

Green Bond Annual & Environmental Reporting

Data as at 31.12.2022

Aim and purpose of this report

As outlined in the "Green Bond Framework", Zürcher Kantonalbank uses green bonds to finance loans and projects that meet recognised sustainability criteria. Specifically, green bonds are issued mainly for refinancing ZKB environmental loans and financing projects with energy-related objectives in the office buildings used by Zürcher Kantonalbank itself.

This report highlights the effects of these activities on energy efficiency. The first section shows the scope and composition of ZKB environmental loans as well as provides an assessment of the presumed impact on the environmental balance of those funded construction projects that are based on the Minergie standard. The impact analysis was methodically developed in collaboration with the Minergie Switzerland office in Basel. The analysis compares the energy consumption of conventional buildings with those built according to the Minergie standard, based on reference values, and is intended to give an indication of the consumption savings that can be achieved with energy-efficient construction. The results presented should not be interpreted as precise estimates, but only as orders of magnitude. The second section highlights the energy savings from internal construction projects. Here, the impact analysis is based on actual consumption values. The third section summarises the energy savings and shows how many green bonds Zürcher Kantonalbank had issued by the end of 2022.

1. ZKB environmental loan

The ZKB environmental loan is mainly requested for financing energy-efficient new buildings and, to a lesser extent, is also used for energy-related renovations. The following sections first show the scope and composition of ZKB environmental loans. The method of analysis used by Minergie Switzerland for the impact analysis is then discussed. In the last part, the presumed effects on the environmental balance through energy savings or through the improvement of the CO₂ balance are shown.

a) Composition of ZKB environmental loans

The portfolio of outstanding ZKB environmental loans amounted to CHF 1.254 billion as at 31.12.2022. Behind this are around 3,200 individual financing tranches. The ZKB environmental loan represents one tranche of the total financing for each of the construction projects supported by Zürcher Kantonalbank. In the case of single-family houses, for example, a maximum of CHF 250,000 of the construction project is financed with ZKB environmental loans. The composition of the portfolio by legal form of the owner and building type, as well as by energy standard, is as follows:

Figures as at 31.12.2022 in CHF million (rounded)	Single-family house	Multi-family house	Apartment in condominium	Commercial real estate ¹	Total
Legal form					
– Private owners	143	215	256	21	634
– Legal entities	5	309	16	69	400
– Cooperatives	–	219	–	1	219
Total	148	743	272	91	1,254

¹ Residential and commercial, mixed use

Figures as at 31.12.2022 in CHF million (rounded)	Single-family house	Multi-family house	Apartment in condominium	Commercial real estate ¹	Total
Energy standard					
– Minergie ²	34	474	252	41	801
– GEAK ³	23	132	9	12	176
– 2000-Watt-Areal	–	24	4	7	35
– Pioneering projects	2	86	2	16	106
– Other measures	89	27	5	14	136
Total	148	743	272	91	1,254

¹ Residential and commercial, mixed use

² Of which 77% of financing volume is Minergie, 21% Minergie-P and 2% Minergie-A

³ GEAK = building energy certificate of the cantons

b) Impact analysis – method

Simplified brief description of the energy impact calculation of Minergie buildings.

(Source: Minergie Switzerland, Basel)



Basic information

The total energy-related effect over the lifespan of the measures is regarded as the impact. For example, the calculations are based on how much less energy a Minergie building consumes per year compared to a standard building, and this amount is multiplied by the lifespan of the building (30 to 40 years, depending on the type of building). Part of the calculated effect therefore refers to the past and part to the future.

The “energy-related effect” adds together two different types of impact:

- energy savings through a better shell; and
- the switch from fossil fuels to renewable energy.

The calculations are carried out separately for single-family houses, multi-family houses and functional buildings, and are carried out separately for the different Minergie standards (Minergie, Minergie-P, Minergie-A).

Effect 1: Energy savings

New buildings

The energy savings of a Minergie new building are calculated by comparing the energy consumption of the Minergie building with the energy consumption of a building constructed in accordance with the regulations valid at the time (model cantonal regulations on energy MuKEn). The difference in annual consumption is then multiplied by the lifespan of the building to calculate the effect over the building’s lifespan (40 years for residential buildings, 30 years for functional buildings).

The indicator for energy consumption is the unweighted energy rating, i.e. the heat requirement for space heating and hot water per m² of energy reference area (ERA). The difference between the legal requirements valid in the year in question and the Minergie version valid in each case corresponds to the saving per m² ERA, which is then multiplied by the number of newly built m² (financed by Zürcher Kantonalbank) to calculate the effect. The resulting energy-related effect in kilowatt hours (kWh) is also converted into a CO₂ impact using emission factors. The emission factors (kg CO₂/kWh) vary depending on the average energy source used.

This approach to calculating the effect corresponds to that used by the cantons in their calculations under the harmonised funding model 2009 (“HFM 2009”).

Renovations

The energy savings of a Minergie renovation are calculated by comparing the energy consumption of a renovated building with the energy consumption of an average building. The assumptions of the cantonal impact calculations in the HFM 2009 are used as the energy consumption of an existing building. For Minergie, the average consumption figures are used depending on the standard (Minergie/Minergie P/Minergie A) and version (e.g. Minergie 1998/2005/2009/2017). As is the case with new buildings, the indicator for energy consumption is the unweighted energy rating, i.e. the heat requirement for space heating and hot water per m² of energy reference area (ERA). The energy-related effect is calculated using the renovated energy reference areas and the difference between the energy performance indicators. The CO₂ impact is derived from this in the same way as for new buildings.

Effect 2: Renewable energy

The method for calculating the effect of renewable energy is the same for new buildings as it is for renovations. As a first step, the average share of renewable energy in average new buildings and existing buildings is surveyed (figures from the Swiss Federal Statistical Office). As a second step, the average share of renewable energy in Minergie buildings is surveyed.

To calculate the renewable effect, the difference between average construction and Minergie construction is multiplied by the energy consumption of the Minergie buildings. The result here corresponds to the number of kilowatt hours consumed in the Minergie buildings that are produced with renewable energy compared to conventional buildings. This energy-related effect is also converted into a CO₂ impact using emission factors.

c) Impact analysis – results

The energy-related effects using the method of analysis described are transferred to ZKB's environmental loans portfolio. The energy savings potential is determined based on the reference values and not based on the effective energy consumption. It should also be mentioned that the results of the analysis are only applicable to Minergie buildings financed with ZKB environmental loans which represent a volume of CHF 801 million. The other energy standards supported with ZKB environmental loans, as defined in the Green Bond Framework, representing a volume of CHF 453 million, are not covered by the method used.

The analysis carried out in collaboration with Minergie Switzerland covers 49% of all ZKB environmental loans for Minergie buildings (CHF 396 million) in great detail. The energy implications for this part of the portfolio are as follows:

Quantity structure in detail	ERA in m ²	ZKB environmental loan in CHF million
Total		
– New buildings	161,130	377
– Renovations ¹	13,954	19
Energy savings	in GWh	in tonnes of CO ₂
Energy savings		
– New buildings	45	3,687
– Renovations ¹	33	5,644
Renewable energy		
– New buildings	80	19,750
– Renovations ¹	17	4,049
Total		
– New buildings	125	23,437
– Renovations ¹	50	9,693

¹ Methodology is based on the renovation of an old property. Accordingly, the effect is significantly higher than with new buildings.

For the remaining financing volume for Minergie buildings of CHF 405 million, which was not included in the analysis in any great detail, the energetic effects are estimated indicatively using a proportional extrapolation:

Quantity structure for extrapolation	ERA in m ²	ZKB environmental loan in CHF million
Total		
– New buildings	164,767	385
– Renovations	14,269	20
Energy savings extrapolated	in GWh	in tonnes of CO ₂
Total		
– New buildings	128	23,966
– Renovations	51	9,911

Overall, this results in the following energy savings:

Total quantity structure	ERA in m ²	ZKB environmental loan in CHF million
Total		
New buildings and renovations	354,120	801
Total energy savings	in GWh	in tonnes of CO ₂
– Life cycle	354	67,007
– per year	8.9	1,675

The objective of the analysis is to provide a rough estimate of the environmental impact of Minergie buildings financed with ZKB environmental loans. As explained in the methodology, these values are based on consideration of the entire lifespan of the financed buildings. If the energy-related effect is converted to one year, the result is energy savings of 1,675 tonnes of CO₂ per year based on the assumptions made and the current portfolio of ZKB environmental loans for Minergie buildings.

2. Internal projects

The following sections highlight the energy implications of projects undertaken by Zürcher Kantonalbank on its own office buildings in recent years.

a) Composition of the projects

As at 31.12.2022, the portfolio of internal projects amounted to CHF 308 million. Since 2012, the bank has examined all projects in the internal building sector individually with regard to their energy impact based on effective consumption measurements. As at the evaluation date at the end of 2022, eleven projects implemented between 2015 and 2021 have been selected for refinancing through green bonds. Included are projects in which a significant reduction in energy consumption and/or CO₂ emissions can be demonstrated. These projects include about 60% of the office areas used by Zürcher Kantonalbank.

- The selected projects include three complete renovations and one new replacement building implemented in the period under review.
- In addition, the selection includes seven smaller projects focused on energy renovation.

The selected internal projects qualify for green bond financing for 15 years from the year of implementation. For example, a project that was implemented in 2015 will remain in the portfolio of projects until 2030. Investments and projects completed before 2012 are not taken into account for the green bond programme, although a further part of the office space was built according to energy-efficient criteria in earlier years as part of the bank's overall building strategy.

b) Impact analysis – method

The impact analysis is carried out individually for each of the selected projects. The energy savings are calculated by comparing the effective energy consumption before and after the project is carried out. Where possible, consumption values over three consecutive years are used as the base figure. To calculate the CO₂ emissions, the energy consumption expressed in kilowatt hours is converted into tonnes of CO₂ using emission factors per energy source before and after the project is carried out according to VfU 2018 (Verein für Umweltmanagement und Nachhaltigkeit in Finanzinstituten e.V.).

All energy consumption and CO₂ emissions relate exclusively to office areas used by Zürcher Kantonalbank. Not included are areas used by third parties (e.g. rental). Grey energy that is used in the course of implementing the project is not included in the impact analysis.

c) Impact analysis – results

The energy-related effect is determined for all internal projects in accordance with the method of analysis described.

- By fully converting to renewable energy sources, a significant reduction in CO₂ emissions can be demonstrated in all selected projects (ten projects with a reduction of at least 70% and one project with a reduction of 50%).
- In absolute terms, this results in a reduction of 1,866 tonnes of CO₂ per year.
- The complete renovations or new replacement building naturally tie up the majority of the funds invested, but also achieve a large overall reduction in energy consumption. The largest project has achieved a reduction in energy consumption of 70%, the other three projects have achieved reductions between 30% to 50%.

– The energy-related renovations make a major difference towards the reduction of CO₂ emissions in relation to the funds used. However, they achieve a smaller reduction in total energy consumption of around 15% on average because the focus is on partial rather than complete renovation.

The following table shows the results, divided into complete renovations and energy-related renovations:

Quantity structure	ERA in m ²	Investment volume in CHF million
Internal projects		
– Complete renovations	44,579	307
– Energy-related renovations	17,288	1
Total	61,867	308

Energy savings per year	in GWh	in tonnes of CO ₂
Internal projects		
– Complete renovations	8.1	1,473
– Energy-related renovations	0.2	393
Total	8.3	1,866

3. Summary of results and comparison with outstanding green bonds

The following table summarises the results of the impact analysis over the course of the year and cumulatively since the launch of the green bond programme:

Year	ZKB environmental loan Minergie			ZKB environmental loan others ¹		Internal projects		
	Volume in CHF million	Savings in tonnes of CO ₂	Savings per CHF million	Volume in CHF million	Savings in tonnes of CO ₂	Volume in CHF million	Savings in tonnes of CO ₂	Savings per CHF million
2017	1,048	1,713	1.6	114	n.a.	–	–	–
2018	1,062	1,498	1.4	138	n.a.	–	–	–
2019	1,000	1,850	1.9	181	n.a.	–	–	–
2020	942	1,821	1.9	276	n.a.	266	1,682	6.3
2021	839	1,643	2.0	378	n.a.	308	1,866	6.1
2022	801	1,675	2.1	453	n.a.	308	1,866	6.1
Cumulated		10,200					5,414	

Year	Total			Outstanding green bonds		
	Volume in CHF million	Savings in tonnes of CO ₂	Savings per CHF million	Volume cumulated	Savings in tonnes of CO ₂	Savings per CHF million
2017	1,162	1,713	1.5	–	–	–
2018	1,200	1,498	1.2	325	406	1.2
2019	1,181	1,850	1.6	525	822	1.6
2020	1,484	3,503	2.4	675	1,593	2.4
2021	1,525	3,509	2.3	825	1,898	2.3
2022	1,562	3,541	2.3	1'025	2,324	2.3
Cumulated		15,614			7,043	

¹ As mentioned in the text, no impact analysis is available for ZKB environmental loans issued for financing GEAK properties or other energy-related measures

Zürcher Kantonalbank's "Green Bond Framework" stipulates that the volume of outstanding green bonds must not exceed the volume of ZKB environmental loans and investments in internal projects. Compliance with this rule is verified on a quarterly basis using an internal control system. Total investment volume of CHF 1,562 billion was offset by green bonds issued by Zürcher Kantonalbank in the amount of CHF 1,025 million as at the end of 2022 (see also <https://www.zkb.ch/de/uu/nb/investor-relations/obligationenleihen.html>):

ISIN	Interest rate	Issue volume	Settlement date	Maturity
CH0373476677	0.250%	CHF 325 million	08.05.2018	08.05.2025
CH0419041238	0.125%	CHF 200 million	06.06.2019	06.06.2029
CH0570576121	0.050%	CHF 150 million	04.11.2020	04.11.2032
CH1131931342	0.150%	CHF 150 million	21.10.2021	21.10.2031
CH1189217925	1.400%	CHF 200 million	25.07.2022	25.07.2029
Total as at 31.12.2022		CHF 1,025 million		

nb: This is a translation of the German version of the Green Bond Annual & Environmental Report. In case of any deviations resulting from the translation, the German version shall prevail.