



Realkredit Danmark
Greenhouse gas footprint

April 2022

REALKREDIT
Danmark

Contents

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Introduction

Realkredit Danmark aims to support society in succeeding with the green transition and delivering on the sustainability targets set forth. As a mortgage bank, we have only limited impact in terms of our own environmental footprint. We can, however, generate significant impact by supporting our customers in their efforts to become more climate-friendly. To this end, we are committed to financing energy-efficient properties and improvements in the energy-efficiency of existing properties, renewable energy and energy supplies based on renewable energy. In doing so, we can turn Denmark just a little bit greener for each mortgage we underwrite.

One way for the financing sector to help society to a more sustainable and greener future is to focus on GHG emissions. In calculating and focusing on GHG-emissions of our lending portfolio, we support our customers directing their efforts to become more climate-friendly.

This report publishes the second GHG calculations on property mortgaged by Realkredit Danmark. It adheres to the GHG-model established by Finance Denmark, and is a first step in creating a common approach to comparable and transparent communication of GHG-emissions in the sector. The Danish principles are in alignment with the Partnership for Carbon Accounting Financials (PCAF), yet in a few selected areas adjustments and deviations are allowed to accommodate Danish circumstances and specificities.

Green initiatives in Realkredit Danmark

Thinking green is not new to us. In 2019, we launched the first green covered bond to see the Danish market. The bond is a floating-rate bond based on Cibur 6M. The loan was originally offered to large real-estate customers only, but as of Q12021 Realkredit Danmark is also offering the loan to mid-corp customers. Today, Realkredit Danmark has issued two green Cibur6 bonds with a total amount outstanding of DKK 14.0bn end of 2021.

In May 2020, a similar loan, based on Stibor 3M, was offered to the Swedish market. The loan is offered to Swedish customers in the large real-estate segment and has experienced great interest. Today, the amount outstanding is SEK 4.2bn. A similar loan to the Norwegian market is still pending.

As pointed out in 2017 by the Danish Council on Climate Change, energy renovations of properties is the initiative with the greatest potential to help society in becoming green and sustainable and at the lowest economic costs.

Hence, Realkredit Danmark is committed to influencing customers to make the right energy decisions. In order to guide our customers, Realkredit Danmark has entered into a collaboration with OBH-gruppen – a consulting engineering firm. New and remaining customers are offered a visit from a building consultant from OBH providing a housing and energy report stating what to improve and how much the energy consumption will be reduced if the recommended improvements are implemented. If the energy improvements are implemented and the loan financed via Realkredit Danmark or Danske Bank, the price of the housing and energy report will be refunded.

Further, Realkredit Danmark has launched an initiative aimed at customers wanting to improve the energy performance of their property. After documenting the energy improving initiatives, e.g. via an offer from an entrepreneur, loans for energy improvements are exempt from origination fees.

In March 2022, Danske Bank launched a new green loan offering the customers lower interest rates than traditional loans. The loan covers energy efficiency costs and has an annual rate of p.t. 0.95% and no administration or handling fees. The loan is offered up to DKK 500,000 and must be repaid over a period of maximum 10 years.

Why calculate GHG footprint?

In order for the financial sector to be able to fulfil its responsibilities effectively, it is crucial to have a well-functioning model for calculating the GHG footprint of the lending and investments they help finance. This, in turn, helps the financial institution to reduce GHG footprint of their loans and investments. At the same time, the model can support the dialogue with customers and help them make their footprints greener.

For Realkredit Danmark as a company, the GHG footprint might be useful input in formulating a green strategy.

GHG emissions of the portfolio

The GHG emissions in this report covers the emissions of a full year, yet, they are calculated for the portfolio end 2021. The GHG emissions are calculated per capital centre and divided into five sub-groups; i) private, ii) agriculture, iii) Offices and business, iv) holiday homes as well as v) manufacturing. At this stage, Realkredit Danmark has not been able to calculate GHG emissions from manufacturing exposures.

| End 2021 | Total CO2e (t) | | LTV-weighted CO2e (t) | | Total CO2e footprint (t/bn) ¹ | | LTV-weighted CO2e footprint (t/bn) ¹ | | Portfolio coverage |
|----------------------------|------------------|---------------|-----------------------|---------------|--|---------------|---|---------------|--------------------|
| Capital centre S | 1.230.312 | (5%) | 485.272 | (-16%) | 3.844 | (-4%) | 1.516 | (-24%) | 93,08 |
| Offices and business | 98.304 | (29%) | 27.877 | (-18%) | 4.134 | (17%) | 1.172 | (-25%) | 74,67 |
| Agriculture | 427.032 | (1%) | 208.348 | (-8%) | 39.467 | (-4%) | 19.256 | (-12%) | 100,00 |
| Private | 701.132 | (5%) | 247.643 | (-22%) | 2.572 | (-4%) | 908 | (-29%) | 93,33 |
| Holiday homes | 3.844 | (24%) | 1.404 | (-3%) | 391 | (12%) | 143 | (-12%) | 100,00 |
| Manufacturing | 0 | (0%) | 0 | (0%) | 0 | (0%) | 0 | (0%) | 0,00 |
| Capital centre T | 2.550.916 | (-3%) | 1.128.073 | (-11%) | 6.097 | (1%) | 2.696 | (-8%) | 92,01 |
| Offices and business | 182.991 | (14%) | 62.595 | (-11%) | 2.363 | (20%) | 808 | (-6%) | 72,01 |
| Agriculture | 1.762.159 | (-6%) | 802.599 | (-12%) | 56.826 | (2%) | 25.882 | (-4%) | 100,00 |
| Private | 601.522 | (3%) | 261.362 | (-9%) | 2.104 | (8%) | 914 | (-5%) | 92,52 |
| Holiday homes | 4.244 | (15%) | 1.517 | (0%) | 372 | (17%) | 133 | (1%) | 100,00 |
| Manufacturing | 0 | (0%) | 0 | (0%) | 0 | (0%) | 0 | (0%) | 0,00 |
| Capital centre A | 71.002 | (139%) | 13.762 | (-24%) | 1.749 | (100%) | 339 | (-36%) | 99,54 |
| Private | 71.002 | (139%) | 13.762 | (-24%) | 1.749 | (100%) | 339 | (-36%) | 99,54 |
| Old capital centres | 139.713 | (19%) | 33.048 | (-18%) | 5.121 | (35%) | 1.211 | (-6%) | 80,54 |
| Offices and business | 5.737 | (-21%) | 1.677 | (-20%) | 4.946 | (17%) | 1.446 | (19%) | 65,89 |
| Agriculture | 22.858 | (42%) | 7.004 | (68%) | 126.989 | (81%) | 38.911 | (114%) | 100,00 |
| Private | 110.912 | (18%) | 24.320 | (-28%) | 4.908 | (33%) | 1.076 | (-19%) | 80,30 |
| Holiday homes | 206 | (-21%) | 47 | (-36%) | 644 | (1%) | 147 | (-18%) | 100,00 |
| Manufacturing | 0 | (0%) | 0 | (0%) | 0 | (0%) | 0 | (0%) | 0,00 |
| Total | 3.991.943 | (1%) | 1.660.154 | (-13%) | 4.950 | (-1%) | 2.059 | (-15%) | 91,96 |

() refers to changes compared to last year.

Holiday homes are calculated as described in the FIDA-model². Hence, the portfolio coverage is 100% for this segment. Likewise, agriculture is calculated on a theoretical model resulting in a portfolio coverage of 100%. Other subgroups are calculated based on data on the specific property. If these data are not available, it's not possible to calculate the GHG emission, and hence the portfolio coverage will be below 100%. Portfolio coverage is calculated based on the number of loans (not the size of the loan).

The table above indicates a total GHG emission of 4.0m tons/year and an LTV-weighted emission of 1.7m tons/year. Of this, 2.2m and 1.0m, respectively, originates from agriculture. This compares to a total CO₂ emission of 85.89m tonnes from the Danish economy³ in 2020.

| Total CO2e (t) | 2021 | 2020 | Change | Growth contribution (%-points) |
|----------------------|------------------|------------------|-------------|--------------------------------|
| Offices and business | 287.032 | 244.165 | 17,6% | 1,1% |
| Agriculture | 2.212.049 | 2.323.118 | -4,8% | -2,8% |
| Private | 1.484.568 | 1.375.230 | 8,0% | 2,7% |
| Holiday homes | 8.294 | 7.066 | 17,4% | 0,0% |
| Total | 3.991.943 | 3.949.579 | 1,1% | 1,1% |

¹ The calculation of CO₂e footprint by segment has changed since the 2020 report. In 2020, the footprint per segment was calculated as CO₂e-emission of segment/outstanding amount in the specific capital centre. In 2021, the footprint is calculated as CO₂e-emission of segment/outstanding amount related to the segment in the specific capital centre. The changes in footprint is calculated on revised numbers from 2020.

² Framework for Financed Emissions Accounting – Principles and methods, Finance Denmark, 2020, pp. 36-37

³ Danmarks Statistik, Emmisionsregnskab, <https://www.dst.dk/da/Statistik/emner/geografi-miljoe-og-energi/groent-nationalregnskab/energi-og-emissioner>

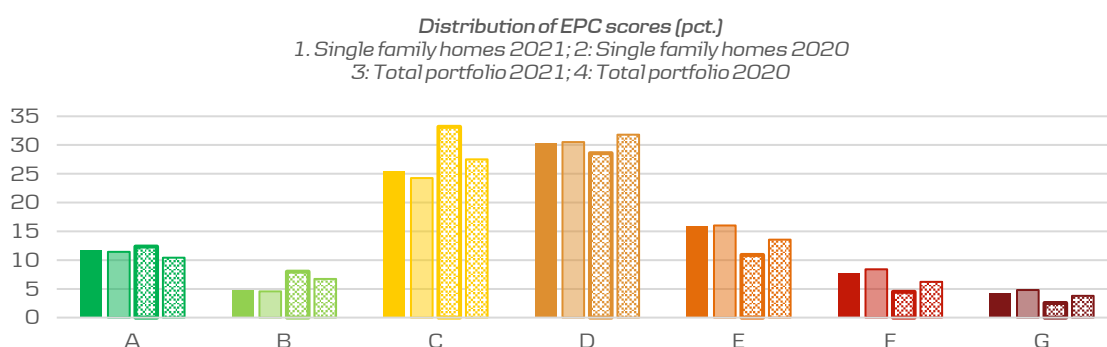
Compared to last year the CO₂ emissions from the Private segment as well as Offices and business have increased. This is mainly due to a slightly different way of calculating as well as better data quality. Further, holiday homes have experienced an increase in CO₂ emissions. This is due to the fact that there has been a large turnover of holiday homes in 2021, and even though Energy Performance Certificates (EPCs) are not mandatory for holiday homes, the increasing interest among consumers on energy performance has led to an increasing number of EPC labels in this segment.

The LTV-weighted numbers have experienced a decline, which is mainly due to rising house prices leading to lower LTV's.

As mentioned, a slightly different way of calculating emissions has been implemented. If 2021 was calculated with the 2020-method, 2021 would end up at the same level as 2020.

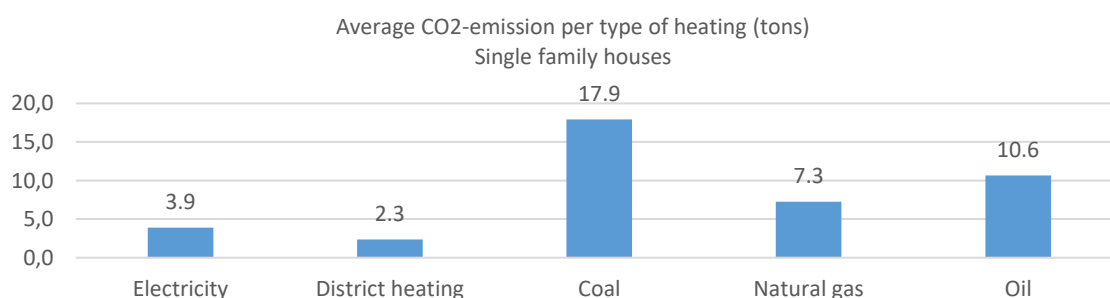
Underlying data

EPCs for the Realkredit Danmark portfolio are mapped in the below chart. 20% of the total portfolio of properties in Realkredit Danmark's portfolio with a valid EPC score scored A or B. 82% has an EPC score of D or better. In the 2020 report, the corresponding numbers were 17% and 76%, respectively.



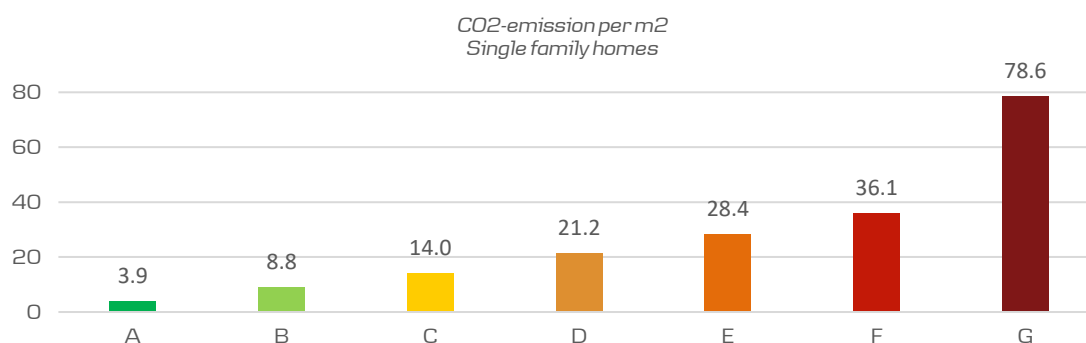
At the lower end of the scale, 7% of the portfolio now has an EPC score of F or G – compared to 10% in 2020.

Taking a closer look on the type of heating in single family homes, it is obvious that the type of heating is crucial for the GHG emission of the property. The below figure illustrates the average GHG emission from a single family home in Realkredit Danmark's portfolio by type of heating. It is obvious that coal, oil and natural gas are the type of heating that emit the most GHG.



No doubt that new houses have higher EPC scores and hence a lower GHG emission per m². However, new houses in Denmark are often bigger than older houses. Hence, it is interesting to make a split of the GHG emission by EPC score per m² in order to investigate whether new houses have lower GHG emissions than older houses.

The below chart clearly shows that EPC A-buildings emit 3,9 kg/m² and hence, they can have double the size than B-buildings and still have a lower GHG emission than a B-building. However, the numbers are not a confirmation of ‘building new’ is more energy efficient than ‘renovating existing’ properties. As mentioned earlier, energy renovations of properties is the initiative with the greatest potential to help society in becoming green and sustainable and at the lowest economic costs. This is supported by a study from Danish engineering, design and consultancy company Rambøll comparing greenhouse gas emissions from the demolition and construction of a new house to the re-construction of the old house. The comparison reveals emissions for demolition and construction of a new house at 56 times that for re-constructing the old house with the same end result in terms of energy-efficiency.



For further interesting splits on Realkredit Danmark’s portfolio, please take a closer look at Realkredit Danmark’s ESG report on Climate change from May 2020 (<https://www.rd.dk/PDF/Investor/Library/Green%20Bond%20Framework/Climate%20change%20MAY2020.pdf>) or the ECBC template⁴ which also includes a few Energy data.

Next steps

The preparation of this report has been made on the basis of a joint agreement with Finance Denmark and our peers in the financing industry in Denmark. The report is the second report calculating GHG emissions and the model used is under continuous review given changes in the industry, regulation etc.

Since it’s only Realkredit Danmark’s second report on GHG emissions, and since the standard is still developing, Realkredit Danmark urges readers to be careful not to jump to conclusions. The size and composition of the lending portfolio differs between financial institutions, and even though a common

⁴ <https://rd.dk/investor/funding/ecbc-label>

calculation method has been developed, the result might still vary until fully implemented. Hence, comparison across institutions is expected to be difficult in the coming years.

However, by calculating the total emissions and by analysing the underlying data the report helps Realkredit Danmark identifying key factors driving the GHG emissions and hence offers valuable input for future development of green concepts and focus on energy improvements when advising our customers etc.

This report is prepared on a yearly basis, based on end-of-year data. Next report is expected in March 2023.

Appendix 1: Method used



The calculation of the GHG footprint of Realkredit Danmark A/S' loan book is based on the principles laid down by Finance Denmark (FIDA)⁵. The model is developed in participation with member institutions and in dialogue with several stakeholders and experts from Denmark and abroad such as Statistics Denmark, The Danish Energy Agency, Danish Business Authority and Partnership for Carbon Accounting Financials (PCAF).

The model will be revised on an annual basis based on national and international developments. The model consists of a set of fundamental principles and specific methodology at a detailed level for ten asset classes – including Mortgages, i.e. loans secured by mortgages on real property.

When calculating financed emissions both total property emissions as well as LTV-weighted⁶ property emission are calculated. Thus, this report discloses:

- LTV scaled total emissions
- Total carbon emissions
- Relative carbon emissions (carbon footprint)
- Portfolio coverage

Private housing, offices and shops

Realkredit Danmark is using the methodology from Finance Denmark (FIDA) on this kind of mortgages in order to estimate the GHG footprint.

The model is based on the use of Energy Performance Certificates (EPC's) for properties. Hence, the calculations are based on average expected energy consumption, reflected by the EPC. Given the average energy consumption, the emission is calculated⁷ using the energy factor as well as updated emission factors⁸ for the type of heating in the specific property.



Realkredit Danmark is using EPC-data from the Danish Energy Agency (Energistyrelsen) distributed by E-nettet.

EPC scores are valid for a period of ten years. Hence, a large part of Realkredit Danmark's portfolio will not have a valid EPC. Further, the GHG emissions stated in the data may be up to ten years old and

⁵ Framework for Financed Emissions Accounting – Principles and methods, Finance Denmark, 2021

⁶ LTV based on property valuation at the time of calculation.

⁷ Framework for Financed Emissions Accounting – Principles and methods, Finance Denmark, 2020, p. 3-3

⁸ [Indhold i energimærkning, herunder skalaen | Håndbog for energikonsulenter \(hbemo.dk\)](#)

might not reflect the changes in emission factors since then. This entails a need for Realkredit Danmark to calculate GHG emissions.

If a property has a valid EPC there are four components that are important in order for Realkredit Danmark to calculate the GHG footprint:

- Property type
- Geography
- Year of construction
- Heat supply

Definition of the four components can be found in the description of the GHG-model from FIDA⁹.

If the four components are present in the data delivered by E-nettet Realkredit Danmark will calculate the GHG footprint. In cases where one of the four components is missing, it will not be possible to calculate a GHG value and Realkredit Danmark will use the calculated emission specified in the energy report, delivered by E-nettet¹⁰. If the energy report is not available from E-nettet the property will not be part of the report.

Realkredit Danmark has decided to treat residential properties¹¹ built after 2017 without an EPC label as properties with an EPC label A as energy efficiency standards commensurate with EPC label A are implied by building regulations.

Further, according to the FIDA-model, EPC labels that expired less than 5 years ago are still included in the calculations with their EPC label

For each subgroup of the above mentioned components a distribution, based on the total EPC labels in Denmark, is calculated, and the GHG emission of the property is then calculated:

If the property does not have a valid EPC, Realkredit Danmark calculates the energy consumption based on the model described by FIDA¹².

If a holiday house has a valid EPC label, this will be reflected in the calculation. Otherwise, the FIDA-model is used.

As described in the example by FIDA (page 39) GHG emissions for properties without an EPC score are calculated based on a distribution of EPC scores depending on the four parameters listed above. For example,

- a) a detached house with a heated floor area of 100 m² and an unknown EPC score
- b) situated in an urban municipality
- c) constructed in 1955
- d) with natural gas as heating source

⁹ <https://finansdanmark.dk/media/47145/finance-denmark-co2-model.pdf>

¹⁰ In this report, emissions for some segments were calculated as described in the FIDA-model since the data from E-nettet was corrupted.

¹¹ The residential properties are: Stuehus til Landbrugsejendom, Fritliggende enfamiliehus, Sammenbygget enfamiliehus, Fritliggende enfamiliehus I tæt bebyggelse, Rækkehuse, Dobbeltbuse, Etagebolig, Kollegium, Boligbygning til døgninstitution.

¹² Framework for Financed Emissions Accounting – Principles and methods, Finance Denmark, 2021, pp. 37-40

has a calculated emission of 4.035¹³ kg/year.

If we change one of the four parameters above we calculate the following emissions:

- If the same house was constructed in 2015 the calculated emission is 1.619 kg/year
- If the type of heating was 'District heating' instead, the calculated emission is 1,526 kg/year
- If the property is situated in a 'Rural municipality' the calculated emission is 5,011 kg/year

As the example above illustrates, the four parameters are important parameters in terms of GHG emissions.



Agriculture

The FIDA model prescribes agricultural properties below 10 hectares to be calculated using the same methodology as for private housing, offices and shops. However, in this report, Realkredit Danmark differs from the FIDA model in that all agricultural properties are calculated in the same way.

GHG emissions from Realkredit Danmark's agriculture portfolio are calculated with a method, developed with input from Troels Kristensen from Aarhus University, based on number and type of animals along with farm size and land use.

The herd is transformed into "animal units" using standard conversion rates, e.g. 1 dairy cow = 1.33 animal unit whereas 1 pig for slaughter = 0.025 animal unit. Further, the use of land is transformed to GHG emissions per ha given standards based on use of land and whether the land is used for organic or conventional farming.

Information about herds, use of land as well as organic/conventional farming is collected from Realkredit Danmark's internal valuation reports. If it is not stated in Realkredit Danmark's internal valuation reports whether the land is cultivated as organic or conventional farming the average split is applied.

This method for calculating GHG emissions on agriculture is used temporarily until the publication of standardised publication of agricultural data is available.

¹³ In the FIDA-document the number is 4.108 kg/year. However, the distribution of EPC-labels has changed since the publication of the FIDA-model.

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