

Process Documentation: Portfolio GHG Accounting for CDFIs

A working document by
Coastal Enterprises, Inc.
Partner Community Capital
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Introduction

During the summer of 2021, three CDFIs (Community Development Financial Institutions) - Coastal Enterprises, Inc. (CEI), Partner Community Capital (PCAP), and Self-Help Credit Union - embarked on the PCAF emissions disclosure process.

What is PCAF? The [Partnership for Carbon Accounting Financials](#) (PCAF) is an industry-led initiative of financial institutions who are committed to developing an approach to disclose and reduce greenhouse gas emissions (GHG) from their loans and investment portfolios. PCAF's methodology, The PCAF Global Standard, helps financial institutions assess and disclose financed emissions. The partnership ultimately aims to facilitate the alignment of the financial industry with [The Paris Agreement](#) and reach net zero emissions by 2050.

Why create this process documentation?

Our CDFIs collaborated during the disclosure process to share resources, address common questions, and make sense of the complicated work of GHG accounting for our financed emissions. In January and April of 2022, Self Help and CEI disclosed their portfolio emissions, and PCAP plans to disclose their emissions in 2022 as well.

Within this document we identify various decision-making points during the disclosure process, including gathering the right data and identifying the correct equations to use for disclosure. We aim to use this document to streamline future disclosure iterations. We hope other financial institutions, and particularly CDFIs, can use this document to understand the initial steps they must take to start their GHG accounting journey.

Disclosure gives CDFIs the opportunity to:

- Develop a GHG emissions baseline for the climate impact of our portfolio companies
- Identify sectors where we have the greatest opportunity to work with companies to reduce their emissions
- Demonstrate to investors that we are first-movers on climate-smart investment and disclosure practices

Ultimately, we believe CDFIs can demonstrate leadership among financial institutions and other community development organizations in addressing climate change. This is the first step.

***NOTE:** This is an informal working document created by three CDFIs to document and improve our internal processes. We have shared this document with the PCAF Technical Assistance team and incorporated their feedback, but it has not been endorsed by PCAF or its affiliates. This project was not funded by PCAF, nor is it intended to replace the PCAF Standard.*

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Step 1: Getting Familiar with GHG Accounting

As GHG (and carbon) accounting practices gain traction within the financial industry, becoming familiar with the available resources and best practices are crucial steps to a smooth disclosure. While outside research is valuable, the [PCAF website](#) is the best place to start.

Current CDFI Disclosures:

- [Clearwater Credit Union](#)
- [Coastal Enterprises](#)
- [Vermont Community Loan Fund](#)
- [Self Help Credit Union](#)

The PCAF Standard and Quick Start Guide

The PCAF Standard and Executive Summary can be found on the PCAF website at: <https://carbonaccountingfinancials.com/standard>

While the Executive Summary and Quick-Start Guide are useful to assess if your institution is interested in joining PCAF, we recommend reviewing the entire [PCAF Global Standard](#).

The appendix information is especially helpful for CDFIs, who will need to become familiar with the levels of data quality that form the basis of disclosure.

Registration and Accounts

CDFIs who would like to join PCAF must complete a [commitment letter](#) and send it to info@carbonaccountingfinancials.com. Once PCAF has accepted the commitment letter, your institution will be designated as “committed” on the PCAF list of [financial institutions taking action](#).

The next step after commitment is disclosure. A representative from the PCAF Secretariat will reach out to schedule an orientation meeting. This will begin the process of gaining access to the PCAF emission factor database. Access to the database is key, as it will serve as the source of the proxy information your CDFI will use to quantify your portfolio emissions. Once you have login credentials you can reach the PCAF database site here:

<https://db.carbonaccountingfinancials.com/login.php>

We will talk more about navigating this database in Step 4 of the guide.

Step 2: Defining the Scope of Your Assessment

In a perfect world, CDFIs would have access to specific, accurate, and recent data about their portfolios' emissions. The best way for a CDFI to account for portfolio GHG emissions would be to require each financed borrower to undertake an independent, expert analysis of its operations performed by a third party in accordance with the GHG Protocol¹ and report these calculated GHG emissions to the CDFI. The CDFI would then determine its attributed share of the reported GHG emissions (using PCAF's methodology), aggregate these individual counts, and, voila! – we would have an accurate measure of our portfolios' greenhouse gas impact.

Needless to say, we're a long way from such a process! So, CDFIs must resort to using *proxies*, or approximations, of GHG emissions. PCAF offers different equations for a financial institution to use. Your chosen approach will depend on the data your financial institution has available about your portfolio.

The first step to a successful disclosure is to assess the scope of your portfolio assessment. Some questions you'll need to ask are:

- What asset classes (types of enterprises or projects) does your CDFI fund?
- Will you include subsidiary data within your PCAF calculations?
- Where do you lend geographically?
- What data do you collect about the borrowers in your portfolio (e.g., revenues, EVIC, leverage, total equity + debt)?

The asset classes that your CDFI lends and the information you have available about those deals determine the proxies you will use to calculate your financed emissions. The available data you have about your borrowers will help you choose the appropriate formula to use in your calculations. As you will see, PCAF considers some proxies more accurate than others.

¹ The GHG Protocol refers to an established and international standard for greenhouse gas accounting: <https://ghgprotocol.org/about-us>.

Determining Asset Classes

There are six asset classes covered in the PCAF Standard (page numbers for definitions listed below). PCAF suggests using a “follow-the-money” principle to determine the asset class of an investment (i.e., defining an investment by its purpose and not by the identity of the borrower/investee).



- **Listed equity and corporate bonds (p. 47):** Listed corporate bonds and listed equity for *general* corporate purposes that are traded on a market.
- **Business loans and unlisted equity (p. 58):** Loans, lines of credit, and equity investments used for *general* corporate purposes.
- **Project finance (p. 69):** Loans and investments to specific and clearly delineated projects, such as a solar farm, an energy efficiency project, or highway/infrastructure construction.
- **Commercial real estate (CRE) (p. 77):** Loans and investments for the purchase or refinance of commercial real estate (CRE).
- **Mortgages (p. 83):** Loans to buy or refinance family homes or multi-family housing.
- **Motor vehicle loans (p. 89):** Loans whose purpose is to finance motor vehicles.

All loans must be on the CDFI’s (or subsidiary’s) balance sheet to be counted during the PCAF disclosure.

Determining Available Data

One of the most significant challenges our CDFIs faced was matching the portfolio data we collect *and* have access to with the correct PCAF equation to calculate the financed emissions.

We asked ourselves:

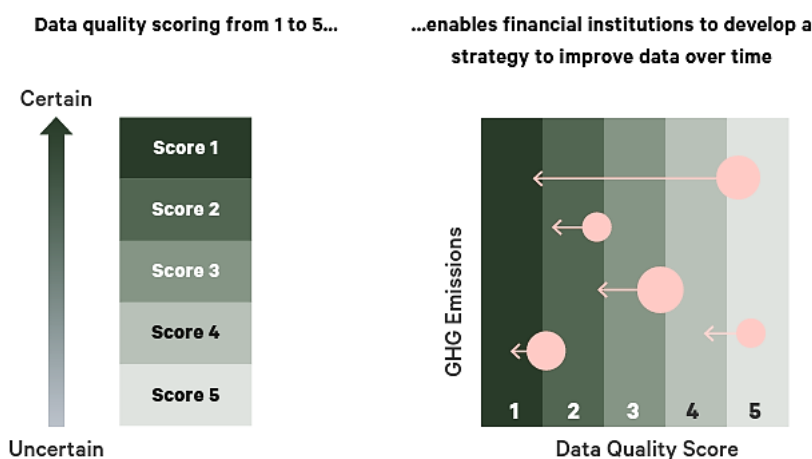
- Do we capture revenue data?
- Do we know the total equity and debt of the companies we fund (i.e., do we have easy access to their balance sheet information)?
- Do we know their EVIC?
- Do we know the energy consumption of the real estate we have financed?

PCAF recognizes that financial institutions capture varying levels of data, and the PCAF Standard provides a number of ways to calculate emissions based on your available data.

These approaches are summarized in the [PCAF Global Standard](#), starting on page 117 in the Annex. There are different equations for each asset class. As a CDFI, you will most likely be focused on one or all of the below:

- Business loans and unlisted equity (pp. 120-122)
- Project Finance (pp. 123-124)
- Commercial Real Estate (pp. 125-126)
- Mortgages (pp. 127-128)
- Motor Vehicles (pp. 129-130)

PCAF “scores” the emission calculations from 1-5 according to the data source available to calculate the financed emissions. Data Score 1 represents the highest data quality and is achieved if your borrower/investee calculates their GHG emissions at the business level using a methodology in line with the GHG Protocol. Data Scores 2-5 rely on proxies in the absence of independently calculated company data. Our three CDFIs expect to use formulas that correspond to Data Scores 4 & 5.



These varying data levels highlight that GHG accounting is a work in progress, and we must start somewhere! Accordingly, PCAF expects that financial institution will seek to improve their data quality scores in the future as they work towards more accurate GHG accounting.

Step 3: Selecting the Right Equation

As described above, your available data will dictate the equations your CDFI is able to use to calculate your financed emissions. **The Standard’s Annex of equations (pp. 117-130), attribution data, and emissions data may be helpful if your FI will be using proxy information for your calculations, as it clearly lays out the required data for each formula and the corresponding data score.** The table below is a simplified version of the information you will find in the Annex. **NOTE:** The [options \(1a, 2a, etc.\)](#) refer to the equations listed in the PCAF Standard. = required emission data = required financial data²

Business Loans & Unlisted Equity (also relevant to Project Finance):

Data Quality Score 1	Data Quality Score 2	Data Quality Score 3	Data Quality Score 4	Data Quality Score 5
Verified GHG emissions data from borrower that follows GHG Protocol (Option 1a)	Unverified GHG emissions data from borrower that follows GHG Protocol (Option 1b)	Borrower’s production data (Option 2b)		
	Borrower’s energy consumption data (Option 2a)			
Outstanding amount	Outstanding amount	Outstanding amount	Outstanding amount	Outstanding amount (Option 3b)
Total equity + debt or EVIC (if listed company)	Total equity + debt or EVIC	Total equity + debt or EVIC	Total equity + debt or EVIC	or asset turnover ratio by sector (Option 3c)
			Borrower’s revenue (Option 3a)	

Commercial Real Estate and Mortgages:

Data Quality Score 1	Data Quality Score 2	Data Quality Score 3	Data Quality Score 4	Data Quality Score 5
Primary data on building energy consumption and Supplier-specific energy source emission factor (Option 1a)	Primary data on building energy consumption (Option 1b)	Estimated building energy use based on building’s energy labels (Option 2a)	Estimated building energy use based on building type and location (Option 2b)	Estimated building energy use based on building type and location (Option 3)
		Floor area	Floor area	Number of buildings
Outstanding amount	Outstanding amount	Outstanding amount	Outstanding amount	Outstanding amount
Property value at origination	Property value at origination	Property value at origination	Property value at origination	Property value at origination

² Please note that the data sourced from the PCAF emission factor database is not listed in these tables but is required.

Motor Vehicle Loans:

Data Quality Score 1	Data Quality Score 2	Data Quality Score 3	Data Quality Score 4	Data Quality Score 5
Primary data on vehicle fuel consumption (Option 1a)	Local statistics on distance traveled (Option 2a)	Regional statistics of distance traveled (Option 2b)	Local or regional statistics of distance traveled (Option 3a)	Local or regional statistics of distance traveled (Option 3b)
or Primary data on vehicle distance travelled and vehicle fuel efficiency and fuel type (Option 1b)	Vehicle fuel efficiency and fuel type from known make and model	Vehicle fuel efficiency and fuel type from known make and model	Vehicle fuel efficiency and fuel type from known make and model	Average vehicle fuel efficiency and fuel type
Outstanding amount	Outstanding amount	Outstanding amount	Outstanding amount	Outstanding amount
Total value at origination	Total value at origination	Total value at origination	Total value at origination	Total value at origination

NOTE: If you have different levels of data quality within your portfolio – e.g., calculated emissions data from some borrowers/investees and only revenue information from others – it is ok to calculate deals within the same asset class using different equations. You should always use the equation with the highest available data quality score. The Standard also permits the disclosing financial institution to calculate a weighted data quality score per asset class/portfolio segment if multiple equation types were used for different deals.

NOTE: CEI, PCAP, and Self-Help used the following equations that generate Data Quality Scores of 4 or 5. It is likely that your CDFI will also use formulas that have Data Quality Scores of 4 or 5 Data Quality unless you have access to the financed borrower’s energy production or GHG reporting directly from your borrower that are calculated in line with the GHG Protocol.

Legend

- **Green** = variable sourced from internal CDFI database
- **Blue** = variable sourced from PCAF’s emission factor database
- **Red** = variable supplied by an outside source

Business Loans and Project Finance:

Option 3a:

$$\sum_p \frac{\text{Outstanding amount}_p}{\text{Total equity} + \text{debt}_p} \times \text{Revenue}_p \times \frac{\text{GHG emissions}_s}{\text{Revenue}_s}$$

Option 3b:

$$\sum_c \text{Outstanding amount}_c \times \frac{\text{GHG emissions}_s}{\text{Assets}_s}$$

Option 3c³:

$$\sum_c \text{Outstanding amount}_c \times \text{Asset turnover ratio}_s \times \frac{\text{GHG emissions}_s}{\text{Revenue}_s}$$

NOTE: The Option 3b and 3c have the same data quality score (as they are mathematically equivalent). Option 3b is preferred by PCAF as the more accurate calculation.

Commercial Real Estate:⁴

Option 2b:

$$\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Estimated energy consumption from statistics}_{b,e} \times \text{Floor area}_b \times \text{Average emission factor}_e$$

Option 3:

$$\sum_{b,e} \frac{\text{Outstanding amount}_b}{\text{Property value at origination}_b} \times \text{Estimated energy consumption from statistics}_{b,e} \times \text{Number of buildings}_b \times \text{Average emission factor}_e$$

To achieve a data quality score of 4 for CRE, the square footage of the property is required. If square footage data is not available and the loan was made to a commercial business, the building number is assumed to be 1.

NOTE: This assumption is not part of the PCAF methodology and should be noted in any disclosures that use it.

For CRE loans made to affordable housing, find the emission factor using the mortgage asset class in the PCAF database. If neither the square footage nor the building number is available, then various assumptions were made to complete calculations. Appendix B lists these assumptions.

³ One source for **Asset turnover ratio** can be found at: https://csimarket.com/Industry/industry_Efficiency.php?ind=109

⁴ Note that the PCAF emission factor database for CRE investments includes emission factors for both floor area and building number

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Below is a list of different values your institution might use to calculate your disclosure and the associated data sources. This is not an all-encompassing list and is debt centric.

Asset Class	Required Information	Data Source
All	PCAF Data Quality Score	Downloaded from the PCAF emission factor database. Data found using NAICS code and Excel function "XLOOKUP"
Business Loans and Project Finance	PCAF Emission Factors Scopes 1-3 (units are GHG emissions/assets or GHG emissions/revenue depending on the equation) ⁵	Downloaded from the PCAF emission factor database. Data found using NAICS code and Excel function "XLOOKUP"
Commercial Real Estate	PCAF Emission Factors Scopes 1-2 ("average emission factor" from the CRE equations above)	Downloaded from the PCAF emission factor database. Data found using NAICS code and Excel function "XLOOKUP"
Business Loan and Project Finance	Outstanding Loan Balance at end of FY of reporting year	Internal CDFI database
Business Loan and Project Finance	Borrower's Revenue	Internal CDFI database
Business Loan and Project Finance	NAICS Code	Internal CDFI database
Commercial Real Estate	Outstanding Loan Balance at end of FY of reporting year (units are \$MM USD)	Internal CDFI database (divide the outstanding balance by 1,000,000)
Commercial Real Estate	Square Footage	Internal CDFI database
Commercial Real Estate	Number of Dwellings (use if sq. ft. is not found)	Internal CDFI database
Commercial Real Estate	Location (state)	Internal CDFI database
Commercial Real Estate	Property Value at Origination	Internal CDFI database
Commercial Real Estate	Estimated Energy Consumption from Statistics	EPA ENERGYSTAR Portfolio Manager, CBECs, or EXIOBASE

⁵ Please note that currently (November 2021), the PCAF emission factor database only contains upstream Scope 3 emissions data, not downstream Scope 3 emissions

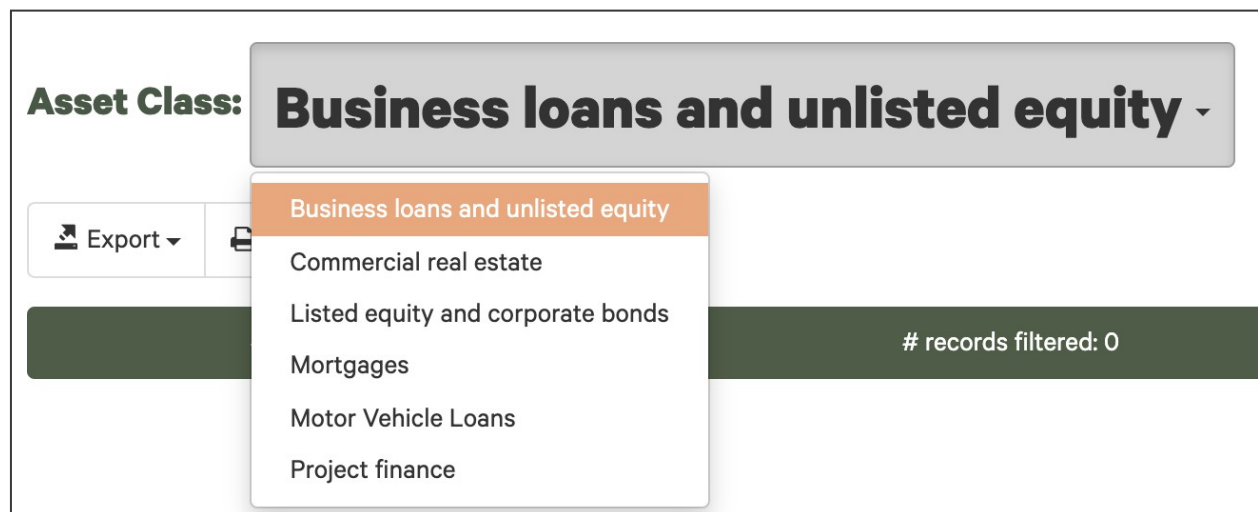
Step 4: Working with the PCAF Database

The PCAF Emission Factor Database was an integral source of data for our calculations. Our CDFIs used the following steps and filters when using the PCAF database to find emission factor numbers.

First, in the upper right-hand corner set your currency and unit values using these drop-down lists:



Next, filter by the current asset class you are working on, using this drop-down list on the left-hand side of the database:



By clicking this icon next to any of the variables in the database, you can filter your data to make it manageable and tailored to your needs. Listed below are the filters we used throughout our disclosure calculations.

All Asset Classes

- Country = US
- Data Levels: **NOTE:** These data levels are distinct from the data quality scores that are described in Step 2. These data levels describe the granularity, not the quality, of the emission factor. Filter each according to the loan purpose – there are five data levels.
- Example: A loan made to a childcare center (asset class = business loan)
 - Data Level 1: Health care and social assistance
 - Data Level 2: Social assistance
 - Data Level 3: Child daycare services

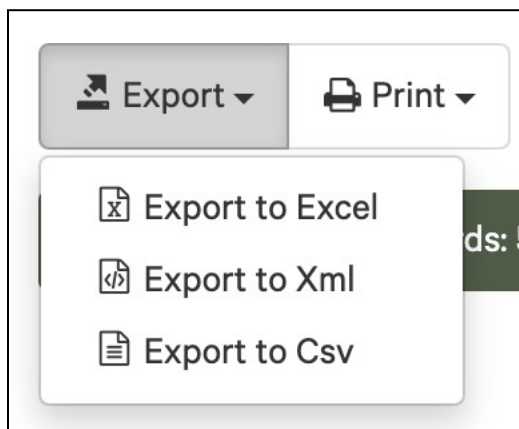
Business Loans, Unlisted Equity, and Project Finance Filters

- Country = US
- Industry Classification = NAICS 2017
- Emission Factor Unit = Revenue or Asset depending on your equation choice

Commercial Real Estate Filters

- Country = US
- State = dependent on borrower or investee location

Once you have filtered the database to your needs, you can easily export it using this option:



Sample Calculation Guidelines

PCAF is supported by Guidehouse, a global consultancy firm specialized in energy, sustainability, risk, and compliance for the financial industry. Guidehouse serves as the PCAF Secretariat, providing free technical support to PCAF participants throughout their disclosure processes. PCAF signatories are strongly encouraged to send the Guidehouse technical assistance team a sample calculation of each asset class for review prior to disclosing. You can also contact them throughout the process with questions, although technical assistance is only offered to financial institutions who have signed a commitment letter to join PCAF.

Prior to sending in sample calculations, be sure to follow these guidelines from Guidehouse:

- Clearly mark the units in every column heading
- Hide values that are not necessary for the emissions calculation
- Scope 3 emissions and emissions intensities must be reported separately from Scopes 1 & 2 (at this time, PCAF only supplies Scope 3 emission factors for business loans)
- Use equations rather than fixed values so the TA team can track the cell sources for each calculation
- If you are using a fixed value, such as an emission factor from the PCAF database, clearly note the source in the spreadsheet (i.e., cite the source of all fixed values)

Step 5: PCAF Disclosure Process

Once your institution has completed all the emissions calculations for your portfolio, you can start the disclosure process. PCAF publishes all disclosure documents to their website here: [Financial institutions taking action: disclosures and commitments](#). PCAF also provides [best practice examples](#) for each asset class. These best practices are helpful sources for inspiration for future, and more in-depth, data disclosures.

PCAF and Guidehouse recommend complete transparency throughout the disclosure process. If your institution has deviated from PCAF's methodology during the data collection or calculation processes, you should describe these differences and reasoning within the disclosure report. You may also wish to play with visualizations by sector, geography, emission intensity, or business type.

PCAF Disclosure Process Summary:

1. Sign the PCAF commitment letter
2. Register for PCAF emission factor database credentials using your company email address for verification purposes
3. Read the PCAF Standard and other resources
4. Determine your CDFI's available data within internal databases
 - a. Which asset classes will you be evaluating?
 - b. What equations will you use? (Choose the equations with the highest data quality score possible).
5. Download the relevant PCAF emission factor datasets by asset class⁶
 - a. Filter the data (as required)
 - b. Download the data to Excel
 - c. Repeat for each asset class
6. Calculate each loan or deal's emissions using PCAF equations.
 - a. Separate Scope 3 from Scopes 1 and 2
7. Sum the financed emissions from each asset class.
8. Double-check the calculations and send a sample from each asset class to the Guidehouse TA team (make sure to follow the guidelines at the end of Step 4)
9. Write report and disclose findings.

⁶ Please note that only 50,000 rows of data can be downloaded at a time from the PCAF emission factor database

Contact Information

Below are the current contacts for PCAF-related questions at our institutions.



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Acknowledgements

The Vermont Community Loan Fund was the first CDFI to use the PCAF process to disclose its financed emissions. Thanks to Jake Ide and the VCLF team for blazing the trail!

Guidehouse, PCAF's Secretariat, is the primary point of contact for CDFIs undertaking the disclosure process. We appreciate the time that Guidehouse team members have spent with us as we've navigated the process of implementing a GHG accounting practice at our CDFIs.

We're grateful for the hard work that our interns Lizzy Kaplan (CEI), Olivia Merritt (Self-Help) and Anna Takis (PCAP) undertook to guide our organizations through the PCAF process. Breaking new ground is always a challenge, and they were patient and determined every step of the way.

Linnea Patterson, Coastal Enterprises, Inc.

Rick Larson and Hannah Vargason, Partner Community Capital

Melissa Malkin-Weber, Self-Help Credit Union

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Appendix A: Sample Calculation for Estimated Energy Consumption

Note: This is an alternative way to estimate CRE emissions – this methodology does NOT use the PCAF emissions factors to calculate emissions.

Required Conversions:⁷

1 kWh = 3412.14 BTU

1 metric ton = 2204.62 lbs.

Step 1: Convert BTU/sq. ft. to kWh

Units	BTU/sq. ft.	kWh/sq. ft.	Total kWh
Equation and variables	Sourced from energy database ⁸	BTU/3412.14	kWh/sq. ft. * borrower building sq. ft.
Example	120,000	120,000/3412.14 = 35.17 kWh/sq. ft.	35.17 * 43,000 = 1,512,310 kWh

Step 2: Calculate Lbs. CO_{2e}/kWh

eGRID GHG Emission Factor ⁹	Lbs. CO ₂ /kWh	Lbs. CH ₄ /kWh	Lbs. N ₂ O/kWh	Lbs. CO _{2e} /kWh
Source	2019 eGRID SummaryTable	2019 eGRID Summary Table	2019 eGRID Summary Table	EPA carbon equivalency equation: CO ₂ + (CH ₄ *25) +(N ₂ O*298) ¹⁰
Example (North Carolina)	0.675	0.000058	0.000008	0.675 + (0.000058*25) + (0.000008*298) = 0.679 Lbs. CO_{2e}/kWh

Step 3: Convert Lbs. CO_{2e}/kWh to CDFI's metric tons CO_{2e}

Units	MTCO _{2e} /kWh	Total MTCO _{2e}	MTCO _{2e} attributed to CDFI
Equation	Lbs./2204.62	MTCO _{2e} /kWh*kWh	(Outstanding balance/ appraisal value) * total MTCO _{2e}
Example	0.679/2204.62 = 0.000308	0.000308*1,512,310 = 466 MTCO _{2e}	(\$3,679,380/\$15,263,155) * 466 = 112 MTCO_{2e}

⁷ https://www.rapidtables.com/convert/energy/kWh_to_BTU.html & <https://www.inchcalculator.com/convert/metric-ton-to-pound/>

⁸ Energy Star Portfolio Manager Technical Reference: <https://portfoliomanager.energystar.gov/pdf/reference/US%20National%20Median%20Table.pdf>

⁹ EPA resource that provides data on the environmental characteristics of electric power generated in the United States: <https://www.epa.gov/egrid>. This resource only calculates emission factors for 3 greenhouse gases, whereas PCAF covers the 7 gases mandated under the Kyoto Protocol.

¹⁰ 25 and 298 refer to the warming potential of methane and nitrous oxide relative to carbon dioxide, as defined by the EPA:

<https://www.epa.gov/ghgemissions/understanding-global-warming-potentials#Learn%20why>

Appendix B: Building Number Assumptions for Affordable Housing Calculations

The following methodology was used by multiple members of the PCAF CRE Working Group to calculate financed emissions for affordable housing loans.¹¹ The PCAF CRE database does not have a data level for residential housing. However, PCAF’s mortgage asset class does have emission factors for residential buildings that are based on 1 housing unit, 2-4 units, 5+ units, or mobile homes (see below). Therefore, mortgage emission factors were used in the CRE equations to calculate financed emissions for affordable housing deals.

<u>Data level 1</u> <u>information</u> ▼	<u>Data level 2</u> <u>information</u> ▼	<u>Data level 3</u> <u>information</u> ▼
Residential buildings	Single-family house (SFH)	Single-family house (SFH) detached
Residential buildings	Single-family house (SFH)	Single-family house (SFH) attached
Residential buildings	Multi-family house (MFH)	Apartments in buildings with 2–4 units
Residential buildings	Multi-family house (MFH)	Apartments in buildings with 5 or more units
Residential buildings	Mobile homes	Mobile homes

For affordable housing loans, sometimes the number of housing units was unknown (i.e., not captured in the CDFI’s database). In order to estimate housing units for these loans, the **average** and **standard deviation of the loan amounts** were calculated from projects that *did* have known unit numbers of 2-4 or 5+.

- If the loan size (\$) was less than the 2–4-unit average, 2 units was assumed
- If the loan was more than the 2–4-unit average and within the 2–4-unit standard deviation, 4 units was assumed.
- For 5+ unit assumptions: if the loan was less than the 5+ unit average, 5 units was assumed.
- If the loan was more than the average loan size plus standard deviation of 2-4 units, 5+ units was assumed.
- There were no unknown loans whose loan amount was more than the 5+ unit average.

¹¹ This methodology is not endorsed by PCAF, as it was developed as a work-around to the limited categories of the CRE emissions factor database.