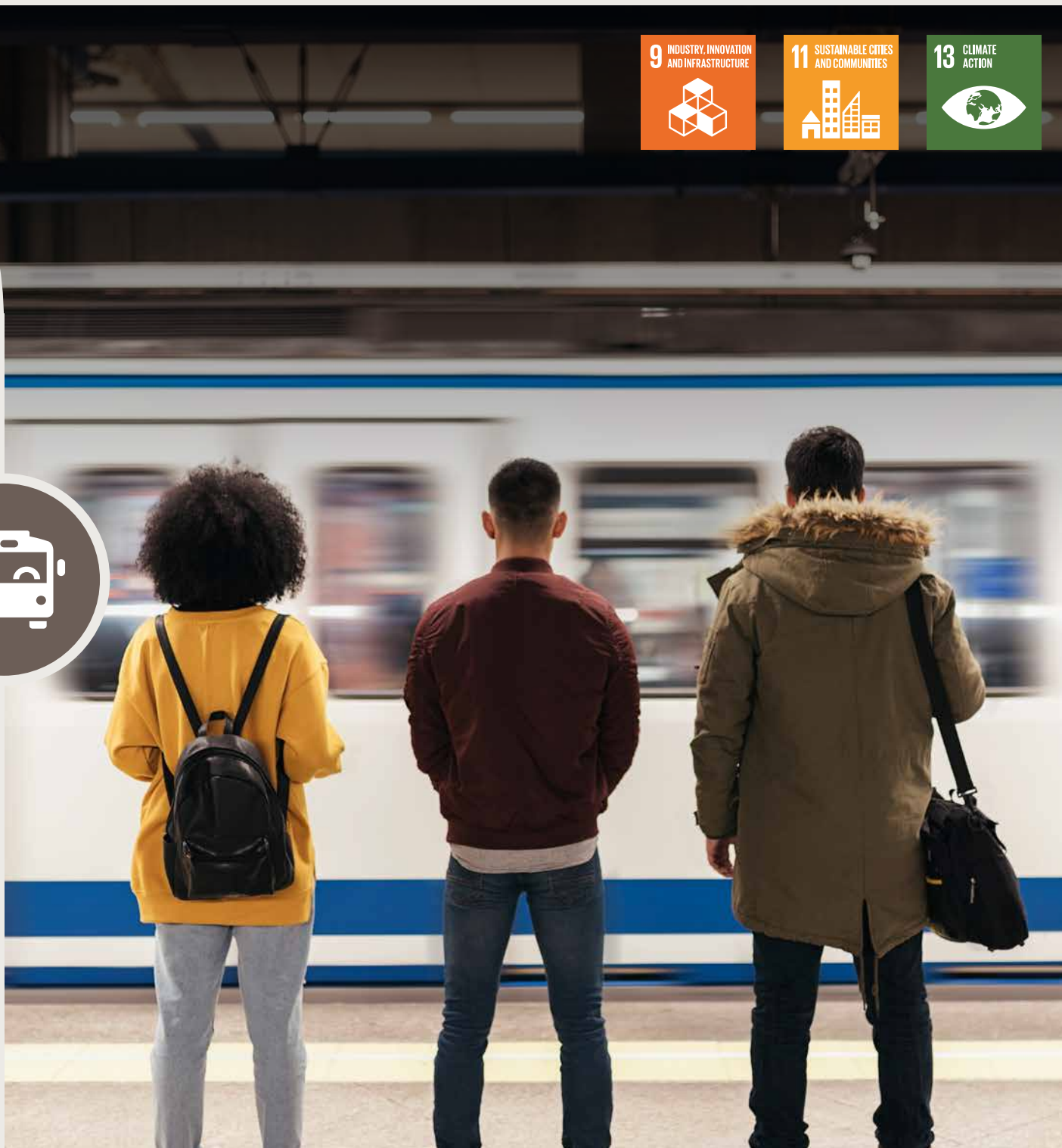
2,683 MSEK

### Estimated annual impact of Green Loans<sup>1</sup>

Greenhouse gas emissions avoided, per year:

15,291 tonnes CO<sub>2</sub>e

<sup>1</sup>) Refers to the Green Loan share of project impacts. The impact attributable to Green Bond investors is presented on page 3.



**PROJECTS**

## Clean transportation: Projects approved in 2020

Borrower	Project ID	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share	
							Renewable energy generation, MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e
Piteå Municipality	998	Expanding the Piteå Port & Hub to increase capacity for freight transport using the sea and railways.	2021	20%	690	40	n/a	n/a
Region Östergötland, Södermanland, Stockholm, Västmanland, Örebro and Uppsala	1015	12 new regional passenger trains for use in "Mälardalstrafiken" but also the enlarged area encompassing the Uppsala region.	2024	15%	2,300	210	n/a	n/a
Region Kalmar, Blekinge, Kronoberg and Jönköping	1016	30 new regional passenger trains for use in the Blekinge, Jönköping, Kalmar and Kronoberg regions.	2028	0%	300	0	n/a	n/a
Skellefteå Municipality	1022	New harbor crane operated entirely on electricity.	2021	0%	40	0	n/a	0

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)



## CASE: CLEAN TRANSPORTATION

### Regional train investments to promote switch from cars

Through deregulation in the early 1990s, Swedish regional transport authorities were given the right to procure train traffic within each region. Towards the end of the decade, the transport authorities decided to form a jointly owned company, Transitio, responsible for procurement, financing and maintenance of trains on behalf of the owners. The trains are leased to owners on long-term rental agreements.

Kommuninvest Green Loans are currently used to co-finance reinvestment and expansion plans in three Swedish regions, equivalent to approx. 50 train sets and a total investment of SEK 5.5 billion. More modern trains, with easier access, shorter dwell times and higher capacity contribute to a better public transport experience and promote a switch from cars to trains for regional commutes.

**Client: Transitio, a public transport company owned by 20 regions and public transport authorities**

Project category:

**Clean transportation**

Objectives: Replacing existing trains to increase capacity and offer better traveling experience; adding more trains to regional fleets to meet demand for clean transport alternative.

Total investment:

**SEK 5,480 million**

Green loans from Kommuninvest (committed):

**SEK 3,890 million**

Green loans from Kommuninvest (disbursed):

**SEK 811 million**

Completed (years):

**2024-2028**



## PROJECTS

# Waste management

Investments are intended to ensure sustainable, energy efficient and resource-saving waste management. Eligible projects include the construction of new waste management facilities, upgrades/expansion of existing ones; waste collection systems that minimise transport requirements and increase recycling scope, etc.

### Green loans to Renewable energy

Total number of projects:

10

Total amounts disbursed and outstanding:

248 MSEK

### Estimated annual impact of Green Loans<sup>1</sup>

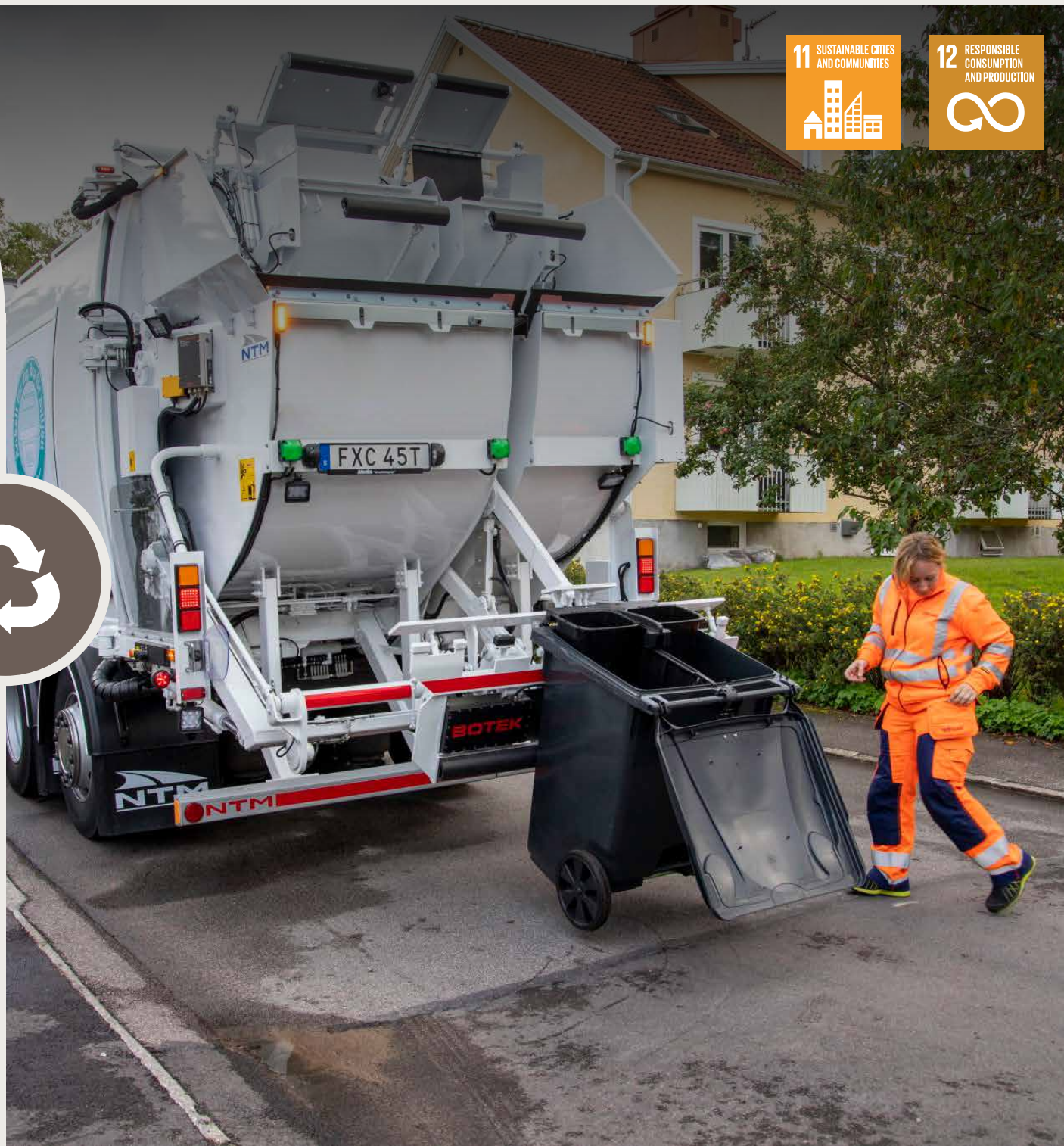
Increase in capacity:

n/a

Greenhouse gas emissions reduced and avoided, per year:

1,151 tonnes CO<sub>2</sub>e

<sup>1</sup>) Refers to the Green Loan share of project impacts. The impact attributable to Green Bond investors is presented on page 3.



**PROJECTS**

## Waste management: Projects approved in 2020

Borrower	Project ID	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share	
							Renewable energy generation, MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e
Södra Smålandsavfall och miljö AB	1017	Introduction of a new waste collection system for households. Expected food waste collection of about 6,000 tonnes will be sorted and used for biogas production amounting to 7,200 MWh annually. The amount of combustible residual waste is expected to decrease by about 40 percent.	2021	0	112	0	0	0
Arvika Teknik AB	1055	New recycling center enabling sorting of more waste fractions. Center treats -9,000 tonnes of household waste and -3,000 tonnes of household sludge annually.	2018	99%	19	19	n/a	n/a
Svenljunga Municipality	1067	New waste collection system for food, packaging and newspapers. About 400 tonnes of food waste is expected to be sorted out for production of biogas and biofertilizer, instead of being incinerated or composted.	2020	0%	20	0	0	0
Svenljunga Municipality	1068	New and expanded recycling center enabling sorting of more waste fractions. Installation of solar panels will cover most of the center's electricity needs.	2020	0%	32	0	n/a	n/a

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)



## PROJECTS

# Water and waste-water management

Construction and upgrading of freshwater and wastewater systems to accommodate population growth and higher precipitation levels and to meet environmental regulations. Project that apply innovative technologies to reduce levels of harmful substances and make good use of the resources contained in wastewater. Examples: water and wastewater networks, water treatment plants, treatment of discharges to watercourses, and investment in energy and heat recovery from water and wastewater networks.

### Green loans to water and wastewater management

Total number of projects:

60

Total amounts disbursed and outstanding:

7,739 MSEK

### Estimated annual impact of Green Loans<sup>1</sup>

Increase in capacity:

367,577

1) Refers to the overall impact of the financed projects, not the Green Loan share of project impacts, and where we have access to such data (29 out of 60 financed projects). The impact attributable to Green Bond investors is presented on page 3.





**PROJECTS**

## Water and wastewater management: Projects approved in 2020

Borrower	Project ID	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
							Renewable energy gener. MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e	Population equivalents change
Upplands Väsby Municipality	759	Stormwater management in connection with the new urban development project Fyrklöver, with a holistic perspective including biodiversity, recreation and climate adaptation. Purification of stormwater via stormwater ponds, rain beds and plantations, as well as underground reservoirs. Stormwater parks are also designed to handle exceptional amounts of water.	2023	47%	430	200	n/a	n/a	n/a
Åre Municipality	784	New wastewater treatment plant for 3,000 p.e., investment includes 8 km of new mains for waste and drinking water and seven pumping stations. Replaces individual water and sewer facilities. Expected to reduce in-leakage and overflows and provide a more controlled purification process.	2021	33%	240	80	n/a	n/a	1,000
Åre Municipality	785	New sewage treatment plant for 8,000 p.e., investment includes 18 km of new mains for wastewater and drinking water, and three pumping stations. Replaces individual water and sewage systems. Expected to reduce in-leakage and overflows and provide a more controlled purification process.	2022	77%	156	120	n/a	n/a	6,154
Mjölby Municipality	994	Increase of capacity in the treatment plant, from 32,000 p.e. to 45,000 p.e., with simultaneous purification improvement and reduced emissions of nitrogen and BOD as well as reduced energy use.	2019	0%	45	0	n/a	n/a	0
Kalmar Vatten AB	995	Renewal of existing water mains, 15 km of mains renewed annually as part of 5-year plan. Environmental benefits include reduced overflow in the mains network which reduces supply of nutrients to the recipient. Electricity consumption is reduced thanks to smaller volumes of water pumped on the mains network and lower volumes of additional water to the treatment plant. Also reduced use of process chemicals.	2024	49%	500	245	n/a	n/a	624
Storuman Municipality	1006	New, more energy-efficient waterworks to replace existing one, increasing capacity to 10,000 p.e. The project involves the construction of 5 km of new pipelines.	2020	49%	55	27	n/a	n/a	1,964
Lycksele Avfall och Vatten AB	1009	Reconstruction of the treatment plant in Lycksele to meet EU requirements. In connection with the renovation, investments are being made to reduce energy consumption, which will nevertheless increase due to a new purification step.	2021	46%	25	13	n/a	n/a	n/a

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)

**PROJECTS**

## Water and wastewater management: Projects approved in 2020

Borrower	Project ID	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
							Renewable energy gener. MWh	GHG-emissions reduced/ avoided, tCO <sub>2</sub> e	Population equivalents change
Trollhättan Energi Aktiebolag	1034	Waterworks remediation (Skoftebyn Skrivaregatan ), replacing a former combined sewer network with new separate pipes for wastewater and stormwater. This significantly reduces the risk of basement flooding in the area and also for the general water and sewage system. The project also contributes to reducing emissions of various environmentally harmful substances.	2021	0%	9.7	0	n/a	n/a	n/a
Trollhättan Energi Aktiebolag	1035	Waterworks remediation (Olof Palme Street), replacing a former combined sewer network with new separate pipes for wastewater and stormwater. This significantly reduces the risk of basement flooding in the area and also for the general water and sewage system. The project also contributes to reducing emissions of various environmentally harmful substances.	2020	0%	2.5	0	n/a	n/a	n/a
Trollhättan Energi Aktiebolag	1036	Waterworks remediation (Österlånggatan, south of Torggatan), replacing a former combined sewer network with new separate pipes for wastewater and stormwater. This significantly reduces the risk of basement flooding in the area and also for the general water and sewage system. The project also contributes to reducing emissions of various environmentally harmful substances.	2021	0%	17	0	n/a	n/a	n/a
Trollhättan Energi Aktiebolag	1037	Waterworks remediation (Skoftebyn Skattegårdsgatan), replacing a former combined sewer network with new separate pipes for wastewater and stormwater. This significantly reduces the risk of basement flooding in the area and also for the general water and sewage system. The project also contributes to reducing emissions of various environmentally harmful substances.	2021	0%	70	0	n/a	n/a	n/a
Värmdö Municipality	1043	Expansion of municipal water and sewage networks, as part of Värmdö municipality's ongoing replacement of individual sewage facilities with high-grade treatment in Käppala sewage treatment plant on Lidingö. A more efficient purification helps to reduce emissions of nitrogen, BOD and phosphorus. Approximately 400 individual sewers are replaced annually.	2022	70%	134	134	n/a	n/a	19
Arvika Teknik AB	1050	Reconstruction and extension of Segerfors waterworks, which, among other things, increases its energy efficiency.	2015	94%	47	47	n/a	n/a	-372

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)

**PROJECTS**

## Water and wastewater management: Projects approved in 2020

Borrower	Project ID	Project description	Construction period ending	Kommuninvest Share of Financing, %	Committed Amount, SEK million	Disbursed Amount, SEK million	Estimated impact, Kommuninvest share		
							Renewable energy gener. MWh	GHG-emissions reduced/avoided, tCO <sub>2</sub> e	Population equivalents change
Arvika Teknik AB	1051	Expansion of municipal sewage and drinking water in the Västra Sund area, and replacement of individual sewage facilities. Some 200 properties have been connected to municipal sewage treatment, with reduced emissions of nitrogen, BOD and phosphorus. In addition, increased energy production as the wastewater treatment plant receives wastewater from additional properties, to produce biogas that is converted into heat.	2023	87%	87	87	n/a	n/a	n/a
Botkyrka Municipality	1060	Investment in new disposal and purification of stormwater, which is currently discharged untreated into Lake Alby and East Mälaren's water protection area via an existing stormwater tunnel. The existing discharge is one of the larger in the area, totalling just over 210,000 m <sup>3</sup> annually. The purification will take place in open stormwater solutions with plantations with variation to benefit the biological diversity. The goal is to improve water quality in Alby and Lake Mälaren and secure future production of drinking water by cleaning the runoff water. The project has also received a loan for Social Sustainability for its social character and ambitions.	2022	41%	57	57	n/a	n/a	n/a
Mark Municipality	1065	Centralisation of water supply and sewerage in Mark municipality by discontinuing water and wastewater treatment plants in smaller towns and utilize resources in the Kinna/Skene agglomeration. 28 km of new mains with pumping and booster stations. In addition, some 475 more households to be connected to the municipal network, leading to significant reduction of emissions of nitrogen, BOD and phosphorus to nearby lakes and streams. Significant emissions reductions also through the closure of older water and sewage plants. The facility is also prepared for expected population growth over the next 30 years.	2022	0%	400	0	n/a	n/a	0
Degerfor Municipality	1075	Investment in new waterworks, including new purification step for securing water supply and water quality in Degerfors and reserve water for Karlskoga Hospital. Also construction of 15 km new pipes to the Svartå village, to improve local water quality. Connection of new subscribers along the way.	2022	0%	80	0	n/a	n/a	0
Jönköping Municipality	1089	Expansion of Häggeberg waterworks, which supplies more than 90,000 people in Jönköping and Habo municipalities with drinking water, to ensure future delivery security in the light of expected population growth. The new waterworks is being built next to the existing one, which will then be renovated. By continuing to use slow filtration as a purification process, electricity use for operation is minimized. The plant will also switch from electricity to district heating for heating purposes.	2023	0%	209	0	n/a	n/a	n/a

Complete project-by-project-reporting in spreadsheet format is available in the impact reporting section for green bonds at [kommuninvest.se](https://kommuninvest.se)



## In-depth analysis into the green benefits of water projects

Better access to quantitative data regarding the climate and environmental benefits associated with freshwater and wastewater projects is a priority for Kommuninvest. As of 2021, we have revised Green Loan application forms to include a range of relevant quantitative information before/after the investment project and seek to include such information in our reporting. The data presented here are the result of an in-depth analysis conducted in 2019, to which has been added information obtained during 2020. Reporting is confined to those projects which have been capable of demonstrating quantitative data before and after the investment.

Project objective (multiple responses possible)	# of projects
Add capacity	24
Comply with new purification requirements	21
Replace individual drains	13

	BEFORE investment	AFTER investment	INCREASE (+) DECREASE (-)	%	Reported share of impact
Number of person equivalents supplied by the facility, p.e.	1,149,234	1,516,811	367,577	32%	180,945
<i>Number of projects included in this reporting</i>	<i>34</i>	<i>34</i>	<i>34</i>		<i>34</i>
<b>Freshwater production</b>					
Annual volume of freshwater treated, m <sup>3</sup>	38,579,230	50,808,478	12,229,248	32%	7,343,637
Annual volume of freshwater treated per p.e., m <sup>3</sup> 2)					
<i>Number of projects included in this reporting (per p.e.)</i>	<i>13</i>	<i>13</i>			<i>13</i>
Energy consumption per m <sup>3</sup> of freshwater supplied, kWh <sup>1)</sup>	0	1	0	52%	0
<i>Number of projects included in this reporting</i>	<i>14</i>	<i>14</i>	<i>14</i>		<i>14</i>
Electricity production on-site, kWh per year	777,250	941,400	164,150	21%	133,261
<i>Number of projects included in this reporting</i>	<i>5</i>	<i>5</i>			<i>5</i>
<b>Sewage treatment and measures to reduce bridges/leaks</b>					
Nitrogen, emissions of, kg per year	1,041,501	783,982	-257,519	-25%	-163,405
<i>Number of projects included in this reporting</i>	<i>18</i>	<i>18</i>	<i>18</i>		<i>18</i>
Phosphorus, emissions of, kg per year	26,206	18,716	-7,490	-29%	-3,336
<i>Number of projects included in this reporting</i>	<i>17</i>	<i>17</i>	<i>17</i>		<i>17</i>
Oxygen-consuming substances, BOD, kg per year	580,390	453,471	-126,919	-22%	-65,907
<i>Number of projects included in this reporting</i>	<i>17</i>	<i>17</i>	<i>17</i>		<i>17</i>
Annual volume of wastewater treated, m <sup>3</sup>	94,523,401	133,722,319	39,198,918	41%	13,060,075
Annual volume of wastewater treated per p.e., m <sup>3</sup> 3)					
<i>Number of projects included in this reporting (per p.e.)</i>	<i>17</i>	<i>17</i>	<i>17</i>		<i>17</i>
Energy consumption per m <sup>3</sup> of wastewater treated, kWh <sup>1)</sup>	1	1	0	13%	0
<i>Number of projects included in this reporting</i>	<i>12</i>	<i>12</i>	<i>12</i>		<i>12</i>
Electricity production on-site, kWh per year	0	111,967	111,967	n/a	24,788
<i>Number of projects included in this reporting</i>	<i>3</i>	<i>3</i>	<i>3</i>		<i>3</i>
Production of biogas, m <sup>3</sup> per year	3,850,879	4,679,764	828,885	22%	746,893
(of which upgraded to vehicle fuel, m <sup>3</sup> per year)	1,107,056	1,240,273	133,217	12%	133,217
<i>Number of projects included in this reporting</i>	<i>8 (2)</i>	<i>8 (2)</i>	<i>8 (2)</i>		

1) Gross, excluding electricity production on-site.

2) Estimated as an average across 10 projects that reported both person equivalents and annual volume of freshwater treated.

3) Estimated as an average across 15 projects that reported both person equivalents and annual volume of wastewater treated.



Botkyrka

## CASE: WATER MANAGEMENT

# Stormwater parks to meet both green and social needs

One of the biggest emission points in the Municipality of **Botkyrka** is the nontreated stormwater flowing into the Alby lake, which is connected to Lake Mälaren, Sweden's third-largest. To improve water quality, increase biodiversity and protect future drinking water production, the municipality will transform two park areas in the Fittja district into stormwater parks. In this process, the municipality takes a holistic and innovative approach, also addressing social sustainability issues, in a district with distinct social challenges. As the first of its kind, the project has been granted both a Green Loan and a Social Sustainability Loan from Kommuninvest.

The stormwater construction – including plantings, ponds and wetlands – will be complemented by various measures to make the parks pleasant and easily accessible to the general public, including footbridge systems, jetty decks, an outdoor gym and exercise tracks. The goal is to increase park usage, and improve integration of people of different ages and from different cultures. The measures have been developed in dialogue with, among others, residents, schools and leisure centers in the area.

### Client: Municipality of Botkyrka

Project category:

**Water management**

Project ID:

732, 770, 771, 772, 773, 774

Objectives: Address one of the city's biggest emission points through creation of stormwater parks, improving water quality and protecting future drinking water production. Incorporating measures to promote social sustainability.

Total investment:

**SEK 138.1 million**

Green loans from Kommuninvest  
(disbursed amounts):

**SEK 57.0 million**

Social Sustainability Loan from Kommuninvest  
(disbursed amounts):

**SEK 57.0 million**

Completed (year):

**2022**



## PROJECTS

# Climate change adaptation

Investments in this category are intended to improve local adaptation to climate change. This includes facilities and installations to manage urban runoff, floods, land-slides, avalanches, rising sea levels, and other challenges due to changed weather and climate conditions. Measures undertaken may be related to buildings, infrastructure and sensitive surroundings.

### Green loans to climate change adaptation

Total number of projects:

1

Total amounts disbursed and outstanding:

16 MSEK

### Estimated annual impact of Green Loans<sup>1</sup>

Increase in capacity:

n/a

1) Refers to the Green Loan share of project impacts. The impact attributable to Green Bond investors is presented on page 3.

3 GOOD HEALTH AND WELL-BEING



11 SUSTAINABLE CITIES AND COMMUNITIES



13 CLIMATE ACTION





## PROJECTS

# Environmental management

Investments in this category are intended to improve local adaptation to climate change. This includes facilities and installations to manage urban runoff, floods, landslides, avalanches, rising sea levels, and other challenges due to changed weather and climate conditions. Measures undertaken may be related to buildings, infrastructure and sensitive surroundings.

### Green loans to environmental management

Total number of projects:

7

Total amounts disbursed and outstanding:

246 MSEK

### Estimated annual impact of Green Loans<sup>1</sup>

Land remediated/decontaminated/regenerated, ha: 53

1) Refers to the Green Loan share of project impacts. The impact attributable to Green Bond investors is presented on page 3.







Kalmar

## CASE: ENVIRONMENTAL MANAGEMENT

### Cleaning up a toxic legacy

The region of **Kalmar** in southeast Sweden is an area whose industrial structure was built on forestry, including paper production and sawmills, as well as glassworks. As a result, a number of former industrial sites and watercourses have been contaminated with heavy metals and various types of persistent organic pollutants, as well as substances with hormonal effects.

Kalmar, the largest city in the region, is cleaning up several polluted areas and finances much of that work with Green Loans from Kommuninvest. The city has been granted a total of SEK 246 million in Green Loans for six projects intended to reduce soil pollution and leakage from former landfills and industrial sites, including the Östra Deponikullen (pictured).

Measures at the six projects include improving landfill coverage, construction of various barriers, treatment of dredged material and excavation of contaminated material. Also measures to improve methane gas capture and reduce leakage to watercourses and groundwater sources.

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#### Client: Municipality of Kalmar

Project category:

**Environmental management**

Project ID:

**732, 770, 771, 772, 773, 774**

Objectives: landfill coverage, treatment and intermediate storage of dredged material and further excavation of contaminated material. Also measures to improve methane gas capture and reduce leakage to watercourses and groundwater sources.

Total Green Loans:

**SEK 245.5 million committed**

**SEK 245.5 million disbursed**





# Impact reporting methodology

## Introduction

The purpose of this impact report is to illustrate the climate and environmental impacts that have resulted or are projected to result from projects financed through the Kommuninvest Green Bonds Framework. Kommuninvest is committed to transparent reporting and conservative assessments when reporting these results.

As of 31 December 2020, Kommuninvest had financed Eligible Projects in eight out of eight project categories: Renewable energy; Energy efficiency in energy systems; Green buildings and energy efficiency; Clean transportation; Waste management; Water and wastewater management; Climate change adaptation and Environmental management.

Investments in these categories, save for adaptation measures and environmental management, typically lead to direct reductions in

greenhouse gas emissions, primarily through provision of added renewable energy capacity, through establishment of more energy efficient housing or other property construction or through direct energy efficiency measures. In the case of water and waste water management, investments typically result in reducing emissions of other harmful substances.

## Interpret results with caution

A number of key result indicators including indicators targeting renewable energy generation, energy savings and reduced and avoided GHG emissions have been selected and where possible quantified. However, it is important to consider the following aspects in order to adequately interpret the reported results:

- Uncertainty and comparability: Estimations of impact indicators and projections of impacts are based on certain assumptions. Kommun-

invest aims to make sound, conservative and reasonable assumptions based on, inter alia, current information and data provided by its borrowers. Actual results may differ from initial projections as a result of unforeseen project outcomes, behavior and slow start-up periods.

- Qualitative results: The projects listed within this report may have impacts across a wider range of indicators than those included in this report. Where quantitative data is unavailable, qualitative data, to the extent possible have been included to illustrate the type and direction of other beneficial impacts.
- Ex-ante and ex-post: Both impact analysis (ex-ante) and impact reporting (ex-post) will be used to report the impacts of a project. Kommuninvest aims to report actual results where feasible, and has included information to that effect in the project disclosures in this



report and online. As required by the Kommuninvest Green Bonds Framework, all Eligible Projects must promote the transition to a low-carbon and climate-resilient society.

### Adhering to harmonised guidelines

The impact indicators summarized in this report focus on results deemed relevant to Green Bond investors, and seeks to be aligned with the recommendations outlined in the Nordic Position Paper<sup>1</sup> (see page 15).

In many respects, this means alignment also with the IFI Harmonized Framework for Impact Reporting<sup>2</sup>, published by a group of international financial institutions, and with impact reporting recommendations as outlined by the Green Bond Principles<sup>3</sup>.

The indicators are intended to illustrate the type and scale of expected results in a variety of projects. It is important to note that, because of the wide range of project categories, comparability between projects (and other project portfolios) may be limited.

### Calculation of climate impact

The environmental impact of Eligible Projects is calculated using actual or estimated annual impact, compared to an alternative base scenario where the investment has not taken place or where it has been completed solely meeting regulatory requirements.

The impact of reduction in greenhouse gas emissions is measured in CO<sub>2</sub>-equivalents (CO<sub>2</sub>e) while energy savings are measured in MWh. Other units of measurements may be used when appropriate. All project climate impact calculations are based on the share of financing provided by Kommuninvest and the actual disbursements to the project.

### GHG emissions and CO<sub>2</sub> impact, by project categories

Project category	GHG emissions reduced/ avoided, tonnes CO <sub>2</sub> e/ year	Disbursed and outstanding, SEK mn	Impact, tonnes CO <sub>2</sub> e per SEK mn
Renewable energy	597,086	9,607	62
Energy efficiency	22,119	251	88
Green buildings	7,228	31,097	0.2
Clean transportation	15,291	2,683	6
Waste management	1,151	248	5
Water management	n/a	7,739	n/a
Climate change adaptation	n/a	16	n/a
Environmental management	n/a	246	n/a
<b>Total GHG emissions reduced/avoided, tonnes CO<sub>2</sub>e</b>			<b>642,875</b>
<b>Total disbursements, SEK million</b>			<b>51,887</b>
<b>Disbursements with quantified CO<sub>2</sub> impact, SEK million</b>			<b>43,886</b>
<b>% of disbursements with quantified CO<sub>2</sub> impact</b>			<b>85%</b>

We report the impact of investments on an ex-ante basis, i.e. on the basis of estimates. If we have access to ex-post data, i.e. actual outcomes, we will report on these. The project-by-project disclosures indicate whether impact is reported based on estimates or actual outcomes.

### Approach

The impact of Eligible Projects funded by Kommuninvest can be calculated in a number of ways:

- by reference to the reduction in energy consumption or added renewable energy capacity, and thus the greenhouse gas emissions avoided as a result of energy savings or crowding out dirtier alternatives (mitigation projects).

- the contribution made to strengthening local adaptation to climate change (adaptation projects).
- the environmental benefits achieved in other ways than through mitigation or adaptation measures (environmental management projects).

### Green buildings and Renewable energy

As of 31 December 2020, 60 (56) percent of the disbursements were for Green building projects and 19 (23) percent for Renewable energy projects, project categories which are deemed greenhouse gas mitigation investments.

To calculate the climate and environmental impact, the completed project has to be compared with an alternative scenario. In some cases, it will be appropriate to consider the

1) Nordic Public Sector Issuers: Position Paper on Green Bonds impact reporting, February 2020

2) International Financial Institutions (IFIs): Green Bonds, Working Towards a Harmonized Framework for Impact Reporting, December 2015

3) See "Handbook - Harmonized Framework for Impact Reporting, April 2020" at the Resource Centre for Green & Social Bonds at icmagroup.com

investment in relation to a baseline scenario – a reference scenario in which the investment does not exist. In such cases the calculation will be as follows:

*Annual climate impact = (emissions produced or energy consumed by the project in a baseline scenario) – (emissions produced or energy consumed by the project after the investment has been completed).*

In other cases, for example where the project financed is a new building, the approach is to assume that the investment will be undertaken regardless but that the borrower may choose to adhere to less strict climate standards. In such instances the climate impact is calculated on the basis of an alternative scenario in which the investment meets the minimum requirements contained in the applicable building regulations. The calculation will then be as follows:

*Annual climate impact = (emissions produced or energy consumed by an equivalent investment if minimum standards were followed) – (emissions produced or energy consumed by the project after the investment has been completed).*

A detailed disclosure of the impact calculations deployed in this report is provided on pages 55-57.

### Scope

At this stage, Kommuninvest report impact on Scope 1 and Scope 2 emissions, ie. including all direct GHG emission as well as indirect GHG emissions from consumption of purchased electricity, heat, cooling or steam.

### Impact disclosed in relation to financed portion

This report illustrates the expected or realized environmental impact made possible as a result of projects to which Green Bond proceeds have been allocated. When we report impact, we do so in relation to the share of the project's total investment cost that Kommuninvest has financed, and to amounts disbursed and outstanding to the project.

It is not uncommon that list of financed projects included in our reporting are projects to which no Green Loans have been disbursed. This may be because clients have applied for funding for projects yet to be started or where the client has yet to draw down on the committed funding. Alternatively, the client may intend to use the Green Loan to refinance an existing traditional loan and is awaiting maturity of the latter. For all cases where no Green Loans are disbursed and outstanding, no environmental impact is reported.

### Impact per invested SEK

Measuring the impact of a green investment project in relation to the money that has been invested is a clear and simple metric to evaluate Green Bonds. While this makes it easy to compare Green Bond issues against each other, it may create a false sense of quantitative rigor, as such an approach puts faith in the precision of numbers related to uncertain environmental calculations, which in many cases are performed ex-ante.

Such an approach may also fail to recognize that some Green Bond frameworks are broad in scope, targeting environmental project categories that do not provide impacts measurable

in CO<sub>2</sub>. This could, for instance, be adaptation and water management projects or sustainable buildings that have other significant environmental values apart from the CO<sub>2</sub> avoided/reduced. For Kommuninvest, this specifically applies to the project categories Water and wastewater management, Climate change adaptation and Environmental management.

We therefore report impact per invested SEK for investment projects or project categories where the CO<sub>2</sub>-impact is quantifiable and relevant. As stated above and for conservative purposes, we report impact based on amounts disbursed to a project. If disbursements are made gradually, environmental impact will also be taken into account gradually. In cases where no disbursements have been made to a project, the environmental benefit for that project will be recognised as zero.

A comparison of impact per invested SEK between the Renewable energy and Green building project categories indicate a considerably higher CO<sub>2</sub>e impact for the former vs. the latter. A couple of perspectives are relevant here.

Firstly, the primary purpose of a new building is to provide a specific function as a residential or non-residential building. Energy savings are important, however not the primary objective of the investment. This is in contrast to renewable energy investments, where the energy production is in focus. Secondly, the majority of green buildings financed by Kommuninvest are heated through district heating. This means that the major part of energy savings are calculated against a baseline of [63] kg CO<sub>2</sub> per MWh, instead of the [315] kg CO<sub>2</sub> per MWh used for electricity savings.

### About baselines for CO<sub>2</sub> emissions

Deciding upon a baseline emission factor against which the environmental impact can be measured is important, since the chosen baseline will determine the calculated environmental benefits. Kommuninvest's choice of baselines and methodology for calculation environmental impact are aligned with the recommendations of the Nordic Position Paper.

Outlined below are the baseline choices for the two largest project categories of the Kommuninvest Green Bonds Framework: Renewable energy and Green buildings and energy efficiency. The full disclosure of baselines used in this report is available on page [45].

For electricity, Kommuninvest uses an EU Mainland grid factor including the UK and Norway as the baseline. The rationale is that a non-negligible interconnection between the Nordic countries and European energy markets exist already today and is planned to increase in the coming decades.

The baseline emission factor is constructed using a Combined Margin (CM) for the grid comprised of an existing Operating Margin (OM) and a future Build Margin (BM), as suggested by the IFI Framework for a Harmonized Approach to Greenhouse Gas Reporting<sup>4</sup>. However, Kommuninvest applies the same combination of the OM and BM for all projects, as recommended by the Nordic Position Paper.

For district heating<sup>5</sup> systems, which are fundamentally local/regional and not interconnected on a national or Nordic basis, Kommuninvest has commissioned an external advisor to develop a baseline emission factor for district heating for Sweden, based on avoided mix of best available alternative heating technologies<sup>6</sup>.

To calculate the impact and energy efficiency of buildings, the financed building is compared with the requirements of the Swedish national building code (Boverkets Byggregler, BBR).

### Energy efficiency in new Green Buildings

As per 31 December 2020, 258 Green Building projects were financed, of which 237 were new buildings (residential, non-residential and other), 3 were energy efficiency projects in existing buildings and 18 were major renovations of existing buildings.

Total energy use in the 90 residential building projects, expected or actual, is 23,646 MWh per annum, or on average 52 kWh per sq.m and year. This equates to 38 percent less than building requirements. Had these buildings solely been built to meet national building regulations, total energy consumption would have been 38,154 MWh. The total heated surface area for these buildings is 440,581 sq.m.

For the 132 non-residential building projects, the total expected or actual energy use is 34,495 MWh per annum, or on average 45 kWh per sq.m and year. This equates to 53 percent less than building requirements. Had these buildings solely been built to meet national building regulations, total energy consumption would have been 72,969 MWh. The total heated surface area for these buildings is 768,569 sq.m. Please note that data above refer to the total for the projects, irrespective of how much has been financed with Green Loans.

For both residential and non-residential building projects the reference to the Swedish building regulation is to the regulation in force upon approval of the project, either national building regulation BBR 21, until March 2018,

or BBR 25, from March 2018. During 2021, Kommuninvest intends to update its Green Bond Framework to reflect the current national building regulation, BBR 29.

### Revised methodology for Green Buildings

As mentioned, the impact for green buildings is calculated by comparing the building's expected or actual energy consumption to a reference scenario, where the building is constructed in accordance with legal requirements. The calculation applies emission factors for electricity and district heating to the reported energy consumption for each energy carrier in the building.

For buildings approved in relation to BBR 21, the data reported to Kommuninvest refers to energy consumption in kWh. This straightforward type of reporting has changed with BBR 25. According to BBR 25, the actual consumption is converted to so-called energy performance, with consideration as to whether the building is heated by district heating or electricity and whether it is classified as a room or home.

Therefore, for BBR 25-buildings in the portfolio, the reported values for energy consumption that Kommuninvest has received does not correspond to actual energy consumption. During the work on this report, it has been necessary to revise our methodology for such buildings. In order to recalculate reported energy performance values to actual energy consumption, a conversion methodology has been developed in dialogue with the Kommuninvest Environmental Committee.

The work has been extensive due to complexity in calculations and a large number of projects but has a limited impact on the reported

4) International Financial Institution (IFI) Framework for a Harmonized Approach to Greenhouse Gas Accounting, November 2015; Green Bonds, Working Towards a Harmonized Framework for Impact Reporting, December 2015.

5) District heating is a system for distributing heat generated in a centralized location for residential and commercial heating requirements. In the Nordic countries, the heat is often obtained from a cogeneration plant burning principally renewable energy sources, including biomass, but plants also use waste and excess heat, and to a minor extent, fossil fuels. District heating plants may also be used to produce electricity (combined power and heating plants, CHP), and cooling.

6) Profu memorandum (in Swedish only): "Stöd till klimatutvärdering av gröna investeringar inom fjärrvärmeområdet - Uppdatering och utveckling 2020", March 2020. Interested parties can obtain this report by sending a request to: ir@kommuninvest.se



climate impact. Some projects report larger CO<sub>2</sub> savings than in our previous reporting, others less. Overall, we estimated that the revised methodology means a slight decrease in the reported climate benefit for the green buildings category as a whole.

### Reduced and avoided emissions

Kommuninvest has applied the following approach to define whether a financed investment project results in reduced or avoided emissions.

The climate benefit for all Renewable energy projects is regarded as avoided emissions, since the production of renewable energy is considered to displace alternative more carbon-intensive energy production.

Also for Waste management projects, the climate benefit is regarded as avoided emissions, as most of the quantifiable climate benefit derives from more efficient waste management leading to increased production of biogas.

Regarding Green buildings, Kommuninvest considers the climate benefit from new buildings as avoided emissions, as the alternative is that the building had been constructed in accordance with applicable legal requirements.

Climate benefits from energy efficiency projects and major renovations within Green buildings, on the other hand, are regarded as reduced emissions.

For the project categories Energy efficiency in energy systems and Clean transportation, the climate benefit is also regarded as reduced

emissions, since the projects financed are mainly considered to result in the replacement of more carbon-intensive alternatives.

### Joule conversion

In this report we use watt-hours as the energy unit, with 1 Wh being the equivalent of one watt of power expended for one hour of time. The Joule (J) conversion factor is: 1 Wh = 3.6 kJ; 1 kWh = 3.6 MJ, 1 MWh = 3.6 GJ.

# Baselines for CO<sub>2</sub> emissions

The baseline emission factors (used to calculate emissions for the alternative scenario) and project emission factors (used to calculate emissions from actual projects) are presented on the next page. Below, the considerations for electricity and district heating project are outlined.

## Electricity

The highly interconnected regional electricity market is the cornerstone of the Nordic energy system, and it can serve as a key enabler for further emissions reductions in the decades ahead. It can also be expected that European energy markets will be increasingly interconnected, with energy traded cross-border to an increasing degree.

In line with the recommendations of the Nordic Position Paper, Kommuninvest has chosen an EU Mainland grid factor including

the UK and Norway as the baseline as the relevant baseline for electricity. The rationale is that the the Nordic electricity market is already characterised by a high level of interconnection, also with neighboring countries in the Northern European region. Furthermore, the integration of European electricity markets is planned to increase in the coming years and decades, which is the relevant time perspective for most investments. Regardless of whether the energy balance is characterised by an export surplus or a need for imported electricity, added renewable energy capacity and reductions in energy use in the Nordic region translate into the crowding out of more carbon-intensive energy production elsewhere. Using a marginal approach for assessing the environmental benefit, rather than an average approach, is in accordance with a consequential perspective for investments.

In line with IFI recommendations<sup>7</sup>, the Nordic Position Paper recommends the use of a Combined Margin (CM) for the grid that is comprised of an Operating Margin (OM) and a Build Margin (BM). However, for simplicity and relevance to the Nordic context, we apply a CM of 50 per cent OM and 50 per cent BM for all relevant projects, as opposed to the IFIs which apply different combinations of the OM and BM depending on the type of project financed. The CM used in this report is 315 kg CO<sub>2</sub>e per MWh.

## District heating

In the Nordic countries, district heating (term is explained in footnote 5 on page 51) has successfully enabled the transition from fossil fuel based heating systems to heating systems based primarily on renewable energy sources. Remaining fossil fuel use is today being gradually substituted and phased out.

7) International Financial Institution (IFI) Framework for a Harmonized Approach to Greenhouse Gas Accounting, November 2015.

The systems of district heating (and district cooling) are fundamentally local/regional and not interconnected on a national or Nordic basis. Kommuninvest has commissioned an external advisor (Profu) to develop a baseline emission factor for district heating for Sweden, based on avoided mix of alternative heating technologies. This estimated baseline figure for district heating in Sweden amounts to 96 kg/MWh, representing an avoided alternative heating mix of 4 percent biofuel boilers, 55 percent geothermal heat pumps, 17 percent air/water heat pumps, 21 percent exhaust air heat pumps and 2 percent gas boilers.

Readers are advised that this figure represents a national average for what are essentially locally based energy systems, in order to facilitate calculations. Using national averages is feasible for most investment projects financed by Kommuninvest, but local circumstances and actual changes in production mix are considered for certain projects related to increased interconnection, energy efficiency and other changes in the production mix.

For the calculation of impact, Kommuninvest compares baseline emissions with actual or expected project emissions. For district heating projects in the renewable energy category, Kommuninvest seeks to calculate project emissions based on the national average emission factor for district heating in Sweden. An additional environmental benefit of 52 kg/MWh, as a national average, is ascribed due to avoided alternative waste treatment (land fill and methane leakage). In certain cases, where financed projects target a change in fuel mix, Kommuninvest calculates impact based on local data.

For district heating projects in the energy efficiency category, we calculate project emissions based on local emissions. No additional benefit for avoided alternative waste treatment is applied.

### BASELINE EMISSION FACTORS (USED TO CALCULATE ALTERNATIVE EMISSIONS SCENARIO), SCOPE 1 AND 2

Type	Emission factor	Comment
Variable electricity generation, e.g. wind and solar power projects	315 kg CO <sub>2</sub> e/MWh	EU25+UK&Norway: Combined Margin (50% Operating Margin (OM) 476 kg CO <sub>2</sub> e/MWh + 50% Build Margin (BM) 154 kg CO <sub>2</sub> e/MWh) <sup>1</sup>
Firm electricity generation e.g. hydropower projects	315 kg CO <sub>2</sub> e/MWh	See above
Electricity consumption from the grid, e.g. green buildings and energy efficiency projects	315 kg CO <sub>2</sub> e/MWh	See above
Electricity generation in district heating projects	315 kg CO <sub>2</sub> e/MWh	See above
Heat consumption from the grid, e.g. green building and energy efficiency projects	63 kg CO <sub>2</sub> e/MWh	Swedish average for heating production from district heating, 2018 <sup>2</sup>
Heat generation in district heating projects	96 kg CO <sub>2</sub> e/MWh	Estimated national Swedish average for avoided alternative heating <sup>3</sup>
Waste incineration in district heating projects	52 kg CO <sub>2</sub> e/MWh	Estimated national Swedish average for avoided alternative waste treatment <sup>4</sup>
Diesel (vehicle fuel)	2,028 kg CO <sub>2</sub> e/MWh	When biogas is used to replace fossil diesel <sup>5</sup>
Passenger cars	130 gram CO <sub>2</sub> e /km	Weighted forecast for average Swedish car fleet in 2020 <sup>6</sup>
City buses	88 gram CO <sub>2</sub> e / passenger km	Based on 12 pax average occupancy <sup>7</sup>
Heavy trucks with trailer	670 g CO <sub>2</sub> e /km	<sup>8</sup>

1) Calculation by Kommuninvest in November 2019, based on IFI Interim Dataset of Harmonized Grid Factors 11.05.2019, as provided by Nordic Investment Bank.

2) Swedenergy.

3) Profu, 2020.

4) Swedenergy (calculations by Profu).

5) Swedish Energy Agency & The Swedish Construction Federation.

6) The Swedish Transport Administration, 2019.

7) Swedish Environmental Protection Agency and IVL Environmental Research Institute.

8) The Swedish Transport Administration, 2019.

### PROJECT EMISSION FACTORS (USED TO CALCULATE ACTUAL PROJECT EMISSIONS), SCOPE 1 AND 2

Type	Emission factor	Comment
Variable electricity generation, e.g. wind and solar power projects	0 kg CO <sub>2</sub> e/MWh	–
Firm electricity generation, e.g. hydropower projects	0 kg CO <sub>2</sub> e/MWh	–
Electricity generation in district heating projects	93 kg CO <sub>2</sub> e/MWh	Swedish average for electricity production from district heating, 2019 <sup>1</sup>
Heating generation in district heating projects	63 kg CO <sub>2</sub> e/MWh	Swedish average for heating production from district heating, 2018 <sup>1</sup>
Biogas generation projects	0 kg CO <sub>2</sub> e/MWh	–

1) Swedenergy.



# Collected data and Climate impact calculation

Collected data represents the information that Kommuninvest asks borrowers to provide in Green Loan applications and annual follow-up reporting. Not all projects have provided all of the information indicated in this section.

## RENEWABLE ENERGY

Eligible Projects in the Renewable energy category exploit or intend to exploit various types of renewable energy sources, in order to expand capacity or replace or offset existing or planned fossil fuel-based energy production and supply.

Renewable energy sources that can be approved for Kommuninvest financing include solar and wind power, geothermal energy, bioenergy, bioenergy and biogas from waste, as well as small-scale hydro power. The maximum share of fossil fuels in district heating projects is 10 percent (peat is treated as a fossil energy source). If fossil waste fractions are used for energy extraction the share of fossil energy is a maximum 20 percent.

The table below outlines the data input collected from Eligible Projects as well as the methodology applied when calculating the environmental impact.

Sub-category	Collected data	Climate impact calculation
Bioenergy	<ul style="list-style-type: none"> <li>Annual production of bioenergy (biodiesel, bioethanol, biogas, CNG<sup>1</sup> and other biofuels), measured in MWh.</li> <li>Annual delivery of specific bioenergy measured in MWh.</li> </ul>	<p>Annual climate impact (CO<sub>2</sub>e) =</p> <p>Annual production of renewable energy in MWh* baseline emissions factor - Annual production of renewable energy (MWh)* project emission factor.</p> <p>Note: Different baseline emission factors and project emission factors are applied to different sub-categories. These are presented on the preceding page.</p>
Wind, wave, solar and geothermal	<ul style="list-style-type: none"> <li>Installed capacity, in MW.</li> <li>Estimated annual production of electricity, in MWh.</li> </ul>	See above
District heating	<ul style="list-style-type: none"> <li>Estimated or actual annual output of heating and electricity, in MWh.</li> </ul>	See above

1) Compressed Natural Gas (Sw: "fordonsgas") from bioenergy plants

## GREEN BUILDINGS

Eligible Projects in this category are intended to reduce energy usage in new or existing buildings, resulting in a reduction in net external energy demand and a reduction in CO<sub>2</sub> emissions.

Impact is reported in relation to the relevant building regulation that has been in force for since the launch of the Kommuninvest Green Bonds Framework (Boverket's Building Regulations BBR 21 and BBR 25). During 2021, Kommuninvest intends to update its Green Bond Framework to reflect the most recent regulation, BBR 29.

Sub-category	Collected data	Climate impact calculation
New buildings	<ul style="list-style-type: none"> <li>• Heated surface area in square metres (Atemp).</li> <li>• Estimated annual heating consumption of the building, measured in kWh/Atemp in accordance with applicable Swedish regulations.</li> <li>• Estimated annual electricity consumption of the building, measured in kWh/Atemp.</li> <li>• Required maximum energy consumption of the building, measured in kWh/Atemp.</li> <li>• Annual production of installed solar panels, measured in kWh/ Atemp.</li> </ul>	<p>Annual climate impact (CO<sub>2</sub>e) =</p> <p>((Heat consumption of reference building in MWh* baseline emissions factor for heat consumption + electricity consumption of reference building in MWh* baseline emissions factor for electricity consumption) - (Heat consumption of project building in MWh* baseline emissions factor for heat consumption + electricity consumption of the project building in MWh* baseline emissions factor for electricity consumption))</p> <p>Note: The relationship between heat and electricity consumption of the reference building may differ from the project building.</p>
Energy efficiency	<ul style="list-style-type: none"> <li>• Heated surface area square metres (Atemp),</li> <li>• Annual energy use before the investment, in MWh.</li> <li>• Annual energy use after the investment, in MWh.</li> </ul>	<p>Annual climate impact (CO<sub>2</sub>e) =</p> <p>((Heat consumption of building pre investment in MWh* baseline emissions factor for heat consumption + Electricity consumption of building pre investment in MWh* baseline emissions factor for electricity consumption) - (Heat consumption of building post investment in MWh* baseline emissions factor for heat consumption + electricity consumption of building post investment in MWh* baseline emissions factor for electricity consumption))</p> <p>Note: The relationship between heat and electricity consumption of the building pre investment may differ from that of the building post investment.</p>
Major renovations	<ul style="list-style-type: none"> <li>• Heated surface area in square metres (Atemp).</li> <li>• Estimated annual heating consumption of the building before/after renovation, measured in kWh/Atemp in accordance with applicable Swedish regulations.</li> <li>• Estimated annual electricity consumption of the building before/after renovation, measured in kWh/Atemp.</li> <li>• Required maximum energy consumption of the building, measured in kWh/Atemp.</li> <li>• Annual production of installed solar panels, measured in kWh/ Atemp.</li> </ul>	<p>Annual climate impact (CO<sub>2</sub>e) =</p> <p>((Heat consumption of building pre investment in MWh* baseline emissions factor for heat consumption + Electricity consumption of building pre investment in MWh* baseline emissions factor for electricity consumption) - (Heat consumption of building post investment in MWh* baseline emissions factor for heat consumption + electricity consumption of building post investment in MWh* baseline emissions factor for electricity consumption))</p> <p>Note: The relationship between heat and electricity consumption of the building pre-investment may differ from that of the building post investment.</p>

## OTHER PROJECT CATEGORIES

For project categories outlined below, no generally applicable calculation model is used, Kommuninvest relies on reported data from projects. More elaborate impact analysis is possible to undertake in relation to these projects, and we aim to develop our reporting in the future. The choice of indicators can also be expected to undergo revision as more knowledge is gathered and best practices are developed.

### Public transportation

Eligible Projects are intended to increase transportation of goods and passengers while consuming a minimal or zero amount of fossil fuels, resulting in a reduction of GHG emissions.

#### Collected data

- Number of kilometres per year with clean transport solutions.
- Number of people the project will affect each year.
- An estimate of the number of cars/road kilometres the project will replace.
- If feasible: Annual energy savings, reduction in greenhouse gas emissions and/or local emissions, or amount of greenhouse gas emissions and/or local emissions that will be avoided as a result of the investment.

### Climate impact calculation

Calculation is performed by comparing the investment to an alternative scenario, typically provided by the customer. Here, Kommuninvest applies emissions factors as outlined in the table on page 54. When the client has not provided an alternative scenario, averages and templates are applied in order to reach conclusions.

### Waste management

Eligible Projects are intended to either increase recycled waste capacity, improve energy efficiency, reduce the amount of release of harmful substances or meet other appropriate conditions set by Kommuninvest.

#### Collected data

- Number of tonnes of waste expected to be processed by the facility each year.
- An estimate of the reduction in greenhouse gas emissions/the amount of greenhouse gas emissions that will be avoided as a result of the investment, in tonnes of CO<sub>2</sub>e.
- If feasible: Estimate annual energy savings attributable to the investment, in kWh.
- Expected improvement in material recovery rate or other target for improved resource use.
- For biogas plants: Expected annual production volume.

### Water and wastewater management

Eligible Projects are intended to reduce leakage or improve filtration of harmful substances in the water purification process, increase output measured in person equivalents (PE) or meet other appropriate conditions set by Kommuninvest.

#### Collected data

- Number of person equivalents (PE) of water or wastewater the plant processes, identifying any increase that can be attributed to the investment.
- Volume of freshwater and wastewater treated.
- Reductions in emissions of nitrogen, phosphorus and oxygen-consuming substances (BOD).
- Qualitative indicators/targets for adaptation to climate change (managing urban runoff etc.), with a description of weather-related or climate-related problems that will be mitigated by the investment.
- Where relevant, amount of electricity, biogas or other energy carrier expected to be produced each year.

### Adaptation measures

This category is dedicated towards adaptation measures to new environmental conditions, due to inter alia anticipated increasing rainfall, rising sea levels, or increased drought. Projects deemed eligible on a case by case basis. Relevant indicators are dependent on the characteristics of the project, and determined by Kommuninvest in consultation with the borrower.



### Environmental management

Eligible Projects are intended to promote sustainable environment development in areas other than climate change. Measures include preserving biodiversity, sustainable agriculture and improvement of eco-systems. Projects are deemed eligible on a case by case basis. Relevant indicators are dependent on the characteristics of the project, and determined by Kommuninvest in consultation with the borrower.

### DEFINITIONS USED IN THIS DOCUMENT

Atemp	All internal area of a building which is heated to more than 10 °C in sq.m. Atemp is the area which energy consumption in Sweden is calculated.
CO <sub>2</sub> e	Carbon dioxide equivalent
kWh, MWh and GWh	Kilowatthour, Megawatthour and Gigawatthour
PE	Population equivalent

Kommuninvest is a Swedish municipal cooperation set up in 1986 to provide cost-efficient and sustainable financing for local government investments in housing, infrastructure, schools, hospitals etc. The cooperation comprises 292 out of Sweden's 310 local governments, of which 278 municipalities and 14 regions. Kommuninvest is the largest lender to the Swedish local government sector and one of the largest credit institutions in Sweden. At year-end 2020, total assets were SEK 527 billion (USD 64.4 billion), with a loan portfolio of SEK 446 billion (USD 54.4 billion). The head office is located in Örebro.

