Nordea

Approach for estimations of CO2-emissions for the lending portfolio of Nordea Kredit - applied input data and approach

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Introduction

From November 2022 Nordea Kredit publishes estimated CO2-emissions for the main part of the lending portfolio.

The estimates will be calculated annually and will be published in the Nordea Kredit "Debt Investor Presentation".

The CO2-emissions will be presented as tCO2 and the carbon footprint as tCO2/mDKK and tCO2/m2

The calculations of the Nordea Kredit estimates are based on the CO2-model from Finans Danmark <link>.

Estimates are currently calculated for the property segments:

- Owner-occupied dwellings
- Commercial residential, incl. TOAs
- Offices and Retail

Loans to these property segments constitutes the main part of the Nordea Kredit lending portfolio.

For the remaining part of the lending portfolio, primarily agricultural and manufacturing properties, the CO2-emissions have not been estimates due to lack of data.

It is the intention to the include these property segments at a later stage, when sufficient data is available.

Data sources

The input data sources applied in the estimations are:

- Energistyrelsen (Danish Energy Agency): EPCs, energy consumption, and CO2-emissions for properties with an EPC
- BBR - Bygnings- og boligregistret: Property type, building year, primary heating source, location, floor area
- Nordea Kredit – loan and property values, building year

Data from the external public data sources are applied without any further adjustments.

Model

The Nordea Kredit CO2-estimations are based on the common model for Danish Credit Institutions prepared by FIDA. The model is a local Danish implementation of the general PCAF model.

The FIDA model utilises the wide availability of public property related data in Denmark, including information from EPC reports, eg. estimated energy consumption and CO2-emission.

Basically, the model is comprised of two related approaches depending on whether a property has a valid EPC connected or not.

The properties financed by Nordea Kredit that have a valid EPCs covers xx% of the lending portfolio.

Model

Data flow:

1. Collection of data from sources
2. Cleaning of data for outliers and obvious registration errors
3. Running model
   - Properties with an EPC
   - Properties without an EPC

Financed emissions are estimated as:

$$Financed\ emissions\ = \sum_{B_i} Emissions\ from\ building_e\ \times LTV_{e_i,t}$$

where,

$$Emissions\ from\ building\ = \frac{Estimated\ energy\ consumption}{Energy\ factor}\ \times\ Emissions\ factor$$

and

$$Estimated\ energy\ consumption = \frac{EPC\ \left(\frac{kWh}{m2}\right) x\ floor\ area\ (m2)}{Energy\ factor}$$

Energy factor - the relationship between the energy provided and energy produced which depends on the energy source (Information in Danish).

Emissions factor – the CO2-emission per unit energy produced which depends on the energy source (Information in Danish).

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Properties with a valid EPC

For properties with a valid EPC, the energy consumption for the building is estimated based on the actual EPC and floor area of the building.

Properties without a valid EPC

All the properties are grouped by

- Property type (6)
- Geographical area (3)
- Construction year bucket (10)
- Primary heat source (6)

For more information on the groupings see appendix

Within each group the EPC-distribution for the properties with EPCs is assumed to apply for all properties without EPC in the group. The implicitly estimated EPC for properties without EPCs in a group will basically be a weighted average of the of the properties with EPCs.

This EPC distribution is used when estimating the energy consumption and CO2-emission for the properties without EPC in the group.

If a group has to few observations the emissions for properties without EPC in the group are not estimated.

Further, estimations are not performed for properties:

- Without registered floor area
- Without registered primary energy/heating source
- Where registrations seem erroneous

Properties with registered negative energy consumption (solar cells or wind turbine) are managed separately.

Appendix

Grouping of properties

Property type	Detached houses Terraced, linked or semi-detached houses Multi dwelling houses Multipurpose commercial premises Farmhouses Properties for social purposes
Geographical area	Urban municipalities Intermediate municipalities Rural and outlying municipalities
Construction year	< 1890 1891-1930 1931-1950 1951-1960 1961-1972 1973-1978 1979-1998 1999-2006 2007-2010 >2010
Primary heat source	Biofuel Electricity District heat Coal Natural gas Oil