

KNOWING WHAT WORKS



# Central Project Evaluation

Sustainable Energy Programme Mexico  
PN 2011.2091.4

## Evaluation Report

On behalf of GIZ by Carsten R. Vonnoh (Enerpol Consulting)  
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## Contents

<b>The Project at Glance .....</b>	<b>7</b>
<b>1 Summary .....</b>	<b>8</b>
<b>2 Evaluation objective and questions .....</b>	<b>11</b>
2.1 Objectives of the evaluation .....	11
2.2 Evaluation questions.....	11
<b>3 Object of the evaluation .....</b>	<b>13</b>
3.1 Definition of the subject matter of the evaluation.....	13
3.2 Results model including hypotheses .....	14
3.3 Target group analysis .....	17
<b>4 Evaluability and Evaluation design .....</b>	<b>19</b>
4.1 Data sources and quality.....	19
4.2 Evaluation design and methods .....	27
4.3 Evaluation process.....	30
<b>5 Assessment of the project's results .....</b>	<b>34</b>
5.1 Relevance.....	34
5.2 Effectiveness .....	38
5.3 Impact.....	46
5.4 Efficiency .....	55
5.5 Sustainability.....	59
<b>6 Overall Rating.....</b>	<b>67</b>
<b>7 Analysis based on Capacity WORKS success factors.....</b>	<b>69</b>
7.1 Strategy .....	69
7.2 Cooperation .....	71
7.3 Steering structure.....	72
7.4 Processes.....	74
<b>8 Recommendations .....</b>	<b>77</b>
<b>Annexes.....</b>	<b>79</b>
Annex 1: Evaluation matrix .....	79

## List of Figures and Tables

<b>Figure 1</b> Results Model .....	15
<b>Figure 2</b> Results Model .....	46
<b>Figure 3</b> Modified Results Model with additional direct (solid line) and indirect (dashed line) contributions .....	50
<b>Figure 4</b> Estimated share of contribution to the improvement of regulatory conditions .....	53
<b>Table 1</b> Budget overview .....	14
<b>Table 2</b> Key documents used in evaluation.....	20
<b>Table 3</b> Discussion of indicators .....	21
<b>Table 4</b> Outcome A.....	40
<b>Table 5</b> Outcome B.....	42
<b>Table 6</b> Outcome C .....	43
<b>Table 7</b> Programme indicators.....	47
<b>Table 8</b> National energy balance 2012–2017 (SENER) .....	48
<b>Table 9</b> PES contribution to training.....	51
<b>Table 10</b> Assessment of production efficiency .....	55
<b>Table 11</b> Assessment of risks .....	60

# List of abbreviations

AV	Officer responsible for the commission
BMZ	German Federal Ministry for Economic Cooperation and Development
CAMEXA	Cámara Mexicano-Alemana de Comercio e Industria/German Chamber of Commerce and Industry in Mexico
CIM	Centre for International Migration and Development, GIZ
COGENEREA	Inter-institutional cogeneration platform where actors of the public, private, academic, financial and other sectors interact.
CONAVI	Comisión Nacional de Vivienda
CONOCER	Consejo nacional normalización certificación competencias laborales/National Council for Standardization and Certification of Labor Competences
CONUEE	Comisión Nacional para el Uso Eficiente de la Energía/National Commission for Energy Efficiency
CRE	Comisión Reguladora de Energía/Energy Regulatory Commission
CW	Capacity WORKS, GIZ management tool
EE	energy efficiency
IDB	International Development Bank
IEA	International Energy Agency
INFONAVIT	Instituto del Fondo Nacional de la Vivienda para los Trabajadores/Mexican Federal Institute for Workers' Housing)
GIZ	The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
KfW	Kreditanstalt für Wiederaufbau/German Development Bank
NAMA	nationally appropriate mitigation action
NDC	national determined contribution
OECD-DAC	Organisation for International Cooperation and Development Assistance Committee
PES	Programa de Energía Sustentable/Sustainable Energy Programme Mexico
PN	project number
PPP	public–private partnership
PRODESEN	National Electric System Development Program 2016–2030
RE	renewable energy
SH	sustainable housing
SDGs	Sustainable Development Goals (Section 5.1)
SENER	Secretaría de Energía/Secretariat of Energy
SH	Sustainable housing
SIMIMEX	An internal monitoring and management tool of the GIZ programme
SMART	specific, measurable, achievable, realistic and time-bound
TC	technical cooperation
ToC	theory of change



# The Project at Glance

Project number	2011.2091.4-001.00
CRS-Purpose Code	23110
Project objective	The framework conditions to increase Energy Efficiency (EE) and the use of Renewable Energy (RE) are improved.
Project term	April 2013 – December 2018 (after extension)
Project volume	EURO 11.1 million BMZ funding
Commissioning party	German Federal Ministry for Economic Cooperation and Development, (BMZ, Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung)
Lead executing agency	German Development Agency (GIZ, Deutsche Gesellschaft für Internationale Zusammenarbeit)
Implementing organisations (in the partner country)	SENER, Comisión Nacional para el Uso Eficiente de la Energía/National Commission for Efficient Use of Energy (CONUEE)
Other participating development organisations	Kreditanstalt für Wiederaufbau (KfW), Physikalisch-Technische Bundesanstalt (PTB), United Nations Environment Programme (UNEP), USAID, Children's Investment Fund Foundation (CIFF), World Bank, DEA, Mission Innovation (MI), Agence Française de Développement, British Embassy Mexico City, Inter-American Development Bank (IDB), Corporacion Andina de Fomento (CAF)

# 1 Summary

## Background

The evaluation unit of The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH commissioned two independent consultants to evaluate the Programa de Energía Sustentable/Sustainable Energy Programme Mexico – PES II (PN 2011.2091.4-001.00). The **purpose of the evaluation** was threefold. First, it aimed to provide accountability. Secondly, it aimed to explain why and how different aspects of the intervention do or do not work to improve decision-making within the intervention. Thirdly, the study's findings were expected to contribute to the planning process, since a mission for the planning of an adjoining intervention took place in the follow-up to the field phase of this evaluation.

The **project subject to evaluation** ran from April 2013 to December 2018, and built on the predecessor project under the same name (PES I). The total estimated project value was EUR 11.1 million.

The **objective of the project** (the intended outcome) was: 'The framework conditions to increase energy efficiency (EE) and the use of renewable energy (RE) are improved'. To achieve this result, the project provided support in the three action areas described below:

- improvement of regulatory framework conditions (action area I),
- promotion and dissemination programmes and mechanisms (action area II), and
- training and awareness raising (action area III).

The project was evaluated on the basis of a **theory-based evaluation design** that relied on the project's Theory of Change (ToC) as a basis for analysis. Specifically, the Evaluation Team implemented a contribution analysis for selected elements of the ToC. A contribution analysis examines the extent to which observed (positive or negative) results could be related to the project.

The evaluation relied on three main data sources: internal documentation provided by the Project Team, secondary data identified and generated by the Evaluation Team, and first-hand interviews and workshops conducted by the Evaluation Team. The interviews were conducted with GIZ project staff, other GIZ staff, staff from the partner institutions (Secretaría de Energía/Secretariat of Energy (SENER), Comisión Nacional para el Uso Eficiente de la Energía/National Commission for Efficient Use of Energy (CONUEE), Comisión Reguladora de Energía/Energy Regulatory Commission (CRE), and others), other development partners, and representatives of civil society organisations and networks for women. Most interviews were conducted during a two-week field mission in Mexico City between 22 January and 2 February 2018. Preliminary findings of the evaluation were presented to and discussed with the Project Team and selected partners, as well as, in part, with the appraisal mission for the follow-up project.



## Assessment of OECD-DAC criteria

In terms of **relevance**, the project was rated very successful (96 out of 100 points). The project reflected, built upon, and supported, key strategic policies of the Mexican government and BMZ, as well as the Sustainable Development Goals. The project's alignment with the UN Agenda is manifested in SDG 7: 'Ensure access to affordable, reliable, sustainable and modern energy for all', which is closely related to the project's outcome objective.

In terms of **effectiveness**, the project was rated very successful (95 of 100 points). The stated outcome indicators were all expected to be achieved by the end of the project. More than half of the output indicators had already been achieved, and the project was on track towards achieving the remainder. To provide a more differentiated analysis of the project's contribution to the outcome objective, the evaluation carried out a contribution analysis in each of the three action areas. The contribution analysis revealed that the project successfully contributed to enhancing partner capacities in line with the outcome objective. Finally, the occurrence of unintended positive results was successfully integrated by the project; negative results could not be detected.

In terms of **impact**, the project was rated very successful (95 of 100 points). Although the formulation of the superordinate long-term results, in terms of programme-level indicators and impact on the general population, was too ambitious and far-reaching for a cooperation project, the contributions in each area could be determined and were aiming in the right direction. In terms of the programme-level indicators, most of them had been achieved and some went further than declared. Reacting to emerging needs, the project had even made contributions that were not expected.

In terms of the impact on the general population as target group, this was not considered by the Project Team in a sufficiently differentiated way; on the other hand, those target groups that collaborated with the project valued the improvements they experienced as significant and strategic.

In terms of **efficiency**, the project was rated very successful (96 of 100 points).

There were considerable deviations in all areas between the annual resources initially planned and those that were actually spent. This was as a result of the project using the budget to respond to partner demand for significant change in the sector. Most of the areas of intervention tackled by the project were developed in close relationship with the partners. The project managed to raise resources from their counterparts, and other cooperation agencies. The project was able to assign sufficient resources to all outputs, enabling them to almost fully achieve all outcome indicators. Some even overachieved on a relatively small proportion of the budget. The high overarching costs were used to establish close working relationships with partners, to finance strategic and technically advanced management, and to develop synergies.

Regarding allocation efficiency, differences were observed between activities but, nonetheless, overall efficiency was considered high.

In terms of **sustainability**, the project was rated successful (81 of 100 points). While the prerequisites for ensuring long-term success in terms of tools, concepts and approaches being anchored in the partner structure were largely fulfilled, the results of the project were assessed as being only partly durable. The project design focused on finding technical solutions, on which it was assessed as being successful. Given the important political dimension of the challenges in the energy framework, it showed a high degree of flexibility towards partner needs and in strategically supporting key initiatives. Yet, the Evaluation Team believed that the political uncertainties needed to be addressed more strongly in the remaining time frame and by the follow-up project. The elections in 2018 posed a serious threat to parts of the projects results. Moreover, in spite of the merits of the project's experienced technical advisors being embedded in the key teams of the partner structure, this

created a risk of dependency and of leaving a gap once the project was over and other priorities set.

Finally, in terms of economic, social, and environmental sustainability the Evaluation Team observed positive results in most of the project's working areas.

The overall score for all criteria totalled  $463/5 = 92.6$ , which amounted to the rating 'Very Successful'.

Criterion	Score	Rating
Relevance	96	<i>Very successful</i>
Effectiveness	95	<i>Very successful</i>
Impact	95	<i>Very successful</i>
Efficiency	96	<i>Very successful</i>
Sustainability	81	<i>Successful</i>
Overall Score and Rating for all criteria	93	<i>Very successful</i>
<b>100-point-scale</b>	<b>6-level-scale (Rating)</b>	
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	
0–9	Level 6 = very unsatisfactory	

## 2 Evaluation objective and questions

### 2.1 Objectives of the evaluation

The evaluation of the GIZ 'Sustainable Energy Programme' was one of the first central project evaluations to be implemented after GIZ's fundamental reform of its project evaluation system in 2016. The reform of the evaluation system was carried out against the backdrop of increasing requirements for accountability arising from the 2030 Agenda for Sustainable Development and the Joint Procedural Reform in commissioning procedures with BMZ. With the reform of its evaluation system, GIZ intends to improve evidence of effectiveness and to enhance credibility of evaluation results.

The objective of all central project evaluations is to contribute to learning, to facilitate decision-making, and to provide accountability. Some projects/programmes are subject to central project evaluations, selected on the basis of a regionally stratified sample, while others are selected in accordance with specific information requirements (see GIZ, 2017a). The Programa Energía Sustentable/Sustainable Energy Programme – PES II intervention was selected through sampling (after preparatory discussion with the GIZ Evaluation Unit). In 2018, the programme was in its final year of five years, which made this evaluation an interim evaluation. The evaluation's findings should provide initial pointers for the planning of the follow-up measure.

The central stakeholders for this evaluation were the GIZ Corporate Unit Evaluation, the programme itself and its partners – Secretariat of Energy (SENER) and National Commission for Energy Efficiency (CONUEE) – which comprised both the direct, though not the entire, target group (see Section 3.1). Since this was an evaluation within the first batch of central project evaluations following the above-mentioned reform, the Evaluation Team and the Corporate Unit Evaluation maintained a close dialogue about the expectations and feasibility of applying standards, quality criteria and mandatory templates introduced with this pilot evaluation.

Internal factors (e.g. strategic discussions with project AV, Project Team input and exchange with the representative of the GIZ Corporate Unit Evaluation ) have influenced the evaluation substantially. The Evaluation Team prepared itself thoroughly and made adjustments to schedule and process in close communication with the programme AV (the officer responsible for the commission) and the Corporate Unit Evaluation.

### 2.2 Evaluation questions

Each project was assessed on the basis of standardised evaluation criteria and questions to ensure comparability. This was based on the OECD-DAC criteria for the evaluation of development cooperation, or the evaluation criteria for German bilateral cooperation: relevance, efficiency, effectiveness, impact and sustainability. The evaluation dimensions and analysis questions derived from this were specified by GIZ. In the medium term, GIZ also aims to provide more concrete evaluation indicators, which are to be developed and tested in this pilot phase, together with the evaluators. In addition to these evaluation criteria, the contributions to Agenda 2030 and its principles (universality, integrative approach, 'leave no one behind', multi-stakeholder partnerships) were also taken into account. The evaluation questions also relate to cross-cutting issues such as gender, the environment and human rights, where applicable (see GIZ, 2017b). The evaluation questions can be found in Annex 1.

Preparatory discussions were conducted between the Evaluation Team (including the Evaluation Unit of GIZ – Corporate Unit Evaluation), the FMB (the technical and methodological support unit of GIZ) and the head of

programme to find out if specific evaluation questions were to be addressed. Although partners expressed their interest in the evaluation results, and participated willingly in the evaluation interviews and workshops, they articulated no additional specific requirements after this initial input in the preparatory workshop of the field phase. The programme team was particularly interested in what it could learn from this evaluation for the follow-up intervention, and how their comprehensive strategic approach could be reflected in relation to the programme's results. For this reason, the evaluators specified those learning needs in the initial team meeting, clarified relevant questions and, based on further discussions, intended fully to understand the scope of activities and the process of strategic alignment of the various activities of the programme.

In addition, GIZ was interested in an analysis of the contribution of the programme to impacts at the level of the partner organisations and the Mexican population. To gain insights into the evaluation interests of the implementing partners, the initial workshop in Mexico provided some additional ideas that were incorporated into the overall process, but did not prove to be very different from initially articulated interests.

## 3 Object of the evaluation

### 3.1 Definition of the subject matter of the evaluation

The subject of the evaluation was the Technical Cooperation module PN 2011.2091.4, running from April 2013 to December 2018. It built on an earlier project (April 2009 – March 2013), which was also taken into consideration during the evaluation, as far as possible. In addition to examining the current phase, the evaluation aimed to examine the long-term results of the previous phase regarding impact and sustainability. Findings in this regard were limited, due to the high degree of complexity of the programme and its sphere of impact(s). The evaluators therefore concentrated on key impacts and their causal link to the programme activities, and on the relevance of PES II strategy and monitoring.

According to the proposal to the BMZ, the **objective of the current programme** was: 'The framework conditions to increase energy efficiency (EE) and the use of renewable energy (RE) are improved'. The intervention was based in Mexico City, Mexico, where its key partner, the Secretariat of Energy (SENER), is located. It operated in a highly political and essential sector, with various degrees of complexity (i.e. strong political changes and a formerly dominant fossil-fuel industry). A multi-level approach addressed key stakeholders at national level, regional and, to a limited extent, local levels, involving government institutions, private-sector associations and other key agents in the field of energy. Since the project worked in key areas of the sector and sometimes beyond, the system boundary of the project was perceived as the entire energy sector.

In terms of capacity development, Programa de Energía Sustentable/Programme for Sustainable Energy (PES) intervened on the individual level, through the training of key political personnel, in institutions, through learning within whole teams, and at society level, through awareness campaigns and training of, for example, technicians.

The German contribution amounted to EUR 11.1 million, including an increase in funds by EUR 3 million, with simultaneous extension of its duration from April 2017 by 21 months to December 2018. The additional funding was intended to support certain ongoing actions relating to the design of the energy transition in Mexico, in particular with a view to increasing energy efficiency (EE) and increasing the use of renewable energy (RE). It was driven by the momentum of the new key legislation in 2013 that increased the demand of PES support by the Mexican government.

The **target group** was the entire population of Mexico, which was supposed to benefit from a secure, long-term cost-effective and environmentally friendly energy supply. The partner structure, and with it the key direct target groups, were comprised of Secretariat of Energy (SENER), the National Commission for Efficient Use of Energy (CONUEE), and the Energy Regulatory Commission (CRE). Mexico plays a special role in sustainable development in Latin America as a dynamic emerging economic nation and was therefore of particular importance as a 'global development partner' for German development cooperation. Mexico's energy system is largely dominated by fossil fuels. In December 2013, a constitutional amendment was passed that initiated a profound transformation of the sector. The reform's aim was to make the energy sector more efficient and competitive. The focus was on breaking the monopoly position of the state-owned oil company Petróleos Mexicanos (PEMEX) and the state-owned utility Comisión Federal de Electricidad (CFE). Private companies would be allowed to invest in the energy sector, so CFE and PEMEX would have to compete with private companies for the promotion of natural gas and oil.

Mexico expects additional foreign direct investment growth of around 2% by 2025. The oil industry continues to

make a significant contribution to the federal budget. In the medium term, however, there is the possibility that reserves will run out. Against this background, the huge potential of renewable energies and for increasing energy efficiency have so far been insufficiently exploited (which had been defined as a core problem the programme sought to address). The main reasons for this were the insufficient implementation of political guidelines, technical regulations, standards, the perception that sustainable energy is a high-risk investment and the lack of suitable funding and financing mechanisms, which would actively promote the greater involvement of the private sector in this area. In addition, there is an acute shortage of well-qualified personnel in the growing EE and RE markets (Annual Report, Part A, 2016).

To address these issues, the programme aimed to improve cooperation between key players, following a multi-level approach that worked at the district, regional and federal levels. Funded components included technical advice from long-term and short-term specialists, the support of political and institutional change processes, training and further education, and the promotion of national and regional cooperation.

Methodologically, the project followed the approach of the **overall programme**.<sup>1</sup> In order to improve the framework conditions for RE and EE, three conditions had to be fulfilled, which were reflected in the lines of action of the project:

- creation of favourable legal framework conditions,
- design and implementation of promotion or dissemination programmes, and
- development of training and awareness-raising of end users.

In addition to state actors, the private sector was intensively involved in development partnerships.

The table below gives an overview of the duration and budget of the two different phases:

*Table 1 Budget overview*

Module	Duration	Total budget	Budget breakdown
PN 2008.2070.4 (Phase I)	04/2009–03/2013	EUR 7 million	
PN 2011.2091.4 (Phase II)	04/2013–03/2017	€6,100,000 + €550,000 (Restmittel) Total: €6,650.000	BMZ €6,100,000
	2015-03/2017	EUR 660,000 First modification offer until 9/2017 to include human capacity development activities	
	01/2016–10/2018	EUR 800,000 Second modification offer	
	2016–12/2018	EUR €3 million increase and prolongation	

### 3.2 Results model including hypotheses

The programme had developed an overall Results Model (see Annex 1 and Figure 1) that had been adjusted according to the latest modification offer. The latest version was designed in the preparation for this evaluation in 10/2017 within a comprehensive commentary on its basis and implications.

The programme team built upon the Results Matrix from the original proposal to BMZ in 2013. Its overall

<sup>1</sup> PES is part of a larger system of components aiming to fulfill a common set of objectives. This increases the potential for synergies, substantial impact and strong linkages to all key areas of the sector.

Results Model provides an understanding of the interplay between the outputs of the three lines of action to achieve the programme objective.

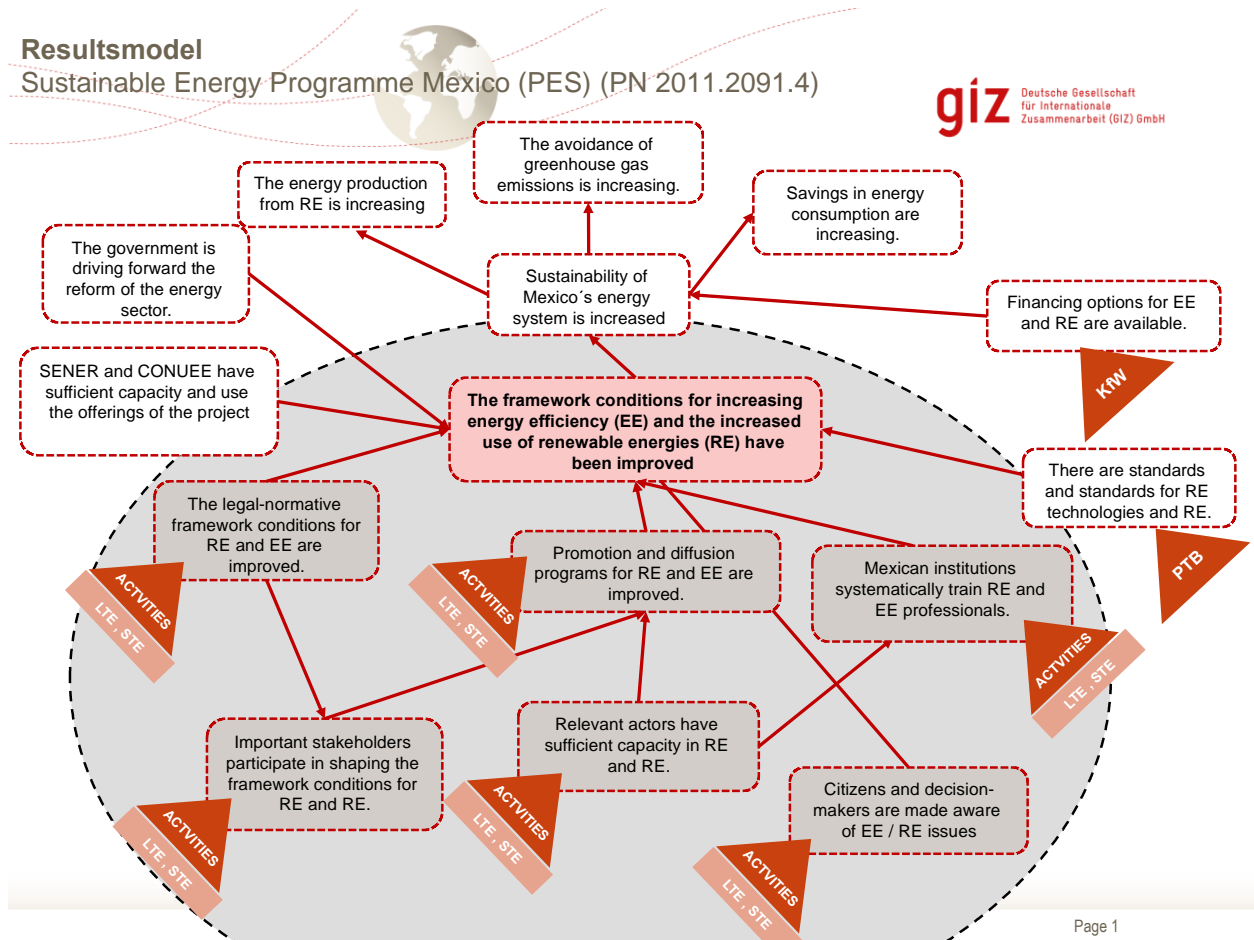


Figure 1 Results Model

The overall **Results Model** includes a total of three outputs in three components. The outputs of all three lines of action jointly contribute towards the intervention's objective.

The Results Model reflects two levels of intervention under the programme objective 'The framework conditions for increasing energy efficiency (EE) and the increased use of renewable energies (RE) have been improved'.

The programme had defined three components:

- The legal-regulatory framework for RE and EE has been improved.
- Promotion and dissemination programmes have been improved for RE and EE.
- Mexican institutions systematically train RE and EE specialists.

In order to achieve these results, the programme required the participation of decision-makers, the development of capacities among relevant actors, and the awareness of public opinion and key stakeholders. The relevant hypotheses (shown as red arrows in the Results Model) were based on the existence of norms and standards in RE and EE technologies (to be developed with the help of PTB, which delivered technical consultancy on the development of those standards), the existence of finance (with the support of KfW), and the continuity of government support and the availability of capacities and willingness to request and use the support of PES by SENER and CONUEE counterparts. These assumptions were outside the programme's direct sphere of influence yet were key for fundamental change in the sector.

The Results Matrix and the Results Model had been broadly maintained since the beginning of the current

phase of the programme in 2012. Those modifications were based mainly on the enactment of the National Energy Strategy (2013), the Energy Transition Law (2015), the Transition Strategy to promote the use of cleaner fuels and technologies (2016), the Special Program for the Energy Transition (2017) and other regulations that represented a great opportunity for the programme and generated high demand for its services.<sup>2</sup>

The programme stated that although the model was formulated in 2012 ‘it reflects the current situation and is still valid to describe the situation that the energy sector in Mexico seeks to achieve’ (Doc 1.5, Results Model, p.2). Yet, some changes were introduced in the formulation of the indicators,<sup>3</sup> which reflected new ideas relevant to the second phase, such as a stronger focus on the terms of regulatory reform, and the introduction of gender aspects and sensitisation goals.

At the same time, the programme reflected in its documents that ‘the current situation in Mexico is very different from what it was in 2012 when the PES Phase II was born. A process of reform of the energy sector had commenced, which also includes an orientation towards the Energy Transition, which promotes a transformation of the sector towards a greater use of clean energies<sup>4</sup> and the strengthening of energy efficiency promotion’. And: ‘The structural reforms framed the agenda of the programme with the regulatory framework to support the transition’ (Doc 1.5, pp. 6, 8), given that ‘the country undergoes energy reform and transition, which puts us in a momentum to work on the issue’ (Doc 1.5, p. 2).

Even so, the programme confirmed that its objective – maintained from the initial phase in 2009 – of ‘creating framework conditions’ was sufficiently broad to allow for flexible adjustments to changing circumstances, and highlighted that aspect as a key strength. The Results Model therefore included three key aspects that made it possible to build upon this framework: the legal and policy issues, the promotion and dissemination, and the development of capacities.

Financing was identified as another relevant aspect, yet in the current Results Model, financing was excluded from the scope of the programme on the assumption that it would be addressed by KfW. However, the programme confirmed its relevance by mentioning that ‘if at this time we had to design a new PES phase, financing would be suggested as a line of action in itself’ (Doc 1.5, p. 2). In this view, the Results Model reflected a generic, common-sense logic. It remained at a relatively broad level that did not entirely illustrate the project’s full array of activities and areas of engagement.

However, a rearrangement between the Results Model and the operation modality of the programme was observed. It was interesting to note that the subsequent and detailed planning, both in the analysis of actors and of the management structure, as well as in the Plan of Action and the monitoring mechanisms, reflected a structure of ordering that did not fully coincide with what was expressed in the Results Matrix and in the Results Model. The detailed documents were organised by three areas of thematic intervention: renewable energy (RE), energy efficiency (EE) and sustainable building. The introduction of the three lines of actions (regulatory framework, promotion and dissemination, and training and awareness-building) to the three thematic areas proved to be very useful when implementing the components with regard to arranging cooperation with the subsector-specific counterparts.<sup>5</sup>

The processes and driving structures were presented by thematic areas. There was an analysis of the general actors of the programme, and up to two for each thematic area in which the programme worked. In the Plan of Action, although there was an initial order according to the Results Model, the activities were grouped by

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<sup>2</sup> Based on reflections by the Project Team on a revised Results Model and annual progress reports.

<sup>3</sup> With each modification offer, a new aspect (human capacity development, integrated experts) was incorporated without changing the overall logic.

<sup>4</sup> Understood as clean energy sources, including large hydropower and nuclear energy.

<sup>5</sup> Based on preparatory feedback by the programme AV.



thematic area: RE, EE and Sustainable Building. In each of these thematic areas of intervention appeared, with greater or lesser intensity, the transversal elements reflected in the Results Model, as part of the services provided by the programme.

The programme had apparently adapted its contributions to the demand that had gradually emerged since 2013, as a result of the evolution of energy regulation in Mexico. This demand had been articulated within those three thematic areas, and ranged from policy support, over software investment for market mechanisms to additional studies and concepts of engagement. Based on the evaluation process, the Results Model reflected and guided the work done. The level of abstraction, given the fundamental changes in the sector, was appropriate, yet required a high level of (strategic) reflection.

In close dialogue with the programme team and relevant actors, the relationship between the three thematic areas of intervention became clear, and the general lines of work of the current Results Model acted as a guiding, unifying and generating element of synergies. While there were numerous activities, the Evaluation Team came to believe that the structure benefited the overall management, even though it did not easily integrate into the given evaluation framework in terms of outputs. Instead, the outputs of legal and policy aspects, training and promotion appeared rather at the level of activities or services, along with other types of activities or services delivered in each area of intervention. The real outputs of the programme would be advances in RE, EE and Sustainable Building. The project may therefore be seen as three projects with the same Results Model, each one focusing on a specific thematic area. The combination of outputs produces the framework conditions of the programme objective. (See Section 7 for further discussion.)

The indicators of PES were also formulated according to the structure of the current Results Model. It was verified that the (adapted) figures they contained reflected the sum of interventions in the RE, EE and Sustainable Building components.

Many discussions were held with stakeholders about the central elements of the framework conditions that maximise the impact on RE and EE in Mexico. The experience accumulated by the actors, a reconstruction of elements of the Theory of Change, and a revision of the hypothesis can guide subsequent activities and the planning of a new project to encourage sustainable energy in Mexico.

Based on the comprehensive material provided, and the apparently high level of reflection and strategic planning, the evaluability of the programme was perceived as good, despite its high complexity. The guidelines and tools provided by GIZ also supported this process.

### **3.3 Target group analysis**

According to the programme's proposal, the target group was the entire population of Mexico. The rationale behind this was that a revised legal and policy framework with appropriate incentive conditions, and sufficient qualified personnel for renewable energy and increased energy efficiency, would ultimately lead to a more sustainable total energy supply for the country. While this rationale seemed plausible to the Evaluation Team, the Evaluation Team considered further differentiation. In its stakeholder analyses, the programme included a multiplicity of relevant stakeholders, mainly from the public sector, and on an implementation level also from the private sector. The actors were differentiated according to thematic area; those involved in implementing the sustainable building component were different from those who provided contributions in the areas of renewable energy. The presence of the central level (capital) was mentioned as a key area of intervention, but also as a strategy for diversifying actors, including at the level of federal state and local government. The counterparts SENER and CONUEE had a role in all areas.

Given that PES strengthened capacities and helped to implement existing laws and regulations, it could be

asserted that its counterparts directly benefited. Other public entities, as well as business associations and specialised service providers (for example in green building, RE generation, EE services) were directly addressed by and benefited from the programme. The population of Mexico, in turn, will also benefit when these actors implement and/or multiply the contribution, in terms of consultancy services, staff, financing activities, etc, that the programme has initiated.

In this sense, although the population of Mexico benefits from the reduction of greenhouse gas emissions and energy savings by RE/EE measures, defined at the level of programme indicators, it could not be verified whether this was attributable to the programme at this level. On the other hand, the programme could take the credit for contributions made at the level of actors who intervened directly in the sustainable energy (and efficiency) sector of Mexico.

The Evaluation Team recommended distinguishing between the direct target group of the intervention (SENER and other partnering organisations) and the final beneficiaries (whole population of Mexico). Due to the long causal chains of expected changes at the level of the final beneficiaries, primary data collection for this evaluation was only carried out at the level of the immediate target group. An analysis of potential impacts on the final beneficiaries was carried out by means of literature analysis and national data. A reflection of a plausible contribution of the programme to potential impacts at the level of the final beneficiaries was carried out on the basis of interviews conducted in the evaluation and a dedicated workshop, keeping in mind different perceptions and interests.

The Evaluation Team also drew attention to the fact that the causal chains between the measures carried out by the intervention at the federal level were very long. This was reflected in the fact that none of the outcome indicators measured change at the level of the population, with the possible exception of specific capacity development and the development of awareness campaigns.

Based on the mission results, various target groups at very different levels of proximity were addressed. In some cases, the effect on direct target groups could be assessed due to savings in electricity and water use (see proposed target group 'total population of Mexico'). In other cases the target group was the industry as a whole or specific industrial areas (e.g. sugar-producing industry for cogeneration processes). The PES capacity-building activities targeted specific workers (e.g. solar technicians, both female and male); other activities (e.g. gender mainstreaming activities) indirectly addressed parts of the Mexican population. To cater for this complexity, the evaluation tried to meet various representatives of those different target groups and sought additional interactions (i.e. with an NGO) that would help to cover their perspectives. Yet, the wide reach of the intervention prohibited a thorough analysis of each of them in the given amount of time. Overall, PES showed a wide variety of ways to address its proposed target group (Mexican population as whole), while most contributions could not be clearly connected to the intervention without looking at the institutions in between. Those were considered the direct beneficiaries of most of the PES activities. This discussion is taken up in Chapter 7.

## 4 Evaluability and Evaluation design

### 4.1 Data sources and quality

The evaluation relied on three main data sources: internal documentation provided by the Project Team and GIZ headquarters, data from key partners, secondary data identified and generated by the Evaluation Team, and first-hand interviews and workshops conducted by the Evaluation Team. The internal documentation included the proposal and annual reports from the project, the proposal(s) and evaluation report of the predecessor measure, the programme proposal and progress report. In addition, it included a range of internal documents, such as the capacity development strategy, stakeholder maps, Results Models and their discussion, and the Theory of Change (ToC). Finally, internal cost data was consulted and disaggregated by the AV for the analysis of efficiency.

Given the vast number of internal data, the amount of secondary data identified by the Project Team was limited, and related to impact, methodologies and aspects of the contribution analysis. The interviews were conducted with project staff, other GIZ projects, staff of the partner institutions, other development partners, and civil society organisations. Interview partners were selected based on their ability to provide relevant information about the project and the sectors in which the project was operating. In order to support the field visit, the Project Team first provided an initial proposal of internal and external stakeholders with whom the project was cooperating, assumed to be based on their daily interaction and strategic reflection. On the basis of the project documentation (project proposal, progress reports and stakeholder maps) and discussions during the initial days of the field visit, the Evaluation Team added to and revised some of the suggestions to incorporate additional perspectives for triangulation (such as that of a sector NGO).

The Evaluation Team used the project's monitoring data, which tracked progress against the indicators from the project proposal in the project-designed SIMIMEX online tool. This monitoring data was usually collected by the advisors from their respective partner institutions. Although, the quality of data provided by the partners was partly insufficient due to the lack of international standardised methodologies, since the outcome indicators need some level of assessment, the data was used, with additional research beyond the project's provision. Other data, such as the output-oriented differentiation of costs, was calculated by the project itself. The Evaluation Team found the information from the project's monitoring, including the baseline data, to be reliable, as it was in line with information provided by partners and external stakeholders during the interviews conducted in the evaluation mission.

Overall, the Evaluation Team considered the data on which this evaluation was based to be of good quality. Yet the complexity of the required approaches and the programme itself required a more decisive data-gathering process that would have provided the key elements needed to complete the reporting structure.

Regarding the interviews, the Evaluation Team managed to talk to almost all relevant interview partners, despite the high number of partners with whom the project worked in the different partner institutions (SENER, CONUEE, CRE). The Evaluation Team considered the availability of many high-level interview partners to be testimony to the high standing of the project within the partner structure.

The following key documents were used in preparing the inception report, and were consulted, as needed, during the mission. In addition, the Project Team provided substantial input within the workshops held, and on various occasions when the Evaluation Team articulated additional needs (e.g. a reflection on OECD-DAC criteria, based on an exercise in summer 2017). In nearly all cases, the data quality was excellent, and data was adapted quickly to the needs of, and questions arising from, the evaluation process.

Table 2 Key documents used in evaluation

	Yes	Intervention proposal (part B) and programme proposal (part A) for current/second phase (PN 2011.2091.4), and for direct predecessor/first phase.
	Yes	One modification offer to include integrated experts as qualified personnel at CRE and Centro Nacional de Control de Energía/National Energy Control Centre (CENACE) for current phase (2014–11, €800,000), an additional modification of €660,000 for human capacity development measures with Consejo Nacional de Ciencia y Tecnología (CONACYT) (2013–10), a larger modification offer for the extension and modest adaptation of the project indicators (07/2016, €3,000,000).
	Yes	Comprehensive context analysis of Mexico (2017), which includes society, economy, technology and national policy.
	Yes	(Limited) gender analysis as part of the project progress review available in 2012; environmental and climate assessments (2011); safeguards were not relevant for this phase of the programme. PCA is demanded by revised GIZ categorisation of Mexico, but is not yet available.
	Yes	Annual progress reports part A and B for current phase (2012, 2013, 2014, 2015, 2016) Annual progress reports part A and B for direct predecessor phase (2008–2011) were available.
	Yes	Based on a very different project set-up with limited usable data.
	Yes	Country strategy dated May 2017.
	N/A	
	Yes	Commentary with recommendations for further improving methodological basis of the programme (2016).
	Yes	Results matrix for all phases of intervention is part of respective proposal part B.
	Yes	Available in different versions (e.g. 2016), recent reflection on the Results Model (2017).
	Yes	Comprehensive monitoring system SIMIMEX (Excel-based), which documents progress on

		indicators and other key aspects of management.
	Yes	Stakeholder map from 2013, revised and extended version from 2017.
	Yes	Capacity Development Strategy for PES II available.
	Yes	Comprehensive commentary on the steering structure (2017).
	Yes	Available for 2016/2017 for each component (with strong partner orientation).
	Yes	Available and to be revisited during the mission.
	Yes	Full account available

### Baseline and monitoring data including partner data

The intervention's monitoring was done on the basis of the Results Matrix and associated indicators of the intervention's proposal, which were operationalised through the advanced and comprehensive tool SIMIMEX.<sup>6</sup>

The indicators on the impact and outcome level largely fulfilled the SMART criteria, while the impact level indicators lacked some precision with regard to their measurement and exact time frame. In the following table the indicators are discussed.

Table 3 Discussion of indicators

Indicator	Means of verification	SMART	Comments
<b>At the Impact level</b>			
1. Increase in the annual primary production from new renewable energies (PJ/a)	<p>Energy Balance, SENER 2014  <a href="http://www.gob.mx/cms/uploads/attachment/file/44353/Balance_Nacional_de_Energia_2014.pdf">http://www.gob.mx/cms/uploads/attachment/file/44353/Balance_Nacional_de_Energia_2014.pdf</a></p> <p>Energy Information System, SENER  <a href="http://sie.energia.gob.mx/bdiControler.do?action=temas&amp;fromCuadros=true#">http://sie.energia.gob.mx/bdiControler.do?action=temas&amp;fromCuadros=true#</a></p> <p>Energy consumption of residential buildings in Mexico, CONUEE  <a href="http://www.conuee.gob.mx/wb/Conuee/de_como_las_nom_de_eficiencia_energetica_cambiaron">http://www.conuee.gob.mx/wb/Conuee/de_como_las_nom_de_eficiencia_energetica_cambiaron</a></p> <p>National Development Plan 2013-2018, successes in 2014, PRONASE</p>	<p>Partly. It seems measurable, but had no values nor explicit baseline</p> <p>Cannot be estimated realistically.</p>	<p>The impact indicators do not state the means of verification based on the latest Results Matrix provided. Yet, those indicators come from an official source, were measured in a systematic way and published at the governmental level. Based on the perception of various interviewed stakeholders, the available data within those documents was based on partly unreliable data due to the lack of comprehensive monitoring mechanisms, which was expected to be part of another interventions output. The numbers therefore do not yet give a substantial base for an assessment on impact level.</p>

<sup>6</sup> The tool was developed in the initial phase of PES and improved and extended over time, providing for a good practice in other GIZ projects as well.

	<a href="http://transparencia.energia.gob.mx/rendicion_cuentas/archivos/Logros_2014_PRONASE.pdf">http://transparencia.energia.gob.mx/rendicion_cuentas/archivos/Logros_2014_PRONASE.pdf</a> National Development Plan 2013-2018, successes in 2014, PROSENER		
2. Increase in annual energy savings (PJ / a or GWh / a)			
3. Increase in annual avoided greenhouse gas emissions (tCO <sub>2</sub> e / a)			
<b>At outcome level</b>			General comments: All indicators on outcome and output level possess baseline values.
1. At least 18 new or amended legal frameworks (such as laws, regulations, standards) to increase energy efficiency or use of renewable energy are in place. Basis value: 6 Target value: 18	Federal Gazette (DOF) <a href="http://www.dof.gob.mx/">http://www.dof.gob.mx/</a>  Official Gazette, Veracruz State <a href="http://www.editoraveracruz.gob.mx/gacetaOficial.php">http://www.editoraveracruz.gob.mx/gacetaOficial.php</a>  Development Program of the National Electric System <a href="http://www.gob.mx/cms/uploads/attachment/file/54139/PRODESEN_FINAL_INTEGRADO_04_agosto_Indice_OK.pdf">http://www.gob.mx/cms/uploads/attachment/file/54139/PRODESEN_FINAL_INTEGRADO_04_agosto_Indice_OK.pdf</a>	Fully	As regulations were an exclusively national competence, the assignability to the programme was discussed during the mission.  The scope, importance and depth of the regulations should be defined. It was important to specify what type of regulations were strategically relevant and addressed. Yet, the programme had shown that the supported legal products were strategically chosen and all played a significant part in the changing sector framework.
2. At least 10 beneficial legal framework conditions for energy efficiency or renewable energies are being applied in practice. Basis value: 4 Target value: 10	Statistics from partner authorities, websites of standardisation institutions and laboratories, Federal Gazette (DOF) <a href="http://www.dof.gob.mx/">http://www.dof.gob.mx/</a>  Manual for classroom training <a href="http://www.conuee.gob.mx/pdfs/normalizacion/Guiarapida.pdf">http://www.conuee.gob.mx/pdfs/normalizacion/Guiarapida.pdf</a>	Fully	Indicator 2 concentrates on the actual effectiveness of those changed framework conditions, which seems a very convincing approach. It was important that the ground-laying statistics and manuals effectively demonstrate the practical application. Many manuals and tools were not used, and laws might not have the effect intended. It would be beneficial to investigate potentially better sources for verification.  The scope of the intended changes could be further defined
3. There are at least	Publications of the	Fully	If only two improvements were in

14 new support/dissemination programmes or mechanisms, or improvements to existing ones, with the involvement of the private sector, two each in the areas of RE and RE. Basis value: 4 Target value: 14	programmes as well as work schedules including monitoring document of CONUEE Photovoltaic (PV) quality study		EE and RE, the question arises whether the other promotion programmes were relevant to the programme's theme. Can be specified during the mission.
4. Increase in selected RE systems.  <i>Solar collectors</i> Base value: 1.9 million square miles (2011) Target value: 4 million sqm (2016)  <i>Photovoltaics</i> Base value: 39 MW (2011) Target value: 70 MW (2016)	Statistics from SENER and Solar Energy Association  Energy Balance SENER	Fully	The question of who selects those systems, and based on which criteria, was raised.
5. At least 3,000 people are qualified by third parties on the basis of competence standards in RE and RE subjects, according to national standards of professional associations and national social housing institutes. Quality criterion: 25% of them women. Basis value: 300 persons, of whom 40% are women. Target value: 3,000 people, including 750 women.	Educational institutions, learning cooperations, certification  GIZ internal document 'Formación y capacitación en estándares de competencia laboratorios referentes al uso eficiente de la energía en estaciones de bombeo'  Internal report of the second pilot phase evaluation system Sisevive-Ecocasa, INFONAVIT	Fully	Indicator 5 shows numbers with regard to qualified personnel in the areas of EE and RE, yet the capacity/function of those trained persons cannot be related directly to their potential impact on the sector.  Its strong gender perspective was remarkable for the sector.
6. At least 3 offers for information and	Documentation of the campaigns by partners	Fully	Includes a widely used formulation that refers to

awareness on RE and RE topics are institutionally anchored (at least one of these offers must include aspects of gender in its design). Base value: 0 Target value: 3	PPP GIZ–Grupo Salinas		institutional anchoring of related offers, yet it was not entirely clear how this was defined and how strong any of these ‘anchored offers’ would be in regard to their reach and impact.
Output level			General comments The logical relationship between output and outcomes was adequate The formulation of the output objectives (improvement of legal-normative framework conditions; promotion and dissemination programmes or mechanisms; training and awareness raising) could be adapted to the actual quality standards
Indicator: 20 new or amended legal framework conditions have been drafted. Base value: 9 Target value: 20	<i>Documentation of responsible institutions</i>	Partly  Measurability: it may be useful to define: what ‘has been implemented’ means.	It may be useful to specify the level and reach of legal framework aimed at.
Indicator: At least 22 proposals for new, or improvements to existing promotion/dissemination programmes have been developed. Base value: 3 Target value: 22	<i>Documentation of responsible institutions</i>	Fully	<i>Same as above:</i> It could be specified what level or kind of ‘proposals for new or improvements to existing promotion/dissemination programmes’ were aimed at.
Indicator: At least 4 competence profiles in RE or RE topics have been developed and at least 4 courses/modules have been developed/updated. Base value: 1 and 1 Target value: 4 and 4	<i>Documented competence profiles and course concepts</i>	Fully	The significance of these profiles, their importance, were not apparent from the indicators. It was not specified if they were addressing the national level, nor if they were valid for various institutions. The logic needs further clarification: are the competency profiles enough to make training



			possible, or were there other components in the implementation chain (trainers, infrastructure) whose availability must also be addressed? An issue that could not be clarified during the field visit.
Indicator: The establishment of at least 6 initiatives for information and awareness-raising on RE/RE topics was supported (including concept for institutional anchoring) Base value: 0 Target value: 6	<i>Concepts for information and awareness campaigns</i>	Fully	More specificity about the kind of initiatives would be helpful.

In addition to the reflection on output indicators, all of them seem appropriate and reasonable. Most of them could benefit from a clear definition (see table above). Yet, a thorough discussion on the presumed small deficits of the indicators was not perceived as a priority during the field visit, since a follow-up measure would most likely be set up, based on an entirely revised concept.

As regards the monitoring and evaluation system, the existing tool (SIMIMEX) was developed in Phase I of the programme, becoming a reference tool for other GIZ projects as well. Its complexity increased over time, parallel to its functionality, serving PES as a suitable tool for keeping up with the wide complexity of its activities. It was used to document the numerous variables affecting indicator development and was able to incorporate changes as well. The tool was accessed and frequently used by various team members and helped to focus activities and financial planning along indicator requirements. Frequent use and updating indicates its usefulness for the team.

Overall, it was difficult to assess the weight of each of the indicators, since not all of them provide for a clear target group or counterpart, nor reflect the overall structure of the programme. It also became not entirely transparent which of the selected outputs of PES II were most relevant to the objective: the advancement of RE or EE. A clearer description of the contribution of the outcomes towards the programme objective could also prove to be beneficial for a new programme based on the experience of PES II.

While the GIZ quality criteria in 2012 were not the same as today, the relationship between output and outcomes appeared clear and logical, if slightly improved in its formulation. In addition to those changes, some definitions with regard to operationalising those indicators were thought to be helpful as well.

### Additional data

To improve the available data and ensure data triangulation, additional formats were included in the evaluation process, some of them developed in the initial days of the mission. This included two workshops and two sets of anonymous questionnaires handed out to all workshop participants (on an operational and management level), inviting them to reflect on their perception and degree of satisfaction with the project. This helped to triangulate more thoroughly the results of the interviews and other data.

The head of the Corporate Unit Evaluation, who spent some time with the evaluation mission during its first week, made a helpful contribution to discussions about the steps of the evaluation process, especially that relating to the additional Section 7 and methodological limitations.

## 4.2 Evaluation design and methods

### Evaluation design

The design of this evaluation strongly reflects a participatory approach that leaves space for spill-over effects, synergies and unintended results. While clear causalities were difficult to determine, it was envisaged that the contribution analysis approach would set the framework for defining questions and hypotheses.<sup>7</sup>

A **contribution analysis** commonly consists of analysing the contribution of a programme (intervention) – the extent to which observed (positive or negative) impacts can be related to the intervention. It not only analyses the Theory of Change, but also seeks to formulate alternative explanations that may explain the intended impacts (Mayne, 2001).

Contribution analysis does not necessarily provide a clear causality of a factor and an impact, but tries to show the extent to which the project had contributed to the observed impacts. Data from various sources was analysed to identify the causal hypotheses between inputs, outputs, outcomes and impacts formulated in the Theory of Change.

The method aimed to build a credible narrative to show whether the programme was a relevant factor, possibly together with other factors, leading to change. Contextual factors that played a role in achieving the intervention's objective were explicitly considered in contribution analysis.

John Mayne, the creator of the contribution analysis approach (Mayne, 2001), divided its process into six steps: (1) Set out the specific evaluation questions to be addressed; (2) Develop a theory of change and risks associated with it; (3) Gather the existing evidence on the theory of change; (4) Assemble and assess the contribution story, its challenges and challenges to it; (5) Seek out additional evidence; (6) Revise the performance story.

Step 1 and 2 are incorporated within the inception report. Step 3, gathering evidence on the theory of change, began with the document review that was part of the inception phase, but mainly took place during the mission in Mexico. Assembling and assessing the contribution story occurred through data triangulation and synthesis at the end and after the field phase.

A constraint of this evaluation was the limited time frame and resources, which restricted opportunities for seeking out additional evidence once the mission phase had ended. As a consequence, there was little chance to comprehensively implement steps 5 and 6 of the contribution analysis.

The evaluation approach proposed – with reference to the standards for evaluations adopted by DeGEval – thoroughly considered the aspects discussed below.

#### *Epistemological foundations*

The perspective was that of a **system-theoretical approach**, in which facts and observations were perceived as interdependencies and arranged in relationships. In addition, the existing diversity of interpretations and experiences was acknowledged from a pragmatic viewpoint. Accordingly, the inquiry did not focus on the classification 'true or untrue', 'right or wrong', which would be difficult to prove in most of the cases. The presence of personal or institutional interpretations was therefore integrated and documented.

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<sup>7</sup> Contribution analyses, based on plausibility considerations and data-supported evidence, why certain effects have occurred (or not), which influencing factors were involved and what contribution the project made.

### *Participation requirements*

From the beginning, the evaluation was conceived as a process and a product built on the perspectives of the different actors. This mainly happened in the workshops held with the programme team and representatives of the counterparts and target groups, where it provided essential findings, questions and hypotheses as the basis for discussions and group exercises. This, and the frequent exchange between the programme and the representative of the Corporate Unit Evaluation, ensured sufficient feedback loops and necessary adjustments to the evaluation process. An attempt was made early on to involve relevant stakeholders in the evaluation process, with the aim of encouraging them to contribute to its design. This included the identification of issues to be addressed and evaluation questions of interest.

### *Reference sciences*

The underlying scientific basis used in each case was determined by the characteristics of the Evaluation Team assigned to it, who considered, on the one hand, a contribution analysis (see above) and, on the other hand, the perspective of organisational development and the evaluators' practical experience of the implementation of participatory, multi-stakeholder management processes in the field of energy policy, RE and EE. Furthermore, the know-how and systemic perspective of the programme participants was considered.

### *Underlying logic*

The underlying logic of action was characterised by the existing Results Matrix and the structure of action (Results Model). The Theory of Change (ToC) was applied to it, and reflected in the various steps of the evaluation process.

### *Prioritised purposes*

Prioritised purposes were, at this point, the systematic assessment of the programme's progress against its outcome indicators and the OECD-DAC criteria, and the stakeholders' learning processes, especially those of the counterparts and programme team. It was believed that in-depth and wide-reaching insights into the strengths, weaknesses and potential gaps in the PES approach would not only be useful to GIZ and other programmes in the field, but might also contribute to a more impact-oriented work on the ground.

### *Evaluation criteria*

The evaluation criteria were the OECD-DAC Principles of Evaluation of Development Assistance (1991), based on figures, data and facts – and using the given grading system. These criteria were supplemented by identifying programme aspects that were of a systemic nature and that potentially influence the outputs beyond the measured criteria of OECD.

### *Evaluation standards*

Evaluation standards were also derived from the OECD-DAC principles. The respective assessment was mainly made by the reviewers, with strong consideration for the arguments of the various stakeholders participating in the evaluation.

### *Relationship between cognitive interest and intention to change*

As mentioned above, both cognitive interest and intention to change were taken into account in the evaluation, ensuring that usability predominated over pure cognition. This seemed helpful in determining the real observed impact of the intervention, regardless of the logical complexity behind its ToC. Nevertheless, this was not directly related to a change intention: the team of experts was aware that the local participants were subject to their own logic, their specific interests and action constraints. Any changes could not be imposed externally by an evaluation, but could only be triggered by a deep conviction gathered by those involved.

Besides the above-mentioned standards considered, the evaluation design was determined by the following characteristics of the programme:

- Although the programme had only one objective, it operated in three very different areas of intervention,

which was also reflected in the target groups and outputs. This affected at least two factors: (i) the challenge of evaluating the relevance, coherence, and complementarity among the three components in terms of achieving the PES objective, and (ii) the simultaneous challenge of adapting the evaluation methodology to the special circumstances and target groups of each component.

- PES II focused on the (close) cooperation with key players, especially at the federal level. Its partner institutions were mainly state and central actors. They performed unique functions, so applying an impact evaluation that utilised the counterfactual to attribute observed outcomes to the intervention was not an option.
- The use of a comparison group would have been more feasible in relation to the interaction of the programme with the private sector or training institutions, or at subnational level (federal states and local governments), where opportunities for counterchecking exist. However, this level was not the central focus of PES.
- Various self-evaluation inputs were made by the programme (see Figure 1 The Results Model), as well as external evaluations that covered substantial elements of the information required for the evaluation.
- Official figures provided by the government on EE and RE change, but always with an understandable time lag. The result at the impact level was therefore measured formally. The focus was on discerning the contribution of PES I + II to this impact, and what would have been achieved without the presence of the programme.
- Another relevant aspect to investigate, with a view to sustainability, was the difference between direct technical assistance and technical assistance with a focus on multiplication by other actors.

## Limitations

The complexity of the programme, its broad lines of action, its vast number of activities/products, and the political dynamics in its context clearly limited the evaluation. The preparatory discussions with the head of programme, and the survey of the vast number of available documents, made it clear that due to the complexity of the intervention, it would not be feasible for all measures carried out to be reflected in the Results Model or in the evaluation process. The prioritisation of those measures was done with the support of the Project Team in a joint reflection process that focused on finding clear contributions to the overall objective. While the programme seemed to be managed very strategically, the intervention still had a very demand-oriented approach that entailed responding to the evolving needs of the key partners; this may not always be reflected in the Results Models. The Evaluation Team addressed this by conducting a thorough kick-off meeting with each of the GIZ team members in order to gain a comprehensive picture of how the implementation of each line of action compared to the Results Model, and how measures that were not outlined in the Results Model contributed to the overall objective.

## Data collection and evaluation methods

On the basis of the findings from the inception phase, the Evaluation Team applied the following data collection methods:

- Academic literature and ongoing debates were analysed in order to arrive at a broad understanding of the methodological foundations of the evaluation process.
- Documents, including the programme's reports, tools and monitoring data, were analysed. The programme had sent various requested inputs, which provided useful insights for the preparation of the field visit and allowed the Evaluation Team to focus on the main aspects.
- Open and semi-structured interviews were conducted with selected stakeholders (see Annex 1 Evaluation Matrix), which provided additional information, assessments of the project's support, and triangulation of available information.
- Quantitative data was collected (e.g. closed questions with answer options on a scale) in meetings and workshops to further triangulate initial results. The possibility of carrying out an online survey with beneficiaries of the training component and/or the participating private enterprises was excluded, as

previous experience predicted a poor take-up rate.

- Further data-collection methods were closely related to the participatory approach, as participative workshops with counterparts and with the programme team were scheduled and used for participative diagnoses. Exercises and techniques partly came from Capacity WORKS, and contributed to deepening the ToC analysis and questioning the hypothesis.

The main focus of the data collection and its questions was the impact analysis, focusing on the relationship between the components and the maximisation of the programme's objective to support the creation of the framework conditions for the increase of EE and the increased use of RE. This was also reflected in the contribution exercise undertaken in Section 5.3.

The programme itself claimed to have been flexible enough to provide answers to special needs associated with the implementation of the energy legislation enacted in 2013, which took place a year after the programme's second phase began. The assumption that the needs expressed by the counterpart were the most effective way of implementing solutions to policy/judicial challenges was reflected upon, not only by the Evaluation Team, but by the Project Team and the counterparts themselves. During the mission this assumption was confirmed as a very strategic, yet opportunity-driven, way of project management.

The overall data quality provided for the Evaluation Report was excellent and very helpful. Nonetheless, on an impact level, national data quality was assessed and questioned during the mission by various stakeholders.

## 4.3 Evaluation process

The Evaluation Team used a participatory approach in its implementation, involving a large number of stakeholders. It thereby aimed to increase ownership of its results and build the foundation for learning from the current programme phase to provide tangible insights for planning and implementation of the follow-up phase. This included making the purpose of the evaluation clear, taking into account the questions that stakeholders would like to see addressed in the evaluation,<sup>8</sup> being transparent in terms of how evaluation results were arrived at, and giving stakeholders the opportunity to provide feedback on evaluation findings. Methodologically, this included internal and external workshops with partners, the use of small questionnaires, working groups and a frequent triangulation within the Evaluation Team, the Project Team and the head of Corporate Unit Evaluation participating in part of the field visit.

The Evaluation Team held preparatory discussions with the GIZ Evaluation Unit and the head of programme to come to a common understanding of aspects to be addressed in the evaluation, identifying the analysis of impact and sustainability as key outputs. The GIZ Evaluation Unit and the head of programme had the opportunity to comment on the inception report prior to the mission, so that remarks could be taken into account for the mission. The final report was developed in close coordination with the GIZ Evaluation Unit and included feedback loops by the project AV, and triangulation within the Evaluation Team.

The key institutional partners (SENER, CONUEE, CRE), who were at the same time the primary direct target group, were not consulted by the Evaluation Team in advance, as they had the opportunity to do so in person at the beginning of, and during, the field visit. A letter informing them of the purpose and dates of the evaluation was sent out to partners, and participants in the project informed their respective counterparts accordingly. In retrospect, the Evaluation Team believed no benefit would have been gained by involving the partners in advance, as the inception report was very complex and most counterparts could only assess the work of their respective component.

While the Evaluation Team was concentrating on joint learning processes, an objective highly valued by GIZ,

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<sup>8</sup> For example, in selecting strategy as key criteria for evaluation.

the task of accountability could have been more strongly and more systematically considered. A lack of clarity with regard to overall methodology and evaluation outputs needed in this pilot endeavour took up more time and energy at the beginning of the field visit. A more dedicated approach, focusing only on the Evaluation Matrix, could have prevented initial complications, but overall, it gave room for additional questions and discussions that, for example, led to Section 7: Analysis based on CW success factors.

Two participatory workshops were held during the evaluation to reflect on initial findings: one with participants mainly from the operational level of all three components and another with more management-level representatives. The inputs and subsequent discussions both helped create an overall picture of the intervention.

Preliminary findings of the evaluation were shared with the programme team and (selected) partners during a debriefing session at the end of the mission. During this session, participants had the opportunity to comment on and discuss results, so that findings were validated before drafting the final evaluation report. This meeting, unfortunately, did not include most of the staff members, due to miscommunication. Owing to the complexity of the programme and the different areas of work by the component's partners and team members, the level of detail was kept relatively broad. Participants concurred with the findings of the Evaluation Team in the debriefing session; only minor clarifications arose. Yet, at the end of the second week of the field visit, many findings were yet preliminary and, in part, vague.<sup>9</sup>

Within the initial days of the mission, the Evaluation Team perceived that the questions elaborated in the Evaluation Matrix (see Annex 1) were sufficient to obtain data on the OECD-DAC criteria, but did not provide a substantial basis for learning about how the project arrived at the results in each of the categories. The team therefore introduced another chapter to reflect especially on observations of internal project aspects, along the lines of the Capacity WORKS success factors.<sup>10</sup> (See Section 7 for details.) Yet, a more stringent orientation along the Evaluation Matrix would have helped generate key inputs for the evaluation report in a smoother fashion.

To assess the intervention based on OECD-DAC criteria, the Evaluation Team based its analysis on the adapted Evaluation Matrix provided by GIZ. For each of the criteria, the guiding questions were divided into concrete evaluation questions, indicators and the respective data sources. Evaluation methods were identified. The full Evaluation Matrix can be found in Annex 1.

The **relevance** criterion established the extent to which the objectives of a development intervention were consistent with beneficiaries' requirements, regional needs, global priorities and the partners' and donors' policies. The underlying question was whether the intervention set the right priorities, both in how it was planned initially, and in how it was implemented in practice. In this regard, the Evaluation Team analysed the extent to which the objectives of the intervention were aligned with sector strategies and priorities of the partners and of German development cooperation. Where applicable, the extent to which evolving needs were considered in programme implementation was also assessed.

The criterion **effectiveness** was used to measure progress towards the product objective indicators (outcome level) and, in line with the contribution analysis, towards the output indicators. As described above in Section 4.1, nearly all indicators fulfilled the SMART quality criteria, and adaptation was deemed unnecessary. In addition to the indicator-based analysis, the assessment of effectiveness included an analysis of the quality of key processes supported by the intervention (see Section 7) and their contribution to results, as well as an analysis of any potential unintended results.

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<sup>9</sup> This approach caters also for the systemic approach that focuses on different perceptions, interests, and relationships. See Section 5.1.

<sup>10</sup> Management model by GIZ.



The **impact** criterion was used to measure the extent to which the intervention contributed to the achievement of overarching development results. In this regard, the evaluation questions related to the contribution to the programme-level objectives, to the implementation of a national development strategy and to the implementation of the Sustainable Development Goals (SDG) agenda. Of particular interest was the extent to which the Programme Team contributed to selected outputs, or other factors and actors could be considered to have contributed. Moreover, as with the analysis on effectiveness, potential unintended results at a superordinate level were analysed.

The criterion **efficiency** was used to measure the extent to which objectives of an intervention had been achieved cost-effectively. An intervention was thus deemed efficient when the highest number of results had been achieved with the financial resources available. The project concept was not explicitly developed based on that guiding principle. Given this fact, and the interim nature of this evaluation, the analysis focused on production efficiency, the transformation of inputs to outputs. To implement this analysis, the Evaluation Team tested an Excel tool introduced by the GIZ Evaluation Unit to carry out a 'follow the money' analysis. Resources allocated to outputs were analysed against progress towards achieving these outputs. Its compilation proved difficult, however, because of an initial limited attribution of provided numbers to the requested reporting format. In addition, other relevant aspects raised by the intervention team in terms of efficiency were also documented.

The criterion **sustainability** was used to examine the extent to which positive results of the intervention could be expected to last once the intervention had ended. In this regard, the Evaluation Team analysed the efforts of the intervention towards sustainability: for example, the extent to which approaches and tools were tested and developed jointly with the partner to foster ownership. The evaluation also analysed the extent to which partners have already taken up or were using approaches and tools developed within the intervention (anchoring). The Evaluation Team looked into the results of the intervention's previous phase to put any potential long-term results into perspective, yet concentrated its assessment on the actual phase.

## Methods used

The methods used in the evaluation included an analysis of internal documentation, of secondary data and of interviews conducted by the Evaluation Team. A systematic approach was used for the document analysis. In the inception phase, the project proposal and the Results Model were used to understand what the project intended to achieve and how. The progress reports and monitoring data were used to understand progress towards the project's objective, as were contextual factors that affected progress. In addition, stakeholder maps and detailed discussions on various further instruments provided by PES were consulted to understand the role of different actors involved and the specific approach of the programme. The internal documentation was continually revisited and amended during the evaluation mission and in the analysis phase to triangulate and complement it with information from other sources. This was especially important because the project's proposal and reporting did not fully capture the complexity of PES.

The strength of the internal documentation lay in the fact that it provided information that could be directly related to the project's Results Model and the quality of the implementation process. The Evaluation Team found the Project Team very open in talking about both its strengths and, in most part, weaknesses. Some of the partners were rather prone to focus on strengths only. Considering the perception of other development partners and external actors was useful in this regard to get a balanced perspective.

The Evaluation Team aimed for systematic data triangulation (taking into account the perspectives of different stakeholders on the same aspect) and/or method triangulation (using various methods of data collection to collect information on the same aspect) whenever possible in order to arrive at valid and reliable information. It was not always possible to do both for every aspect, and a stronger prioritisation of selected areas of work would have helped to get more precise lines of attribution.



Possibilities for data triangulation were limited to some evaluation aspects because only the Project Team and the respective partner with whom the project was cooperating in a given area were familiar with specifics about the project. For this reason, external actors (other GIZ project teams, sector experts, other cooperation agencies or donors) could only triangulate part of the evaluation aspects, such as general developments in a sector, the quality of coordination between different development partners, or an overall impression of the project's contribution to changes in a given area. Possibilities for method triangulation were limited for some evaluation aspects as well, because not all aspects of the project were covered in internal documentation, and secondary data does not cover project specifics. The Evaluation Matrix in Annex 1, and Section 5: Assessment of the project's results, was intended to give the sources and methods of data collection for each finding in order to make transparent how the Evaluation Team came to its conclusions.

In addition to data and method triangulation, the Evaluation Team carried out researcher triangulation. The regional and international evaluator, as well as the representative from the GIZ Evaluation Unit, regularly, but non-systematically, reflected and analysed their findings during the evaluation mission and beyond. The analysis of evaluation results was intended to be carried out systematically along the Evaluation Matrix in Annex 1, yet specific questions could only be addressed to some of the stakeholders, none of them to all.

This Evaluation Matrix was developed in the inception phase of the evaluation and details evaluation dimensions, analysis questions and indicators for each evaluation criterion. During the evaluation mission, the Evaluation Team documented results in interview minutes, but did not rely more strongly on the structure of the Evaluation Matrix. At the end of the evaluation mission, both evaluators elaborated the presentation for the debriefing of the mission, which was commented on by partner representatives and team members. A triangulation of results with involved stakeholders was carried out by means of an internal debriefing session with the Project Team, and with two questionnaires addressed to all participants in the two workshops. The comments made by participants in the debriefing sessions were taken into account in the elaboration of the final report. The final report was drafted by the international evaluator. Finally, the regional evaluator reviewed the draft report and contributed with additional chapter inputs, which further consolidated the researcher triangulation.

The overall participation of partners and selected (secondary) target group was perceived as excellent. Partners on all levels were supportive and (to some extent) open to sharing their experience with the programme. Due to the complexity of the stakeholder landscape, the Evaluation Team felt uncertain as to the Project Team's selection, which did seem to have affected the overall output of the evaluation. The vast number of activities and actors involved required substantial focus and energy, leaving limited room for the Evaluation Team to expand the analysis to possibly further revealing perspectives. Yet, based on the evaluators' observed professionalism of the Project Team, the evaluators had confidence in the overall list of visited stakeholders.

# 5 Assessment of the project's results

The following assessment is based on the OECD-DAC criteria.

## 5.1 Relevance

### Relevance regarding strategic reference frameworks

At the time of evaluation, the objectives of the programme were not only still valid, but even more relevant than at the point at which they were defined. The dynamics of the energy sector have accelerated since the publication in 2013 of the Energy Transition Law, which was followed by the regulations and norms to implement it. Further measures focused on reaching the nationally determined contributions (NDCs) target Mexico had agreed to. This evolution, called the 'Mexican energy revolution' by several interviewees, could be foreseen in 2012, when PES Phase II was formulated.

As a consequence of this 'sector revolution', the activity of the public institutions accelerated and the need to respond strongly increased. The Energy Regulatory Commission (CRE), for instance, had to define new regulations for the energy-producing industry, considering not only transmission, but also the connection of new RE providers in a network traditionally defined by fossil energy (Int\_4,8). The Mexican Secretariat of Energy/Secretaría de Energía (SENER), had not only implemented clean energy certificates (certificados de energía limpia (CEL)), which allow investors to invest in renewable energy (RE) projects, but had already launched its third clean-energy auction, aiming to reach 35% of clean energy in 2024.<sup>11</sup> According to the Director of Energy Generation and Transmission in SENER, in 2018 Mexico would reach 5.8%, and as the RE installations sold in the auctions were built this number would increase rapidly. The National Commission for Energy Efficiency, CONUEE, had the goal of reducing industrial energy use by 1.9% a year.

All these tasks were quite new for the Mexican public sector. Its structures had not been exposed to such challenges before. Its legislators confronted new territory. Its public servants were not sufficiently prepared. In this context, the need for a sustainable energy programme such as PES had increased exponentially. Therefore, the module fitted into the relevant strategic reference frameworks.

PES not only fitted into this context but substantially adapted its activities and outputs to it. In the words of SENER's General Director for Clean Energies (second authority level after the Energy Minister), the programme had made contributions to the legislative body, giving input to members of Congress, making presentations, participating in discussions, and contributing through studies to the orientation of legislation. PES was said to have made a significant contribution to the matching of the Energy Transition Law with Mexico's post-2020 climate actions, their NDC goals. It was also recognised for helping the public sector, especially SENER, implement the following goals of the transition law: increasing the participation of RE in the energy matrix, certifying the training of personnel as RE installers, facilitating the integration of distributed energy, and incentivising gender mainstreaming in the energy sector.

The key strategic principles of PES at the international level were the Sustainable Development Goals (SDGs) of the UN Agenda 2030 and its underlying principles, such as 'leave no one behind', 'do no harm' and gender equality. On the side of the German ministry, the BMZ document on Sustainable Energy for Development (see BMZ, 2014) and the energy and climate strategy (see BMZ website, May 2018), with the focus on RE and energy efficiency (EE) cooperation, show its overall strategic orientation. The programme was aligned to the

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<sup>11</sup> In Mexico, this includes nuclear energy and large hydropower as well.

UN strategic framework under SDG 7 (ensure access to affordable, reliable, sustainable and modern energy for all), explicitly contributing to SDG 7.2 (significant increase in the share of renewable energy) and SDG 7.3 (doubling the rate of increase in energy efficiency). By reducing greenhouse gas emissions from fossil fuel power generation, the project contributed to SDG 13 (taking immediate action to combat climate change and its effects) and was in line with the United Nations Framework Convention on Climate Change (UNFCCC). The strategic intervention objective of increased use of renewable energies and the efficient usage of energy (especially for the Mexican population) show a clear link directly to SDG 7. The attainment of the intervention objective was through improving framework conditions for the sustainable supply of energy and related outputs of policy/regulation, dissemination and institutionalised capacity development.

SENER's General Director for Clean Energy Generation and Transmission acknowledged that PES helped to implement the key software (Plexus) and to train key personnel to design and adapt the Mexican clean energy modelling system, a key aspect in transforming the entire sector. As a result of PES technical and financial help (PES financed software rights for three years), he claimed, SENER had been able to define the steps needed to reach the NDC goals of 35% clean energy, breaking the dominance of the former monopolistic energy company Comisión Federal de Electricidad/Federal Electricity Commission (CFE) with internationally recognised transparent assumptions, which gained the market's trust and allowed Mexico to organise three successful clean energy auctions. Clean-energy certificates were mandatory for energy providers, pushing them to invest in RE; more finances were generated through bonuses to regions with transmission difficulties, and many other signals were given to the energy market.

SENER's General Director for Energy Efficiency and Sustainability affirmed that 'PES support has been essential for designing the energy reform and for its further implementation.' He mentioned the methodology for the energy efficiency framework, in which SENER, PES and the Danish Energy Agency worked together, 'co-leading the project'. Energy efficiency in building, housing and infrastructure, capacity building and certification of workers and those issuing certificates were listed as other contributions made by PES, as well as the support to the Energy Efficiency Agency, CONUEE.

The General Director of CONUEE (first level in the institution) and his team of Directors (second level) acknowledged PES's role in introducing ISO 50001 (energy management) into their institution and in the industry, in training facilitators, building up networks and learning communities, and thus 'creating an energy efficiency market in Mexico'. He further mentioned the introduction of the learning network methodology as an instrument now incorporated in his institution and implemented within the industry, the actual assistance in designing an EE roadmap with representatives of the main Mexican industry sectors and of some development banks, and praised PES institutional assistance in pursuing CONUEE priorities to match the agile energy sector.

The manager of the General Direction of Trustworthiness and Electric Expansion (third level in his institution) of CRE recognised and praised the contribution of the Centre for Migration and Development (CIM) expert provided by PES. Her advice to define and improve aspects in regulation, net energy metering, electric tariffs and other aspects was valued not only in her unit, but also by others who had to confront the demands and expectations the Energy Regulatory Commission had to cope with in order to implement the Energy Transition Law.

All these statements were confirmed by other public, private and international cooperation actors interviewed by the mission (Int\_3,4,5,6,7,8,12,13,15,16,21,23). It could therefore be affirmed that PES had made a relevant contribution to the development of the Mexican RE and EE sectors.

PES had also been able to promote sustainable housing (SH) standards and install them as an official Mexican norm for social housing. By fostering the NAMA (nationally appropriate mitigation action) Housing Project with INFONAVIT (Instituto del Fondo Nacional de la Vivienda para los Trabajadores) and CONAVI (Comisión

Nacional de Vivienda), and helping to develop a tool for modelling and designing energy-efficient social houses, it was able to attract international financing from the International Development Bank (IDB) and the KfW development bank to incentivise building with higher EE standards than usual in Mexico. The system needs further improvement and effective monitoring of its real impact, but it was nationally used for official social housing and, according to the Instituto del Fondo Nacional de la Vivienda para los Trabajadores/Institute for the national fund for social housing (INFONAVIT), the minimum EE standards have risen.

Another contribution that should be mentioned is the strengthening of cooperation between the public and private sectors, achieved by participative processes and methods introduced by the project. The now autonomous work of the Comité de Energías Renovables y Competencias de Eficiencia Energética (Committee for Renewable Energy and Energy Efficiency Competencies) and the support to the Comisión interinstitucional para la acreditación de empresas que proporcionan energía renovable y eficiencia energética (Interinstitutional Commission for accreditation of companies providing RE and EE) and the 'Reliable Supplier Programme' may prove to be even more relevant in the future, when EE and RE services and products expand as result of a stronger demand.

The same conclusion could be drawn on PES's active support of cogeneration at industry level (mainly the sugar industry) such as through the strengthening of the exchange of know-how and the network COGENERA, in which industry, technical suppliers, and cogeneration consultants joined to create a market through lobbying regulatory changes to increase opportunities for EE technology. This initiative had provided the impulse for innovative EE measures in the sugar industry and EE standards, as well as public-private coordination on the subject, and was considered successful amongst the participating actors (i.e. Int\_6,12,13,16). Although up to now its impact has been more anecdotal, it might prove to be more relevant in the energy market and in lowering carbon emissions in the future.

Another PES initiative that had a prospective relevance was its contribution to the consideration of gender in the energy institutional framework. Gender was mentioned in the transition law and was well recognised within key partner institutions, though it was not defined in a more operational way in the regulations arising out of the law. The founding of Red Mujeres en Energía Renovable y Eficiencia Energética (REDMEREE), the Mexican women and energy network, with 400 members and 40 allied institutions (as of January 2018) may also be part of the future framework for EE and RE in Mexico.

PES publications and capacity-building activities contributed to specific and strategic topics and discussions, ranging from energy-saving courses and materials and technical analysis of the electricity market to wide-reaching efforts with regard to gender and energy.<sup>12</sup>

The programme helped to design and support its implementation with technical, methodological and strategic advice. Processes and methodologies were established that helped to align priorities and identify the most relevant barriers and steps to address them. The close relationship of the project to key authorities helped make it party to priority discussions, and enabled it to participate in the preparation, drafting, and implementation of key documents and norms, etc. Various spin-off projects within the energy cluster (such as the solar energy programme DKTi Solar) that further addressed relevant processes were developed. It was frequently stated that PES was available and open to react to urgent demands, and that it followed up implementation, having a key strategic reach among donors and stakeholders.

### **Suitability of the strategy/conception to match core problems/needs**

Although, on balance, PES's contributions were positive, and widely recognised among the partners and

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<sup>12</sup> A newly published Promotion of Renewable Energy and Energy Efficiency Programme catalogue shows more than 80 substantial contributions to the sector.

others, not all of its contributions were at that level, nor as relevant, and not all of them were systematically and strategically implemented nor intended to be implemented. Some of them were opportunities that simply arose, such as the partner request for the Plexus software. Others, strongly intended by the programme, such as the support for energy-efficient methods for water producers at subnational level, were not taken up by the water administrations, and therefore had a nearly imperceptible effect at point of the evaluation. The documents and experiences produced by the programme will remain available.

PES also chose to work at different levels, not only focusing on heads of the public sectors. According to Output Indicator 3 it trained at least 3,000 workers in RE and EE topics. Though this work was also said to have been successful, going even further than expected (competencies were developed together with industrial representatives, certified, and autonomously financed training systems built up), the dispersion and multiplicity of actors involved might have contributed to divert attention from more systematically tackling the training needs of the public sector to implement the energy reform, which could have been a more relevant contribution. PES's flexible capacity to react to spontaneous requests and unscheduled needs, ranging from hiring of workrooms and facilitators to the contracting of studies for wide-reaching laws carries the risk of providing isolated non-relevant services.

The efforts to conduct public sensitisation campaigns (part of Indicator 2, together with promotion programmes), took the form of a gender and energy campaign with a large private wholesale company, the Elektra shops. Though the TV campaigns were said to have been watched by 13 million viewers, and the short film produced by PES received a recognition from GIZ in 2016,<sup>13</sup> the spark it created was not necessarily sustainable. Despite the continued expansion of established women-centred networks, it would have been better if PES had followed the strategy used on other occasions: working, for example, with marketing associations or communication expert groups to hand over gender-equity concepts and induce their long-lasting application in the overall sector.

### **Design of the project was adequately adapted to the chosen goal.**

In comparison to other transforming countries, the RE and EE sectors in Mexico were small. Given the flexibility of the initial project design, this allowed it to be flexible in the face of numerous opportunities to meet urgent requests by the key stakeholders. While PES Phase I started the groundwork, with various key studies to identify key areas of activity (see also National Renewal Energy Laboratory), and with it established a relationship of value and trust, the focus of PES II was more strongly on the support of the implementation processes in legal–normative, technical and capacity-building issues, which in turn contributed to expand the trust relationship with its stakeholders. (Int\_3,4,6,7,12,13,15,23).

The formation of the Project Team through three components rather than the proposed lines of action (see discussion in Section 7), increased the number of opportunities both for PES and the respective key stakeholders (Int\_AV). This opened up a variety of activities that contributed additionally to the overall indicators.

### **Overall assessment of relevance**

The Evaluation Team concluded that the project fitted very well into the relevant strategic reference framework. It built upon and supported key strategy documents from the Mexican government and significantly addressed SDGs 7 and 13. The strong momentum in the sector followed by the initial phase of the programme gave numerous opportunities to PES to help shape the newly created market system of renewable energy and energy efficiency.

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<sup>13</sup> The project was awarded second place in GIZ Gender Competition 2016.

Regarding the suitability of the strategy to match the core needs of the target group, the intervention was considered highly relevant in terms of working towards the improvement of adequate framework conditions for the sustainable energy sector, which addressed both the core needs of the government and of the general population. Yet the direct contribution towards the general population could have been addressed with more differentiation. The Evaluation Team therefore awarded this dimension 28 out of 30 points.

The design of the project was assessed as strongly adapted to the chosen goal, giving the project management a high degree of flexibility in the areas to be addressed with its activities. The conceptualisation at the time of planning was plausible and reflected the needs and priorities of the partner and it was assumed that this was still the case. Therefore, this aspect was awarded 18 out of 20 points.

Finally, the Project Team adapted strongly to evolving partner needs and changing framework conditions, strategically supporting key initiatives and approaches, and therefore received a rating of 10 out of 10 points.

The overall score for the assessment criterion 'relevance' adds up to 96 out of 100 points: very successful.

Criterion	Assessment dimension	Score
Relevance	The project fits into the relevant strategic reference frameworks	40/40 points
	Suitability:	28/30 points
	<ul style="list-style-type: none"> <li>• of the strategy</li> <li>• of the conception?</li> <li>• to match core problems/needs of the target groups</li> </ul>	
	The design of the project was adequately adapted to the chosen goal.	18/20 points
	The conceptual design of the project was adapted to changes in line with requirements and re-adapted where applicable.	10/10 points
Overall Rating relevance		96/100 points

## 5.2 Effectiveness

With regard to effectiveness, the evaluation measures the progress towards achieving the intervention's objective. This includes an analysis of the degree to which the outcome indicators were achieved, as well as an analysis of the extent to which the project successfully contributed to the achievement of the objective. In addition, the occurrence of additional, not formally agreed, results was examined under effectiveness. Since effectiveness strongly related to the management success of an intervention, further aspects were discussed in detail in Section 7.

A necessary condition for using indicators as a basis for assessment was that they fulfil the SMART quality



criteria. Of the three outcome indicators formulated in the project's proposal, two were considered fully SMART by the Evaluation Team, and one partly SMART. The need to reformulate this one indicator was not shared by the evaluators. The inception phase had found all output indicators to be fully SMART, yet with some open questions with regard to definitions, which were partially addressed but not answered satisfactorily due to other priorities within the process. (See Section 4.1 for details.)

### Analysis and assessment regarding effectiveness

*Achievement of the objective in accordance with the project indicators*

**Effectiveness evaluation dimension 1** focused on the achievement of the project goal on time, in accordance with the TC-measures' goal indicators agreed upon in the contract. Below is an analysis of the project performance in regard to the dimension.

Assessing the indicators at outcome level, the following picture emerges, which is more thoroughly discussed in 5.3 Impact.

**Impact indicator 1** sought to achieve an annual increase of primary energy production through RE, with a strong increase expected in 2017 and 2018, based on the newly established market mechanism for RE (clean energy certificates) and the improved framework conditions. The overall share of RE had grown since 2010, but the overall level remained relatively low at the time of evaluation. Based on various feedback, the data on RE installations in the country did not yet seem sufficiently accurate for it to serve as a basis for the indicator.

**Impact indicator 2** sought to increase the annual savings in energy consumption (GWh/a) but was not based on reliable calculation methods and progress could not (yet) be determined.

**Impact indicator 3** addressed the reduction of annual gas house emissions (CO<sub>2</sub>) but, so far, no clear positive tendency could be observed. The values assessed were based on simple estimations related to energy production (Indicator 2) and lacked sufficient data.

Overall, it was difficult to assess the weight of each of the indicators, since none of them provided a clear target group or counterpart. It was also not entirely transparent which of the selected outcomes of the programme were most relevant to the objective, the advancement of RE or of EE. A clearer description of the contribution of the impacts towards the programme objective could also prove to be beneficial for a new programme based on the present experience. While the GIZ quality criteria at the project start (of the last phase) were not the same as at the time of evaluation, the relationship between output and outcomes appeared clear and logical, if slightly improved in its formulation. In addition to those changes, some definitions regarding operationalising those indicators were thought to be helpful.

The Evaluation Team argued that in light of the high complexity of the intervention (three (sub)sectors, several levels of implementation, a very broad stakeholder landscape, highly political environment, numerous synergies and potentials) and the resources available for the evaluation, it was not possible to take into account all approaches the programme had been using. Support for the key processes and how they contribute to the programme's objective was therefore the focus of the contribution analysis (an explanation of contribution analysis is provided above), as a prerequisite to understanding the relation between the achieved results and the contribution of the programme and (possibly) other actors.

To further focus on the evaluation objective(s) the Evaluation Team should have focused on a limited number of indicators and their presumed hypotheses from the start, yet this happened only in the face of the vast activities and results experienced in the field. This gave a broader analysis that potentially lacked clarity in details of attribution.

## Contribution to the achievement of the project objective

**Effectiveness evaluation dimension 2** assessed the services implemented by the intervention that successfully contributed to the achievement of the goal agreed upon in the contract. This assessment was done through a focused contribution-analysis exercise with the programme team, and evaluators' critical analysis of the ToC and its link to the evidence gathered. Based on the above-mentioned prioritisation, the evaluation process reconstructed potential contributions of the programmes activities in those areas of action and with it their overall effectiveness. While clear causalities were difficult to determine, assumptions and questions were investigated on the basis of contributions (rather than attributions).

A contribution analysis commonly consists of an analysis of the contribution of a programme (intervention), and the extent to which observed (positive or negative) impacts could be related to the intervention (Mayne, 2001). It not only analyses the Theory of Change, but seeks to formulate alternative explanations that may explain the intended impacts. Contribution analysis does not necessarily provide for a clear causality of a factor and an impact, but tries to show the extent to which the project had contributed to the observed impacts.

In **action area I (Legal and regulatory framework)**, the central hypothesis was that the development and improvement of favourable legal and regulatory conditions would substantially contribute to a stronger deployment of RE and EE technologies. The related output had indeed been achieved through numerous contributions by PES and other actors in that field. Indicator 1 on new or changed legal framework conditions to increase energy efficiency or the use of renewable energy had been almost achieved already by the time of the evaluation. Looking at indicator 2, which sought to put at least 10 beneficial legal framework conditions for EE or RE into practice, progress was visible, having reached 70% by the time of this assessment.

At the outcome level, the action area aimed to contribute mainly to impact indicators 1 and 2, and indirectly also to impact indicator 3 (Reduction of CO<sub>2</sub> emissions). In terms of activities, a strong focus was put on providing technical advice and capacity building to CONUEE, SENER and other relevant stakeholders. Advisory services were also provided to the growing regulatory institution CRE through a Centre for Migration and Development (CIM) expert.

In the following, progress towards the project's module indicators<sup>14</sup> will be analysed for the different action areas<sup>15</sup> separately. The tables below, developed by the mission, together with the PES team, try to address the question of if and how the various stated activities above did indeed contribute to the expected outputs. While this process poses some risk of built-in bias, the critical moderation and reflection of the evaluators led to results with a high level of triangulation. The contribution analysis presented here argues that alternative explanations were not sufficient to explain observed changes, and it therefore attributes them to the contributions of the programme (for each of the three output indicators).

Looking at **Outcome Indicator A**, the following alternative explanations were put in relation to PES contributions and their working hypotheses:

*Table 4 Outcome A*

Level	Outcome A: The legal-normative framework conditions for RE and EE are improved
Assumed hypotheses	The legal-regulatory framework essentially contributes to enabling the growth and use of RE/EE.

<sup>14</sup> During the mission it was decided to make no adaptations to the existing indicators, given the limited amount of time and the complexity of the intervention.

<sup>15</sup> While the programme concept and monitoring is based on the three action areas, its management is structured along three thematic components (RE, EE, EE in buildings) that each address all three action areas.



Additional hypothesis	<p>Political will and capability to transform the framework conditions was sufficient to cope with resistance.</p> <p>The relevant priorities for RE and EE were addressed.</p> <p>The changed framework conditions will be implemented according to assumptions.</p>
PES contributions	<p>Developing and providing arguments.</p> <p>Cultivating relationships and trust to gain access to decision-makers.</p> <p>Strategic analysis of barriers and necessary adjustment of framework conditions.</p> <p>Strengthening capacities.</p> <p>State of the art technical discussions.</p> <p>Gender mainstreaming.</p>
Alternative explanation	<p>Attempts to reallocate budgets.</p> <p>RE and EE were current trends and will be tackled without PES.</p> <p>The capacity of key institutions depends on key drivers more than the built up of capacity.</p>

To improve respective framework conditions at the regulatory–normative level, direct support to the design and drafting of these documents was required – a key task. PES concentrated on all its three components (Int\_7,11,13). While all the alternative explanations discussed had some relevance with regard to the overall change in the sector, the contributions listed in the table were confirmed by key stakeholders (e.g. Int\_7,13) as essential to the intended objective. Based on the team's feedback, the project contribution was seen as developing and providing arguments, strengthening capacities at key positions, the provision of international experience for technical discussion, and a thorough analysis of barriers. These were key activities in this line of action and showed causal linkage to the changes made in the framework conditions.

In order to better assess the contribution that the described activities and results made to the objective of improving framework conditions for RE and EE, they were juxtaposed with a number of alternative explanations and discussed with the Project Team as well as internally among the Evaluation Team. For example, substantial global trends for RE and EE deployment existed, but real changes in the framework conditions and deployment numbers seemed to appear only with substantial governmental ownership and support from international development partners, private-sector investors, and academia. They could constitute an additional contribution, in addition to the part played by PES in the development.

In **action area II (Promotional/dissemination mechanisms/installations)** (see Figure 1 Results Model ), the central hypothesis was, similarly, that the development and enhancement of promotional mechanisms would contribute to the overall deployment of RE and EE technologies. The indicator addressing new or improved promotion/dissemination programmes or mechanisms with the private sector, was expected to be achieved by the end of the project. One example is the learning networks introduced by PES, which were internalised by CONUEE (Int\_14). Through this participative internationally used method, key representatives from the private and public sector came together and reflected on benefits and obstacles of EE in their respective fields. This not only increased interaction and understanding on technical matters, but helped key players to adopt different perspectives and develop suitable approaches to incorporating them. The method led to a general agreement among dozens of participating industries and set them on a path of further EE.

On the outcome level, the action area aimed to contribute mainly to indicators 1 and 2 and partly also to indicator 3. In terms of activities, a strong focus was put on providing technical advice through studies and multi-stakeholder (learning) processes with CONUEE and SENER, as well as private sector and other stakeholders.

Looking at **Outcome Indicator B**, the Evaluation Team identified alternative explanations. The PES Team Workshop did not plausibly explain indicator achievements (discussions within WS with PES team). Elaborated

areas of activities of the project could generate sufficient evidence of PES having contributed to indicator 2 (WS I, Int\_13,19,27). Various actors also confirmed the effectiveness in this output and the moderated elaboration of key processes in the initial partner workshop made those attributions visible.

*Table 5 Outcome B*

Level	Outcome B: Promotion and dissemination programmes and mechanisms are improved
Assumed hypothesis	<ul style="list-style-type: none"> <li>Dissemination and promotional programmes essentially contribute to enabling the growth and use of RE/EE.</li> </ul>
Additional hypothesis	<ul style="list-style-type: none"> <li>The right programmes were developed and implemented and the reach is sufficient.</li> <li>Design and implementation of promotional programmes address an existing demand and overcome key barriers.</li> <li>The capacities to design, implement, and adjust the programmes were available within the stakeholders.</li> <li>The willingness of the stakeholders to implement the programmes is there.</li> </ul>
PES contributions	<ul style="list-style-type: none"> <li>Grounding studies to provide sufficient argument for programmes. (does not work in all cases)</li> <li>Support in practical implementation increases chances of success and ensures quality.</li> <li>Adapt methodologies to Mexican context.</li> <li>Products were combined with CB activities / training. Mainstreaming Gender.</li> <li>Creating multi-stakeholder platforms</li> </ul>
Alternative explanations	<ul style="list-style-type: none"> <li>Instead of studies multi-stakeholder diagnosis would have the same effect.</li> <li>Convincing training institutions to prepare for future demands would have delivered the same results.</li> <li>Promoting pilot projects would generate sufficient momentum</li> </ul>

In **action area III (Organisational awareness and training)** the underlying hypothesis was that systematic training would provide sufficiently qualified staff to implement growth in RE and EE. This was to be achieved largely by establishing new standards and curricula as well as through an awareness process within various institutions. The results were expected to contribute to an institutional setup that systematically educated specialists in RE and EE, which was indirectly reflected in **outcome indicator 2** (Deployment of RE). In terms of modes of delivery/activities, advisory services and multi-stakeholder processes were supported to create national standards in key areas of the sector and capable institutions to largely contribute to national capacitation based on the growing sector's needs (Int\_7,8,13,15,16,27).

With regard to **output indicator 3**, a similar picture emerged as in the previous indicators. While, once again, alternative explanations delivered additional options for momentum in the energy sector, they were also reflected upon and partly incorporated by the project management. For example, PES engaged external trainers for technical issues and attempted media campaigns, but only as a part of a more strategic approach to selecting the most suitable activities to fulfil indicators through learning and thorough analysis. A good understanding was therefore developed as to the most effective way of changing framework conditions with regard to training and awareness raising (interview with AV, internal team workshop).

While PES had provided prospective studies, created a multi-stakeholder process and, through it, promoted and convinced relevant institutions of the necessary changes in the training capacities for the sector, it contributed significantly to the increase of trained people and the level of awareness (Workshop I – members of the German-Mexican Chamber of Commerce and Industry, representatives of the National Council for Standardisation and Certification of Labor Competences and of the inter-institutional cogeneration platform COGENER – and internal workshop with PES team). It showed that PES had, indeed, chosen suitable

approaches to contributing significantly to strategically selected areas of work. Some additional approaches were tried and then adapted; others were neglected, based on a thorough understanding of the sector (for example, through studies and consultation processes with key stakeholders). Ultimately, other contributing factors were considered to put the project's contribution to the product objective into perspective, and none challenged the described contribution of the project. (See Section 5.3 Impact.)

*Table 6 Outcome C*

Level	Outcome C: Training and awareness raising of RE and EE professionals is improved
Assumed hypothesis	<ul style="list-style-type: none"> <li>• Systematic training will provide sufficiently qualified staff to (the market) implement growth in RE and EE</li> </ul>
Additional hypothesis	<ul style="list-style-type: none"> <li>• Critical/appropriate qualifications were selected for the design of the trainings.</li> <li>• There were binding standards of competences to ensure quality growth.</li> <li>• Training capacities were available to address demand.</li> <li>• Private and public-sector demand trained personnel.</li> <li>• Public institutions demand qualifications/standards.</li> <li>• Sector needs to be professionalised.</li> </ul>
PES Contributions	<ul style="list-style-type: none"> <li>• Prospective studies.</li> <li>• Creating and promoting multi-stakeholder processes to develop competency maps.</li> <li>• Promoting the benefits/need through demonstration and information.</li> <li>• Convincing actors/institutions to formally require certified personnel.</li> <li>• Strengthening relevant institutions.</li> <li>• Promoting labour standards in the sector.</li> </ul>
Alternative explanations	<ul style="list-style-type: none"> <li>• Importing foreign training / external training / scholarships Internships / study programmes</li> <li>• Publicity in the media</li> <li>• Development of PPPs.</li> </ul>

**The services implemented** by the project were assessed as making a successful contribution to increasing the partner capacities in all areas (Int\_7,8,11,12,13,19,22,27). In every action area, the contribution analysis could demonstrate how the project's technical and strategic advisory services helped to increase partner capacity in line with the product objective. The lack of an effective sector steering committee delayed some key processes because critical issues were not appropriately addressed by all relevant stakeholders. Keeping this shortcoming in mind, the Evaluation Team awarded 28 out of 30 points for the successful contribution to the achievement of goals.

With regards to **unintended results**, additional results – whether positive or negative – were explicitly reported, but were not specifically considered in the project's monitoring system. Additional results were created through the reaction to opportunities such as the better provision of additional key documents, including manuals, and of pilots, the creation of jobs through capacity-building activities and many more. Supported institutions, multi-stakeholder coordination mechanisms and spin-offs such as DKTI Solar provided additional funding, in some areas multiplied funding by 30 to 40 times (Int\_18, see also 5.4 Efficiency).

With the extension of the indicator targets during the actual phase, based on a changed project environment, a large number of potential products was envisaged in the revised indicators and could therefore be described as additional results. While the project used a comprehensive, Excel-based tool to monitor project progress constantly, no specific monitoring for unintended results was observed.

Only one **risk** area was mentioned frequently (Int\_13): the potential change in government in the 2018 elections as possibly leading to unintended results. However, partners and Project Team focused on anchoring the project so that it would survive even a total change of personnel. This was considered a key risk by PES itself, since some of the unsuccessful activities were influenced by changes in key personnel and changed priorities by partners (as with Solar Thermal). Nonetheless, PES kept the topic alive and showed persistence until the topics reached another momentum.

### Overall assessment of effectiveness

On balance, the project was assessed as achieving the objective on time and in accordance with the TC-measures' goal indicators. The stated outcome indicators were all expected to be achieved by the end of the project. While Impact indicators 1 and 3 had already been achieved, the project was on track towards achieving indicator 2 as well. Available data quality posed a risk to the measurement of the impact indicators, implying uncertainty about their fulfilment. All output indicators were already showing significant progress and, based on the Evaluation Teams' perception, were expected to be achieved by the end of the phase. The Evaluation Team awarded 38 of 40 points to the first aspect of goal achievement, despite the limitations in terms of the outcome objectives.

In action area I, indicator 1 gave a clear orientation towards expected results, yet left space for PES to change priorities within the changing environment of the sector. PES was able to and did, in fact, strongly concentrate on strategic relevance and partner needs within the three components (RE, EE, Sustainable Building). The project successfully contributed to the 'Improvement of legal-normative framework conditions' and was well aware of other influencing factors and opportunities for its parallel engagement. In action area II, output indicator 2 offered sufficient flexibility to ensure the relevance of all measures taken for meeting the project objective and its indicators. Regarding the achievement of the outcome indicators as a whole, the project was perceived to be on track, while uncertainties with regard to data collection and data quality by the Mexican government existed, and the entire energy cluster (in part) addressed similar outcome indicators.

The good progress towards meeting the outcome indicators was likely to be based on the design of the intervention, which was sufficiently adapted to the chosen goals. The output indicators reflect the results of the project to a remarkable degree, but only partially incorporated additional results.

The services implemented by the project were assessed as successfully contributing to increasing partner capacity in all areas and, to some extent, beyond (i.e. gender activities). In every action area, the contribution analysis (see Section 5.3 Impact) could describe the project's work as helping to increase partner capacity and with it framework conditions in line with the product objective. In this context, the lack of an effective steering committee limited the potential for an even stronger coordination of the sector. The Evaluation Team awarded 29 of 30 points for the successful contribution to the achievement of goals.

Finally, the occurrence of unintended positive or negative results was only partly assessed. Due to the wide range of possible products and approaches considered in the indicators, potential for unintended positive results seemed limited. While crucial risks were identified in the initial Results Model and reflected in some of the interviews, it remained uncertain if the project followed a systematic approach to cope with them. Yet, it did so with regard to anchoring its products for sustainability beyond political change. In conclusion, the Evaluation Team awarded 28 of 30 points to this aspect.

The overall score for the assessment criterion effectiveness added up to 95 out of 100 points: very successful.

Criterion	Assessment dimension	Score
Effectiveness	The project achieved the goal on time in accordance with the TC-measures' goal indicators agreed upon in the contract.	<i>38 of 40 points</i>
	The services implemented by the project successfully contributed to the achievement of the goal agreed upon in the contract.	<i>29 of 30 points</i>
	The occurrence of additional (not formally agreed) positive results had been monitored and additional opportunities for further positive results had been seized.	<i>28 of 30 points</i>
	No project-related negative results had occurred – and if any negative results occurred the project responded adequately.	
Overall rating for effectiveness		<i>95 of 100 points</i>

## 5.3 Impact

The impact criterion measures the extent to which the intervention contributed to the achievement of overarching development results. In this regard, the evaluation questions related to the contribution of the programme and module level impact indicators. The extent to which, and how, the general population, as the ultimate target group of the intervention, was affected by the intervention was also assessed, and whether unintended results on the superordinate level could be observed. With regards to the ultimate target group, however, there was an attribution gap between the product objective and the general population, which none of the indicators in the indicator system addressed. Moreover, primary data at the level of the population could not be collected in the framework of this evaluation, which drew on secondary sources and interview partners from various institutions. This therefore limited the analysis with regards to impact on the population.

### Theory of Change

The programme had developed and adapted the following Theory of Change (ToC) (available in German and in Spanish):

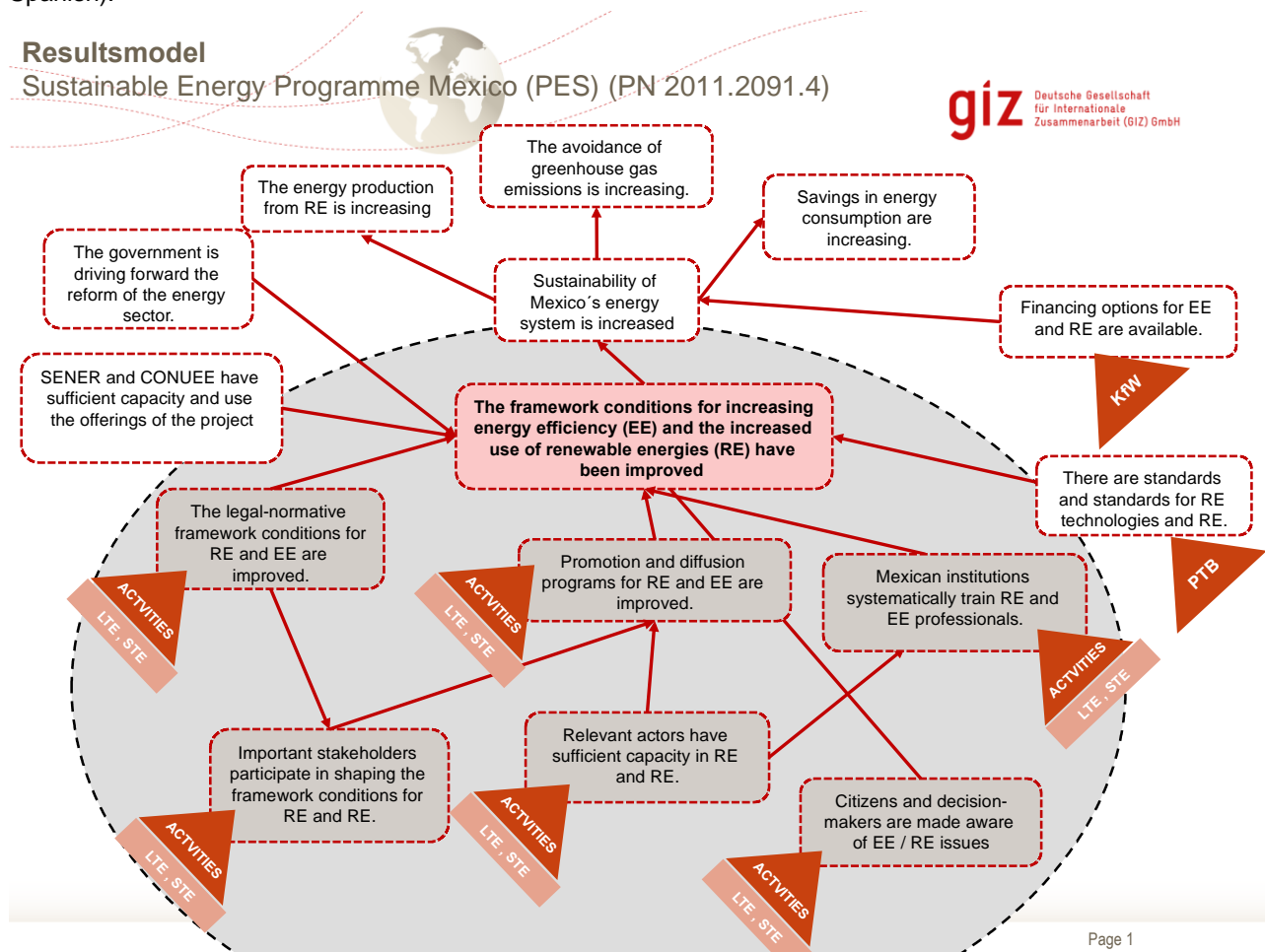


Figure 2 Results Model

The hypothesis was that improving the framework conditions for better use of RE in Mexico, and increasing EE would increase the sustainability of the energy sector. Energy produced by RE would increase, energy savings would increase and, with it, greenhouse gas emissions would be reduced. To make this possible, apart from the contribution of PES, the collaboration of counterparts SENER and CONUEE was needed, as were strong incentives to the energy sector, and the above-mentioned reforms. Within that context, the existence of norms and standards for RE and EE technology was key, and financing options needed to be available for broader impact.

## Analysis of programme and module indicators

To assess the impact at the programme level, the three impact indicators were analysed. They all refer to the whole energy system in Mexico.

The programme objective is an improvement in the sustainability of Mexico's energy system.

*Table 7 Programme indicators*

Indicators at programme level <sup>16</sup> :	Evidence in Mexican statistics	PES contributions
1. Increase in annual primary growth from new renewable energies (PJ/a)	According to SENER, from 2013 to 2016 (2017 information not available) RE production had increased 1% per year on average. But at the same time, general energy primary production had increased at the same level, so that the percentage of RE in the general energy system had stayed at 7% and not increased yet.	Though actually PES's exact contribution might not be determined, its inputs in normative aspects, especially for the introduction of clean energy certificates, should be considered here. For 2018 the Mexican government had set a goal of 25% of renewable energy, 5% using the clean energy certificate mechanism fostered by the programme.
2 Increase in annual savings in energy consumption (PJ/a bzw. GWh/a)	The per capita energy consumption in Mexico had been increasing from 2013 to 2016 (SENER, data from 2017 not available until December 2018)	Though the exact contribution might not be determined at the time of the evaluation, there certainly were several initiatives supported by the programme that have an impact on the reduction of energy consumption and energy efficiency. For instance, the contribution to savings in CO <sub>2</sub> emissions using efficient building designs/norms promoted by the programme was estimated at 20% of total energy.
3 Increase in annual avoided greenhouse gas emissions (tCO <sub>2</sub> e/a)	According to the International Energy Agency (IEA) Report on Mexico 2017, the Special Programme on Climate Change 2014–2018 (PECC) summarises quantified mitigation-relevant policy measures that could lead to a reduction of some 8% of the forecast emissions by 2018. There were no further measurements available, but according to IEA projections of current policies, Mexico will reduce emissions, though not enough to meet its conditional pledge of 30% emissions reduction by 2020.	As a consequence of both indicators commented on above, in the future the avoided greenhouse gas emissions could be measured. As an anecdotal example, the sugar mills that participate in the Cogenera learning circles report having reduced petroleum for production from 18l/t to 1l/t.

<sup>16</sup> The programme concept is taken from the GIZ Result Matrix, and is used here for an aggregated level of different initiatives or projects like PES, more equivalent to a cluster level or a sum of different projects with the same overall goal. In this respect, the PES programme is considered a 'module', and is part of several other German cooperation initiatives grouped in a cluster.



As can be seen in the matrix above, there was little precise evidence to measure the indicators at programme level, nor at national Mexican level. Nevertheless, there were indications to affirm that Mexico was going in the right direction in terms of increased RE, EE and greenhouse gas reduction. The measures taken in this regard were high-level policies, whose results may be observed in a longer period than that of the PES programme, as can be seen by official statistics 2012 to 2016 from the Secretariat of Energy SENER.

*Table 8 National energy balance 2012–2017 (SENER)*

	Gross energy production in Mexico (petajoules (PJ))					
Year	2012	2013	2014	2015	2016	2017
Mexico total	8,809.36	9,011.83	8,854.25	8,528.87	9,140.19	n/a
Renewable Energy	620.22	634.44	669.97	647.91	654.05	
% RE / total	7.04%	7.04%	7.57%	7.60%	7.16%	
Annual increase - decrease RE		1.02%	1.06%	0.97%	1.01%	

Relevant Mexican statistics were published with one or two years' delay, yet the basis of their methodology, and their capability to gather information were criticised to a certain extent. Support for improvements in methods for gathering statistics could be a focus of a future GIZ project. The GIZ Mexican Energy cluster is developing a new aggregated monitoring model, trying to combine the contributions made by all its projects in the sector.

Up to now, numbers for exact superordinate long-term results have not been available, but there have been explanations that superordinate long-term results were already occurring at a small scale, or were foreseeable (interviews by SENER, CRE and CONUEE officials (Int\_7,8,13,19) and International Agency Representatives (Int\_15)). In any case, PES could only make a limited contribution to the wider macro-economic impact.

These influencing factors, as well as the limitations of the current project design in terms of addressing the challenges, have been analysed in the above matrix, and will be further analysed in the contribution analysis and the module indicator analysis below.

The main outputs of PES to build up the required framework conditions were the improvement of the regulatory and normative framework, the strengthening of the promotion and diffusion programmes in RE and EE, and the systematic training of experts and specialists in RE and EE. Other conditions needed were the involvement of stakeholders and the sensitisation of citizens and decision-makers. On the one hand, interviews and discussions revealed that there were many improvements that contributed to the programme-level impacts (Int\_7,8,12,13,19). On the other hand, it was reported by several external stakeholders (Int\_15,16,20,21) that in spite of incremental improvements on the technical level, larger political challenges remained untouched.

At module (project outcome and output) level, PES had been monitoring its products, trying carefully and systematically to fulfil its goals. It reported new regulations or norms published or implemented, the promotion programmes developed in collaboration with the private sector, the number of people trained in EE and RE (including women as a percentage of those trained), the sensitisation and diffusion proposals institutionalised, and the photovoltaic and solar thermal systems installed. According to the monitoring of PES, those were easily traceable. All of the indicators defined at outcome and output level were reached, except for the photovoltaic installations, as the promotion programmes needed to support them (hypothesis) were discontinued and had been taken over by another GIZ project as a spin-off of PES (DKTI Solar).

The programme stated that its beneficiary group and target was the whole Mexican population. As one can see in the programme's evaluation, its direct or indirect beneficiaries were in effect only the part of the population who lived in sustainably built houses. Other direct beneficiaries could be participating industries, public sector institutions and their personnel, in circumstances where they received training or increased their competency by means of the project.



With regards to the immediate target group (partner institutions), the project contributed with capacity building, strategy, cooperation, learning and innovation and, in some cases, even by strengthening the steering structures. (For further details, see Section 7.)

The above analysis shows that PES contributed constructively to the intended superordinate long-term results, though it cannot be stated that the country could not have produced changes in the right direction without the programme.

PES had supported the significant change in sector framework conditions to increase growth of renewables that reduce CO<sub>2</sub> emissions, in comparison to the fossil-fuel-dominated national system before. The percentage of distributed RE was growing steadily through the newly established auction mechanism (clean energy certificates with contribution by PES). Incentives had been developed and were implemented. Interest and demand was growing strongly.

### Linking PES contributions to intended superordinate long-term results

As mentioned above, the programme's direct contributions were small and very difficult to measure, especially in the short term. The following list of products and services provided by PES tries to establish a link.

Intended superordinate long-term results	Examples of PES contributions to the intended superordinate long-term results
Increase in annual primary growth from new renewable energies (PJ/a).	<p>Mainly contributions by the RE component, and also by the housing component</p> <p>Support software acquisition and training to design yearly national energy auctions by PRODESEN, SENER (initiated in 2014 by PES, continued by other donors and reinforced by PES again 2017–2018 to secure the approaching government transition period. Other contributions include: auction contract model study, clean energy requirements paper, MRV tracking study. In the first three auctions since 2015, Mexico achieved 7,451 MW of new clean generation capacity, with nearly USD 9,000 million of resources, which puts it on course to achieve the national goal of 35% of generation from green energy sources by 2024. In solar and wind power, from 4% of the total electricity generation (2014), with the new projects it was projected to reach 11% (source: SENER and Federal Commission for Electricity)</p> <p>Mexico's installed distributed generation capacity by small and medium projects grew from 29,313 KW (2013) to 304,167 KW (June 2017) (CRE). An increase in distributed generation projects from 2013 to 2017 was attributed by SENER to PES support (Int_7). It also encouraged the Special Programme for Energy Transition (PETE) 2017–2018 to implement the clean energy goals. PES products and services were studies and stakeholder-discussion forums to contribute to the norms and regulations,</p> <p>Mexico was considered the most robust solar thermal market in North and South America, with 8% growth in 2015 (<a href="http://www.solartermalworld.org">www.solartermalworld.org</a>). PES generated programmes to promote, certify and train people about solar heaters in housing and industry, e.g. providing guidelines for the development of programmes for the promotion of renewable energies in general and specific photovoltaic plants, competency standards for solar heaters and training programs for technicians.</p>
Increase in annual savings in energy consumption (PJ/a bzw. GWh/a).	<p>Mainly contributions by the EE component, and also by the housing component.</p> <p>Reduction of 18 litres of fuel per ton of sugar production to 1 litre of fuel per tonne of sugar production in the sugar mills participating in the EE learning circle in COGENER, introduced and supported by PES (Sugar industry Chamber)</p>

	<p>Annual energy savings in social housing promoted by CONAVI and the programme Sisevive Ecocasa were estimated at 0.62 tonnes CO<sub>2</sub> per house, for more than 69,000 social houses 2012–2016 (CONAVI). PES introduced a calculation software for use by constructors, bump-started a NAMA housing initiative, and also allowed KfW and IDB to invest in trustworthy EE housing programmes. Several Mexican actors and other donors all contributed to significant aspects (finance, training, indicators, EE standards).</p>
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### Further unintended contributions

There was evidence that the occurrence of additional (not formally agreed) positive results had been monitored, and additional opportunities for further positive results had been seized in a flexible and creative way.

PES expanded its intervention to create the framework needed for RE and EE. The modified Results Model in Figure 3 reflects other intervention areas that were supposed to be outside the reach of PES, but were tackled by the programme (direct contributions in blue continued line, indirect contributions in blue dashed line).

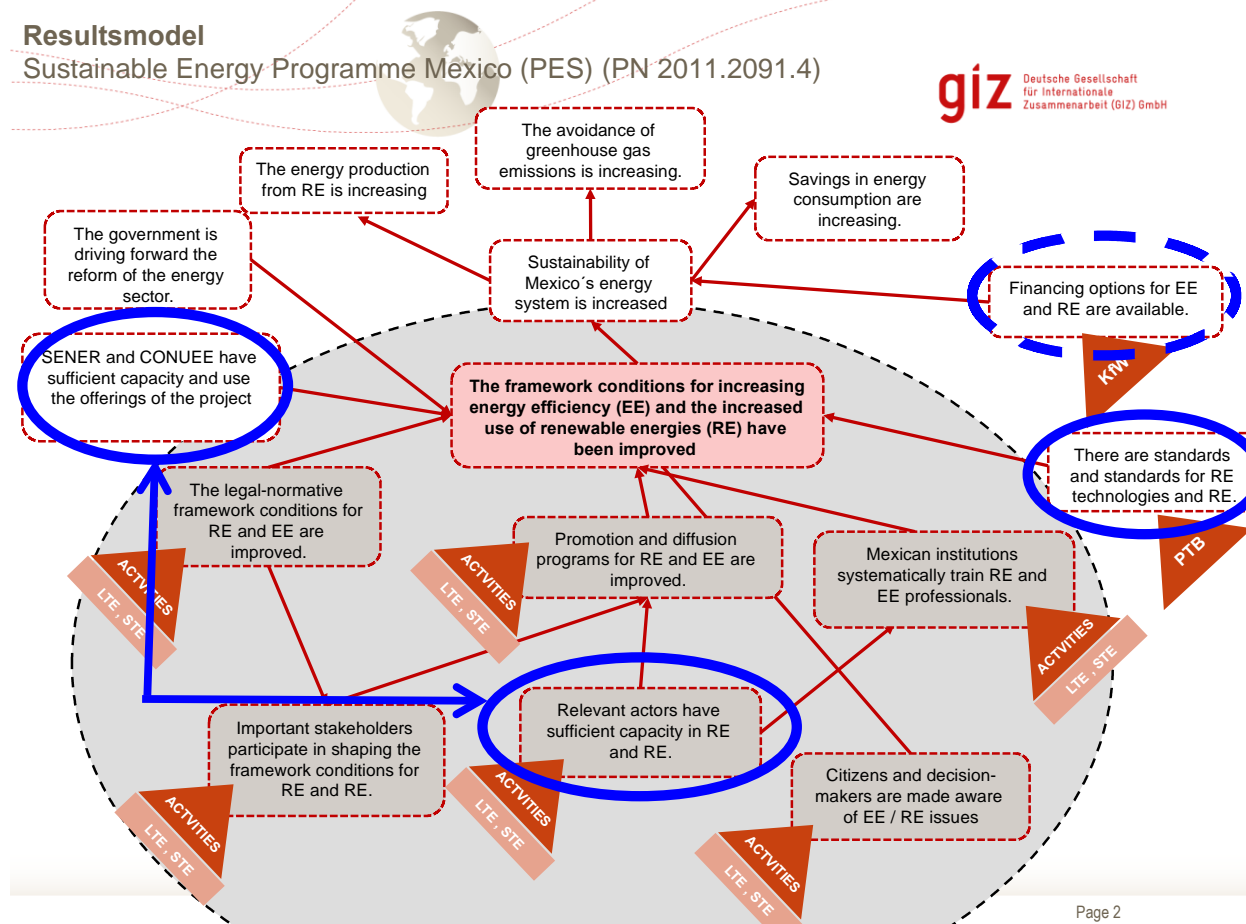


Figure 3: Modified Results Model with additional direct (solid line) and indirect (dashed line) contributions

PES intervened directly in the creation of norms and standards for RE and EE technology, as well as the standards for their installation. It also actively promoted the standard ISO 50.001. PES motivated its counterparts SENER and CONUEE to actively expand their capacities (e.g. clean energy modelling capacities, gender and energy) and address new issues such as co-generation and energy certification systems. It laid the foundations for other actors to join and invest in the RE and EE sector (e.g. World Bank and KfW being able to use the energy efficient housing design and evaluation software offered by the official housing programme

Sisevive Ecocasa for measuring sustainable housing (SH) contributions, supporting plexus software to invest in clean energy auctions with transparency in prices and modelling).

Additionally, in at least one area of action, PES exceeded, by its flexible and efficient work, the impact stated in the indicators.

*Table 8 PES contribution to training*

<b>PES contribution to training</b>	<b>PES achievements</b>
<p>At least 3,000 persons are qualified on the basis of competence standards in EE and RE, according to national standards of professional associations and state housing institutes.</p> <p>Quality criterion: 25% of whom are women.</p>	<p>1,500 people trained and certified in installation of RE equipment.</p> <p>Public–private co-development of competency standards.</p> <p>Multi-stakeholder structures (public–private Committee for Competency Management) for the diffusion, training and actualisation of existing and new competencies.</p> <p>Development of regular training providers.</p> <p>Self-financed multiplication.</p>
	<p>60 multipliers and 1,700 designers of SH, trained in the use of software for the design of social houses according to EE standards.</p> <p>Creation of a committee to maintain and promote the SW instrument.</p> <p>Public prioritisation and incentives to apply the sustainability housing standards.</p>
	<p>More than 900 women trained in (for women) non-conventional skills.</p> <p>Gender and Energy Network was built up and works autonomously with public and private, institutional and individual associates.</p> <p>Congresses and other training instances.</p>
	<p>Other training in EE, energy certification systems, learning networks, co-generation, RE.</p>

Analysing the results, one can observe that not only were the training figures reached, but also deeper foundations for replication and further development of EE and RE training were achieved. Interviewees estimated that the demand of EE and RE training needs increased to 35,000 people (Int\_7,9,13). Creating well-functioning training systems had a greater long-term effect than simply meeting the target of the number of people to be trained.

There were no project-related negative results mentioned in any interview or document. On the contrary, the interviewees repeatedly confirmed the ability of PES to react at difficult moments and support them to overcome bottlenecks and unexpected problems. (For further details, see Section 7.)

### **Contribution evaluability**

PES had fulfilled many of its objectives and, according to the Results Matrix logic, had obtained the results proposed.

Nevertheless, there was difficulty in the attribution, the evaluability and complexity of PES contributions, as there were contributions by the counterparts, the industry, and other donors and projects as well. The Evaluation Team also considered that PES's contributions, and therefore its impact, were, in some respects,

even more than those defined in the indicators of the Results Matrix. It also argued that the weight of the items measured differed from each other, as outlined in Section 5.1 Relevance.

To assess the contributions made by PES, one should consider (Wimbush & Beeston, 2010):

- the multiple interventions in the Mexican RE and EE fields targeting the same aspects, which made it more difficult to allocate or identify the programmes contributions (attribution),
- the extent to which the programme could be evaluated reliably and credibly with the existing specifications of the Results Model and the Results Matrix (evaluability), and
- the emergent or evolving focus in the dynamic setting, considering the multi-components, and the multiple partners and stakeholders involved (complexity).

### **Building a contribution story**

The following model tries to illustrate PES contributions, according to the programme's documentation and the Evaluation Team's findings. PES effectively contributed either partially or in a defining way to the increased use of clean energy and to the reduction of energy use. This impact could be measured at a small scale, but would likely grow as the energy sector initiatives matured, investments were made, and agreements and know-how continued to be practised.

Overall, it could be stated, the documented achievements at programme and module level, as well as the additional results obtained, provided substantial evidence that PES had contributed to the above-mentioned impacts. However, these contributions were not only attributable to PES. For example, the political will for Mexico to become a front runner helped their efforts, as did other donors' contributions, the capacity of leaders, which opened up opportunities, and the main reform of the energy transition, which brought additional momentum.

The contributions of PES differed, depending on the product involved. Participating in discussions about a law issued by the Mexican congress, such as the Energy Transition Law, was perceived as less important than making a contribution to the EE road map. In all cases, as elaborated in the final evaluation workshop by the Mexican participants (Int\_31), although PES support was highly valued, the main contribution was made by local institutions.

Figure 4 demonstrates this graphically. The generation of favourable regulatory conditions for EE and RE was mainly a function of the Mexican authorities, and the main opportunities for an external cooperation agency to contribute were concentrated in the study and input phase, and in the implementation phase, creating favourable conditions for the different stakeholders. Private sector and other interested stakeholders also participated intensively in the process. As fostering cooperation was recognised as one of the strengths of PES (see Section 7.2 Cooperation), there was also space for promoting public–private dialogue. The example was constructed with interviewee information on PES activities, PES's own information, and the application of common sense.

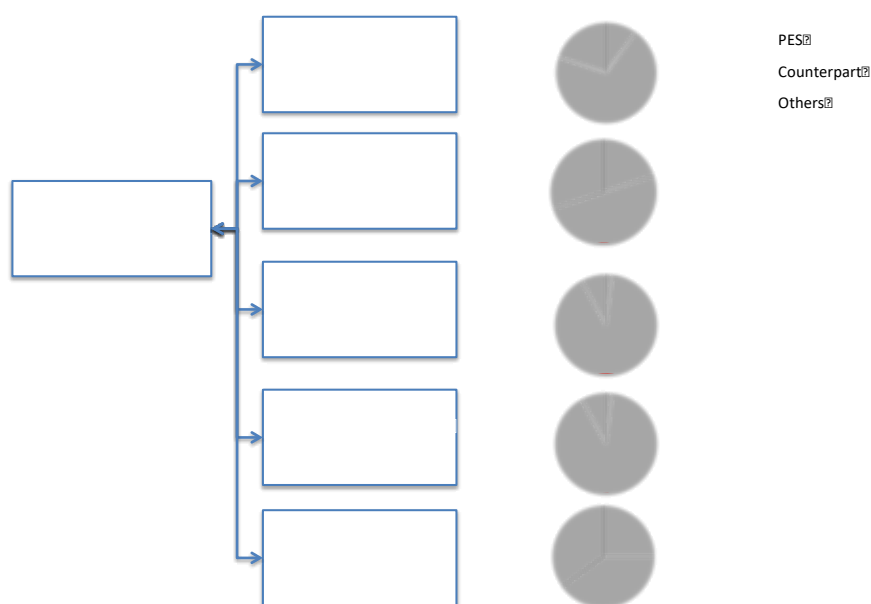


Figure 4 Estimated share of contribution to the improvement of regulatory conditions

The example also leads to a reflection on how to further evaluate the PES contribution: the amount of effort made to achieve the final product, or the relevance of the programme's input. Some of the PES ideas and contributions were the key determining input to get an initiative by the counterparts started. On another occasion, PES contributed to solving a strategic bottleneck that might have caused an initiative to fail. At other times, PES might have been just one of many sources of support. Without being able to measure these aspects, the Evaluation Team could only state that PES's contributions had been valued by counterparts and other stakeholders, based on their technical capacity and on their ability to strengthen relationships and gather the trust required to have influence.

### Main risks and strengths

An unintended risk, not directly attributable to PES, but with potential impact for the intended long-term results, was the decrease in the sale price of 1 MW/h of clean energy from USD 47.78 in the auction of 2015, to USE 33.4 in the second auction in 2016, and to less than USD 20.57 in 2017. This trend towards lower energy prices, which could be observed also in countries such as Chile, will significantly lower end consumer prices and therefore might facilitate an increase in energy consumption, unless counteracted by EE measures or others. This is especially the case as the average Mexican family's energy consumption was still significantly below the average OECD standard. The low prices also might reduce incentives to further invest in RE and apply EE measures.

Other risks and strengths of PES and its work were also addressed in Section 5.1 Relevance, Section 5.5 Sustainability, and Section 7.

### Overall assessment of impact

With regard to the evaluation dimensions, the impact indicators defined in the project proposal were largely achieved. While external factors, such as political momentum with regard to the sector transformation in 2013, played a major role in explaining these successes, the programme did address strategic measures to foster and support numerous steps towards implementation of that process.

With regard to the impact evaluation dimension 2, the Evaluation Team found that the project contributed to the

intended long-term development results.

With regard to impact evaluation dimension 3, the Evaluation Team assessed the achievement and monitoring of unintended results as a positive characterizing feature of the programme.

Criterion	Assessment dimension	Score
Impact	(1) The announced superordinate long-term results have occurred or were foreseen.	<i>35 of 40 points</i>
	(2) The project contributed to the intended superordinate long-term results	<i>30 of 30 points</i>
	(3) The occurrence of additional (not formally agreed) positive results had been monitored and additional opportunities for further positive results have been seized.	<i>30 of 30 points</i>
	(4) No project-related negative results occurred – and if any negative results occurred the project responded adequately.	
Overall rating for impact		<i>95 of 100 points</i>

The overall score for the assessment criterion impact adds up to 95 out of 100 points: very successful.

## 5.4 Efficiency

The efficiency criterion measured the extent to which objectives of a project were achieved cost effectively. The assessment of efficiency in GIZ central project evaluations was based on analysing a) production efficiency, which describes the transformation of inputs to outputs, and b) allocation efficiency, which examines the transformation of inputs to outcomes. In addition, aspects of implementation efficiency (structures and processes of project implementation) were analysed and considered in the assessment of production efficiency, since they contributed to maximising outputs. (See Section 7 for further details on project implementation.)

To perform the analysis of production efficiency, the GIZ Evaluation Unit introduced an Excel tool to carry out a 'follow the money' analysis. The tool aimed to show what resources had been spent on the respective outputs, and to analyse this against progress on the indicators associated with each output. The process of using this tool proved rather difficult, with substantial input needed by the Project Team, which had difficulty in delivering suitable inputs. As with most GIZ programmes running, PES was not conceptualised on the expectation of clear input–output efficiency, which made a post-implementation analysis along the GIZ guidelines an energy-intensive exercise, and resulted in unclear relationships between listed activities and their specific relevance to the achievement of the output.

The costs related to national personnel involved in each of the outputs. Seconded personnel and external contractors (national consultants and international consultants) could be identified without major problem, but it was not possible to reasonably identify respective costs regarding administrative expenses for both the GIZ Mexican Head Office and GIZ Headquarters. Because the project was structured along the three components mentioned above, and not along the intended outputs, assessing the efficiency in terms of outputs posed more challenges (i.e. the provision of project cost data according to those requirements).

In addition, an entire component was contracted out to a consulting firm from which differentiated data per activity and output was not available during the evaluation process. Since the sustainable building component does not have disaggregated information on the resources that were used for each output, the Project Team took many of the products that were developed in relation to one output and assigned a percentage value of the total cost of the consultancy contract. Although this was a very approximate calculation, it gave a general idea of the resources used and served as an indication for the assessment below.

Nonetheless, to conduct the assessment, the Evaluation Team (with support from the Project Team) used the Excel tool to examine how much money had been disbursed or committed so far for each of the three output areas (based on data derived from the components). It then undertook a qualitative assessment of progress on the different action areas. The process provided numbers that were then adjusted according to the respective output. It remained unclear how to differentiate the weight of each activity in terms of the achievement of the respective output objective.

*Table 10 Assessment of production efficiency*

Product objective	The framework conditions for increasing energy efficiency (EE) and the increased use of renewable energies (RE) have been improved.		
Total cost	EUR 8,465,069 (up to November 2017)		
<b>Project indicators</b>	1. At least 18 new or amended legal frameworks (such as laws, regulations, standards) to	2. At least 10 beneficial legal framework conditions for energy efficiency or renewable energies	3. There are at least 14 new or improvements to existing promotion / dissemination programmes or mechanisms involving the

	increase energy efficiency or the use of renewable energy are in place.	are being applied in practice.	private sector, two each in the areas of RE and EE.		
Target achievement	94%	90%	100%		
	<b>Outcome A</b>	<b>Outcome B</b>	<b>Outcome C</b>		
<b>Outcomes</b>	Legal-normative framework conditions for RE and EE are improved	Promotion and dissemination programmes and mechanisms for RE and EE are improved	Training and awareness raising of RE and EE professionals is improved		
				Overarching costs	
Total cost	EUR 1,632,280	EUR 1,132,4618 €	EUR 248,036	EUR 1,016,504	
Total cost in %	41%	28%	6%	25%	
<b>Output Indicators</b>	A-1: 20 drafts for new or amended legal framework conditions were developed.	B-1: There are at least 14 new support/dissemination programmes or mechanisms, or improvements to existing ones, with the involvement of the private sector, two each in the areas of RE and EE.	C-1: At least three offers for information and sensitisation on RE and EE topics were institutionally anchored (at least one of these offers must have included aspects of gender in its design).		
Target achievement	85%	64%	133%		
<b>Output Indicators</b>	A-2: It was supported in the implementation of at least 10 favourable legal framework conditions for RE or EE.	B-2: Increases in selected renewable energy systems:  Solar collectors (m2)	C-2: Support was provided for the creation of at least six initiatives for information and awareness raising on EE/RE topics (including concept for institutionalisation)		
Target achievement	70%	125%	183%		
<b>Output Indicators</b>		B-3: Photovoltaic systems (MW)	C-3: At least 3,000 persons were qualified by third parties based on competence standards in		



			RE and RE subjects, according to national standards of professional associations and state social housing institutes. Quality criterion: 25% of them are women.
Target achievement		227%	141%

The team achieved or overachieved most of the programme indicators, and therefore found a way to attribute reasonable amounts of resources for each of the outputs. The demand-oriented strategic decision to concentrate the majority of resources in 2013/2014 had proved to be wise, since it allowed the project to track as closely as possible the unexpected changes within the 'energy revolution'. It also very much helped in fulfilling the indicators, in a revised, more ambitious, version along the way (Int\_AV and Int\_7).

In addition to fulfilling its indicators, PES, through its close communication with key partners and high-quality strategic and technical advice, helped to initiate mind shifts and reduce reservation towards key elements of a sustainable energy system, such as photovoltaics (Int\_7) or cogeneration (Int\_12). Along with the US institute the National Renewable Energy Laboratory (NREL) and Danish cooperation, it created the basis for discussion in many other areas of the newly developing sector, often with limited investments in selected activities.

The strong conviction of the AV and the Project Team of the need to thoroughly understand the subject as a basis for judging the best solution available, made it easier to manage the Project more strategically and therefore more efficiently. To further select activities with potential, the Project Team assessed interest among stakeholders in order to avoid wasting resources if insufficient engagement could not be generated<sup>17</sup> (Int\_AV). Key strategic decisions (i.e. cogeneration, pumping systems) were taken, based on studies and specialists who helped convince stakeholders of their relevance, their potential and often the most efficient way to approach the issue (discussion with AV on 31 January 2018).

In comparison to other donors, costs for GIZ salaries and consultancies were considered relatively low (Int\_16, 31), providing the general personnel budget a high level of allocation efficiency.

A strong focus on coordination with various actors (e.g. the Danish contribution to SENER) and the strong dedication to the 'EE learning networks' helped greatly in making PES the most relevant donor in the sector (Int\_13,7). The friction losses of the partly atomised sector were reduced to a significant degree by the work of the programme, as it created more efficiency in key areas of the system (Int\_13,19). PES was perceived as a programme that was able to 'handle many different interests' and sustain a long process of convincing decision makers of the importance of strategically relevant topics (Int\_11). It also recognised the inter-institutional difficulties and differing priorities, and addressed them through strategic processes such as the 'Energy Efficiency Road Map' with CONUEE. PES established a level of relationship that helped to reduce unsustainable requests by partners (Int\_AV) and introduced a process of strategic bargaining that brought about a high degree of efficiency as well. The strategy of bringing change through catalysing key topics and bringing together stakeholders seems to have significantly contributed to the project's outreach and overall success. To use the opportunities and, to some extent, steer them, enabled the project to be useful, efficient and relevant throughout the changing relevance and momentum of topics (Int\_AV).

<sup>17</sup> Assessing interest (and with it specific relevance) through large stakeholder events (e.g. initial cogeneration event with numerous private-sector actors) or processes helped to get and stay on the right track.

**Allocation efficiency** considers inputs in relation to outcomes. The traditional approach for such an analysis would be to monetise the added value of outcomes. The evaluation basis for such an approach within this intervention was limited, as it was extremely difficult to monetise the added value of improved framework conditions, stronger capacities and awareness within the sector. Therefore, the Evaluation Team decided to stick with a qualitative assessment of allocation efficiency.

In Output A, much was achieved using the largest share of financial resources in this area (41%). Given the highly technical nature of this area, which required strong advisory skills, this approach was assessed positively by the partner and other stakeholders (Int\_8,13,19,22). Remaining financial resources for the final year of the intervention would be used for anchoring even further the products and mechanisms, as well as the promotion of achieved results.

Within Output B, the use of approximately 28% of project resources, the second largest share for an action area, had contributed to the achievement of the relevant module indicator before the end of the project term. When looking at the value for money in Action Area I, relevant interview partners did not identify any inefficiencies or alternative measures that could have achieved more results. No aspects were brought up, which indicate that alternative measures might have been able to achieve even more. Yet, with the focus on the efficiency tool, questions with regard to efficiency fell short in some cases.

With regard to Output C, the project made efficient use of its resources, given the overachievement in two out of three indicators with a relatively small part of the overall budget (6%). Examples are the EE Learning Networks, said to be very productive with relatively small investment (Int\_12,19) and Sisevive Ecocasa, which was able to provide the basis for developing a nationally appropriate mitigation action, as well as the financing of Plexus software, which ensured international standards and trustworthy investment.

Finally, the overarching costs of 25% were high, resulting in an administrative 'burden' that could potentially be used to even further maximise results. Nonetheless, as mentioned by some stakeholders, the strong network, reputation and capacity of GIZ as a whole might have provided the access and leverage needed to tackle the results expected and therefore more than justify those substantial overheads (Int\_16).

German Development Bank (KfW) (Int\_5) had supported various aspects throughout Mexico and some in the energy sector, yet no recent (joint) new financing was developed. This could have been an area where PES could have prepared tangible proposals to leverage its own activities.

Regarding synergies with other funding sources, leverages could be achieved with various project partners, e.g. the COGENEREA association that commenced with GIZ funds but was now fully covered by its members' contributions (Int\_12).

### **Overall assessment of efficiency**

Overall, the Evaluation Team observed an efficient allocation of resources to the outputs. The Evaluation Team awards 68 of 70 to the aspect of production efficiency.

In terms of allocation efficiency, the Evaluation Team observed examples of synergies, which could, however, be further exploited in part through better coordination within the donor landscape. In conclusion, the Evaluation Team awarded 28 of 30 points to the aspect of allocation efficiency.

The overall score for the assessment criterion efficiency added up to 96 out of 100 points: very successful.

Criterion	Assessment dimension	Score
Efficiency	The project's use of resources was appropriate with regard to the outputs achieved	<i>68 of 70 points</i>
	[Production efficiency: Resources/Services in accordance with the BMZ]	
	The project's use of resources was appropriate with regard to achieving the TC-measures' goal (outcome).	<i>28 of 30 points</i>
	[Allocation efficiency: Resources/Services in accordance with the BMZ]	
Overall rating for efficiency		<i>96 of 100 points</i>

## 5.5 Sustainability

The sustainability criterion examined the extent to which positive results of the intervention could be expected to last once the programme had ended. The potential risks for the project's products, results and overall impact could be identified within the Results Matrix, the analysis of economic, political, institutional and other framework conditions, as well as through the forecasts of the project stakeholders and the Project Team. Therefore, in many aspects, the sustainability evaluation was a – hopefully well-founded – guess rather than an accurate measurement, while in other aspects, especially at outcome level, there were relevant indications to affirm the degree of sustainability (i.e. the priority of the new government regarding-climate change policies).

The Evaluation Team analysed the efforts of the programme and its counterparts towards sustainability: whether risk-mitigation strategies with regard to the risks identified in the intervention's proposal were developed, whether learnings and recommendations from previous evaluations had been taken into account, and the extent to which approaches and tools were elaborated jointly with the partner to foster ownership. The evaluation analysed the extent to which partners were incorporating approaches and tools developed with PES, and the extent to which products were taken up, drawing on new legislation and other key documents. The evaluation examined also the extent to which external conditions, such as a change of management in any of the counterparts, or the rededication of funds, affected sustainability. Finally, the evaluation examined pointers for sustainability or an exit strategy of the project, approaches for follow up, or activities for handing over elements to partners.

The assessment of sustainability was also limited by the fact that this was an interim evaluation. Therefore, the focus of this analysis lay on future sustainability. To assess this, the Evaluation Team took into account three aspects: (1) An analysis of the extent to which selected results were being anchored in partner structures, (2) A

forecast of the durability of results based on already existing levels of ownership, and (3) An analysis of the results' balance with regard to ecological, social and economic dimensions.

### Strategies for sustainability

There were many indications to affirm that PES had been proactively considering measures to strengthen sustainability and that it was a relevant issue in decision taking. This could be deduced not only from the concerns expressed verbally by the project members, who expressed the awareness of their temporary presence and the near closure of the project, but also by the strategies the team members had developed to gain a fertile and sustainable ground for their inputs.

The Results Matrix of the recent phase mentions only three risks, all of them for the output level. Two of them were estimated as 'low':

Risks considered in the Results Matrix	Comments
1. The new government continues to focus on transforming the energy system towards a sustainable energy system and following the policies and policies developed so far. It was possible that efforts to continue sector reform would decline and climate protection would become less important. (Risk: low)	The risk was well identified, the classification as 'low' might be proved wrong in the short- and medium-term, considering the quite radical political change the new president was threatening. His party was aiming to change public administration radically. Also, one of his main promises was to strengthen the petroleum sector. In his governmental programme <a href="http://proyecto18.mx/conoce/?tab=economia">http://proyecto18.mx/conoce/?tab=economia</a> he committed to 'accelerate the transition to RE', which did not necessarily mean continuity. Although Mexico was internationally committed to climate-change adaptation and mitigation and therefore to EE and RE, this goal might get a far lower governmental priority in the near future. Therefore, in the short- and medium-term, this risk should be classified at least as medium.
2. SENER and CONUEE were efficient partners and took the opportunities offered by the project. In any case, after the elections, there would be a change of personnel in the public administration, which would meet the state actors in the energy sector. (Risk: medium)	The probability of personnel change after the elections was not a risk; it was almost certain at decision-maker levels, and it would permeate the organisation. Especially so, when the new government had no previous connection with former governing parties. Up to now, several older and experienced officials could be found in the governmental sector, some of whom had known PES since Phase I. This might change. Instability was expected and would probably affect the capabilities of the project's counterparts and the acquired institutional know-how. The risk should be classified as medium to high.
3. The country can stem the power of drug cartels and remain governable. The increasing power of cartels had so far not materially affected energy policy and economic development, but made certain regions ungovernable. (Risk: low)	Indeed, Mexico was suffering heavily by the drug cartels, and some regions were too dangerous to travel and work. Nevertheless, this seems to affect only regional initiatives and not the energy sector as a whole. From a national (not a regional or local) point of view, the risk was actually considered low.

Table 10 Assessment of risks

As observed above, the risks in the Results Matrix were well identified, but in two cases the project planning might have estimated them too optimistically.

In spite of what was written in the Results Matrix, the team actively implemented different strategies to encounter the risks at the project and its component levels:

- capacity building,
- training the trainers,
- building up Mexican organisations and networks,
- handing over organisational and technical responsibilities that were previously in the project's hands,
- extensive documentation and open publications of handbooks, good practices, training materials, etc.,
- triangulation of public responsibility with the private sector,
- direct private-sector involvement,
- 'investing' for a period of time that goes beyond the project's lifetime,
- inviting other international cooperation agencies,
- facilitating financial cooperation in specific needed areas, and
- contributing to developing new GIZ projects in related aspects.

### Prerequisite for ensuring long-term success: results are anchored in (partner) structures

Looking into **sustainability evaluation dimension 1**, the evaluation aimed to identify successful examples of anchoring results in the partner structures and how strongly each partner institution was involved in this process, creating a list of consolidated achievements. For the partner to achieve the intended effect of creating favourable legal framework conditions for RE and EE, the project contributed significantly to the legislative changes in 2013 and 2014, including the definition of ambitious targets for Renewable and Clean energy, as well as the norms and regulations for their implementation.<sup>18</sup> In addition, PES supported the mechanism for calculation and later implementation of the clean energy certificates, which created the framework conditions for a new auction-based market that was now driving a substantial rise of investments for RE. Hence, this support led to market transparency and trust in potential investments (such as the National Electric System Development Program 2016–2030, PRODESEN). Similarly, the intervention shaped the newly established standards for solar water heaters which were now adopted nationally for all the respective technologies (Int\_1,7,18). The key processes for the development and adoption of photovoltaic-related standards of competence were strongly supported. Those widely recognised standards were now integrated in the curricula of various institutions. PLEXUS software support was fundamental for defining national RE targets that changed the architecture of the market. This reform would not have been delivered without software support (Int\_19).

About **energy efficiency**, and in line with **action area II**, the project anchored its products and strategic advice for example in CONUEE through the jointly prepared EE road map for the industry, involving nearly 20 representatives from business associations, showing substantial commitment and interest (EE Road Map workshop at CONUEE). The same observation could be made for the intensively used EE learning platforms, involving numerous stakeholders and establishing this participative approach as a tool for key partners, now used with other donors, and for Cámara Mexicano-Alemana de Comercio e Industria/German Chamber of Commerce and Industry in Mexico (CAMEXA) to work with private sector stakeholders (Int\_13). Also, cogeneration was introduced as a key national topic, which was fostered in the sector by the self-sustaining COGENEREA association, hence a shift in perception about the subject. Therefore, the positive mind-shift remained (Int\_13, 6, 16). It was noted that the National Chamber of Sugar Industries took up essential support of GIZ and provided for a stable framework for COGENEREA, the key association for the promotion of cogeneration. The interest of its members remains high, though member fees do not provide for much

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<sup>18</sup> E.g. through technical support and short-notice consultancy services, the CIM-support at CRE, the active participation in congressional hearings in the process of the energy transition law.

investment. In addition, the establishment of a similar body would have taken up much more time and resources. The association proved effective in bringing all relevant topics and stakeholders together while developing a joint vision (Int\_12).

In respect to energy efficient buildings (**sustainable building**), the criteria and standards for the design and building of energy efficient housing were also substantially supported by the respective component and the head of the Project Team. Key institutions of the sector, including INFONAVIT, CONAVI, and the bank SHF, have implemented those new standards, partially financed by KfW and IDB (green mortgages). Those activities were complemented by new forms of benchmarking for energy use through private appliances, the capacity building of designers for energy efficient buildings, and key contributions for formally setting the respective normative standards (Int\_9,11). Therefore, through PES and the spin-off project of the NAMA facility, a national standard was established and nearly 100,000 newly built houses increased efficiency standards. In addition, use of solar water heaters increased from 1% in 2010 to 40% in 2018, implying that it became a strong topic in the building sector (Int\_11). Also, a financing scheme (green mortgage) in combination with solar water heaters was introduced at a national level, as well as the energy management system (Independent System Operator, ISO), which would have taken longer to become relevant in the country and now remains as guiding framework (Int\_16).

With regard to cross-cutting issues, gender and its relevance for the sector as a more general concept had been legally anchored in the energy transition law, and both key partner organisations (CONUEE and SENER) have facilitated gender-oriented training. Private-sector partners and other public institutions like the National Commission for Energy Efficiency (CONOCER), responsible for education and training, have been involved in gender programmes. Networks of women in the energy business and beyond were initiated by PES team members and have provided an energetic platform for women to organise and strengthen their positions and voices in the sector (initial workshop and interviews with AV and respective project manager). The issue of gender was well implemented and was recognised by the award of second prize in the GIZ Gender Competition 2016. The newly institutionalised women's groups in the sector continued to take up the topic in their areas of work, and the topic was considered strong and important, such as at director level in SENER (Int\_2,25). In addition to other areas, close to 90 publications and other materials on numerous sector-relevant aspects also remained available for everyone to access, in many cases providing the national standard for discussions on technology, policy and regulation within all three sub-sectors, and paving the path towards a sustainable energy system.<sup>19</sup> The massive effort regarding capacity building on various topics most certainly also left its mark, most likely within the key partners and the close to 3,000 trained professionals. Therefore, all the above approaches, methods and concepts will be continuously used by the implementing partners.

With a view on the availability of the partner resources and capacities to ensure the continuation of achieved results, a committee for standards in the sector was created, national guidelines were provided for equipment, and qualification for various sector experts, later reviewed and developed further (Int\_15). Therefore, the objectives set by Mexico for EE, as well as standards and regulations for their implementation and the industry's certification of ISO 50.001, coupled with a growing EE market in services, points to sustainability of EE processes, given that they were induced by reform (Int\_13). However, SENER does not yet have the personnel needed by a key actor in the sector (Int\_20). The Evaluation Team noted that sustainability in some areas was yet to be developed, such as strengthening the monitoring and reporting system of the industry (CONUEE), and long-term commitment to the implementation of the Road Map for Energy Efficiency in the industry.

Looking at exit strategies, such as the DKTi Solar project within the overall energy programme, ensured sustainability in terms of involvement of other stakeholders (Int\_5). It was articulated by the team on various occasions that it was systematically aiming to foster and further anchor their outputs within and beyond the

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<sup>19</sup> See PES catalogue of publications (to be published in 2018)



partner institutions (Int\_27). Whereas funding by the Government of Mexico was not adequate to address all the PES areas in the event of the termination of the project, a strong commitment by key personnel of the partners to maintain and further develop products arising from the intervention was articulated (Int\_7,12,13). Further to this, the legal and policy frameworks in the energy sector remained a key focus of GIZ and other partners, implying that resources could be continued to be directed to the intervention areas. Similarly, the capacity that was built in EE would ensure the continuity of the project.

While many products and contributions of PES have been anchored, risks remain in the political sphere. The actual phase four strongly concentrated on consolidating products and results at which it was remarkably successful. Results were aligned to international levels and adapted to Mexican standards (Int\_8). High-level ownership was perceived throughout all partners (Int\_8), and no effects with regard to CO<sub>2</sub> measures were measurable yet (Int\_12). Also, GIZ brought all key topics together, established processes and helped to develop a vision that became a strong impulse for the sector (Int\_12). PES left a mark with regard to communication, coordination, mind-shift and the multi-stakeholder approach (ref.15). It is worth noting that CONUEE staff substantially increased in size and capacity and possibly remained after elections, and donor coordination became excellent (Int\_13, 18, 22). PES had delivered the pioneer work for the sector and opened up access to other stakeholders. Many, if not all, of the contributions were well designed and were therefore difficult to undo (Int\_22), such as the high quality of the Energy Transition Law, thanks to GIZ support.

## **Durability of results**

**Sustainability assessment dimension 2** looks into the durability, stability and resilience of programme results in the longer-term. In respect of the legal and regulatory aspect, the support on key legislation was essential and the policy in place will most likely remain over the long-term. In addition, newly established market rules were strongly supported by PES and now shape the changed dynamics regarding the quality and quantity of the exponential deployment of RE and EE technology (Int\_8, Section 5.3 Impact). The project provided expert advice to the increasingly relevant partner CRE on various reform processes through a dedicated Centre for International Migration and Development (CIM) expert, introducing various regulatory instruments to the market (Int\_8). In addition, the team responsible for those areas of work increased capacity substantially, supported the adoption of a more appropriate institutional set-up and improved overall exchange and process. Capacity (especially in terms of photovoltaics) at partner level (Int\_7), including the annual joint planning process, will therefore remain. Furthermore, the creation of awareness through media campaigns reached possibly millions of people, although its sustainability was unclear in the absence of the champions and a strategy that goes beyond the available budget of PES (Int\_27). Another area that will remain was the labour and quality standard for solar water heaters (Int\_16). While the coming elections pose a serious threat to the accomplishments, tools, processes and capacities of PES, especially with regard to likely personnel changes in key positions, the methods, standards and mind-set will most likely endure, due to GIZ remaining a partner for key actors beyond the recent phase. The potentially changing administration had committed to the overall focus on RE and EE, although this does not imply continuity of many of the initiated activities and processes. While the project acts in a very dedicated, target-oriented and fast way, it puts the partner, on occasion, in a passive and receptive client role, possibly having less ownership of some of the supported projects (Int\_13).

In respect to risks and the emerging potential for the long-term protection of the results, clear risks remain for the dependency on PES in some areas, i.e. CRE, CIM support, SENER capacity building, etc. (Int\_8). The limited budget (at the end of the phase) and missing ownership failed some smaller activities, such as Aqua Morelos working with municipalities on EE in water companies. In addition, budget for own activities for networks were lacking (Int\_14), possibly limiting their reach and effects. In respect of potentials being considered and promoted by counterparts, there were newly introduced standards for credit approval with regard to environmental and social issues (Int\_1), possibly changing large-scale sustainability of housing and energy supply. Private investors became part of the RE sector and support to reduce overall electricity prices with an impact on the general population as the key target group (Int\_1). Furthermore, USAID and other

development partners addressed social conflict in RE, while PES carried out a study on its implications (Int\_21).

### Ecological, social and economic balance

**Sustainability assessment dimension 3** examined whether the results of the programme were ecologically, socially and economically balanced. Here, PES worked towards economic and ecological sustainability through the overall aim of improving deployment conditions for RE and EE technologies, potentially reducing the dependency on fossil fuel energy supply, which have substantial ecological and social costs. The adaptation of energy-saving technologies, especially in buildings, had reduced economic and ecological costs. PES most strongly addressed the economic area through, for example, improving framework conditions for more EE and more sustainable energy supply in production processes and for the general population. As shown above, its contribution to this area was substantial.

Ecological balance was addressed mainly indirectly by the promoted energy sources RE, for example, solar heaters, and EE through less contaminating technology. The social dimension was addressed directly by its workers' training and gender-advocacy activities, and indirectly through the establishment and support of women and energy networks and the cooperation with private-sector companies and an advertising campaign (Int\_25). The constant and thorough reflection within the team, and the advanced multi-stakeholder-processes, helped to incorporate various perspectives to create a high degree of usefulness and sustainability.

In regard to the intended and unintended economic, social, ecological results produced by the programme, there was stronger awareness of selected communities on energy-related sustainability aspects, such as within district governments of the state of Aqua Morelos (Int\_14). In general, a stronger vision for alternative fuel sources and RE meant that a more sustainable energy supply could reduce ecological issues through reduced fuel use and emissions that cause health risks.

**In respect to the limits of sustainability**, the work with PES was described by one interviewee as 'the most successful cooperation with any foreign partner' (Int\_13). There were numerous products that were said to remain within their targeted use and structure, which, as commented above, may change when the new government accedes to power in December 2018. Many of the products were initiated by the programme, yet almost none were exclusively implemented by PES. Therefore, they were achievements that were reached jointly with counterparts and key actors (see Section 5.3 Impact).

Counterparts and the PES team share the concern for potential changes in staff and priorities with a newly elected government within this year. A strategic approach, combined with a steady process of technical support, helped to diversify actors and responsibilities, trying, if possible, to limit the risks associated with those changes. In that respect, the active involvement of the private sector in the design of a new road map for EE in industry, as well as the empowerment of the cogeneration association COGENER to hold political and technical dialogue with the governmental institutions and Congress, were examples of a strategy agreed upon by PES and its counterparts to strongly adhere to sustainability.

### Overall assessment of sustainability

Regarding the first evaluation dimension of sustainability, the Evaluation Team found that results were relatively well anchored in the partner organisations. In each component, PES was successfully consolidating achievements in the partners' tools (social housing energy efficiency standards), methods (adoption of certified learning circle methods for EE and facilitators data bank) and structures (competency training and developing formalised private–public committees) and intends to do so until the end of the actual phase. Only in the component 'energy efficient buildings' was the project not yet able to fully institutionalise results in the partner structure due to license issues with Passivhaus and other limitations. Nonetheless, to solve this was one of the



next steps of the project management, so the Evaluation Team expected PES to further increase sustainability in this component as well. Though the efforts have been made, the unpredictable new government's reaction, and the likely staff and management replacement in the counterpart structures after December 2018, put the achievements at risk. Also, as discussed in Section 7.3, PES's flexibility to react to spontaneous requests and unscheduled needs had sporadically generated unstrategic services that put the partner in a passive and receptive client role. Therefore, the Evaluation Team awarded 32 of 40 points to the sustainability evaluation dimension 1.

Looking at durability, the assessment of sustainability delivered ambivalent results. On the sustainable side was the existence of the Energy Transition Law and the contribution to regulations, norms and standards for EE and RE, as well as the relevant clean energy auction mechanism supported by PES. To this could be added the installation of certification and training mechanisms, managed for more than a year by independent public-private institutions. The efforts to strengthen EE in water pumping were unsustainable. This did not mean that the measures originally intended were not highly relevant to the country. The project publications were available, the seed was planted, and the future might hopefully prove the Evaluation Team wrong, but unfortunately the project's products and services were not yet integrated sufficiently to achieve relevant impact and sustainability. Another non-sustainable aspect was the EE communication campaigns, which were praised by GIZ headquarters because of their quality and the width of the audience reached. Yet, in the end, they were reduced to a single campaign and discontinued by the organisations involved.

Therefore, the larger political environment had substantially changed in recent years and PES was able to work at the forefront of technical and methodological support, strongly contributing to the sector's framework conditions. The project was able to become part of a sector revolution with wide-reaching effects for renewable energy and energy efficiency in the whole country. The process of further legal and normative anchoring of RE and EE, also sustained by international agreements, was expected by the PES team and key political partners to continue in the long run, even after potential disruptions due to political change. The latter posed a serious threat to short- and even medium-term continuity.

At the operational level, the potential for sustainability without a possible radical governmental change could also be considered high, since actual partners had strongly incorporated procedures, guidelines and new methods into their day-to-day business. Partner institutions showed a high degree of ownership of the approaches, methods and tools developed together in the project. Also, the expected governmental changes and the above-mentioned products and services of PES that were not fully anchored had to be considered here. Balancing these aspects and considering the limited influence on overall national political factors, the Evaluation Team awarded 21 out of 30 points to this dimension.

Finally, the Evaluation Team observed positive results regarding economic sustainability within the above-mentioned sector revolution and its influence on industry energy consumption and overall composition of the energy mix. Energy auctions were institutionalised and market-financed, EE social housing programmes were being supported and promoted by respective banks. RE and EE certifying trainings were paid for by the trainees or public-private partnerships. Successfully addressing sustainable sources of energy and energy-savings could be evaluated as a high-level ecological dimension of sustainability (compared with the fossil-fuel-based structure of Mexico's energy sector before 2013). While the intervention strongly addressed gender mainstreaming and participative processes, it remained unclear to what extent its work could be assessed as socially balanced. Working more closely with the direct target group proved unsuccessful but could have been a stronger focus of the project's activities. With these considerations, this aspect was rated 28 of 30 points.

The overall score for the assessment criterion sustainability added up to 81 out of 100 points: successful.

Criterion	Assessment dimension	Score
Sustainability	Prerequisite for ensuring the long-term success of the project: results were anchored in (partner) structures.	<i>32 of 40 points</i>
	Forecast of durability: Results of the project were permanent, stable and long-term resilient.	<i>21 of 30 points</i>
	Were the results of the project ecologically, socially and economically balanced?	<i>28 of 30 points</i>
Total rating for sustainability		<i>81 of 100</i>

## 6 Overall Rating

Based on the above assessment, the intervention was very successful at meeting its objectives and in terms of the OECD-DAC criteria. Both on the political and technical level, the Project Team provided highly relevant and effective advisory services to the partners. Due to the challenging political environment following the elections of 2018, limitations were only found within the criteria of sustainability.

In terms of relevance, the project was rated very successful (96 out of 100 points). The project reflected and built upon key strategies of the BMZ and the Sustainable Development Goals, and supported key strategic policies of the Mexican government. The project's alignment with the UN Agenda was manifested in SDG 7, 'Ensure access to affordable, reliable, sustainable and modern energy for all', which was closely related to the project's objective.

With regards to its effectiveness, the project was rated very successful (95 of 100 points). The stated outcome indicators were all expected to be achieved by the end of the project. More than half of the output indicators had already been achieved, and the project was on track towards achieving all of them. A contribution analysis revealed that the project successfully contributed to enhancing partner capacities in line with the outcome objective. Finally, the occurrence of unintended positive results had been successfully integrated by the project; negative results could not be detected.

In terms of impact, the project was rated very successful (95 of 100 points). Though the formulation of the superordinate long-term results in terms of programme-level indicators and impact on the general population was too ambitious and far-reaching for a cooperation project, the contributions in each area could be determined and were aimed in the right direction. In terms of the programme-level indicators, most of them were achieved and some went further than declared. Reacting to emerging needs, the project had even made contributions that were not expected.

This was limited, however, by the partly inappropriate indicator system and the handling of unintended results.

In terms of efficiency, the project was rated very successful (96 of 100 points). There were considerable deviations between the initially planned and the actually spent annual resources in all action areas, which were a result of the project's ability to maximise results in the time frame, with most partner demand for significant change in the sector. Most of the areas of intervention tackled by the project were developed in close relationship with the partners, managing to raise resources from the counterparts, other cooperation agencies and BMZ cooperation as well. The project was able to attribute sufficient resources to all outputs so that almost all indicators were fully achieved, some of them even over-achieving with relatively small amounts of the budget. The high overarching costs generated the overall relationship to partners, the strategic and technically advanced management, and the strong consideration of synergies and further potentials. Regarding allocation efficiency, differences between activities could be observed, but despite this, overall efficiency was considered very successful.

In terms of sustainability, the project was rated successful (81 of 100 points). While the prerequisites for ensuring long-term success in the form of tools, concepts and approaches being anchored in the partner structure were largely fulfilled, the results of the project were assessed to be only partly durable. The project design was focused on finding technical solutions and was assessed to be successful at that. Given the important political dimension of the challenges in the energy framework, it showed a high degree of flexibility towards partner needs and strategically supporting key initiatives. Yet, the Evaluation Team believed that the political uncertainties needed to be addressed more strongly in the remaining time frame and by the follow-up

project. The elections in 2018 posed a serious threat to parts of the projects results. Moreover, the embeddedness of the project's experienced technical advisors, closely located to key teams of the partner structure, in spite of its merits, created a risk of dependency and of leaving a gap once the project was over and other priorities set. Finally, regarding economic, social, and environmental sustainability, the Evaluation Team observed positive results in most of the project's different working areas.

The overall score for all criteria added up to  $463/5 = 92.6$ , which amounted to the rating 'very successful'.

Criterion	Score	Rating
Relevance	96	<i>Very successful</i>
Effectiveness	95	<i>Very successful</i>
Impact	95	<i>Very successful</i>
Efficiency	96	<i>Very successful</i>
Sustainability	81	<i>Successful</i>
Overall score and rating for all criteria	93	<i>Very successful</i>

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

## 7 Analysis based on Capacity WORKS success factors

While the analysis of the OECD-DAC criteria did show a clear tendency for each of the evaluated areas, the Evaluation Team observed that key elements of understanding the success of the programme could not be described sufficiently through that logic of analysis. It felt that the widely used approach of Capacity WORKS and its success factors provided an additional array of perspectives that proved to be even more relevant for understanding and learning how PES came to become a 'driver' in the sector. Therefore, it intends to include an additional layer of analysis along those CW factors that are closely connected to the effects mentioned in sections 5 and 6, and provide further insight.

### 7.1 Strategy

#### Specific interventions instead of a global strategy

The PES strategy was characterised by pragmatism and flexibility, based on the original planning of the programme, focused on key activities in the sector. The framework of the strategy originated in the previous PES I programme. With the aim of 'improving the framework conditions for increasing energy efficiency (EE) and the increased use of renewable energies (RE)', the action lines and components were initially defined and kept in PES II, with slight modifications.

Although the PES strategy was grounded in the Results Matrix, that document only contained objectives and indicators, and a few activities. It was surprising that, despite the new major changes in the sector since the initial formulation in 2012 and to date, and the depth of the work carried out by PES, a more detailed all-encompassing strategy paper was not drawn up. An integral, comprehensive analysis of the elements that constituted the needed 'framework for the improvement of RE and EE' was missing, and therefore it had not been possible to explicitly select the global intervention strategy in a thoughtful, consented and shared way with the counterparts. The mission understood that this 'absence' or 'omission' was part of the strategy effectively applied by PES, which, instead, responded to qualified detection of specific needs and opportunities in the RE and EE sector. This could be partially explained by characteristics of the relationship with and between the counterparts (see Section 7.3).

The lack of an explicit global strategy gave the programme a wide margin to define its intervention. The interviewees highlighted PES's 'comprehensive approach', and its 'bandwidth with consistency' (Int\_8,13,18). At the same time, it was difficult for any of the counterparts, or even SENER, as the institution responsible for the energy sector, to have a complete panorama of the programme's focus and products and be able to participate in its regular decision-making.

Based on the guidance provided by the initial Results Matrix and its indicators, PES had lines of action – regulatory, installation of capabilities and dissemination/awareness – which were applied to ensure a transversal monitoring and compliance, but had organised its intervention strategy by components – renewable energy (RE), energy efficiency (EE) and Sustainable Building. In each of them, it had developed a sum of strategies and agreements with the respective thematic counterparts, based on specific interventions with associated products or services.

#### Combined reaction to demands and proactive offering

The strategy of PES was characterised by two types of decisions: those arising from programme initiatives (PUSH) and those determined by contributions requested by the counterparts (PULL). The strategy was also marked by the great historic opportunity represented by what several interlocutors had called the 'energy revolution' of Mexico and to which the programme had been able to react opportunely, taking into account the challenges, laws, regulations and norms the energy sector was needing.

The PUSH modality originates in the programme team's detection of potential opportunities and barriers around its central concerns, RE and EE, identifying novel or pilot aspects that might interest counterparts or other actors. These experiences included, for example, the significant efforts made by the programme to promote EE water pumping by water companies, the introduction in Mexico of the methodology of the learning networks, and the transversal incorporation of the gender component in all its activities. The initial impulse may have come from the team's know-how on the subject. It may have arisen through the identification of any need in the counterparts or related institutions that was perceived but not expressly requested by the counterparts (e.g. 'cogeneration was totally unknown in Mexico' or 'they put gender on the agenda' (Int\_7,12,18)). In relation to the OECD-DAC criteria, although some PUSH initiatives (technical assistance for EE in water pumping or in public buildings, for example) have little acceptance and continuity on the part of the responsible actors, others (e.g. the methodology of learning networks and the theme gender & energy) have become assets of great acceptance, constituting themselves in products with relevance, impact and sustainability (see Section 5).

The PULL modality needs the programme to be strategically close and available for the counterparts and other related actors, reacting quickly and flexibly to demands and identifying opportunities to grow upon the original requests made. It could be seen in many activities the programme had carried out at request of counterparts. Some of those may be spontaneous and of little relevance (e.g. organising a workshop, carrying out a small study) or, conversely, of special significance. Examples are the participation with inputs in the development of the law of energy transition and the regulations for its implementation, the appliance of software and the installation of capabilities that allow modelling and defining national goals in clean energy for Mexico. The counterparts unanimously stand out the flexibility of PES to respond to their demands and the great value they attribute to it. (Int\_7,13,15,16,22). The PES team, in turn, argues that sometimes responding to minor requests opens doors and makes it possible to have an impact on strategic issues (Int\_23,24,25,26,27).

### **Closeness to counterparts and fulfilment of expectations**

Applying the intervention focus to components, the PES strategy found acceptance and recognition by the actors involved. The different counterparts emphasised that the programme gave them 'institutional support, behaving not like just a project' (Int\_7,8,12,13). Annual agreements were established per thematic area (RE, EE, SH) with a needs-and challenges-approach (Int\_7,13,18,30,31). According to the relevant actors surveys carried out in the PES evaluation workshop, 'the ability to draw long-term objectives, generating and consolidating associated programmes' was a strength noted by 44% of participants. However, there were also unfulfilled demands, which were considered as not part of the PES or GIZ strategy. This was the case, for example, with SENER's interest in deepening geothermal RE, CONUEE's request for support to work in EE with the transport sector, or the demand for finance for an oil industry cogeneration pilot project. Actors emphasised that the programme 'has the opening, listens to you' (Int\_7,13,16,19,22), but the final decision to access the requests was reserved for GIZ, always followed by an explanation of the reason why.

PES members assured the Evaluation Team that for both the PULL and the PUSH modalities they applied the following implementation strategy: (1) make an initial diagnosis and define the baseline in the subject, (2) implement or develop the measures, and (3) install the capacities to continue developing the theme with relevant actors, and at the same time document the learnings through guides, manuals or publications.

## 7.2 Cooperation

For the actors involved, cooperation was valued as the main strength of PES: 72% of the participants of the evaluation workshop highlighted the feature of ‘promoting synergy, collaboration and coordination among the many active actors in their environment’. The cooperation modalities supported by the programme were diverse.

### *Cooperation with the counterpart*

Although this aspect has already been mentioned in Section 7.1 and will be expanded upon in Section 7.3, it should be noted that the counterparts value the proximity of PES and their close collaboration with the programme.

### *Multi-stakeholder cooperation, especially with the private sector*

‘The programme manages to attract all parties’, ‘it creates a room for trust to share with private companies’ (Int\_15), ‘gives credibility to the public sector to win over companies’ (Int\_13,31). These and many other citations were mentioned as special achievements that resulted in regular public–private coordination, which was greatly valued by both sides (see sections 7.3 and 7.5).

### *Cooperation with other donors*

Faced with the large number of active donors in the energy sector in Mexico, it may happen that the public sector requested the same product from two different organisations. In some cases, this promoted an information exchange among donors (e.g. a CONUEE meeting in which donors presented their achievements and challenges), though, on the other hand, donors mentioned that some counterpart organisations ‘sometimes does not want us to talk ‘ and ‘consider it rude if we coordinate amongst ourselves or with other actors’ (Int\_15,16). Thus, PES made agreements between donors, such as the Danish Energy Agency, the Institute for Energy Research, the US-financed Tetrattech, often in informal meetings. It also involved and attracted other donors, for example laying the foundations and context for SH funding by KfW and the World Bank (Ecocasa II Programme, EUR 260 million, Green Mortgage) and attracting the PES – EUEI PDF collaboration for CONUEE’s EE Road Map for Industries (Int\_3,5,15,16).

### *Cooperation between public sector institutions*

In an environment in which public institutions tend to pursue their own goals, this coordination had special weight. For example, although SENER had powers over the EE-agency CONUEE, the agency’s budget was independent and it develops its own work programme. The same was true in the sustainable building sector between INFONAVIT, CONAVI and the FIDE and SHF development banks. In a context of occasional controversies amongst counterparts (‘Mexican power-play’, ‘lack of institutional coordination and strategic one view between counterparts’, ‘conflicts between counterparts’ were mentioned (Int\_3,13,15,16,18)), it was valued that PES sought appointments, promoted agreements among the multiple actors of the public sector (Int\_3,9,11,13), and enforced participatory dialogues on specific topics (Int\_7,12,13).

### *Cooperation within the Energy Cluster and with other GIZ-Mexico programmes*

The projects of the recently created Energy Cluster recognised in PES a pioneer fulfilling the role of spin-off for multiple initiatives, as a ‘door-opener’ in the energy sector, motivating cooperation with cross-cutting themes and actively participating in the cluster, as well as with other programmes (eg Cluster Climate Change). Several projects have joint activities with PES (eg DKTI Solar, Energy Alliance) (Int\_1,2,4,17,18).

### *Triangular cooperation*

Last, but not least, PES had contributed to the generation of four triangular cooperation projects between Mexico, Germany and third countries, thus helping Mexico to promote its role in the Latin America and the Caribbean region. Of special interest for German Cooperation was the first triangular cooperation project with the normally not easily accessible Cuba.



According to different actors (Int\_5,6,8,12,16,22), the cooperation fostered by the programme was based on a relationship of trust achieved due to the role of 'honest broker' that listens and attempts to find the best solution.

It was strengthened by the reliability of the programme team, due to compliance with committed deliveries in time and quality, highlighting the technical capacity (see citations in Section 7.3).

PES cooperation strength was said to manifest itself in the closeness to the counterpart's characteristics and needs, and the promotion and support of stakeholder dialogues, resulting in several cases of an acquired and installed capacity among the actors (see Section 7.5). Nevertheless, it should be remembered that the coordination between actors of the RE, EE and SH components, and the general coordination of the PES, was concentrated in the Project Team: no single counterpart or counterpart committee was involved or co-managed the entire programme in conjunction with GIZ.

## 7.3 Steering structure

### General coordination in GIZ, driving structures by component

Reflecting the strategy and cooperation characteristics outlined above, PES's steering structure was determined by the three components: EE, RE and SH. All of them had a person in charge and a specific work team (with a variable number of people according to the stage of the programme); they were installed in the offices of their main counterpart institution, as they valued close proximity to their interlocutors. The general management of the programme was carried out to a large extent by the responsible coordinator. Although PES had actively and successfully promoted coordination among actors in various areas, as mentioned in Section 7.2, there was no coordinating body with the counterpart (steering committee) at programme level. Internal team meetings, the overall presence and direction of the manager responsible for the programme, and regular monitoring sessions fulfilled the function of coordination among the components, generating among the team a general vision of PES. This information did not translate systematically to the counterparts.

Confirmation of this was provided directly or indirectly by the interviewees, who mentioned differences of approach between public-sector institutions (see also Section 7.2). Although SENER exercised power over different agencies and public institutions of the energy sector, such as CONUEE, in practice there was also a wide margin for the implementation of programmes, with independent budgets and strategies (Int\_3,13,18,22). The housing sector, in turn, had a broad stakeholder map in which actors were coordinated but did not necessarily have hierarchical attributions amongst each other (Int\_5,9,11). It was mentioned that 'power is divided in Mexico', and that there were 'pulls and differing interests also in the territorial field' (Int\_31,13,15,18), hindering access to actors in the federal states and local governments as well.

In this context, the driving mechanisms of the PES strategy were adapted to the counterpart and the respective product, generating ad hoc coordination opportunities. Within the components there were spaces of shared management, with counterparts at a high institutional level (second hierarchical level in SENER and INFONAVIT, first and second hierarchical level in CONUEE). The main counterparts per component, SENER, CONUEE and INFONAVIT, mentioned the existence of annual agreements on activities, work plans agreed upon and follow-up instances once or twice a year. Spaces of direct and close collaboration with the heads of the counterpart institutions were described as open and fluid semi-informal channels to advance the issues that concerned both parties.

### Institutional capacity and decision-making

At the same time, all the counterparts highlighted and valued PES's flexibility in reacting to spontaneous requests and unscheduled needs, ranging from aspects of lower incidence, such as hiring of workrooms and



facilitators, to aspects of greater weight, such as the contracting of studies or software programmes ('it is so good that GIZ is here, it covers institutional holes' (Int\_7,9,11,13,19,22,30,31)). In these cases, there is a danger, recognised by PES, of falling into a role as a provider of isolated services that were not always strategic and putting the partner in a passive and receptive client role. Those responsible for PES analysed and weighed their participation (see Section 7.1 Strategy).

In this regard, the counterparts highlighted PES's capacity to respond and manoeuvre. Those who had contact with several donors recognised on the one hand the German cooperation's permanence and institutional establishment, as opposed to other donors, which they perceived as less stable, 'they come and go' (Int\_11, 13,22). A counterpoint was also made between GIZ's relatively broad availability of resources and capacity in terms of hiring technical advisors, as opposed to the budgetary, procedural and personnel restrictions of the counterpart: 'one step for GIZ means many steps in the public sector' (evaluation presentation workshop, Int\_31). Both partners and the PES team mentioned the work overload and functions that public institutions faced, especially after the energy reform. The support and advice of PES were highly valued in this context (Int\_7,8,9,13,19,22).

However, this capacity also had a downside, mentioned by the counterparts: GIZ, or some members of its team, were perceived by SENER and CONUEE as an occasionally strong and dominant partner: 'if we were weaker and less proactive, GIZ would define the agenda', 'they are sometimes too determined and say 'we'll do it this way' (Int\_13,22,31).

### **Credibility, transparency and closeness**

Even in this context, there was a high assessment of the credibility of PES in terms of the quality of its delivery and contribution, the professionalism of its team and the compliance with committed deadlines. Counterparts, donors and other stakeholders expressly and spontaneously mentioned the Project Team's commitment, expertise, technical capacity and contribution as outstanding features (Int\_3,6,7,8,10,11,12,13,14,15,16,17,18, 19,22,30,31).

Other highlights were (a) transparency and clarity, once the decision had been made as to whether or not to support the request of the counterpart ('they are open, they listen to you, they say 'I cannot', 'it is very clear' (Int\_12,13), and (b) PES independence from own manifest interests ('in no sense they come to sell', 'they do not move for commercial interests', 'they do not promote the German products over everything', 'they are not aligned with any interest group' (Int\_3,6,12,13,29)). This perception was founded, among others, by the PES support to the US Energy Star system, chosen by the counterparts, or to the active participation of a Spanish co-generation company.

The PES Project Team's closeness to the counterpart was particularly valued ('we have a very good and open relationship' (CONUEE), 'they know their customers, as if they were part of us' (SENER)), which was reinforced thanks to personal trust, the physical closeness in the offices of the counterparts and the long-term presence of PES in the country. The Evaluation Team believed that the personal empathic and communicational characteristics of the team, and especially of its programme leader, also played a significant role.

### **Multi-stakeholder steering structures for product or service delivery**

The component's steering structures generated by PES with the counterparts were functional for project management and therefore temporary. However, the programme had built multi-stakeholder steering and cooperation structures to develop, implement and sustain diverse specific products. Several of these structures were considered successfully installed, as the actors involved estimated that they would last over time beyond the programme. In this regard, the following could be mentioned as examples:

- REDMEREE, the Mexican Women and Energy Network, initially promoted by PES in 2015, comprised of women, men and public and private institutions, with the aim of generating transformational change empowering women as agents of change in the energy sector. Had more than 400 members and 40 allied institutions and currently works independently of the programme.
- COGENEREA México, a co-generation association, initially promoted by a PES organisational design proposal supported by SENER, CONUEE and CRE. Was comprised of actors from the public sector, companies with cogenerating potential, experts and advisers, business associations and others.
- The Committee for Renewable Energy and Energy Efficiency Competencies, with participation of the public body responsible for certifying competencies, CONOCER, as well as training centres and industry representatives. Promoted by PES, currently autonomous ([www.gob.mx/sener/documentos/comite-de-gestion-por-competencias-de-energia-renovable-y-eficiencia-energetica-35733](http://www.gob.mx/sener/documentos/comite-de-gestion-por-competencias-de-energia-renovable-y-eficiencia-energetica-35733))
- The Interinstitutional Commission for accreditation of companies providing renewable energy and energy efficiency and the 'Reliable Supplier Programme', which seeks to standardise qualities in RE equipment. Directed by SENER as the responsible institution and with the participation of public entities that play a relevant role or can grant financing: CONUEE, FIRCO, FIRA, FIDE. It consults certifying bodies, laboratories and RE companies. With strong initial support from the head of GIZ, it already had its own structure and work programme.
- The Maintenance and Updating Committee of Sisevive Ecocasa, whose task was technical decision-making in training, with the participation of INFONAVIT, SHF, CONAVI and the Housing Fund of the Institute for Security and Social Services of State Workers (FOVISSSTE). With strong initial support from GIZ, it already had its own driving structure, financing and work plan.

All these instances were characterised by (1) having emerged to solve a specific challenge in the field of RE and EE, (2) having been very actively promoted by PES, and (3) sharing the support of the public-sector counterpart of PES and convening actors from the private sector. They were multi-stakeholder's collaboration platforms that have been strengthened through participatory work methods and were now capable of sustaining themselves and fulfilling their mandate in the medium- and long-term. In this way, the programme built up functional steering structures, now independent of GIZ.

## 7.4 Processes

The PES team considered that its core processes were organised within the components (RE, EE, SH) or transversally (gender), around key products of the programme. This was reflected in the process map prepared by the programme as an input for the evaluation, based on steering processes, key processes and support. Instead of a programme outline, three schemes had been developed, one per component, with similar conduction and support processes and an organisation of key processes by each component's output. To address each of the products, the members of the programme claimed to apply the strategic analysis scheme described in 7.1. It was worth noting the integration of learning and coordination processes as an element of the key processes and products shown on the map. The description of the processes also reflected the organisation by components, the multiplicity of PES products with a variety of execution modalities, and the incorporation of cooperation and learning variables in each of the products. The – sometimes informal and spontaneous – coordination processes with the counterparts were arranged according to the pending products and deliveries. (See text on steering structure in Section 7.3.)

Together with the components' steering processes, the central processes of the programme could be deduced. The permanent presence and orientation by the PES coordinator, as well as regular team meetings, constituted this process. The PES team used a complex Excel table for collective regular comprehensive monitoring, ensuring both the follow up of the components and the contributions they made to the established programme indicators.

## Learning and innovation

In accordance with the strategy, PES contributions in learning and innovation do not seek to promote systematically and exhaustively elements explicitly and previously defined as required to build up the framework for EE and RE in Mexico. Instead, they addressed those topics in which they detect opportunities. Therefore, multiple initiatives were tackled to manage knowledge, to innovate and to install processes amongst the related actors. The team linked learning and innovation with a concern for sustainability (Int\_22,24,25,26,27). The counterparts recognised this attitude. Of participants of the first evaluation workshop, 38% highlighted the strength of the programme in 'transferring knowledge, technology and training' (int\_30), and in the interviews they commented that PES 'has developed our capacities', 'is a hotbed' and 'promotes learning' (Int\_6,7,10,12,14,19,22,29).

The team has been concerned that each of the great products or services of PES was anchored with learning and innovation, applying two modalities:

- Documenting the products and knowledge acquired in publications, manuals, application guides. At the time of the evaluation, PES had 89 publications that could be consulted and downloaded online (<https://energypedia.info/wiki/>) and were registered in a catalogue of publications ordained by subject (published by GIZ Mexico in 2018).
- Capacity-building activities on various levels, training of counterparts and relevant actors for the appropriation of the subjects. Learning networks and triangular cooperation projects provided opportunities for partners and the programme team to learn and look for innovative approaches and solutions to address

Although some counterparts affirmed that occasionally they had to insist on learning and enabling in-house skills instead of hiring external consultants (Int\_13), they predominantly mentioned multiple examples of capacity building and knowledge transfer, which were the networks and institutions promoted by PES. The following cases were briefly presented as examples of strategies followed in innovation and learning by the programme; their impacts were mentioned in Section 5.3.

### *PRODESEN – SENER*

The request made in 2014 for support for a software acquisition for the modelling of clean energy was met not only by the supply of software, but by PES experts to train on the system and develop personnel qualified to define strategic key assumptions, as well as the publication of orientating guides and manuals. Since then, and with the subsequent help of other cooperations and PES, the General Directorate of Energy Generation and Transmission had been able to model national demands for clean energy, define prices and design auctions in a transparent and traceable manner, seeking to minimise costs and pursue the fulfilment of Mexico's clean-energy goals. The alternative, without this intervention of PES, would have been to continue with the modelling system determined by the monopoly energy supplier company Comisión Federal de Electricidad/Federal Electricity Commission, or, failing that, to buy only the software, without investing in developing the required modelling capabilities for the country (Int\_19,23,28).

### *COGENER Association*

Following the model already existing in other countries, PES launched in 2013 an innovative idea for Mexico, encouraging public and private actors to partner, therefore taking advantage of new legal cogeneration, EE and financing opportunities through the system of clean energy certificates. The contribution made by PES included, among other things: a proposal for the organisational design of the association, which was validated with the participants and sponsored by the main counterparts, SENER, CONUEE and CRE; two studies of EE potential in sugar mills; the temporary management of the association, which was afterwards handed over to a representative financed by the Sugar Chamber; training and manuals, participatory workshops, calls for multi-stakeholder instances of public–private dialogue and their initial facilitation, and support for the association's congress organisation. The result of this process, expressed by members of the chamber of the sugar industry, which was a committed participant of the association, was not only the autonomous operation of Cogenera, but

also 'a change of culture in the sugar industry'. Participating companies now 'speak in carbon and in KW/hour', have detected a new business rentable both for them and their suppliers and, as a result, the yearbooks of the chamber now include analysis of energy expenditure and good practices (Int\_12).

The alternative would have been not to intervene and let the idea eventually mature. Instead, PES contributed to the public–private dialogue and to the development of the legislation and regulations favouring cogeneration, and gave support to COGENEREA, which allowed the sugar association to adopt this energy alternative in a timely manner.

#### *Learning networks*

The learning network methodology, widely applied in Germany, was introduced by PES in collaboration with CONUEE, which was not familiar with the methodology, but was interested in strengthening its dialogue with the industry. Training took place in CONUEE. The methodology was applied in several cases. Some of them were not as successful as hoped for, due to the lack of investment of the participating institutions (water pumping in Morelos, energy efficiency in public buildings), and others were quite successful (energy-management systems – ISO 50.001). In this process, the PES and CONUEE team monitored the learning procedure, obtaining lessons learned on desired characteristics of the participants, facilitators and experts, generating manuals and guidelines on how to organise a network and how to be a facilitator, and training a pool of facilitators who were now certified and registered in a Directory managed by CONUEE. The 'sustainability strategy' of the learning networks foresaw the need to promote the methodology in chambers and industry associations (it was already anchored in CAMEXA), with the aim of offering this collective learning mechanism to their partners, as a self-financed service that contributed to win–win (Int\_12,13,24). The alternative would have been either not to introduce this method or it being applied by external experts, without building local institutional capacities.

The collective design of competences related to the installation of RE, artefact quality standards, housing design with EE criteria and others, promoting their documentation, replication capabilities, certification and medium- and long-term endorsement by involved institutions, as well as the transversal installation of the theme of gender and energy in the participating institutions, were other examples of the aim of PES to leave actors of the system with the capacity to continue to progress.

The tangible achievements in this success factor do not prevent the observation that the potential for the dissemination of knowledge and experiences was even greater than what had so far been achieved.

## 8 Recommendations

The evaluation took place in January/February 2018, at a time when PES (I & II) had been operating for almost 10 years; fewer than 10 months were left before it closed. The programme team was fully aware of the need to sustainably anchor its contributions, and even designed 'sustainability strategies' for different products. Its interest coincided with the outspoken Mexican public institution's concern to leave their initiatives integrated as firmly as possible, considering that elections for a new president were to be held in July and the new government would assume its responsibilities in December 2018.

Therefore, the recommendations had to take into consideration the context of high political uncertainty and the brief period left, for which the central actions had already been defined and planned by PES.

As potential opportunities, the mission envisioned the following recommendations::

- either reinforcing or reorienting some of the already planned activities of PES,
- the adoption of tasks or challenges by other existing GIZ programmes ,
- the development of new initiatives or projects ,
- the incorporation of evaluation recommendations into the new project whose preliminary proposal (Kurzstellungnahme) had already been submitted to BMZ and was expected to start at the end of 2018, briefly overlapping with PES II,
- making suggestions of scale-up with other donors based on groundwork by the project,
- the adoption of activities/processes by different Mexican actors, mainly the private sector, and
- the institutional adoption of changes in legislation, of tools and newly established processes by the new Mexican government and its institutions.

Considering this, the mission suggested carrying out the following measures.

### **Agree to a framework of conditions required for increasing energy efficiency (EE) and the increased use of renewable energies (RE)**

As the programme followed the strategy of tackling opportunities and partial interventions, it might be appropriate to promote a shared and consensual analysis of the framework required for increasing energy efficiency (EE) and the increased use of renewable energies (RE) in Mexico even more effectively, with the focus on the nationally determined contributions (NDCs), the goals established in Mexican legislation and the Agenda 2030.

This recommendation sought to address the challenges assessed in terms of sustainability of specific actions of the programme. PES could possibly be in a position to summon public institutions, private actors, experts and actors close to the presidential candidates, inviting them to a balance of achievements, lessons learned and challenges in the sector, fostering simultaneously an ex-post reflection and a projective 'upgrade' of priorities to be addressed in the future. This recommendation assumed that it was possible to promote an open and realistic analysis (as opposed to the mere demonstration of achievements).

The benefit of this activity would be to generate a consensual orientation about future measures for the sector, promoting awareness of progress and limitations in the subject, a greater knowledge of the current state and opportunities, and strengthening networks of dialogue between actors beyond the life of PES II. A strategic and shared diagnosis about the remaining challenges in RE and EE in Mexico could be a relevant legacy delivered by a well-recognised leaving actor.

## Sustainability strategies

Extend developing sustainability strategies for additional products. This recommendation sought to face the challenges identified in terms of sustainability of specific actions of the programme. It included, for example, finding a solution for the Passive House software license used by Sisevive Ecocasa, or continuing to position and deliver the Learning Network methodology to different chambers of industry for its associates, or generating an alliance between CONUEE, SENER, the representatives of chambers of industry and the development banks for the sake of the EE Roadmap for the Industry.

## Addressing practical aspects that will remain open

Make an 'in house' survey of the aspects that could not be fully addressed by the project and therefore remain 'open', in order to identify future practical 'to-dos'. This recommendation aimed at aspects that the programme team itself, as well as other actors, identified as not sufficiently achieved. Among them there can be mentioned:

- The reinforcement of the management in Sisevive Ecocasa, which presents challenges in various aspects, such as the quality and quantity of its multipliers (training, certification), the obligatory certification of competences of housing energy advisors, the control of its verification units and others. These aspects were recognised by PES and other actors, but exceeded PES's actual possibilities. Nonetheless, they should be tackled proactively, even more so as they provide orientation for the financing of the ECOCASA III programme by World Bank and KfW.
- The monitoring and effective verification of SH construction, as well as associated energy and other savings.
- The effective reporting, monitoring and verification of achieved and future EE in the industry.
- The adaptation of the normative conditions for cogeneration, of both large and small suppliers, including remuneration, distributed generation, transmission and other aspects.
- And many other aspects that the programme and its counterparts can easily identify.

Raising these topics would have the purpose of seeking alternatives or sponsors from among the various actors mentioned above.

## Sensitisation and diffusion

This recommendation aims to maximise the usability of the multiple studies, guides and knowledge generated by PES, and at the same time take charge of the merely incipient level of awareness that the project had achieved. It was even more relevant when considering the needs of dissemination and awareness in such innovative subjects as RE and EE.

The catalogue of PES publications was recognised as a remarkable overview of vast strategic activities. This and other documents of lessons learned deserved a detailed analysis to identify further opportunities to strengthen their diffusion. Specialised entities could be addressed, as well as public servants, decision-makers (who were not necessarily specialists), beneficiary groups and the public in general. The mission was convinced that many messages and key information from the publications were being underutilised. It therefore recommended strengthening exponentially the use of communication strategies aimed at different target groups.

# Annex

## Annex 1: Evaluation matrix



**Relevance (100 points)**

Evaluation dimension	Analysis questions	Evaluation indicators	Available data sources	Other planned data collection projects	Evaluation strategy (evaluation design, method, procedure)	Expected evidence strength (narrative)	Assessment by the evaluation team
The project fits into the relevant strategic reference frameworks	What NDCs and objectives of the 2030 Agenda committed by Mexico addresses the programme?	(1) The objectives of the programme address at least 1 objective of the NDC and the 2030 Agenda.	Documents Agenda 2030 and NDC committed by Mexico	Consultation with decision makers	Document analysis	It is expected to find good quality data for min. of 3 questions	The project addresses mainly SDG 7, especially 7.2, and 7.3, but also 13 and Gender-related aspects. PES is said that it had contributed significantly to match the Energy Transition law with Mexico's NDC goals. The overall objective shows a clear linkage that are reflected within all three components, including substantial input to framework conditions and capacity development.
	Up to which point do the programme priorities tackle the energy policy of Mexico?	(2) The objectives of the programme address at least one priority objective of Mexico's energy policy	Result matrix of the programme		Semi-structured interviews with key informants		The programme has made contributions to the legislative body itself, provided for grounding studies of key priorities of the political partners and supported strategic investments in various priority objectives of the Mexican government.
			Laws and energy policies of Mexico	Identification of studies and official communications in this regard	Participative diagnosis workshops with program team, counterparts and some stakeholders	It is expected that the sources of verification related to emission targets and reduction policy are more subjective (results of the questionnaire, opinions of interviewed)	In addition, the project is also recognised for helping to increment the RE share of the revised definition of the energy mix (i.e. through the PLEXUS software and technical advice)
Suitability of the the project concept to match core problems/needs of the target groups	To what extent are the components of the programme most relevant to contribute to Mexico's emission reduction policy?		Project documents (modification offers)		Document analysis, Consultation of key stakeholders, Reflection of result model	Strong	While the project aims to also provide technical advice on key policy documents that cater for the introduction of substantial RE and EE, key pilot projects (i.e. for Cogeneration) it supports key framework conditions to reduce emissions in the energy sector. All components do respective work in this regard, addressing EE, RE and Sustainable building, leaving flexibility to address strategic needs.
	To which extent are the programme priorities the priorities of the heads of counterparts and / or other stakeholders?	(3) Compliance with indicators related to government action with programme support: Objectives and Indicators of the programme vs. relationship with measures taken up by the Government of Mexico to reduce emissions	Programme documents / reports	Semi-structured interviews with selected actors	Semi-structured interviews with key informants	Strong	All key management of political partners (SENER, CONUEE, CRE) stated, that PES is closely contributing to their key areas of work. Annual planning is jointly done, strategic decisions are based on sector expertise and partner demands.
	To what extent is the work done by the programme aligned with Germany's priorities in climate change and the 2030 Agenda?		BMZ documents, GIZ documents		Document analysis, reflection within project team	Strong	The overall strategic orientation is given by the BMZ document on Sustainable Energy for development (BMZ 2014), where PES is closely aligned with. A sector strategy is yet in the making.
	How is the programme being integrated in the Energy Cluster of GIZ Mexico and in the position papers of the German Cooperation for Mexico?	(4) Evaluation of other programmes, counterparts and other relevant actors of the contributions of the interaction with the project		Structured questionnaire filled out by the mission interlocutors and comments in interviews	Interview with cluster coordinator, review of programme planning	Strong	Given the umbrella position of PES, strategic integration of additional projects and synergies is ensured, spin-offs carry on PES work of previous phases. Due to the close relationship and coordination, this aspect was not further explored.
	Has the programme been able to adapt to the changes and priorities of the Mexican government without losing its focus on CC and NDC?		Project reports, strategic documents		Semi-structured interviews with key informants, incl. AV and management of political partners	Strong	PES has strongly been able to adapt its budget and priorities along the changes of the Mexican government objectives (see "Energy revolution" in 2013 and Energy transition law). Numerous examples show the strong dedication to supporting the government bodies in the sector while complementing with international experience, CD and strategic advice.
The conceptual design of the project was adapted to changes in line with requirements and re-adapted where applicable. The design of the project is adequately adapted to the chosen goal		(5) The objectives of the programme coincide with the emission reduction objectives of Germany and with the objectives of the Energy Cluster of GIZ	Programme Concept	Strategic documents prepared by the project team	Document analysis and reflection within team	Medium	No clear policy document on BMZ side.
		(6) Ability to adapt the programme to the changes and priorities of the Mexican government		Objectives of CC of Germany and BMZ	Semi-structured interviews and progress reviews	Medium to Strong	See above. Apart from the significant adaptation of the budget planning, the design was not changed. The relatively generic structure (RE, EE, Sustainable Building) enabled a high degree of flexibility for adaptations.
				Objectives of the GIZ energy cluster			still in the making during the evaluation process

**Effectiveness (100 points)**

Evaluation dimension	Analysis questions	Evaluation indicator	Available data sources	Other planned data sources	Evaluation strategy	Expected evidence strength	Assessment by the evaluation team
<b>The project achieves the goal on time in accordance with the TC-goals' goal indicators agreed upon the contract, or it exceeds its goals and originally planned dimensions</b>	To what extent have the agreed-upon measures been reached at the time of evaluation, measured against the goal indicators?	(1) <i>Present degree of goal-attainment and anticipated degree of goal-attainment until the end of the project phase for the outcome indicators 1 to 5 and for the output indicators</i>	<i>Verification Sources delivered by the Programme</i>	<i>Consultation with decision makers</i>	<i>Document analysis</i>	<i>Strong. It is expected to have a substantial base for evidence provided by the programme and the arranged meetings with key stakeholders.</i>	The indicator on module level are expected to be partly met ( <a href="#">ref. project monitoring data</a> ), yet unreliability of data with regard to system installations and definition (renewable vs. clean energy) does not give substantial base to fully assess this evaluation dimension on outcome level. All output indicators are fulfilled or on the path to being fulfilled.
	To what extent is it foreseeable that unachieved goals will be achieved during the current programme phase?	(2) <i>Number of initially unexpected or already achieved results in relation to defined results</i>				<i>Strong</i>	All analysed indicators on output level are expected to be fulfilled in the given time frame, some of them are already over-achieved. (see efficiency overview and monitoring data)
<b>The occurrence of additional (not formally agreed) positive results has been monitored and additional opportunities for further positive results have been seized.</b>	Did the programme obtain more and / or initially not intended or expected outputs?	(3) <i>CPs and / or other stakeholders' perception as Expressed in structured interviews and questionnaires</i>	<i>Documents delivered by the programme as input for the evaluation</i>	<i>Self-assessments and interviews</i>	<i>Semi-structured interviews with selected actors and discussion with project management</i>	<i>Strong</i>	It is assumed that a variety of additional positive results have been seized, e.g. the strategic and strong support of women-centered networks and gender-based trainings with private sector and governmental partners. ( <a href="#">ref. 7</a> ); the various pilots on cogeneration ( <a href="#">ref. 16</a> ) and the influence on aspects of the changing sector that shape its form and success long beyond the project framework (e.g. <a href="#">ref 21</a> ), as well as the numerous publications that largely define sector discussions and perspectives on key aspects. (see booklet on publications)
	The occurrence of additional (not formally agreed) positive results has been monitored and additional opportunities for further positive results have been seized.	<i>Additional positive result find mentioning on partner levels</i>	<i>Reports provided &amp; Monitoring data</i>	<i>Interview feedback</i>	<i>Triangulation with various stakeholders and discussion with project team</i>	<i>Moderate</i>	The programme team gave the impression to address additional opportunities strongly and well analysed. Especially the engagement for the preparation and implementation of the Energy transition law showed a high degree of flexibility and engagement to seize more positive results. ( <a href="#">Ref. 7, 19</a> )
<b>The services implemented by the project successfully contribute to the achievement of the goal agreed upon in the contract</b>	What external or other aspects outside the programme have contributed to the achievement or non-achievement of the objectives?	<i>External aspects are mentioned by key stakeholders</i>		<i>Programme financial reports</i>	<i>Structured questionnaire filled out by the mission interlocutors and comments in interviews</i>	<i>Moderate</i>	While numerous aspects play a role in such a substantial transformation of the energy sector as seen in Mexico, only very few stakeholders reported the projects activities as not substantially contributing (see questionnaire results); Yet, other actors like e.g. Iniciativa Climática Mexicana claim to have substantially impacted the shape of the new sector framework conditions as well, with reasonable base. (see impact analysis for exercise on percentage of perceived contribution). In addition, the governmental priorities in the USA has left even more room to maneuver in the sector, having only few donors substantially contributing to objectives.
	What concrete contributions to the strengthening and capacity-building of the counterparts has the programme made, which are established / applied in the sector?					<i>Strong</i>	PES has built capacity for thousands of people related to the energy sector (see indicator 3.2) and laid the foundations e.g. for institutional changes with regard to standards and curricula, therefore providing the base for substantially scaling-up respective outputs. In addition, the programme has strongly developed the key teams in all three partner institutions on various aspects and provided exposure through study visits and exchange with international experts. ( <a href="#">Ref. 7, 19, 22</a> )
	How is the technical planning and quality of steering estimated in the team and by the CP?	<i>Degree of planning and quality of steering by project team / key partners</i>	<i>Initial documents provided by PES; Capacity Works based reflection documents</i>	<i>Structured feedback based on Capacity Works success factors and comments in interviews/workshops</i>	<i>Ministerial or organizational objectives / Team perception / Evaluation team perception</i>	<i>Moderate - Strong</i>	The team was perceived by the evaluation team and key partners as one with a high degree of quality in technical planning and steering (Workshop questionnaire, feedback in workshops and several Interviews e.g. 12, 13). A key partner perceived the cooperation as the best with any donor. (Interview 13) A detailed analysis can be found in Chapter 7.
	To what extent did the programme management have to address the risks and hypotheses and develop alternative strategies? What happened?	<i>Degree to which Hypotheses changed over time and risks were strategically addressed</i>	<i>Annual reports and discussion on results model</i>		<i>Qualitative perception by the partner and / or other stakeholders</i>	<i>Moderate</i>	N/A
					<i>Participative diagnosis workshops with program team, counterparts and</i>		

**Impact (100 points)**

Evaluation dimension	Analysis questions	Evaluation indicator	Available data	Other planned data	Evaluation strategy	Expected evidence strength	Assessment by the evaluation team
<b>The announced superordinate long-term results have occurred or are foreseen</b>	Is there a measurable impact of the programme's work on Mexico's fulfilment of the NDCs or Agenda 2030 or its governmental strategies or goals? Or is it likely that it will do so in the future?	(1) Outcome indicators 1 to 3	Program proposals, strategic documents by the project team	Collection of further programme and stakeholder's documents	Document analysis and discussion with key stakeholders and team	Moderate. The time gap between official measurements and their publication makes it more difficult to observe short range changes of this phase.	Though actually PES' exact contribution might not be determined, it's inputs in normative aspects, specially for the introduction of Clean Energy Certificates, should be considered here. For 2018 the Mexican government has set a goal of 25% of renewable energy, 5% using the CELs mechanism. There certainly are several initiatives supported by the programme that have an impact on the reduction of energy consumption and energy efficiency. For instance, the contribution to savings in CO2-emissions using efficient building designs/norms promoted by the program is estimated at 20% of total energy. According to the International Energy Agency (IEA) Report on Mexico 2017, the Special Programme on Climate Change 2014 -2018 (PECC) summarises quantified mitigation-relevant policy measures that could lead to a reduction of some 8% of the forecast emissions by 2018. There are no further measurements available.
	What expected and / or unexpected changes have occurred since the programme has commenced its work?	(2) Programme objective & Outcome indicators 1 to 6	Progress reports, documents of reflection by the team	Perception of key stakeholders, additional sources of documents	Semi-structured interviews with key informants	Strong.	There is a plausible link between the project's output/outcome objectives and the impact level. Compared to external influence factors (global economic developments, popularity of the topic, low market prices), the project's activities appear to play a rather significant role in contributing to achieving these indicators.
	Which of those changes can be attributed directly or indirectly to the Programme?	(3) Output indicators	Documents delivered by the program as input for the evaluation	Participatory diagnosis in workshop with program team and counterparts, other stakeholders	Semi-structured interviews with selected actors	Moderate. The unexpected results and the sustainability of the resources/products are expected to be to a great extend subjective perceptions.	Several changes can be attributed to the programme: The achievements in the training area have directly been impelled by the programme (eg. EE and RE competency training, sustainable housing evaluation; several energy efficiency measures introduced by the Mexican government have directly been introduced by the project (eg. learning circles, international EE certification, EE housing standards. In RE the main contributions lay in the regulatory field. Also, the introduction of the Gender aspect in Energy Policy and measures can directly be attributed to the programme.
	Can changes for the beneficiaries (population), attributable to the Programme, be measured?	(4) CP's and stakeholders' perception of the different improvements achieved by them with the support of the programme	Mexico's NDC, project documents and reports		Interviews and discussion of additional data during mission	Moderate. The programme is expected to have a good monitoring system with information available.	The project's contribution to the national and international development agenda is (yet) limited, but will show significant results in the years to come. While the project in action area 1 supports the implementation of the SDGs through operationalization in key sector documents and regulatory conditions, it is yet unclear how these inputs have contributed to more sustainable energy supply and reduced CO2 emissions due to unreliable partner data. Given the "constructed" calculation based on available data, a contribution can be identified. Direct changes (savings in energy and water spending, higher confort) can be measured for the inhabitants of sustainable social housing projects built following the standards set with the projects' support.
	To what extend are the programme's outputs used or applied, and what are their effects on its executing institutions & beneficiaries?	Degree to which key outputs are used or applied	Annual Reports and monitoring data	Semi- structured interviews with selected actors	Participative diagnosis workshops with program team, counterparts, etc.	Strong.	Except for the area of EE in water pumping, all other main programme outputs can be considered used or applied, their application integrated in counterpart and other organisation, which have been strengthened in their capacities.
	Have long term changes in capacity building in the CP -institutions been brought up by the programme? Are these changes positive or do they have unintended negative effects?				Qualitative perception by the partner and / or other stakeholders	Strong	The CP institutions and other participants definitely confirm their capacities have been strengthened by the project. Most of them have been trained, instruments and methodologies have been installed. Some of them have gained financial independence and are self-financed
<b>The project contributed to the intended superordinate long-term results.</b>	The results and the capabilities developed under the programme are institutionalized and budgets allow for them to stay over the programme duration?	(1) Outcome indicators 1,2,6	Programme proposals	Other data and documents provided by counterparts and stakeholders	Document analysis	Strong	Though some results and capacities are, as stated above, financially independent and self-financed (eg. training, learning circles) others still need to be solved during the time left (eg. software licence to evaluate EE in social housing, new co-generation programmes). Most of the project's inputs rely on governmental budget financing, and as the Mexican's government commitment with NDCs and prevention of climate change is involved, the perspectives for continuity are good.
	The people trained and strengthened by the programme remain in functions related to the objective?	(2) Counterpart's and stakeholder's perception of sustainability of results provided in outcome indicators 3,4,5			Semi-structured interviews with key informants	Medium	This particular aspect cannot be assured, as many trained people work in governmental institutions and Mexico's governmental changes (the next in December 2018) involve a significant rotation of public servants. Nevertheless, in all institutions the evaluation mission met people that had been trained by the programme and stayed in similar posts for many years. The programme has also trained private sector actors and has made the systematization of knowledge publicly available. (see booklet of publications)
	The attributions and functions of the Counterparts and other actors strengthened by the programme are maintained over time, despite governmental changes?	(3) % of people trained and strengthened by PES that remain in functions related to the objective	Documents delivered by the programme as input for the evaluation	Consultation with decision makers	Participative diagnosis workshops with program team, counterparts and some stakeholders	Strong	It was reported by several stakeholders that key products were specifically designed and integrated to last beyond one governmental period. Though vulnerability to governmental changes cannot totally be excluded, the programme, together with its counterparts, has taken precautions to anchor attributions and functions. (Interview 13 and others)
	Are the multi-stakeholder-coordination processes supported by the programme being institutionalized (i.e. officially defined functions, budgets) in the medium and / or long term?	(4) Degree of CP's and stakeholders' perception of the sustainability of the different improvements achieved by them with the support of the project		Identification of studies and official communications in this regard	Qualitative perception by the partner and / or other stakeholders	Strong	Some of the processes are legally determined and more difficult to ignore by a new government. On the other hand, especially multi-stakeholder processes are more prone to be continued, as agreements with the private sector or other actors like international cooperation agencies have many real chances to be continued: this strategy is confirmed by several interviewees of the public and private sector.
<b>Risks and potentials of the programme contributions for counterparts, stakeholders,</b>	What are the risks and potentials of the programme, the contributions for the counterparts, stakeholders and beneficiaries?	(6) % of risks assessed by the programme team, counterparts and stakeholders already taken care of or monitored by the	Documents delivered by the programme as input for the evaluation	Semi-structured interviews with selected actors	Qualitative assessment by the programme team, counterparts and stakeholders /	Medium to strong	The assessment of the project's risk analysis and handling provides a positive picture. The proposal includes a number of key risks and suggests mitigation strategies. No explicit or additional risks were articulated during the selected interviews, workshops or questionnaires.
	Are the risks being monitored and / or taken care of?	(7) % of potentials assessed by the programme team, counterparts, and stakeholders already considered in institutional goals or projects.			Document analysis	Medium	The project did appear to follow a coherent strategy to address these risks and changing needs. Since external factors such as macroeconomic factors and the political situation play a large role in the mid- and long-term of the impact, the project did take strategic measures to address the latter by addressing the political level directly in process and technical advice (eg Interview 13)
	Are the potentials being considered and promoted by counterparts, or foreseen for a new cooperation programme?			Structured questionnaire		Strong	The programme has triggered several other German and other agencies cooperation projects. It is considered by many a kind of mother project or "sourdough" in that respect. A special new cooperation programme is being designed to start when PES is finishing.

**Efficiency (100 Points)**

Evaluation dimension	Analysis questions	Evaluation indicator	Available data sources	Other planned data sources	Evaluation strategy	Expected evidence strength	Assessment by the evaluation team
<b>Efficiency in the delivery of activities and products</b>	To what extent was the budget used in the achievement of the indicators at the output level?	(1) % of budget used to obtain the indicators at output level vs.% of budget used for non-achieved outputs (and products)	Program proposals, Cost Obligo report 2017	Collection of further programme and stakeholder's documents/ financial data	Document analysis and use of GIZ efficiency tool based on project team input and analysis	Moderate, since there is no detailed financial data of programme based on each output. Possible data is most likely a construction, causal relationships and strength of each activity is difficult to assess.	The overall use of resources was very wide and concentrated on numerous activities and products, yet its distribution was perceived as highly efficient with regard to the fulfillment of the indicators. (See efficiency tool attached)
	Were the outputs delivered on time?	(2) % of outputs delivered timely / total delivered outputs		Partners perceptions, Monitoring data	Interviews with key decision-makers and discussion with project team	Strong	The key partners explicitly referred to PES as extremely fast to respond to their needs. The evaluation team has not perceived substantial delays and assumes, that 100% of outputs were or are delivered on time. (Interviews 7,8, 14)
	Can we identify elements to reanalyze the cost-effectiveness and availability of alternatives for the achievement of the results?	(3) Perception of cost-efficiency by programme team and counterparts	Documents delivered by the programme as input for the evaluation	Consult the programme team and counterparts, other stakeholders	Semi- structured interviews with selected actors	No information on the existence of data on the total cost of the measurements implemented by the counterparts and other institutions	
	The capabilities and potential installed for the programme have been used properly?	(4) % of resources allocated by the programme as part of the total resources allocated to reach the indicators		Team and partner perception, reporting	Interviews with key decision-makers and discussion with project team based on financial data and GIZ evaluation tool	Moderate	Given the existing calculation with the GIZ efficiency tool as well as the feedback by partners and selected team members, resources were very clearly allocated to reaching the indicators, but also beyond. The very effective team was able to address substantial parts of the indicators in a short amount of time, dedicating a high, unplanned amount of resources to increase overall position and results.
	The programme resources have complemented the resources of Mexico related to the joint goals?		Programme proposals	Data from collaborating institutions (trainers, promotion of EE and ER, others)	Interviews with key decision-makers and discussion with project team	Strong	Key stakeholders have affirmed the use of project resources along strategic decisions and explicit needs for governmental reforms.
<b>Efficiency of allocation to deliver on outcomes</b>	To what extent was the budget used in the achievement of the outcome indicators 1 to 3?	(1) % of budget used in effectively achieved results		Collection of further program and stakeholder's documents	Document analysis	Moderate. There is no detailed financial data of programme based on each output available and the requested input did only provide very rough estimations.	All results were or will be effectively achieved using efficient percentages for each of the outcome indicators. (Data quality for measuring outcome indicators remains low.)
		(2) Current perception of the efficiency of the program approach by program team, counterparts and stakeholders				No information on the existence of data on the total cost of the measurements implemented by the counterparts and other institutions	No negative aspect with regard to efficiency was mentioned by interviewed stakeholders. GIZ is perceived as efficient agency with relatively low personnel cost (Interview 16) and a strong relationship to the respective partners, able to catalyse additional investments and create spin-offs (DKTI Solar, COGENEREA). Many smaller activities have produced substantial contribution to impact.
	The areas of work of the programme and the counterparts are the mechanisms most efficient to generate the framework required for increased EE and RE in Mexico?	(3) % of actual measurable outcomes and measurable outcomes expected till 12/2018 / total outcomes delivered by the programme		Consultation with the programme team and counterparts, other stakeholders	Semi-structured interviews with selected actors	Information about timeliness is expected to be available in the programme monitoring system	The programme is nearly achieving all indicators and proved to have impact beyond. Based on the ToC this indicates to have chosen the right working areas with the partners.
	The impacts of the programme can be checked with (relative) promptness?			Semi-structured interviews with selected actors	Qualitative perception by the partner and / or other stakeholders		With regard to the impact indicators, checking its progress has proven to be difficult, especially with regard to promptness and accuracy. There is no state-of-the-art national monitoring of solar installations nor substantive CO2-modelling/measuring. Further discussion with key stakeholders was not attempted, since this issue is addressed in the follow-up measure of PES.
					Processing of data provided by programme team, partners and other stakeholders		Given the calculation base available at the time of the project design and the results mentioned in the BMZ monitoring for 2014-16, evidence is strong, that the impacts will also be measurable based on a newly developed M&E system for Mexico.

**Sustainability (100 points)**

Evaluation dimension	Analysis questions	Evaluation indicators	Available data sources	Other planned data collection projects	Evaluation strategy (evaluation design, method, procedure)	Expected evidence strength (narrative)	Assessment by the evaluation team
Anchoring the contributions of the program over time	The results and the capabilities developed under the program have institutionalized and budgets that allow to stay in time	Outcome indicators 1,2,6	Program proposals	Other data and documents provided by counterparts and stakeholders	Document analysis	The information about the fulfillment of the program indicators is expected to be completed and monitored by the program	PES has anchored numerous results of its contribution within the partner structure, including cross-cutting issues like Gender and Energy as well as new methods of planning and learning. <b>Energy Efficiency:</b> In line of action II, the project anchored its product and strategic advice e.g. in CONUEE through the jointly prepared EE road map for the industry as well as the EE learning platforms that are now used with other donors (ref. 14). On the legal and regulatory side, the project provided expert advice to the partner CRE on various different reform processes through a dedicated CIM. The team responsible for those areas of work increased capacities substantially, changed to more appropriate institutional set-up and improved overall exchange and process, which will last, incl. annual joint planning process, number of contracts double every year (ref. 8). Cogeneration was introduced as a key national topic and the association COGENERAs self-sustainingly further fosters the issue in the sector, mind-shift remains (ref. 13, 6, 16); A committee for standards in the sector was created and provided standards for i.e. equipment, qualification for various sector experts and develops them further (ref. XX); Media campaigns have reached possibly millions of people, its sustainability is yet unclear (ref. 27); The issues of Gender was so remarkably done that it recieved the 2nd prize of GIZ Gender Competition; newly institutionalized women groups in the sector continue to take the topic in their areas of work; topic was considered strong and important on Director level in SENER (Ref. 2, XX); More than 90 products incl. groundbreaking studies, tools, and outlooks will remain the base for discussion in RE and EE (ref. publication booklet); Outcome indicators are largely derived from insufficient quality data, which is addressed as key area of work in predecessor project (ref. 1); Issue of Solar Water heater, "atlas de calor", and industrial process heat was established as central topics (ref. 1); transformation process that was supported a unique process and opened tremendous opportunities that created results that will last (ref. 27); PES worked as catalyst in many areas and sparked change that will most likely continue (ref. WS I); Participative processes, road map for EE in industries, EE learning networks will remain, concepts of norms and standards will further develop (ref. 13); <b>Renewable Energy:</b> Investments in RE have increased exponentially and will do so further; DKTl takes up some of the topics of PES and ensures sustainability (ref. 5); labour and quality standards for solar water heaters will stay (ref. 16); private banks are working in PV Solar projects due to project support (plus KfW), support on key legislation was essential and policy in place will most likely remain, mind-set and capacities (esp. on PV) at key partner as well (ref. 7); Market rules are now strongly supported by PES (ref. 8.) Cooperation with CAMEXA will be continued (ref. 13); EE learning networks are now used by CONUEE with other development partners (ref. 13);
					Semi-structured interviews with key informants	Information about % of staying trained people is expected to exist, and can be completed by stakeholder's assessment.	Leave no one behind principle integrated in Gender mainstreaming through decentralisation of the ministry, cp. Agenda 2030 (ref. 2)
	The people trained and strengthened by the program I remain in functions related to the theme ?	Counterpart's and stakeholder's grounded perception	Documents delivered by the program as input for the evaluation	Consultation with decision makers	Participative diagnosis workshops with program team, counterparts and some stakeholders	Medium	While the coming elections pose a serious threat to the accomplishments, tools, processes and capacities of PES, especially with regard to likely personnel changes in key positions, methods, standards and mindset will most likely remain (also due to GIZ remaining a partner for key actors beyond recent phase).
Risks and potentials of the contributions	f.) What are the risks and potentials of the program? contributions for the counterparts, stakeholders and beneficiaries?	f.) g.) % of risks assessed by the program team, counterparts and stakeholders already	Documents delivered by the program as input for the evaluation	Semi- structured interviews with selected actors	Qualitative assessment by the program team, counterparts and stakeholders		Risks remain for the dependency on PES in some areas, i.e. CRE CIM Support, SENER capacity building, etc. (ref. 8, XX); limited budget and missing ownership failed some smaller activities, i.e. Aqua Morelos working with municipalities on EE in water companies, but change of mindset remains; budget for own activities for networks, etc. are lacking (ref. 14); speed of GIZ and partners at times different, risk towards ownerships (ref. 13)
		f.) h.) % of potentials assessed by the program team, counterparts and stakeholders already considered in institutional goals or projects.			Document analysis		While many products and contributions of PES have been anchored, risks remain in the political sphere. The actual phase four is strongly concentrating on consolidating products and results and, so far, shows remarkable success in that. Results were aligned to international standards, were adapted to Mexican standards and can not go back from there (ref. 8) High-level ownership was supported through all partners (i.e. ref. 8); no effects with regard to CO2 measures yet (ref. 12); GIZ brought all key topics together, established processes and helped to develop vision, became strong impulse (ref. 12); PES has left a mark with regard to communication, coordinations, mindshift, process of multi-stakeholder-approach (ref. 15); CONUEE staff substantially increased in size and capacity and possibly remains after elections, donor coordination became excellent (ref. 13, 18, 22); uncertainties about key ministry SENER; PES has delivered the pioneer work for the sector and opened up access to other stakeholders; everything is well designed, so to put it in a bin will be difficult (ref. 22), i.e. high quality of energy transition law through GIZ
Sustainability along the three dimensions (ecological, economical, social)							Newly introduced standards for credit approval with regard to environmental and social issues (ref. 1); private investors became part of the RE sector and help to reduce overall electricity prices with effects for the general population as key target group (ref. 1); USAid and others have addressed social conflict in RE, PES created study on implications (ref. 21)

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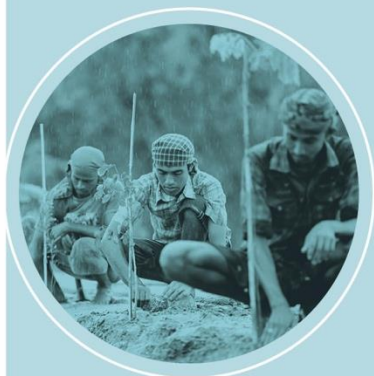
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