Corporate Unit Evaluation Central Project Evaluation

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Central Project Evaluation

Renewable Energies Bolivia

Evaluation Report

On behalf of GIZ by Mainlevel Consulting AG

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The Evaluation Unit commissioned the evaluation to external independent evaluators. The evaluation report was written by these external evaluators. All opinions and assessments expressed in the report are those of the authors.

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Abbreviations

AETN	Autoridad de Electricidad y Tecnología Nuclear
AFD	Agence Française de Développement
BID	Banco Interamericano de Desarollo
BMZ	German Federal Ministry for Economic Cooperation and Development
CNDC	Comité Nacional de Despacho de Cargo
CPE	Central Project Evaluation
CRE	Rural Electrification Cooperative
DAC	Development Assistance Committee
DC	Development Cooperation
EE	Energy Efficiency
ENDE	Empresa Nacional de Electricidad
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
GW	Gigawatts
IDB	Inter-American Development Bank
JICA	Japan International Cooperation Agency
KfW	German Development Bank
LNOB	Leave-No-One-Behind
M&E	Monitoring and Evaluation
MoE	Ministry of Energy
MW	Megawatts
OECD	Organisation for Economic Co-operation and Development
PDES	*Plan de desarollo económico y social* (National Plan for social and economic development)
PEERR	Renewable Energies Programme
PTB	Physikalisch-Technische Bundesanstalt
PV	Photovoltaic
RE	Renewable Energies
SDG	Sustainable Development Goal
SIN	Sistema Interconectado Nacional
UN	United Nations
UNEG	United National Evaluation Group
UMSA	Universidad Mayo de San Adnrés
VMEEA	Vice Ministry for Electricity and Alternative Energy

The project at a glance

Renewable Energies Bolivia (PEERR)

Project number	2015.2035.2
CRS-Code(s) (Creditor Reporting System Code)	23210
Project objective	Conditions for expanding grid-connected renewable energy and increasing energy efficiency are improved
Project term	04/2016 to 03/2019
Project volume	EUR 4,500,000
Commissioning party	German Federal Ministry for Economic Cooperation and Development (BMZ)
Lead executing agency	GIZ
Implementing organisations (in the partner country)	Ministerio de Energías; Viceministerio de Electricidad y Energías Alternativas
Other development organisations involved	
Target group(s)	Direct: staff of government institutions and agencies, universities and training institution departments; indirect: Bolivian population
Current and former project manager(s) (=Officer(s) responsible for the commission)	Dr Johannes Kissel

1 Evaluation objectives and questions

1.1 Objectives of the evaluation

The German Agency for Technical Cooperation (GIZ) evaluation unit has commissioned the independent consultancy Mainlevel Consulting AG to carry out an evaluation of the GIZ project 'Renewable Energies Bolivia' – PEERR (the project) (see section 2. 'Evaluation object'). This is a final evaluation of the project, which ended on 30 March 2019.[1] It forms part of GIZ's centrally steered Central Project Evaluations (CPEs). The project to be evaluated has been selected randomly following the guidelines of GIZ's CPEs – a 50% random sample is selected annually that is regionally structured proportionally. It represents the first CPE of the GIZ project portfolio in Bolivia.

The main stakeholders of this evaluation and their key knowledge interests are:

- GIZ corporate unit evaluation: (i) *accountability* towards the public (success rate of GIZ's projects); (ii) *learning* to understand strengths and weaknesses of single projects, potentials for replications in other countries and lessons learnt in terms of GIZ's reputation in the participating countries, as well as (iii) *informing* key stakeholders who inquire about GIZ activities in certain regions and/or sectors.
- BMZ: *accountability* towards the public (success rate of German development cooperation (DC) projects).
- Project team: (i) *learning and improving* to integrate lessons learnt in their upcoming activities of the follow-up project; and (ii) *better understanding* of key stakeholder perceptions. (iii) Eventually, results can be *communicated* on the Energypedia platform.
- Key project partners, especially the Vice Ministry for Electricity and Alternative Energy (VMEEA): (i) *learning* when it comes to future cooperation initiatives and (ii) *informing* the Bolivian population, i.e. the final target group on progress made by the German technical cooperation.

1.2 Evaluation questions

The project is assessed on the basis of standardised evaluation criteria and questions to ensure comparability by GIZ. These are based on the Development Assistance Committee (DAC) criteria of the Organisation for Economic Co-operation and Development (OECD) for the evaluation of development cooperation and the evaluation criteria for German bilateral cooperation: Relevance, Efficiency, Effectiveness, Impact and Sustainability. Aspects regarding the criteria 'coherence, complementarity and coordination' are included in the other criteria. In addition, the contributions to Agenda 2030 and its principles (universality, integrative approach, leave-no-one-behind (LNOB), multi-stakeholder partnerships) are further considered, as well as cross-cutting issues such as gender, the environment, conflict sensitivity and human rights. Also, aspects regarding the quality of implementation are included in all OECD/DAC criteria.

Specific evaluation dimensions and analytical questions are derived from this given framework by the GIZ and form the basis for all CPEs. The evaluation questions, however, need to be broken down and operationalised to provide a robust methodology, thus, avoiding misinterpretation and mere anecdotal evidence. Therefore, the evaluation team has completed an evaluation matrix, including evaluation indicators, as the basis for this evaluation (see annex 1).

[1] PEERR II started on 1 April 2019. It will not be a part of the OECD/DAC criteria assessment of the selected project. However, the evaluability of the follow-on project as well as additional questions of interest (see section 2.2) will be taken into account to enhance the usefulness of the evaluation for subsequent activities.

During the inception mission, a participatory exercise ('Wish Tree') was conducted with the project team members to understand their knowledge interests in the evaluation and identify additional evaluation questions in the project context. Additional questions of interests comprise: (i) managerial aspects (e.g. 'What are alternative concepts and set ups to manage and steer the project?'); and (ii) communication aspects (e.g. How can we improve the communication to (Empresa Nacional de Electricidad) ENDE Corani (key partner)?' The list of additional questions raised by the project team was integrated into the evaluation matrix.

2 Object of the evaluation

2.1 Definition of the evaluation object

The main object of the evaluation is the selected Technical Cooperation Measure (TC-measure) 'Renewable Energies Bolivia' categorised by the project number (PN: 2015.2035.2) and henceforth called the project. It forms part of the BMZ focal programme 'Energy in Bolivia', which started in 2017.

Political, socio-economic and sectoral framework of the project

As a result of a range of nationalisation processes in Bolivia since 2006, the energy sector is managed by the state, both in the area of hydrocarbons as well as that of electricity. Thus, ENDE, the main institution for energy generation, transmission and distribution turned into a public, national, strategic and corporate company. Bolivia is a net exporter of energy (especially natural gas) and aims to export electricity in the near future.[2] The income generated through exporting will significantly support the social and economic policy development of the current government. However, this cannot be taken for granted; in recent years it has been repeatedly shown that natural gas reserves are declining. A peculiarity in Bolivia is a comparable cheap cost of electricity, mainly induced by government subsidiaries for electricity generation in thermoelectric gas power plants. Saving electricity and/or generating electricity through renewable energy (RE) is not yet sufficiently economically relevant and competitive. In 2011, the government, through the VMEEA of the Ministry of Hydrocarbons and Energy, issued the Alternative Energy Policy for the Electricity Sector in the Plurinational State of Bolivia document, which contains guidelines for the development and use of RE resources in the country. In the field of energy efficiency (EE), a programme aimed at saving energy was launched in 2008, replacing incandescent lamps with compact fluorescent lamps. Subsequently, several energy saving campaigns were carried out at the national level and finally, the 'Energy Saving and Efficiency Plan' was formulated in 2014, but never came into force. In January 2017, the Ministry of Energy (MoE) was created and became the key counterpart of the project. It is in charge of developing the electrical sector and resourcing of Lithium, another strategic resource, considering that

The energy sector is led by the Ministry of Energy, with two vice ministries: (1) Vice Ministry of Electricity and Alternative Energies; and (2) Vice Ministry of High Energy Technologies. Several strategic state enterprises are under the direct responsibility of the minister, including the National Committee for Charge Dispatch (CNDC), Autoridad de Electricidad y Tecnología Nuclear (AETN) and the national electricity utility (ENDE). ENDE has eleven subsidiary companies (electricity generators, transmissions and distributors) of which CORANI SA (Cochabamba) is responsible for all wind energy projects and Guaracachi (Santa Cruz) is responsible for solar and biomass projects.

[2] At the same time, Bolivia imports nearly all of their fuels (gasonline, kerosene and diesel).

Bolivia possesses one of the largest reserves in the world. Another important player in the electricity sector, positioned under the MoE, is the Comité Nacional de Despacho de Cargo (CNDC), which is coordinating the release of energy into the Sistema Interconectado Nacional (SIN) by generation companies, planning the expansion of the sector and assuming responsibility for the dispatch of electricity. Finally, the Autoridad de Electricidad y Tecnología Nuclear (AETN) is the entity that implements audits, sets tariffs and grants licences to the actors of the electricity sector. It is a very relevant and important actor for the introduction of RE into the SIN. Within this institutional and policy framework, the Bolivian electricity sector has initiated the development and execution of photovoltaic (PV) farms (currently 70 megawatts (MW) in operation and 120 MW more under construction); wind farms (27 MW in operation and additional 153 MW under construction – detailed figures to be confirmed), biomass plants (under study), geothermal plants (under design) and hydroelectric plants (several projects in operation, construction and design). The Bolivian electric market is small (1.5 gigawatts (GW) was the maximum demand while 2.4 GW of installed power is available). Yet, the government aims at achieving a surplus of at least 3 GW in order to increase exports. This is undoubtedly an economic, institutional and technical challenge, as it involves an accelerated growth of the electrical sector.

The project in a nutshell

The project was implemented between 04/2016 and 03/2019 and financed by BMZ funds. The final budget of the project was EUR 4,500,000, while the original budget was EUR 4,000,000. A change offer was successfully submitted in November 2017 to react to the change in counterpart (followed by the formation of the MoE). The budget was increased by EUR 500,000 and two indicators were added in the area of EE. The project's objective is to improve the (technical, economic, legal and institutional) conditions for the integration of alternative RE into the electricity system and to promote EE. To achieve this objective, the project adopts a system-strengthening, multi-level approach by pursuing four key outputs (*Líneas de acción)* at the macro (in the area of energy policy, through the MoE) and meso (at the operational level through ENDE and its subsidiaries level: (i) planning and legal framework for renewable energy; (ii) project development and integration of RE into the grid; (iii) creation of institutional and technical bases for the implementation of EE measures; and (iv) training, capacity building and knowledge management in RE and EE.

The project is embedded into the national stakeholder landscape and closely collaborates with all relevant local actors of the energy sector. Key partner institutions belong to the public sector, except some universities and private institutions. The project further closely discusses with other donor agencies, such as the German development bank, KfW, Inter-American Development Bank (IDB) and the French Development Agency (AFD). A detailed stakeholder mapping is shown in section 3.2. The project is of national scope and carries out interventions in different locations. The project is based in the city of La Paz, where key partners such as the MoE, AETN and other cooperation agencies are situated. Operationally, the offices of ENDE Corporación and ENDE Corani in Cochabamba develop and operate the wind farms. The public company ENDE Guaracachi, which develops and operates PV parks, is located in Santa Cruz. The CNDC is also headquartered in Cochabamba. Visits and fieldwork are carried out where the PV plants (Oruro, Potosi, Pando, Tarija) and wind farms (Cochabamba, Santa Cruz) are located. Indirect beneficiaries of the project are the Bolivian society that would benefit from the introduction of RE in the Bolivian electric system, relying on a cleaner and more resilient electric system. Employees of the ministries and companies as well as teachers at universities can be considered as the target group as they directly receive capacity development support through project activities.

2.2 Results model including hypotheses

Contribution analyses (following Mayne, 2011) form a cornerstone of the underlying evaluation design. A project's theory of change (ToC) is central to a contribution analysis to make credible causal statements on interventions and their observable results. At GIZ, ToCs are visualised in results models and complemented

by a narrative including corresponding hypotheses. A results model is a graphical representation of the project. It describes the logical connection and interrelationship of results and how they contribute to the overall objective. A results model defines all possible results, change hypotheses including multi-dimensional causalities, system boundaries, assumptions and risks and external factors of the project. A main added value of basing the evaluation on a results model is the enhanced visibility of causalities beyond linear and mono-dimensional relationships between different results on different results levels.

Prior to the inception mission, the evaluation team reviewed the project's results model. Both the evaluation team and the project management agreed that the model has to be revised to a great extent to ensure a realistic representation of the project's activities and results and enhance its usage. This was mainly due to the following reasons: (i) the results model was drafted prior to the project start, during the project conceptualisation phase, with most of the project team members not being involved; (ii) it was only conceptualised in German, limiting the actual use of the model during the project implementation; and (iii) it was generic and did not specify on any outcomes and impacts. Therefore, jointly with the project team, the evaluation team reconstructed the results model during the inception mission. The figure below shows the revised results model. It was decided to use the Spanish version as the working version, which both the evaluation and project team will further rely on and work with. In addition, this could increase the utility and usage of the model among the project team and stakeholders and avoids the risk for misinterpretations through translation into English. The corresponding narrative, i.e. the elaboration of underlying hypotheses, is given below.[3]

[3] Chosen hypotheses for the contribution analysis will be described in greater detail in the effectiveness and impact section.

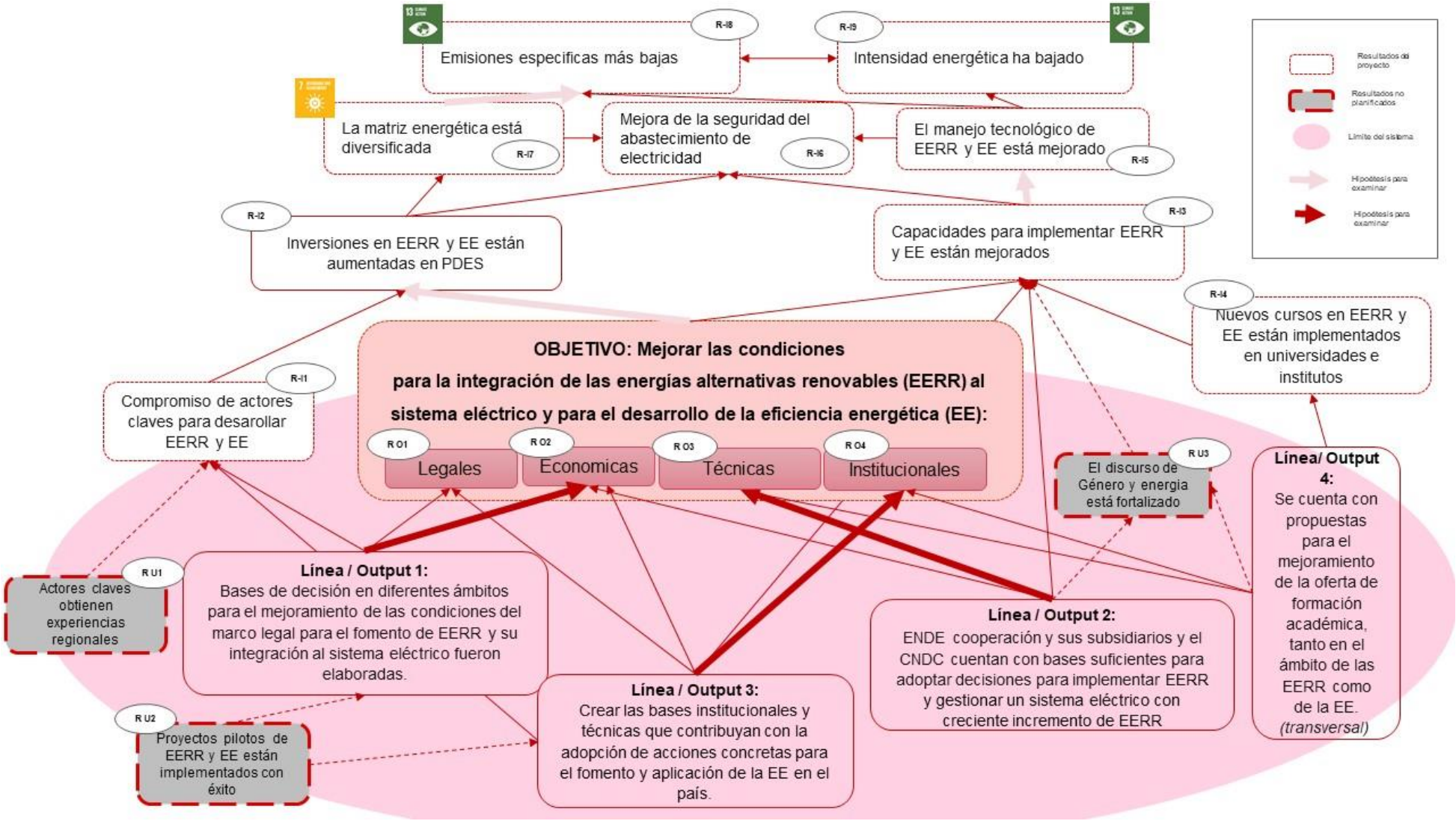


Figure 1: The project's results model including selected hypotheses for the contribution analysis (developed by evaluation team with inputs from project team in April 2019)

As said, the project's objective is to improve the conditions for expanding grid-connected RE and increasing EE. It was deemed necessary to further break down the objective into different dimensions to specify the contribution of the results. Thus, it is differentiated between legal, economic, technical and institutional conditions (RO1–4) that shall be improved.

At output level

To achieve the improvement of legal conditions (RO1) and economic conditions (RO2) through Output 1,

> *'Decision bases in different fields for the improvement of the legal framework conditions for the promotion of renewable energy and its integration into the electricity system were elaborated, and Output 3, creating the institutional and technical bases that contribute to the adoption of concrete actions for the promotion and application of the energy efficiency in the country',*

the project team worked directly with the VMEEA and the executing governmental agency AETN, mainly providing consultancies. It was further assumed that by the implementation of studies and experience sharing through field visits in Germany/Brazil (e.g. RE and EE Week, Intersolar) and trainings for key personnel, the VMEEA counts with strengthened institutional decision bases to expand RE and EE. A key assumption for both outputs is that there is a persisting political will to expand RE, follow the EE plan and make available necessary resources. Energy audits, which are an important source of information for the conception of an EE programme in public buildings, were implemented as part of Output 3. To strengthen local capacities in this context, intensive and certified educational seminars on energy audits were conducted, presumably leading to a pool of trained auditors.

Outputs 1 and 3 should further contribute to improved engagement of key actors to develop RE projects and improve EE. In addition, this was presumably promoted by unintended results, such as (i) by activities of the trilateral cooperation project (Brazil-Germany-Bolivia) where regional exchange on EE (industrial sector and labelling) and distributed generation was promoted (RU1) and pilot projects, such as a development partnership with the private sector (develoPPP.de) to install LED lights in La Paz and El Alto (RU2), which yield the potential to inform policy strategies on EE.
Output 2, i.e. ENDE cooperación and its subsidiaries and the CNDC have a sufficient basis to make decisions to implement renewable energies and manage an electricity system with increasing renewable energies, focused on the meso level and intended to strengthen economic and technical conditions and collaborations by consulting operating companies. The project supported these agencies with a number of trainings and studies. Another instrument applied at ENDE Corani were integrated experts who should contribute with their expertise and experience to close potential information gaps during the implementation of wind energy projects and, thus, ensure better functioning. Output 2 further aimed at strengthening capacities within the institution through trainings and seminars on, for example, operation and maintenance, safety and security in the wind and solar sector or international treaty management (R 2.1). Support to CNDC mainly comprised the development of recommendations.

Output 4, i.e. *Recommendations for improving the professional continuing education and the exchange of information to RE and EE are available*, is considered cross-cutting to strengthen education and professional training in the RE/EE sector. Within the scope of this project, new modules were developed or existing ones adapted. Improving institutional conditions at universities and technical training centres will presumably contribute to an increase in qualified RE/EE experts and graduates. It is assumed that by providing technical input for curricula development and improvement, institutes count with the necessary material to implement improved courses and certificates, thus leading to improved capacities and skills of the potential workforce.

At outcome/impact level

Improved legal, economic, technical and institutional conditions presumably lead to an increase in investment

in RE and EE initiatives, presumably committed to in the upcoming *Plan de Desarrollo Económico y Social (PDES) 2021-2025*. This, however, builds on the assumption that there is no significant political change after the upcoming elections and is subject to continuous political will to plan and invest into RE as well as starting investments in EE.

At the impact level, committed investments, a favourable and functioning legal framework and improved capacities could lead to a diversified energy matrix, and therefore contribute to the UN Sustainable Development Goal (SDG) 7 by improved electricity supply and better technical RE and EE management of existing initiatives. Eventually, if the investments scheduled are released and the planned project implementation is followed, energy emissions would reduce and energy intensity drop, contributing to SDG 13 (climate action). The project objective also contributes to the articulated BMZ-programme objective 'Improved access of the Bolivian population to an affordable, sustainable, modern, reliable and efficient energy supply with a growing proportion of renewable energies and reduced energy intensity'.

Additional information on the results model

The system boundary is defined based on the scope of control of the project, i.e. results outside the system boundary are beyond the exclusive responsibility of the project and, indeed, affected by other factors, stakeholders and interventions in the respective country. In general, results that require political will and support lie outside the model's system boundary, as changes in the commitment of political actors (for instance caused by the upcoming elections) cannot be controlled for by the project. This affects both the pathway of change regarding increased investments and the approval and implementation of university curricula.

3 Evaluability and evaluation process

3.1 Evaluability: data availability and quality

The evaluation relied on a mix of primary and secondary data sources, which are briefly summarised in the following:

Secondary project documents: Key documents comprised project documents, such as the project proposal, modification offer and annual progress reports. Furthermore, the BMZ country strategy, the DC programme description as well as national strategies and planning documents were examined. Further secondary data included the results matrix, the previous results model and a map of actors.

Monitoring data: A monitoring system at project level was in place and well maintained. The Wirkungsmonitor tool was used for measuring changes in key indicators, i.e. the GIZ internal web-based software to monitor data and indicator progress for projects and programmes.[4] All categories necessary for a results-based management system were filled: baseline values, yearly status update, sources for verification, time and frequency of data collection, and person in charge. Specific links to the internal database are provided and results hypotheses of the underlying results model are formulated and depicted in the Wirkungsmonitor. The evaluation team received access to the Wirkungsmonitor and could analyse project data in the evaluation

[4] As mentioned before, the project is part of a DC programme. Programme indicators at the objective level resemble the project objective indicators and are simply transferred when reporting at the programme level. This yields true for all parties (GIZ, KfW, PTB) involved. Thus, there is no need for additional data collection and monitoring. Still, there are regular discussions with the contributing partners on the progress of the indicators, above all during times of reporting.

phase. Most indicators did not require extensive primary data collection but could be assessed through secondary documents as well as through the team's insights. The latter were collected through biannual workshops with all team members involved and documented in Spanish, allowing access for everyone. One team member was assigned to manage and update the *Wirkungsmonitor* twice a year after consultations with the project team. The project did not apply the qualitative KOMPASS procedure to survey and explore different perspectives of key stakeholder groups on an open basis. However, there were regular consultations and discussions with representatives and experts from the project's counterparts and partners. Capacities in monitoring and evaluation (M&E) were found to be rather weak among some of the partner institutions. The VMEEA does not count with a monitoring system. However, the evaluation team could make use of the data provided on the website of ENDE Corporación (2019), which shows the status of RE projects and investments. Research from a local university (Vaszguez 2018), to which the local consultant had access, complemented this specific source of information.

Semi-structured interviews in person: When interviewing, the evaluation team took care of robust approaches to avoid bias created by a wrong question or method (suggestive question, cultural insensitivity). To reduce potential bias of information gathered, 'think aloud' and paraphrasing techniques[5] for interviews were used.

Focus group discussions based on semi-structured guidelines, with four to six people in each, lasting approximately two hours.

Last, the evaluation team applied a **quantitative data collection method** in the format of an online survey for participants of a specific capacity-building activity on EE. Participants of this seminar stemmed from various types of institutions from the public and private sectors. It was decided to conduct a survey on this specific measure because:

1. The evaluation wanted to understand how capacity development measures that the project provided worked in the given context and with the given target group. The underlying rationale was to understand the effectiveness of these trainings and the applications of learnings and knowledge gained. The evaluation team acknowledges the limitation that the seminar on EE only serves as an example without allowing to generalise findings for other capacity development activities.
2. Data on Output 3 was difficult to retrieve as the project worked with different kind of institutions – at different levels – to promote EE. Only interviews with the main counterpart and one target group organisation (AE Viviendia) were possible. To understand better to which extent the topic was promoted among and used by different actors, the evaluation team found it useful therefore to set up this additional survey.
3. Last but not least, this seminar was chosen due to practical reasons: a full database of participants was available, and the participants were still connected via a WhatsApp group, facilitating the mobilisation of respondents.

The survey was jointly drafted with GIZ project staff and installed on LimeSurvey. It ran for 16 days and recorded 23 answers, representing a satisfying response rate of 47.9%.

3.2 Evaluation process

The evaluation included an inception phase, a data collection phase and an analysis and reporting phase. The inception phase lasted from March to May 2019 and included the clarification of roles in the evaluation team, explorative interviews with the GIZ evaluation unit and a workshop with the project team, a desk study and the

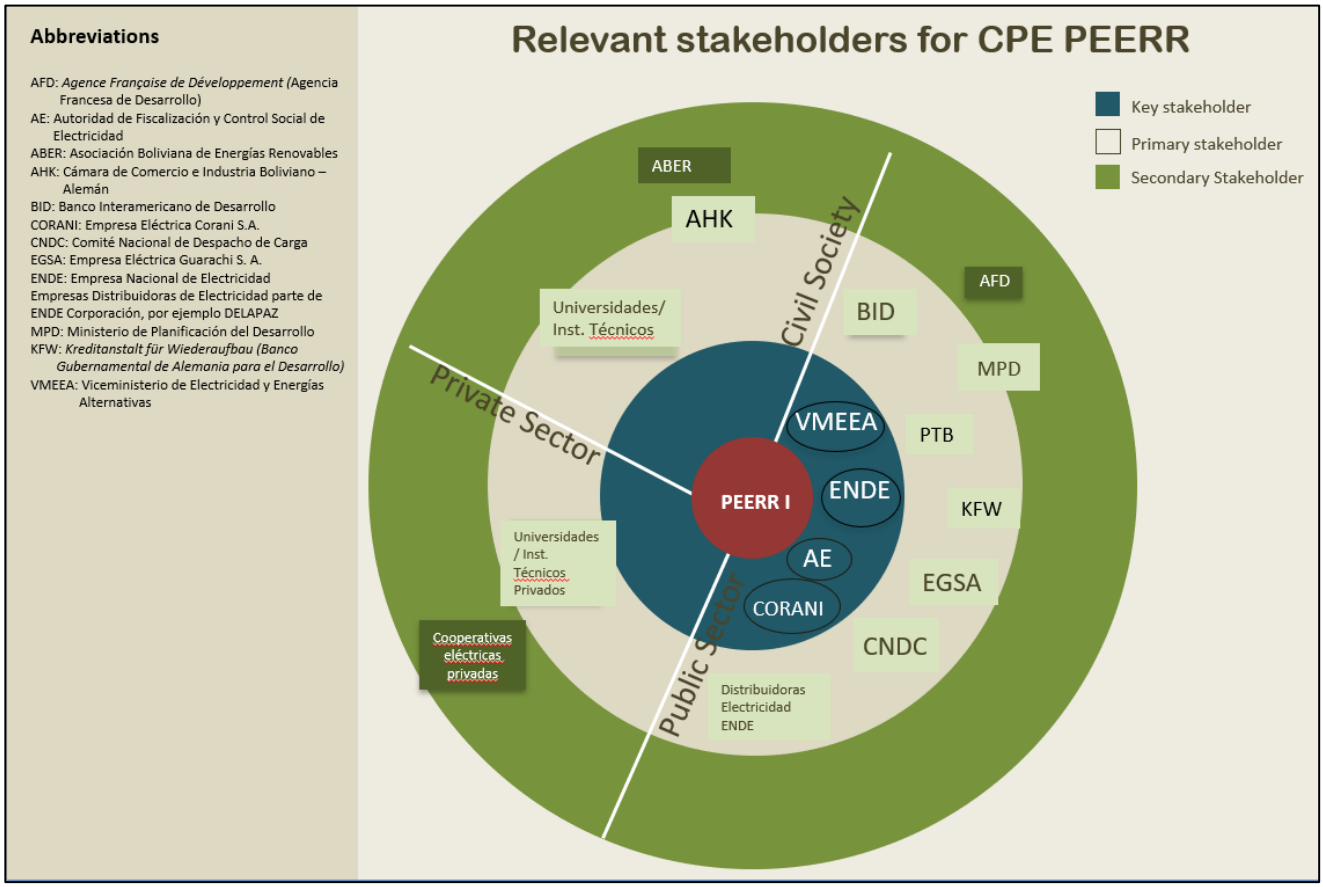
[5] Think aloud, inviting participants to redefine the questions asked and question the methodology used to gather their knowledge. The technique does not require additional resources but has proven to create engagement and to ensure the right answering of the question. Paraphrasing, where participants are asked to comment on affirmations, rather than answering to direct questions. It fosters neutral answers, giving the participants the opportunity to question concepts and opens the discussion.

elaboration of the inception report. The data collection phase mainly revolved around the field mission in Bolivia, which was carried out from 14 to 26 July 2019. The analysis and reporting phase started at the end of the field mission and the draft report was submitted to GIZ end of August 2019. In the following, we provide detailed information on the evaluation process. First, we present relevant stakeholders that were involved and should benefit from this evaluation. In addition, adherence to evaluation norms, internal processes as well as knowledge transfer mechanisms are described.

Stakeholders of the evaluation

The involvement of various stakeholders in the evaluation is crucial for CPEs, as it strongly determines the success of the evaluation and acceptance of the evaluation findings and recommendations. During the inception mission, the evaluation team initiated an activity with key project team members to map crucial stakeholders of the project and discuss their involvement in the evaluation.[6] Figure 1 shows the constantly adapted stakeholder mapping. A detailed and gender-disaggregated list of stakeholders included can be found in Annex 2.

Figure 2:Stakeholder mapping provided by the project team and adapted by evaluation team



Public stakeholders

Vice Ministry for Electricity and Alternative Energy: The VMEEA is the direct project counterpart and has high influence and a veto right on any activity of the project. The VMEEA was visited during the inception mission to inform the director and other representatives about the evaluation and receive their inputs in terms of

[6] The discussions were based on a very elaborated stakeholder map that was compiled at the beginning of the project by the project team.

implementation. The director as well as relevant staff members were interviewed during the evaluation mission.

Other public stakeholders included Autoridad de Electricidad y Tecnología Nuclear (AETN), Empresa Nacional de Electricidad (ENDE), Empresa Eléctrica Corani S.A. (CORANI), Comité Nacional de Despacho de Carga (CNDC), Empresa Eléctrica Guarachi S. A. (EGSA): They were informed, partly in person during the inception mission (e.g. AETN), or by other project team members. Their views were integrated either through interviews (at director/manager level) and focus group discussions (FGDs) (at technical level).

Banco Interamericano de Desarollo (BID), KfW, AFD: Donor organisations or other implementing agencies was considered necessary during the evaluation mission. Three semi-structured interviews were set up to integrate their independent views and perceptions into the evaluation.

Civil society stakeholders

Public and private universities and technical institutions: Output 4 is specifically directed to selected universities and technical institutes which, thus, form a key stakeholder group for assessing project activities in this regard. Four of the 13 institutions engaged in the project were jointly selected to be visited by the evaluation and project team. The selection of the institutions was based on purposive/critical case sampling to obtain the most important information possible. It was ensured that a diverse range of institutions (public vs private, technical institute vs university) was selected to understand the project's contribution in different contexts and settings. Three interviews with directors, headmasters and teachers were set up during the mission, while one was cancelled last minute.

Norms, standards and internal procedures

First, the evaluation team followed UNEG's (United National Evaluation Group) Norms and Standards for Evaluation (2016), the UNEG Ethical Guidelines and the UNEG Code of Conduct (2008) for Evaluation in the United Nations (UN) system. It was further ensured that names or other personal data of interview and discussion participations are by no means revealed. To ensure anonymity, codings are used in the evaluation assessment.

Second, the international and regional consultant built up strong team rapport and established an effective and fruitful working relationship. At the end of each field mission day, the consultants discussed and documented key findings and validated data retrieved from interviews and discussions. Researcher triangulation was fostered in the sense of a common interpretation and analysis of the available data material. The national consultant was in charge of drafting interview transcripts at the end of each day while the impressions were still fresh in the mind. Furthermore, the national consultant provided data analysis and inputs, proofread and final validation for the final report in Spanish.

Knowledge transfer

It was considered very important to ensure immediate knowledge transfer and sharing of results at the end of the mission. A validation workshop at the end of the data collection with the project team was conducted successfully. Furthermore, a debriefing took place with the GIZ country coordinator and the German Embassy. The de-briefing presentation was shared with the GIZ evaluation unit to inform about preliminary results. Partners could not take part in the validation workshop but were informed by the project team about key results. Key partners will presumably receive the final version of the evaluation report in English. In addition, to ease understanding and dissemination of findings, a short summary in Spanish should be compiled.

4 Assessment of the project according to OECD/DAC Criteria

4.1 Relevance

The relevance criterion examines whether the project is doing the right thing. An assessment was conducted of the extent to which the project's objectives are consistent with the key strategic reference frameworks, the priorities of the target groups, and the policies of the partner country and the commissioning party. In addition, in contrast to past practice, more importance is awarded to the analysis of the design and the results logic (theory of change) of the underlying project.

Evaluation basis: In the first evaluation dimension of the relevance criteria, the evaluation aims at analysing whether the aspired results at outcome and impact level of the project (see Results Model and Results Matrix in the annex) are in line with relevant strategic reference frameworks – e.g. the priorities of the BMZ as well as with national strategies. When it comes to analysing the needs and potential benefits of the project's target group, the project's focus areas and activities are contrasted with strategic reference documents as well as target groups' perceptions and expectations. The project's results model was reconstructed to assess the adequateness of the project design (evaluation dimension 3); and to understand changes during the implementation (evaluation dimension 4), the change offer, progress reports and other supporting documents were analysed and reflected with the project team's and stakeholders' opinions.

Evaluation design and methods: As indicated in the evaluation matrix (annex 1), the relevance criterion was mainly assessed through the analyses of secondary project data which underwent qualitative content analysis. Additional strategic documents and primary data from stakeholders were also considered and triangulated with insights gained from primary data. The updated results model formed a solid base to understand the adequateness of the project design and was discussed and verified during interviews and discussions with key stakeholders. The strength of evidence is found to be strong for the dimensions of the relevance criteria.

Analysis and assessment regarding Relevance

Evaluation dimension 1: The project fits into the relevant strategic reference frameworks

The project is in conjunction with both national policies in Bolivia and strategic reference frameworks of the German DC. The major strategic national reference frameworks for this project are: (i) the Ministry of Hydrocarbons and Energy, through the VMEEA, elaborated the 'Electric Plan of the Plurinational State of Bolivia 2025', with the main objective to establish general guidelines for the development of the electric infrastructure that allow to satisfy the internal demand, to impel the productive apparatus, achieve national electric integration and universal access to electricity. The plan details the demands, projects, investments and requirements necessary to sustain national growth by 2025, laying the foundations for the development of the electric industry from the diversification of the energy matrix for the export of energy surplus; (ii) the Alternative Energy Development Plan 2025 (*Plan de Desarrollo de las Energías Alternativas 2025*) defines the lines of action to achieve an effective integration of alternative energies in the energy matrix of the electricity sector, visualising them as an alternative for the diversification of the energy matrix and the displacement of fossil fuels. The plan, formulated in 2014, contemplated the installation of 242 MW in alternative energies to the SIN and a total of 251 MW at national level, requiring an investment of USD 877 million; (iii) the Economic and

Social Development Plan (PDES) 2016-2020 of the Plurinational State of Bolivia constitutes the general strategic framework for the development of the country considering a four years span. The PDES was formulated by the Ministry of Development Planning. For the electricity sector, the challenge has been to satisfy the generation of electricity in order to meet domestic demand, as well as generate a significant surplus of effective power for export, positioning Bolivia as a regional energy centre. Specifically, it indicates that electricity generation should be increased by 2,954 MW, of which 411 MW should be alternative energies (solar, wind, biomass and geothermal).

Furthermore, in July 2014, the presidential decree Nr. 2048 was passed to create a financing mechanism to retrieve additional financial support from the revenues of the electricity market for the injection of RE into the national electricity grid. At the beginning of the project, it remained unclear whether this financial umbrella would serve sufficiently to cover expenses caused by RE investments, making the project highly relevant to improve decision bases for further planning.

Operational partners confirmed the project's synchronisation with the country's strategic guidelines and plans *(Int_2 with partner, Int_12 with partner, Int_10 with partner)*. The project is relevant and very timely because it has improved the planning and implementation of RE projects to comply with the requirements shared in the PDES. The measures under Output 2 were, thus, of great importance, which was recognised by the main counterpart, the operational counterparts and even other international cooperation agencies working in the sector *(FGD_2 with partner, Int_2 with partner, Int_14 with partner)*. Actions aimed at achieving the transfer of knowledge, as well as the training carried out, have responded to the actual weaknesses and/or needs identified by the counterpart entities. A fundamental and appropriate instrument in the area of wind energy was the instalment of two integrated experts at the counterpart institution, ENDE Corani.

On the specific relevance of wind and solar energy technologies in the Bolivian context contrasting results were found, especially when it comes to future perspectives: On the one hand, the focus on solar and wind, despite not being overwhelming in their size of energy production (*FGD_8 with project team*), is considered appropriate: *'Solar and wind are important […], in the case of the north of the country the displacement of subsidized diesel is important' (Int_12 with partner).* On the other hand, the relevance of these technologies might be influenced in the future by the increasing demand for hydropower projects, which are usually large-scale projects. Hydropower is an area not touched by the project. Last, it was reiterated in each interview that the future relevance of these technologies highly depends on increased income through exporting natural gas at higher prices.

EE was a relatively new topic in the country upon project start. In 2014, the 'Strategic Plan for Saving and Energy Efficiency' *(Plan Estratégico para el Ahorro y la Eficiencia Energética, PAEE 2014)* was concluded but no concrete actions followed. At that time, the need for a coordinating agency to implement the measures planned was identified. Although operational partners recognise its value and usefulness, most actors in the state sector interpret the concept of 'energy efficiency' as 'energy saving' and not as optimal use of energy; this situation hampers its development especially at the political-institutional level, because there is currently an over-supply of electricity. However, regarding aspects such as the thermal comfort of houses, or the energy improvement of institutions that work in health, the relevance of the methodology and the measures proposed are highly appreciated.

Eventually, the development of curricula in RE and EE is a specific but highly relevant activity for the beneficiary institutions, such as universities and technical institutes. It was a request by the German Embassy to integrate a component on RE and EE education in the project and also corresponded well with national demands in Bolivia to renew training and education material in this field.

As a stand-alone TC-measure, at the beginning, the project did not contribute to any DC programme but derived its objective from the BMZ's Latin America Strategy, in which climate and resource protection, as well as sustainable economic development, are central components (*BMZ Position Paper 8/2015).* The project

further follows the BMZ sectoral concept 'Sustainable Energy for Development' (2007), which promotes climate protection by avoiding fossil fuels for energy generation. The BMZ Country Strategy for Bolivia on Energy was formulated in 2017, after the project start. According to the document, German DC, being in line with EU Joint Programming, aims at contributing to the protection of the environment and natural resources as well as the adaptation to and mitigation of climate change, thus, supporting poverty reduction in the country. The promotion of RE and EE developed into a focal area of German DC for achieving that '*the Bolivian population benefits nationwide from an affordable, sustainable, modern, reliable and efficient energy supply with a growing share of renewable energies and a reduced energy intensity*' *(BMZ Länderstrategie Bolivien 2017)*. In May 2018, a DC Programme on Energy was formulated to which GIZ, KfW and Physikalisch-Technische Bundesanstalt (PTB) contribute with their projects (Progress Report 2019). The project subject to this evaluation contributes mainly through inducing an increase in RE and EE projects, while other projects are concerned with infrastructure and access to energy.

With the 'United Nations Framework of Reference for a Good Life in Bolivia 2018-2022' (*Marco de Complementariedad de Naciones Unidas para el Vivir Bien en Bolivia 2018-2022, 2017*) the Bolivian government committed itself to align its national development efforts, as expressed in particular in the patriotic Agenda 2025 (Agenda Patriótica 2025) and in the PDES, with the goals and principles of the Agenda 2030. The promotion of RE and EE to safeguard ecosystems, preserve biodiversity and create energy surpluses for exports are included as overarching goals. In the statement to the Agenda 2030, Bolivia states to aim at ensuring '*access to affordable, reliable and sustainable modern energy services*' (*SDG Knowledge Platform 2015*). As articulated in the project concept (*Modulvorschlag 2015)*, the project is oriented towards SDG 7 on affordable and clean energy and SDG 13 on combating climate change.

Evaluation dimension 2: Suitability of the project concept to match core problems/needs of the target group(s)

As elaborated in the first evaluation dimension, the project is very much in line with strategy reference frameworks and responds to core targets of selected SDGs. To compile with the objectives set at national level, responsibilities to bring forward the energy sector were shared among different governmental institutions. The project identified and targeted these institutions for their support measures. Thus, the following target groups can be distinguished:

- Directors, specialists and managers from VMEEA, ENDE and AETN – who benefited, for instance, from direct capacity-building measures and technical input through studies and exchange visits
- AE, CNDC and ENDE staff – benefited, for instance, from direct capacity-building measures. ENDE Corani benefited as well as from support through integrated experts (i.e. on-the-job training)
- University and institute staff – benefited from the support in terms of curriculum design

In the following, the evaluation team sets out how much the project concept was geared to the core needs of

the mentioned project's target groups. With the creation of the MoE, roles and responsibilities were newly distributed. Establishing the MoE put weight on the importance of electricity (including RE) and represented a new coordination partner for the project and other development cooperation initiatives in the field. While this restructuring process caused time delays, it also represented an opportunity for the project (*Int_9 with project team*) to provide very specific support and accompany the vice ministry to roll-out and strengthen projects from the very beginning. In specific, key personnel benefited, for instance, from direct capacity-building measures and technical input through studies and exchange visits. These measures respond to the demands articulated by the target group at managerial level. Above all, exchange visits, workshops and seminars appear to be highly relevant to deepen the knowledge of people involved and to introduce new concepts and methods relevant to improving framework conditions. At operational level, all partners confirmed the relevance of the activities (*FGD_5 with beneficiaries, FGD_7 with beneficiaries, FGD_4 with beneficiaries, FGD_7 with beneficiaries*). The demand-based implementation of activities was founded on participatory planning, as illustrated in the quote below:

> *'There is high utility of the activities executed with the PEERR for [XXX], as there was always joint planning of consultations.' – FGD_5 with beneficiary*

Among the beneficiaries, there were five junior professionals who confirmed the relevance and applicability of the capacity development activities in their daily work, considering that they didn't have a lot of experience in the planning and operation of RE projects (*FGD_7 with beneficiary)*. Similarly, within output area 4, the project adapted the design of the given support to the different institutional requirements: while some institutions required modules in RE or EE, others demanded a fully fledged curriculum. In both cases, the project filled the identified gaps within the academic institutions to bring forward education programmes in the two areas (*Int_14, Int_1*). Although, initially, the demand to focus on improving the educational offer solely rose from the German embassy, over the course of the project, more institutions than expected showed demand and interest (*Int_9 with project team*).

Answers to the question of whether needs and concerns of women and men are represented in the project concept are two-fold. On the one hand, according to the evaluators' perception, the project concept does not distinguish sufficiently between the different needs of women and men. The main project activities are equally open for both sexes, but, there is a generally a higher share of male technical staff within the target organisations, and women are mostly outnumbered. No gender identifier was given to the project within the conceptualisation phase. On the other hand, the project team recognised the need to provide additional support to women who work in the energy sector and established the working group 'Género y Energía' (Gender and Energy). It serves as a platform to foster women's engagement in the energy sector, plans and executes activities, e.g. conferences or informal meet-ups between female engineers or staff members of key institutions within the sector.

> *'The theme of gender was a commitment, without indicators, the same that has been very active. We found some connections within the internal project team and saw opportunities with other topics such as street lighting and relation with women's safety at night.' – Int_9 with project team*

Considering that the project does not operate at the final beneficiary level (i.e. no concrete measures are directly provided to the Bolivian population) the question how disadvantaged groups are reached cannot be answered. Energy retrieved from RE parks is fed into the general national system. Energy sources are not yet reaching the remote areas, where most disadvantaged population groups live. However, we should mention that project activities are complementary to the GIZ EnDev project, which specifically aims at energising rural and remote areas (GIZ 2019).

Evaluation dimension 3: The design of the project is adequately adapted to the chosen project objective

An assessment of the project's results model prior to the evaluation showed that there was scope for revision. Thus, during a participatory exercise the results model was reconstructed to more realistically represent the project's logic. The project objective was specified further and considered to be – to a large extent – achievable given the system-strengthening approach of the project to induce changes at the legal, technical, economic and institutional levels. However, neither the objective nor the corresponding indicators specify to what extent conditions should be improved. This leaves room for interpretation. Outputs are generally specific and achievable, except for Output 1, which highly depends on external factors. Most hypotheses between outputs and outcomes remain plausible and coherent.

Under Output 1, it was key to provide timely and relevant data, capacity development activities and exchange visits in order to allow for informed decision-making by political actors. Achieving the expected results along these lines was, however, not very realistic, because there is a high dependence on political will and external factors (such as the development of energy export markets, for example). There is agreement among all the international cooperation agencies interviewed, that it is necessary to update the legal framework of the sector (a project task), which is, however, challenged by the current political environment (*Int_5, Int_3, Int_8)*. Also, other agencies were forced to slow down initiatives in the normative and legal field.

Improving technical conditions of the executing governmental agencies (Output 2) was perceived to be highly relevant, as the existing RE projects (wind parks and photovoltaic farms) were very new and operators could not build on existing experience in operating and maintaining these projects *(Int_9, Int_12 with partner*). To achieve Output 2, the instrument of an integrated expert was perceived to be relevant due to two major reasons:

- the receptor organisation was already used to having an integrated expert within their institution (Int_9 with project team), as there had been an expert working for the last 10 years (who, according to the project partner, brought high added value).
- the experts could provide constant and direct support in situations where it was needed the most. A flagship example was the technical support provided on-site by the expert, when one of the wind parks had a fall-out.

In output area 3, similarly to 1, studies and trainings were provided. In contrast to Output 1, the project did not count with institutional structures that could already build on any previous experiences in EE. Studies appeared to have a more limited use, since most of them were not approved until the project end and the counterpart issued concerns on the quality and reliability of the report. The intended objective of improving the institutional conditions to anchor EE within political structures might not have been feasible in the project time line. In contrast, seminars and trainings on EE enhanced the capacities and created awareness among a wide range of different actors, which is prerequisite to further institutionalise the topics in different organisations.

Output area 4, as mentioned above, represents a comparably small intervention. It can be considered a cross-cutting measure as advancement in the educational sector in respect to RE and EE presumably affect the sustainability of all other output areas. It complements other activities and thus contributes more indirectly to the project objective of improving institutional conditions.

Evaluation dimension 4: The conceptual design of the project was adapted to changes in line with requirements and re-adapted where applicable

The most significant change that appeared in the project context was caused by the creation of the MoE and, thus, a change in the direct counterpart. As mentioned above, while this caused distress in the short term, it was considered an opportunity in the long term as both the relevance at national level and the needs of the newly created vice ministry enlarged. Furthermore, '*an active partner is needed to achieve the indicators*' (Int_9 with project team) and '*the MoE concentrated the communication*' *(Int_10 with partner).* According to several data sources, the project team reacted very quickly and diligently to the proposed changes. The execution agreement was signed three months after the setting-up of the ministry, providing the project team with the

necessary licence to operate. Another change concerns the increased demand for more activities in output area 3, on energy efficiency, which was articulated by the project partner and resulted in a change offer with an increased budget and the addition of two indicators. Whether this change in project concept was indeed effective and efficient will be elaborated on in the following sections.

Eventually, the project as well as other donors had to deal with partial stand-stills that occurred because of the upcoming elections in fall 2019 *(Int_9, Int_5)*. This required a high degree of flexibility and led to some deviations in smaller planned activities. Other donors reported that it was necessary to continue with other activities, whenever more disputed engagements were on hold due to external circumstances. No other significant changes were recognised by the interviewees or identified in the progress reports.

Overall assessment of relevance

The evaluation team comes to the conclusion that the project concept fits into the relevant strategic reference frameworks. It builds upon key strategic documents of the Bolivian government and BMZ and is well embedded in the global priorities on clean energy and the fight against climate change, anchored in the Agenda 2030. The evaluation team thus awards 30 out of 30 points in the first evaluation dimension of the relevance criteria. The project concept also addresses core needs of the immediate target groups (management and technical staff from public institutions and operational agencies). It has a more indirect relevance for the Bolivian population, however, with the integration of renewable energies in the SIN, clean energy now does reach the final beneficiary. The project concept ‘on paper’ does not appear to sufficiently represent the different needs and concerns of women and men, but in practice, actively engages in promoting women within the energy sector. The evaluation team awards 27 out of 30 points in respect to evaluation dimension on matching the needs of the target group.

The evaluation team, furthermore concludes, that the design of the project is for the majority of activities and results adequately designed to achieve the chosen project objective. A limitation in this regard concerns Output 1, where the high dependencies on public decision-makers meant that improvements to the legal framework were not implemented as quickly as planned. Therefore, 15 out of 20 points are given. Lastly, the project reacted quickly to changes in the context, particularly to the change in main counterpart, and found effective mechanisms to bring forward agreements and activities despite the time pressure caused by these changes. This leads to an assessment of 20 out pof 20 points for the dimension on adapting to change.

All in all, the relevance of the project in general is awarded with 92 out of 100 points: *VERY SUCCESSFUL.*

Criterion	Assessment dimension	Score & Rating
Relevance	The project concept* is in line with the relevant strategic reference frameworks.	*30 of 30 points*
	The project concept* matches the needs of the target group(s).	*27 of 30 points*
	The project concept* is adequately designed to achieve the chosen project objective.	*15 of 20 points*
	The project concept* was adapted to changes in line with requirements and re-adapted where applicable.	*20 of 20 points*
Overall Score and Rating		*Score: 92 of 100 points* *Rating: VERY SUCCESSFUL*

4.2 Effectiveness

Evaluation basis and design for assessing Effectiveness

Corroborated under the 'Effectiveness' criterion, the evaluation aimed at analysing the extent to which the project has achieved its desired objective (Evaluation dimension 1) and the degree to which all its measures have really contributed to its objectives based on the pre-defined indicators (Evaluation dimension 2). The latter was largely based on a contribution analysis, whereas three key causal relations were selected to be scrutinised in-depth. Eventually, the evaluation of the effectiveness also examined positive or negative unintended results (Evaluation dimension 3).

Evaluation basis: As a first step, by assessing evaluation dimension 1, the evaluation team assessed to what extent the agreed project objective (outcome) has been achieved, measured against the objective indicators, and if additional indicators are needed to adequately reflect the project objective. This required a comparison between the current status and the targets of the outcome indicators. In a second step, a contribution analysis was conducted to assess to what extent the activities and achieved results (outputs and outcomes) of the project contributed substantially to the project objective achievement. Following Mayne (2011), a contribution analysis was based on six steps. As mentioned in section 3.2, the validated results model including risks and assumptions guided the analysis (Step 1). During a participatory exercise with the project management, three key causal links were identified from output to objective (Step 2).[7] Selection criteria for the hypotheses comprised key interest of the project team as well as feasibility of implementing contribution analyses in the given time frame. As a third step, the evaluation also assessed unintended changes under the effectiveness criteria. Unintended changes could, for instance, refer to aspects that have positively or negatively influenced the attitude, the subjective norm or the perceived behavioural control of national actors. While a few unintended results could be detected during the inception mission and, thus, included in the results model, further

[7] However, the evaluation team remains open to select other pathways in case the GIZ corporate unit expresses doubts or the project team changes their preferences.

unintended positive or negative results were identified during the actual data collection.

Evaluation design and methods: To achieve conclusions about the effectiveness and the achievement of indicators, the evaluation team built on both, secondary and primary data sources. During a qualitative content analysis, key project documents as well as relevant external documents were reviewed and examined for evidence regarding the indicators. The consultants further collected and triangulated perceptions from key stakeholders, including (i) the project team management and team members, and (ii) key partners identified and further project stakeholders. To then collect evidence on influencing factors and conflicting explanations (Step 3), the evaluation team built on a mixed-method approach and, thus, on a variety of data sources and data collection and analysis methods: qualitative data collection instruments were three-fold. They comprised semi-structured interviews with higher-level authorities, such as the director of VMEEA, AETN and ENDE Cooperación, Corani and Guaracachi. Further, FGDs with partner representatives at the operational level (ENDE, CNDC, AETN) were set up. FGDs followed a semi-structured guideline. In addition, as a quantitative element, to collect evidence on Output 3, an online survey was implemented to assess the effectiveness of a one-week specialisation course on EE audits. Eventually, a contribution story was compiled (Step 4 of the contribution analysis). Step 5 entailed collecting further evidence for alternative hypotheses. At the end of the data collection with the project team, a validation workshop supported the validation of findings and revealed explaining factors for certain developments. Eventually, the contribution story was finalised. Unexpected positive and negative outcomes were identified through the posing of open questions and one participatory exercise with project team members, in which they were asked to list and rank potential unintended outcomes and provide explanations. These were then verified during the remaining data collection.

Analysis and assessment regarding effectiveness

Evaluation dimension 1: The project achieves the objective on time in accordance with the project objective indicators agreed upon in the contract

The following section provides an overview on the achievement of the project's objective along the indicators of the results matrix.

- Objective: 'The conditions for the expansion of grid-connected renewable energies and an increase in energy efficiency have improved'

As previously mentioned, the evaluation team broke down the objective to specify the conditions that would need improvement. It was understood that legal, economic, technical and institutional conditions must be improved to enable the increased and successful implementation of RE and EE projects and programmes.

- Indicator 1 at module level: 'The legal framework conditions for the promotion of grid-connected renewable energies have been adapted' (e.g. Promotion Act or Presidential Decree)

This indicator was assessed as not realistic by either the evaluation or the project team as it lies beyond the system boundary of the project and depends highly on external factors, above all, the political climate and willingness *(Int_9 with project team, FGD_6 with project team)*. Nevertheless, advances towards the achievement could be made resulting that the indicator obtained a final achievement rate of 50%. While the project was not in the position to provide the foreseen support to the VMEEA to induce specific changes on the legal framework within the project time frame, it could provide important inputs and pre-work (data, studies, capacity development) to the vice ministry. These inputs support evidence-based decision-making and will continue to do so in the future. The study on cost calculation of the presidential decree 2048 was an important contribution to validate the existing financing mechanism (*Int_9 with project partners*). Other than expected, the results were found to confirm the functioning of the current cross-financing model for RE. Direct action on revising the decree was, therefore, not necessary. To the contrary, the *Ley de la Electricidad* (the electricity law) which has been passed in 1994, requires urgent adaptation. Here, the project encountered the issue that activities in this regard were eventually commissioned to other actors *(Int_5, Int_9 with project team).* As of

now, no progress on renewing the law could be recognised.

- Indicator 2 at module level: Investment decisions to a total of 200 MW grid-connected wind or solar power plants and two PV diesel hybrid systems (with at least 1 MW PV share each) are taken

The given indicator is multi-dimensional as it counts the amount of MW produced and the number of installations of diesel hybrid systems (with a specification on the size of the installation). For the purpose of this evaluation, to enable better measurement the indicator was disaggregated into (i) investment decisions to a total of 200 MW grid-connected wind or solar power plants are taken; and (ii) investment decisions are taken on two PV diesel hybrid systems. The sub-indicator (i) has been overachieved: in total, 308 MW of investment decisions were taken representing an achievement of 154%. An overview of current projects is given below. The VMEEA, as counterpart and decision-maker, previously did not consider PV diesel hybrid systems a priority and did not (at that time) issue investments in this area. However, two studies on hybrid systems were commissioned and are currently running – a prerequisite for an eventual implementation (*Int_7 with project team*). Thus, the overall achievement of the sub-indicator (ii) is estimated to be 90%.

Overview of current projects
Projects in operation: 60 MW Uyuni Solar Project, 5 MW Yunchará Solar Project
Project under construction: 50 MW Oruro Solar Project, 108 MW Proyecto Eólico Warnes, El Dorado y San Julián
Project in tender: 45 MW Proyecto Eólico Warnes II y La Ventolera, 50 MW Proyecto Fotovolatico Oruro II

Source: Project Monitoring Data (Wirkungsmonitor 2019, ENDE Corporación 2019))

- Indicator 3 at module level: operation plan activities of an EE programme have been implemented (e.g. energy efficiency program in public buildings)

Against the probable assumption set during the conception phase, an operational plan of an EE programme has never been passed by the counterpart. Despite the lack of an official overarching plan, the project nevertheless implemented activities on EE.[8] While five activities were foreseen, four could be implemented, leading to an indicator achievement of 80%.

Energy efficiency activities
(1) + (2) Trainings of energy auditors and practical implementation of learnings in the development of planning and decision-making bases through energy audits in selected buildings.
(3) Establishment of an indicator system to measure impact
(4) Establishment ofrenewable energy measures, RE construction measures have been taken.

Source: Project Monitoring Data (Wirkungsmonitor 2019)

- Indicator 4 at module level: educational institutions (universities, technical schools) presented six recommendations for setting up new or adapting existing education programmes in the field of EE or RE.

Education institutes who presented curricula adaptations
1. Escuela Militar de Ingeniería and Institutos Tecnológicos Superiores, 2. Santo Toribio de Mogrovejo, 3. Don Bosco, 4. Sayarinapaj, 5. Padre Antonio Berta 6. Nuestra Señora del Pilar

Source: Project Monitoring Data (Wirkungsmonitor 2019) and Preogress Report 2019

Indicator 4 has been fully achieved with six institutions presenting to the VMEEA new modules for or adaptations to educational programmes. These modified curricula are a first step, i.e. a basis for improving the

[8] Considering that the indicator is quite problematic, depending on the official launch of the EE programme (which was set as an assumption, but beyond the scope of the project), the evaluation team decided to put focus on the different activities that should be implemented, and not on the launch of a programme as such.

institutionalisation of topics on RE and EE in target universities and institutes.

Evaluation dimension 2: The activities and outputs of the project contributed substantially to the project objective achievement (outcome)

In a first step, the achievements of the different output indicators are presented. Afterwards, the chosen hypotheses for the contribution analysis are scrutinised to illustrate how outputs contribute to the project objective.

Línea/Output 1: Decision bases in different fields for the improvement of the legal framework conditions for the promotion of renewable energies and their integration into the electricity system were elaborated.			
	Target value	**Final value**	
A.1 A long-term study (considering scenarios) for the integration of renewable energies into the electricity system is published.	100%	50%	The indicator lost its relevance during the project time. The indicator presumably will be achieved in the short term, but the achievement is not connected to project activities. The IDB had implemented a short-term study and ENDE already commissioned a study for the long term which is about to be published. Due to these overlaps, the foreseen project activities to achieve this indicator could not be pursued.
A.2 Decision-makers are in possession of a proposal to adjust the legal framework conditions for RE to allow the profitable operation of plants.	100%	100%	The indicator lost its relevance during the project time. The indicator has been achieved but the achievement is not connected to project activities but published by the IDB. The project team had submitted Terms of References to the Ministry, however, due to the overlap with the IDB study, the partner did not agree to take this foreseen activity forward. The project supports the adjustment of legal framework conditions with the analysis of a degree of remuneration for solar, wind and biomass energy which is currently used. Furthermore, decision-makers have received special training on technical and economic aspects related to RE and EE, which allow building a favourable legal framework

Indicators under Output 1 were comprehensively discussed with the project team, as they did not reflect the project's efforts in achieving the specified output. While originally foreseen in the project concept and discussed with partners in the operational plan, the counterpart assigned the foreseen study and proposal to other entities. As of July 2019, the long-term study now executed by ENDE has not been published. The proposal to adjust legal framework conditions was developed by IDB and given to the VMEEA. It remains unclear whether the given inputs were further used. During the project time frame, the project team did not actively intend to change the output indicators, as they were assuming that the planned activities would still take place (the partner had formally agreed on these activities during project planning meetings). However, during the evaluation mission the project management and team did reflect on the difficulties caused by keeping these indicators:

> *'It is clear that there are problems with indicators that do not reflect what was done' – Int_9*

Considering that both indicators lost their relevance for the project team, other activities that contributed to the achievement of the output needed to be considered. These comprise: (i) a study on fixed and variable costs was of great use for the AETN; (ii) exchange travels of key actors to Germany and Brazil, which not only enabled the enhancement of knowledge on state-of-the-art technologies but also brought together the different actors of the national energy value chain; (iii) capacity-building activities on, for example, tariff setting and distributed generation, which strengthened the work of the VMEEA and the AETN; and (iv) a study on CO2 emissions for another sub-division of the VMEEA, which was given to the 'Autoridad de la Madre Tierra' and highly appreciated (*FGD_9 with partner*). Another study on adapting the clock in summer and winter proved less useful (*Int_9 with project team, Int_14 with partner*). In the end, nevertheless, fewer recourses than

planned were used for Output 1 (see efficiency section).

Output 1 – RO2: The creation of better decision-making bases has led to improved economic conditions to integrate renewable energies

As part of the contribution analyses, the project team analysed whether Output 1 contributed to the project objective, i.e. whether the creation of better decision-making bases led to improved economic conditions to integrate RE. The evaluation team has found *little evidence* that this hypothesis can be considered fulfilled.

Main hindering factors include:

- **The current political standstill due to the upcoming elections in fall 2019:** It was mentioned that no firmed decisions would be taken at present (*Int_5, Int_9 with project team*).
- **Lack of clear strategic priorities by the counterpart regarding legal framework updates:** The current electoral programmes do not show a clear side on how they propose RE and EE to develop.
- **Discrepancies with the main counterpart regarding the quality of studies:** During discussions with the main counterpart, the issue of quality emerged and the wish for better quality control by the project team was issued. A share of studies had not not reached approval from the counterpart. Operational partners showed satisfaction with the quality of studies and the usability of the results (*Int_14*)

Main supporting factors include

+ Important inputs that support policymaking towards renewable energies and energy efficiency: Exchange visits provided important inputs and examples from other contexts to staff members of the VMEEA. Furthermore, the project contributed to strengthening capacities through seminars and trainings, above all in topics that were new in the Bolivian context.

+ Showcasing functioning through projects and pilot initatives: The BoliviaLED project and the ArcoIris model project demonstrated the functionality of energy efficiency measures at larger scale and proved its benefits.

Línea/Output 2: The Bolivian electricity sector has the necessary decision bases to expand alternative renewable energies and manage an electricity system with a growing increase in renewable energies.			
	Target value	**Final value**	
2A. Feasibility studies for additional 300 MW wind and grid solar plants completed.	300MW	318 MW	This indicator requires an additional explanation as it suggests that the project is in charge of the studies. In reality, the project only provides capacities and guidance for the implementation of the study. Indicator has been overachieved, as feasibility studies of 318 MW were implemented.
2B: Feasibility studies for 4 completed hybrid solar power plants (minimum 1 MW of Solar Energy).	4	0.5	This indicator needs re-formulation as it suggests that the project is in charge of the studies. In reality, the project only provides capacities and guidance for the implementation of the study. Only one study could be realised, which was below 1 MW. The project furthermore supports the ENDE staff with training in specific software for the design of hybrid plants and other technical and economic related aspects
2C: The CNDC and the electricity sector entities have at least 3 documented recommendations for the operation of a network with increasing participation of intermittent RE.	3	30	This indicator was fully reached within the first year of the project phase.
2D: The CNDC and the electricity sector entities implement 2 recommendations for the operation of a network with a growing participation of intermittent RE.	2	9	Out of the 30 recommendations provided, 9 could have been implemented.

In Output 2, three out of four indicators have been overachieved. Indicators 2A and 2B do not fulfil the SMART

criteria, as they are not specific enough. The indicator formulation suggests that the project is in charge of conducting the given feasibility studies. The project could only provide capacities and support in enabling the government agencies (ENDE Corani and ENDE Guaracachi) to conduct these feasibility studies. While this was successfully achieved for wind and solar plants (2A), feasibility studies could also be completed for hybrid solar power plants, however, they were smaller than the minimum size of 1 MW stated in the indicator. These smaller hybrid plants respond to needs of the foreseen areas of investment. It would have been better to not specify the size of the plants in the indicator to allow for contextual adaptations. Indicators 2C and 2D have been largely overachieved, as the project team worked closely and effectively with the operating partners, (particularly with CNDC) to not only document relevant recommendations but also create ownership towards implementing them.

Output 2 – RO3: The strengthening of government agencies and public energy companies and has led to improved technical conditions to implement energy projects

As part of the contribution analyses, the project team analysed whether Output 2 contributed to the project objective, i.e. whether the strengthening of government agencies and public energy companies and has led to improved technical conditions to implement energy projects.

The evaluation team has found to a great extent *evidence* that this hypothesis can be considered fulfilled. Several different sources (*FGD_5 with beneficiary, Int_2 with partner, FGD_8 with project team)* have confirmed that project activities (capacity development, technical studies) and instruments (especially the integrated experts) strengthened technical capacities to plan, implement and manage RE projects.

The following positive changes could be identified:
+ Improving technical conditions in maintenance and operation: Owing to technical issues the wind park in Quolpanna had to be shut down for three months. The integrated expert together with team members from ENDE Corani was on-site to fix the problems and renegotiate with the supplier to take responsibilities for the technical problems caused. The expert contributed substantially to maintenance and operation of the wind park to not encounter a similar situation of loss due to shut-down in the future.
+ Improving technical conditions by institutionalising new collaborations: Integrated experts introduced new collaborations with external consultants to verify the conditions and functioning of infrastructure provided by the suppliers. An objective and external audit is crucial to claim repair etc. in case of non-functioning of infrastructure supplied. ENDE Corani have now institutionalized these audits in their processes when purchasing and setting-up wind parks.

Nevertheless, limitations to the contribution of improving technical conditions could be found as well:

- **Barriers in setting up effective knowledge exchange:** The integrated experts wanted to set up internal capacity development workshops to foster knowledge exchange. However, up to now, these could not be regularly implemented. Staff members saw more added value in (external) certified workshops than in internal capacity strengthening.
- **Less focus on improving conditions in the area of solar energy:** The two integrated experts were employed within ENDE Corani, in charge of wind parks. The collaboration with ENDE Guaracachi, focusing on solar and located in Santa Cruz, was characterised by more distance and exchange was rather infrequent. Despite foreseen originally, no integrated expert could be found to be employed at ENDE Guaracachi and the number of activities implemented to develop better capacities was significantly lower. Thus, there might be a certain imbalance between the wind and solar sector in terms of improving technical conditions.
- **Contextualisation of consultancies:** While most cases were confirmed, there were some where the consultancy services or trainings provided were limited in their use. This was sometimes the case when consultants came from abroad (Europe). Barriers included lack of Spanish proficiency by the consultant or missing contextualisation of the key problems and solutions that were discussed.

Línea/Output 3: Crear las bases institucionales y técnicas que contribuyan con la adopción de acciones concretas para el fomento y aplicación de la EE en el país.			
	Target value	**Final value**	
3A: The VMEEA has a documented strategy for the promotion and implementation of the EE in the country.	100%	100%	This indicator was part of the change offer. The strategy has been delivered. To foster the exchange on the document, there will be a symposium.
3B: The VMEEA has a documented proposal for the establishment of an instance for the promotion and development of the EE (including tasks and funding).	100%	100%	The proposal was handed in.
3C: There are EE indicators that will make it possible to establish the baseline and, in the future, to measure the impact of the implementation of the EE actions envisaged in the strategies (elaborated in 3A).	100%	50%	This indicator has been added in the change offer and work only began recently. The respective document has been handed in and a revision process followed. It will be finalised within the next weeks.
3D: The VMEEA has an operational plan for the implementation of an EE programme (e.g. public offices or public lighting).	100%	100%	The plan has been submitted and currently revised by the VMEEA

EE is a very new topic in the Bolivian context. There exists a lot of misinterpretation of the concept itself, understanding that EE refers only to the saving of energy. Considering that energy is one of the country's key economic pillars and the internal supply surpasses the demand, minimising energy usage is not considered adequate. Three out of four output indicators have been achieved, as the stated documents were handed in. The document on EE indicators has not yet been completed. In general, there have been delays in fulfilling the indicators – most documents have been handed in in the final weeks of the project time frame or shortly after.

Contribution analysis: Output 3 – RO4: The supporting measures on energy efficiency have led to improved institutionalised conditions to promote energy efficiency

As part of the contribution analyses, the project team analysed whether Output 3 contributed to the project objective, i.e. whether Output 3 RO4: The supporting measures on EE have led to improved institutionalised and technial conditions to promote EE. To this case, it is important to differentiate between actors that benefited from the activities: besides public representatives from the counterparts, the activities also included external stakeholders with an interest in enhancing their capacities in EE. The evaluation team found to *a minor extent evidence* that the measures led to improved institutionalisation of EE within the public sphere (see section above) and *substantial evidence* that measures were effective to improve technical conditions. To examine the latter pathways of change, the evaluation team examined one specific, but exemplarly, activity: a one-week course on audits for EE, in more detail. An online survey was set up that inquired about different levels of training effectiveness (following Kirkpatrick 1959).

Level 1: Reaction (direct feedback)

Some 82% of the course participants found both the material provided in the training, and the applied methodology to be either completely or to a large extent useful or appropriate. For each, the provided material and the applied methodology, 17% said they found it to be useful or appropriate only to a degree. Most participants (78%) further found the trainer to be completely able to provide knowledge (17% said to a large extent, 17% to a certain extent). All participants said they received new information through the training, either completely or to a large extent. The workshop's relevance for the participants' work was given in almost all cases and varied from 35% completely, 52% to a large extent, 9% to a certain extent to 4% not applicable. Concrete suggestions for improvement comprised including a system or software to carry out calculations into the training and extending the duration of the training itself. It was further stated several times, that country context and specific regional contexts, challenges and requirements should be considered in the training.

Level 2: Learning

All participants stated to better understand the concepts and tasks associated with the energy efficiency course (30% completely, 70% to a large extent). Some 73% further said to feel secure in performing their tasks related to EE. All participants improved their skills and abilities compared to their level before the course to varying degrees (27% completely, 59% to a large extent, 14% to a certain extent). However, only 9% said they were completely able to transfer the knowledge of the course to their colleagues. Nonetheless, 43% said they were able to do so to a large extent, and 48% to a certain extent.

Level 3: Behaviour

Of the participants, 30% said they could completely apply their acquired knowledge within an EE audit, evaluation or monitoring task, 39% applied it to a large extent and 30% at least to a certain extent. 44% further regularly apply their acquired knowledge to their tasks completely or to a large extent, while 43% apply it to a certain extent. However, 9% said to not apply it regularly.

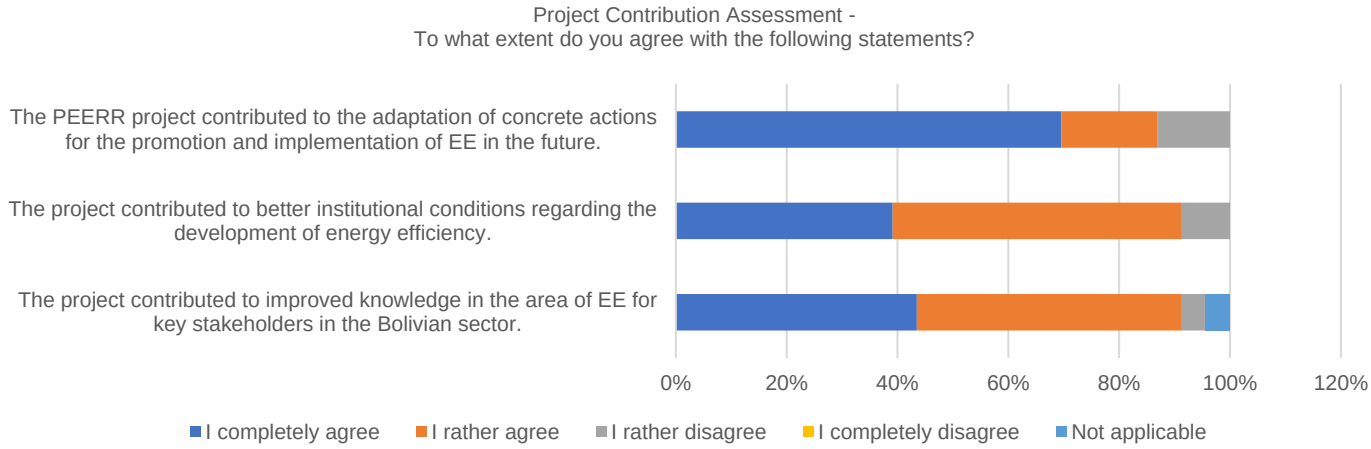
Some participants still found the identification of adequate building materials to be complex. Others stated that the implementation of systems with new or alternative technologies was challenged by their high costs and scarcity. Missing national guidelines were further mentioned as a challenge. The absence of tools for measurements and limited availability of information on EE as well as a lack of commitment on the executive level were further identified obstacles when trying to apply course content.

Level 4: Results

Figure 2, shows the eventual perceived project contribution to (potential) outcomes. Most participants (87%) said they completely or rather agreed, that the PEERR project contributed to the adaptation of concrete actions for the promotion and implementation of EE in the future. Almost all participants (91% each) said they completely or rather agreed that the project further contributed to better institutional conditions regarding the development of EE as well as improved knowledge in the area of EE for key stakeholders.

The studies require final approval and acceptance from the counterpart and need to be disseminated to relevant entities below the VMEEA. However, the counterpart perceived issues of quality regarding these studies and stated that their usage remains uncertain.

Figure 3: Project contribution to improvements in EE



The survey results show that the training was perceived to be very relevant and appropriately designed and implemented. Positive results at Level 1 are the prerequisite to enable learning at Level 2. Survey results in this context, also confirm that learning took place and capacities were built. In terms of behaviour change and the actual application of the learnings, the survey confirmed that the majority (69%) applied the new knowledge to a great extent or completely. The results of the training measure can only be examined within the next months.

Therefore, the participants' perception on the project contribution was assessed. It could be seen that the majority of participants perceive and confirm project results in terms of institutionalising knowledge and measures of EE.

Survey data must be interpreted along with findings provided above regarding the different indicator achievements. At this point, the evaluation team would also like to point out a major barrier to institutionalising the topic of EE within the public sector. Within the VMEEA, only one person in the counterpart is responsible for EE. Accordingly, there is a high workload to achieve but limited capacity to rapidly implement suggestions made by the project. Advances on institutionalising EE, thus, might not have advanced as much as expected.

Línea/Output 4: There are proposals for improving the offer of academic training, both in the field of the RE and the EE.			
4A: Training institutions (Universities, Technical Institutes) have at least 10 justified proposals for the implementation of new courses or the adaptation of existing offers in the area of RE and EE.	10	14	The indicator has been overachieved. 14 institutions received support, and, in total, 11 curricula proposals were issued. More private institutes were integrated than planned.

Output 4 represents a comparably minor area of support compared to other areas (see Efficiency section 4.4). The support given was very specific and consisted in proposals to integrate topics of RE and EE into curricula and modules of the partner educational institutes. Because of the high demand of these institutions, the indicator was overachieved and included more institutions than planned.

Evaluation dimension 3: The occurrence of additional (not formally agreed) positive results has been monitored and additional opportunities for further positive results have been seized. No project-related negative results have occurred – and if any negative results occurred the project responded adequately

The terms of reference (ToR) of this CPE also require assessing unintended changes produced by the project. Given the feedback provided by stakeholders and based on the evaluators' observations, it appears that no negative results have been produced by the project. There were, however, several unintended positive results emerged as consequence of additional efforts by the project team. The team went 'the extra mile' several times to achieve results beyond their official mandate. The following *unintended results* could be detected and were further verified during the evaluation:

- **Key actors obtaining regional experiences** triggered by the project's engagement in the trilateral cooperation
- **Successful pilot projects in energy efficiency are implemented.** The project made extraordinary use of synergies to leverage on other available funding sources which enabled them to achieve the actual implementation of pilot initiatives to demonstrate the value of energy efficiency. A first pilot project included the instalment of LED lights in the cities of El Alto and La Paz, financed by the public-private-partnership between PFM SRL and GIZ as part of the develoPPP.de initiative, supported by BMZ. In total, more than EUR 200,000 were invested to install more than 90 luminaires in public streets of the two cities (BoliviaLed 2019). The mayor of El Alto took part in the inauguration and media and press reported on the change created by LED lights. A second pilot project focused on a holistic improvement of EE for the public hospital 'Arcoiris', which focuses on the most vulnerable population groups, and the La Paz bus terminal. Leveraging on the German Embassy's 'Klimafonds' programme, the project enabled the successful implementation of measures to improve EE in these public places.
- **A discourse on gender and energy is fostered,** triggered by the project team's efforts on promoting gender as a cross-cutting issue in the energy sector. According to the project team, the necessity to engage in this discourse arose internally, following own experiences, observations and discussions on the

importance of gender issues in the energy sector (FGD_6 with project team). A working group was set up which brought different actors together. Furthermore, a one-day conference on Gender and Energy was hold.

Unintended positive results at outcome level do not appear to be explicitly monitored in the Wirkungsmonitor. Related activities to these results are integrated in the operational plan and discussed with the partners. Furthermore, key results are very well documented in the knowledge sharing platform Energypedia.

Overall assessment of effectiveness

Causal pathway in the results model / hypothesis	Degree of evidence	Selected results
Output 1 – RO2: The creation of better decision-making bases has led to improved economic conditions to integrate renewable energies.	**To some extent**	The project contributed with technical advisory services, exchange visits and studies to some extent to the creation of decision-making bases; however, the political climate as well as the non-realisation of key activities hampered a more intensified contribution.
Output 2 - RO3: The strengthening of government agencies and public energy companies has led to improved technical conditions to implement energy projects.	**To a great extent**	The project's key activities under Output 2 contributed to the improvement of technical conditions at the operating agencies. Integrated experts proved to be an adequate tool to continuously support the maintenance and operation of renewable energy projects.
Output 3 - RO4: The supporting measures on energy efficiency have led to improved institutionalised conditions to promote energy efficiency.	**To some extent**	The project contributed to strengthening technical capacities of key stakeholders in energy efficiency but could not achieve the improvement of institutional conditions. The strategies compiled are still only on paper without realising their implementation at the respective public institutions.

Indicators at outcome level are only partially achieved. Indicator 1 at project objective level could not have been realistically achieved due to the high dependencies on the political counterpart and external influences, such as the elections, which delayed decision-making in this regard. Therefore, the evaluation team awards 27 out of 40 points. In terms of the output indicators, it can be stated that the indicators of Output 2 and 4 have been completely achieved and the indicators of Output 3 have been achieved to a large extent. Indicators of Output 2 do not reflect the project activities and lost its relevance in the course of the project, as the counterpart decided to delegate the planned activities to other stakeholders. The contribution analyses showed evidence that activities and outputs contributed to some and to a great extent to the project objective (see table below) and illustrated examples of causal relations. 22 out of 30 points are awarded.

Given the feedback provided by stakeholders and based on the evaluators' observations, it appears that no negative results have been produced by the project, but unintended positive results of high importance were achieved. Above all, the results achieved through the trilateral project and the pilot projects contributed substantially to the achievement of the project objective. However, potential unintended positive results at outcome level do not appear to be explicitly monitored and exploited. This leads to an assessment of 28 out of 30 points. Thus, with regards to its effectiveness, the project is assessed to be RATHER SUCCESSFUL.

Criterion	Assessment dimension	Score & Rating
Effectiveness	The project achieved the objective (outcome) on time in accordance with the project objective indicators.*	*27 of 40 points*
	The activities and outputs of the project contributed substantially to the project objective achievement (outcome).*	*22 of 30 points*
	No project-related negative results have occurred – and if any negative results occurred the project responded adequately. The occurrence of additional (not formally agreed) positive results has been monitored and additional opportunities for further positive results have been seized.	*28 of 30 points*
Overall Score and Rating		*Score: 77 of 100 points* *Rating: RATHER SUCCESSFUL*

4.3 Impact

Evaluation basis and design for assessing Impact

Evaluation basis: The impact criterion aimed at determining the extent to which a contribution was, or continues to be, made to achieve the intended overarching objectives, taking into account the 2030 Agenda and the SDGs. In addition, the nature of any unintended positive or negative results is examined. During the reconstruction of the results model, the evaluation team and project team members identified overarching development results to which the project contributes. They were also linked to relevant SDGs and allocated at the respective spot in the results model. The project's contribution to these overarching results will be examined. It needs to be considered, however, that the project has not been built on a predecessor project. This project was the first initiative in respect to improving conditions at a macro and meso level. Conclusively, the contribution to overarching development results might not yet be fully established, limiting the information value of the impact criteria.

Evaluation design and methods: Nevertheless, perceptions about potential contributions were identified during the evaluation. To do so, the evaluation team followed a similar methodological basis (contribution analysis) to that chosen for the effectiveness criteria. Key data sources were GIZ management and team, other donors, the BMZ representative as well as partner perspectives. Secondary documents included national strategic documents. Three hypotheses from the results model were examined in more detail in order to explain causal relationships between the project outcome and impacts. Tendencies of unintended impacts or results were

identified through the examination of different data sources, such as (i) Wirkungsmonitor data, (ii) perception of the project team and (iii) perception of key partners and the target group.

Analysis and assessment regarding Impact

Considering the short project timeline, it was very tricky to assess whether overarching development results have been achieved or are likely to be achieved It was thus decided to jointly answer the two evaluation dimensions: (i) overarching results of the results model are shown and described; and (ii) the causal links between project outcomes and contributions of the project to the impact are analysed. The three selected hypotheses are described and assessed in boxes below.

Evaluation dimension 1: The intended overarching development results have occurred or are foreseen

Evaluation dimension 2: The project contributed to the intended overarching development results

- New courses in renewable energy and energy efficiency are implemented:

  One result – located at the medium-term outcome level – concerned the establishment of new courses/trainings/study programmes at the partnering educational institutions. While the project rather contributed with a punctual input, the partner institutes now have to bring the documents compiled to life. Here, the perception of stakeholders is utterly positive: at one partner institute, the curricula for a new study programme have been revised and the formal introduction of the programme is planned for the next semester (*Int_14* with partner). A second institute mentioned that the shared material is very useful, but teachers need training in implementing the shared content (*Int_1*). The project dedicated follow-up activities in the current project to cater to these needs and ensure the sustainability of this first measure.

- Investments in renewable energy or energy efficiency increase in the upcoming PDES:

Contribution analysis: Objective RI2: Improved conditions lead to an increase in investments in renewable energies and energy efficiency articulated in the PDES

As part of the contribution analyses, the project team analysed whether the objective contributes to RI2, i.e. an increase in investments in RE and EE. Crucial for a substantial increase are the national indicators and commitments articulated in the upcoming PDES. At the point of the evaluation, the current PDES was under evaluation and concrete planning regarding the upcoming planning could not be retrieved – other than expected – from key stakeholders. Instead, the evaluation team enquired about the perception of key stakeholders. There are mixed perspectives on the development of RE and EE in the country, but the consensus is that it depends on political will and that the commitment will be expressed in the next PDES 2020-2025. Accordingly, different scenarios could emerge. Influencing factors are listed as follows:

- **Positive experience with achievements of current PDES:** A very effective contribution of the project has been to ensure that the goals of the PDES are met with satisfaction and optimal use of resources by parts of the Bolivian state. This provides a grand perspective, as these projects are considered the beginning of a larger development and roll-out.
- **Change in political positioning and willingness after election 2019:** At the point of the evaluation, political decisions were at a standstill. Future decisions and commitments of the PDES will depend on the newly elected government. Since the topics of RE and EE have not been placed prominently in the parties' campaigns, it cannot be estimated if and to what extent commitments will change in the future.
- **Abundance of energy:** Currently, the energy supply in the country is larger than the internal demand. This represents a substantial risk to the roll-out of RE projects, as they are substantially more expensive than current fossil fuel options (which are highly subsidised) and might be dropped again if they become too cost-intensive without providing adequate returns. The profitability of large-scale RE is not viable, as long as gas continues to be subsidised.
- **Need to export energy:** In line with the previous point, a highly discussed topic in the country is the urgency to start exporting natural gas to neighbouring countries. According to several stakeholders, the investments in RE only rise if energy can be sold abroad, achieving higher prices than within the country. Target countries are, chiefly, Brazil and Argentina, since Bolivia, due to its historically rooted discrepancies with Chile, will not provide the state with energy (despite their need). While opportunities to export are currently explored, external market behaviour and price votality would continuously represent a major risk (*Int_14 with partners*). If the international price of natural gas falls, Bolivia will have to accommodate those prices and the decision to export electricity or natural gas will depend in each case on the specific market situation. In any case, it could not be exported with RE either, because at current state they are more expensive energies than those produced with natural gas.
- **Financing of renewable energy projects:** While the presidential decree 2048 was sufficient to cover expenses for current RE projects, it won't yield enough financial resources to invest in future projects. Building on the success of the 2048 decree, new financing mechanisms have to be developed to guarantee resources to expand RE projects.
- **Role of hydropower:** Different partners at the operational level mentioned the increasing importance of hydropower projects for the country. They would be able to provide a huge amount of energy at rather low costs, thus being the only source, which could somehow be comptetetive with gas. The vice minister also confirmed the ministry's determination to invest in hydropower (*Int_9 with project team*). The rise in hydropower could represent both a risk and a chance. It could divert potential investments from RE projects and bears environmental and social risks if not being implemented appropriately, but also could be complementary to RE projects, achieving a sustainable energy mix and substantially lowering the amount sourced from fossil fuels.
- **Identification of niches:** It was mentioned that there was a lot of potential for solar in the north of the country. Furthermore, setting up isolated systems could be a valid opportunity for regions that are not connected to the SIN (*Int_5*).

- Capacities to implement renewable energy and energy efficiency projects have improved and *the management of renewable energy and energy efficiency* projects is provided

Contribution analysis: RI3-RI5: Improved capacities to implement renewable energy and energy efficiency projects lead to better technical management

As part of the contribution analyses, the project team analysed whether improved capacities to implement RE and EE projects (RI3) lead to better technical management (RI5). The evaluation team found *to a great amount of evidence* that the management of RE projects is improved and some evidence that the management of EE projects has improved. Perspectives of operating partners were taken into consideration.

Partners confirmed that the project helped to broaden the horizon for RE projects regarding knowledge and the actual application (*Int_14 with partners*). It also helped to gain self-confidence in planning, designing, implementing and integrating RE projects into the SIN.

- The energy matrix is diversified

Contribution Analysis: RI7-RI8: A diversified energy matrix will contribute to lower specific emissions

In a third contribution analyses, the evaluation team examined whether a diversified energy matrix will contribute to lower specific emissions. These impacts, at the highest level of the results model, are difficult to assess at this point, since initatives just started. Supporting factors to expect this impact are the following:

- **International commitment:** The state of Bolivia recognized the Agenda 2030, including SDG 13 on Climate Action (SDG Knowledge Platform 2015) and stated their commitment to the Paris declaration (Evaluation of the Paris Declaration 2008). Reduction of greenhouse gas emmisions is a key goal, which was also emphasised in the official SDG statement:

  'We will address decisively the threat posed by climate change and environmental degradation. The global nature of climate change calls for the widest possible international cooperation aimed at holding the increase in global average temperature below 2 degrees or 1.5 degrees Celsius above pre-industrial levels by accelerating the reduction of global greenhouse gas emissions.'

- **Integration of renewable energies:** Setting up wind and solar parks is one side of the coin. A milestone achieved by the project was the successful integration of the energy generated into the national system (*Int_10 with partner*). Thus, by incorporating projects of significant size, the country's energy matrix has definitely been more diversified already. Although compared to conventional systems, the projects are still proportionally small and with the gas sector still growing, there might not be a proportional increase.
- **Awareness on CO2 emissions:** As a mandate from the environment division of the VMEEA, the project conducted a study on CO2 emissions. The emissions study was carried out for solar, hydropower plants and wind. It is possible to repeat the calculations of the NCIS studies in the future, with the developed methodology. The quantification of CO2 emissions can be used to establish goals for the proximate PDES (*FGD_9 with partner*).
- **Openness towards systems of distributed generation**: The project could introduce the concept of distributed generation (especially photovoltaic) with small and medium powers that inject directly into low or medium voltage, but for the end user. This could be a reasonable and effectice concept, considering the logic of generation energy for self-consumption.
- **New prospective areas:** The necessity to create demand to balance out the surplus of generation is acknowledged (*Int_9 with project team, Int_5*): New demand could stem from electric vehicles, productive uses or large industries.

Evaluation dimension 3: The occurrence of additional (not formally agreed) positive results at impact level has been monitored and additional opportunities for further positive results have been seized. No project-related negative results at impact level have occurred – and if any negative results occurred, the project responded adequately

Eventually, unintended impacts and the handling of risks at the impact level shall be shared. The following unintended results were identified during the evaluation mission:

- **Improved synergies between actors of the energy value chain:** Induced by the project and the trilateral cooperation was the foundation of interinstitutional working groups after field trips to Germany and Brazil. These working groups have developed independently from the project and only later included project team members.
- **Improved coordination between donor organisations:** It was confirmed by several interview partners *(Int_5, FGD_6)* that the project took the initiative to set up improved donor coordination. The coordination platform Sub-Grus, which covers all cooperation projects with a focus on energy, was initiated and presided by the project for two consecutive terms.
- **Accelerating innovative solutions:** The project team went beyond their mandate whenever they found innovative and impactful solutions that would support the achievement of overarching impacts. One specific example was support to a university professor who has been researching on a forecasting/wind modelling tool. The CNDC and ENDE have already identified the forecasting of solar and wind resources as a tool to improve the delivery of energy. The existing (and applied) approach is to buy the service from external suppliers. However, the resolution of the data is very coarse. In this context, a university project was identified at the Universidad Mayo de San Andrés (UMSA) that was working on climate modelling and it was decided to support the modelling of the wind resource in a specific way. The project provided the connectivity resources, environments, equipment and also practitioners that allowed the tool to be developed. The project team provided a room, equipment and technical assistance via an intern to facilitate the further development of the tool. Both the project team and the operating partners see great potential in this application to improve forecasting of energy supply in wind and solar parks (*Int_7 with project team, Int_ 2 with partner; FGD_6 with project team*).

The assessment of the project's risk analysis and handling provide a mixed picture. On the one hand, the evaluators have not found evidence that the project follows a specific strategy to address any risks. On the other, it must be highlighted that the project stays in very close contact with all operational partners to keep them aware and updated about trends and new developments, allowing them to intervene quickly if needed. The project rather sought to apply its technical advisory capacity flexibly and to mitigate the risks as much as possible on an ad hoc basis with a sound and profound understanding of the context.

Finally, we shall answer the question of whether potential synergies between the ecological, economic and social dimensions are being exploited. Synergies between the three dimensions of sustainability (ecological, economic and social) were exploited by the project team wherever possible, which can be illustrated by the following examples: The project team established themselves as being expert in the area of RE and received requests to share their knowledge by various institutions. Although they could not engage in concrete activities with actors from the civil society or private sector, owing to their mandate by the government, they continued to share their knowledge and provided consultancies wherever possible. For instance, they provided support to the Rural Electrification Cooperative (CRE), whose work has a strong social dimension *(Int_7 with project team)* or they brought together female engineers to promote exchange on energy topics between them. In addition, in respect to activities in EE, new actors, such as the AE Vivienda were integrated in activities.

Overall assessment of Impact

While several overarching development results have been defined in the results model, their assessment is difficult due to the short project timeline. There are different scenarios regarding the achievement of

overarching development results. Perceptions of key stakeholders show that there are both positive and negative factors that might favour a positive development of RE and EE. While the future government's priorities lie outside of anyone's control, the project greatly contributed to illustrating the effectiveness and impact of current RE parks and to enabling the achievement of the current PDES. The evaluation team, therefore, awards 30 out of 40 points in this dimension.

When it comes to the contribution of the project to overarching development results, the evaluation team awards 20 out of 30 points. Evidence can be found that the project contributes to the overarching development results, but the extent cannot be clearly identified. The rather high rating can nevertheless be justified, as it is recognised that no other development agency or donor contributed in the focus areas. Still, there are several external risk factors that might hamper the contribution – outside of the project's control.

Given the feedback provided by stakeholders and based on the evaluators' observations, it appears that no significant negative results occurred regarding overarching results. At the same time, the evaluators have found evidence for positive unintended results, which emerged out of the project's activities and outputs. The evaluation team awards 27 of 30 points in this dimension. The overall score for the assessment criterion effectiveness adds up to 77 out of 100 points: RATHER SUCCESSFUL.

Criterion	**Assessment dimension**	**Score & Rating**
Impact	The intended overarching development results have occurred or are foreseen.*	*30 of 40 points*
	The outcome of the project contributed to the occurred or foreseen overarching development results.*	*20 of 30 points*
	No project-related negative results at impact level have occurred – and if any negative results occurred the project responded adequately. The occurrence of additional (not formally agreed) positive results at impact level has been monitored and additional opportunities for further positive results have been seized.	*27 of 30 points*
Overall Score and Rating		*Score: 77 of 100 points* *Rating: RATHER SUCCESSFUL*

4.4 Efficiency

Evaluation basis and design for assessing Efficiency

Central to the criterion 'Efficiency' is the question whether the project is managed in an economic manner. The evaluation team will examine whether the proportion of resources provided (e.g. finances, expertise) has led to satisfactory results. Combining information on both project costs and results, as happens in all robust efficiency analyses, provides more insights than just looking at these two components separately. Focusing on results alone would limit the use of data in strategic decision-making. Focusing on costs alone may detract the recommendations from ensuring quality in the results.

The concept of efficiency is usually applied when a defined input is transformed into a result or an effect, or to describe the implementation of processes, procedures and structures. In the field of international cooperation, aligned with the OECD/DAC criteria, efficiency is often defined as '*a measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results*'. GIZ follows a maximisation approach, which asks whether results (at output our outcome level) have been maximised with the given resources. Consequently, efficiency is understood as transformation efficiency: inputs are transformed into results and effects whose relation to each other represents the efficiency of the measure. A distinction is made between two types: production (Evaluation dimension 1) and allocation efficiency (Evaluation dimension 2). While the former evaluates the transformation of inputs to outputs, the latter evaluates the transformation of inputs to effects at outcome and impact level. This includes the analysis to what extent even more results at output level could have been achieved with the same overall use of funds. It is therefore not a question of investigating how costs could have been saved, but rather of how the use of existing resources could have been better used to achieve the desired results.

There are many ways to evaluate the efficiency of a project. Following GIZ's guidelines on assessing efficiency, this CPE will apply the 'follow-the-money approach'. This approach is a pragmatic and comprehensive method for identifying potential improvements in a project's efficiency. All expenditures are allocated to the corresponding outputs of the project. While the first step involves a systematic 'mapping' of costs, the second step covers both the evaluation of cost expenditure per output and the assessments by involved or external actors. The strength of the 'follow-the-money approach' lies in the fact that all costs of the project can be systematically tracked and costs that cannot be assigned to outputs are easily identified. In addition, outputs can be identified that may make little or no contribution to the module goal.

Evaluation design and methods

The evaluation team makes use of an Excel tool – that has been the developed by GIZ's corporate unit evaluation to standardise the efficiency analysis of the project. It refers to sources that are available in the project. These are

- the project's 'Kostenträger-Obligo' (cost commitment report)
- the comparison of planned budget figures with actual figures
- the results matrix
- the contracts for possible procurements as well as possible co-financing

The Excel tool consists of six sheets: cockpit, costs, co-finance (Co-Fi) and partner, target/actual planning, expert months, and impact matrix.[9]

9 The five sheets are as follows:
In the cockpit, the tool calculates the required distribution of costs to the respective outputs and puts this in relation to the achievement of objectives at indicator level.
In the costs sheet, the 'Kostenträger-Obligo' report of the project is entered, and the individual costs are allocated to the outputs.
In the Co-Fi & partners sheet, co-financing and partner contributions are recorded and allocated to the outputs.

The tool provides a good basis for evaluating the project's production efficiency criterion. However, the tool does not provide an 'automatic evaluation' of this criterion. Numbers and relations also need to be interpreted with the support of qualitative evaluation instruments to allow for robust statements on the project's efficiency. Thus, questions regarding the project's efficiency will be integrated into interviews and discussions to strengthen the evidence of secondary data. In terms of the allocation efficiency, the evaluation team envisages to assess to what extent the project's use of resources is appropriate with regard to achieving the project's objective. The evaluation team would like to point out that assessing the allocation efficiency is one of the most demanding evaluation exercises. Given the scope of this CPE, the evaluation team does not intend to apply robust approaches for measuring the allocation efficiency, for example, shadow price approaches or complex benchmarking methods, but rather base findings on plausibility assumptions and anecdotical evidence during interviews and discussions.

Analysis and assessment regarding Efficiency

The following assessments are based on information extracted from the 'Kosten-Obligo (costs and commitments) report' and further discussions with the project team and stakeholders, using GIZ's 'follow-the-money' approach. The costs and commitments of the project are presented in the figure below.

Tabelle 1: Project cost overview

Module objective	"The conditions for the expansion of grid-connected renewable energies and an increase in ener-gy efficiency have improved."
BMZ costs (sum of single costs)	3.811.278,09 €
Co-Financing	0,00 €
Partner contribution	0,00 €
Total cost	3.811.278,09 €

Deviations

Based on the feedback received by the project and the information provided to the evaluation team, the evaluation team, there were considerable deviation of costs at the beginning of the project due to the creation of the ministry and thus a change in counterpart. In the first year, only about half of the planned costs could be spent. Accordingly, costs in year three (2018 and the first three months of 2019) were higher than originally foreseen. All in all, the project managed costs well and reacted to the changes in the environment and the delay caused by the change in partner.

Table 1: Target / Actual costs overview

Comparison of target and actual planning values									
2016		2017		2018		2019		TOTAL	
Target	Actual incl. obligo	Target	Actual incl. obligo	Target	Actual incl. obligo	Target	Actual incl. obligo	Target	Actual incl. obligo
€1.000.000	€522,927.74	€1.300.000	€1,271,091.54	€1,300,000	€1,887,865.07	€400,000	415,753.35	€4,000,000	€4,097,637.70

Evaluation dimension 1: The project's use of resources is appropriate with regard to the outputs achieved [Production efficiency: Resources/Outputs]

Most of the output indicators are achieved. It is very likely that the outputs have been maximised with the given

In the sheet target/actual planning the target/actual planning of the project as well as the planned costs of the future outputs are entered (starting at the date of the evaluation).
In the 'expert months' sheet, the man days of the employees of the project per output are to be documented. These serve as the calculation basis for distributing the costs of the personnel instruments to the outputs in the project.
In the results matrix sheet, the impact matrix from the last current progress report of the project is transferred in order to provide state of the art data in the cockpit.

amount of resources (see Effectiveness section 4.2) when compared to the initial plan and targets. Information received in interviews and FGDs corroborate this assumption (which are presented later). The achievement ratings from the Effectiveness section are summarised in the following tables.

Table 2: Output achievement rates

Output indicators	A long-term study (considering scenarios) for the integration of renewable energies into the electricity system is published	Decision-makers are in possession of a proposal to adjust the legal framework conditions for RE to allow the profitable operation of plants	Feasibility studies for additional 300 MW wind and grid solar plants completed	Feasibility studies for 4 completed hybrid solar power plants (minimum 1 MW of Solar Energy)	The CNDC and the electricity sector entities have at least 3 documented recommendations for the operation of a network with increasing participation of intermittent RE	The CNDC and the electricity sector entities implement 2 recommendations for the operation of a network with a growing participation of intermittent RE
Achievement	**50%**	**100%**	**106%**	**12,5%**	**1000 %**	**450%**

Output indicators	The VMEEA has a documented strategy for the promotion and implementation of the EE in the country	The VMEEA has a documented proposal for the establishment of an instance for the promotion and development of the EE (including tasks and funding)	There are EE indicators that will make it possible to establish the baseline and, in the future, to measure the impact of the implementation of the EE actions envisaged in the strategies (elaborated in 3A)	The VMEEA has an operational plan for the implementation of an EE programme (e.g. public offices or public lighting)	Educational institutions have presented recommendations for setting up new or adapting existing education programmes in the field of RE and EE
Achievement	**100%**	**100%**	**50%**	**100%**	**140%**

It is now interesting to assess the costs allocated under each output. Figure 4 shows that to achieve Output 2 almost half of the project costs were used. Output 1 and 3 count with approximately a quarter of the costs. Output 4 assumed only 8% of project costs. This distribution can be largely justified by two aspects.

- First, strengthening the governmental agencies who plan, implement and manage renewable energy projects was considered highly necessary for achieving the project objective, as these organisations represent the backbone of a successful implementation of the country's solar and wind parks. Only if these existing renewable energy plants work well and bring in the desired benefits, investments in the future would be extended by the political decision-maker.
- Second, directly collaborating at the operational level promises direct improvements and results, as enhanced capacities could be applied on their daily job.

The project has sufficient influence to induce changes in output area B. Spending a quarter of costs on Output 1 and 3 was also found to be reasonable, even though the picture might not seem so clear at first glance. Considering that the two Output 1 indicators lost their relevance and cannot be achieved, it might seem at first glance as if spending on Output 1 was not sufficiently efficient. However, Output 1 was directly related to the VMEEA as main counterpart. Setting up exchange visits, implementing workshops and trainings with government staff and collaborating on relevant studies that bring in needed data to the vice ministry and sub-agencies such as AE was of high importance to not only build rapport with the vice ministry as the decision-making agency, but also to lobby for an improved inclusion of topics on renewable energy in the political agenda. Through its partly close communication with key partners and high-quality technical advice, the project enabled to initiate mind shifts and reduce reservation towards new topics for sustainable energy systems (such as distributed generation). Similar, in terms of Output 3, considering that energy efficiency is a very new topic in the Bolivian context, efforts were needed to create awareness among different parties on its importance and create a common understanding on how relevant measures could be implemented.

Nevertheless, understanding that there was a very high demand for Output 4 by educational institutes, and reflecting that the achievement of indicators was very effective and efficient, could lead to deliberations on

whether the amount spent on Output 4 should have been increased to maximise their positive results. Maybe a reallocation from Output 1 to Output 4 might have created a bigger impact on the output level. Additional measures to anchor the new curricula and structures within the educational institutes could have maybe brought rapid positive results. However, this assumption cannot be proved by the evaluators.

Figure 4: Cost allocation to outputs

	Output A	Output B	Output C	Output D
Outputs	Entscheidungsgrundlagen zur Verbesserung der rechtlichen Rahmenbedingungen zur Förderung von netzgebundenen erneuerbaren Energien liegen vor.	Elektrizitätsunternehmen und Netzbetreiber verfügen über die Entscheidungsgrundlagen zum Ausbau der erneuerbaren Energien (RE) und zum Netzmanagement mit steigendem RE-Anteil.	Die Möglichkeiten des Vizeministeriums für Elektrizität und Alternative Energien (VMEEA), qualifiziert Entscheidungen zur Umsetzung der nationalen Energieeffizienzstrategie zu treffen, sind verbessert.	Empfehlungen zur Verbesserung des fachlichen Weiterbildungsangebotes und des Informationsaustausches zu erneuerbaren Energien (RE) und Energieeffizienz (EE) liegen vor.
Kosten inkl. Obligo	886.807,06 €	1.699.023,81 €	936.475,89 €	250.182,87 €
Ko-Finanzierungen	0,00 €	0,00 €	0,00 €	0,00 €
Partnerbeiträge	0,00 €	0,00 €	0,00 €	0,00 €
Gesamtkosten	**886.807,06 €**	**1.699.023,81 €**	**936.475,89 €**	**250.182,87 €**
Gesamtkosten in %	**23%**	**45%**	**25%**	**7%**
BMZ Gesamtkosten in % ohne Kofi	**23%**	**45%**	**25%**	**7%**

Looking at the distribution of staff to the different outputs reveals that the two international staff (AMA/PMA) mainly worked on Outputs 1 and 2. In this retrospective cost allocation exercise, only 5% of costs considered overarching costs (such as coordination and management work) – which might be a rather modest estimate. Presumably, there is an overlap between time spent on Output 1 and general coordination of the project team. National staff put almost half of their resources in Output 2 and around a third in Output 1. Outputs 3 and 4 were almost completely outsourced to an external consultancy, who employed two local consultants to execute the expected operations.

Table 3: Allocation of time worked on outputs

	Output 1	Output 2	Output 3	Output 4	Overarching costs
Projektmitarbeiter/-innen Ausland (AMA/ PMA)	39%	46%	5%	5%	5%
Nationales Personal (NP)	33%	55%	9%	3%	
Fremdpersonal zentral	5%	25%	60%	10%	

Further positive aspects in terms of production efficiency

Management and leadership: In terms of project management and leadership, many good aspects were underlined by both the project team and key partners (*FGD_6 with project team, FGD_2 with partner*). The project director was able to provide guiding leadership and establish clear structures and roles and responsibilities. Motivation and commitment levels of staff members were found to be extraordinarily high. Frequent internal exchange between the project team supported team building and the identification of potential synergies between the outputs.

Qualification of project team: A second supporting factor centres around the high technical qualification of the project team, which was, above all, confirmed by partners at the operational level (*FGD_5 with beneficiaries, Int_2, FGD_1 with beneficiaries*). All team members have an adequate academic background and valuable experience in the field of renewable energies/energy efficiency. Single team members can build on previous experience with the (German) development cooperation. While the majority of key partners expressed satisfaction with the technical advisory by the project team, one (rather influential) party expressed doubts on the qualification of the project team and the quality of products delivered (*FGD_2 with partners*).

Coordination and communication with partner institutions: In the framework of the collaboration, the project team has to adhere to established protocols, which require that the VMEEA, as principal counterpart, is

not only constantly involved and informed but also coordinates with and delegates activities to the subordinated government agencies. Accordingly, communication processes can sometimes be rather stretched and time consuming. The project team has found very efficient mechanisms for communicating effectively with different parties. For instance, updates or requests to the ministry are shared via physical letters that are handed in at the ministry. Similar, responses are shared back on written notes. Furthermore, some processes, such as the formulation of ToRs for studies or consultancies, are first elaborated with operational partners and then sent by them to the ministry for approval. These mechanisms accelerate the coordination and bring forward crucial decisions to move ahead. Nevertheless, partners (FGD_2 with partners) expressed the need to articulate roles and responsibilities of the project team members as well as coordination processes more clearly. Eventually, partners found the collaboration with GIZ easier than with similar agencies or donor organisations (*Int_14 with partner*).

Outsourcing of activities: The contracting of external consultants or agencies happened at two levels. Firstly, as mentioned above, output areas 3 and 4 were fully outsourced to a German development cooperation consultancy, who then employed two local and one international expert. This is indeed considered as very cost efficient as payments are made on deliverables. Nevertheless, it was found that the responsibility on fulfilling the intended results under these outputs cannot fully be outsourced. The external consultants require back up by the project management, especially when it comes to direct collaboration with the partner.

Maximising implementation efficiency: A last factor that could be observed to support efficiency was the lean personnel structure (five technical staff, three consultants, two integrated experts, two interns) and sharing of non-output-related personnel (e.g. for communication, administration) with other GIZ projects. Staff fluctuation was very low with most of the staff members accompanying the project from start to end and beyond.

Evaluation dimension 2: The project's use of resources is appropriate with regard to achieving the projects objective (outcome) [Allocation efficiency: Resources/Outcome]

In contrast to the production efficiency, allocation efficiency describes the transformation of inputs to outcomes/ impact. At project objective level, three indicators show achievement levels of between 80% and 100%. The indicator on changing legal requirements could not be achieved, but important pre-work was done. Table 3 below summarises the results already described in more detail in the effectiveness section.

Table 4: Achievement of project objective indicators

Project objective indicators	The legal framework conditions for the promotion of grid-connected renewable energies have been adapted (e.g. Promotion Act or Presidential Decree)	Investment decisions to a total of 200 MW grid-connected wind or solar power plants and two PV diesel hybrid systems (with at least 1 MW PV share each) are taken	Activities of the Operation plan of an EE programme have been implemented (e.g. energy efficiency program in public buildings)	Educational establishments institutions (universities, technical schools) presented six recommendations for setting up new or adapting existing education programmes in the field of EE or RE
Achievement	50%	90%	80%	100%

Considering that the project didn't count with predecessors, it initially emerged as a single initiative, with substantial delay caused by the change of partner, achieving the stated outcome indicators was not considered realistic in the project time frame. Therefore, the aggregated achievement rate of approximately 80% is found to be satisfactory.

The question to what extent the outcome could have been maximised with the same amount of resources is difficult to answer in this evaluation setting and given the limited number of days available. In fact, the traditional approach for such an analysis is to monetise the added value of outcomes and results at impact level (e.g. via shadow price models). However, in this project, the evaluation basis for such an approach was limited, since it was not really possible to monetise the added value of the project objective. Further acknowledging that the given indicators do not sufficiently represent the results achieved at project level objective, it might be of use to scrutinise supporting factors of allocation efficiency in more detail.

Scaling-up impacts: It was found that the project team members had an intrinsic motivation and a determined mindset to maximise and scale up impacts wherever possible. This was achieved by, for example, leveraging on other programmes and funds to initiate pilot projects and exchange programmes that would support other project activities.

Synergies: The project made efforts to build up synergies wherever possible. Through the set-up of the donor coordination meeting, where the GIZ project played a significant role, synergies were sought, above all with BID and to a lesser extent with AFD and Japan International Cooperation Agency (JICA). Losses in efficiency because of insufficient coordination and complementarity with interventions of other donors were and continue to be avoided. Synergies within the German development cooperation could be created with the German embassy (Klimafond programme) and less importantly with the GIZ EnDev project. Synergies with the financial cooperation (KfW) could not be recognised, but one should understand that KfW recently started to prepare prominent investment in the sector. We need to emphasise that additional efforts to create synergies to GIZ programmes in Brazil, Uruguay and Mexico were made, out of which the trilateral cooperation with Brazil materialised. Two more trilateral projects are expected but have not yet been realised. Finally, synergies with the German Chamber of Commerce were sought to integrate (to the best extent possible) the private sector (*Int_7 with project team*).

Holistic approach: The multi-level approach was found to be very appropriate to improve conditions for a better integration of renewable energies and energy efficiency from different angles. This also enabled to react to changes in the environment and never stand still in case certain activities came to hold. The project team was aware that it was necessary to work with different partners at both the strategic and the operational level. By doing so, the project achieved to be involved in all major renewable energy projects of the government and was in the position to improve their planning, operating and maintenance.

While the factors mentioned above favour allocation efficiency, there are also aspects that hinder the maximation of impacts. Mentioned here could be the **lack of co-financing and partner contribution**. In the given project context, it appeared to be impossible to initiate co-financing, as the project was the first of its kind to work in these focal areas. Only recently, BID and AFD are joining with increased efforts and investments. Partner contributions could not be retrieved, because the newly created MoE did not have enough financial resources. This is visible in the staff structure of the VMEEA, as direct partner of the project, where overburden of work can be recognised.

Overall assessment of efficiency

In general, the production efficiency is assessed very positively. There are several positive aspects worth mentioning. First, the cost distribution to the different outputs appears to be adequate: spending almost half of the budget on Output 2 deemed necessary to provide necessary technical assistance. Despite the non-achievement of the indicators under Output 1, the amount spent seems valid, considering that the structure of the project is complex, and the project is implemented in a context of weak institutional capacities. Other positive aspects refer to clear roles and responsibilities, a well-maintained monitoring system, the way risks are dealt with, and how lessons learnt are considered in the current project implementation. There appears room for improvement when it comes to coordination with the main partner, as misconception regarding the technical staff exists and roles and responsibilities are not articulated clearly enough. The evaluation team awards 60 of

70 points in this dimension.

The evaluation team awards 30 of 30 points in the dimension allocation efficiency given that additional efforts were made to maximise impacts within the given budget, either through leveraging on other funding programmes to implement pilot projects or through proactively improving donor coordination in the sector.

Criterion	Assessment dimension	Score & Rating
Efficiency	The project's use of resources is appropriate with regard to the outputs achieved. [Production efficiency]	*60 of 70 points*
	The project's use of resources is appropriate with regard to achieving the projects objective (outcome). [Allocation efficiency]	*30 of 30 points*
Overall Score and Rating		*Score: 90 of 100 points* *Rating: SUCCESSFUL*

The overall score for the assessment criterion efficiency adds up to 90 out of 100 points: SUCCESSFUL

4.5 Sustainability

Evaluation basis and design for assessing Sustainability

Under the Sustainability criteria, the evaluation aims at analysing whether the project results are likely to be sustainable, and whether positive prerequisites for ensuring the long-term success of the project are in place. In specific, the evaluation dimensions are 'Prerequisite for ensuring the long-term success of the project: Results are anchored in (partner) structures (Evaluation dimension 1)' and 'Forecast of durability: Results of the project are permanent, stable and long-term resilient (Evaluation dimension 2)'.

Evaluation basis: Since the analysis of sustainability also strongly goes hand in hand with the assessment of the impact and the effectiveness of the project, the evaluation team built on questions posed on the two criteria. The findings of the impact and effectiveness sections were scrutinised and hindering factors (trade-offs) and supporting factors (e.g. synergies) for sustainability were assessed.

Evaluation design and methods: Considering that the project does not have a predecessor, the evaluation team computed tendencies on the sustainability of the project through perception questions posed in interviews and discussions to the project team, key partners and the target group.

All perception-based findings were supplemented with so-called hard facts, i.e. analyses on what approaches, methods, models, instruments, etc. are in place and on what resources and capacities at the individual, organisational or societal/political level are available. The expected strength of narrative is medium.

Analysis and assessment regarding Sustainability

Evaluation dimension 1: Prerequisite for ensuring the long-term success of the project: Results are anchored in (partner) structures

The structure of the project, as well as its direct relationship with the MoE and the VMEEA, which are the head of the sector, emphasise the necessity to discuss the issue of sustainability, as it depends on external factors over which the project has no control. It is worth looking at the different services and products the project delivered to understand to what extent results are anchored. A highly disputed topic concerns the studies that were compiled as part of the project. Without doubt, there had been a need for better, timely and contextualised data to improve decision-making bases on enhancing the impact of renewable energies and energy efficiency in the country. All studies requested were delivered by the project team and while the technical inputs were considered useful by operational partners *(FGD_5 with beneficiary, FGD_7 with beneficiary, Int_14 with partner)* the main partner issued doubts about the quality of the studies. Until today, a share of them have not been approved. Only one study, which was not guided by the main partner division of the VMEEA, is about to be published. Whether in the end there are quality issues or other factors that impede moving forward with the studies, in the end this will hamper the usage and therefore sustainability of the products delivered. The project team recognised these difficulties.

Other deliverables, such as the exchange visits and capacity development trainings, appeared to be more sustainable. The importance was considered two-fold: first, these activities were important to generate noise in the sector to address strategic issues and introduce new concepts and ideas *(FGD_6 with project team)*. Second, it was of value to set up regional exchanges, to ensure higher transferability (FGD_2 with partner). An indication for sustainability is the formation of inter-organisational working groups that actors set up independently after the travels. According to the project team, these groups continue working on topics that emerged during the exchange visits.

> *'Knowledge exchange trips, as a method, are highly profitable for the exchange of information and to see the reality in technology'. – Int_12 with partners*

Under Output 2, intensive capacity development support and exchange visits were set up. After experiencing the trainings carried out, some operational partners such as ENDE Corani have decided to incorporate resources into their budgets to (partially) pay for these training costs and have set themselves the goal of achieving international certifications in these areas. They have acknowledged the strategic value it entails and the possibilities for expansion that the sector envisages within and outside the country. Other institutions, such as the CNDC, have also incorporated resources into their budgets to carry out technical exchange visits that allow them to gather experiences from primary sources, especially from countries in the region to learn from experiences that have already been developed.

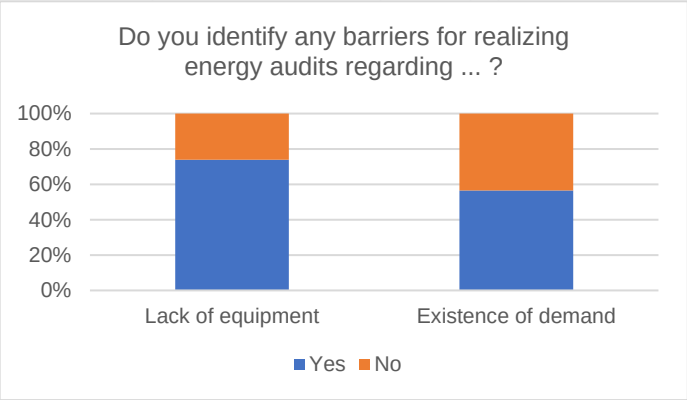
Under Output 3 on energy efficiency, two main support measures can be identified. The first entails studies and consultancies on establishing, for example, an energy efficiency agency. Here, the issues described above hold equally true, and final approval of studies still needs to be given. The second support measures concern trainings in energy efficiency, and the one-week seminar on energy efficiency audits for both public and private actors. Evidence was found that governmental agency AE Vivienda actively integrates lessons learnt from the trainings in their work *(FGD_4 with beneficiary)*. Concrete examples are the adaptation of housing structures in low-cost communities in the Amazon, where architects and constructors now consider things, such as creating shade through canopies for windows or choosing a housing colour, that supports energy efficiency. The agency furthermore sees tremendous scope in integrating energy efficiency measures in their large-scale housing projects. Considering that the AE Viviendia builds 20,000 houses/year there is tremendous scope to achieve sustainable impact. According to the beneficiaries, a short documentation of key energy efficiency measures in the housing sector would have been useful to further disseminate key learnings.

Questions on the sustainability of the seminar were also posed in the online survey. Results are shown in the following:

Sustainability of energy efficiency seminar

The seminar on energy efficiency was a first capacity development measure to introduce the topic on energy efficiency to interested actors in the field. The evaluation team would like to reiterate that the results can only be considered representative for the given course, not for any other capacity development measure. Three questions on sustainability were posed to the participants. First, the survey showed that if there was a governmental programme for energy efficiency audits, all participants would be interested. However, 39% stated they would need more training. The second question enquired about existing barriers. Figure 3 shows that 74% of participants found the lack of equipment to be a barrier for realising energy audits and 54% further found the existence of demand to hamper their realisation. One participant found the lack of qualified human resources to be a challenge.

Figure 5: Barriers for utilising knowledge gained



The third question centered on areas of support that are needed. Several participants said they need more support with regulations concerning the industry, construction of buildings, the environment and EE related sectors. More participants wished for equipment and further training on how to use related tools and software for measuring and implementing EE. Others said they would need more support in the analysis, design and financing of techniques for EE measurements and project implementation. A few people wished for support regarding renewable energies and EE in the context of small and medium enterprises (SMEs), the construction of social housing as well as hospitals. Others said they would like support in building networks to exchange experiences and periodic workshops. Some participants mentioned the need for capacities regarding energy classification of buildings.

Eventually, under Output 4, high expectations have been generated in the institutions and universities about the potential that exists in training of human resources in the field of renewable energies and energy efficiency *(Int_1, Int_11).* While this first step is not enough to guarantee sustainability of results, the follow-up project deliberately now builds on these first results and will institutionalise them further to guarantee sustainability of the activities in this field.

Evaluation dimension 2: Forecast of durability: results of the project are permanent, stable and long-term resilient

Considering that the new project has already started and recent negotiations between the Bolivian and German ministries indicated the readiness to launch an extension of the follow-up project until 07/2022, entails the acknowledgement on both sides to intensify the results achieved. The presumably most lasting results of the project are inputs provided through the technical assistance and training to the staff of the partners. Several partners and project team members are certain that the knowledge generated and exchanged will be

maintained over time.

One risk to sustainability could be staff turnover. Indeed, this could affect the knowledge generated within ENDE Corporación, as these junior professionals only have short-term contracts. Mitigation measures include the set-up of more informal meetings for staff members to share experiences and knowledge (á la German Stammtisch) and other formal internal knowledge sharing mechanisms. To the contrary, at ENDE Corani, long-term contracts prevent staff turnover.

Regarding the studies, it will be of high value to publish those already drafted and share among the network. A few examples show that these technical contents are highly appreciated and are used as a reference even by other donors to build their work on. A second risk identified concerns the high dependence on the political partner. A change caused by the upcoming elections could require new relationship building and capacity development. To mitigate this risk, the project actively attempts – as much as possible – to establish direct working relationships with the operating partners, while still abiding by the official protocols.

Eventually, a strong factor that supports the durability of results is the project's diligent documentation of activities on the Energypedia platform, which is publicly accessible.

Overall assessment of sustainability

The project's **sustainability** is rated RATHER SUCCESSFUL. While there are certain prerequisites to ensure long-term success of the project leading to an award of 40 out of 50 points, the durability of the project depends highly on the political willingness and risks – beyond the project's sphere of influence – for sustainability to be identified. Thus, 30 out of 50 points are awarded in the sustainability dimension of durability of results.

Criterion	Assessment dimension	Score and Rating
Sustainability	Prerequisite for ensuring the long-term success of the project: Results are anchored in (partner) structures.	*40 of 50 points*
	Forecast of durability: Results of the project are permanent, stable and long-term resilient.	*30 of 50 points*
Overall Score and Rating		*Score: 70 of 100 points* *Rating: RATHER SUCCESSFUL*

4.6 Overall rating

Criterion	Score	Rating
Relevance	*92 of 100 points*	*Very successful*
Effectiveness	*77 of 100 points*	*Rather successful*
Impact	*77 of 100 points*	*Rather successful*
Efficiency	*90 of 100 points*	*Successful*
Sustainability	*70 of 100 points*	*Rather successful*
Overall Score and Rating for all criteria	*81.2 of 100 points* *Average Score of all criteria* *(sum divided by 5, max. 100 points see below)*	*SUCCESSFUL*

100-point-scale (Score)	6-level-scale (Rating)
92-100	Level 1 = very successful
81-91	Level 2 = successful
67-80	Level 3 = rather successful
50-66	Level 4 = rather unsatisfactory
30-49	Level 5 = unsatisfactory
0-29	Level 6 = very unsatisfactory

5 Conclusions and recommendations

5.1 Factors of success or weakness

To facilitate learning from this evaluation, this section corroborates key factors of success and central weaknesses of the project. During the evaluation mission it became evident that key results (can be centred on five (success) dimensions). Efforts and positive achievements in these dimensions (which sometimes overlap) appear to have the potential to leverage current achievements and/or mitigate current or future risks.

Factors of success

- **Opportunity in time:** The project was executed at the very moment when institutions needed to bring into operation renewable energy projects. It was possible to immediately address the urgency to successfully maintain and operate the established wind and solar parks and thus to accomplish the goals set by the government. When the project started, it was an exclusive niche in this area of work. There were no other cooperation agencies working on the issue of technical assistance at the level proposed by the project.
- **Team set-up:** The professional and technical staff of the project and their teamwork have been mentioned as a key strength of the project by most stakeholders. The team, besides their sound technical background and experience in the sector, further capitalised on their own networks of contacts and personal relationships to bring forward activities. Besides the correct choice of staff, the continuity of the project team was also a key factor that allowed to provide sustainable and strategic assistance over the years. Nevertheless, it could also be shown that the working relationship between the partner and the long-term consultants in charge of Outputs 3 and 4 must be improved (see below).
- **Leadership:** The project team has good leadership, which positively influences interinstitutional relations. Internal communication mechanisms, and regular team meetings and exchanges, support good team work.
- **Maintaining flexibility while adhering to protocols:** The perception of the operational counterparts is that there is a good level of cooperation and that the project is more flexible than other agencies. The team managed to establish communication channels with partners at the operational level that speeds up the work without violating or breaking the established channels and protocols.
- **Reaction to changes:** In relation to changes that are presented by the dynamics of the sector, there is a good capacity to react and adapt to changes. The speed of progress of the different outputs is adapted according to the institutional political climate, which allows for continuity of activities and achievement of results where other activities are on hold.
- **Intrinsic motivation to maximise impact:** The additional efforts of the project to showcase RE and EE pilot models have been very important to achieve the objective and are a key strength of the project team. Besides the mentioned pilot projects financed by DeveloPPP and Klimafonds, the project also (i) triggered resources to introduce their own electrical bikes, which can be used by project staff; and (ii) established certain guidelines to improve energy efficiency within their own building (‘Casa de la Energía’). These initiatives illustrate the intrinsic motivation of the project team members to work towards promoting better energy solutions.

Conversely, hindering factors that weaken the project results and the achievement of the objective and overarching development results were identified.

Factors of weakness

- **Dependency on main counterpart:** As mentioned before, the project highly depends on the political climate in the country for the achievement of indicators, especially in Outputs 1 and 3. This entails that

processes, due to institutional weaknesses (mainly because of a lack of human resources), can slow down or change substantially (in the case of elections or change in governmental structures).

- **Personal conflicts between partner and staff members:** Tense personal relationships with the main counterpart staff represent a burden that in certain cases hinders the progress of the project in terms of administration and product approval.
- **Insufficient communication with final beneficiaries:** A low level of interaction with beneficiaries of the operating partners (technicians) has been detected; more exchange could take place in order to integrate perceptions from the operational level and recommendations for the project.
- **Low understanding on project concept:** A low synergy has been detected between the lines at the beneficiary level (e.g. technical staff who took part in capacity development measures) as they only have information about their specific activity but lack more general information about the project. Being aware of the overall project concept would allow them to visualise that they are part of a larger and more holistic project and enable to find additional synergies between them.
- **Increasing competition in the near future:** At present, several cooperation agencies are trying to increase their offer of technical assistance to the MoE along similar lines to the project. Considering that these agencies have both technical assistance and financial resources, the project might need to defend their front position in the future.
- **Low synergies within German development cooperation:** While it is acknowledged, that the sectoral focus programme on energy just started in 2017 and other German DC agencies had not yet started projects in energy, it is recommended that from now on synergies with other GIZ programmes and with KfW/PTB in Bolivia should be deepened. Working more closely, especially with the financial cooperation that is about to start, would better position the project within the field, considering that other donors (i.e. the BID and AFD) are backed by attractive financial resources.

5.2 Conclusions and recommendations

Bearing in mind the follow-up project has just started and that prospects for an extension of the follow-up project are quite positive, recommendations given be used for reflecting on the past as well as considering improving future project implementation. The following recommendations are divided into three sections and are based on the analysis and conclusions in the previous sections. All of them are primarily addressed to GIZ, and within GIZ to specific stakeholders.

Recommendation on the design of future activities

Recommendation 1: It has been shown that technical assistance can by catalysed when accompanied by effective and visible (pilot) measures or very practical inputs. In this sense, it is recommended to expand practical actions that can either be directly applied in the projects or illustrate the effectiveness of certain technologies.

Recommendation 2: Following R1 in bringing theory and practice together, the project should seek alliances with other stakeholders to have a series of pilot projects that exemplify the technical assistance being promoted.

Recommendation 3: It is necessary to make a strategic survey to again locate niches of opportunity, where the contribution of the project is greater and where competition of other agencies is low. This becomes especially valid as new agencies are offering technical assistance to the VMEEA. It is further recommended to continue efforts in donor harmonisation and maintain the pivotal position to strengthen coordination with the agencies to avoid duplication.

Recommendation 4: While it remains important to strengthen the capacities of governmental institutions, the need was recognised to integrate more actors from the public, private and academic sectors. Widening the

audience for the inputs provided, could also contribute to sustainability in terms of dissemination of knowledge and technology transfer.

Recommendation 5: In relation to training provided, it was mentioned by several stakeholders to reinforce the concepts of continuity of the personnel being trained, both in the participation of sequential training exchange visits. This would support the sustainability of the capacity development measures. In terms of training material, it is recommended that a minimum amount of physical material is provided to promote the distribution of content within the organisation – especially with operating partners.

Recommendation 6: Regarding Output 4, it is important that activities are carried out to take the designed content to the implementation level by the teachers, support the internal processes to implement the courses and improve the follow-up and periodic interaction plans. Since the activity under Output 4 in the project was very specific and punctual, it is important to keep the target group involved not to generate feelings of abandonment or neglect.

Recommendation 7: The support to the AE Vivienda is an example of how the technical assistance has high potential for success and upscaling. Specifically, the AE Vivienda builds 20,000 houses/year and is already introducing small changes in housing design applying the concepts of EE. Recognising this potential and intensifying activities in this regard, a more sustained support to AE Vivienda or similar multipliers could maximise impacts.

Recommendation on partner management:

Recommendation 8: Due to the persisting fractiousness in the working relationship between the counterpart and some of the project team staff members, it has been found necessary to conduct a mediation workshop or another similar activity with the VMEEA. This session could support to clarify the roles, functions, scope, processes, time frame and means of communication that are and will be used during the process of project management, delivery, product review and ongoing monitoring and evaluation.

Recommendation 9: Periodic and systematic contact should be established with people at the technical level in order to receive direct feedback (e.g. from the CNDC on the integration of renewable energies into the system), on possible activities to be developed, or also feedback in relation to the activities being carried out.

Recommendations on implementation processes:

Recommendation 10: While the project internal staff is very well connected and animatedly exchanges knowledge and collaborates, there is scope for improvement to better involve integrated experts in project design. The project could make even more use of their position to gain specific information on the partners' activities, needs and new developments. Integrated experts should be aware of the projects' indicators to integrate impact orientation in their daily work. Similarly, the long-term consultants who oversaw Outputs 3 and 4 require more acknowledgement by the counterpart and should not be seen as something separate.

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Annex

Annex 1: Evaluation Matrix

	Assessment dimension	Evaluation questions (pilot phase, work in progress)	Evaluation indicator	Available data sources	Additional data collection	Evaluation strategy (evaluation design, method, procedure)	Expected evidence strength (narrative)
Relevance	**RELEVANCE (max. 100 points)**						
	The project concept* is in line with the relevant strategic reference frameworks. Max. 30 points	Which strategic reference frameworks exist for the project? (e.g. national strategies incl. national implementation strategy for 2030 agenda, regional and international strategies, sectoral, cross-sectoral change strategies, if bilateral project especially partner strategies, internal analysis frameworks e.g. safeguards and gender**)	Number/type of strategic reference frameworks	Länderstrategie zur bilateralen Entwicklungszusammenarbeit mit Bolivien, Plan de desarollo 2016 - 2020, Project docuemnts (Estudio de diseño técnico de pre inversión para Programas de Fortalecimiento Institucional)		Secondary data analysis	Strong
		To what extent is the project concept in line with the relevant strategic reference frameworks?	Comparison of objetives and goals between project and frameworks	Länderstrategie zur bilateralen Entwicklungszusammenarbeit mit Bolivien, Plan de desarollo 2016 - 2020, Project docuemnts (Estudio de diseño técnico de pre inversión para Programas de Fortalecimiento Institucional), Jefe de la cooperación alemana en Bolivia	Interview	Secondary data analysis, qualitative content analysis	Strong
		To what extent are the interactions (synergies/trade-offs) of the intervention with other sectors reflected in the project concept – also regarding the sustainability dimensions (ecological, economic and social)?	Numer /type of interactions with other sectors	Project documents (Estudio de diseño técnico de pre inversión para Programas de Fortalecimiento Institucional); Jefe de la cooperación alemana en Bolivia		Secondary data analysis,	Strong
		To what extent is the project concept in line with the Development Cooperation (DC) programme (If applicable), the BMZ country strategy and BMZ sectoral concepts?	Comparison of objetives and goals between project and BMZ documents	Länderstrategie zur bilateralen Entwicklungszusammenarbeit mit Bolivien, Plan de desarollo 2016 - 2020, Project docuemnts (Estudio de diseño técnico de pre inversión para Programas de Fortalecimiento Institucional), EZ Energie Programm; Jefe de la cooperación alemana en Bolivia; Jefe de la cooperación alemana en Bolivia	Interview	Secondary data analysis, qualitative content analysis	Strong
		To what extent is the project concept in line with the (national) objectives of the 2030 agenda? To which Sustainable Development Goals (SDG) is the project supposed to contribute?	Comparison with relevant SDGs	SDG overview, GIZ proposal		Secondary data analysis	Strong
		To what extent is the project concept subsidiary to parter efforts or efforts of other relevant organisatons (subsidiary and complementarity)?	Comparison between project and partner concepts	GIZ proposal, Plan de desarollo, Partner documents		Secondary data analysis	Strong
	The project concept* matches the needs of the target group(s). Max. 30 points	To what extent is the chosen project concept geared to the core problems and needs of the target group(s)?	Perception of partners and target groups	Representatives of VMEEA, AE, ENDE, CNDC; Project progress repots	Interviews, Focus Group Discussions	Secondary data analysis, qualitative content analysis	Strong

		How are the different perspectives, needs and concerns of women and men represented in the project concept?	Perspectives of women and men are considered in project document	Project concept, progress report		Secondary data analysis	Strong
		To what extent was the project concept designed to reach particularly disadvantaged groups (Leave-No-One-Behind – LNOB) principle, as foreseen in the Agenda 2030)? How were identified risks and potentials for human rights and gender aspects included into the project concept?	Disadvantaged groups are considered in key project documents	Project documents, regulatory frameworks, factsheets (e.g. VWU, EFU Life)			Strong
		To what extent are the intended impacts realistic from today's perspective and the given resources (time, financial, partner capacities)?	Comparison current status and goals Preception partners	Representatives of VMEEA, AE, ENDE, CNDC; Project progress reports	Interviews, focus group discussions	Secondary data analysis, qualitative content analysis	Strong
	The project concept* is adequately designed to achieve the chosen project objective. Max. 20 points	Assessment of current results model and results hypotheses (theory of change, ToC) of actual project logic: - To what extent is the project objective realistic from today's perspective and the given resources (time, financial, partner capacities)? - To what extent are the activities, instruments and outputs adequately designed to achieve the project objective? - To what extent are the underlying results hypotheses of the project plausible? - To what extent is the chosen system boundary (sphere of responsibility) of the project (including partner) clearly defined and plausible? - Are potential influences of other donors/organisations outside of the project's sphere of responsibility adequately considered? - To what extent are the assumptions and risks for the project complete and plausibe?	Consistency, coherence and quality of results model	Project documents, progress reports to BMZ			Very strong
		To what extent does the strategic orientation of the project address changes in its framework conditions?	Changes in legislation Changes in project set-up	Progress reports, project team	Interviews with project team members	Secondary data analysis Qualitative content analysis	Strong
		How is/was the complexity of the framework conditions and guidelines handled? How is/was any possible overloading dealt with and strategically focused?	Risks / bottlenecks outside the sphere of responsibility mentioned by project staff	Progress reports, project team	Interviews with project team members	Secondary data analysis Qualitative content analysis	Strong
	The project concept* was adapted to changes in line with requirements and re-adapted where applicable. Max. 20 points	What changes have occurred during project implementation? (e.g. local, national, international, sectoral, including state-of-the-art of sectoral know-how)	Number/type of changes occured	Progress reports, project team	Interviews with project team members	Secondary data analysis Qualitative content analysis	Strong
		How were the changes dealt with regarding the project concept?	Activities conducted to address changes	Progress reports, project team	Interviews with project team members	Secondary data analysis Qualitative content analysis	Strong

	Assessment dimension	**Evaluation questions (pilot phase, work in progress)**	**Evaluation indicator**	**Available data sources**	**Additional data collection**	**Evaluation strategy (evaluation design, method, procedure)**	**Expected evidence strength (narrative)**
	EFFECTIVENESS (max. 100 points)						
Effectiveness	The project achieved the objective (outcome) on time in accordance with the project objective indicators* **max. 40 points**	To what extent has the agreed project obective (outcome) been achieved (or will be achieved until end of project), measured against the objective indicators? Are additional indicators needed to reflect the project objective adequately?	Comparison current status and outcome indicators Perception of project team members Perception of key partners	Key partners (VMEEA, AE, ENDE), project team members	Interviews, focus group discussions	Mixed-methods, data triangulation	Strong
		To what extent is it foreseeable that unachieved aspects of the project objective will be achieved during the	Perception of key partners, perception of	Key partners (VMEEA, AE, ENDE), project	Interviews, focus group	Contribution Analaysis	Strong

		current project term?	project team members	team members	discussions		
	The activities and outputs of the project contributed substantially to the project objective achievement (outcome).* max. 30 points	To what extent have the agreed project outputs been achieved (or will be achieved until end of project), measured against the output indicators? Are additional indicators needed to reflect the outputs adequately?	Comparison current status and output indicators Perception of project team members Perception of key partners Number of products presented to partner	Studies. Reports. Proposals. Delivery notes. Lists of participants. Certifications. Conformities. Photographic recordKey partners (VMEEA, AE, ENDE), project team members	Interviews, focus group discussions	Contribution Analaysis	Very strong
		How does project contribute via activities, instruments and outputs to the achievement project objective (outcome)? (contribution analysis approach)	Evidence for fulfilment of results hypothesis is established	project team and key partners; monitoring documents	Interviews, focus group discussions	Contribution Analaysis	Very strong
		Implementation strategy: Which factors in the implementation contribute successfully to or hinder the achievement of the project objective? (e.g. external factors, managerial set-up of project and company, cooperation management)	Underlying factors for results hypotheses	project team and key partners; monitoring documents	Interviews, focus group discussions	Contribution Analaysis	Strong
		What other/alternative factors contributed to the fact that the objective was achieved or not achieved?	Alternative factors explained	Other agencies BID, AFD, KfW	Interviews, focus group discussions	Contribution Analaysis	Medium
		What would have happened without the project?	Counterfactual situation	Other agencies BID, AFD, KfW; partners	Interviews, focus group discussions	Contribution Analaysis	Medium
		To what extent have risks (see also Safeguards & Gender) and assumptions of the theory of change been addressed in the implementation and steering of the project?	Explanation on managemen tof risks	Project team; other agencies	Interviews, focus group discussions	Mixed-methods, data triangulation	Medium
	No project-related negative results have occured – and if any negative results occured the project responded adequately. The occurrence of additional (not formally agreed) positive results has been monitored and additional opportunities for further positive results have been seized. max. 30 points	Which negative or positive unintended results does the project produce at output and outcome level and why?	Additional outcomes identified	Project team, partners, target group	Interviews, focus group discussions	Mixed-methods, data triangulation, participatory exercise	Strong
		How were risks regarding unintended negative results at the output and outcome level assessed in the monitoring system (e.g. compass)? Were risks already known during concept phase?	Risk management and monitoring	Monitoring documents, data from the Wirkungsmonitor	Interviews, focus group discussions	Mixed-methods, data triangulation	Medium
		What measures have been taken by the project to counteract the risks and (if applicable) occured negative results? Inhowfar were these measures adequate?	risk mitigation measures	Progress reports, project team	Interviews	Mixed-methods, data triangulation	Medium
		To what extent were potential unintended positive results at outcome level monitored and exploited?	Risk management and monitoring	Monitoring documents, data from the Wirkungsmonitor	Interviews	Mixed-methods, data triangulation	Medium

	Assessment dimension	**Evaluation questions (pilot phase, work in progress)**	**Evaluation indicator**	**Available data sources**	**Additional data collection**	**Evaluation strategy (evaluation design, method, procedure)**	**Expected evidence strength (narrative)**
	IMPACT (max. 100 points)						
Impact	The intended overarching development results have occurred or are foreseen.* Max. 40 points	To which overarching development results is the project supposed to contribute (cf. module and programme proposal, if no individual measure; indicators, identifiers, link to national strategy for implementing 2030 Agenda, link to SDGs)? Which of these intended results at the level of overarching results can be observed or are plausible to be achieved?	Overarching development results the project is contributing to	Proposal BMZ, GIZ management team, other donors; AP 2025; PDES 2016 - 2020	Interviews	Qualitative content analysis; data triangulation	Medium
		Target group and LNOB: Is there evidence of results achieved at target group level/specific groups of population? To what extent have targeted marginalised groups (such as women, children, young people, the elderly, people with disabilities, indigenous	Degree of contribution at target group levell; Perception of partners on impact for final	Proposal BMZ, GIZ management team, key partners	Interviews	Qualitative content analysis; data triangulation	Weak

	peoples, refugees, IDPs and migrants, people living with HIV/AIDS and the poorest of the poor) been reached?	beneficiaries				
The outcome of the project contributed to the occured or forseen overarching development results.* Max. 30 points	To what extent is it plausible that the results of the project on outcome level (project objective) contributed or will contribute to the overarching results? (contribution analysis approach)	Contribution to Climate Action, Contribution to Clean Energy	Proposal BMZ, GIZ management team, key partners	Interviews	Contribution Analysis	Medium
	What are the alternative explanations/factors for the results observed? (e.g. the activities of other stakeholders, other policies)	Alternative factors explained	Other donors, partners	Interviews	Contribution Analysis	Medium
	What would have happened without the project?	Counterfactual situation	Other donors, partners	Interviews	Contribution Analysis	Medium
	To what extent is the impact of the project positively or negatively influenced by framework conditions, other policy areas, strategies or interests (German ministries, bilateral and multilateral development partners)? What are the consequences of the project?	Influence of framework conditions	EZ Program Strategy, documents on EZ projects; Jefe de la cooperación alemana (German Embassy)	Interviews	Contribution Analysis	Medium
	To what extent has the project made an active and systematic contribution to widespread impact? (4 dimensions: relevance, quality, quantity, sustainability; scaling-up approaches: vertical, horizontal, functional or combined)? If not, could there have been potential? Why was the potential not exploited?	Evidence for widesprad impact established	Progress report; project team; key partners; Sub-grus	Interviews and discussions	Contribution Analysis	Medium
No project-related negative results at impact level have occured – and if any negative results occured the project responded adequately. The occurrence of additional (not formally agreed) positive results at impact level has been monitored and additional opportunities for further positive results have been seized. Max. 30 points	Which positive or negative unintended results at impact level can be observed? Are there negative trade-offs between the ecological, economic and social dimensions (according to the three dimensions of sustainability in the Agenda 2030)? Were positive synergies between the three dimensions exploited?	Additional impacts identified; Synergies leveraged	Progress report; project team; key partners; documents to Brazil-Bolivia-Germany Cooperation	Interviews and discussions	Mixed-methods, data triangulation, participatory exercise	Medium
	To what extent were risks of unintended results at the impact level assessed in the monitoring system (e.g. compass)? Were risks already known during the planning phase?	Degree of assessment ing monitoring tools	Monitoring documents, data from the Wirkungsmonitor		Mixed-methods, data triangulation, participatory exercise	Medium
	What measures have been taken by the project to avoid and counteract the risks/negative results/trade-offs**?	Mitigation measures mentioned	Progress reports, project team		Mixed-methods, data triangulation, participatory exercise	Medium
	To what extent have the framework conditions for the negative results played a role? How did the project react to this?	Role of framework conditions in negative resukls	Monitoring documents, data from the Wirkungsmonitor		Mixed-methods, data triangulation, participatory exercise	Medium
	To what extent were potential unintended positive results and potential synergies between the ecological, economic and social dimensions monitored and exploited?	Synergies of sustainability dimensions	Monitoring documents, data from the Wirkungsmonitor; project team, German Embassy; AE Vivienda, Comunidad de Género	Interviews and discussions	Mixed-methods, data triangulation, participatory exercise	Medium

* The first and the second evaluation dimensions are interrelated: if the contribution of the project outcome to the impact is low or not plausible (2nd evaluation dimension) this must be considered for the assessment of the first evaluation dimension also.
** risks, negative results and trade-offs are separate aspects and are all to be discussed here.

Assessment dimension	**Evaluation questions (pilot phase, work in progress)**	**Evaluation indicators (pilot phase, only available in german so far)**	**Evaluation indicator achievement**	**Available data sources**	**Evaluation strategy (evaluation design, method, procedure)**	**Expected evidence strength (narrative)**
EFFICIENCY (max. 100 points)			0%, 25%, 50%, 75% 100%			

Efficiency	The project's use of resources is appropriate with regard to the outputs achieved. [Production efficiency: Resources/outputs] Max. 70 points	1 To what extent are there deviations between the identified costs and the projected costs? What are the reasons for the identified deviation(s)?	Das Vorhaben steuert seine Ressourcen gemäß des geplanten Kostenplans (Kostenzeilen). Nur bei nachvollziehbarer Begründung erfolgen Abweichungen vom Kostenplan		Project document	Secondary data analysis	
		2 Focus: To what extent could the outputs have been maximised with the same amount of resources and under the same framework conditions and with the same or better quality (maximum principle)? (methodological minimum standard: Follow-the-money approach)	Das Vorhaben reflektiert, ob die vereinbarten Wirkungen mit den vorhandenen Mitteln erreicht werden können		Project document	Secondary data analysis	
			Das Vorhaben steuert seine Ressourcen gemäß der geplanten Kosten für die vereinbarten Leistungen (Outputs). Nur bei nachvollziehbarer Begründung erfolgen Abweichungen von den Kosten		Project document	Secondary data analysis	
			Die übergreifenden Kosten des Vorhabens stehen in einem angemessen Verhältnis zu den Kosten für die Outputs		Project document	Secondary data analysis	
			Die durch ZASS Aufschriebe erbrachten Leistungen haben einen nachvollziehbaren Mehrwert für die Erreichung der Outputs des Vorhabens		Project document	Secondary data analysis	
		3 Focus: To what extent could outputs have been maximised by reallocating resources between the outputs? (methodological minimum standard: Follow-the-money approach)	Das Vorhaben steuert seine Ressourcen, um andere Outputs schneller/ besser zu erreichen, wenn Outputs erreicht wurden bzw. diese nicht erreicht werden können (Schlussevaluierung). Oder: Das Vorhaben steuert und plant seine Ressourcen, um andere Outputs schneller/ besser zu erreichen, wenn Outputs erreicht wurden bzw. diese nicht erreicht werden können (Zwischenevaluierung)		Project document	Secondary data analysis	
		4 Were the output/resource ratio and alternatives carefully considered during the design and implementation process – and if so, how? (methodological minimum standard: Follow-the-money approach)	Das im Modulvorschlag vorgeschlagene Instrumentenkonzept konnte hinsichtlich der veranschlagten Kosten in Bezug auf die angestrebten Outputs des Vorhabens gut realisiert werden		Project document	Secondary data analysis	
			Die im Modulvorschlag vorgeschlagene Partnerkonstellation und die damit verbundenen Interventionsebenen konnte hinsichtlich der veranschlagten Kosten in Bezug auf die angestrebten Outputs des Vorhaben gut realisiert werden		Project document	Secondary data analysis	
			Der im Modulvorschlag vorgeschlagene thematische Zuschnitte für das Vorhaben konnte hinsichtlich der veranschlagten Kosten in Bezug auf die angestrebten Outputs des Vorhabens gut realisiert werden		Project document	Secondary data analysis	
			Die im Modulvorschlag beschriebenen Risiken sind hinsichtlich der veranschlagten Kosten in Bezug auf die angestrebten Outputs des Vorhabens gut nachvollziehbar		Project document	Secondary data analysis	
			Die im Modulvorschlag beschriebene Reichweite des Vorhabens (z.B. Regionen) konnte hinsichtlich der veranschlagten Kosten in Bezug auf die angestrebten Outputs des Vorhabens voll realisiert werden		Project document	Secondary data analysis	
			Der im Modulvorschlag beschriebene Ansatz des Vorhaben hinsichtlich der zu erbringenden Outputs entspricht unter den gegebenen Rahmenbedingungen dem state-of-the-art		Project document	Secondary data analysis	

	5 For interim evaluations based on the analysis to date: To what extent are further planned expenditures meaningfully distributed among the targeted outputs?			Project documen t	Secondary data analysis	
The project's use of resources is appropriate with regard to achieving the projects objective (outcome). [Allocation efficiency: Resources/O utcome] Max. 30 points	6 To what extent could the outcome have been maximised with the same amount of resources and the same or better quality (maximum principle)?	Das Vorhaben orientiert sich an internen oder externen Vergleichsgrößen, um seine Wirkungen kosteneffizient zu erreichen		Project documen t	Secondary data analysis	
	7 Were the outcome-resources ratio and alternatives carefully considered during the conception and implementation process – and if so, how? Were any scaling-up options considered?	Das Vorhaben steuert seine Ressourcen zwischen den Outputs, so dass die maximalen Wirkungen im Sinne des Modulziels erreicht werden. (Schlussevaluierung) Oder: Das Vorhaben steuert und plant seine Ressourcen zwischen den Outputs, so dass die maximalen Wirkungen im Sinne des Modulziels erreicht werden. (Zwischenevaluierung)		Project documen t	Secondary data analysis	
		Das im Modulvorschlag vorgeschlagene Instrumentenkonzept konnte hinsichtlich der veranschlagten Kosten in Bezug auf das angestrebte Modulziel des Vorhabens gut realisiert werden		Project documen t	Secondary data analysis	
		Die im Modulvorschlag vorgeschlagene Partnerkonstellation und die damit verbundenen Interventionsebenen konnte hinsichtlich der veranschlagten Kosten in Bezug auf das angestrebte Modulziel des Vorhaben gut realisiert werden		Project documen t	Secondary data analysis	
		Der im Modulvorschlag vorgeschlagene thematische Zuschnitte für das Vorhaben konnte hinsichtlich der veranschlagten Kosten in Bezug auf das angestrebte Modulziel des Vorhabens gut realisiert werden		Project documen t	Secondary data analysis	
		Die im Modulvorschlag beschriebenen Risiken sind hinsichtlich der veranschlagten Kosten in Bezug auf das angestrebte Modulziel des Vorhabens gut nachvollziehbar		Project documen t	Secondary data analysis	
		Die im Modulvorschlag beschriebene Reichweite des Vorhabens (z.B. Regionen) konnte hinsichtlich der veranschlagten Kosten in Bezug auf das angestrebte Modulziel des Vorhabens voll realisiert werden		Project documen t	Secondary data analysis	
		Der im Modulvorschlag beschriebene Ansatz des Vorhaben hinsichtlich das zu erbringenden Modulziels entspricht unter den gegebenen Rahmenbedingungen dem state-of-the-art		Project documen t	Secondary data analysis	
	8 To what extent were more results achieved through synergies and/or leverage of more resources, with the help of other bilateral and multilateral donors and organisations (e.g. Kofi)? If so, was the relationship between costs and results appropriate?	Das Vorhaben unternimmt die notwendigen Schritte, um Synergien mit Interventionen anderer Geber auf der Wirkungsebene vollständig zu realisieren		Project documen t	Secondary data analysis	
		Wirtschaftlichkeitsverluste durch unzureichende Koordinierung und Komplementarität zu Interventionen anderer Geber werden ausreichend vermieden		Project documen t	Secondary data analysis	
		Das Vorhaben unternimmt die notwendigen Schritte, um Synergien innerhalb der deutschen EZ vollständig zu realisieren		Project documen t	Secondary data analysis	
		Wirtschaftlichkeitsverluste durch unzureichende Koordinierung		Project documen	Secondary data analysis	

			und Komplementarität innerhalb der deutschen EZ werden ausreichend vermieden		t		
			Die Kombifinanzierung hat zu einer signifikanten Ausweitung der Wirkungen geführt bzw. diese ist zu erwarten		Project document	Secondary data analysis	
			Durch die Kombifinanzierung sind die übergreifenden Kosten im Verhältnis zu den Gesamtkosten nicht überproportional gestiegen		Project document	Secondary data analysis	
			Die Partnerbeiträge stehen in einem angemessenen Verhältnis zu den Kosten für die Outputs des Vorhabens		Project document	Secondary data analysis	

	Assessment dimension	**Evaluation questions (pilot phase, work in progress)**	**Evaluation indicator**	**Available data sources**	**Additional data collection**	**Evaluation strategy (evaluation design, method, procedure)**	**Expected evidence strength (narrative)**
	SUSTAINABLILITY						
Sustainability	Prerequisite for ensuring the long-term success of the project: Results are anchored in (partner) structures. Max. 50 points	What has the project done to ensure that the results can be sustained in the medium to long term by the partners themselves?	Perception of the partners	Key partner documents, partners; Energypedia, Bivica	Interviews	Qualitative content analysis; data triangulation	Medium - strong
		In which way are advisory contents, approaches, methods or concepts of the project anchored/institutionalised in the (partner) system?	Degree of institutionalisation of results	Key partner documents, partner	Interviews	Qualitative content analysis; data triangulation	Medium - strong
		To what extent are the results continuously used and/or further developed by the target group and/or implementing partners?	Use of studies; use of capacities gained, use of curricula draftet	Key partner documents, partner	Interviews	Qualitative content analysis; data triangulation	Medium - strong
		To what extent are resources and capacities at the individual, organisational or societal/political level in the partner country available (longer-term) to ensure the continuation of the results achieved?	Perception partners	Partners, GIZ team	Interviews	Qualitative content analysis; data triangulation	Medium - strong
		What is the project's exit strategy? How are lessons learnt prepared and documented?	na (project continues); lessons learnt developed	GIZ management and project tean	Interviews	Qualitative content analysis; data triangulation	Medium - strong
	Forecast of durability: Results of the project are permanent, stable and long-term resilient. Max. 50 points	To what extent are the results (outcome and impact) of the project durable, stable and resilient in the long term under the given conditions?	Perception of partners, GIZ team	Partners, GIZ team; Energypedia, Internal reports	Interviews	Qualitative content analysis; data triangulation	Medium - strong
		What risks and potentials are emerging for the durability of the results (outcome and impact) and how likely are these factors to occur? What has the project done to reduce these risks?	Perception of partners and GIZ team	Partners, GIZ team; Web site ENDE Cooperación	Interviews	Qualitative content analysis; data triangulation	Medium - strong

Annex 2: List of stakeholders included

Annex 2: List of stakeholders included **Organisation/ Company/ Target Group**	**Overall number of persons involved in evaluation** (*gender disaggregation)	**Envisaged participation in interview** (no. of persons)	**Envisaged participation in focus group discussion** (no. of persons)	**Envisaged participation in workshops** (no. of persons)	**Envisaged participation in survey** (no. of persons)
Donors	5 (4:2, F:1)	5			
Name of donor I: BMZ					
Name of donor II Inter-American Development Bank					
Name of donor III Agence Française de Développement (AFD)					
Name of donor IV KfW Bolivia					
GIZ	10 (M:7, F:3)	10	10	10	
GIZ project team/ GIZ partner country staff					
GIZ headquarters Germany					
Partner organisations (direct target group)	26 (M:23, F:3)	11	15		
Name of partner organisation I: ENDE Corporación					
Name of partner organisation II: ENDE Corani					
Name of partner organisation III: Comité Nacional de Despacho de Carga (CNDC)					
Name of partner organisation IV: Viceministerio de Electricidad y Energías Alternativas (VMEEA)					
Name of partner organisation V: Autoridad de Fiscalización de Electricidad y Tecnología Nuclear (AE)					
Other stakeholders (public actors, other development projects, etc.)	3 (M:2, F:1)	3			3
Name of other stakeholder I: AEVivienda					
Name of other stakeholder II:					
Name of other stakeholder III					
Name of other stakeholder IV					
Name of other stakeholder V					
Civil society and private actors	3 (M:2, F:1)	3			
Name of civil society actor I: Hospital Arco Iris					
Name of civil society actor II:					
e.g. name of industry association					
e.g. name of company					
Universities and think tanks	10				
Name of think tank/ university I: Universidad Mayor de San Simón					
Name of think tank/ university II: Instituto Tecnológico 'Sayarinapaj'					

Name of think tank/ university III: Escuela Militar de Ingeniería					
Name of think tank/ university IV: Universidad Católica Boliviana, Regional La Paz					
Name of think tank/ university V: Instituto Tecnológico Don Bosco					
Final beneficiaries (indirect target groups)					
(Indirect) Target group I *(e.g. farmers in region X)* Not applicable	** Please disaggregate gender*				
(Indirect) Target group II *(e.g. companies in the energy efficiency sector/in region X)* Not applicable	** Please disaggregate gender*				

Group picture after the project team workshop during the inception mission in April 2019

PROGRAMA

Fecha: 07-12-18

cooperación alemana

giz

GÉNERO Y ENERGÍA

Jornada de conferencias

Lugar: Hotel Camino Real (Av. Ballivián, calle 10 de Calacoto), La Paz - Bolivia

Hora	Actividad
08:30 - 09:00	Registro de participantes **GIZ Bolivia**
09:00 - 09:10	Palabras de bienvenida **Dr. Johannes Kissel, Coordinador Programa de Energías Renovables / GIZ**
09:10 - 09:40	Datos: Violencia contra las mujeres y sus efectos sociales y económicos **Lic. Irma Campos Garvizu, Experta en Temas de Prevención de la Violencia Contra las Mujeres, GIZ**
09:40 - 10:10	Sistematización del Proyecto EnDev Bolivia - Acceso a Energía con enfoque de género **MSc. Lic. Mariana Butrón, Coordinadora Nacional del Proyecto EnDev Bolivia**
10:10 - 10:45	Género y Energía: Mujeres en el sector eléctrico **Dra. Ing. Johanne Hanko, Sociedad Alemana de Energía Solar / Escuela Solar DGS de América Latina**
10:45 - 11:00	Pausa para el refrigerio
11:00 - 11:30	Ingenieras trabajando **Ing. Begonia Fernández, Distribuidora de Electricidad La Paz (DELAPAZ)**
11:30 - 12:00	Mujeres en la ingeniería **Ing. Maxine Salazar, Escuela Militar de Ingeniería (EMI)**
12:00 - 12:30	Género en las industrias extractivas (minería) **Lic. Ana María Aranibar, Cumbre del Sajama**
12:30 - 12:50	Brechas de género y temas transversales **MSc. Ing. Carlos Ormachea, Asesor Senior en Entrenamiento, Capacitación y Gestión del Conocimiento, Programa de Energías Renovables (PEERR) / GIZ - IP Consult**
12:50 - 13:00	Palabras de clausura - cierre del evento

Inauguration of the develoPPP.de pilot project in El Alto city and conference agenda on gender and energy (Source: PEERR)

Figure 11: Field visit at an educational institution that received support to draft modules on renewable energies and energy efficiency. The institution has their own solar panel energy efficiency. The institute which co-produced electricity for daily use

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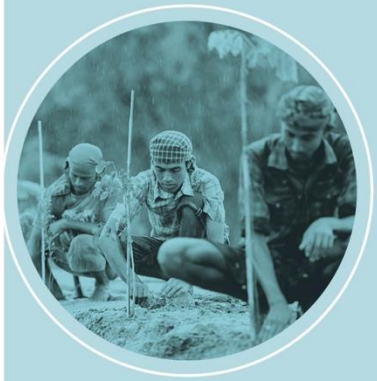

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