
Mid-term Evaluation and Learning Exercise of the PotenzializEE Project Brazil

Project Evaluation and Learning Exercises for the Mitigation Action Facility

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Final Report

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Preface

The Mitigation Action Facility is a joint initiative of the German Federal Ministry for Economic Affairs and Climate Action (BMWK), the UK's Department for Energy Security and Net Zero, the Danish Ministry of Climate, Energy and Utilities (KEFM), the Danish Ministry of Foreign Affairs (MFA), the European Union and the Children's Investment Fund Foundation (CIFF). The Mitigation Action Facility evolved from the NAMA Facility, which was established in 2012. The Mitigation Action Facility's vision is to accelerate decarbonisation to keep temperature rises to below 1.5 degrees Celsius by financing measures that shift priority sectors in a country towards a sustainable, carbon-neutral pathway. All projects with an overall duration of more than three years are subject to a mid-term and a final evaluation and learning exercise.

The Technical Support Unit (TSU) functions as the secretariat of the Mitigation Action Facility. The TSU commissioned AMBERO and Oxford Policy Management to conduct mid-term and final Evaluation and Learning Exercises (ELEs). Each ELE is conducted using the same Theoretical Framework (FW), which involves the application of a document review, participatory workshops, and stakeholder interviews to collect evidence about projects' results and lessons analysed using a Theory-based approach centred on the use of contribution analysis reinforced by elements of process tracing.

This document presents the findings of the **mid-term ELE of the Transformative Investments for Industrial Energy Efficiency (PotencializEE)**. The report has been reviewed by Luca Petrarulo (Technical Lead, ELE programme). For further information, please contact vera@ambero.de.

Executive summary

The project Transformative Investments for Industrial Energy Efficiency (PotencializEE) is implemented in Brazil by the Gesellschaft für Internationale Zusammenarbeit (GIZ), with several relevant national partners including the Federal Ministry of Mines and Energy (MME), the National Development Bank (BNDES), the Ministry of Development, Industry, Commerce and Services (MDIC), and the Energy Research Office (EPE). Concrete measures are implemented in the state of Sao Paulo together with the National Service for Industrial Learning (SENAI) and the Sao Paulo State Financial Institution *Desenvolve SP*.

The project's planned implementation period is 54 months (07/20 – 12/24) and it is funded by a Mitigation Action Facility grant of EUR 18.3 million (EUR 7.1 million in technical assistance to manage the project and develop capacities of SMEs and energy professionals and EUR 11.2 million in financial assistance to set-up and operate a guarantee fund for energy efficiency solutions).

The project strategy addresses Brazil's industrial sector's greenhouse gas (GHG) mitigation potential through energy efficiency (EE). The Brazilian industrial sector contributes 18% of the national energy related GHG emissions and mainly comprises (99%) of micro, small and medium enterprises employing a fifth of the total national workforce. The state of Sao Paulo is Brazil's most important industrial hub, contributing 32% of Brazil's gross domestic product (GDP), and it is home to most of the country's energy service companies (ESCOs).

The project intends to mitigate 1.092 MtCO₂e emissions directly through EE measures in 425 SMEs in Sao Paulo. Project outputs entail developing the capacities of energy professionals and mobilising EUR 80 million in investments backed by public and commercial financial institutions.

In accordance with its Terms of Reference, this mid-term evaluation and learning exercise (ELE) seeks to address the following General ELE Questions (ELEQs):

- Has the project been achieving its results?
- Has the project started to trigger transformational change?
- What has been learnt from the project so far?

The mid-term ELE comprises four main phases: inception (June-August 2023), fieldwork (August 2023), analysis (August-September 2023), and reporting (October-November 2023). During the 11-day mission (August 2023), the ELE team conducted 23 qualitative, semi-structured interviews in Sao Paulo and Brasilia and a focus group discussion with a sample of representatives from three SMEs participating in the project.

ELE respondents confirm that **the project is succeeding in breaking the cultural barrier composed of risk aversion and lack of awareness about cost savings and improved production processes associated with EE solutions**. The project's communication and awareness strategy has scored significant success in recruiting over a thousand SMEs and engaging manufacturers and suppliers of the best internationally available energy-efficient technologies. Thus, the project's catalogue of efficient technologies is likely to become industry standard in Brazil.

Nevertheless, the awareness and technical materials are only beginning to result in viable EE projects for SMEs. The current project pipeline results from the more intense involvement of the project team (GIZ and SENAI) directly with SMEs and ESCOs, in reaction to the initial slow pace and uneven quality of ESCO-developed EE audits. **While at the time of the mid-term ELE, some projects (out of the 301 audits) seemed to be moving forward, the project still needs to cover much ground to reach its intended target of 425 implemented EE projects.**

Regarding policy measures to support the upscaling of EE support nationwide, the project has not succeeded in introducing SME-friendly measures into the federal flagship efficiency programme, Energy Efficiency Program (PEE – from the Portuguese abbreviation). **PEE's focus on electric efficiency does not catalyse the thermal efficiency projects endorsed by the project.** Thermal energy projects have a much greater mitigation potential than purely electrical projects, given the renewables share of the Brazilian energy mix. Yet, **the project has designed two national programmes¹ supporting EE, expected to mobilise at least an additional EUR 39 million, that most informed ELE respondents expect to effectively upscale PotencializEE's approach beyond the state of Sao Paulo.** Moreover, the project has provided technical assistance to design the new guarantee fund supporting EE at the federal level: *FG-Energia*.

PotencializEE has been only moderately successful in addressing the financial barriers to EE implementation identified in the project proposals. The expected "flow of financing under more attractive conditions for deploying industrial EE solutions leveraging public and private finances" resulting from a project-supported guarantee fund was **framed in the favourable macroeconomic context at the project design time.** According to plan, the project has invested significant resources in setting up the Sao Paulo State Guarantee Fund for Energy Efficiency Development (FAEE). However, **FAEE has faced significant delays** due to administrative and legislative procedures compounded by misunderstandings with the state government and the project's main financial partner, *Desenvolve SP*. However, **all stakeholders involved agree that these issues have been resolved**, and the fund's operation is guaranteed to start before the end of the year. This should **finally eliminate or significantly diminish the financial barrier faced by the project-supported energy efficiency SME initiatives.** Moreover, thanks to the project's engagement, some commercial banks are starting to consider the possibilities of EE projects while remaining cautious before committing to a path that has yet to show the same proven results as renewable energy. Still, the suboptimal performance of the federal fund (*FG-Energia*), hindered by the current high interest rates and transaction costs, should serve to caution expectations should the current unfavourable macroeconomic context persist.

Despite the setbacks, provided continuous support from the federal and state government, PotencializEE is likely to boost the number of successfully implemented EE projects in SMEs in Sao Paulo and beyond, **especially if the expected decrease of interest rates materialises.** The first successful projects funded through public risk-sharing facilities (*FG-Energia* and FAEE) can convince an increasing share of Brazil's SMEs to engage with thermal EE and catalyse private finance. Given the project's delays and the time needed to develop, implement, and verify results from EE projects, the

¹ PROCEL, which will fund the up-scale of PotencializEE in five further states, and SEBRAE's Brasil Mais Produtivo. See reference <https://www.gov.br/mdic/pt-br/composicao/se/cndi/plano-de-acao/nova-industria-brasil-plano-de-acao.pdf> (page 84) for the extended PotencializEE, and <https://agenciasebrae.com.br/inovacao-e-tecnologia/com-participacao-do-sebrae-programa-de-apoio-a-medidas-de-eficiencia-energetica-deve-chegar-a-10-mil-mpe/> for SEBRAE.

commitment of the project partners, SENAI, *Desenvolve SP*, MME and MDIC, to maintain the project's technical and financial instruments beyond 2025 is paramount to achieving the project outcome of broad reduction of GHG emissions brought about by more efficient use of energy in industrial SMEs in Sao Paulo and beyond.

A summary of the mid-term ELE recommendations is provided below:

1. The project team and SENAI (after the project ends) should maintain direct support to EE projects in SMEs, including monitoring and effectively communicating results to encourage the development of a thermal efficiency solutions market.
2. The project team should continue engaging commercial banks. The few matured EE projects and the experience of the federal EE fund *FG-Energia* show that more than a guarantee fund is needed to ensure SMEs' access to finance, especially in the current high-interest-rate context. Future EE projects will likely need a variety of finance sources, including commercial bank loans.
3. National project partners (steering and technical committee members) should consider engaging with the project in a more proactive manner. The project has demonstrated that engagement with other stakeholders (e.g., PROCEL, SEBRAE) can result in expansion and upscaling of the project's solutions to other states and sectors.
4. Project partner *Desenvolve SP* should consider further engaging with the state government of Sao Paulo, resulting in a more agile approval of FAEE's rules and operations and promoting EE within the state.
5. The Mitigation Action Facility should consider granting a project extension of at least one year. Relevant stakeholders estimate at least a year as the time needed for an implemented EE project to start producing results, and the project should be able to consolidate its support and communicate the results. Project-supported EE implementations and their GHG mitigation should be counted as a project's contribution, regardless of how they have been financed (in the project proposal, project success was linked to the number of FAEE and commercial bank loans for EE projects).

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List of abbreviations

ABESCO	Brazilian Association of Energy Conservation Services Companies (<i>Associação Brasileira das Empresas de Serviços de Conservação de Energia</i>)
ANEEL	National Electric Energy Agency (<i>Agência Nacional de Energia Elétrica</i>)
BMWK	German Federal Ministry for Economic Affairs and Climate Action
BNDES	National Bank for Economic and Social Development (<i>Banco Nacional de Desenvolvimento Econômico e Social</i>)
CHP	Combined Heat and Power
COVID-19	Corona Virus Disease 2019
EE	Energy efficiency
EEM	Energy efficiency measure
ELE	Evaluation and Learning Exercise
ELEQ	Evaluation and Learning Exercise Question
ENBPar	Brazilian Nuclear and Binational Energy Holding Company (<i>Empresa Brasileira de Participações em Energia Nuclear e Binacional S.A.</i>)
EPE	Energy Research Office (<i>Empresa de Pesquisa Energética</i>)
EQ	Evaluation Question
ESCO	Energy service company
EUR	Euro
FAAE	Guarantee Fund for Energy Efficiency Development (<i>Fundo de Aval para Desenvolvimento da Eficiência Energética</i>)
FC	Financial Cooperation
FIESP	Federation of industries of the State of São Paulo (<i>Federação das Indústrias do Estado de São Paulo</i>)
FINAME	Special Industrial Financing Agency (<i>Agência Especial de Financiamento Industrial</i>)
FINEP	Financier of Studies and Projects (<i>Financiadora de Estudos e Projetos</i>)
FW	Framework
GHG	Greenhouse Gases
GIZ	Gesellschaft für Internationale Zusammenarbeit

KfW	KfW Development Bank (<i>KfW – Kreditanstalt für Wiederaufbau</i>)
KII	Key Informant Interview
Logframe	Logical Framework
M&E	Monitoring and Evaluation
MDIC	Ministry of Development, Industry, Commerce and Services (<i>Ministério do Desenvolvimento, Indústria, Comércio e Serviços</i>)
MME	Ministry of Mines and Energy (<i>Ministério de Minas e Energia</i>)
MRV	Measuring, Reporting, and Verification
NAMA	Nationally Appropriate Mitigation Action
NDC	Nationally Determined Contributions
OECD DAC	Organisation for Economic Co-operation and Development’s Development Assistance Committee
OPM	Oxford Policy Management
QA	Quality Assurance
QC	Quality Control
PROCEL	National Electric Energy Conservation Program (<i>Programa Nacional de Conservação de Energia Elétrica</i>)
RAG	Red Amber Green
SEBRAE	Brazilian Support Service for Micro and Small Businesses (<i>Serviço Brasileiro de Apoio às Micro e Pequenas Empresas</i>)
SENAI	National Service for Industrial Training (<i>Serviço Nacional de Aprendizagem Industrial</i>)
SEMIL	Secretariat (Department/ Ministry) of Environment, Infrastructure and Logistics of the State of São Paulo (<i>Secretaria de Meio Ambiente, Infraestrutura e Logística do Estado de São Paulo</i>)
SIMA	State Ministry of Infrastructure and Environment (<i>Secretariat for Infrastructure and Environment</i>)
SMART	Specific, Measurable, Achievable, Relevant and, Time-Bound
SMEs	Small and Medium Enterprises
SP	Sao Paulo
TC	Technical Cooperation

ToC	Theory of Change
TS	Types of Sources
TSU	Technical Support Unit, Mitigation Action Facility

1 Introduction

This document presents the findings of the **mid-term evaluation and learning Exercise (ELE) of the project Brazil – Transformative Investments for Industrial Energy Efficiency (PotencializEE)**. The ELE was undertaken during the period of June-October 2023.

1.1 Overview of the project

PotencializEE is implemented in the state of Sao Paulo by the implementation organisation Gesellschaft für Internationale Zusammenarbeit (GIZ), with the Federal Ministry of Mines and Energy (MME)² as partner ministry and the National Service for Industrial Learning (SENAI)³, the Sao Paulo State Financial Institution *Desenvolve SP*⁴, the National Development Bank (BNDES), and the Brazilian Association of Energy Service Companies (ABESCO) as the main project partners. The Secretariat for Development of Industry, Commerce, Services and Innovation of the Ministry of Economy, now Ministry of Development, Industry, Commerce and Services (MDIC), and the Energy Research Office (EPE) are also project partners and participate in the project's steering committee. The project's planned implementation period is 54 months⁵, divided into an 18-month set-up phase (July 2020-December 2021) and a 36-month implementation phase (January 2021 – December 2024). The project is funded by a Mitigation Action Facility grant of EUR 18.3 million.

The project strategy addresses Brazil's industrial sector's greenhouse gas (GHG) mitigation potential through energy efficiency (EE). Industries in Brazil are responsible for 5% (114.3 MtCO₂e)⁶ of the country's total GHG emissions or 18% of the national energy-related emissions⁷. Moreover, Brazilian industries have become increasingly energy-intensive in this decade, mainly due to maintaining relatively old and inefficient equipment⁸. Although the industrial sector's energy intensity has kept on rising, the overall energy efficiency has slightly improved, but mostly in steel industries, dominated by big corporations. The energy intensity of the Brazilian industrial sector has grown by 12% between

² The Ministry of Industry, Commerce and Services (MDIC) was reestablished 1.5 years into project implementation after the November 2022 presidential elections. The MDIC leads the national industrial decarbonisation strategy, and the ministry participates in the project governance structures, being considered by the project and its partners, including the MME as a co-partner ministry.

³ SENAI (<https://www.portaldaindustria.com.br/senai/>) is a private, not-for-profit institution with over 80 years of experience in providing services in the fields of technical and vocational education, technological support, and industrial technology innovation. SENAI is funded by a 1% levy on the payroll of contributing companies.

⁴ *Desenvolve SP* has been providing support to the development of small and medium businesses in São Paulo since 2009 (State Law 10,853/01, regulated by Decree 52,142/07).

⁵ Revised proposal of 2021. The original project proposal was revised to account for the withdrawal of the Carbon Trust as implementing partner.

⁶ The project proposal states that Brazil industrial GHG emissions represent 9% of total GHG emissions (185 MtCO₂e) for 2017, citing the Brazil's Greenhouse Gas Emissions and Removals Estimation System (SEEG): <https://seeg.eco.br>. However, the ELE, using the same source could not replicate the figure of 185 MtCO₂e for 2017. 195 Mt CO₂e was the result of including the categories of HFC use, Energy Production, Metallurgy and Other Industries. The ELE estimates that industrial emissions are better represented by metallurgy and other industries (which also excludes cement production). Metallurgy, dominated by a limited number of big corporations constitutes half of the industrial GHG emissions. By comparison, agriculture represents between a quarter and a fifth of Brazil's GHG emissions for the 2017-21 period.

⁷ Source: project team.

⁸ According to the Associação Brasileira pela Conformidade e Eficiência de Instalações (ABRINSTAL) cited by the project, the average age of industrial equipment in Brazil is 20 years.

2015 and 2020, slightly decreasing afterwards. Energy efficiency has improved by 3% in the same period. The project proposal states that the Brazilian industrial sector mainly comprises (99%) small and medium enterprises (SMEs) that employ nearly a fifth of the total national workforce and contribute almost half the gross national income. The state of Sao Paulo is one of Latin America’s most important industrial hubs⁹, and its economy has the largest contribution to Brazil's GDP (32% in 2020)¹⁰. According to the project proposal, Sao Paulo is home to most of the country's energy service companies (ESCOs).

The project identified several barriers hampering the development of the EE market in Brazil, characterised as follows in the project proposal:

- Barriers limiting the demand for EE products and services, including lack of awareness, low priority of EE and lack of regulatory incentives.
- Limited capacity of ESCOs, consultants and suppliers to generate and service a pipeline of investable, low-risk EE projects.
- The attractiveness of existing public and private financial mechanisms is limited due to financial institutions’ perceived risk, excessive bureaucracy and, above all, excessive collateral requirements.

The impact and outcomes of the project

According to the project proposal, the project will mitigate 1.092 MtCO₂e emissions directly¹¹ (abatement cost EUR 16.81/ton) by avoiding 7,267 GWh of energy consumption (~EUR 310 million in energy costs) through energy efficiency measures in 425 SMEs in Sao Paulo. Project outputs entail developing capacities of circa 100 energy professionals (30 women and 70 men) who would contribute to energy audits in 1,036 SMEs (benefitting 15,589 female and 40,244 male employees), although implementation support is only expected for 425 firms. The project expects to mobilise EUR 80 million in investments (loans), of which EUR 64 million in public financing (*Desenvolve SP*) and EUR 16 million from commercial banks. Upscaling and replicating the project approach is expected to cause the indirect reduction of an additional 1.21 MtCO₂e, avoiding an energy consumption of 8,051 GWh.

The proposal distinguishes between Technical Cooperation (TC) and Financial Cooperation (FC) Components’ intermediate outcomes as follows:

Intermediate outcomes: TC Component	Intermediate outcomes: FC Component
1. Increased awareness and understanding of opportunities in EE and financial mechanisms and technical assistance.	1. Increased ability of banks to evaluate loans with reduced risk perception. 2. Increased financing under more attractive conditions for the deployment of industrial

⁹ According to the project proposal Sao Paulo State is the largest industrial hub in Latin America and a transformative impact in Sao Paulo State will affect industries on the entire continent. However, this statement could not be corroborated.

¹⁰ (Instituto Brasileiro de Geografia e Estatística, 2021)

¹¹ 1.1 MtCO₂e emissions equal 8% of Sao Paulo’s 2021 industrial emissions (11% excluding metallurgy, which represents 22% of Sao Paulo’s industrial emissions) (Sistema de Estimativas de Emissões e Remoções de Gases de Efeito Estufa (SEEG), 2023), and 1% and 0.2% of Brazil’s 2021 industrial and total CO₂ emissions (excluding land use change emissions) (Global Carbon Project, 2022).

Intermediate outcomes: TC Component	Intermediate outcomes: FC Component
<ol style="list-style-type: none"> <li data-bbox="220 250 762 389">2. Flow of low-risk projects to banks based on increased ability to identify EE opportunities, build business cases, and provide implementation support. <li data-bbox="220 405 683 472">3. Improved incentives for the scale deployment of industrial EE solutions. 	<p data-bbox="874 246 1331 309">EE solutions leveraging public and private finances.</p>

The original causal pathways

The project's expected outcome is a “Broad reduction of GHG emissions brought about by more efficient energy use in industrial SMEs in Sao Paulo and outside Sao Paulo”. To progress from the initial barriers identified to the outcome, the project Theory of Change (ToC) foresees 4 causal pathways, illustrated in

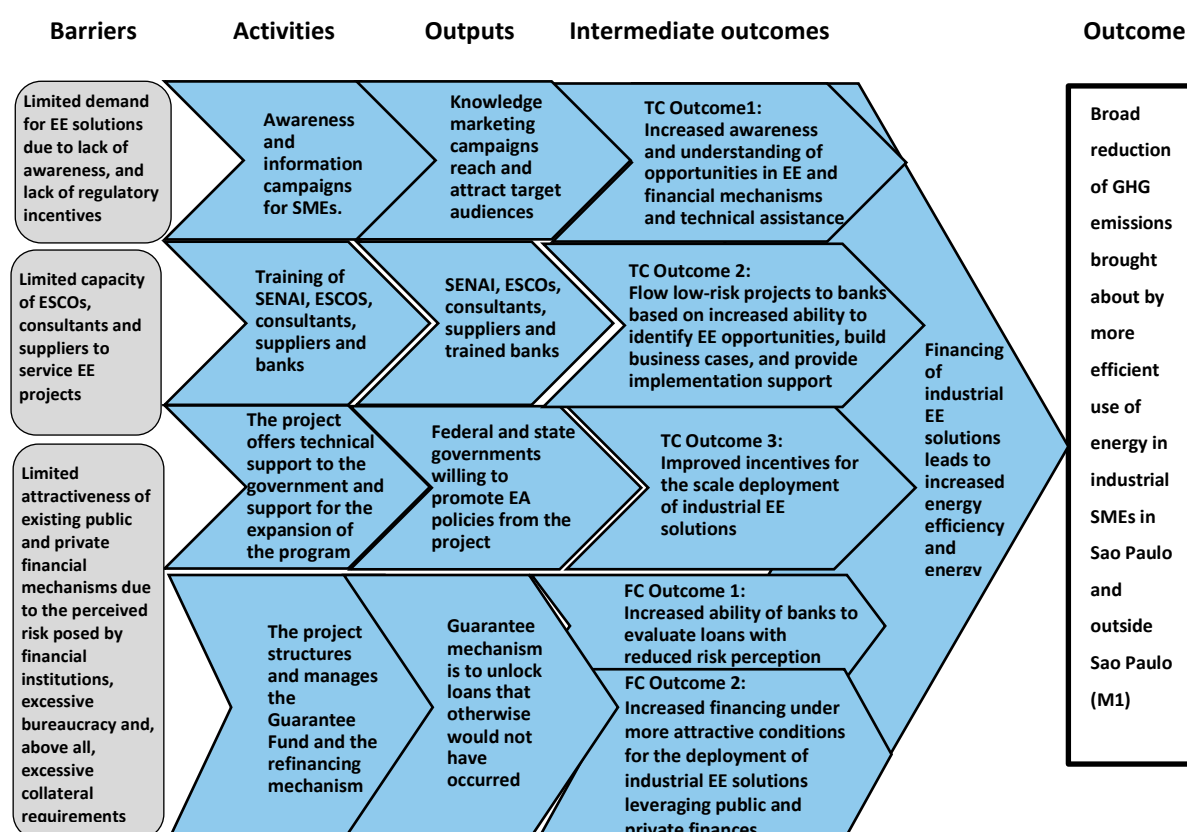
Figure 1.

The ELE confirms the **four causal pathways** already contained in the project proposal but **slightly modifies the order of outputs and intermediate outcomes and makes implicit assumptions explicit**. The four causal pathways link four blocks of project activities to eight intimately interlinked intermediate outcomes, logically leading to the project outcome if the assumptions hold.

- **Causal pathway 1:** If the project delivers awareness campaigns on energy efficiency for SMEs, ESCOs and energy consultants, assuming that the messages successfully reach the target audience and attract a sufficient number of industries and service providers, then a sufficient number of SMEs and service providers would be ready to implement energy-efficient solutions.
- **Causal pathway 2:** If the project delivers capacity development activities for service providers (ESCOs, energy consultants), assuming that there are enough eligible ESCOs, consultants, and suppliers to join the training, then they would be able to assist SMEs in presenting viable EE projects for financing.
- **Causal pathway 3:** If the project offers technical support to the state and federal government, then the state and federal governments will be more interested in promoting EE as a means to mitigate GHG emissions and will develop public policy instruments that can provide nationwide (scale-up deployment) incentives to industrial EE solutions.
- **Causal pathway 4:** If the project sensitises and trains staff from commercial and public banks about the financial viability of energy-efficient solutions, and a risk-sharing facility is established (guarantee fund), then banks will increase their ability to evaluate loans with reduced risk perception and there will be increased financing under more attractive conditions for the deployment of industrial EE solutions leveraging public and private finances, assuming the macroeconomic environment is conducive to investments.

Altogether, the four causal pathways sustain the availability of sufficient funding for viable energy-efficient projects in SMEs, leading to energy and cost-saving, causing a broad reduction of GHG emissions directly in Sao Paulo and indirectly in the totality of Brazil.

Figure 1. Overview of the Original Causal Pathways of the Project



The project’s logical framework included 21 output and 14 outcome indicators (besides the Mitigation Action Facility’s mandatory core indicators M1 to M5). All indicators are SMART (Specific, Measurable, Achievable, Relevant and Time-Bound) and have been reported in the project’s annual report. However, the two outcome indicators for outcome three are not connected to the TC Component outcome three on policy incentives but to the FC Component outcome four on finance for energy efficiency projects. Policy incentives are gauged by the four TC Component 3 output indicators.

1.2 Focus of the Evaluation and Learning Exercise

In accordance with its Terms of Reference, this ELE seeks to address the following General ELE Questions (ELEQs):

- Has the project been achieving its results?
- Has the project started to trigger transformational change?
- What has been learnt from the project so far?

In addition, the following specific elements will be considered in this ELE:

- Are awareness-raising and dissemination actions effectively mobilising industrial SMEs to benefit from the project? (ELEQ 2.3)
- Is the project effectively inducing the development of thermal EE investments in Brazil (i.e., on top of electricity efficiency savings)? (ELEQ 2.1)
- Is the project’s strategy to ensure the utilisation of its energy technology list in energy efficiency projects and existing credit lines compelling? (ELEQ 2.2)
- Does the Guarantee Fund decrease the risk perception towards EE projects and facilitate access to finance for industrial SMEs? (ELEQ 2.4)

- Are the policies for industrial energy efficiency being developed relevant and in line with the current government’s priorities? (ELEQ 1)
- Is the scale-up proposal of the project and its partners coherent and sustainable? (ELEQ 4, ELEQ 5)

The General ELEQs presented above were broken down and operationalised into Specific ELEQs answered in this report. Table 1 maps the General and Specific ELEQs against the Organisation for Economic Co-operation and Development’s Development Assistance Committee’s (OECD DAC) evaluation criteria¹², widely used as international standards for evaluating development interventions. Reference to the relevant report section where each ELEQ/ evaluation criterion is treated is also given. Finally, the specific ELEQs were broken down further into sub-questions, which are included in the official ELE Matrix, approved by the Mitigation Action Facility Technical Support Unit (TSU), and reported in Annex B.

Table 1. General and specific ELE questions and their link to the ELE Report sections

General ELE Question	Specific ELE Question	Evaluation criteria (relevant ELE Report section)
Is the project achieving its planned results?	To what extent does the project address an identified need?	Relevance (Section 3.1)
	To what extent has the project been achieving intended intermediate outcomes (and unintended ones)?	Effectiveness (Section 0)
	To what extent is the relationship between inputs and outputs timely and to expected quality standards?	Efficiency (Section 0)
Is the project starting to trigger transformational change?	What evidence is there that the project will likely contribute to the intended impact in the ToC (incl. transformational change)?	Impact (Section 3.4)
	What is the likelihood that the outcomes will be sustained after the end of the project funding period?	Sustainability (Section 3.5)
What has been learnt from the project so far?	What key lessons can be learnt to the benefit of this or other projects funded by the Mitigation Action Facility in achieving their results?	Learning (Section 5.1)

1.2.1 The Mitigation Action Facility Transformational Change Measurement Framework

Some words need to be spent on the concept of transformational change, which is included in the General and Specific ELEQs. The enabling of transformational change is one of the key aims of the Mitigation Action Facility and, therefore, of projects. The Mitigation Action Facility defines Transformational Change as “*Catalytic change in systems and behaviours resulting from disruptive climate actions that enable actors to shift to carbon-neutral pathways*”¹³. The Mitigation Action Facility Theory of Change explains how transformational change is expected to be achieved through

¹² Relevance, Effectiveness, Efficiency, Impact, Sustainability. The ELE Team added a 6th criteria, namely Learning.

¹³ https://mitigation-action.org/wp-content/uploads/Mitigation-Action-Facility_TC-factsheet.pdf

its outputs and outcomes. The Theory of Change is broad, and transformational change can be achieved through the projects in different ways. Figure 2 illustrates three dimensions that interact and reinforce each other to produce project-induced transformational change. Each project will work on different elements of the three dimensions to define its pathway to or “recipe” for transformational change. A more detailed explanation of the ELEs’ Transformational Change Measurement Framework (TCMF), summarised in Figure 2, is presented in Annex A.

The ELE used the TCMF to assess the project’s progress towards its impact in Section 3.4. In particular, in the evidence gathered through the ELE, the evaluators have looked for “signals” of the materialisation of the three dimensions and classified them as early, interim, and advanced signals according to the definitions in Table 2. Table 3 shows the minimum level of signals of each of the three transformational change dimensions projects are expected to achieve by their mid-line and end-line.

Figure 2. Transformational Change Measurement Framework

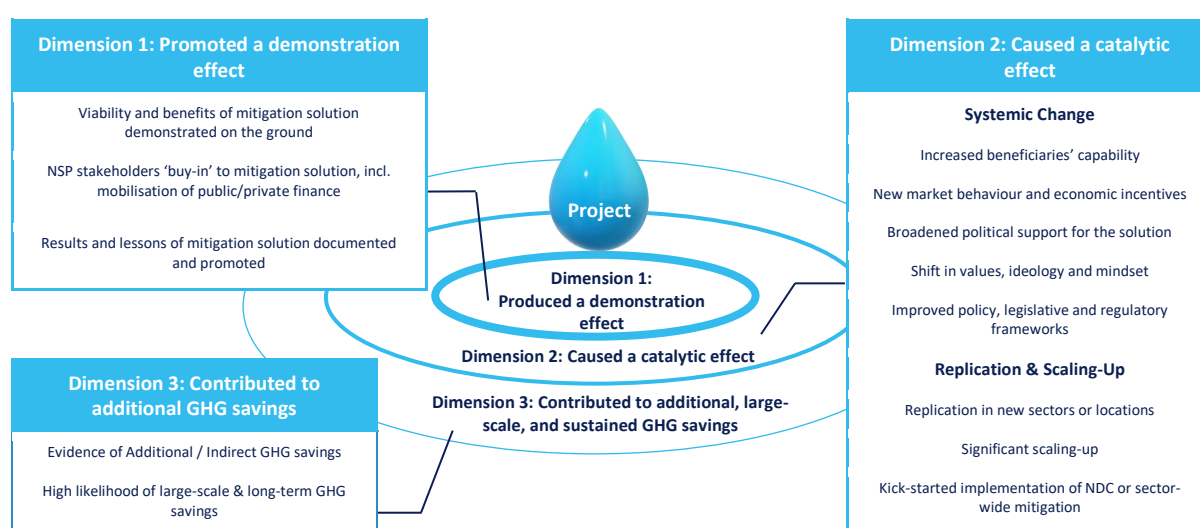


Table 2. Transformational Change “Signals” assessment by ELEs

Signal level	Definitions
No evidence	Evidence suggests little to no progress is being made in line with the ToC causal pathways to Transformational Change.
Early signals	There is emerging evidence of the transformation related to the dimension, or the foundations for the transformation have been laid by the project, but no signals of the change are present.
Interim signals	Evidence shows some signals that the transformation related to the dimension is underway, and it is likely to continue.
Advanced signals	Evidence shows strong signals that the transformation related to the dimension is underway, and there is little doubt that it will continue.

Table 3. Minimum expected signals of project-induced transformational change

Dimension	Mid-point	End-point
1: Promoted a demonstration effect	Interim signals	Advanced signals
2: Caused catalytic effect	Early signals (of one or more of the types of possible changes)	Interim signals
3: Contributed to additional GHG savings	None	Early signals

2 Methodological approach

The mid-term ELE comprises four main phases: inception, fieldwork, analysis, and reporting.

Inception phase (June-August 2023)

The inception phase involved the definition of the ELE matrix, including the ELE questions, data collecting methods and identifying respondents among the three main groups: project team, stakeholders, and third parties. Project team respondents are those parties directly involved in the implementation of the project, such as the Implementation Organisation (GIZ) and the main Project Partner (SENAI). In this category were also included the entities participating in the project steering committee, i.e., MME, MDIC, *Desenvolve SP* - Guarantee Fund and Credit Operations, and the National Bank for Economic and Social Development (BNDES). Project stakeholders are actors affected by project actions and can influence project outputs and outcomes. This group comprised important national government bodies influencing the regulatory process, including the Brazilian Association of Energy Conservation Services Companies (ABESCO), the Energy Research Office (EPE), the National Electric Energy Agency (ANEEL), the Brazilian Nuclear and Binational Energy Holding Company (ENBPar) and manager of the National Electric Energy Conservation Program (PROCEL), as well as several ESCOs directly involved in the project implementation. Third parties included project beneficiaries and other actors involved in the PotencializEE project in Brazil.

Fieldwork (August 2023)

The fieldwork started with a kick-off workshop involving the extended project team, director, and staff and was finalised with a mission debrief and validation workshops with the same actors. During the 11-day mission, the ELE team conducted 23 qualitative, semi-structured interviews in Sao Paulo and Brasilia and a focus discussion group with sample representatives of three SMEs participating in the project.

Table 4. Overview of the number of interviews and interviewees by sampling category

	Project Team	Project Stakeholders	Third Parties	TOTAL
No. interviews	9 ¹⁴	7	7	23
No. interviewees	16	10	9	35

Analysis (September 2023)

The ELE team consolidated its interview notes and documentary evidence in an evidence map table, extracting common themes and weighing the evidence to answer the evaluation questions, confirming the evidence or absence of evidence for the causal pathways of the project's ToC. The main steps undertaken during the analysis phase are summarised in Table 5.

¹⁴ Including the Kick-Off and Validation Workshop.

Table 5. Summary of the ELE Analysis Methodology

Integrating Primary and Secondary Data	Evaluating the Strength of Evidence	Draft Contribution Story
Tailor analytical tools	Assess the strength of evidence of common themes	Draft contribution stories in the ELE report for each ELEQ and causal pathway
Tidy up notes	Identify concurrent/alternative explanations in ToC causal pathways	Final QC / QA
Data mining and evidence mapping from interviews and docs along ELEQs	Agreement on the contribution of the project vs. context	
Extract positive and negative common themes for each ELEQ	Perform process tracing formal tests of causal pathways	
Consolidate and cross-check common themes	Develop a figure with RAG rating of causal pathways	
1st Quality Control (QC) / Quality Assurance (QA)		

Table 6. Scorecard for assessing the strength of evidence.

		Variety (number of types of sources (TS) reporting the evidence)		
		1 TS only	2 TSs	3 TSs
Quantity (number of sources reporting the evidence)	1 interview only	Single source		
	2 interviews	Weak evidence	Medium evidence	
	3+ interviews	Medium evidence	Strong evidence	Very strong evidence

Reporting (September-November 2023)

The ELE team prepared a draft report during September-October 2023, which was submitted to the TSU in October 2023. The TSU, project team, and the Mitigation Action Facility Board provided comments to the report, which were used to prepare the final report, finalised in November 2023.

2.1 Limitations

Despite repeated requests, the ELE team could not interview some institutions like some Brazilian ESCOs (BGF), the association of Combined Heat and Power (CHP) suppliers (COGEN), and the German Chambers of Commerce Abroad (AKH). Due to time constraints, some interviews (e.g., with stakeholders from Rio or remote places in Sao Paulo) were held online.

3 Key Findings

In this section, the ELE Team presents the main findings of the ELE. These are structured according to the ELE Questions in Table 1. At the beginning of each section, a Red-Amber-Green (RAG) rating of the strength of the project's contribution story to the ToC and the OECD DAC criteria is included, following the scale: Good / Very good = Green; Problems = Amber; Serious deficiencies = Red; Not enough info to rate = Grey.

3.1 Relevance of the project

Relevance

1. To what extent does the project address an identified need?

ELE interviews showed that PotencializEE's objectives are fully understood by the interviewees, who consider them appropriate and worthwhile. Most ELE respondents confirmed the validity of the project proposal barriers for energy efficiency in industrial SMEs: 1) lack of EE awareness among industrial SMEs, 2) financing gaps and 3) technical capacity of EE specialists and banking staff. They consider that PotencializEE adequately addresses them.

For several interviewees, the cultural barrier, i.e., **convincing SMEs of EE's opportunities, is the main barrier.** Many SMEs are not even aware of the concept. According to most interviewees, PotencializEE is one of the main catalysts for EE in the industrial sector in Brazil and, possibly, the only EE programme focusing on industrial SMEs. Thus, stakeholders endorse the project strategy of raising EE's awareness by engaging SME owners and businesspeople in the dissemination strategy because, as one interviewee stated: *"Businessmen's testimony convinces other businessmen, not the consultant, not the ESCO, not the project"*. Several stakeholders from all interviewed segments believe that disseminating the first financial EE results will improve engagement from SMEs' decision makers.

PotencializEE early foresaw the lack of adequate financing for EE in industrial SMEs as a key barrier. Project partners involved in the project design realised that it is necessary to provide technical solutions, identify efficient technologies and suppliers, and support SMEs to access credit. For the latter, it was identified that the banks lacked the capabilities to identify EE opportunities, leading to suboptimal financing. Another barrier is the low credit rating of many SMEs due to credit being based on debt analysis, preventing access to loans. This is where the Guarantee Funds may support the EE measures implementation.

The interview process revealed that **the policies for industrial energy efficiency supported by PotencializEE are relevant and in line with the current government's priorities on a national level.** The project supports employment policy (since SMEs are the biggest contributors to employment), industrial policy (acquisition of machines, including national manufacturing), national manufacturing, and GHG mitigation policy. There is strong evidence that **the project included the various stakeholders involved in the design of public policies, thus mitigating the possibility of misalignment between public strategies. Yet a significant number of stakeholders denounce the lack of a coherent policy in support of energy efficiency (section 3.2.3).**

This policy alignment and the **government’s priority is not a consensus at the state level**. The green agenda is not the state of Sao Paulo’s main priority, and although the state has an energy transition plan, **the project has primarily collaborated with the federal government**. The state government of Sao Paulo informed GIZ that industrial EE and PotencializEE are a priority to them, but at the same time it significantly delayed the process for the Governor to sign a decree that allows *Desenvolve SP* to legally establish the guarantee fund on the basis of an already existing law approved by the state assembly (parliament). Sao Paulo's state government declared to GIZ that staff changes are the reason for delays. On the other hand, the development and growth of the economic potential are very important for the state (of Sao Paulo). Changing political dynamics have affected how the state government perceives the project (see section 3.2.4). Thus, despite the support provided by the project to the state’s government economic priorities, the project is not perceived as a key component of the state government's actions. However, it must be noted that the State Secretary of Infrastructure and Environment (SEMIL) cooperates with the project team to ensure the sustainability of energy efficiency support (see section 3.5).

The project considers gender issues, supports national gender equality goals, and consistently strives to promote women's participation in training. In this regard, beyond access to training, the project mentored 30 female energy specialists. **However, most interviewees were unaware of these activities and achievements; yet overwhelmingly welcomed them:** *“As in all aspects of Brazil, in the field of EE, there is not enough action for gender or racial equity”*.

The project intends to continue its mentoring programme for female professionals in energy efficiency. **ELE respondents confirm the significant improvements in gender equality and perceptions in the energy and engineering fields over the last 20 years**. However, while changing, the historical perception of the industry, particularly engineering, is the one of a “masculine” field. Thus, the relatively small female professional pool limits the access of women entrepreneurs and professionals to the project’s capacity development activities (see Table 7).

Table 7. Women's participation in project events

Event/ Action	Male	Female	Female %
Applicants for SENAI certification training for EE consultants	510	90	15%
Participation in training for EE specialists	420	33	7%
Examined and certified engineers (EE specialists)	180	7	4%
% male and female training participants certified	43%	21%	NA
Engineers contracted by SENAI-SP to implement energy audits	64	4	6%
The staff of industrial SMEs benefitted from the project (49 completed audits)	2603	764	23%

Based on the evidence found and presented above, the ELE Team considers the performance of the project in terms of relevance to Sao Paulo and national policies and to public and private stakeholders’ needs, as well as complementarity and appropriateness, to be adequate. Consequently, it marks this evaluation criterion as green.

3.2 Effectiveness of the project

Effectiveness	2. To what extent has the project been achieving intended intermediate outcomes (and unintended ones)?
	Intermediate Outcome 1: Increased awareness and understanding of opportunities in EE and financial mechanisms and technical assistance
	Intermediate Outcome 2: Built capacity of industrial SMEs to support the steady flow of low-risk projects to banks
	Intermediate Outcome 3: Improved incentives for scale-up deployment of industrial EE solutions
	Intermediate Outcome 4: Increased finance on more attractive terms for deployment of industrial EE solutions

3.2.1 Intermediate Outcome 1: Increased awareness and understanding of opportunities in EE and financial mechanisms and technical assistance.

The project team designed and implemented awareness campaigns that included sector-specific technical presentations and publications in social media, its newsletter, and its webpage: <https://www.programa-potencializee.com.br>. The project has a significant presence on LinkedIn and other social media outlets and its webpage, where all its materials are posted, including technical guides, podcasts with industry leaders, and sector presentations (including on finance for energy efficiency).

After the implementation started, the project team and implementing partners realised the inadequacy of the previous project name coming from the English acronym TI4E (Transformative Investments for Industrial Energy Efficiency) to convey sound technical solutions adapted to the local context. Thus, since 2021, the project has presented itself as PotencializEE. ELE interviewees acknowledged the attractiveness of the renewed project brand, which is intimately associated with the very positive reputation among industry actors of the implementation organisation, GIZ, and the project partner, SENAI. Project reports verified during the ELE show that the project is on track to reach its communication targets (Table 8).

Table 8. Awareness campaign performance indicators. Numbers are cumulative.

Indicator		2021	2022	June 2023	End-of-Project Target	% Mid-term ELE
Outcome	Leads generated to the programme because of the awareness campaign	0	538	577	1,036	56%
Output	Companies reached by multimedia awareness raising campaign (number)	0	1,870	2,573	5,260	49%
	Companies visiting the programme's website (number)	182	1,921	2,177	4,208	52%
	Awareness raising workshops (number)	0	14	17	9	189%

All ELE interviewees, including industry representatives, confirm the challenges involved in reaching and convincing the management of small and medium enterprises (SMEs) to introduce even slight changes in how they do things. Firstly, SMEs tend to be very conservative and risk-averse, as a wrong investment decision can mean the end of the activity. Secondly, SMEs often do not have dedicated departments and staff that can quickly analyse and process new information as advice on energy efficiency. Industry representatives confirmed that it has taken them time to internalise the message and reach out to seek assistance. Some sources indicate that many SMEs are family-led and have operated for at least two generations. They tend to excel in their products and intimately know their technical field and market, contributing to a strong conservative¹⁵ culture. Thus, the project is currently recording testimonials from SMEs that have undertaken an energy audit or are designing their efficiency projects, which all actors interviewed agreed will be successful in reaching and convincing other SMEs. Section 3.2.2 discusses how the attracted interest translates into actual efficiency projects and how their success will determine the future of energy efficiency in SMEs in Sao Paulo and Brazil. In fact, the cultural barrier and risk aversion by SMEs and commercial banks persist, which, together with a discouraging investment context, does not guarantee the realisation of energy efficiency projects in the project-audited SMEs.

While costs and performance (production) are the main variables of interest for SME managers, according to several sources, there is a growing number of entrepreneurs, especially young ones, who are attracted to be associated with environmental sustainability. This is either due to a belief in its importance or because it can provide a competitive advantage for their business.

In summary, the ELE found strong evidence that the project has established a respected brand under its new name, PotencializEE, adopted in 2021, and it is acknowledged as a principal actor in promoting energy efficiency by industry actors in Sao Paulo and at the federal government level. The reputation of its main implementing partners, GIZ and SENAI, is a significant component of PotencializEE's brand. Converting interest into action is constrained by the limited capacities of SMEs to internalise PotencializEE's message. However, the project's communication strategy successfully addresses said limitations, and the project is on track to achieve its communication and reach targets. PotencializEE has rightly identified that overcoming SMEs' traditional risk aversion entails addressing the SME's core interests: cost savings and competitiveness. Still, it has also nurtured the growing attractiveness of being environmentally sustainable among SMEs and commercial banks. Considering the evidence, the ELE team concludes that the project has contributed to increasing awareness and understanding of opportunities in EE and financial mechanisms and rates the effectiveness towards this intermediate outcome as green.

3.2.2 Intermediate Outcome 2: Built capacity of industrial SMEs to support the steady flow of low-risk projects to banks

Relevant stakeholders agree that project technical assistance has significantly developed the capacities of the project's leading national partner, SENAI, enabling it to establish a practical training and mentoring system reaching over 1,000 SMEs interested in improving their energy efficiency. The project initially intended to have ESCOs and energy consultants conduct energy audits and accompany

¹⁵ Conservative here refers to adherence to established practices and not to political or social views and opinions.

the development and implementation of EE projects, generating a self-sustaining market for energy-efficient solutions. Indeed, the project exceeded its targets on training for ESCOs and energy consultants (Table 9). However, while ESCO representatives manifested their satisfaction with the training, the results could have been more effective in the number and quality of the energy audits performed. There are divergent opinions between ESCOs, institutional stakeholders, and the project team on why ESCOs have played a minor role than expected at the project's design stage in assisting SMEs. Yet, most stakeholders interviewed agree that, despite project training, ESCOs showed capacity limitations to advise the development of projects in efficient thermal energy, as ESCOs' primary orientation has been towards electric efficiency measures in the frame of the National Energy Efficiency Programme¹⁶ (PEE), compounded by limited supply of efficient thermal solutions during the first two years of project implementation. Moreover, ESCO audits in the project's structure required additional processing, as ESCO's reports and methods were not standardised nor included an analysis of the company's financial capacities, resulting in many audited enterprises not qualifying for further development of their projects.

The project's solution to this impasse was a more significant involvement of the project's leading project partner, SENAI, directly mentoring SMEs, ESCOs, and energy consultants, deploying a monitoring system that tracks progress and identifies bottlenecks in real-time. While SENAI's enhanced role has raised some apprehensions in ESCOs about unfair competition in their business, it has directly contributed to an increase of 514% in ongoing audits between 2022 and mid-2023 (Table 9). The project is addressing ESCO's apprehensions by working closely with them. Despite the engagement, ESCOs currently only handle 9% of the audits, but project stakeholders expect an increasing share of ESCOs accompanying EE projects as their capacities increase and EE projects become mainstream under project support.

Table 9. Selected outcome and output indicators for the second outcome

Indicator		2020	2021	2022	June 2023	EOP Target	% MT ELE
Outcome	OA 2.1: Number of SMEs following up from audits to deliver interventions per sector	0	0	0	11	518	2.1%
	OA 2.2: Number of SMEs investing at least 50% of what is recommended in energy audits to unlock face-to-face implementation support	0	0	0	0	425	0%
Output	OP 2.1: Number of service providers completing training provided by SENAI	0	0	453	453	100	453%
	OP 2.3: Number of energy audits delivered to SMEs per sector	0	0	49	301	1036	29%
	OP A2.4: Number of projects received and assessed by the Investment Advisory Group (IAG)	0	0	0	32	1036	3%
	OP A2.5: Number of projects shortlisted by the IAG to Desenvolve SP	0	0	0	5	518	1%

¹⁶ Programa de Eficiência Energética, established in 2000 (Law nº 9.991 of 24 July 2000) and administered by the National Electric Energy Agency (ANEEL) to promote electric efficiency measures by grants funded by contributions from private energy utilities.

“Yes (the project effectively induces the development of thermal energy efficiency investment in Brazil). However, the thermal demands of the SMEs investigated were low compared to the (total) energy efficiency demands” (Manager, Energy Service Company)

The project is among the few entities developing tools (e.g., catalogue, calculator, training, and other materials) promoting thermal energy efficiency, where most mitigation gains can be achieved (as opposed to electric efficiency). Two factors work against project efforts: limited availability of thermal efficient technologies and strong industry association of energy efficiency with electric efficiency, rooted in the long-standing federal (electric) efficiency programme (PEE). PotencializEE has started to generate momentum in generating demand for thermal efficiency measures through the catalogue of energy efficient technology and the awareness and mentorship measures. Most respondents agree that PotencializEE is crucial in promoting thermal energy efficiency but must still bridge a significant gap.

The project's analysis of the first 49 audits confirmed that the limited share of thermal energy efficient technologies proposed (merely a quarter of all solutions included in the projects) meant a reduced GHG mitigation potential (42,695 tCO₂eq), or an average of about 900 tCO₂ per project, which would mean giving up on achieving the goal of directly causing the mitigation of 1.1 million tCO₂eq (425 energy efficiency projects implemented). Thus, the project boosted its efforts to promote efficient thermal technologies by engaging with thermal efficient technology (heat pumps, heat exchangers, CHP, solar thermal applications, etc.) manufacturers and suppliers, focusing audit tools on thermal interventions and reviewing completed energy audits. The project needs yet to calculate the mitigation potential contained in the 301 audits so far conducted (September 2023).

Most respondents see the catalogue of thermal efficient technologies¹⁷ as one of the project's main results, as it significantly reduces transaction costs by identifying and linking suppliers and potential demand. However, most respondents also admit to needing more clarity about how the catalogue will be updated and what institution will continue to guide SMEs and ESCOs after the project ends, as they see the networking with efficient technology suppliers to unfold its full potential over the next decade, including not only installation of said technology but also maintenance. Thus, the institutional arrangements (including certification of technologies and suppliers) and the link to other financial facilities (such as BNDES' FINAME¹⁸) are crucial to establishing the catalogue as an essential driver of success in developing thermal EE projects.

Partners estimate 1-2 years as the minimum implementation time of a thermal efficiency project. Consequently, the project is behind schedule in delivering energy savings and GHG mitigation results. Despite the delay, relevant sources agree with the project's efforts in promoting thermal EE solutions to the detriment of electric efficiency as the most promising strategy to achieve PotencializEE's ultimate mitigation goals.

The project expects a significant rise in audited SMEs and efficiency projects ready for implementation. The project assumes that the start of operations of the project's guarantee fund (see section 3.2.4) will ensure access to finance and boost the number of implemented projects, enabling

¹⁷ <https://tecnologias.programa-potencializee.com.br>.

¹⁸ The Special Industrial Financing Agency (FINAME) is dedicated to promoting the production and sale of machinery and equipment. <https://www.bndes.gov.br/wps/portal/site/home/quem-somos>.

it to reach the intended number of 425 energy efficiency projects implemented and the mitigation of 1.1 MtCO₂eq. The project expects these results to need an extra year, extending the project's implementation period to December 2025 (instead of December 2024). However, as explained in the next section (3.2.4.), reducing collateral and loan risk is a necessary yet insufficient condition for investing in energy efficiency projects, especially in the current economic context (see section 3.2.5).

The project's vision and efforts towards promoting thermal energy and developing tools and capacities within SENAI and for ESCOs and consultants have boosted and significantly improved PotencializEE's project pipeline, improving its GHG mitigation potential. Thus, 15% of audits have resulted in EE projects that are mature enough to start implementation (44 out of 301), and 14 SMEs have started implementation with their resources (11) or have secured funding (3). Yet, to achieve the intended 425 projects implemented target, the project needs to: 1) vastly improve current access to finance (see section 3.2.4), and 2) secure more support from federal and state level institutions to craft an enabling policy environment promoting thermal energy measures (section 3.2.3). This would create the conditions for the mainstreaming of EE measures in the industrial sector of Sao Paulo and beyond. Considering the distance between current and intended results, the ELE rates this outcome as amber.

In the project logframe, the second intermediate outcome included a component on capacity development for commercial banks to catalyse loan risk appraisals for EE projects. Banks' awareness raising and training will be reported under the intermediate outcome 4 (see section 3.2.4).

3.2.3 Intermediate Outcome 3: Improved incentives for scale-up deployment of industrial EE solutions

Most stakeholders point out the unique "energy efficiency ecosystem" that PotencializEE has created, working at the state and federal levels with private and public organisations, SMEs, commercial banks, and industry regulators. PotencializEE has become a referent on EE¹⁹ and has successfully supported EE measures through technical studies, recommendations, and presentations to the federal congress. PotencializEE cooperated with EPE to craft proposals for public policy measures, including launching a capacity-building programme for technicians of industrial companies, fostering energy management systems, and promoting innovation and local manufacturing of key thermal efficiency technologies. PotencializEE successfully supported the MME and MDIC in contesting the resource cuts for ANEEL's PEE. It also prepared a study for ANEEL with 44 specified propositions for PEE's underlying rules, procedures and guidance manual that would make the funding scheme more appealing to industrial companies and ESCOs. Moreover, PotencializEE has partnered with several federal organisations to provide nationwide support to EE in SMEs, securing additional funding of at least **EUR 39 million** for these initiatives (section 3.4).

Moreover, since 2022, the political environment at the federal level has become more receptive to decarbonisation and GHG mitigation. It has since re-established the Ministry of Development, Industry and Commerce, working with the project through its Department of Decarbonisation. However, private sector stakeholders have yet to see significant changes in public policy favouring EE. Private-

¹⁹ Based on the ELE interviews, which included the most relevant EE players in São Paulo and at the institutional (federal ministries) level nationwide.

sector respondents contest the existence of coherent public support for EE beyond PEE. Thus, project recommendations have yet to become integrated into public policy.

In summary, PotencializEE established an enabling ecosystem of public policy-making and finance institutions, industry representatives, vocational training facilities, service providers, SMEs, and commercial banks in a favourable political context. This aligns public strategies with GHG mitigation and enables upscaling and replication of the project's approach in other Brazilian states. However, while the project has successfully supported and strengthened federal policy instruments, including the electric efficiency flagship programme PEE, it has yet to catalyse a coherent public strategy at the federal and state levels to promote thermal energy efficiency improvements. However, PotencializEE provides essential support to state and federal organisations promoting EE, support that has translated into tangible steps towards replication of the project approach nationwide, mobilising public funding in support of EE measures in SMEs, despite the slower pace of adoption of project-promoted instruments of public policy at the state and federal level (beyond project's control). Considering all of the above, the ELE rates the project's effectiveness towards this intermediate outcome as green.

3.2.4 Intermediate Outcome 4: Increased finance on more attractive terms for deployment of industrial EE solutions

“(Guarantee funds are) the carrot that commercial banks need”. (Federal government representative)

Many ELE respondents, particularly from the public sector, recognise the guarantee fund as a crucial means to facilitate access to credit for SMEs, absorbing the risk of credit institutions, including the project partner, *Desenvolve SP* (Sao Paulo public finance institution), which is intended to be the primary source of loans for EE projects. Beyond *Desenvolve SP*, the project expected to get sufficient commercial banks to have an increasing role in financing EE projects.

GIZ, SENAI, and *Desenvolve SP* designed the fund based on current credit parameters, including the average default rate. Despite delays linked to the November 2022 federal and state elections, a state bill²⁰ constituting the fund was passed in December 2022 by the Sao Paulo Legislative Assembly (ALSP), triggering the first disbursement for the Guarantee Fund for Energy Efficiency Development (FAEE)²¹ from the Mitigation Action Facility (25% of the EUR 8 million project's FC Component). However, a different understanding of the administrative procedure between the project and *Desenvolve SP*, compounded by the political branding of the project, associated with the federal government²², has caused friction, resulting in further delays in the final signature of the new state governor's decree authorising the fund operation. The project team and main stakeholders, including *Desenvolve SP*, had initially expected the decree to be signed before the end of the year at the time of this ELE.

The project expects the operationalisation of the FAEE to lead to a dramatic increase in the number of EE projects implemented. Additionally, *Desenvolve SP* has obtained multiple loans from international financial institutions, which eliminates the need for commercial banks to participate in

²⁰ <https://www.al.sp.gov.br/propositura/?id=1000480568&tipo=1&ano=2022>.

²¹ Fundo de Aval para Desenvolvimento da Eficiência Energética

²² Of different political colour than the state government.

the efficiency credit markets. This would allow *Desenvolve SP* to finance the entire planned EE project portfolio without requiring additional funding from commercial banks.

However, even with FAEE, several industrial and financial sector interviewees expressed uncertainty about access to finance for EE projects for SMEs. SMEs are reluctant to engage in credit operations due to their risk aversion, as well as the economic context characterised by high interest rates, uncertainty, and anxiety about a potential economic contraction. Commercial banks share this reluctance to provide credit to SMEs under these conditions. Moreover, the example of the 2021-established BNDES own guarantee fund *FG-Energia* shows that even the operation of a guarantee fund does not necessarily catalyse financing. *FG-Energia* has only completed six credit operations, far below the expected output. Project stakeholders partly ascribe the poor performance to the macroeconomic context and the high transaction costs compared with other federal risk-sharing facilities, such as the Emergency Credit Access Program (FGI-PEAC)²³. The project strengthened *FG-Energia* by co-developing a concept note with BNDES to secure additional funding through the Green Climate Fund (GCF). BNDES used a project-developed impact model²⁴ to raise EUR 25 million from KfW for *FG-Energia*.

Moreover, despite project efforts and training, commercial banks still need to be convinced about financing SMEs in their energy efficiency undertakings. Although PotencializEE has engaged with leading commercial banks in the industrial sector through workshops and sharing information on its pipeline as part of the pre-appraisal process, private sector stakeholders still need to be educated on the benefits of energy efficiency. They are likely to invest only after seeing proven results, often citing how renewable energy projects had to overcome initial mistrust to become mainstream projects with regular access to credit.

In summary, commercial banks, ESCOs, SMEs, and institutional actors involved in the project perceive the two guarantee funds being set up (FAEE) and supported (*FG-Energia*) by PotencializEE as critical in decreasing the perception of risk in financing EE projects by public and private funding institutions. However, actual financing of EE projects has yet to occur due to delays in setting up the FAEE, risk aversion of SMEs and commercial banks, and an unfavourable macroeconomic environment (high interest rates). These factors, together with limited information, pose a significant risk to the project's FC Component even after the establishment of the FAEE. Relevant stakeholders state that BNDES' *FG-Energia* guarantee fund is less known and considered less attractive than other public guarantee funds, such as BNDES' FGI-PEAC.

Beyond operationalising the Guarantee Fund Sao Paulo State Guarantee Fund for Energy Efficiency Development (FAEE), the project still needs to work on facilitating access to credit for SMEs' EE projects. The project needs to continue to share and communicate successes in financial terms to commercial banks and ensure the attractiveness of the guarantee fund for SMEs.

Having considered the evidence, the ELE team rates the effectiveness towards this intermediate outcome as amber because the project has yet to catalyse its first loan. It must be noted that the

²³ FGI-PEAC was established in 2020 to facilitate credit for micro, small and medium enterprises in the face of the economic crisis during the COVID-19 pandemic.

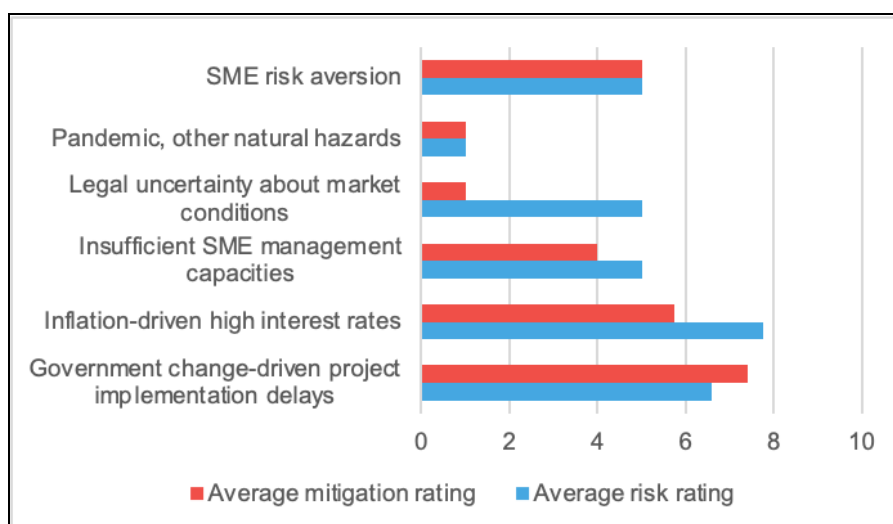
²⁴ Standardised model and capacity building on reverse logistics for accredited technology suppliers to ensure proper disposal of retrofitted equipment. For further information, please check the "Project Annual Report 2022".

rating reflects the challenges, to a great degree external to the project, of establishing a finance market for EE in Brazil and not the lack of project initiatives to overcome said barriers.

3.2.5 How external factors impacted the project's effectiveness.

Figure 3 represents the relative ratings given by relevant project stakeholders to the project's external risks and the strategies that the project is using to mitigate said risks.

Figure 3. Relative importance of external risk and project strategies and actions (to mitigate those risks) as rated by project stakeholders (scale 1 to 10)



ELE respondents unanimously identified the current macroeconomic situation, linked to high inflation and incertitude, as the primary and most significant risk to the project's success. Although it is widely acknowledged that this situation is beyond the project's control, institutional actors are confident that project actions, including the expected operation of the guarantee fund and the successful communication strategy, will be able to overcome such challenges. Several ELE respondents considered the "cultural barrier", i.e., SME's risk aversion, as an external factor that the project is successfully addressing. Likewise, although it is one of the main barriers identified in the project design, stakeholders considered limited SME capacities ("Insufficient SME management capacities" in **Error! Reference source not found.**) as an external factor that the project has been adequately addressing. The risk identified here, mostly by private sector stakeholders, mainly refers to financial management rather than technical know-how.

The project horizon extends beyond the electoral cycle, and the decarbonisation goal is not up for debate among political parties. Moreover, private stakeholders have expressed confidence in the project's ability to address changes in government policies or potential delays in implementation. However, there is some concern, even apprehension, among private sector respondents regarding how government policy instruments (e.g., PEE) may be applied and how the EE market may be affected (see factor "Legal uncertainty about market conditions" in **Error! Reference source not found.**). Some stakeholders highlighted that, although the government has not been an impeding factor towards the rise of EE in SMEs, e.g., through overregulation, complicated bureaucracy or additional taxations, it has not been providing sufficient incentives or stimulation for the EE market. Additionally, insufficient synergies and alliances between actors were perceived. Forming alliances

and bringing together relevant political and business actors would break down barriers, which interviewees feel is not happening (yet).

Respondents agree that a new pandemic or an unexpected natural disaster would enormously impact the project. Still, the negligible likelihood eliminates this risk.

Summarising, there is high agreement on the significant risk to project success posed by the current high-interest rates context and linked negative perceptions of the mid-term economic outlook. There is much less agreement and more diversity of views regarding other identified risks, such as SME financial capacities and the government's insufficient efforts to favour EE.

3.3 Efficiency of the project

Efficiency

3. To what extent is the relationship between inputs and outputs timely and to expected quality standards?

Given that the EE market for industrial SMEs, especially for thermal efficiency measures, is still in its infancy in Brazil, the project proposed a comprehensive approach to address all barriers (technical, financial, and cultural) to the uptake, sustainable financing and implementation of EE measures. **Both the FC and TC Components are being implemented by a mixed team of SENAI and GIZ staff, who are closely interlinked.**

“It is important to strengthen the project’s governance”. (Project team)

Four key groups were created to run the project, along with financial and technical delivery partners. These are: the **(i) Project Steering Committee (SC)**, composed of representatives of the key federal ministries MME and MDIC, Brazil's Energy Research Office (EPE) and GIZ. The SC is responsible for the project's strategic direction and alignment with governmental policies; **(ii) a Technical Advisory Committee (TAC)**, composed of representatives of EPE, ABESCO, SENAI and GIZ, is responsible for advising on the project's technical implementation; **(iii) a Project Management Office (PMO)**, which is responsible for the project's set up and delivery and is led by GIZ (the Implementation Organisation) and reports to the SC; and **(iv) an Investment Advisory Group (IAG)** responsible for screening projects submitted by end-users and service providers to ensure financial and technical soundness before these are submitted for *Desenvolve SP's* credit team. The IAG is composed of representatives of *Desenvolve SP*, the Brazilian Federation of Banks (FEBRABAN) and the Brazilian Development Association (ABDE).

Most interviewees say the interaction with ESCOs, banks, SENAI and GIZ is quite interesting and are very supportive of it. On the other hand, the SC meetings' frequency is perceived as being too low for several stakeholders. Discussion during the validation workshop revealed that **further engagement from SC members in communicating the project's results may enable broader recommendations for PotencializEE's improvement.** Public sector stakeholders acknowledged staff limitations to attend project meetings and internalise and act upon project information. They suggested increased communications and meetings within the current project management arrangements to facilitate its public policy dimension.

The interview process indicates that the TC Component's activities have been implemented on time and in accordance with its design and quality standards. **There is very strong evidence that human resources have been sufficient for the project implementation.** The ELE found that, despite the on-time development of tools, their implementation does not depend solely on the project. For example, even after 10 workshops delivered for 120 professionals from 30 banks in 2022²⁵, interviewees from this segment reported that they are at the stage where banks are learning to implement (EE related) loans and that there is still a lack of full alignment between PotencializEE and private banks to implement the first EE pilot projects financed by the banks.

Interviewees from the banking sector indicated that BNDES' FGI-PEAC, a guarantee fund set up to support enterprises in the aftermath of the COVID-19 pandemic with more favourable conditions than BNDES' *FG-Energia*, may be guaranteeing loans to part of the industrial SMEs supported by PotencializEE. However, BNDES' FGI-PEAC is not specific for EE and interviewed stakeholders identified it as a factor in the suboptimal performance of BNDES' *FG-Energia* (see section 3.2.4). It is expected that this temporary issue will be overcome after the phase-out of BNDES' FGI-PEAC at the end of 2023²⁶.

The FC Component has suffered a 12-month delay, mainly due to the difficulty of establishing the guarantee fund (FAEE) and the current level of the base interest rate of the Central Bank of Brazil (SELIC) level. While the first challenge has been managed with the establishment of the FAEE in December 2022 (two years after the project's commissioning) and the expected upcoming authorisation signature of the FAEE decree by Sao Paulo's Governor, the second challenge with the base interest rate exceeds the project management capacity.

From August 2020 to August 2022, SELIC ramped from 2% to 13,75%²⁷ due to inflation and other aspects. As a result, the interest rates of all Brazilian banks, including *Desenvolve SP* and private banks accessing PotencializEE's guarantee fund, were also raised. Hence, **borrowing becomes relatively less attractive for SMEs compared to times of lower SELIC rates. This applies to loans provided by Brazilian banks for all types of investments.** The interest rate has been in the double digits since February of 2022. The Brazilian Central Bank started reducing SELIC in August of 2023. The rate fell to 12.75% after a prolonged period at 13.75%. Local issuances are gradually recovering after a sharp capital market contraction in January through May of 2023, and PotencializEE's team is expecting to receive a larger number of EE projects in the second half of 2023. There is strong evidence from the interviews that **what is missing is more time and resources for implementation. A deadline extension would be necessary** due to the delay in decreasing the SELIC.

In conclusion, the ELE evidence presented above supports the ELE Team's decision to rate the TC and FC Component's effectiveness as green.

²⁵ As stated in chapter 6.2 of the Project Annual Report 2022.

²⁶ According to the Brazilian law 14.462, from 26th October 2022, only credit operations contracted up to 31st December 2023 will be eligible for the BNDES' FGI-PEAC guarantee.

²⁷ <https://www.bcb.gov.br/controleinflacao/historicotaxasjuros>

3.4 Impact of the project

Impact

4. What evidence is there that the project is likely to contribute to the intended impact in the ToC (incl. transformational change)?

The project is expected to have a transformative impact in Sao Paulo State, affecting industries in the entire nation. According to the project proposal, the project aims to directly avoid 7,267 GWh, mobilise ~EUR 80 million in EE investments, and mitigate emissions of ~1.1 MtCO₂e throughout its lifetime. Below, we use the Transformational Change Measurement Framework illustrated in Figure 2 (section 1.2.1 **Error! Reference source not found.**) and further explained in Annex A to unpack the different dimensions of the project's pathway to its transformational impact.

Dimension 1: Promoted a demonstration effect

A positive change was observed across the three dimensions (**EE perceptions, EE demand, and some limitations regarding GHG reduction**), although the early moment in the demonstration with so far only 11 showcases²⁸ (and particularly few thermal ones) makes it difficult to say the solutions have been demonstrated and to capture learnings of the application of the solutions. Nonetheless, the results of specific cases of EE projects within the scope of PotencializEE successfully helped showcase and establish a correlation between EE measures and GHG emission reductions.

There have been **first signs of increased private and public²⁹ investment related to energy efficiency**. Through effective awareness-raising and knowledge-sharing campaigns in the industry sector and effective capacity building of ESCOs, the project successfully established a **pipeline with the first 44 prepared EE projects with viable investment opportunities**. There are currently 301 EE projects (energy audits) under development, and as of June 2023, 11 have been implemented. On the other hand, it was also mentioned that if the Guarantee Fund is not established soon, it may prevent the first EE investments from taking place and further negatively impact the project pipeline development process. In addition, the flexibility of the business model at PotencializEE is still not perceived as enough to bring the speed the client needs, as bureaucratic hurdles and inflexible guidelines due to regulatory issues in Brazil, which the project can only partially influence, leave little room for creative improvisation and design adaptations.

The **general economic situation is perceived as negative** and hampers greater investment without external support, as already highlighted in section 3.2.5. Political and geopolitical challenges and the conflict in Ukraine have impeded the development of some mitigation actions. With SELIC at 13.25%, the investment climate is hampered. **On the other hand, the trend towards high energy prices makes EE more attractive**. Increased energy prices for electricity and fuel consumption severely impact industrial SMEs. They are further leveraging the demand for EE services being provided through the project.

The expectation is that **the market functions independently of public incentives**, which happens in an incipient but still very small way. In addition, the MME tries to better disseminate information

²⁸ See also Table 9, OA 2.1

²⁹ E.g., the proposal of BRL 8 million from the Ministry of Development, Industry, Commerce and Services for PotencializEE (which is however not yet approved). Other sources claim up to EUR 39 million.

about the results and how people perceive energy efficiency measures in the media. It is necessary to promote the knowledge of SMEs regarding thermal EE technologies to stimulate demand.

In summary, interim signals of a demonstration effect of EE measures for industrial SMEs can be observed. These were due especially to effective capacity building, awareness raising and stakeholder commitment through the project pipeline. However, the general economic context is not exclusively favourable and sets its limitations to the project.

Dimension 2: Caused a catalytic effect

Systematic Change

The project is generally perceived as on a good way forward and shows **early signs of a shifting attitude**. The cultural change has already occurred within companies and institutions, e.g., they are currently talking more about energy efficiency. The industry got under the impression that **cost is a key issue**. The work of PotencializEE is being cited in this regard. Energy efficiency seems complementary and is becoming very relevant, especially for SMEs. The conversation surrounding sustainability in the industrial sector is driving a push for environmental responsibility among suppliers, creating a "green chain"³⁰. There are internal and international pressures promoting sustainability.

The financial sector is being sensitised, too. **Non-commercial banks are interested in directly investing in EE**. For instance, BNDES declares it is willing to provide special financing conditions for technologies that meet efficiency criteria (which could largely increase the project's indirect impact) if the approach proves successful. The project also developed an impact model, which BNDES used to raise EUR 25 million from KfW. Besides, six banks have qualified for the (BNDES') *FG-Energia* guarantee fund.

As indicated in section 3.2.1 **Error! Reference source not found.**, SMEs are risk-averse and conservative. SMEs are motivated to introduce changes by the prospect of savings in energy bills, not GHG mitigation, which might encourage larger companies. **Creating and institutionalising culture will, therefore, take some time.**

ELE respondents are sure of the fundamental role of efficiency in Brazil's decarbonisation strategy. Still, they acknowledge that **energy efficiency** is associated with recession and crisis and **does not have the attractive image** of renewable energies, including solar, wind, and green hydrogen, and mitigation through land use change actions and conservation.

Replication and scaling-up potential

For the proposal to leverage the project and its partners to be coherent and sustainable, PotencializEE must continue to take permanent actions. The business concentration in Sao Paulo makes it easier. In other states, it must be adapted, as they do not have the industrial density of Sao Paulo. The project is a pilot to create a structure so the model can be applied in other regions. The

³⁰ E.g., suppliers must certify and seek low-carbon processes to avoid being taxed.

project's GHG reduction potential is of a relevant size to support Brazil's NDC commitments, even if it is not as important as, e.g., deforestation (in relative terms).

Once the positive impacts have been demonstrated, carrying out recurring energy diagnoses is expected to **become a common practice among industrial SMEs. The project is leaving SENAI with a "mould"³¹ for promoting and operating EE measures for industrial SMEs.** The project team must consolidate the instruments into an EE financing toolkit and select different types of banks for further scale-up support.

PotencializEE's data is being used to operationalise public policy: based on its operation in Sao Paulo, SENAI managed to expand PotencializEE with funding from PROCEL (EUR 9 million) in at least 5 states, which has already been approved. Another proposal is being developed with the Brazilian Support Service for Micro and Small Businesses (SEBRAE)³², intending to reach 41,000³³ companies throughout Brazil. According to an interviewee, there is already a memorandum of understanding worth BRL 750 million (EUR 30 million) just for the subsidised audit stage.

Another source estimates that private capital from commercial banks and/or institutional investors have the potential to mobilise approximately 94 million EUR for replication investments. BNDES has yet to submit the concept note as it needs to adjust the guarantee fund's internal accounting framework, making it compatible with international standards.

Several interviewees, however, cannot say if the upscaling proposal is coherent and sustainable, as **financial leverage will depend on the experience of banks and the positive experiences disseminated by entrepreneurs.** Others state that it will be difficult to continue autonomously once PotencializEE ends. According to a few interviewees, it still seems unlikely that financial institutions will take the PotencializEE experience and reduce bureaucracy in EE project concessions, as banks need to absorb valuation structures based on project finance to ensure market sustainability. **Sustainability depends on consumers and companies feeling that they are saving money through energy efficiency,** which is not a diffused conviction today.

To sum up, there are early signs of several types of possible positive systematic changes and scaling-up potential in the system due to the project's catalytic effect, especially regarding a cultural change and perception of energy efficiency measures within SMEs, replication capability and the commitment of the banking sector to promote EE.

Dimension 3: Contributed to additional GHG savings

Changing habits in relation to climate change were observed. According to government plans, EE in the industry sector is expected to keep rising, with an increase in the percentage of EE measures penetration in the state of Sao Paulo.

³¹ Project template or pattern and simple step-by-step instructions.

³² The Brazilian Support Service for Micro and Small Businesses is non-profit private entity that promotes small businesses (microenterprises) through advisory services courses. SEBRAE is financed by a 0,3% compulsory contribution from the payrolls of Brazilian firms; <https://sebrae.com.br>

³³ This figure includes micro and small businesses from the retail and service sectors.

Considering the life cycle of proposed EE technologies, the first 44 prepared EE projects with viable investment opportunities indicate a cumulative emission reduction potential of 42,695 tCO₂eq. The expected average of EE projects is 2,000 tCO₂eq avoided per project in its life cycle. Additional measures were identified and will be carried out by the project team in 2023 to **reinforce the GHG mitigation impact of its EE project pipeline** in Sao Paulo, support outstanding decision-making processes of SMEs, and reduce the transaction costs for commercial banks to engage in EE financing through digital solutions.

Therefore, evidence shows early signals that the project is likely to reach its goal of 1.21 MtCO₂eq of indirect GHG emissions reduction, although not within its original timeline³⁴. Yet, because of the lack of relevant numbers so far supported by the project components, there is not enough evidence to confirm the target at this stage.

The resulting impacts may be even greater than those projected in the proposal if the inclusion of thermal EE measures (e.g., heat pump, cogeneration) can be implemented as expected and increase avoided emissions. The gain would be very relevant to achieving the GHG reduction targets. Some previously completed energy audits are being revised to increase the GHG mitigation impact potential by integrating additional technologies into the project scope. **Regarding expected energy savings, most presented EE projects align with the programme's target.**

However, several sources point out that it is too early to talk about the results and, for the time being, they have not been accounted for so far. Signs of an increase in private or public investment can only be assessed after the execution of EE project measures, which have an average implementation cycle of two to three years.

Regulatory institutions usually monitor macro data, so the reduction in GHG emissions can be attributed to a reduction in production, for example, or the adoption of renewable energy, making it difficult to prove the reduction via EE. Many times, the changes and impacts are not seen. **The big change occurs only in the sum of multiple elements and gains strength** with several elements.

In summary, no signals can be expected regarding the contribution to additional GHG savings due to the short implementation period at the mid-point of the project. This is in line with the expectations of the TCMF for mid-term ELEs.

Following the instructions from the TCMF in Annex A, the ELE Team assessed the evidence to assign a value to the Core Mandatory Indicator M3 and compare it with the indicator's self-assessment given by the project team³⁵. The project team has given a score of 2 for the year 2022 to the M3 indicator. **Based on the evidence described above, the ELE Team confirms a rating of 2 to the Project's M3 indicator at its mid-term, i.e., the sought transformation is judged likely.** In fact, despite the different challenges described in the previous sections, EE measures have a strong base, given the current levels

³⁴ See also recommendation 1 in Chapter 5.2.3.

³⁵ The Core Mandatory Indicator M3 reads: "Degree to which the supported activities are likely to catalyse impacts beyond the project". The project team is asked to self-assess it using the following 0 to 4 scale: 0 = Transformation judged unlikely; 1 = No evidence yet available; 2 = Some early evidence suggests transformation likely; 3 = Tentative evidence of change – transformation judged likely; 4 = Clear evidence of change – transformation judged very likely.

of interest of the private and public sectors support. The possible expansion of PotenzializEE to other states and incorporation of SEBRAE is additional evidence of transformational change.

In conclusion, the evidence confirms that the project achievements along the TCMF are of the levels expected at Mid-Term (see Table 3). Therefore, the degree to which the supported activities are likely to catalyse impact beyond the project is scored “2 - some progress achieved”, and the “impact” evaluation criterion has been marked as “green”.

3.5 Sustainability of the project

Sustainability

5. What is the likelihood that the outcomes will be sustained after the end of the project funding period?

Project sustainability is concerned with measuring the extent to which project benefits (outcomes) are likely to continue after the end of the project assistance.

Energy efficiency will continue to be relevant. There is no risk of going backwards, according to most sources. Sustainability becomes more relevant and key (growing sector) every year. New technologies with greater efficiencies will become increasingly available and ubiquitous. The proposal is coherent and sustainable, and the strategy is correct. Public policy promoting EE is fairly stable under all governments. The established ecosystem is self-sustaining and produces the expected outcomes.

Risks to the sustainability of results exist since part of the results (from PotenzializEE) depend on the financial sector. This sector has a strong interest in operating in this segment. Still, it strongly depends on external factors such as interest rates (the economic moment is currently not very favourable due to high interest rates), as already discussed in section 3.2.5. However, the movement towards EE is practically irreversible, and the programme is very well structured to combat this risk. Updating the technology catalogue is a very important aspect in this context, as an outdated catalogue is of no value to the financial sector.

There is a risk (or lack) of awareness and funding. The industry in Brazil has tight margins. Companies need to understand that simple measures like equipment maintenance will lead to lower costs so they can improve production. Technical maintenance over time is a challenge, and the programme tries to support training and standardising processes, measurement, and verification. It has an internal measuring, reporting, and verification (MRV) database to gather information on the subject. Operation and maintenance management through performance contracts further help to mitigate these risks. If this is associated with better management and gains in demonstrated competitiveness, entrepreneurs' perceptions would change and enter another dynamic. **Once companies realise that they can make more money by implementing EE measures, the sustainability of these measures will be ensured.**

The continuity of the programme is essential to guarantee the project implementation and absorption of knowledge. Therefore, a longer period is needed to consolidate, as this is about cultural changes and the ambitions to achieve results at the national level. In this regard, the project has been trying to transfer more governance responsibilities to SENAI (e.g., on MRV). SENAI will try to provide continuity at the end of the programme's term and guarantee consistency. There are adequate funds at FIESPs' and SENAI's disposal regarding human, financial, and infrastructure resources. Also, Sao

Paulo's State Ministry of Infrastructure and Environment (SEMIL) is in close contact with the project team to ensure the programme's long-term sustainable impacts. Additional policies are needed to strengthen the consolidation process, and public policies also must be adequate to avoid, for example, the unfeasibility of the investment.

However, if the project is not expanding, there would be a risk of backsliding (not completely, but partially), e.g., due to changes in customer behaviour. There are difficulties ensuring the commercial sustainability of technical support (SENAI, ESCOs, consultants, suppliers, and banks) beyond the programme's lifetime. **The products of this project can be lost if the governance and the communication of the results are not well attributed** or would be abandoned, and no further public resources are assigned for EE. As an educational process, awareness raising and others must be continuous. Whoever continues must be in an intimate relationship with the companies to continually "sell" the idea of EE to business owners. Currently, there is no one (yet) assigned to replace PotenzializEE. However, **it is necessary to continue the work to support the current trend of evolution**, which needs support. To mitigate the risk, it is necessary to replicate the project results with the right actors.

In conclusion, the project components are likely to be sustained after the end of the project as the respective evidence gathered indicates a rather low risk of backsliding or reversing. The industry sector shows solid evidence of continuing its investment in EE measures after the project timeline. Evidence confirms that the project achievements are of the levels expected towards mid-term, and therefore, the project's sustainability has been assessed as green.

4 Conclusions

Now that the evidence collected and analysed by the ELE has been explored, this section goes back to the project’s Theory of Change to test to what extent the original causal pathways and assumptions behind them (see Section 1.1) have held.

Figure 4. Overview of Project Causal Pathways Assessment at Mid-Term

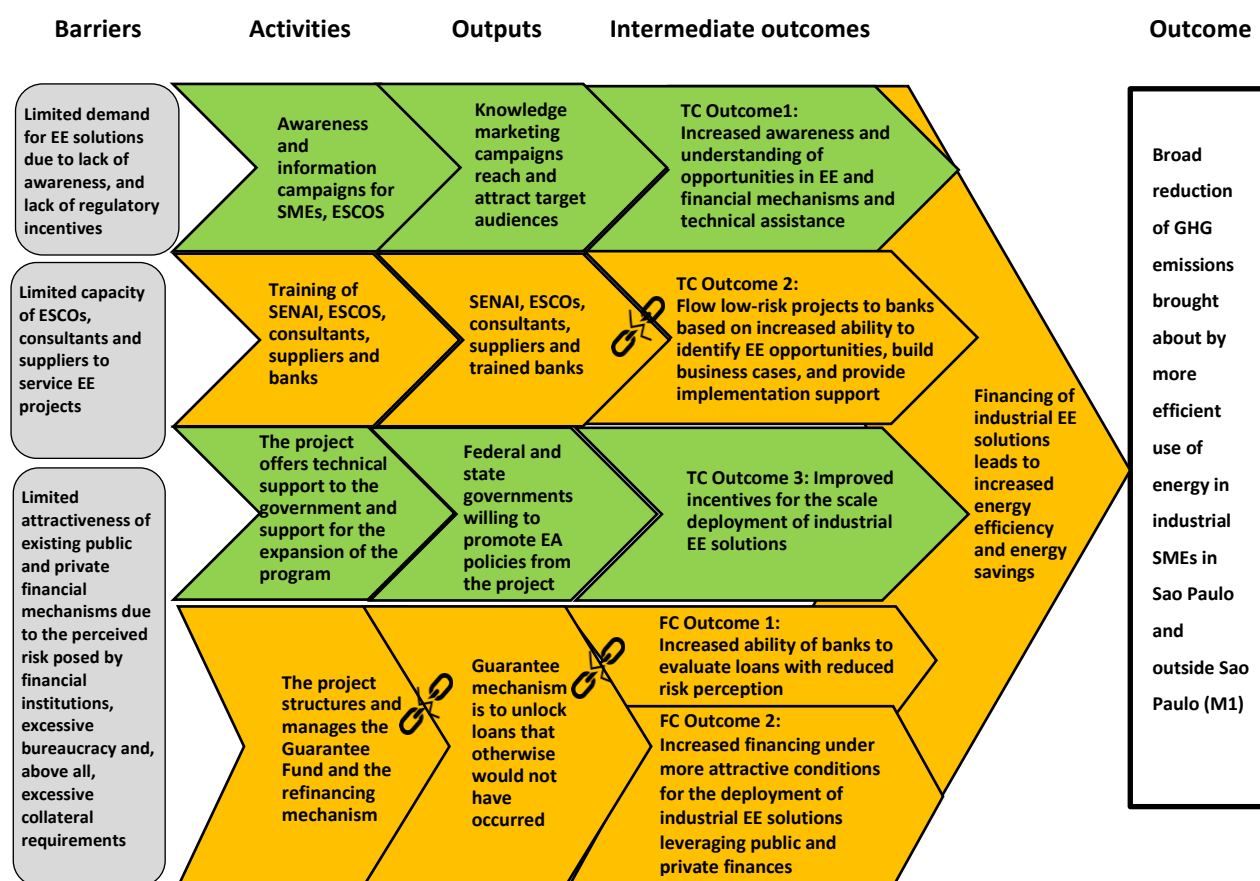
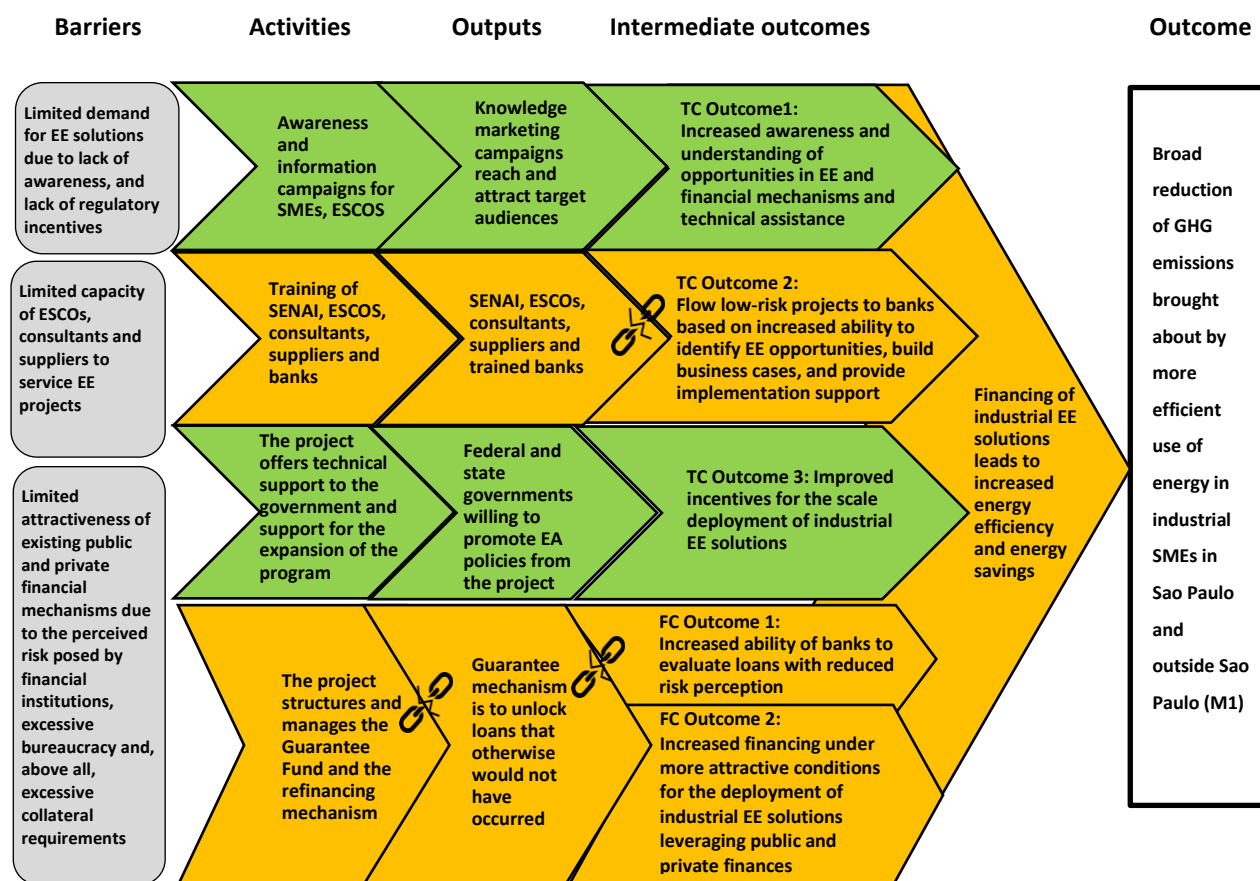


Figure 4 presents an overview of the project's progress along its ToC causal pathways towards its intended outcomes. The RAG rating uses the same scale as the previous section (i.e. Good / Very Good = Green; Problems = Amber; Serious deficiencies = Red; Not enough info to rate = Grey), and the colours of the Intermediate Outcomes' shapes are the same colours used in Section 3.10 to rate the project's achievements for each Intermediate Outcome. This is to be read as an assessment of the project's situation at this point in time, i.e., at mid-term.

What transpires from Figure 4. Overview of Project Causal Pathways Assessment at Mid-Term



is that some key assumptions need yet to materialise, significantly affecting the project's expected intermediate outcomes.

PotencializEE's partners started drafting the project strategy in 2014 and correctly identified the main barriers to the wide deployment of EE solutions, together with reasonable assumptions on the macroeconomic trends, political environment, and capacities of energy service providers.

As confirmed by most ELE respondents, the project is succeeding in breaking the "cultural barrier" composed of risk aversion and lack of awareness about cost savings and improved production processes associated with EE solutions. **The project's communication and awareness strategy has scored significant success** in recruiting over a thousand SMEs, and ELE respondents almost universally endorse it. Moreover, **the project has significantly reduced transaction costs of thermal EE projects** by engaging manufacturers and suppliers of the best internationally available technology in elaborating its catalogue of efficient technologies, which relevant stakeholders agree, if institutionalised, will be one of the fundamental legacies of PotencializEE. **Yet the awareness and technical materials are only beginning to result in viable EE projects for SMEs**, with limited implementation. The project strategy assumed a "sufficiently large number of ESCOs, consultants, suppliers [to] attend to eligibility criteria and see value in the training programme, to join the training" that would have kick-started the EE solutions market. Despite ESCOs and consultants' participation in the training, the current project pipeline results from the deeper project involvement directly with SMEs and the additional tools developed to facilitate quality energy audits to become feasible projects.

The second key assumption was official support at the federal and state levels for EE incentives. While energy efficiency is not opposed, it also needs more decisive support in the form of financial or regulatory incentives beyond the well-established PEE. PEE's focus on electric efficiency, not particularly for SMEs, does not catalyse the thermal efficiency projects endorsed by the project. Moreover, despite the resources invested in recommending reforms to promote EE measures in SMEs, they still need to be adopted. However, the project has catalysed the design of two programmes (SENAI in partnership with PROCEL and SEBRAE, see section 3.4) supporting EE, expected to mobilise at least EUR 39 million, that most informed ELE respondents expect to effectively upscale PotencializEE's approach beyond the state of Sao Paulo. Moreover, the project has supported the new guarantee fund supporting EE at the federal level, *FG-Energia*.

Still, **the suboptimal performance of *FG-energy*, hindered by high interest rates and transaction costs, should serve to question the third project assumption of rapid access to finance after establishing a risk-sharing facility.** The expected "*flow of financing under more attractive conditions for deploying industrial EE solutions leveraging public and private finances*" resulting from a guarantee fund was framed in the favourable macroeconomic context at the project design time. Moreover, the flagship project of the Sao Paulo State Guarantee Fund has faced significant delays due to a lack of support and some misunderstandings with the state government and the project's main financial partner, *Desenvolve SP*. However, all stakeholders involved agree that these issues have been resolved, and the fund's operation is guaranteed to start before the end of the year.

The project planned to entice increasing participation from commercial banks to crowd into the EE financial market. Yet, given the financial health of *Desenvolve SP*, the project assumes that loans for SMEs could happen even in the absence of proactive engagement by commercial banks. However, **the project's FC Component must learn from the challenges affecting *FG-Energia* and continue engaging commercial banks.** Thanks to the project's engagement, some commercial banks are starting to consider the possibilities of EE projects while remaining cautious before committing to a path that has yet to show the same proven results as renewable energy.

Despite the setbacks, provided continuous support from the federal and state government, PotencializEE is likely to boost the number of successfully implemented EE projects in SMEs in Sao Paulo and beyond, especially if the expected decrease of interest rates materialises. The first successful projects funded through public risk-sharing facilities can convince an increasing share of Brazil's SMEs to engage with thermal EE and catalyse private finance. Given the project's delays and the time needed to develop, implement, and verify results from EE projects, the commitment of the project's partners SENAI and *Desenvolve SP* and the project's ministries MME and MDIC to maintain the project's technical and financial instruments beyond 2025 is paramount to achieving at least partially, the project's outcome of broad reduction of GHG emissions brought about by more efficient use of energy in industrial SMEs in Sao Paulo and beyond.

5 Lessons and recommendations

5.1 Key lessons

The evidence gathered during the ELE, along with the key findings presented in Section 3 and the conclusions in section 4, have been used by the ELE Team to draw the lessons below.

5.1.1 Lessons for the Project Team to achieve the goal of the Project.

1. The project's partners and stakeholders mobilised by the project constitute an ecosystem that significantly adds value to the project implementation but requires strengthening the project's governing structures and management arrangements to enhance each actor's contributions. The involvement of committee members in disseminating results and activities can provide more relevant recommendations for improving the project.
2. The communication strategy must change the paradigm about energy efficiency, targeting the beneficiary's core needs (cost savings and competitiveness) with tangible examples (implemented projects) and making energy efficiency an attractive topic for companies and banks after the example of renewable energies.

5.1.2 Lessons for the Project Partners for supporting the success of the Project.

1. The project approach, tools and methods must be adopted and expanded by the project's partners at the federal and state levels.
2. To avoid the project's legacy becoming a dead end and unfolding the potential of EE for the Brazilian industry, the project's approach must be expanded in other states and economic sectors (retail and services).
3. Engaging the private financial sector to demonstrate that EE projects could be as successful as renewable energy generation projects could boost the EE market. An expanded advisory service for banks needs to be included in a possible expansion of the programme.

5.1.3 Lessons for the Mitigation Action Facility for the review, approval, and management of future interventions

1. Complex problems involving different actors can be solved by establishing the right mixture of partners in an ecosystem, in this case, composed of industries, vocational training, public and private finance institutions, and government organisations at the federal and state levels, meeting the expectations of different actors. Such an ecosystem must count on appropriate management arrangements, including the participation of relevant actors in steering and advisory committees.

5.1.4 Lessons for improving other or future projects' design and implementation.

A similar project can work in other countries, provided there exist the needed "ecosystem" components, a sufficient industrial park, an industry-linked technology-development and vocational training organisation, a development bank, and sufficient political support at the central and state/provincial levels.

5.2 Recommendations

The project design correctly identified the gap in Brazil's GHG mitigation strategy related to EE measures in industrial SMEs. The design was based on a sound understanding of SMEs' challenges in developing and implementing EE projects. Where the assumptions held (see section 1.1), the project has made significant progress, starting to show EE as an attractive saving strategy for SMEs. PotencializEE also turned SENAI into a more effective EE hub that is not only actively supporting the development of SME EE projects in the state of Sao Paulo but has already catalysed the upscaling to the rest of the country, for instance, through partnerships with SEBRAE, PROCEL and BNDES. However, the assumptions³⁶ underlying key results did not wholly materialise, and hence, the project has been slow at delivering EE projects, public policy instruments and access to finance for SMEs. Thus, to contribute to the project's stated outcome, the project team and partners must focus on bridging the gaps left by those partially fulfilled conditions. Here, the ELE team provides some recommendations for the project team to achieve the project goal and the project partners and the Mitigation Action Facility to support the success of the project.

5.2.1 Recommendations to the project team to achieve the goal of the project.

1. **Maintain the direct support to SMEs.** The project team and SENAI's direct support boosted the number of energy audits that can mature into viable EE projects (section 3.2.2). All relevant stakeholders interviewed during this ELE are confident that the first EE projects will show and prove that thermal energy efficiency projects foster savings in production processes that translate into short-term (1-2 years) investment returns. If the project packages and effectively communicates these gains, more SMEs will likely follow suit. Furthermore, promoting the development of a thermal solutions market may incentivise more ESCOs to participate (currently managing merely 9% of the project's 301 audits; see section 3.2.2).
2. **Continue engaging commercial banks.** The project's main financial result entails loans by *Desenvolve SP* secured by the FAEE (sections 1.1 and 3.2.4). The project expects the FAEE to start operations this year, and *Desenvolve SP*'s financial health (section 3.2.4) eliminates the need for the planned refinance of *Desenvolve SP*'s loans by private banks. **However, the few matured EE projects have shown that SMEs sometimes only use loans to finance their projects.** Moreover, *FG-Energia*'s (section 3.2.4) example shows that more than a guarantee fund is needed to ensure SME's access to finance, especially in the current high-interest rates

³⁶ Those assumptions were listed in the causal pathways' description in section 1.1. and can be summarised as: sufficient eligible ESCOs and consultants (that can effectively be trained and assist SMEs), (all relevant) state and federal governments interested in promoting efficiency as a means to mitigate GHG emissions, and a favourable macroeconomic environment. The degree to which these conditions materialised is described in section 3.2.

context. Future EE projects will likely need a variety of finance sources, including commercial bank loans. Engaging and communicating the results of EE projects to commercial banks will promote their involvement in financing further EE projects even if the FAEE suffers further delays or shows the same weaknesses as *FG-Energia* and the interest rates do not evolve favourably.

3. **Improve the communication of gender results.** The project's efforts to promote gender equity are unknown even to direct project stakeholders. Thus, **the project must improve the communication and dissemination of said successes** (section 3.1) and consider involving the appropriate cross-cutting gender structures in its institutional partners (Federal and State governments).

5.2.2 Recommendations to the project partners to support the success of the project.

1. **Project partners (steering and technical committee members) need to engage with the project in a more proactive manner.** While the project should strengthen the information flow³⁷ for the project's governing structures, project partners, particularly MDIC, MME, ANEEL and EPE, could act to promote EE instruments based on project proposals. For example, the project's recommendations for Brazil's flagship electric efficiency programme PEE (section 3.2.3), have not yet been acted upon. The project has demonstrated that engagement with other stakeholders (e.g., PROCEL, SEBRAE) can result in expansion and upscaling of the project's solutions to other states and sectors (sections 3.2.3 and 3.4).
2. As a corollary (of the more proactive engagements by project partners), **Desenvolve SP should play a key role in further engaging the state government of Sao Paulo.** The Sao Paulo government has been slow to support the project's EE solutions. Among others, the state government has apprehensions about the project's identification with the federal government. Thus, a more active engagement by *Desenvolve SP*, a key component of the state's institutional framework, could result not only in a more agile approval of FAEE's rules and operations but also in promoting EE within the state.

5.2.3 Recommendations to the Mitigation Action Facility

1. **Consider a project extension.** As a corollary of recommendations 1 and 2 for the project team, **the Mitigation Action Facility should consider granting a project extension of at least one year** and implemented EE projects supported by the project should be included as contributions to the project's outcome. Relevant stakeholders estimate at least a year as the time needed for an implemented EE project to start producing results. Thus, the project should be able to consolidate its support and communicate the results of ongoing projects. These projects and their GHG mitigation effect should be counted as a project's contribution, even if loans do not finance the projects³⁸.

³⁷ Advanced reports on real time progress and challenges and hindrances. Lack of timely information was cited as a constraint to support the project-by-project partners.

³⁸ The project's results framework insists on achieving 425 loans for SMEs.

Annex A Capturing Project-induced Transformational Change

Introduction

This is a brief guidance developed by AMBERO/OPM outlining a framework to consistently evaluate Mitigation Action Facility-funded projects' progress towards bringing about transformational change.

Transformational change is embedded in the Mitigation Action Facility's goals, and Theory of Change (ToC), and projects are the main way through which the Mitigation Action Facility will achieve this transformational change. Therefore, the projects need to be aiming to achieve this level of change, and the Evaluation and Learning Exercises (ELEs) of such projects should evaluate their progress.

In a way, key elements of transformational change are already monitored through the project's Mandatory Core Indicators M1-M5, part of the Mitigation Action Facility M&E Framework³⁹. However, they only cover partial elements of transformational change. Therefore, clearer guidance in identifying the signals or evidence of project-induced transformational change is needed.

This brief document clarifies how transformational change is expected in projects and provides guidance to both project and ELE teams on how to characterise the elements and evidence of project-induced transformational change.

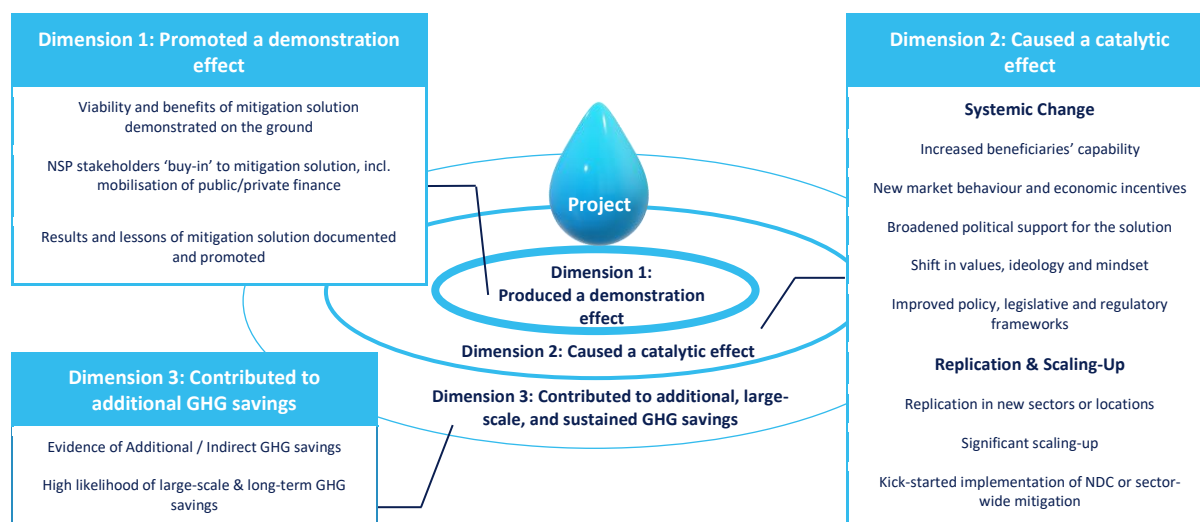
Breaking down project-induced transformational change

The Mitigation Action Facility defines transformational change as "*Catalytic change in systems and behaviours resulting from disruptive climate actions that enable actors to shift to carbon-neutral pathways*"⁴⁰.

The Mitigation Action Facility's ToC explains how transformational change is expected to be achieved through its outputs and outcome. The ToC is broad, and there are different ways transformational change can be achieved through the projects, which are simplified into the three *dimensions* summarised in the figure below.

³⁹ <https://mitigation-action.org/our-approach/monitoring-evaluation-learning/>

⁴⁰ https://mitigation-action.org/wp-content/uploads/Mitigation-Action-Facility_transformational_change-factsheet.pdf.

Figure 5. Dimensions of project-induced transformational change

Three dimensions interact and reinforce each other to produce project-induced transformational change (Figure 5). These are described below with an indication of what is expected to be achieved at the project’s mid- and end-point (see Table 11 and Table 12 for more details on scoring criteria).

- **Dimension 1: Promoted a demonstration effect.** The most direct way in which a project can contribute to transformational change is to produce a demonstration effect, which will imply that:
 - The project has **demonstrated** or proven the viability and benefits of a particular **mitigation ‘solution’ (e.g., models, practices or technologies)** through implementation on the ground (e.g., using pilot projects), thereby directly contributing to GHG emissions savings;
 - There is **evidence of buy-in by key project stakeholders**, e.g., by mobilising additional public/private finance along with the project Financial Cooperation Component;
 - The demonstrated **results and lessons of the mitigation solution have been documented** (e.g., in knowledge or communication products) **and promoted externally to a wider audience.**

By mid-line, projects are expected to show interim signals of achieving this demonstration effect, which should have become clear evidence (i.e., advanced signals) by the end-line.

- **Dimension 2: Caused a catalytic effect.** To amplify the impact of the mitigation solution demonstrated (Dimension 1), the project needs to cause a virtuous catalytic effect in the operating country or region. This can take the form of one or more of the following catalytic changes:
 - **Replication and/or significant scaling-up** of the project’s demonstrated solution in other sectors or locations, or of the project itself. This could include kick-starting sector-wide mitigation or the NDC; and/or
 - As a result of the project improving enablers and/or eliminating barriers to the uptake of the mitigation solution, it will result in wider **‘systemic’ change**, which could be supported by one or more of the following: a) Increased beneficiaries’ capability; b) new market behaviour and economic incentives; c) improved policy, legislative and

regulatory frameworks; d) broadened political support for the solution; e) shift in values, ideology and mindset.

By mid-line, projects are expected to have produced some early signals of one or more of these changes (or that they are likely in the near future), which by the end of the project should have been strengthened into interim signals.

- **Dimension 3: Contributed to additional GHG savings.** As a result of contributing to Dimension 1 and Dimension 2, the project will indirectly influence *additional, large-scale and sustained GHG savings*⁴¹.

During the project's lifetime, projects are not expected to have achieved this. Yet, by the end of the project, there should be early signals of additional (i.e., indirect) GHG savings and evidence that these will become large-scale and sustained GHG savings in the future.

Box 1. Connection between transformational change Measurement Framework and Knowledge Management and Learning Strategy

One of the key objectives of the Knowledge Management and Learning Strategy (KMLS) is to ensure that learning from both successes and failures is taken into account, changes are implemented accordingly, and innovative approaches are replicated. There is therefore an important connection between the ELEs and this strategy, and the learning documented through the ELEs is expected to be used by the Mitigation Action Facility in its function of 'Knowledge and Learning Hub' for the international climate finance community explained in the strategy. In particular, project-specific learning should be proactively shared and discussed with other projects (at least with those funded by the Mitigation Action Facility). The KMLS also expects to engage with and influence international debates on climate finance and transformational change. The Mitigation Action Facility will use and synthesise learning on supporting transformational change, documented through the ELEs, to inform this engagement.

Measuring project-induced transformational change

As shown, the transformational change dimensions come directly from the Mitigation Action Facility ToC. As the projects are expected to be aligned with the overall Mitigation Action Facility ToC, it should be possible to map the dimensions of transformational change in the project ToC. All projects must monitor their progress using their Monitoring and Evaluation (M&E) Plans which include Mandatory Core Indicators and project-specific indicators.

The ELE teams will be evaluating and learning from the projects' progress in supporting transformational change, which will include reviewing progress against the indicators and milestones set out in their M&E Plans. In addition, this can be complemented (and verified) with more qualitative ELE questions and data sources. **Error! Reference source not found.** below provides some guidance to ELE teams in terms of criteria and evidence for assessing the project-induced transformational change. This includes the three dimensions but also the scoring for the Core Mandatory Indicator M3, which can be seen as the summation of results for the three dimensions.

⁴¹ Additional = the GHG savings achieved are in addition to those achieved by the direct implementation of the project. Large-scale = the additional GHG savings will have a significant impact on overall GHG savings in the geography/sector. Sustained = there is no chance of the GHG savings being reversed.

Table 10. Guidance for ELE teams for measuring project-induced transformational change

Transformational change dimension	Element within transformational change dimension	Alignment with OECD DAC Criteria / ELE report section	Where should it feature in project ToC and M&E Plans?	How to measure success?	Expectations at mid-line and final ELE
1: Promoted a demonstration effect	Viability and benefits of mitigation solution demonstrated on the ground	Effectiveness	<ul style="list-style-type: none"> Milestones set for outputs and/or Intermediate Outcomes (if used) should represent the scale of uptake needed to demonstrate the solution is viable (meaning it has been shown to work in practice at a large scale in diverse contexts, and provide the expected economic, social and climate benefits) Also aligns with M1: Reduced Direct GHG emissions and M2: Number of people directly benefiting 	<p><i>Quant:</i> Achievement of project milestones for the adoption of the mitigation solution by target users and resulting direct GHG emission savings</p> <p><i>Qual:</i> Feedback from target users that viability and benefits have been demonstrated.</p>	<ul style="list-style-type: none"> Mid-line: Interim Signals End-line: Advanced Signals
1: Promoted a demonstration effect	Results of mitigation solution documented and promoted	Effectiveness	<ul style="list-style-type: none"> Milestones set for outputs on producing knowledge and learning documents and engaging with wider stakeholders to share this insight. Seek alignment with the KMLS. 	<p><i>Quant:</i> Achievement of project milestones for knowledge and communication products/activities</p> <p><i>Qual:</i> Feedback from other stakeholders (e.g. other funders) on their awareness and understanding of the project and solution.</p>	<ul style="list-style-type: none"> Mid-line: Interim Signals End-line: Advanced Signals
1: Promoted a demonstration effect	project stakeholders 'buy-in' to mitigation solution	Effectiveness	<ul style="list-style-type: none"> Milestones set for outputs and/or Intermediate Outcomes for the volume of finance expected to be mobilised and/or other examples of 'buy-in' (e.g. policy statement). Also aligns with M4-5: Public and Private finance mobilised 	<p><i>Quant:</i> Achievement of project milestones for public and private finance mobilised</p> <p><i>Qual:</i> Feedback from government and other stakeholders that they are convinced of the viability and benefits of the solution</p>	<ul style="list-style-type: none"> Mid-line: Interim Signals End-line: Advanced Signals

Transformational change dimension	Element within transformational change dimension	Alignment with OECD DAC Criteria / ELE report section	Where should it feature in project ToC and M&E Plans?	How to measure success?	Expectations at mid-line and final ELE
<p>2: Caused a catalytic effect</p>	<p>Systemic change underway to enable widespread adoption of mitigation solution:</p> <ul style="list-style-type: none"> Improved policy, legislative and regulatory frameworks New market behaviour and incentives Increased institutional capacity and management practices Shifts in values, ideology and mindset Broadened political support for the solution 	<p>Effectiveness</p>	<ul style="list-style-type: none"> Milestones set for outcomes should indicate specifically what needs to change to enable widespread uptake of the mitigation solution. 	<p><i>Qual:</i> Evidence of contribution to achieving expected systemic change and unexpected changes.</p>	<ul style="list-style-type: none"> Mid-line: Early Signals End-line: Interim Signals
<p>2: Caused a catalytic effect</p>	<p>Replication and scaling-up of mitigation solution and/or project</p> <ul style="list-style-type: none"> Replication in new sectors of the mitigation solution and/or project itself Significant* scaling-up of the mitigation solution and/or project itself Kick-starting and influencing sector-wide mitigation <p><i>* Significant compared to the size of the project and the overall target user group. For example, if the project promoted the installation of 2,000 Solar PV systems (representing approximately 2% of all target users), significant replication would imply that it has reached around 20% of target users. However, there is no quantitative target to meet, and a rationale can be provided to justify it meeting this criteria.</i></p>	<p>Effectiveness Sustainability</p>	<ul style="list-style-type: none"> Milestones set for outcomes for replication/ scaling-up by others of project activities. 	<p><i>Quant:</i> Volume of scaling-up (e.g. # of new geographies/ beneficiaries or \$ of new funding)</p> <p><i>Qual:</i> Feedback from other funders and programmes on the influence of project in their decision to scale-up activities and/or invest in the project's sector.</p>	<ul style="list-style-type: none"> Mid-line: Early Signals End-line: Interim Signals

Transformational change dimension	Element within transformational change dimension	Alignment with OECD DAC Criteria / ELE report section	Where should it feature in project ToC and M&E Plans?	How to measure success?	Expectations at mid-line and final ELE
3: Indirectly contributes to additional, large-scale and sustained GHG savings	As a result of the changes from dimensions 1 and 2, there is evidence of additional and potentially large-scale and sustained GHG emissions savings	Impact	<ul style="list-style-type: none"> • Milestones set for Impact should represent the scale of GHG emissions savings required for sector decarbonisation. • Also aligns with M1: Reduced Indirect GHG emissions and 	<p><i>Quant:</i> Achievement of project milestones for indirect additional GHG emissions savings</p> <p><i>Qual:</i> Given progress for dimensions 1 and 2, an assessment of the likelihood that this will result in additional GHG savings in the future. This is informed by feedback from wider stakeholders in the sector.</p>	<ul style="list-style-type: none"> • Mid-line: No signals • End-line: Early Signals
Overall Transformational Change potential	M3: Degree to which the supported activities are likely to catalyse impacts beyond the projects (potential for scaling-up, replication and transformation)	Impact		<p><i>Mixed:</i> Based on whether the expected minimum level of signals for each transformational change dimension is found, the ELE gives: 1) a RAG rate to the 'Impact' evaluation criterion; and 2) a rate from 0 to 4 to the M3 indicator.</p>	

Guidance for describing and scoring progress towards transformational change in ELE reports

Although transformational change is ultimately related to the project's Impact, **evaluating progress towards it cuts across different parts of the ELE report related to Evaluation Questions on Effectiveness, Sustainability and Impact (see table above)**. In particular, the Effectiveness and Sustainability sections of the ELE report will describe key aspects of dimensions 1 and 2 (which relate to the projects' outputs, intermediate outcomes and outcomes). Therefore, the Impact section will provide an analytical synthesis of the three transformational change dimensions referring to the previously described evidence and assign an overall score to the project's transformational change potential. ELE reports' authors should avoid duplications across the sections and cross-reference to other relevant parts of the report, if some of the evidence has already been discussed.

Each dimension should be described and assessed according to the following "signal levels":

Table 11. Transformational Change "Signals" assessment by ELEs

Signal level	Definitions
No evidence	Evidence suggests little to no progress is being made in line with the ToC causal pathways to Transformational Change.
Early signals	There is emerging evidence of the transformation related to the dimension, or the foundations for the transformation have been laid by the project, but no signals of the change are present.
Interim signals	Evidence shows some signals that the transformation related to the dimension is underway, and it is likely to continue.
Advanced signals	Evidence shows strong signals that the transformation related to the dimension is underway, and there is little doubt that it will continue.

ELEs would expect projects to have achieved at least the "signal levels" in Table 12 **Error! Reference source not found.** by the project's mid-point and end-point for each dimension.

Table 12. Minimum expected signals of project-induced transformational change

Dimension	Mid-point	End-point
1: Promoted a demonstration effect	Interim signals	Advanced signals
2: Caused catalytic effect	Early signals (of one or more of the types of possible changes)	Interim signals
3: Contributed to additional GHG savings	None	Early signals

Within the relevant dimension's sub-sections, these signal levels should be presented and justified by referring to the evidence provided throughout the report (e.g. in the Effectiveness and

Sustainability sections). Below are some guiding questions to support this (aligned to measures presented in Table 10).

For presenting the evidence on **Dimension 1**, the report could provide a narrative answering the following questions:

- Is the project in line with the expected direct GHG savings per M1 and the number of beneficiaries reached per M2?
- Have the key project stakeholders (i.e. those closer to the project implementation) shown concrete evidence of buy-in/adoption of the project's mitigation solution? Is this demonstrated by public and private sector actors investing resources into it, as per M4 and M5?
- Is the project documenting the key results and lessons from the process of demonstrating the validity of the mitigation solution and sharing these with wider stakeholders?
- Do the answers to the above questions constitute interim/advanced signals of Dimension 1 for the mid-line and end-line ELEs, respectively?

Similarly, for **Dimension 2**, the narrative could present evidence around the following questions:

- Has the project contributed to improving/removing systemic enablers/barriers to the widespread uptake of its demonstrated mitigation solution? What wider effects might this produce?
- What is the evidence that the project's mitigation solution will be scaled-up and/or replicated in new sectors and/or locations?
- Is there evidence that the project has informed or kick-started the implementation of the NDC or sector-wide mitigation?
- Do the answers to the above questions constitute early/interim signals of Dimension 2 for the mid-line and end-line ELEs, respectively?

Concerning **Dimension 3**, as no signals are expected at mid-term, the following questions are suggested for the analysis in Final ELEs only:

- Is the project in line with the expected indirect GHG savings per M1?
- What is the evidence that the project's mitigation solution will generate additional and large-scale GHG savings in the long term?
- Do the answers to the above questions constitute early signals of Dimension 3?

Finally, the assessment would conclude by providing an overall rating of transformational change potential. This aligns with M3: "Degree to which the supported activities are likely to catalyse impacts beyond the projects (potential for scaling-up, replication and transformation)".

The project will likely have provided a self-score for M3 within their routine M&E reporting. Therefore, the ELE teams can discuss with the project teams their rationale for this score, and then provide their own independent judgement of it.

To do this, the ELE authors should look back on whether the expected minimum level of signals for each transformational change dimension (Table 12) was found by the ELE and, on that basis, rate from 0 to 4 the M3 indicator using the scale recommended in the Mitigation Action Facility M&E Framework:

- 0 = Transformation judged unlikely;
- 1 = No evidence yet available;
- 2 = Some early evidence suggests transformation likely;
- 3 = Tentative evidence of change – transformation judged likely;
- 4 = Clear evidence of change – transformation judged very likely.

Based on that score, a Red-Amber-Green (RAG) rating will be assigned to the Impact evaluation criterion. The RAG rating can follow the guidelines in the matrix below (Table 13), while leaving some flexibility to account for the project-specific trajectories of progress.

Table 13. Indicative project’s Impact RAG rating based on its M3 indicator score

M3 score	0	1	2	3	4
Mid-term ELE	Red	Amber	Green	Green	Green
Final ELE	Red	Red	Amber	Green	Green

Legend: 0 = Transformation judged unlikely; 1 = No evidence yet available; 2 = Some early evidence suggests transformation likely; 3 = Tentative evidence of change – transformation judged likely; 4 = Clear evidence of change – transformation judged very likely.

Annex B Evaluation and Learning Exercise Matrix

This evaluation and learning exercise matrix is based on the Theoretical Framework provided (version April 2022). It is a working tool that allows the evaluators to focus on a feasible target and assemble information for each question that can be synthesised in the final report, hence creating an integrative overview of the project at large.

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
1 RELEVANCE					
1	To what extent does the project address an identified need (by the national government and SMEs)?	<ul style="list-style-type: none"> ▪ Project-supported IIEE policies aligned with national and state priorities as stated in relevant strategy documents. ▪ The project design responds to the goals and interests of its institutional and private beneficiaries and addresses all relevant barriers. ▪ The project considers gender issues and/ or supports national gender equality goals. 	<ul style="list-style-type: none"> ▪ The policies for developing industrial energy efficiency are relevant and in line with the current government’s priorities. ▪ The project supports national mitigation or energy efficiency objectives. 	<ul style="list-style-type: none"> ▪ Project team ▪ Project stakeholders ▪ Third parties 	<ul style="list-style-type: none"> ▪ Interviews ▪ Document analysis
2 EFFECTIVENESS					
2	To what extent has the project been achieving intended intermediate outcomes (and unintended ones)?	<ul style="list-style-type: none"> ▪ The project is directly building the capacity of ~100 individuals (30 women and 70 men) among EE consultants, ESCOs and suppliers, delivering audits that identify energy savings in 1,036 SMEs (15,589 women and 40,244 men) and provide implementation support to at least 425 of these (6,342 women and 16,444 men) that effectively invest in EE interventions identified, requiring EUR 80 million in investments by the end of this project lifetime, of which EUR 64 million in public financing and EUR 16 million in private co-financing. 	<ul style="list-style-type: none"> ▪ The project strategy is feasible with the designed resources and management arrangements. ▪ The project actions are the main driver of change. 	<ul style="list-style-type: none"> ▪ Project team ▪ Project stakeholders ▪ Third parties 	<ul style="list-style-type: none"> ▪ Interviews ▪ Document analysis

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
2.1	Is the project effectively inducing the development of thermal EE investments in Brazil (i.e., on top of electricity efficiency savings)?	<ul style="list-style-type: none"> The project is effectively inducing the development of thermal EE investments in Brazil. 	<ul style="list-style-type: none"> Efficiency measures in thermal energy generation are needed to achieve the project's mitigation targets. 	<ul style="list-style-type: none"> Project team Project stakeholders Third parties 	<ul style="list-style-type: none"> Interviews Document analysis
2.2	Is the project's strategy to ensure the utilisation of its energy technology list in energy efficiency projects and existing credit lines compelling?	<ul style="list-style-type: none"> The project implements a compelling strategy to ensure the utilisation of its energy technology list in energy efficiency projects and existing credit lines. 	<ul style="list-style-type: none"> SMEs in Sao Paulo, potentially in all of Brazil, understand the advantages of energy efficiency, even if they cannot implement them due to insufficient capacity. 	<ul style="list-style-type: none"> Project team Project stakeholders Third parties 	<ul style="list-style-type: none"> Interviews Document analysis
2.3	Are awareness-raising and dissemination actions effectively mobilising industrial SMEs to benefit from the project?	<ul style="list-style-type: none"> Awareness-raising and dissemination actions effectively mobilise industrial SMEs to benefit from the project. 	<ul style="list-style-type: none"> SMEs will be attracted to participate in the project's mechanisms by the project's communication strategy. 	<ul style="list-style-type: none"> Project team Project stakeholders Third parties 	<ul style="list-style-type: none"> Interviews Document analysis
2.4	Does the Guarantee Fund decrease the risk perception towards EE projects and facilitate access to finance for industrial SMEs?	<ul style="list-style-type: none"> The Guarantee Fund and the refinancing mechanism will likely produce indirect impacts that double the impact of the first cycle. 	<ul style="list-style-type: none"> The Guarantee Fund decreases the risk perception towards EE projects and facilitates access to finance for industrial SMEs 	<ul style="list-style-type: none"> Project team Project stakeholders Third parties 	<ul style="list-style-type: none"> Interviews Document analysis
3 EFFICIENCY					
3	To what extent is the relationship between inputs and outputs timely and to expected quality standards?	<ul style="list-style-type: none"> The project's outputs can be delivered during the project's implementation period with the allocated resources. If there are delays in the implementation, what have caused them (endogenous or exogenous factors), and how seriously have they impacted the project implementation? The level of satisfaction of the project's direct beneficiaries Project management arrangements enable efficient implementation, monitoring, and reporting. 	<ul style="list-style-type: none"> Project activities run smoothly on time and budget. Project design identified national organisations relevant to achieving IEE measures in SMEs with agile and transparent implementation mechanisms. 	<ul style="list-style-type: none"> Project team Project stakeholders Third parties 	<ul style="list-style-type: none"> Interviews Document analysis

ELEQ No.	Evaluation Question	Evaluation criteria	Original hypotheses	Who can answer this question	Source of information Data gaps
3.1	Does the project funding and resources suffice to achieve the project's results?	<ul style="list-style-type: none"> The project funding and resources suffice to achieve the project's results. 	<ul style="list-style-type: none"> Project design contemplated sufficient financial and human resources and capacities. 	<ul style="list-style-type: none"> Project team Project stakeholders Third parties 	<ul style="list-style-type: none"> Interviews Document analysis
4 IMPACT					
4	What evidence is there that the project is likely to contribute to the intended impact in the ToC (incl. transformational change)?	<ul style="list-style-type: none"> The project is starting to trigger transformational change and will likely directly avoid 7,267 GWh, saving end-users ~EUR 310 million in energy costs and mitigating emissions of 1,092 ktCO₂e at EUR 16.81/ton within this PROJECT's lifetime. The project has set the stage for scaling-up efficiency solutions for SMEs 	<ul style="list-style-type: none"> The project starts to trigger transformational change, including scaling up efficiency solutions for SMEs The project will likely avoid 7,267 GWh, saving end-users ~EUR 310 million in energy costs and mitigating emissions of 1,092 ktCO₂e at EUR 16.81/ton within this PROJECT's lifetime 	<ul style="list-style-type: none"> Project team Project stakeholders Third parties 	<ul style="list-style-type: none"> Interviews Document analysis
5 SUSTAINABILITY					
5	What is the likelihood that the outcomes will be sustained after the end of the project funding period?	<ul style="list-style-type: none"> The extent of the evidence supporting the project sustainability (e.g., evidence of self-sustaining institutional structures, official standards and political and financial commitment of key stakeholders) The scale-up proposal of the project is coherent and sustainable 	<ul style="list-style-type: none"> The scale-up proposal of the project and its partners is coherent and sustainable beyond the scope and duration of this project. 	<ul style="list-style-type: none"> Project team Project stakeholders Third parties 	<ul style="list-style-type: none"> Interviews Document analysis
6 LEARNING					
6	What key lessons can be learnt to the benefit of this or other projects funded by the Mitigation Action Facility in achieving their results?	<ul style="list-style-type: none"> Lessons learned can be identified by the ELE team, and knowledge can be shared effectively with stakeholders. 	<ul style="list-style-type: none"> Lessons learned from the project can be applied to future Mitigation Action Facility projects. 	<ul style="list-style-type: none"> Project team Project stakeholders Third parties 	<ul style="list-style-type: none"> Interviews Document analysis

Annex C List of ELE sources

C.1 Internal documents

1. Project Proposal Brazil Industrial Energy Efficiency - TI4E (PotencializEE), 2019
2. Annual Report 2020 Brazil Industrial Energy Efficiency FC+TC
3. Semi-Annual Report 2021 - Brazil Industrial Energy Efficiency TC+FC
4. Annual Report 2021 Brazil Industrial Energy Efficiency FC+TC
5. Amendment request TI4E 2021
6. Semi-Annual Report 2022 - Brazil Industrial Energy Efficiency TC+FC
7. Annual Report 2022 Brazil Industrial Energy Efficiency FC+TC
8. Semi-Annual Report 2023 - Brazil Industrial Energy Efficiency TC+FC
9. Meeting notes: Brazil Industrial Energy Efficiency Up-scale, June 2023

C.2 Public documents

1. Diário Oficial - Lei nº 17.615-22 - Institui Fundo de Aval - FAEE-PotencializEE, 2022
2. Lista de Pré-Qualificados - Concurso para seleção de beneficiários, 2023

C.3 List of organisations interviewed

Institution	Position
Project Team	
GIZ	Team Leader & Project team
SENAI	Implementing Partner
Ministry of Mines and Energy (MME)	Implementing Partner
Ministry of Development, Industry, Commerce and Services (MDIC)	Implementing Partner
Desenvolve SP - Guarantee Fund and credit operations	Implementing Partner
National Bank for Economic and Social Development (BNDES) - (FINAME)	Implementing Partner
National Bank for Economic and Social Development (BNDES) - (FGEnergia)	Implementing Partner
Project Stakeholder	

Brazilian Association of Energy Conservation Services Companies (ABESCO)	Policy advisory
Energy Research Company (EPE)	Policy advisory
National Electric Energy Agency (ANEEL) - (International area)	Policy advisory
National Electric Energy Agency (ANEEL) - (Electricity Regulation)	Policy advisory
Brazilian Nuclear and Binational Energy Holding Company (ENBPar)	Manager of PROCEL
Ativa Energia	ESCO
Eletrizante	ESCO
Third Party	
Instituto Clima e Sociedade (ICS)	Policy advisory
AGES Consultoria e Projetos	ESCO
Banco ABC	Bank
BTG	Bank
Produflex (Diadema-SP)	Project beneficiary
Hausthene (Mauá-SP)	Project beneficiary
Electrocoating (Diadema-SP)	Project beneficiary