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# What Financial Institutions Need to Consider for Measuring and Monitoring the Decarbonization Impact of Energy Efficiency Loans

*WHITE PAPER*

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**With support from:**

EVO's IEEFP Committee

**DECEMBER 2023**

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## White Paper

*In memory of our friend Adalberto Padilla, who inspired the creation of this group.*

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## INTRODUCTORY CONCEPTS

All human activities require, to some extent, the use of energy, usually in the form of fossil fuels – and therefore carbon – contributing to climate change. Decarbonization refers to reducing the amount of carbon used when conducting an activity. Replacing inefficient appliances at homes or upgrading outdated equipment in industries, for example, not only reduces energy consumption and generates economic savings but also contributes to the decarbonization of society and reduces its environmental impact. The most common form of measuring the decarbonization efforts and the climate change impact of an activity is in the amount of greenhouse gases (GHG)<sup>1</sup> that the activity emits into the atmosphere.

Financial institutions worldwide are delving into understanding their impact on climate change due to societal demands, corporate principles, and legal requirements. This has been spurred from countries and regions adopting the recommendations of the Task Force on Climate-Related Financial Disclosures<sup>2</sup> (TCFD) or when considering becoming signatories to the Net Zero Banking Alliance or the Science Based Target Initiative, or perhaps when these entities seek to have their portfolios aligned with the Paris Agreement. Decarbonization also brings new potential business for financial institutions as it contributes to their GHG emissions reductions goals, helps them in meeting environmental social and governance (ESG) criteria, and also assists them in addressing the growing sustainability requirements of their investors, regulatory authorities, and governments.

Energy efficiency investments are a proven mechanism of decarbonization and are usually profitable investments. However, determining a loan operation's energy savings or avoided energy consumption is uncertain because savings represent the absence of energy use and thus cannot be directly measured. Instead, savings are determined and quantified by comparing measured consumption before and after the implementation of a project. The same logic applies to avoided emissions.

The estimation of emission reductions from energy efficiency measures or projects can be quantified by taking the reference of a baseline (energy consumption before the measure was implemented or the level of consumption that would have been expected without the measure) and comparing it with the energy consumption after the implementation. This difference in energy consumption is then multiplied by an emissions factor of the type of energy being saved (electricity from the grid or fuel) or, in the case of a fuel switch, the emissions factors of the fuels before and after the intervention<sup>3</sup>.

In that context, measurement<sup>4</sup> and verification (M&V) is a powerful management tool that increases confidence in reported energy savings by reducing uncertainty and safeguarding against potential

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<sup>1</sup> Expressed in tons of CO<sub>2</sub> equivalent (CO<sub>2</sub> eq or, in simplified terms, “carbon”).

<sup>2</sup> Concurrent with the release of its 2023 status report on October 12, 2023, the TCFD has fulfilled its remit and disbanded.

<sup>3</sup> This emission reduction is classified as “avoided emissions.” It can be reported in a section apart from scopes 1 to 3 (see section 1.1 of this white paper) to demonstrate the contribution the energy efficiency measure makes to decarbonization.

<sup>4</sup> Measuring shall not be confused with monitoring. Measuring is a compulsory process that includes tools and involves uncertainties. Monitoring is a routine activity that proves a project is operating as intended with a process of checking using defined methods, procedures, tests, and other evaluations.

misrepresentation. It also helps provide a solid basis for risk mitigation mechanisms in energy efficiency financial schemes such as energy savings insurance (ESI).

This white paper provides financial institutions with an overview of the existing protocols to measure decarbonization in energy efficiency investments, the aspects they should consider when selecting a decarbonization protocol for their existing and future portfolios, and more generally, the relevance of properly tracking climate change impact in loan operations.

## 1 EXISTING PROTOCOLS TO MEASURE DECARBONIZATION IN ENERGY EFFICIENCY

The landscape of methodologies and frameworks for measuring and reporting GHG emissions has flourished in the past few years. This discussion focuses on the three most relevant in energy efficiency for financial institutions: the Greenhouse Gas Protocol<sup>5</sup> (GHG Protocol), the Partnership for Carbon Accounting Financials<sup>6</sup> (PCAF), and the International Performance Measurement and Verification Protocol<sup>7</sup> (IPMVP®).

### 1.1 The GHG Protocol

The GHG Protocol is a widely recognized and used standard for accounting and reporting GHG emissions. It provides businesses, governments, and organizations with a comprehensive framework to track their carbon footprint. The GHG Protocol consists of a set of standards that help organizations to identify and quantify GHG emissions, categorizing them into three main categories or "scopes":

Scope 1: Direct emissions from owned or controlled sources, such as on-site fuel combustion.

Scope 2: Indirect emissions associated with purchased electricity, heat, or steam.

Scope 3: Indirect emissions from sources not owned or controlled by the organization, including emissions from the supply chain, employee commuting, and business travel.

The GHG Protocol calls for an intensive data process, and depending on the data availability, financial institutions can potentially use it to estimate the GHG emissions of their operations (Scope 1 and Scope 2) and also their loan portfolios, which falls under Scope 3 (since these emissions are indirect, from the operations of companies that they finance). These indirect (financed) emissions are estimated to be 700 times larger<sup>8</sup> than those from banks' operations (Scope 1 and Scope 2).

### 1.2 The PCAF Methodology

In response to the demand for a global, standardized approach to measuring and reporting financed emissions of loans and investments, the PCAF developed a specific methodology, the Global GHG Accounting and Reporting Standard, specifically for the financial industry<sup>9</sup>. The financial sector has almost unanimously

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<sup>5</sup> <https://ghgprotocol.org/>

<sup>6</sup> <https://carbonaccountingfinancials.com/en/>

<sup>7</sup> <https://evo-world.org/en/products-services-mainmenu-en/protocols/ipmvp>

<sup>8</sup> <https://www.cdp.net/en/articles/media/finance-sectors-funded-emissions-over-700-times-greater-than-its-own>

<sup>9</sup> <https://carbonaccountingfinancials.com/standard>

adopted the PCAF methodology to account for and report on their financed emissions. For example, for loans made to a given company, the methodology<sup>10</sup> defines that the *financed* emissions are a proportion of the total emissions of that company. An attribution factor represents this proportion, a relation between the outstanding amount of the loan and the company's full value. The calculation of this attribution factor and the financed emissions attributed to the bank's Scope 3 emissions is subject to the availability and quality of data the bank has – i.e., the total GHG emissions of the company (loan recipient), the total company value (equity and debt), and the outstanding loan amount.

Given that data on some companies' GHG emission are not widely available, PCAF works with databases such as EXIOBASE that provide proxies for companies' conversion factors (CO<sub>2</sub> eq per EUR or USD) based on the type of activities in which they engage (e.g., mining, food service, education, etc.). There are proxies to calculate emissions of scopes 1 to 3 for different activities and regions of the world. Although the PCAF methodology can provide a gross estimate at a portfolio level, it cannot inform the specific actual impact of financed energy efficiency measures or projects due to its use of proxies and the fact that it does not differentiate the specific corporate purpose of the loan or financial instrument.

### 1.3 The International Performance Measurement and Verification Protocol (IPMVP)

The IPMVP is the world's paramount M&V protocol and has been used for over 25 years by energy services companies (ESCOs), governments, and utilities worldwide. M&V is the process of planning, measuring, collecting, and analyzing data to verify and report energy savings resulting from implementing a single or several energy efficiency measures at a facility.

Different M&V activities must take place before, during, and after implementing an energy efficiency measure per the IPMVP. These steps are detailed in an M&V plan, and the resulting outcome (energy savings quantification) is documented in periodic (often annual) M&V reports. Savings commonly quantified include electricity consumption, electric demand, natural gas and other fossil fuel consumption, as well as water usage. M&V reporting may also address any *generated* energy, as well as the carbon emissions or other pollutants of concern from the project.

The IPMVP contains four M&V options to determine savings. Two consider specific energy efficiency measures in isolation (e.g., a motor or a chiller replacement), and two measure savings at the entire facility level where multiple efficiency measures are implemented (e.g., a school or a hospital). IPMVP methods quantify energy savings in energy units saved at the site by energy type and do not consider the impacts of site-level energy savings at the energy *source*, which may differ due to generation, transmission, and distribution losses.

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<sup>10</sup> PCAF (2022). The Global GHG Accounting and Reporting Standard Part A: Financed Emissions. Second Edition.

## 2 ASPECTS FINANCIAL INSTITUTIONS NEED TO CONSIDER WHEN MONITORING DECARBONIZATION IMPACT

When planning and monitoring the impact of decarbonization on energy efficiency investments, financial institutions should consider several factors in choosing the protocol that best suits their needs. Some basic questions that could help the bank in the decision-making process include a) why they want to monitor the decarbonization impact of loan operations or portfolios, b) who the audience of the results is, c) what type of information and level of accuracy they need, d) what resources are necessary to collect the required information, and lastly, e) whether the assessment will be a one-time exercise or become common practice for the bank. Each of these is addressed below.

**RATIONALE.** This is perhaps the most relevant initial question a bank should consider, as it will help define the other aspects. A bank could be interested in tracking individual loans' performances toward decarbonization goals over time as they could have financial implications, for example, in results-based finance programs. In other cases, the motivation could be to generate general sustainability indicators or measure progress towards decarbonization goals. In the first case, strict protocols would be needed, while in the second, the bank may use proxies based on aggregate information. Sometimes, banks are interested in measuring the impact of existing portfolios, which can be limiting, as it is not practical to request additional information from clients on approved loans.

**BENEFICIARY.** Various divisions of a financial institution can benefit from the results – e.g., sustainability, commercial, risk management, operations, etc.). However, there is usually a key user for whom the information is strategic, which should be the entry point for the bank to decide the type of protocol to be used. In cases where the primary motivation is driven by commercial indicators, such as in green loan operations based on positive lists of investments, using simple protocols can be more convenient as they usually do not require additional technical information from the applicant. More complex protocols would be needed in situations where the technical information needs to be evaluated by the fiduciary divisions, such as in concessional loans that require frequent reporting on climate indicators.

**ACCURACY.** This refers to the level of certainty required by a particular bank and a specific line of credit. For example, the impact of energy efficiency projects on decarbonization in the residential sector, such as the substitution of outdated refrigerators, can be managed at a high level and reported using surveys. On the other hand, the impact of replacing fossil fuels with more efficient ones in a specific location usually requires historical data and monitoring of the project performance during a certain period. Also, a single bank can have multiple green lines, each with different reporting requirements. Consequently, they might require multiple protocols and levels of accuracy.

**RESOURCES.** Information to monitor or measure the impact of decarbonization of a specific investment requires technical data that the financial institution normally does not collect. This poses a challenge and can force loan applicants, as well as the commercial officers of the banks, to collect and interpret information that does not fall in their area of expertise. This can also become a financial burden for both the applicant – especially if it is a small or medium enterprise, as they might need to hire consultants to collect the information – as well as for the bank, which will need to put in place the human, technical and IT infrastructure to collect and process the information.

**FREQUENCY.** A bank may be interested in just a one-time assessment, or it might consider decarbonization protocols a strategic move for climate-friendly investment. In the first case, using a simple protocol can be enough. In the second, the bank might consider integrating different types of protocols and decide which is the best for specific applications.

Ultimately, the decision on the type of protocols to be used for monitoring, measuring, and reporting the impact on the decarbonization of energy efficiency investments should be a corporate decision based on a cost-benefit analysis of the situation and requirements of all stakeholders involved. However, in the long run, most banks will likely be required to implement protocols to disclose their investment portfolios' impact and ongoing performance. In selecting a protocol, a key factor to consider is the risk of being labeled as a greenwasher, which might happen if it does not incorporate adequate monitoring or measurement requirements.

As discussed earlier, the GHG Protocol serves organizations primarily to account for and report their GHG emissions. PCAF helps financial institutions measure and report financed emissions of loans and investments using proxies at a portfolio level based on clients' activities. On the other hand, the IPMVP offers a more consistent approach to measuring and verifying carbon emissions reduction in a broad range of sectors, including different types of facilities, industrial applications, and renewable energy. The GHG Protocol and PCAF proxies use a top-down approach, while IPMVP has a bottom-up focus.

### **3 USE OF IEEFP AND IPMVP BY FINANCIAL INSTITUTIONS**

Energy efficiency projects reduce a company's operational expenses, increasing its cash flow and credit capacity. They also contribute to an organization's GHG emissions reductions and ESG goals. For financial institutions, financing of energy efficiency measures is a market opportunity for new debt products that improve customers' financial conditions while contributing to sustainability and green finance targets required by investors, regulatory authorities, and governments.

The International Energy Efficiency Financing Protocol (IEEFP) provides concepts and guidelines to credit officers to facilitate their understanding of the critical elements needed to evaluate and provide attractive energy efficiency project loans to facility owners, ESCOs, and other potential developers and implementers of energy efficiency projects. Neither IEEFP nor its companion protocol, IPMVP, require bankers and financiers to perform M&V calculations. Their goal is to facilitate the understanding and willingness of financial institutions to provide commercially attractive debt to energy efficiency projects by getting their credit risk and loan officers comfortable with proven energy efficiency technologies and the projects' abilities to generate long-term savings that can be reliably measured and verified. An adequately structured debt or lease instrument can significantly enhance the facility owner's or operator's ability to repay the energy efficiency loan, as well as any existing debt they may hold.

The IEEFP provides a structured framework to make financing energy efficiency easier for financial institutions. The IPMVP's M&V options rest upon six fundamental principles: accuracy, completeness, consistency, relevance, transparency, and conservativeness. Uncertainty may arise from M&V activities such as metering, modeling, sampling, estimated values, interactive effects, or data collection and analysis. The IPMVP guides users with proven scientific and statistical tools for quantifying, evaluating, and reducing some of these sources of uncertainty. Minimizing the uncertainty on savings quantification maximizes the quality



of reported savings and potentially increases their value. This, in turn, enhances the reliability and value of the associated GHG emission reductions.

## **CONCLUSION**

When selecting a protocol for monitoring the decarbonization impact of energy efficiency investments, financial institutions should evaluate aspects such as rationale, beneficiaries, accuracy, frequency, and resources needed. This paper presents three approaches using different levels of effort and resources from a top-down or a bottom-up focus. We suggest that the combined use of the IEEFP and the IPMVP offers a solid framework for financial institutions interested in measuring, verifying, and reporting the impact of their financing activity, while also allowing them to properly track decarbonization efforts and the climate change impact of investments at the individual loan level.



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