

Tracking and Reporting Emissions Impacts: A Guide for CDFIs

In collaboration with



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1. Purpose of this document

This document guides Community Development Finance Institutions (CDFIs), Green Banks and other lenders through the world of measurement and verification (M&V), tracking and reporting for clean energy loans for multifamily and commercial properties. It is intended to:

- Demystify M&V concepts;
- Show pathways for CDFIs and other lenders to incorporate these concepts into their business operations;
- Share best practices for the M&V, tracking and reporting of impacts related to energy, water and carbon reduction in buildings.¹

2. Key Takeaways

- Carbon reporting can be accomplished with typical building utility data.
- M&V is more than just utility benchmarking, and requires information on projects and loans.
- A successful tracking and reporting program needs intentional design and administration.
- Successful M&V requires collaboration.
- This has been done before! Learn from others' experience—no need to start from zero.

3. Introduction

Figure 1 shows HPN's essential elements for CDFIs to consider in developing a successful longterm clean energy lending strategy. Tracking and reporting is the mechanism for both internal and external stakeholders to understand the impacts, successes and challenges of this lending strategy. These insights then feed back into a periodic review of the lending strategy and activities, informing future program improvements and operation.

While the internal mechanics of M&V are well known and documented, it takes intention to incorporate them into a CDFI's tracking and reporting process. For an M&V program to be effective, information must be distributed to and collected from borrowers at multiple stages in the loan process.



for a Clean Energy Lending Strategy

¹ Though concepts in this document will indeed be useful toward their end, is not meant to not cover tracking and reporting of other program requirements such as LIDAC, BABA, Davis-Bacon Act, etc.



4. Key Terms

This section defines key terms as they are used in the context of this guide.

Tracking and reporting: The mechanism for both internal and external stakeholders to understand the impacts, successes and challenges of a lending strategy.

Measurement and verification (M&V): The collection of processes that enable quantification of savings from projects to reduce energy and water consumption, utility spending, and carbon emissions in buildings.

Utility tracking: Collecting energy and water usage data from a property's utility bills, storing in a database, and analyzing the data to see trends.

Benchmarking: Annual assessment of tracked utility data for the purposes of comparing a property to itself, similar properties, and building performance standards.

Commissioning: The process of assuring that all systems and components of a building are designed, installed and verified to operate according to the project requirements.

Greenhouse Gas (GHG) Emissions: The outputs of burning fuel either on a property (site emissions) or at an electricity generating plant (source emissions) that are considered to change Earth's climate and/or cause health problems. Includes CO₂ (carbon dioxide), nitrogen oxides (NOx), sulfur dioxide (SO₂), methane (CH₄), and nitrous oxide (N₂O).

CO2e: Carbon dioxide equivalent, which is a measure of the equivalent amount of CO₂ emissions with the same global warming potential, from a set of a emissions which may include CO₂ and other gases. This is the most common measurement of total emissions and is normally stated in metric tons.

5. Why track carbon and utilities for clean energy loans?

Broadly, lenders track and report on clean energy loans to support both compliance and impact measurement. The data needed for each may be partially overlapping. The specific rationale may also vary by stakeholder. For instance:

- For **Borrowers** receiving preferential loan terms or other benefits based on specific commitments related to energy or water efficiency, decarbonization, or sustainable building, tracking and sharing certain information may be a requirement of the loan.
- Lenders have an interest in ensuring that loans comply with energy and carbon related requirements, and may be required to report on loan compliance and impacts to **capital sources**.
- **Lenders** and other stakeholders need to track impacts to understand the effectiveness of clean energy loans in supporting their mission.
- Lenders, Borrowers and Capital Providers may find additional benefit from tracking that supports marketing, brand, annual reports, future fundraising, etc.



6. Assessing a Loan's Emissions Impact

How are emissions calculated?

Loans that support decarbonization may require reporting on reductions in CO₂ and other air pollutants. Since building energy consumption (including onsite use of electricity, gas, propane, fuel oil, etc) is the primary source of operational building emissions, these impacts can be derived from utility bill data. This is a relatively simple calculation which requires utility data and referencing appropriate coefficients² to convert energy to emissions.

For example, the calculation for a building using electricity and gas is as follows:

Carbon Emissions = Utility Consumption × Carbon Coefficient

The carbon coefficient is utility dependent and, in the case of electricity, region dependent. So the carbon coefficient for natural gas in Dallas is different from that for electricity in Dallas, and the carbon coefficient for electricity in Dallas is different from that for electricity in Pittsburgh.

Turning Emissions Calculations into Loan Impact

For loan impacts on emissions, we calculate the difference in emissions between the pre-project (known as 'baseline') and post-project periods.

Carbon Emissions Savings = Carbon Emissions $_{pre-project}$ – Carbon Emissions $_{post-project}$

For retrofits to existing buildings, the baseline emissions can be determined from actual utility bills, and for new construction, the baseline is determined by modeling the building with the minimum code-compliant energy performance. In both cases, post-project emissions are determined from actual utility bills.

For project loan qualification, where the actual post-project utility bills are not available, utility savings are estimated by calculating physical changes or by guaranteeing that a performance requirement will be met.

Other impacts and assessment methods

It is common for a program or loan product to require reporting on impact besides emissions or utility consumption, such as the number of people benefited and asthma-related pollutant reduction. For the former, simple property characteristics like bedroom-per-unit breakdown can be used along with standard references for occupancy rates. For the latter, individual emissions coefficients are available to derive the amount of specific pollutants related to health impacts (e.g. the relevant particulate matter from building emissions that may be associated with asthma rates).

² https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator-calculations-and-references



7. Measurement and Verification Concepts

In determining a project's impact, several M&V concepts, each of which answers different questions and may be useful for different loan scenarios, are worth understanding.

Project Scope

Scope verification seeks to quickly determine the loan appears to have been spent in accordance with its obligated impact requirements. It checks for scope or installation, but not performance.

Examples:

- Checking the final project plans to confirm that efficient equipment is specified.
- Checking consultant reports to see if a project is expected to qualify for a green building certification.
- Walking a site or reviewing photographs to determine if certain measures were installed.

Project Performance

Performance verification seeks to assess if the expected impact-generating measures are installed and operating correctly, and that the project as a whole is meeting its impact expectations.

Equipment and System Performance Verification

Many measures intended to lead to high-performing buildings are dependent on installation quality, and, in some cases, their performance can actually be measured, rather than just verifying if something was installed. **Equipment- and system-level performance verification** typically happen during the commissioning phase of construction.

Examples:

- Measuring ventilation air flow to determine if ventilation system is operating according to requirements.
- Measuring air leakage to determine if building is air sealed according to requirements.
- Measuring indoor-air quality to determine if space-conditioning systems are meeting temperature and humidity requirements.
- Measuring indoor-air quality for VOC's or pollutants.
- Measuring solar PV generation.

This type of work is typically done by the commissioning agent. It should be required to have this role, usually fulfilled by a specialized engineering consultant, on the project team.

Utility Benchmarking

Whole-property performance verification typically happens through utility benchmarking once the building is operating. This approach helps determine if the property is meeting energy and emissions targets.

Benchmarking is typically done by a third party who has developed systems for collecting utility bill data and can generate appropriate reporting for owners, lenders, and, local government requirements. While hiring a benchmarking company is not strictly required for a borrower to obtain and submit benchmarks, most programs have historically required a service be used to improve data quality and consistency.



8. Roles in the M&V Process

Effective M&V requires a multidisciplinary team with each member clear about their role and expectations in the process. Following is a summary of each role's responsibilities.

Lender: Makes obligations clear. Holds parties responsible for loan obligations.

Borrower: Conveys loan obligations to design and construction teams.

Design Team: Delivers design documentation that reflects loan obligations. Works with commissioning agent to specify equipment and establish commissioning checklists for construction team.

Construction Team: Builds project according to design documentation. Interfaces with inspectors and commissioning agent to document work and verify performance.

Commissioning Agent: Works with owner, design and construction teams to specify project criteria and equipment/system testing requirements. Verifies equipment and system performance according to requirements.

Benchmarking Provider: Collects and stores utility data, analyzes data and generates required reporting.

Consultants to Lender: Help design, administer and perform the tracking and reporting process.

9. Paying for M&V

Projects that are eligible for clean energy loans may already have a design and commissioning team that can provide the data required for the scope, equipment, and system performance verification described above. The loan obligations should make clear the types of technical assistance needed for the project. Some lenders prefer to require the borrower to hire the requisite team and services, while others may contract to perform their own verification, similar to a bank progress inspection before disbursing funds.

For utility benchmarking, the borrower must be responsible for providing data access since they control utility accounts. A qualified benchmarking service should be used to ensure data quality and consistency (rather than Borrower self-reporting). Historically, some green financing programs have centrally procured this benchmarking service while others have asked Borrowers to contract with their own benchmarking providers, often from an approved vendor list. Where possible, the lender should centrally procure benchmarking support for all Borrowers to ensure consistent data quality, maximize portfolio coverage and so the lender can have all their impact measurements in the same data platform.

Analyzing and reporting utility and project data in the format required by the lender and including all required data points should be expected to involve some additional work over standard benchmarking services (e.g. those contracted by the Borrower for local energy disclosure compliance).

10. Data Collection

Successful tracking and reporting requires an intentional approach to data collection and storage.

For all data collection points it is critical that the lender identify a method for not only collecting but also storing and quality controlling the data. Without this organized approach to data storage and quality control,



the information will not be readily available to answer key questions on loan compliance and impacts – which were the original motivation for tracking. Even required reporting will not be thorough or reliable if there is not a thoughtful approach to data collection and consistent program communication and administration. Borrowers and other stakeholders will not report data reliably if they do not understand the requirements and if there is not a clear and practical way of doing so.

Commonly tracked data points can be broken down into a few categories: project/loan information, property/ building information, utility information, inspection results, resident surveys, and compliance status. The data points may be collected through a variety of approaches including surveys and intake forms, utility data collection services, reviews of project documentation, onsite inspections, etc. Each lender will need to determine the data and tools required that reflect their organizational needs, existing tools, and specific loan products.

11. Setting up a tracking & reporting program

For a lender getting started with a clean energy lending program, the following steps are recommended to put in a place a practical tracking and reporting program.

- 1. Identify key loan compliance and loan impact metrics.
 - a. Ideally this list should be kept as short as possible and should include the metrics that must be reported to funders and that are key for you, as the lender, in understanding and managing your business and impact over time.

To report on	A CDFI should track
Compliance with eligibility requirements for carbon or energy savings	Projected energy or carbon savings at the time of underwriting
Compliance with affordability requirements	Proof of affordability from each loan
Compliance with loan terms for a rehab loan	Completion of required building upgrades
Impact in terms of number of properties, buildings, apartments, people, geographies reached.	Basic loan information on building size, location, populations
Carbon emissions savings impacts	Building energy consumption before and after a building upgrade
Impacts on utility expenses for owners and residents	Building utility spending for owners and residents before and after a building upgrade
The types of upgrades, measures or green design that are most effective	Detailed scopes of work alongside pre- and post-upgrade utility data
Health impacts on residents from upgrades	Demographic information on residents, resident perceptions of health risks before and after upgrades

2. Identify which data must be collected to report on your metrics.



3. For each loan scenario, establish which party provides the required data, which stage the data is collected at, and who pays for it.

- a. Pay special attention where information is required beyond the term of the loan—is this included and explicit in the loan obligation?
- b. What happens if a Borrower fails to provide required information?

For example, for a retrofit construction loan, data might be collected at the following stages:

Data	Loan Stage Collected
Project clean energy commitments	Application
Baseline carbon emissions	Underwriting
Retrofit scope verification	Underwriting
Retrofit performance verification	Servicing
Ongoing utility data	Post-repayment

4. Establish roles related to tracking and reporting.

- a. Which departments or individuals are responsible for overseeing data collection, storage, analysis and reporting?
- b. Which other departments or organizations may need to work with them to be successful?
- c. Where will you need outside help (e.g. on utility data collection, inspections, data platforms or services)? Will this outside help be paid for centrally by the lender or by Borrowers?
- d. What is the escalation process or enforcement mechanism if borrower does not provide required data and who oversees it?

5. Create a process map or description which outlines the information flows at every step in the loan process. The process map should answer questions like:

- a. When does the Borrower provide key types of information to the lender?
- b. What are the expectations in terms of timeline for data delivery?
- c. Where is the data-delivery requirement in relation to the loan stage?
- d. If an outside vendor or other stakeholder is involved with data collection and reporting, when do they enter the process, what information do they collect?
- e. Where is data stored and when is reporting and analysis delivered?
- 6. Develop guides and training to ensure all parties understand the loan expectations and can perform their assigned roles within the tracking and reporting process.
- 7. Launch the tracking and reporting with clear communication to all parties that the process is starting.



8. At regular intervals, review participation or compliance metrics to see how complete and accurate the reporting is.

a. Adjust as needed by changing assignments, updating training or providing feedback when course correction is needed.

12. Integrating New M&V Processes Into Lending Operations

Several steps shown above are new to a lending program. Here we list specific new documents and process items in relation to the loan stage.

	Outreach	Marketing that includes clean energy loan requirements
•	Application	 Review project description for clean energy loan applicability Confirm project scope meets clean energy loan criteria Baseline utility data collection
•	Underwriting	Additional review for clean energy loan scopeApproval memo for clean energy loan scope
.	Commitment	 State additional obligations for clean energy loan, including those still required after repayment Include utility M&V requirements Include scope-verification requirements
•	Closing	 Send informational reminders to borrower parties about additional loan requirements Begin utility data setup process
Þ	Servicing	 Scope verification Performance verification Review disbursal requests Utility data collection and analysis Project impact reporting
	Post-repayment	 Many of the items in 'servicing' may occur after repayment, depending on if loan is predevelopment, construction, or term.

Figure 2: New process requirements by loan stage



13. Principles for Tracking and Reporting Success

While individual lenders may have additional requirements specific to their organization, a successful M&V practice should generally follow these principles:

- **Balance reporting rigor with making it easy** for Borrowers to comply. A reporting plan that is overly burdensome or not adequately supported by the lender is likely to lead to borrower frustration without producing useful information.
- Hands-on assistance is critical to get good results don't expect self-reporting. Structured outreach with escalation processes and clear data standards is key. Flexibility in data sources is necessary for national programs that span many properties and utility territories.
- Procure the right help and tools.
 - Utility data collection is non-trivial and requires an experienced service and platform to generate useful data and insights.
 - Onsite inspections are typically necessary for accurate data on physical building conditions and equipment.
 - Data should be stored in a structured database. Spreadsheets or online surveys can work well for collecting simple data.
 - A CRM or other flexible project management tool can be invaluable for tracking Borrower communications and program status.
- Successful tracking requires education and reinforcement. Create guides, training material for all stakeholders involved in tracking so requirements and process are clear. Periodically update, repeat, republish, redeliver trainings so new staff can learn the process and old staff can get refreshed. Assume a percentage of Borrowers will not comply with reporting requirements and create a process for escalation or additional assistance as needed.
- **Tailor reporting and analysis to audience needs.** Utility data and project status is the raw material for impact tracking; plan for analysis and reporting to gain the insights the program needs. Different analyses may be useful for internal program learning and external stakeholders. Make sure reporting is tailored to the appropriate audience and delivered in a format that is accessible even if the underlying data is the same.

