

Terminal Evaluation Validation form, GEF Independent Evaluation Office

1. Project Data

Summary project data			
GEF project ID		4136	
GEF Agency project ID		CH-X1007	
GEF Replenishment Phase		GEF-4	
Lead GEF Agency (include all for joint projects)		IADB	
Project name		Promotion and Development of Local Solar Technologies in Chile	
Country/Countries		Chile	
Region		Latin America & Caribbean	
Focal area		Climate Change	
Operational Program or Strategic Priorities/Objectives		CC-SP1 – Promote EE in residential & commercial buildings CC-SP3 – Promote Market Approaches for Renewable Energy	
Stand alone or under a programmatic framework		Standalone	
If applicable, parent program name and GEF ID			
Executing agencies involved		Ministry of Energy (MINENERGIA) Superintendency of Electricity and Fuel (SEC)	
NGOs/CBOs involvement			
Private sector involvement (including micro, small and medium enterprises) ¹		Gestión Creativa Goup ACESOL (industry association)	
CEO Endorsement (FSP) / Approval (MSP) date		5/31/2012	
Effectiveness date / project start date		11/5/2013	
Expected date of project completion (at start)		11/5/2017	
Actual date of project completion		5/5/2020	
Project Financing			
		At Endorsement (US \$)	At Completion (US \$)
Project Preparation Grant	GEF funding	0	0
	Co-financing		
GEF Project Grant		2.727	2.244
Co-financing	IA own	0.650	0.650
	Government	30.900	34.378
	Other multi- /bi-laterals	0.200	
	Private sector		
	NGOs/CBOs		
	Other		
Total GEF funding		2.727	2.245
Total Co-financing		45.900	35.028
Total project funding (GEF grant(s) + co-financing)		48.627	37.273
Terminal evaluation validation information			
TE completion date		11/19/2021	
Author of TE		Victoria Galeano (PRISSMA LLC)	
TER completion date		11/21/2022	

¹ Defined as all micro, small, and medium-scale profit-oriented entities, including individuals and informal entities, that earn income through the sale of goods and services rather than a salary. ([GEF IEO 2022](#))

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TER peer review by (if GEF IEO review)	Neeraj Negi

Access the form to summarize key project features here: <https://www.research.net/r/APR2023>.

2. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF IEO Review
Project Outcomes	S	HS	—	HS
Sustainability of Outcomes		L	—	L
M&E Design		HS	—	S
M&E Implementation		HS	—	S
Quality of Implementation		HS	—	S
Quality of Execution		HS	—	S
Quality of the Terminal Evaluation Report			—	MS

3. Project Objectives and theory of change

3.1 Global Environmental Objectives of the project:

The global environmental benefit of the project is carbon emissions reduction resulting from implementation of proposed pilot projects that will diminish energy demand from electricity grid as well as fossil fuel combustion for industrial heating (p. 15 of CEO Endorsement Request).

3.2 Development Objectives of the project:

The objective of this project was to provide support the Government of Chile (GoC) and the Ministry of Energy (MINENERGIA) to develop the industry for solar water heating (SWH) and power generation in Chile (Photovoltaic (PV) panels and Concentrated Solar Power (CSP) (p.1 Request for CEO Endorsement).

3.3 Were there any **changes** in the Global Environmental Objectives, Development Objectives, or project activities during implementation? What are the reasons given for the change(s)?

Terminal evaluation does not report any changes.

3.4 Briefly summarize project's theory of change – describe the inputs and causal relationships through which the project will achieve its long-term impacts, key links, and key assumptions.

None of the project documents explicitly presents a theory of change. The northern region of Chile experienced higher energy demand due to increased mining activities. As there was no hydropower potential in that region, the government was keen to explore wind and solar potential in the region to avoid the environmental impacts of coal. Barrier analysis identified unavailability of technical regulations, shortage of technicians due to lack of formal training programs, lack of quality control of equipment, lack of knowledge and access to finance as factors hindering introduction of solar power. Therefore, the project was designed to develop demonstration projects in areas with high solar potential and sectors with high saving potential focusing on the strengthening of local capabilities for manufacturing, designing and maintenance of solar systems. It also aimed to transfer and develop capacities of both private and public stakeholders on CSP to ensure successful adoption locally.

The specific objectives of the projects were also identified as three components of the project, which are: (i) promoting technology transfer, institutional strengthening and capacity building in solar technologies; (ii) developing pilot projects using solar technologies (SWH and power generation) and (iii) supporting the design of incentives, financial mechanisms and a public awareness campaign to promote solar projects with SWH and power generation technologies.

4. GEF IEO assessment of Outcomes and Sustainability

Please refer to the GEF Terminal Evaluation Review Guidelines for detail on the criteria for ratings.

The outcome ratings (relevance, effectiveness, efficiency, and overall outcome rating) are on a six-point scale: Highly Satisfactory to Highly Unsatisfactory. The sustainability rating is on a four-point scale: Likely to Unlikely.

Please justify the ratings in the space below each box.

4.1 Relevance and Coherence	HS
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The terminal evaluation assesses the relevant of the project outcomes to be ‘highly satisfactory’ – this review concurs. The project is consistent with Chile’s national energy strategy. The TE notes that project supported the government’s agenda of encouraging of solar Photo Voltaic systems in four strategic lines: regulatory, enforcement, stimulation of demand, and reduction of supply asymmetries. The project also supported the adoption of new financial and fiscal incentives and contributed to developing professional technical training qualifications framework for the energy sector. The global environmental benefits are clear, and the specific objectives for developing local industry are also salient. The project was aligned with GEF climate change focal area’s strategic program 1 promoting energy efficiency in buildings, as well as strategic program 3 promoting market approaches for renewable energy.

4.2 Effectiveness	S
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The project had a clear results framework with indicators identified at the impact, outcome and output levels. Nearly all the targets were achieved despite the delays. At the beginning of this project there were about 30 companies able to provide SWH installation services, which increased to over 82 companies by the end of project. Government data from 2019 reports about 9,466 new jobs associated with the installation of Solar Water Heating (SWH) systems (p.66 of TE). The project successfully developed definition standards and monitoring protocols for solar panels, and a price index for SWH providing information on the cost of single-family and multi-dwelling SWH. All the proposed studies in the results framework were completed, which helped in drafting evidence-based policies that were clearly identified in the terminal evaluation (p. 57).

The successful demonstration of a 100 MW CSP Plant in Cerro Dominador was supported by this project by facilitating international knowledge exchange and institutional capacity building to design and implement a bidding process for CSP technologies. It is the first CSP in Latin America and will help promote the technology within the region through appropriate learning and conducive regulatory

environment. Another 300 kW of PV was installed in government buildings through the project supported Solar Rooftops Program.

An estimated direct reduction of 5,712 tCO₂ emissions was achieved since the beginning of the Solar Public Roofs Program (2015-2018). For the implemented demonstration and solar projects supported, the project will contribute to estimated lifetime direct GHG emissions avoided of 7,664,155 tCO₂eq and estimated lifetime indirect GHG emissions avoided of 15,328,310 CO₂eq (bottom-up) – 6,190,479.25 CO₂eq (top-down). (p.6 of TE).

4.3 Efficiency	MS
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Although the terminal evaluation rated efficiency to be ‘Highly Satisfactory’, the information in the TE was not sufficient to assess cost-effectiveness in delivering intended results and comparing it with alternative scenarios. This review is revising the efficiency rating to ‘moderately satisfactory’. The project took over six and half years to complete (from November 2013 to May 2020), whereas it was originally planned to take 2.5 years. The execution delay was approximately four years, which is substantial even though they were mainly due to external factors. The materializing of co-financing was also not satisfactory as some planned sources did not contribute.

4.4 Outcome	HS
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The project contributed to diversifying the energy generation distribution of Chile with solar energy now featuring prominently. It promoted the transfer of new solar technologies, supported the adoption of new financial and fiscal incentives, and contributed to developing professional technical training qualifications framework for the energy sector. The project also contributed to the economic development of Chile by fostering the growth of new solar industry service-related markets that were nonexistent before the project. The project exceeded contributions to global environmental benefits in terms of emissions reduction, and the long-term objectives of the project will likely be sustained.

4.5 Sustainability	L
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The TE rates sustainability of project outcomes as ‘likely’ and this review concurs. The basis for TE rating was through assessment of risks affecting sustainability of outcomes, which were low to begin with. The project addressed the risks in policy, technical capacity, and financial access to develop solar equipment industry in Chile. The risks were addressed through the development of regulations, technical capacities and credit lines. The political and institutional risks to project outcomes were low and did not materialize during execution. However, environmental risks were not assessed in the terminal evaluation despite building power plants as part of project activities. This review notes that replicability of projects was incorporated in the design phase through activities under component 3 with public awareness and education campaign, and under component 1 of the project increasing government institutional technical capacities in both solar technologies and regulations.

5. Processes and factors affecting attainment of project outcomes

Before describing the factors, you may choose to summarize reported outcomes and sustainability here: <https://www.research.net/r/APR2023>.

5.1 Co-financing. To what extent was the reported co-financing essential to the achievement of GEF objectives? If there was a difference in the level of expected co-financing and actual co-financing, what were the reasons for it? Did the extent of materialization of co-financing affect project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

The co-financing that materialized was lower than the expectations at project start. The contribution committed from Economic Commission for Latin America and the Caribbean did not materialize along with credit line expected from national entity Corporación de Fomento de la Producción (CORFO). The government of Chile exceeded their initial co-financing commitment. It was not clear how lower than expected cofinancing affected project results.

5.2 Project extensions and/or delays. If there were delays in project implementation and completion, then what were the reasons for it? Did the delay affect the project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

The project experienced delays affecting initiation of activities from signing of contracts in September 2013 to effective start of November 5, 2013, due to the continuous change of authorities at MINENERGIA (p. 16 of MTR). Another major reason for the project delay was the corporate crisis of a private contractor. In 2014, the government of Chile awarded Abengoa the contract for the construction of CSP project in the Atacama Desert. In November 2015, Abengoa started insolvency proceedings complicating the construction of the CSP plant. The construction of the project was transferred to EIG Global Energy Partners in 2016, and it was successfully completed in 2021. Other identified reasons for project delays were the social outburst in Chile starting on October 18th, 2019, and the COVID-19 pandemic (p. 3 of 2021 PIR). However, the project outcomes and sustainability were not affected by these delays as the original results framework didn't change.

5.3 Stakeholder ownership. Assess the extent to which stakeholder ownership has affected project outcomes and sustainability. Describe the ways in which it affected outcomes and sustainability, highlighting the causal links.

The terminal evaluation did not discuss stakeholder ownership in detail. It only mentions that involvement of a ministry from the Government of Chile ensured effective collaboration and cooperation with other ministries as well as the private sector.

5.4 Other factors: In case the terminal evaluation discusses other key factors that affected project outcomes, discuss those factors and outline how they affected outcomes, whether positively or negatively. Include factors that may have led to unintended outcomes.

The TE noted that the project had a strong gender and youth employment focus along the various segments of developing solar value chain (p.25 of TE), which is likely to sustain the project outcomes.

6. Assessment of project's Monitoring and Evaluation system

Ratings are assessed on a six point scale: Highly Satisfactory to Highly Unsatisfactory.

Please justify ratings in the space below each box.

6.1 M&E Design at entry	S
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The M&E design of the project covered multiple indicators at the impact, outcome and output level that remained consistent throughout the project duration. The year-wise allocation of output indicators was also aligned with project strategy. The terminal evaluation did not rate M&E design, but the satisfactory rating in this review is based on the consistent results framework of project document and project implementation reports. None of the project documents included budget and responsible authorities for M&E.

6.2 M&E Implementation	S
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This TER concurs with the TE rating of highly satisfactory for monitoring & implementation. Within the first six months of project start, the Project Execution Unit ensured the consolidation of the baseline information for all indicators in the results framework. Changes in few indicators were documented in the MTR, while most of the indicators remained same. The project used of GEF tracking tools to assess achievement of focal area relevant results and employed multiple means of verification. The project also utilized the Government of Chile's Monitoring, Reporting and Verification (MRV) system for Renewable Energy Projects Implemented in Chile to quantify the direct and indirect reductions of greenhouse gas emissions.

7. Assessment of project implementation and execution

Quality of Implementation rating is based on the assessment of the performance of GEF Agency(s). Quality of Execution rating is based on performance of the executing agency(s). In both instances, the focus is upon factors that are largely within the control of the respective implementing and executing agency(s). A six-point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess.

Please justify ratings in the space below each box.

7.1 Quality of Project Implementation	S
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The TE does not provide details on IDB's role in project implementation. The basis of the rating "highly satisfactory" was missing in the TE. The IDB country office in Chile supervised the Terms of References (TORs) and procurement of studies commissioned with contribution resources and reviewed the technical quality of all studies financed under this project. This TER revised the rating to "satisfactory" based on the role IDB played in monitoring and evaluation of the project (p.63 of TE). There is limited

information available in the terminal evaluation that can be used to assess timeliness of activities and adaptive management practiced by the implementing agency.

7.2 Quality of Project Execution	S
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MINENERGIA was the executing agency of this project, with the project manager located within the ministry. The ministry had the long-term vision and the necessary institutional capacity to run the project with cooperation from other stakeholders. It embarked on efficient collaboration with the Ministry of Education, the Chilean Association of Solar Energy, the private sector, and training schools for the development of job skills profiles and improvement of technical skills curricula (p.67 of TE). The terminal evaluation rated quality of project execution as highly satisfactory. This review is revising the rating to satisfactory since project execution was severely delayed due to institutional changes at MINENERGIA.

8. Lessons and recommendations

8.1 Briefly describe the key lessons, good practices, or approaches mentioned in the terminal evaluation report, including how they could have application for other GEF projects. Lessons must be based on project experience.

The six lessons in the terminal evaluation are presented below reorganizing them based on thematic similarities –

- i) Long-term vision of all stakeholders can create a stable market where manufacturers, distributors and retailers become comfortable to invest. An active renewable energy sector requires a long-term vision with clear institutional goals that transcend the political and government cycles.
- ii) A mix of policy instruments are needed for the development of the domestic solar-based technology market. The project championed policies that led to the introduction of technical standards, product labels for systems and special certificates for installation contractors to ensure the quality of the solar products. However, education, training and retraining policies are needed to meet the occupational and skills requirements of the solar industry. Financial incentives such as grants, low-interest loans and tax incentives are also needed to increase the cost-competitiveness of solar products.
- iii) Designing such policies for the entire value chain of solar products while maximizing local benefits requires a deep understanding of the requirements for labor, skills, materials, installations and equipment.

8.2 Briefly describe the recommendations given in the terminal evaluation.

No recommendations were provided in the terminal evaluation.

9. Quality of the Terminal Evaluation Report

Before rating the quality of the terminal evaluation, click here to summarize your observations on the sub-criteria: <https://www.research.net/r/APR2023>.

A six-point rating scale is used for each sub-criteria and overall rating of the terminal evaluation report (Highly Satisfactory to Highly Unsatisfactory)

Criteria/indicators of terminal evaluation quality	GEF IEO COMMENTS	Rating
1. Timeliness: terminal evaluation report was carried out and submitted on time?	The terminal evaluation was completed more than a year after project completion.	MU
2. General information: Provides general information on the project and evaluation as per the requirement?	Project was sufficiently described with effective comparison of expected outcome versus actual outcome.	MS
3. Stakeholder involvement: the report was prepared in consultation with – and with feedback from - key stakeholders?	There was a lack of detail on how consultation with stakeholders were undertaken and the type of stakeholders that participated.	MS
4. Theory of change: provides solid account of the project's theory of change?	The barrier analysis and resulting project strategy was conceptually sound, and well-explained in the TE.	S
5. Methodology: Provides an informative and transparent account of the methodology?	The methodology of the evaluation was not discussed.	U
6. Outcome: Provides a clear and candid account of the achievement of project outcomes?	The project description provided sufficient detail to assess outcomes and their sustainability.	S
7. Sustainability: Presents realistic assessment of sustainability?	The assessment was focused more on risks, and less on replicability of outcomes.	S
8. M&E: Presents sound assessment of the quality of the M&E system?	There were more details about M&E system in the mid-term review compared to the terminal evaluation.	S
9. Finance: Reports on utilization of GEF funding and materialization of co-financing?	The associated figures on fund utilization were effective in showing trends and delays for each years.	HS

10. Implementation: Presents a candid account of project implementation and Agency performance?	Not enough information were included highlighting the challenges of project implementation.	MS
11. Safeguards: Provides information on application of environmental and social safeguards, and conduct and use of gender analysis?	The TE was clear on the specific instances where environmental and social due diligence processes were required and found them to be satisfactory.	S
12. Lessons and recommendations are supported by the project experience and are relevant to future programming?	The terminal evaluation had no recommendations, but the lessons learned were based on project experience.	S
13. Ratings: Ratings are well-substantiated by evidence, realistic and convincing?	Not all aspects of the project were rated, but the included aspects were	MS
14. Report presentation: The report was well-written, logically organized, and consistent?	The sections were logically organized.	S
Overall quality of the report		MS

10. Note any additional sources of information used in the preparation of the terminal evaluation report (excluding PIRs, TEs, and PADs).

ANNEX 1. GEF IEO THEORY OF CHANGE FRAMEWORK

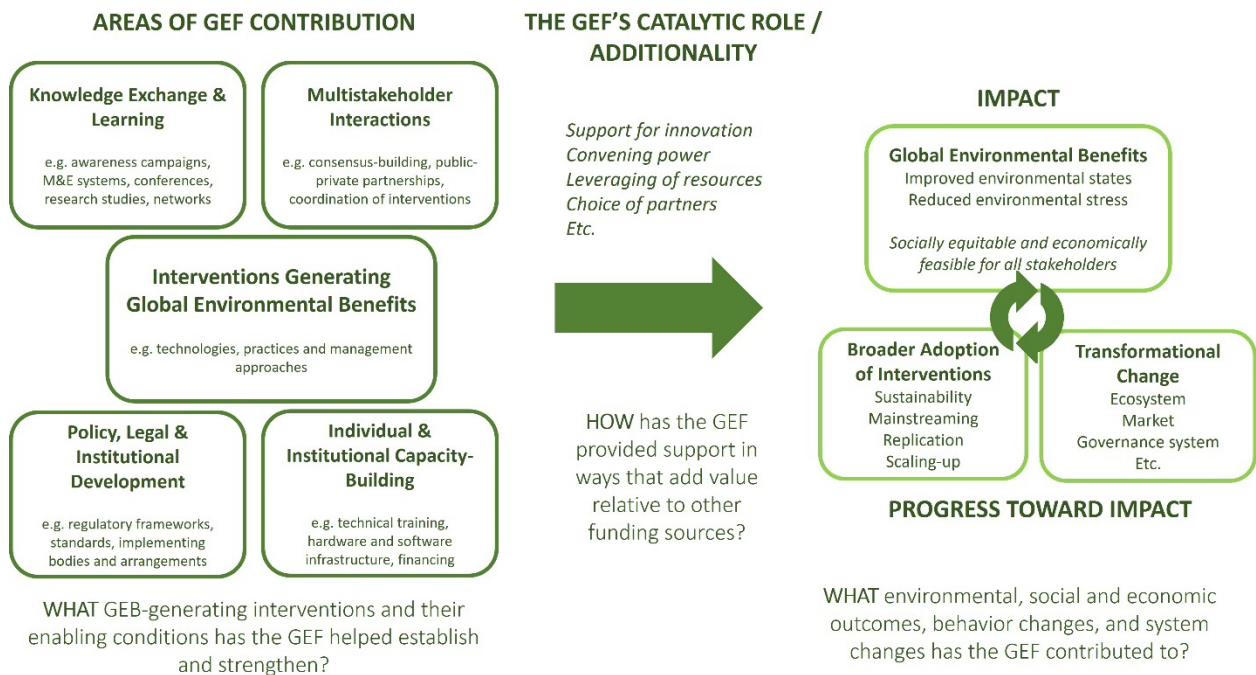


Figure 1. The GEF IEO's updated Theory of Change Framework on how the GEF achieves impact

The general framework for the GEF's theory of change (figure 1) draws on the large amount of evaluative evidence on outcomes and impact gathered over the years by the GEF Independent Evaluation Office. The framework diagram has been updated to reflect the IEO's learning since OPSS5 (GEF IEO 2014, p. 47-50) about how the GEF achieves impact, as well as the evolution of the GEF's programming toward more integrated systems-focused and scaled-up initiatives.

The framework outlines the three main areas that the IEO assesses in its evaluations: a) the GEF's contributions in establishing and strengthening both the interventions that directly generate global environmental benefits, and the enabling conditions that allow these interventions to be implemented and adopted by stakeholders, b) the GEF's catalytic role or additionality in the way that the GEF provides support within the context of other funding sources and partners, and c) the environmental, social and economic outcomes that the GEF has contributed to, and the behavior and system changes that generate these outcomes during and beyond the period of GEF support.

The circular arrow between impact and progress toward impact, as before, indicates how bringing about positive environmental change is an iterative process that involves behavior change (in the form of a broader group of stakeholders adopting interventions) and/or systems change (which is a key characteristic of transformational change). These three areas of change can take place in any sequence or simultaneously in a positively reinforcing cycle, and are therefore assessed by the GEF IEO as indicators of impact.

Assessing the GEF's progress toward achieving impact allows the IEO to determine the extent to which GEF support contributes to a trajectory of large-scale, systemic change, especially in areas where changes in the environment can only be measured over longer time horizons. The updated diagram in particular expands the assessment of progress towards impact to include transformational change, which specifically takes place at the system level, and not necessarily over a long time period.

The updated diagram also more explicitly identifies the link between the GEF's mandate of generating global environmental benefits, and the GEF's safeguards to ensure that positive environmental outcomes also enhance or at the very least do not take away from the social and economic well-being of the people who depend on the environment. Thus the IEO assesses impact not only in terms of environmental outcomes, but also in terms of the synergies and trade-offs with the social and economic contexts in which these outcomes are achieved.

ANNEX 2. DEFINITION OF TERMS

Intervention	Any programmatic approach, full-sized project, medium-sized project, or enabling activity financed from any GEF-managed trust fund, as well as regional and national outreach activities. In the context of post-completion evaluation, an intervention may consist of a single project, or multiple projects (i.e. phased or parallel) with explicitly linked objectives contributing to the same specific impacts within the same specific geographical area and sector. https://www.gefio.org/evaluations/gef-evaluation-policy-2019
Activity (of an intervention)	An action undertaken over the duration of an intervention that contributes to the achievement of the intervention's objectives, i.e. an intervention is implemented through a set of activities. E.g. training, (support to) policy development, (implementation of) management approach.
Outcome	An intended or achieved short- or medium-term effect of a project or program's outputs. https://www.gefio.org/evaluations/gef-evaluation-policy-2019
Impact	The positive and negative, primary and secondary long-term effects produced by a project or program, directly or indirectly, intended or unintended. https://www.gefio.org/evaluations/gef-evaluation-policy-2019
Environmental outcomes	Changes in environmental indicators that could take the following forms: <ul style="list-style-type: none"> • Stress reduction: reduction or prevention of threats to the environment, especially those caused by human behavior (local communities, societies, economies) • Environmental state: biological, physical changes in the state of the environment http://www.gefio.org/sites/default/files/ieo/evaluations/ops5-final-report-eng.pdf
Social and economic outcomes	Changes in indicators affecting human well-being at the individual or higher scales, e.g. income or access to capital, food security, health, safety, education, cooperation/ conflict resolution, and equity in distribution/ access to benefits, especially among marginalized groups.
Synergies	Multiple benefits achieved in more than one focal area as a result of a <i>single intervention</i> , or benefits achieved from the interaction of outcomes from at least two separate interventions in addition to those achieved, had the interventions been done independently.

	http://www.gefio.org/evaluations/evaluation-multiple-benefits-gef-support-through-its-multifocal-area-portfolio-map-2016
Trade-offs	A reduction in one benefit in the process of maximizing or increasing another benefit. http://www.gefio.org/evaluations/evaluation-multiple-benefits-gef-support-through-its-multifocal-area-portfolio-map-2016
Broader adoption	The adoption of GEF-supported interventions by governments and other stakeholders beyond the original scope and funding of a GEF-supported intervention. This may take place through sustaining, replication, mainstreaming, and scaling-up of an intervention and/or its enabling conditions (see definitions below). http://www.gefio.org/sites/default/files/ieo/evaluations/ops5-final-report-eng.pdf
Sustainability	The continuation/ likely continuation of positive effects from the intervention after it has come to an end, and its potential for scale-up and/or replication; interventions need to be environmentally as well as institutionally, financially, politically, culturally and socially sustainable. https://www.gefio.org/evaluations/gef-evaluation-policy-2019
Replication	When a GEF intervention is reproduced at a comparable administrative or ecological scale, often in different geographical areas or regions. http://www.gefio.org/sites/default/files/ieo/evaluations/ops5-final-report-eng.pdf
Mainstreaming	When information, lessons, or specific aspects of a GEF initiative are incorporated into a broader stakeholder initiative. This may occur not only through governments but also in development organizations and other sectors. http://www.gefio.org/sites/default/files/ieo/evaluations/ops5-final-report-eng.pdf
Scaling-up	Increasing the magnitude of global environment benefits (GEBs), and/or expanding the geographical and sectoral areas where they are generated to cover a defined ecological, economic, or governance unit. May occur through replication, mainstreaming, and linking. http://www.gefio.org/evaluations/evaluation-gef-support-scaling-impact-2019
Transformational change	Deep, systemic, and sustainable change with large-scale impact in an area of major environmental concern. Defined by four criteria: relevance, depth of change, scale of change, and sustainability. http://www.gefio.org/evaluations/evaluation-gef-support-transformational-change-2017
Additionality	a) Changes in the attainment of direct project outcomes at project completion that can be attributed to GEF's interventions; these can be reflected in an acceleration of the adoption of reforms, the enhancement of outcomes, or the reduction of risks and greater viability of project interventions. b) Spill-over effects beyond project outcomes that may result from systemic reforms, capacity development, and socio-economic changes. c) Clearly articulated pathways to achieve broadening of the impact beyond project completion that can be associated with GEF interventions. https://www.gefio.org/sites/default/files/ieo/council-documents/files/c-55-me-inf-01.pdf