Carbon Footprint of Bank Loans to Domestic Non-Financial Corporations

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Content

1. Project's objectives
2. Data sources
3. Terminology
4. Methodology (scope 1 emissions)
5. Carbon footprint indicator
6. Test calculations for scope 2 emissions
7. Use cases
8. Conclusions

Project's objectives

- The first aim is to measure transition risk within domestic bank loans to NFCs

  - The transition risk emerges when businesses are facing the requirements of low carbon economy

  - This can imply lower incomes and higher costs for businesses

  - The transition risk can be measured with carbon footprint of NFCs

- The second aim is to follow the transition of banks' NFC loan portfolio towards net zero parallel with national climate goals

Data sources – the frame and financial information

- Statistical business register (SBR)

    - Frame population and number of personnel of NFCs

- Analytical credit database (AnaCredit)

    - Financial data: credit level information on NFC loans and counterparties' balance sheet total

- Emission trading system (ETS) data

    - The corporate level ETS data covers large part of emissions of the industries namely mining (B), manufacturing (C), energy (35) and air traffic (H51)

- Air emissions accounts

    - The air emissions accounts follow the System of Economic-Environmental Accounting (SEEA) -handbook and are published by Statistics Finland. These statistics include information on green house gasses (GHG) and industries

Terminology

- Scope 1 emissions covers direct GHG emissions

- Scope 2 emissions covers indirect GHG emissions from consumption of purchased electricity, heat, cooling or steam. That is, consumption of products produced by industry (NACE/ISIC) division 35 Electricity, gas, steam and air conditioning supply.

- Scope 3 covers other indirect emissions. Scope 3 emissions are also called value chain emissions. Include both downstream and upstream emissions from company perspective (e.g. supply and consumption of company products).

- The LULUCF refers to land-use, land-use change, and forestry. It is defined as greenhouse gas inventory sector that covers emissions and removals of GHG resulting from direct human activities within the LULUCF sector.

- EU fit for 55: The Commission's proposal to cut GHG emissions by at least 55% by 2030 sets Europe on a responsible path to becoming climate neutral by 2050.
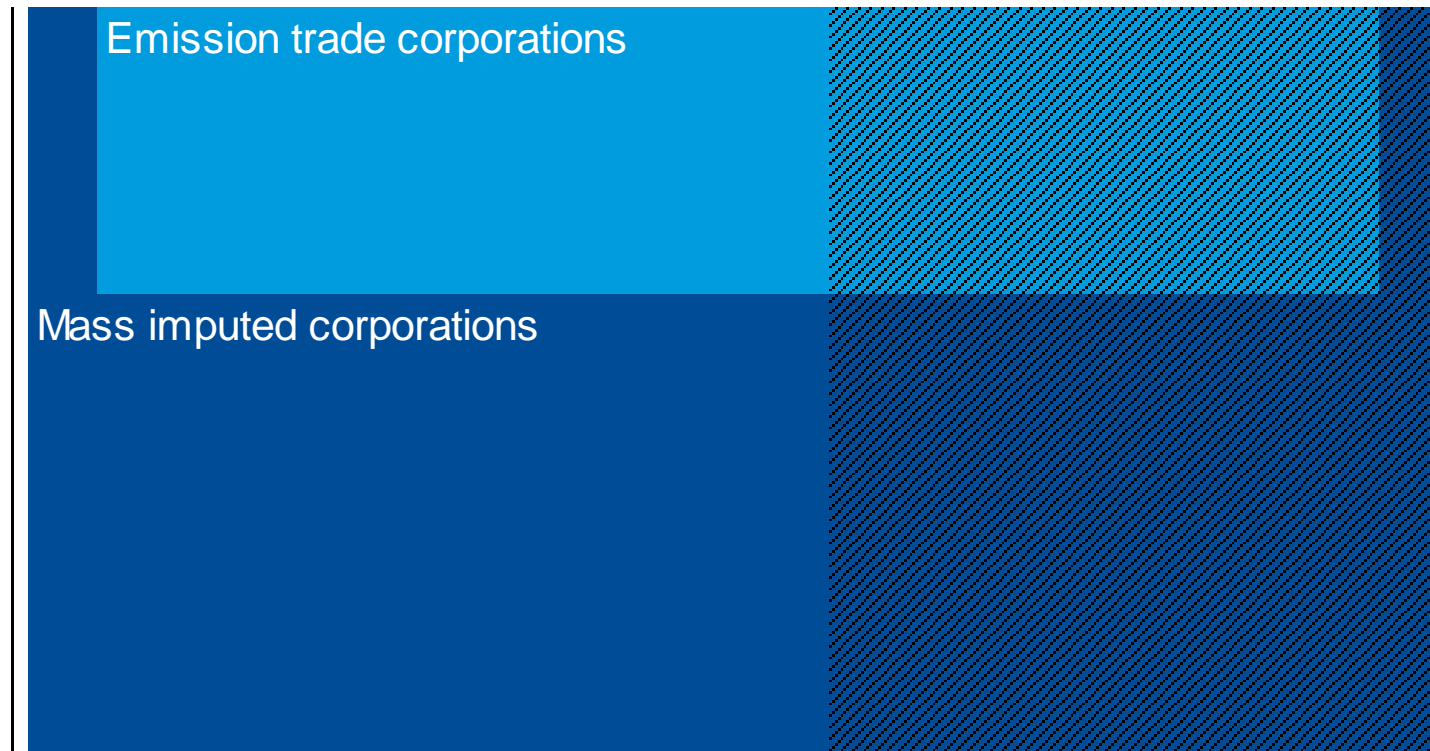
Methodology

Total scope 1 emissions of (NFCs) by source

NFCs with loans from banks   *NFCs without loans from banks*

Industries

Emission trade corporations

Mass imputed corporations

Methodology, contd.

- Equation formulates the procedure for determining NFC level (estimated) CO2 scope 1 emissions EE_{it} :

$$(1)\ EE_{it} = \begin{cases} If\ NFC\ participates\ in\ ETS, then\ ETS_{it} \\ \\ If\ NFC\ does\ not\ participate\ in\ ETS, then\ \dfrac{Personnel_{it}}{Personnel_{jt}} * (E_{jt} - ETS_{jt}) \end{cases}$$

- i denotes NFCs (i.e. debtors, i = 1, 2, 3, …, n),
- t denotes time period (year, t = 2018, 2019, 2020),
- j denotes industry level,
- ETS_{it} is NFC level CO2 emissions from emission trading system data,
- Personnel is NFC's or industry's total personnel (excluding personnel of corporates participating in ETS) at time period t,
- E_{jt} is the industry level CO2 emissions from air emission accounts and
- ETS_{jt} is ETS_{it} aggregated to industry level

Methodology, summary

- Methodology can be arranged from the best to the worst performing methods

- The financial data are available directly for all NFCs

- For emissions direct data is available for ETS NFCs

- The emissions for other NFCs are mass imputed

- Below are main statistics (year 2019) on these sources:

Most of the CO2 emissions are covered with verified emissions ETS data

Data source/methodology	Emissions (millions tons)	Share	Loans (billions euro)	Share	Nr. of NFCs	Share
ETS data	26.3	77.5 %	4.1	10.9 %	123	0.2 %
Imput. (ETS industries)	3.3	9.8 %	11.0	29.0 %	12 602	20.1 %
Imputation (other)	4.3	12.6 %	22.7	60.1 %	49 891	79.7 %
Total	33.9	100.0 %	37.8	100.0 %	62 616	100.0 %

Carbon footprint indicator

- Carbon footprint can be measured with scope 1 – scope 3 indicators

- Scope 1 is the narrowest measure and can be aggregated without double counting. Scope 2 and scope 3 measures are needed to fully understand the risk included with the counterparty/industry

- Carbon footprint of financed emissions

- (2) $CFI_{it} = \frac{LoanStock_{it}}{BalanceSheet_{it}} * EE_{it}$

- EE_{it} stands for NFC level (estimated) CO_2 emissions, CFI_{it} is the loan stock's carbon footprint indicator at the NFC level, $LoanStock_{it}$ is NFC's loan stock, and the $BalanceSheet_{it}$ is NFC's total balance sheet amount. t stands for time.

Testing scope 2 emissions

- Also test calculations for scope 2 emissions were made

- Input-output framework was used: the intermediate inputs by energy industry (35) were used as a proxy to distribute the energy industry's emissions to other industries as scope 2 emissions.

- To break down the emissions to NFCs within the industries the personnel split was used.

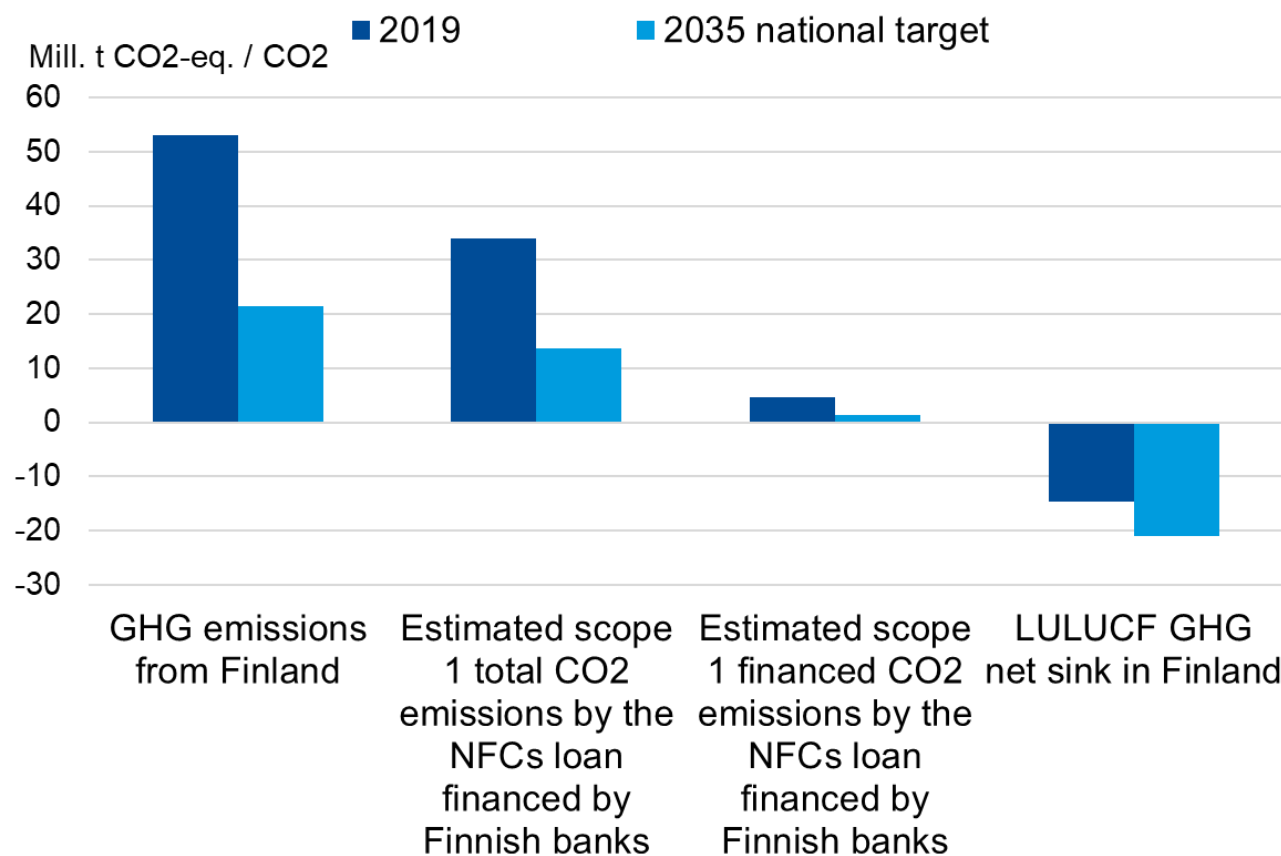|		Intermediate consumption				Final consumption	Total output
	Industry	1	2	…	99	C+G+I+X	
Intermediate input	1						
	2						
	…						
	35						
	…						
	99						
Primary input							
Total input							

Use cases

Transition risk analysis

Scope 1 and Scope 2 emissions are important to understand how transition risk spills over the economy

■ Scope1 ■ Scope2

Source: Bank of Finland calculations
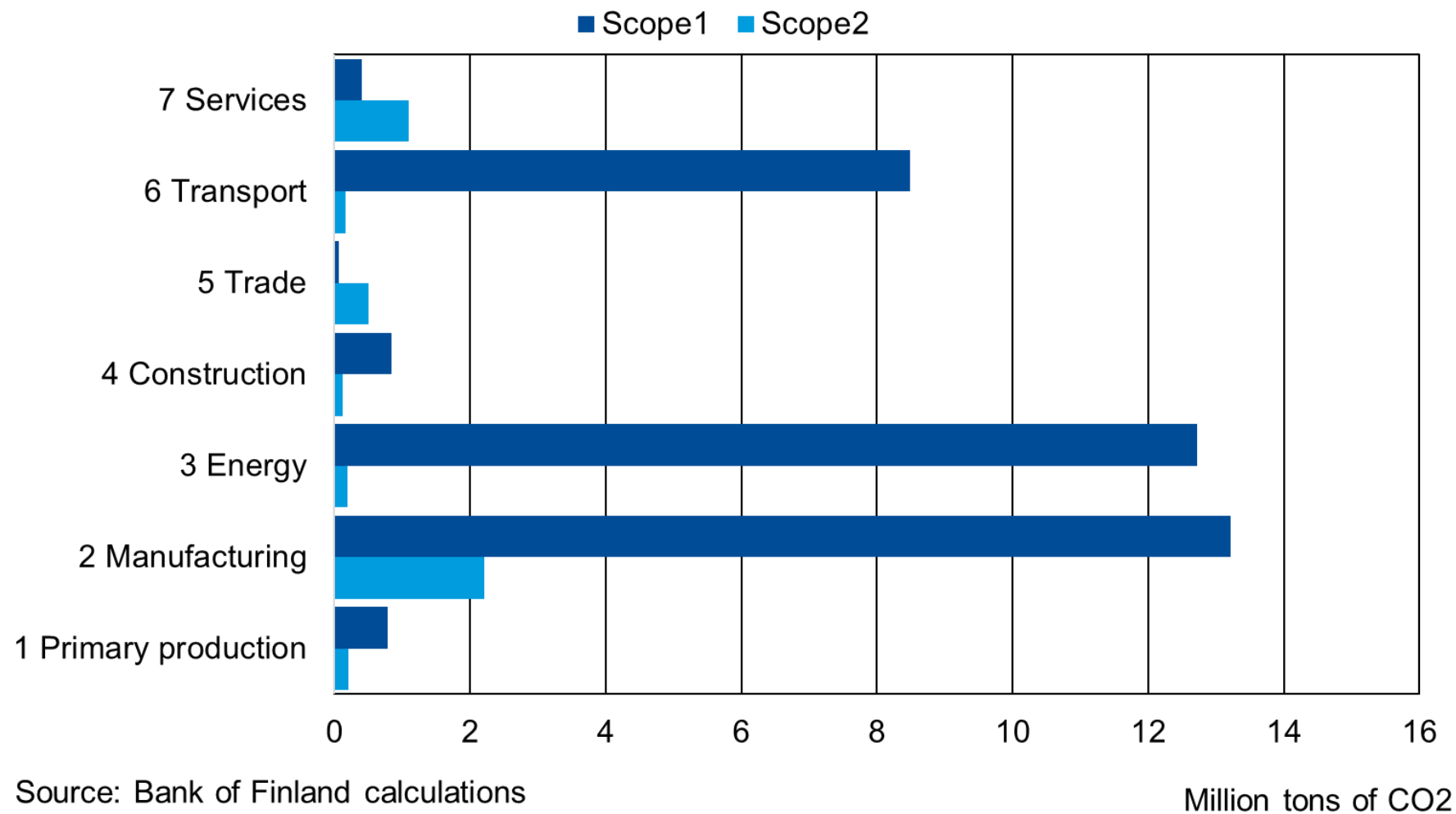
Million tons of CO2

Follow-up the alignment of banking sector with the national climate strategy

Domestic NFCs that have loans emitted 34 million tons of CO2 in 2019, of which 5 million tons is allocated to NFC loan stock

■ 2019   ■ 2035 national target

Mill. t CO2-eq. / CO2

GHG emissions from Finland | Estimated scope 1 total CO2 emissions by the NFCs loan financed by Finnish banks | Estimated scope 1 financed CO2 emissions by the NFCs loan financed by Finnish banks | LULUCF GHG net sink in Finland

Source: Bank of Finland calculations and Statistics Finland

Follow-up the alignment of Finnish banking sector with the EU Fit for 55 strategy

The EU Fit for 55 targets that the NFCs that have loans should reduce emissions from 34 to 20 million tons of CO2 by 2030

■ 2019   ■ 2030 EU Fit for 55 target

Mill. t CO2-eq. / CO2
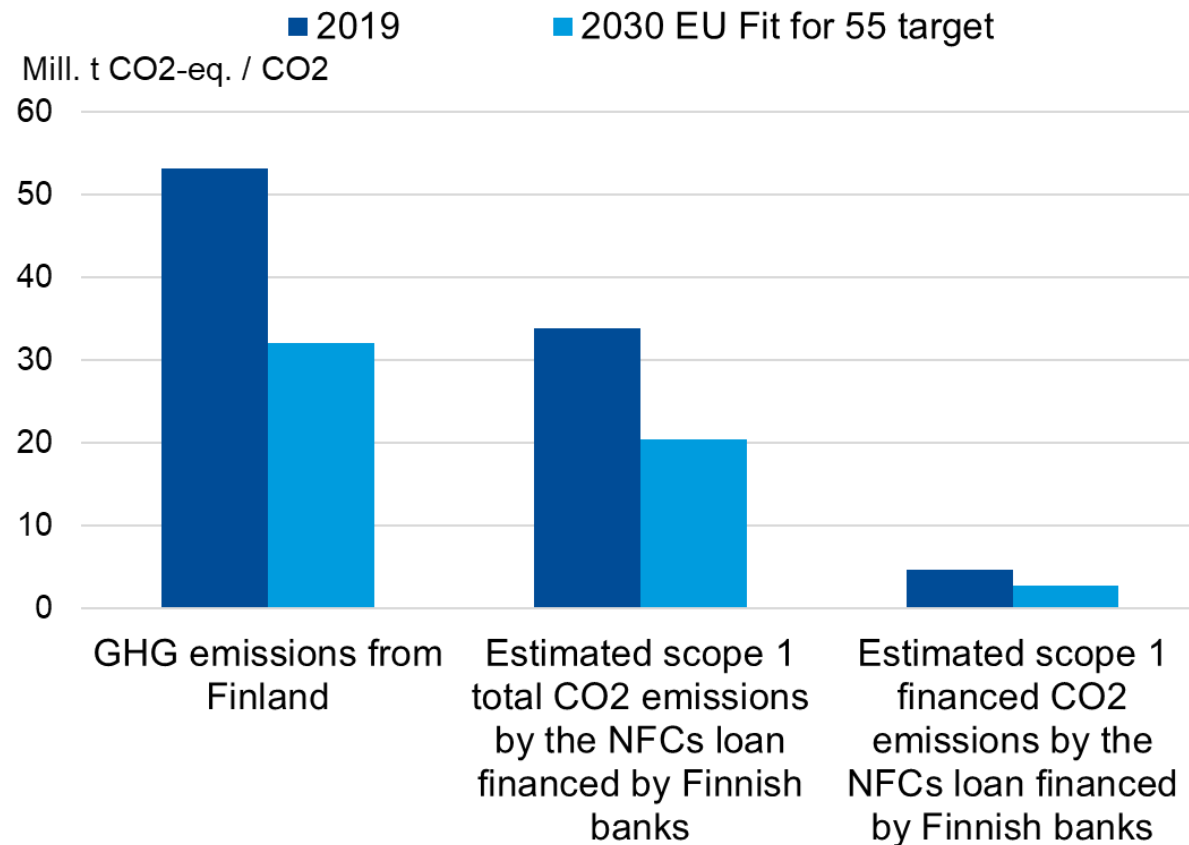
Source: Bank of Finland calculations and Statistics Finland

Conclusions

Pros and cons of granular vs aggregate indicators

- The granular methodology enables drill down heterogeneous sectors such as energy. The NFCs within energy industry have high variation in emission intensities and transition risks – we really need to know which of them are financed via banks

- The granular and aggregate data sources need to be combined to assess scope 2 and scope 3 emissions. Based on the findings the scope 1 emissions does not provide sufficient information on the range of transition risk

- Challenges in coverage. From ETS only fossil CO_2 emissions are available. Also industry coverage should be better. Some large polluters such as agriculture is left out

Way forward

- To tackle under coverage problems with stepwise approach. First identify relevant industries and then investigate alternative sources and methodologies such as
  - For agricultural activity the aggregate sources for assessing other GHG than CO_2 should be investigated
  - Investigate data sources for measuring carbon footprint for Real estate activities.
- Use of input-output framework to measure scope 3 links for industries
- Forward looking indicators should be investigated