Methodology And Assumptions: Sustainable Transparency Template

Jyske Realkredit

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1   Sustainable Transparency Template

This document describes the methodologies applied to produce the 'Sustainable Transparency Template' (STT) for Jyske Realkredit.

The STT is produced to provide investors investing in Jyske Realkredit's covered bonds transparency about how the assets in the cover pool affects the climate. The STT contain information about CO_2-emission and Energy Performance Certificates (EPCs) for properties financed through Jyske Realkredit, as well as the distribution of energy resources used in the properties, including the proportion of the total energy consumption derived from renewable energy sources.

As Denmark has a well-developed system for producing EPCs for properties that reflect the expected energy consumption of individual properties, it is possible to produce the STT for Jyske Realkredit. Moreover, Denmark has detailed information about the energy consumption of the various sectors in Denmark, as well as the types of raw materials used for energy generation and their respective CO_2-emissions. The template is produced, as far as possible, by using data for the individual properties financed through Jyske Realkredit. Where no data are available for individual properties, statistical calculations are used to estimate its energy performance or the fuel type in energy generation.

2   EPC Property score

The EPC score for properties in Denmark is retrieved from the Danish Energy Agency. Data are retrieved for all properties in Denmark with a valid EPC.

For properties for which Jyske Realkredit has granted loans and which have a valid EPC, this EPC is attached directly to the property.

For properties with no valid EPC, the distribution of EPCs for the total population is used to estimate energy performance. To this end, distributions have been made for all properties with a valid EPC in Denmark, based on property type, area (Copenhagen and environs, Aarhus and environs, Large provincial towns and Small provincial towns), year of construction and type of heating used to heat the property (gas, oil, district heating etc.).

As an example, the figure below shows the distribution of valid EPCs for apartment buildings in Copenhagen built in the 1891-1930 period, heated by district heating. A total of 5,034 valid EPCs match this category. Thus, a property in Jyske Realkredit's portfolio that matches this category and does not have a valid EPC will be distributed as having 0% EPC grade A, 1% EPC grade B, 19% EPC grade C, 54% EPC grade D etc.

Figure 1 Distribution of EPCs for blocks of flats in Copenhagen built between 1891 and 1930 and heated by district heating
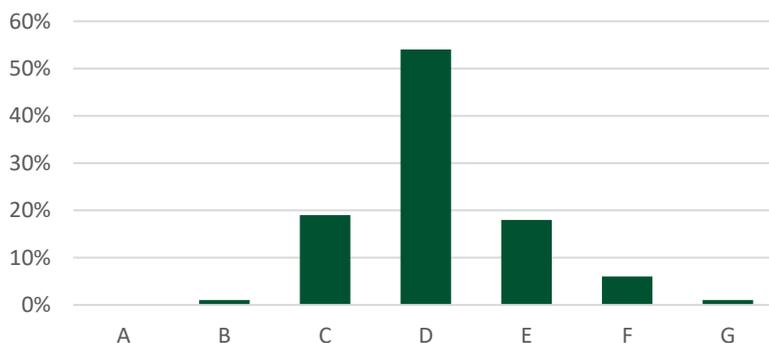
Source: Danish Energy Agency and own calculations

For the distributions, only combinations of categories (Property type, area, year of construction of the property and source of heating) with more than 20 observations are used. For properties in Jyske Realkredit's portfolio with no valid EPC or with a combination of categories for which a distribution cannot be made, a less granular distribution is made of all properties with a valid EPC, based on property type, area and year of construction.

Approximately 61% of the properties (in terms of outstanding debt) of Jyske Realkredit's Capital Centre E have a valid EPC. About 33% are assigned an EPC value based on the distribution using property type, geographical area, year of construction and source of heating. About 2% are assigned an EPC value based on the less granular distribution, and for about 0.5%, it has not been possible to assign an EPC value. For about 4.5%, it is not relevant to assign an EPC value (manufacturing industry, warehouses, holiday homes, undeveloped plots etc.).

The Appendix provides a breakdown of the categories.

3   Calculated CO_2-emission

Emissions of greenhouse gasses from production of electricity and heat is almost entirely CO_2. In the STT we therefor only calculate CO_2-emissions and not emissions from other greenhouse gasses.

In order to calculate the CO_2-emissions for properties the model use the following five variables: EPC-score, Property type, Heating source, Heated m^2 and CO_2-emission factors. The EPC-scores and CO_2-emission factors are published by the Danish Energy Agency, while property type, heating source and heated m^2 are based on data from the IT and Development Agency of the Danish Ministry of Taxation. For properties without a valid EPC the model uses the estimated EPC-score explained in section 2.

The energy consumption for heating depends on the energy consumption of the property (measured by EPC) and heated m^2. The model calculates the property's energy consumption as an average of the minimum and maximum consumption for a given EPC-score[1]. The Danish Energy Agency publish CO_2-emissions factors for each heating source [2 & 3] and by combing these factors with the calculated energy consumption, the model estimates a property's yearly CO_2-emission.

Example: CO_2-emission for a single family house, 150 m^2, EPC-score C and natural gas for heating:

*Calculated energy consumption: (90 + 2700/150) * 150 = 16.200 kWh/year*

*CO_2-emission: 16.200 kWh/year * 0,204 kg CO_2/kWh = 3.305 kg CO_2/year*

The calculations are based on a property's net energy consumption. The model only includes the part of a property's energy consumptions, which ensures a standard temperature inside the property. The Danish Energy Agency decides the standard temperatures[4]. The model does not take into account what temperature individual households sets, as well as it does not include energy consumption used for appliances.

CO_2-emissions are calculated for all properties financed in Jyske Realkredit. The CO_2-emissions do not depend on the loan size or loan to value.

For holiday houses there only exist few EPC since holiday house owners are not obligated to show a valid energy performance certificate when selling the house. When calculating the CO_2-emission for holiday houses the model use average numbers produced by the Danish Energy Agency and Statens Byg-geforskningsinstitut[5]. In order to estimate CO_2-emission the model use average numbers for energy consumption used to heating and size. The majority of holiday houses have electricity as heating source.

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[1] https://sparenergi.dk/forbruger/boligen/energimaerkning-boliger/huse

[2] http://www.hbemo.dk/haandbog-for-energikonsulenter-hb2019-gaeldende/bilag-4-energimaerkning-af-eksisterende-bygninger/vejledende-tekniske-bilag-og-tabeller/braendsel/braendvaerdier-og-co2-emissionsfaktorer

[3] https://ens.dk/service/fremskrivninger-analyser-modeller/basisfremskrivninger

[4] http://www.hbemo.dk/haandbogen

[5] https://sparenergi.dk/forbruger/boligen/sommerhus/skal-du-koebe-sommerhus

CO2-emission for property types *Agriculture, Manufacturing and Manuel industries* depends on the industry specific CO2/kr-factor. This factor is based on sector averages and is calculated in accordance with the method suggested by Finance Denmark in their Framework for Financed Emissions Accounting[6].

3.1　Loan-to-value adjusted CO2-emission

In order to calculate the part of the assets CO2-emission, which Jyske Realkredit finance, we adjust the buildings full emission with the borrower's loan-to-value (LTV). This number only includes the share of the asset's total CO2-emission, which correspond to borrower's outstanding debt to Jyske Realkredit relative to the asset valuation.

For buildings categorized as subsidised housing the LTV is one. Most of these buildings have funding in multiple mortgage institution and have LTV's above one because of renovations, expansion etc. This complicates finding the share of the asset Jyske Realkredit finance. For now we using a conservative approach, by including the buildings total CO2-emission to our cover pool.

4　Sustainable Development Goals

Table 4 shows Jyske Realkredit's amount of loans supporting UN's Sustainable Development Goals (SDG). Jyske Realkredit contribute to a more sustainable world by financing Energy Efficient Buildings, Renewable Energy and Social Housing. Mapping loans to environmental and social objectives is verified by Sustainalytics in our Green Finance Framework[7].

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[6] https://finansdanmark.dk/media/47145/finance-denmark-co2-model.pdf

[7] https://www.jyskebank.dk/wps/wcm/connect/jfo/28e25f09-5069-4a41-b431-a8ca1fb67e16/Jyske+Bank+Group+Green+Finance+Framework+2021.pdf?MOD=AJPERES&CVID=nzbgkNA

5   Appendix

Information about energy consumption is available at the Danish Energy Agency's website – ens.dk.

In the distribution of EPCs for properties in Jyske Realkredit's portfolio without a valid EPC, the following categories are used:

Property type	Area	Construction year	Heat source
Single-family homes	København/Frederiksberg	-1890	District heating
Townhouse	Aarhus	1891-1930	Electric heating
Appartments	Large cities	1931-1950	Natural gas
Production	Smal cities/towns	1951-1960	Oil
Office		1961-1972	Coal
Properties for social purposes		1973-1978	Biofuel
Holiday houses		1979-1998	
		1999-2006	
		2007-2010	
		2011-	

For questions and comments please contact

Christian Bech-Ravn
Head of Rating & IR
cbr@jyskerealkredit.dk
+45 89 89 92 25

Michael Mølskov Jarlstrup
Analyst
mmj@jyskerealkredit.dk
+45 89 89 92 26

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